

Corona in both mathematical and human terms

A rational approach to managing the current pandemic requires that we identify the correct objective function: the goal we are pursuing. A meaningful objective function would maximize both life expectancy and quality of life. Protecting against death is not enough.

I realise how painful the current situation is for many people. Many of us have lost someone close to us. Others have family members who, often exhausted, fight for the lives of others every day.

For some of us, the virus is truly serious and can be fatal. Yet I believe our fear is too great. Covid is not the only serious disease, though it is new and unexpected. Unfortunately, our Western society is not prepared to accept death and we resist it at almost any cost. After more than a year of the pandemic's existence, I am confident that the protective measures of Western countries are, for the most part, excessive and therefore counterproductive. It can be reliably calculated that a number of these measures will together take away more years of human life than the virus itself.

Rational analysis

In order to reach an agreement and find a measure of social consensus, it is necessary to begin a joint discussion among experts and practitioners from multiple disciplines - not only clinicians, immunologists, virologists and epidemiologists, but also psychologists, teachers, sociologists, economists, lawyers and others. These experts must be independent and free of conflicts of interest, and their discussions must be transparent and free of dogma. Consensus building requires that we acknowledge that no one can have a completely objective view, and everyone is at least slightly biased by their specialisation and life experience. The complexity of the world fundamentally exceeds the abilities of even the best and most talented people.

The key to a rational approach to the current pandemic is to determine the correct so-called objective function, which can be imagined as our goal. It would be a critical error to try to minimize the number of deaths from Covid, regardless of other effects. Some researchers, whether consciously or not, have used this destructive objective function and many of their recommendations are, perhaps paradoxically, irrational [1]. Taken to its extreme, the objective function of "minimizing deaths from Covid" would justify locking everyone up in isolation and letting them die in solitary confinement. Yet the measure need not be so extreme to have devastating effects.

A more meaningful objective function would maximize life expectancy and quality of life. Minimising deaths is not enough. With this in mind, we realize how hard it is to defend closing society and forcing some people just to survive. Sadly those who draw attention to this fact are often labelled as manipulators or purveyors of fake news [2, 3, 4].

Impact of restrictions on human health

While COVID-19 has a major negative impact on only a small fraction of those infected, the consequences of drastic restrictive measures (such as long-term school closures) and scaremongering have a major impact on most of us. The whole of society is being destroyed

physically and psychologically, materially and spiritually. The health impact of this is substantial.

Data from Switzerland illustrates the severity of the impact of anti-coronavirus restrictions on mental health. Switzerland has seen a huge increase in severe depressive symptoms: from 3 % before the pandemic to 9 % in March 2020 and 18 % in November 2020. In young people under 24 years of age, the figure has climbed to 29 % [5]. It seems clear that the impact in the Czech Republic will have been much worse, since Switzerland has never introduced the drastic measures that we have and has, with a few exceptions, kept schools open.

The psychological effects of social isolation can affect our immune system. Our antiviral response is suppressed when we feel lonely. For example, a meta-analysis from 2010 of 148 different studies involving more than 300,000 people found that people who are more socially connected are 50 % less likely to die [6]. Stress has similarly detrimental effects on immune function because the hormones involved in the stress response - cortisol, which stimulates sugar production, and epinephrine and norepinephrine, which increase heart rate and blood pressure - interfere with immune cell function [7].

Psychological problems and mental health are critical problems for many people [8]. Trauma is also a huge problem for the elderly and many suffer in isolation [9]. Other impacts of coronavirus restrictions include domestic violence, increased suicide or suicidal ideation [10, 11]. Family and other interpersonal relationships are disrupted. One in three single parent families do not have good quality food [12]. Lockdowns create health problems, reduced immunity and strength due to lack of exercise and time outdoors. Obesity is increasing significantly, even among children [13, 14]. Many people are forced to neglect prevention, and health care is often delayed [15]. Vitamin D, which has been shown to defend against various infections including COVID, is critically deficient in most people, and a lack of sun due to anti-coronavirus restrictions has exacerbated this deficiency [16].

Comparison of impacts

The preceding factors have a major negative impact on health and shorten the lives of a large proportion of the population, some by many years. The whole population is affected and therefore, when all the health impacts above are added up, we get a loss of life of at least several months per person.

What about on the other side? Let's do the math: If 0.5 % of the population died with Covid, with an average reduction in life of 10 years (the reality is less), we get an average reduction in human life of $10 \times 0.5 \% = 5 \%$ of a year, or 0.6 months per person. That is an order of magnitude less!

How many lives do the measures save?

Given the extraordinary speed of the spread of the virus, even restrictive measures are not very effective and there is surprisingly little difference in deaths per capita between areas with heavy restrictions and those following a liberal approach. For example, we can compare the situation in Israel with three hard lock-downs and in Sweden with a maximally liberal approach [17], or California with major restrictions and Florida with minimal restrictions, among others [18]. Of course, to compare the impact on human health, one needs to consider how many lives the measures save, which is a fraction of the total number of

deaths. Thus, only a smaller fraction of the 0.6 months per person figure remains as a relevant number.

