



31 May 2024

AI model confirms vaccination is key to cutting COVID in prisons

A new study has found vaccination and prompt lockdown to be the most effective strategies to minimise COVID-19 spread in prisons, however a combination of other measures is needed to contain spread of the disease in confined settings.

People in prison are [highly vulnerable to infectious diseases](#), with [major outbreaks](#) of COVID-19 reported around the world at the height of the pandemic. Inevitable close contacts, a disproportionate burden of co-morbidities, and a high risk of broader community infection through workers and visitors mean these environments must be prioritised in public health responses to virus outbreaks.

A team of scientists has developed an artificial intelligence (AI)-based transmission model that can predict prison infection rates with high accuracy. Incorporating real-world data from every facility in the NSW prison system, the new findings add weight to current theoretical models.

Lead author on the study, the [University of South Australia's Dr Neil Bretaña](#), says the model shows that while vaccination was instrumental in reducing the spread of the virus, additional measures were necessary to halt the disease.

"The most effective strategies were a combination of vaccination and prompt lockdown of centres upon detection of an infection, which reduced outbreak size by 62–73%," Dr Bretaña says.

"Other measures that reduced virus spread included quarantining inmates upon entry, isolating proven or suspected cases, and using personal protective equipment such as masks."

Dr Bretaña says mathematical models have been widely used to inform health policy throughout the COVID-19 pandemic, however they generally lacked real world data to validate their accuracy. Within the prison system, previous modelling tended to focus on individual prisons.

"Our modelling incorporated data from NSW's entire prison system, comprising 33 centres, 13,458 inmates and 7487 workers. Its accuracy was validated by the major Delta outbreak of August - September 2021, where it predicted very similar case rates to what occurred," Dr Bretaña says.

"The COVID-19 pandemic has shown the importance of public health planning to effectively mitigate disease spread. This study also shows that collaboration with government agencies is important to inform evidence-based policy decisions.

"Our findings have been used by Corrective Services NSW as a basis for their intervention protocols. The model can also be extended to emerging COVID-19 variants, as well as other similarly transmissible respiratory pathogens - helping us to prepare for future outbreaks such as the Bird Flu, H5N1."

The study, [Controlling COVID-19 outbreaks in the correctional setting: A mathematical modelling study](#), was published in PLOS ONE this month.

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