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Evaluating the Effectiveness of COVID-19 Vaccines Over Time

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1:30PM-2:50PM
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Abstract:

Approximately 800 million COVID-19 cases and 7 million COVID-19 deaths have been reported to the World Health Organization thus far. Vaccination is a major tool to combat the COVID-19 pandemic, but its effectiveness wanes over time and tends to be lower against new SARS-CoV-2 variants. The knowledge about the waning effects of vaccination can guide boosting strategies. In a series of papers published in *The New England Journal of Medicine* and *JAMA*, we reported several large cohort studies using COVID-19 case surveillance and vaccination data from the states of North Carolina and Nebraska. We developed a novel statistical framework to evaluate the time-varying effects of four generations of COVID-19 vaccines produced in the United States on infections with different SARS-CoV-2 variants and on severe outcomes (hospitalization and death). Our findings have been cited by the World Health Organization and the U.S. Centers for Disease Control and Prevention and Food and Drug Administration and reported by *The New York Times*, *The Washington Post*, *ABC News*, and *NBC News*.

Reading List:

Lin DY, Gu Y, Wheeler B, Young H, Holloway S, Sunny SK, Moore Z, Zeng D (2022). Effectiveness of Covid-19 vaccines over a 9-month period in North Carolina. *New England Journal of Medicine* 386: 933-941. https://www.nejm.org/doi/full/10.1056/NEJMoa2117128

Lin DY, Gu Y, Xu Y, Wheeler B, Young H, Sunny SK, Moore Z, Zeng D (2022). Association of primary and booster vaccination and prior infection with SARS-CoV-2 infection and severe COVID-19 outcomes. *JAMA* 328: 1415-1426. https://jamanetwork.com/journals/jama/fullarticle/2796893

Lin DY, Gu Y, Xu Y, Zeng D, Wheeler B, Young H, Sunny SK, Moore Z (2022). Effects of vaccination and previous infection on omicron infections in children. *New England Journal of Medicine* 387: 1141-1143. https://www.nejm.org/doi/full/10.1056/NEJMc2209371

Lin DY, Xu Y, Gu Y, Zeng D, Wheeler B, Young H, Sunny SK, Moore Z (2023). Effectiveness of bivalent boosters against severe omicron infection. *New England Journal of Medicine* 388: 764-766. https://www.nejm.org/doi/full/10.1056/NEJMc2215471

Lin DY, Du Y, Xu Y, Paritala S, Donahue M, Maloney P (2024). Durability of XBB.1.5 vaccines against omicron subvariants. *New England Journal of Medicine* 390:2124-2127. https://www.nejm.org/doi/full/10.1056/NEJMc2402779

Du Y, Paritala S, Xu Y, Maloney P, Lin DY. Durability of 2024-2025 COVID-19 vaccines against JN. 1 subvariants (with commentary by Robert M Califf). *JAMA Internal Medicine* 185:1501-1504. https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2840565