

Corona Pandemic: Fraunhofer ITWM Advises State Government of Rhineland-Palatinate



During the Corona pandemic, the weekly forecasts for the expected infection numbers by Fraunhofer ITWM are important indicators for the state government of Rhineland-Palatinate to make political decisions. Our researchers have contributed to the fact that the state has weathered the pandemic better than other German states.

“The forecast for the coming days” – a phrase you’re actually more familiar with from weather reports, but not in connection with hospital loads, intensive care bed occupancies and mortality rates. In the Corona pandemic, the forecast of the number of infections is a crucial factor in deciding whether to tighten or loosen protective measures.

Provide decision makers with solid foundations

In April 2020, Fraunhofer ITWM began making forecasts of pandemic developments. Initially, in order to better prepare hospitals, municipalities, and public health departments for what was to come. “It was clear to us: we can calculate what’s coming. Then we asked the district councils and mayors in Rhineland-Pa-

latinate whether they needed help. For the political players, our calculations were authoritative decision-making criteria.”

Behind the forecasts is a dedicated team that brings together diverse expertise and experience across departments to jointly contribute to pandemic response. The accuracy of the predictions is remarkable. The Rhineland-Palatinate state government is also aware of this fact, so that a weekly meeting has been arranged with representatives of the Ministry of Science and Health and the State Investigation Office since August 2021. The results received attention by several ministries and by Minister President Malu Dreyer. The cooperation is having an effect: Rhineland-Palatinate is coming through the pandemic relatively unscathed.

Contact

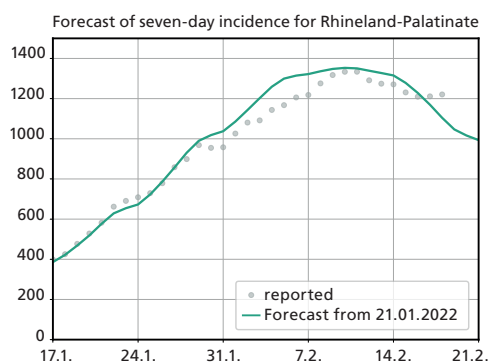
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Calculating the Future From the Past

“We have developed a simulation and forecasting program to look into the future based on reported values from the past,” says Dr. Jan Mohring from the “Transport Processes” department. What is modeled is how the infection figures develop. Parameters are contact, testing and vaccination rates. The dynamic events are reconstructed on the basis of the numbers recorded over the last few weeks. For this purpose, the contact and detection rates are adjusted so that the model reproduces the reported new infections and deaths for the past. The parameters found are then used to extrapolate the spread dynamics into the future. From this, forecasts can finally be made for indices such as mortality rates or intensive care bed occupancy rates.

During the pandemic, the system could be increasingly supplemented and adapted. The accuracy of the hits impressed everyone involved: “We predicted the peak incidence of the fourth wave in February 2022 for Rhineland-Palatinate to the day and the incidence with a deviation of about 20 cases – and that three weeks in advance,” says Mohring. This also makes it clear that testing is an important part of the pandemic response. In Mohring’s



The maximum of the Omikron-BA.1 wave was predicted three weeks earlier with a deviation of less than two percent.

view, even more crucial than contact restrictions, which is why Fraunhofer ITWM was an early advocate of representative testing in

schools as a containment measure. The state was also one of the first to introduce 2G-Plus on the advice of Fraunhofer ITWM.

Mirroring Human Behavior

With relaxations in the summer and the scaling back of regular testing, it became more difficult to provide concrete forecasts. However, since a changing detection rate is explicitly taken into account, forecasts remain at least possible with trade-offs in accuracy. Therefore, the Fraunhofer ITWM continues to work on its modeling software and is starting a new project with the Catastrophe Research Center from Berlin and the German Research Center for Artificial Intelligence (DFKI), in order to be able in the future to incorporate feedback that takes greater account of people’s behavior more closely. “Central to this for us is the question is how knowledge of a threat situation influences people’s influences people’s behavior,” says Mohring.

When Will the Pandemic Be Over?

The question about the end of the pandemic has often been asked to the researchers of Fraunhofer ITWM. There is a consensus: We will not get rid of Corona any time soon. Depending on the prevailing variant of the virus, the summer months will be more summer months will be more relaxed than the cold seasons. Küfer and Mohring agree, however agree: “The fall wave will roll.” Measures will depend on the particular variant of the virus. The consulting services of the Fraunhofer ITWM for the state of Rhineland-Palatinate will continue.

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