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Covid-19: Expedite vaccination or deaths will surge, researchers warn

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Deaths from covid-19 in England in the first half of 2021 could exceed those seen in the whole of 2020 unless the vaccination programme is vastly increased and a national lockdown implemented—with educational settings closed for at least a month—researchers have warned.

In a preprint released on 24 December,¹ researchers from the London School of Hygiene and Tropical Medicine used modelling to compare the effects of varying covid-19 restrictions on the virus spread, hospital and intensive care admissions, and deaths from 15 December 2020 to 30 June 2021. The model took account of the new variant spreading rapidly in southern England, which it estimated to be 56% more transmissible than non-variant covid-19.²

As of 11 December 2020 some 67 591 people in England had covid-19 on their death certificate, the government's dashboard advised.³ Currently, the government plans to stagger the reopening of schools from 4 January. However, its Scientific Advisory Group for Emergencies (SAGE) has reportedly warned that infections will become uncontrollable unless secondary schools are closed in January.⁴

The study, which has yet to be peer reviewed, said that control measures similar to the November national lockdown would be “unlikely to reduce the effective reproduction number to less than 1, unless primary schools, secondary schools, and universities are also closed.” It added that it would be necessary to “greatly accelerate vaccine rollout to have an appreciable impact in suppressing the resulting disease burden.”

Restriction scenarios

The research team compared three main scenarios. The first considered the impact of having only tiers 1 to 3. The second looked at what would happen if tier 4 were introduced from 20 December in the East of England, London, and South East regions and then in all other regions of England from 26 December until 31 January 2021. The third scenario was the same as the second but also included schools and universities remaining closed until 31 January 2021.

The preprint reported that scenario 1 (tiers 1 to 3 only) would lead to a peak intensive care (ICU) burden of 162% relative to the first wave, 426 000 hospital admissions, and 118 000 deaths, by 30 June. Scenario 2 (nationwide tier 4, education open) would lead to a peak ICU burden of 113%, 394 000 admissions, and 107 000 deaths. Scenario 3 (nationwide tier 4 plus education closed) would lead to a 114% peak ICU burden, 375 000 admissions, and 102 000 deaths.

It noted that the peak ICU burden was slightly higher under the “schools closed” scenario than in the “schools open” prediction because closing schools would shift the peak to later in the East of England,

South East, and London regions, to coincide with the projected peak in other regions.

The researchers said that closing schools in January might “delay the peak and decrease the total burden in the short term” but that a lifting of these stricter measures in February 2021 would then lead to a “bigger rebound in cases, particularly in those regions that have been least affected so far.” Despite this, they said, these delaying measures “may buy time to reach more widespread population immunity through vaccination.”

Vaccination scenarios

The research team looked at two vaccination scenarios on top of the third lockdown scenario: 200 000 vaccinations a week (similar to the rates reached in December 2020); and two million vaccinations a week. They assumed that vaccine rollout started on 1 January 2021, that the vaccine had a 95% efficacy against disease and 60% efficacy against infection, and that vaccine protection was provided immediately on receipt of one dose.

In the 200 000 weekly vaccination case the researchers predicted that the peak ICU burden relative to the first wave would be reduced to 104%, admissions would drop to 335 000, and deaths would fall to 83 000. If vaccine rollout were accelerated to two million a week the peak ICU burden would drop to 84%, admissions to 147 000, and deaths to 35 700.

“In the absence of substantial vaccine rollout, cases, hospitalisations, ICU admissions and deaths in 2021 may exceed those in 2020,” the paper warned.

It added that “even Tier 4 measures together with closure of educational facilities are less stringent than the measures imposed in March 2020, and therefore it is possible that restrictions beyond Tier 4 may be required. If children are more susceptible to [the new variant] VOC 202012/01 than to pre-existing variants, we expect that the impact of school closures would be larger.”

The preprint has a number of limitations, including that the conclusions about school closures were based on the assumption that children had lower susceptibility and infectiousness than adults and that the efficacy of tier 4 measures was based on the second national lockdown in November, as tier 4 had not been in place long enough to determine effectiveness.

1 Davies NG, Barnard RC, Jarvis CI, et al. Estimated transmissibility and severity of novel SARS-CoV-2 Variant of Concern 202012/01 in England. Dec 2020 (preprint). https://cmmid.github.io/topics/covid19/reports/uk-novel-variant/2020_12_23_Transmissibility_and_severity_of_VOC_202012_01_in_England.pdf.

2 Mahase E. Covid-19: What have we learnt about the new variant in the UK? *BMJ* 2020;371:m4944. doi: 10.1136/bmj.m4944 pmid: 33361120

3 Deaths in England. Gov.uk. Dec 2020. <https://coronavirus.data.gov.uk/details/deaths?areaType=nation&areaName=England>.

- ⁴ Hymas C. Secondary schools must stay closed in January to stop Covid spread, Sage warns government. *Telegraph* 2020 Dec 28. <https://www.telegraph.co.uk/politics/2020/12/28/secondary-schools-must-stay-closed-january-stop-covid-spread/>.

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