

Patients should receive COVID-19 vaccine before surgery to reduce risk of death

25 March 2021

	30-day postoperative SARS-CoV-2 rate in surgical patients	Adjusted 30-day postoperative mortality		Number needed to vaccinate (NNV) to prevent one COVID-19-related death in surgical patients over 1 year†
		Patients without SARS-CoV-2 infection	Patients with SARS-CoV-2 infection	
Age 18-49 years				
Elective non-cancer surgery	0.68%	0.26%	1.03%	18,421
Elective cancer surgery	1.00%	1.00%	3.63%	3,922
Age 50-69 years				
Elective non-cancer surgery	0.79%	1.13%	8.39%	1,621
Elective cancer surgery	1.56%	2.16%	13.71%	559
Age ≥70 years				
Elective non-cancer surgery	0.87%	1.57%	12.03%	733
Elective cancer surgery	1.56%	2.79%	18.64%	351

†Number needed to vaccinate (NNV) based on median global SARS-CoV-2 incidence in 2020 (26.48 cases per million population per day). For comparison, NNV to prevent one COVID-19-related death in the general population, by age group (best- and worst-case scenarios in parentheses):

- 18-49 years: 196,131
- 50-69 years: 12,889
- ≥70 years: 1,840

Data presented for elective inpatient surgery (patients admitted in hospital overnight). Credit: University of Birmingham

Patients waiting for elective surgery should get COVID-19 vaccines ahead of the general population—potentially helping to avoid thousands of post-operative deaths linked to the virus, according to a new study funded by the NIHR.

Between 0.6% and 1.6% of [patients](#) develop COVID-19 infection after elective [surgery](#). Patients who develop COVID-19 infection are at between 4- and 8-fold increased risk of death in the 30 days following surgery. For example, whereas patients aged 70 years and over undergoing cancer surgery would usually have a 2.8% mortality rate, this increases to 18.6% if they develop COVID-19 infection.

Based on the high risks that surgical patients face, scientists calculate that vaccination of surgical patients is more likely to prevent COVID-19 related deaths than vaccines given to the population at large—particularly among the over-70s and those undergoing surgery for cancer. For example,

whereas 1,840 people aged 70 years and over in the [general population](#) need to be vaccinated to save one life over one year, this figure is only 351 in patients aged 70 years and over having cancer surgery.

Overall, the scientists estimate that global prioritisation of pre-operative vaccination for elective patients could prevent an additional 58,687 COVID-19-related deaths in one year.

This could be particularly important for Low- and Middle-income Countries (LMICs) where mitigation measures such as nasal swab screening and COVID-free surgical pathways, which can reduce the risk of complications related to the virus, are unlikely to be universally implemented.

The COVIDSurg Collaborative international team of researchers, led by experts at the University of Birmingham, has published its findings today in *BJS* (incorporating the *British Journal of Surgery* and the *European Journal of Surgery*), after studying data for 141,582 patients from across 1,667 hospitals in 116 countries -including Australia, Brazil, China, India, UAE, UK and U.S.—creating the world's largest ever international study on surgery.

Co-lead author Mr Aneel Bhangu, from the University of Birmingham, commented: "Preoperative vaccination could support a safe re-start of elective surgery by significantly reducing the risk of COVID-19 complications in patients and preventing tens of thousands of COVID-19-related post-operative deaths.

"Many countries, particularly low- and [middle-income countries](#), will not have widespread access to COVID for several years. While [vaccine](#) supplies are limited, governments are prioritising vaccination for groups at highest risk of COVID-19 mortality. Our work can help to inform these decisions."

Co-lead author Dr. Dmitri Nepogodiev, from the University of Birmingham, commented: "Restarting elective surgery is a global priority. Over 15,000 surgeons and anaesthetists from across 116 countries came together to contribute to this study, making it the largest ever scientific collaboration. It's crucial that [policy makers](#) use the data we have collected to support a safe restart to elective surgery; COVID vaccination should be prioritised for [elective surgery](#) patients ahead of the general population."

During the first wave of the pandemic, up to 70% of elective surgeries were postponed, resulting in an estimated 28 million procedures being delayed or cancelled. Whilst surgery volumes have started to recover in many countries, ongoing disruption is likely to continue throughout 2021, particularly in the event of countries experiencing further waves of COVID-19. Vaccination is also likely to decrease post-operative pulmonary complications—reducing intensive care use and overall healthcare costs.

More information: 'SARS-CoV-2 vaccination modelling for safe surgery to save lives: data from an international prospective cohort study' - COVIDSurg Collaborative is published by the British Journal of Surgery.

Provided by University of Birmingham

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