Other consequences of restrictions

Note that purely life-protection arguments are sufficient to argue against excessive restrictions. Thus, these restrictions are wrong even if we place an infinite value on every day of human life. The really difficult analysis, complex discussion and argumentation would be for a virus that was contagious like Covid but had a 73-fold mortality rate than Covid, like the MERS coronavirus!

The length of life lost is not the only deciding factor. Quality of life is also important, which of course argues against restrictive measures. The economic factor is also very crucial. Many people also have to face personal financial disasters as a result of the measures, for example, single mothers or bankrupt entrepreneurs. The total exorbitant cost of the measures in the Czech Republic will almost certainly exceed one trillion crowns. If we put a few percent of these resources into supporting the long-underfunded health service, increasing hospital capacity and nurses' pay, or preventing, for example, cardiovascular and other diseases, we would also save more lives than Covid alone will save!

Why the whole western world?

If it is thus relatively easy to logically deduce that excessive covid measures do more harm than good, how come they are implemented in most of the Western world? The explanation is, as usual, human nature. The primary problem can be summed up in the phrase:

It pays to scare!

Why? An expert who tends to scare is essentially taking no risks. After catastrophic predictions fail, he will say that he only wanted to warn (see, for example, Prof. Flegr) [19]. This is completely wrong, because scaring people is not prevention, but in itself creates health risks. Fear and stress have proven adverse effects on human health [20] and tend to encourage hysterical or aggressive behaviour. Conversely, a scientist who rather wants to encourage people to be brave and argues against extreme measures risks losing prestige if the situation worsens substantially, for example due to an unexpected mutation.

Another reason is so-called disciplinary bias. Virologists have always seen the health risks that, until recently, the majority of the population ignored and warned of our unpreparedness for epidemics. They were right, but no one listened. Now that it's happened, they're finally on a roll. It's easy to succumb to self-importance, especially when some are so deeply convinced by their narrow rationality that they can't see the forest for the trees. Many are incapable of a more objective perspective, some may not even want it.

Abuse of science

Some scientific arguments are being misused to promote extreme measures. Personally, I can comment knowledgeably on the misuse of mathematics:

One of the basic principles of mathematical modelling is an a priori distrust of any model, let alone untested models with insufficient data in terms of both quantity and quality. And that is the current reality. We can take the results of such models as indications of possible developments, but we should certainly not take heavy-handed or even drastic measures

such as closing schools on the assumption that they are correct. For example, Kulveit's model for assessing the effects of restrictive measures [21] is very unreliable and can produce very inaccurate and misleading results due to the multicollinearity of individual factors. Moreover, the model implicitly and unjustifiably assumes that all observed effects are due to government measures alone, which confounds causality and correlation. In particular, the conclusion regarding the large effect of school closures is likely to be quite wrong, not least because we have, in my view, considerably more reliable analyses [22, 23, 24]. I am frankly surprised that the author is not concerned about the possible practical implications of his analyses, because he must be aware of the problem of possible bad model conditioning given his expertise.

Let us at least open the schools

Even if school closures had a major effect on the spread of COVID, which they likely do not, the measure is not defensible. It has a major, often very negative, impact on our children, their families, and on society as a whole [25]. The impact of school closures during a pandemic in terms of interrupted education and reduced life expectancy was examined in a study in JAMA network. It concluded that missed schooling during 2020 could be associated with an estimated 13.8 million years (95% CI 2.5-42.1) of life loss based on data from US schools [26]. Incidentally, children were still going to school during World War II, unless they were being bombed.

The hospital overcrowding argument

Overcrowded hospitals are, of course, a major problem that we can clearly blame on our government. Staff shortages have long been known [27, 28]. The government totally failed regarding the transfer of patients in the badly affected Karlovy Vary region, where human lives were saved by a citizens' initiative to speed up the transfer of patients to Germany without waiting for a decision by the Ministry of Health and the government.

From a moral point of view, it is difficult to accept the situation that we cannot save a human life because of overcrowding. It is a huge problem. However, on the other hand, we cannot make more mistakes and inflict even greater loss of life, not least on our children.

What we must recognize is that the best strategy for saving lives are not severe lockdowns, but a trade-off between some rational degree of targeted and socially acceptable restrictions, to protect the lives of the most vulnerable, and the ability to live normally and minimize the impact of the pandemic and the restrictions on all of our lives. These impacts will only become apparent in mortality rates or health, economic and social problems later, but will be dramatic. Exceptionally and for a while, it may make sense to introduce restrictions because of hospital capacity, but in the long term, just surviving is not the way to go.

