Schools and the pandemic: Simulation model allows for safe operation
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The research team developed and calibrated its "school tool" with data on 616 corona clusters that had occurred in Austrian schools in the fall of 2020. The anonymized data were contributed by the Austrian Agency for Health and Food Safety (AGES).

To get a sense of what measures could realistically be implemented in schools, the researchers also conducted several interviews with school principals and teachers.

The multitude of possibilities makes the undertaking complex

First, the scientists defined different types of schools: How many classes does a school have, how big are the classes, how many teachers are there at the school, etc. "In our model, we distinguish primary schools with or without afternoon daycare, lower secondary schools with or without afternoon daycare, upper secondary schools, or secondary schools with children from 10 to about 18 years," Lasser said.

These virtual schools can take different measures to prevent clusters if possible. The measures included: wearing masks, a frequent intensive ventilation of classrooms, the regular testing of children and teachers, and class size reduction.

The scientists also simulated different vaccination rates among teachers and children.

It's all about the mix

One result of the work: the measures must be adapted to different school types. "Secondary schools tend to be larger, with more children in the classes and changing teachers, so there are significantly more opportunities for infection spread. The web-based visualization we also developed shows nicely how an infection runs through a school," Lasser explains. This higher likelihood of contagion in larger schools means they need to
implement more measures than elementary schools.

Based on the delta variant, and given that 80 percent of the teachers are vaccinated, the model shows that elementary and lower secondary schools can keep the reproduction rate $R$ below 1 (i.e., one sick person infects less than one other person on average) with classroom ventilation, wearing masks, and class size reduction even when children are not vaccinated. In all other types of schools, the same measures can help to keep $R$