



RESPONSIBILITY, VACCINATION, VENTILATION: FROM VIRUS PREVENTION TO ERADICATION^{i, ii}

*To summarise the situation in military terms: we are at war with the coronavirus. We have put up a valiant defence through passive methods, but more than one battle has already been lost. We face a triple challenge: we will prevail against the virus if we behave **responsibly** at the individual, employer, and state level, if we can ensure the **vaccination** of a sufficient number of our fellows and friends and if we modernise our **ventilation systems**.*

The prolonged limitations to our accustomed activities, social isolation, a standstill in multiple economic areas and loss of income for many of our inhabitants pose a major interruption to the functioning of our society and have decreased the quality of life and future outlook of many of our already vulnerable fellow citizens. Medically speaking, the elderly people in particular are in danger. Mental health issues pose a threat to various social groups. Medical and education workers shoulder a vast burden. Entrepreneurs must act under unpredictable conditions. Yet, the social impact of the pandemic is the heaviest for our youth. The education of school and university students may develop gaps, and the crisis significantly limits the opportunities available for youth about to enter the labour market.

The apparent economic impact of the restrictions may be surpassed by their social impact. Already, the restrictions have polarised and distressed society. In this situation, we need fast-acting measures to avoid overburdening the healthcare system and long-term solutions. The necessary decisions are threefold: responsible behaviour, vaccination, and the modernisation of ventilation systems.

RESPONSIBILITY. Estonia has chosen to tackle the pandemic chiefly through a framework of recommendations rather than orders or restrictions. Its success depends on a reasonable distribution of responsibility between individuals, employers, and the state.

Most of our fellow citizens act responsibly. Diligent mask use, physical distance and, if necessary, self-isolation curb the spread of the virus. Statistics from these recent weeks indicate that the individual responsibility-led measures have not brought the expected result. The escalation of restrictions puts additional pressure on those who have followed recommendations and whose quality of life has suffered as a consequence. Therefore, the proportion of those ready to dismiss the recommendations and restrictions may yet increase.

The role of employers should not be limited solely to tackling the economic consequences of the crisis. It is up to them to prevent and restrict the spread of the virus by a smart organisation of work and protection of staff and clients alike (e.g., allowing remote work, online meetings, free protective gear, limiting contact, etc.). This view is supported by strategic business interests, as no short-term profit will outweigh a long-term recession.

The state's responsibility is not restricted to dealing with the crisis and its consequences; it has the mandate and the duty to prevent the excess spread of the virus and its unchecked growth. If the delegation of responsibility to individuals and employers fails to bring the desired results, the state must

compensate it with stricter restrictions and coercive measures in the interest of society. Just like the state defends us against criminals, it has an equal responsibility to protect its people and providers of vital services against the reckless behaviour of the few.

VACCINATION. All viruses, including COVID-19, are engaged in a kind of never-ending chess game with humanity. The virus always plays white. There are three possible outcomes: victory, draw and defeat. The minimum goal is always to draw. Draws are possible by perpetual check. Vaccines provide the means for perpetual check.

Rapid vaccination increases the proportion of those whom the virus can no longer infect. The presence of a sufficient number of vaccinated individuals allows us to restore social interaction and to re-open society. In the opposite case, a long-term depression is inevitable.

Hopefully, there will be enough vaccine for everybody in the very near term. This does not mean that the pandemic will disappear on its own. If a critical proportion of inhabitants remains unvaccinated, the virus will be able to draw on a large resource to spread through. As it continues to circulate, it continues to mutate, until new strains are produced against which existing vaccines may no longer work. Therefore, taking part in vaccination means responsible behaviour for the common good, and vaccine deniers pose less of a threat to themselves than to the entire society.

All vaccines approved for use in European Union are highly effective and guarantee nearly a hundred per cent protection against severe cases of the disease. Therefore, it is sensible to motivate those who doubt and mistrust vaccination, systematically debunk the arguments used by the opponents, and to reward vaccinated individuals through easing the restrictions.

VENTILATION. To win the war against the virus, we must deploy active means in addition to passive measures. To limit the likelihood of infection, the concentration of the virus must be systematically reduced: virus-laden aerosol droplets must be removed from closed spaces and virus particles must be physically deactivated.

In addition to regular airing, we must update the ventilation systems of our buildings. In our climate, large parts of the year are mainly spent indoors, in close proximity with many others. In a vast majority of cases, coronavirus infection occurs either through close contact with an infected individual or in spaces with insufficient ventilation. The virus spreads predominantly through the air and can remain active in aerosol drops exhaled by the host for several hours. Minuscule drops can spread far in airstreams and endanger many.

The concentration of the virus can be reduced using air purifiers that destroy viral particles using ultraviolet radiation at a particular wavelength. Since such equipment has seen very little use in Estonia and involves radiation, we must urgently take steps to ensure their safety, certify and deploy them.

High-quality ventilation is a long-lasting good. Air purifiers and virus-destroying equipment may provide effective solutions to future crises. The modernisation of ventilation systems of education and healthcare institutions or the construction of new systems is of the essence. It is an investment in our future, providing us with a beneficial indoors climate and a capability to stop the spread of other respiratory diseases in the long term.

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ⁱ <https://www.akadeemia.ee/en/responsibility-vaccination-ventilation-from-virus-prevention-to-eradication/>

ⁱⁱ Original text in Estonian: V3 väljakutsete vanik. Postimees, 03.03.2021, 50(7364), 15, <https://leht.postimees.ee/7192307/akadeemikud-v3-valjakutsete-vanik> . Formulated by Tarmo Soomere, Tiina Randma-Liiv, Eero Vasar, Jarek Kurnitski.