Covid as a messenger of change

Right now we are standing at the crossroads of history. Almost all of us, without distinction between rich and poor, face a critical situation that has forced many of us to face fear and put us outside our comfort zone. The situation is serious, potentially even critically threatening human civilization. And not because of the virus per se, but primarily because of fear, which is in fact the greatest enemy. The fear that many of us feel can be exploited. We face the risk of losing a primary human value - freedom - even in developed countries, or perhaps especially there.

Despite all the suffering that came with Covid, I can see that Covid can be an opportunity and a chance for change for our civilization. This relatively mild virus has completely changed our perception of the world, taking people out of their comfort zones and forcing us to face our fears.

Our society was on the road to total destruction, both environmentally and socially. We were living in a strangely stuffed pressure cooker that was on the verge of exploding. Covid has punched a hole in it, releasing pressure at great speed and stirring the contents. The situation is difficult, but the need to face fear and the need for change will allow us to wake up. A severely destabilised system forces change and thus opens up the possibility of fundamental positive change.

Unfortunately, we are currently locking ourselves into a new pressure cooker that is increasingly suffocating us as individuals and as a society. For the noble goal of saving lives, we accept the loss of freedom. It is sad and absurd that the loss of freedom caused by irrational restrictions is almost guaranteed to cause even greater loss of life than the virus itself.

It is fascinating how science is being misused. In the past, we have had ethnic, military or class dictatorships. Now we are facing a dictatorship in the name of science, a dictatorship in the name of health. Let us not allow fear to be artificially fostered in us in order to impose harsher lockdowns ostensibly to protect our lives. Solidarity and mutual aid have always accompanied the way out of the crisis, while artificial polarisation of opinion, aggression or even denunciation open the door to extremism and remind us of a bygone era to which we certainly do not want to return.

Six years ago, I said that in 2021 there would be a test of human civilization. I never dreamed that the trigger for global change would be biological. However, it is now our reality.

Let us find the courage and strength to live freely and accept the risks involved. Let us accept death as a part of life and we will be able to live deeper lives without fear. And long lives, if we also take active care of our health.

We all want to minimise the loss of human life. However, we must not and do not want to be weak; we want to exercise, go out and be healthy. Therefore, it is important to live freely, increase our resilience and to build our strength. And to be kind and considerate of our surroundings. And to create. We cannot sacrifice our civilization and our values for a longer life. We'd rather have a shorter one. It is better to live a short honourable life than a long shameful life. So, it is not rational to be afraid.

It's important to see the light at the end of the tunnel that drives away the darkness, just as warmth melts frozen ice or old snow. Let us not succumb to the fear that some spew at us. It is my firm belief that our future is free and rational and full of love.

1. Neracionální tlak iniciativy Sníh.
2. Prý jsem Mengele, ale já jen chci chránit rizikové, říká epidemiolog Beran.

3. Úplná katastrofa pro tělo i duši, říká lékař Balík k distanční výuce a zákazu sportování dětí.
4. Zlatý olympionik a lékař Lukáš Pollert už před deseti měsíci reakci společnosti na covid označil za „šílenou paniku“
5. Significant increase in psychological stress in the second Covid-19 wave.
6. Social relationships and mortality risk: a meta-analytic review
7. Psychological Stress and the Human Immune System: A Meta-Analytic Study of 30 Years of Inquiry
8. Češi hlásí rapidní nárůst deprese kvůli pandemii
9. Přibývá seniorů, kteří kvůli pandemii zvažují sebevraždu
10. Domácí násilí během pandemie zesílilo
11. In Japan, more people died by suicide last month than from COVID in all of 2020
12. Epidemie drtí samoživitele. Třetina nemá na kvalitní jídlo, hromadí dluhy
13. "Covid-19 není jen otázkou tělesného, ale i duševního zdraví," říká profesor Kolář
14. Děti se nehýbou, lékaři se bojí krize dětské obezity
15. Effects of the COVID-19 Pandemic on Cancer-Related Patient Encounters
16. Over 200 Scientists & Doctors Call For Increased Vitamin D Use To Combat COVID-19
17. Israel vs Sweden Coronavirus cases by Date
18. California vs. Florida: Who handled COVID-19 better?
19. Flegr: Za mrtvé může Babiš, v ulicích uvidíme mrazáky na mrtvolu, moje předpověď se plní a bude daleko hůř
20. Strach oslabuje imunitu, říká profesor Kolář
21. Inferring the effectiveness of government interventions against COVID-19
22. Kids catch and spread coronavirus half as much as adults, Iceland study confirms
23. Covid-19 in schoolchildren – A comparison between Finland and Sweden
24. Po otevření škol se tempo šíření nákazy snížilo, spočítali Němci
25. Adverse consequences of school closures
26. Years of Life Lost Associated With Primary School Closures
27. Rok 2015: Pacienti leží hodiny na chodbě, nápor nezvládáme, říká primář interny
28. Rok 2018: Situace chebské interny je kritická, tvrdí vrchní sestra