

Human choices in a simulated pandemic: New study tests interventions to foster safer behavior

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The world has relied on adherence to non-pharmaceutical interventions, such as ventilation, mask-wearing and physical distancing, to keep us

safe throughout the ongoing pandemic. With vaccines completing the toolbox, these measures and the accompanying public health messaging continue to play an important role.

Now a new study has shown that it is possible to test the effectiveness of interventions designed to foster safer [behavior](#) in order to slow the spread of a virus.

The study, led by the Max Planck Institute for Human Development, Germany, with collaborators at the University of Plymouth, UK, and the IESE Business School, Spain, found that the most effective approach was a message that directly appealed to the public, contained moral reason, and was clear and consistent.

The research, published in *Science Advances*, asked seven groups of 100 people each in a cross section of the US population to take part in games designed to emulate [virus transmission](#).

How did the game work?

The game was presented in a neutral framing, replacing terms associated with pandemics by references to neutral colors. Blue players represented healthy individuals, and purple players infected individuals.

All 100 players in each game started as blue; then eight randomly selected players were switched to purple (this represents the initial outbreak).

In each of 25 rounds, players decided between two actions: action G offering low risk and low reward (8 points) and action H offering high risk and high reward (40 points). All players were randomly paired. Blue paired with purple players may switch to purple; the transmission probability was between 0.05 and 0.25 and was determined by the

riskiness of the pair's chosen actions.

Finally, scores summed across all rounds were translated into payoffs for blue players only, at a rate of £1 per 200 points—so if they took more risks and managed to stay blue, they got a higher reward.

However, if they got 'infected' and turned purple, they lost everything.

What was being tested?

The research tested the effectiveness of different types of interventions in preventing risk-taking behavior.

The scenario was purposely chosen to be separate from COVID-19 to ensure that participants were at the same level of experience. The interventions implemented principles of several methods used by countries and media outlets worldwide, and found that people reduced their risk-taking behavior as follows:

- The most effective method was a message with the simple imperative (ie giving an instruction) with a moral explanation: "Choose action G to protect your and other players' bonus money". On average, participants also earned the highest amount of money in this condition.
- Second most effective were illustrations of the spreading consequences of early transmission.
- Third most effective was a simulator tool that allowed participants to observe the outcome of simulated games with different levels of risk-taking behavior.
- Not at all effective was sharing (purple) case rate numbers: Based on the results, people did not anticipate exponential growth in transmissions and under-reacted to initial increases.
- Worse still was the communication of 'descriptive norms'

describing other participants' behavior (eg 60% of participants chose the safer option) – this actually led to a slight increase in risk-taking behavior.

Lead study author Dr. Jan Woike, Lecturer in Psychology at the University of Plymouth, said: "Nonpharmaceutical interventions—such as wearing masks, maintaining physical distance, and reducing contacts—require large-scale behavior change, which depends on individual compliance and cooperation. The [behavioral sciences](#) offer cognitive and communicative tools to help, but the effectiveness of the methods to increase compliance has rarely been tested in controlled scenarios that still reflect the dynamics of infectious outbreaks.

"What's so important about this framework is that it allows to test the effectiveness of an [intervention](#) before implementing it in a real pandemic with health consequences for participants.

"It was interesting to note that the most effective intervention was not the one that participants liked the most. Clear and consistent messaging worked best in reducing risk-taking behaviors.

"We don't know if and when the next pandemic, or even the next concerning variant in this pandemic, may arrive, but policy-makers need to know which interventions are most likely to promote socially advantageous behavior, and this is a step to making that possible."

The full study, entitled "The Transmission Game: Testing behavioral interventions in a pandemic-like simulation," is available to view in the journal *Science Advances*.

More information: Jan K. Woike, The transmission game: Testing behavioral interventions in a pandemic-like simulation, *Science Advances* (2022). [DOI: 10.1126/sciadv.abk0428](https://doi.org/10.1126/sciadv.abk0428).

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