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Covid-19: “Freedom day” in England could lead to “significant third wave of hospitalisations and deaths,” modelling predicts

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The government’s decision to lift all covid restrictions in England on 19 July could lead to “a significant third wave of hospitalisations and deaths,” modellers have projected.

Researchers at Imperial College London evaluated the impact of removing non-pharmaceutical interventions such as physical distancing and mask wearing on 19 July in a range of scenarios, including variable vaccine efficacy and people’s different behaviours.

The team noted uncertainty about the level of impact but concluded, ¹ “Across all transmissibility and vaccine effectiveness scenarios explored, we estimate that lifting restrictions on 19 July in the context of [the delta variant] could lead to a significant third wave of hospitalisations and deaths.”

On 12 July England’s health secretary, Sajid Javid, confirmed ² that the government would proceed with the removal of all mandatory restrictions including social distancing and mask wearing on 19 July, which ministers have dubbed “freedom day.” Javid insisted that all four government tests to trigger the removal of restrictions had been met, including that the NHS would not be put under unsustainable pressure by infection rates.

He told the Commons, “Cases are rising, propelled by the new, more transmissible delta variant. We could reach 100 000 cases a day later in the summer. Hospitalisations are also rising, with sustained growth over the past month—and once again, they will rise too.

“But we should be encouraged that hospitalisations are far lower than they were at this point during the previous wave. On the basis of the evidence in front of us, we do not believe that infection rates will put unsustainable pressure on the NHS.”

However, a modelling paper released by the government’s Scientific Pandemic Influenza Group on Modelling (SPI-M-O), ³ a subgroup of SAGE, struck a more cautious tone.

“The scale of the resurgence in hospital admissions after 19 July is highly uncertain and depends on unknowable factors including how behaviours change in the coming weeks and months,” it warned. “Many modelled scenarios show a peak in hospital admissions well below that of January 2021, but SPI-M-O cannot rule out a wave of a similar or even larger scale.

“Given this uncertainty, it would be prudent for contingency plans to be put in place for how to respond if hospital admissions approached levels that could disrupt the smooth functioning of health services.”

SPI-M-O’s paper was based on separate modelling from a range of sources, including teams at Imperial, the London School of Hygiene and Tropical Medicine, the University of Warwick, and the Juniper consortium.

What does the modelling show?

The Imperial team’s modelling predicts that, in all scenarios explored, lifting restrictions on 19 July in the context of the delta variant could lead to a total additional number of deaths ranging from 9400 (95% credible interval 4600 to 19 800) in the most optimistic scenario to 115 800 (81 700 to 143 600) by 1 June 2022.

In a scenario where people’s adherence to current precautionary measures wanes gradually from 19 July onwards, the Imperial team forecast substantially lower numbers of hospital admissions (central assumption 258 300 (173 600 to 360 000)) and deaths (central assumption 33 700 (21 600 to 48 000)) than if adherence drops off suddenly from 19 July (central assumption 283 500 admissions (161 800 to 445 400); central assumption 36 700 deaths (20 600 to 59 200)).

By comparison, delaying a full lifting of restrictions until 16 August but with a sharp increase in transmissibility at that point would delay the third wave but have less of an effect on peak admissions or total deaths, the team’s modelling showed.

The Imperial researchers said that—beyond the key message to get vaccinated if you are eligible—good adherence to mask wearing, social distancing, and the use of test, trace, and isolate after 19 July, along with other measures, may play an important role in reducing admissions and deaths, “as it could dampen and slow the increase.”

Speaking at a Science Media Centre briefing, Anne Cori, lecturer in infectious disease modelling and a member of the Imperial team, said, “If people act cautiously after 19 July so that we have a gradual rather than an abrupt return to contacts . . . like continuing to wear a mask, continuing to work from home if you are able to . . . all of that will be beneficial.”

Behavioural uncertainty

The London School of Hygiene and Tropical Medicine (LSHTM) ⁴ made similar projections on hospital admissions and deaths in its modelling, also highlighting the uncertainty around the impact of behavioural changes.

For example, in a scenario with no waning immunity and medium estimates of vaccine efficacy, the LSHTM team projected that an 80% reduction in self-protective measures—such as the use of test,

trace, and isolate, physical distancing, and mask wearing—might result in 160 000 hospital admissions and 19 000 deaths from 1 July to 31 December 2021. In contrast, a 20% reduction in such measures is projected to lead to 82 000 hospital admissions and 9000 deaths.

Nicholas Davies, assistant professor of mathematical modelling at LSHTM, said that while it was difficult to untangle the impact of each intervention on transmission risk, an increased riskiness among contacts overall after 19 July was clearly “the biggest difference.”

“It has a much larger impact on the magnitude of the peak: there is almost a doubling the size of the peak in terms of admissions and deaths,” he told the briefing.

If there is a high level of mobility after 19 July the team’s projections are 160 000 hospital admissions and 18 000 deaths. If there is low mobility the projections reduce to 81 000 hospital admissions and 8900 deaths.

Davies said, “We know the vaccines are highly efficacious; we don’t know what is going to happen with behaviours.”

Gradual release will slow peak

The University of Warwick team modelled seven scenarios, all of which generated a third wave this summer. Scenarios with the slowest decline in precautionary behaviour generated the smallest wave, with a projected peak in daily hospital admissions of 668 (prediction interval 530 to 951), while scenarios featuring a relatively abrupt change in behaviour after 19 July led to the largest third waves, with a peak of 2490 (1270 to 4760) daily hospital admissions.

Matt Keeling, professor of populations and disease at Warwick, told the briefing that his team’s modelling⁵ showed that a gradual release of restrictions was likely to produce a far smaller wave than a sudden “explosion.”

He explained, “We are saying that there is very limited benefit from delaying further beyond 19 July. But what we are stressing is that when we open up, it has to be a gradual approach and done with care. If we suddenly change behaviour there is going to be a much larger epidemic.”

The Warwick team’s estimates on admissions are lower than those made before the one month delay in relaxation and the increased vaccine efficacy estimates, but it warned that this scenario “could still place a heavy burden on healthcare services.”

Louise Dyson, associate professor in epidemiology at Warwick, told the briefing, “There is not really a threshold at which everything [in the NHS] falls over—there is just a gradual degradation in the care they are able to provide. There will also be regional variation.”

Keeling added that “huge amounts of uncertainty” remained about the impact of opening up on the number of deaths. “We don’t really have a good understanding of vaccine efficacy against mortality,” he said. “Forecasting death is much more difficult than anything else.”

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