

# Bacille Calmette-Guérin (BCG) vaccination and COVID-19

Scientific brief

12 April 2020



## Summary

There is no evidence that the Bacille Calmette-Guérin vaccine (BCG) protects people against infection with COVID-19 virus. Two clinical trials addressing this question are underway, and WHO will evaluate the evidence when it is available. In the absence of evidence, WHO does not recommend BCG vaccination for the prevention of COVID-19. WHO continues to recommend neonatal BCG vaccination in countries or settings with a high incidence of tuberculosis.<sup>1</sup>

There is experimental evidence from both animal and human studies that the BCG vaccine has non-specific effects on the immune system. These effects have not been well characterized and their clinical relevance is unknown.<sup>2,3</sup>

On 11 April 2020, WHO updated its ongoing evidence review of the major scientific databases and clinical trial repositories, using English, French and Chinese search terms for COVID-19, coronavirus, SARS-CoV-2 and BCG.

The review yielded three preprints (manuscripts posted online before peer-review), in which the authors compared the incidence of COVID-19 cases in countries where the BCG vaccine is used with countries where it is not used and observed that countries that routinely used the vaccine in neonates had less reported cases of COVID-19 to date. Such ecological studies are prone to significant bias from many confounders, including differences in national demographics and disease burden, testing rates for COVID-19 virus infections, and the stage of the pandemic in each country.

The review also yielded two registered protocols for clinical trials, both of which aim to study the effects of BCG vaccination given to health care workers directly involved in the care of patients with COVID-19.<sup>4,5</sup>

BCG vaccination prevents severe forms of tuberculosis in children and diversion of local supplies may result in neonates not being vaccinated, resulting in an increase of disease and deaths from tuberculosis.<sup>6-8</sup> In the absence of evidence, WHO does not recommend BCG vaccination for the prevention of COVID-19. WHO continues to recommend neonatal BCG vaccination in countries or settings with a high incidence of tuberculosis.

## References

1. BCG vaccines: WHO position paper – February 2018. *Vaccins BCG: Note de synthèse de l’OMS – Février 2018. Wkly Epidemiol Rec.* 2018;93(8):73–96. Published 2018 Feb 23.
2. de Bree LCJ, Marijnissen RJ, Kel JM, et al. Bacillus Calmette-Guérin-Induced Trained Immunity Is Not Protective for Experimental Influenza A/Anhui/1/2013 (H7N9) Infection in Mice [published correction appears in *Front Immunol.* 2018 Oct 25;9:2471]. *Front Immunol.* 2018;9:869. Published 2018 Apr 30. doi:10.3389/fimmu.2018.00869.
3. Arts RJW, Moorlag SJCFM, Novakovic B, et al. BCG Vaccination Protects against Experimental Viral Infection in Humans through the Induction of Cytokines Associated with Trained Immunity. *Cell Host Microbe.* 2018;23(1):89–100.e5. doi:10.1016/j.chom.2017.12.010.
4. Reducing Health Care Workers Absenteeism in Covid-19 Pandemic Through BCG Vaccine (BCG-CORONA). <https://clinicaltrials.gov/ct2/show/NCT04328441>.
5. BCG Vaccination to Protect Healthcare Workers Against COVID-19 (BRACE). <https://clinicaltrials.gov/ct2/show/NCT04327206>.
6. Cernuschi T, Malvoti S, Nickels E, Friede M. Bacillus Calmette-Guérin (BCG) vaccine: A global assessment of demand and supply balance. *Vaccine.* 2018 Jan 25; 36(4): 498–506. doi: 10.1016/j.vaccine.2017.12.010
7. du Preez K, Seddon JA, Schaaf HS, Hesseling AC, Starke JR, Osman M, Lombard CJ, Solomons R. Global shortages of BCG vaccine and tuberculous meningitis in children. *Lancet Glob Health.* 2019 Jan;7(1):e28-e29. doi: 10.1016/S2214-109X(18)30474-1.
8. Roy P, Vekemans J, Clark A, Sanderson C, Harris RC, White RG. Potential effect of age of BCG vaccination on global paediatric tuberculosis mortality: a modelling study. *Lancet Glob Health.* 2019 Dec;7(12):e1655-e1663. doi: 10.1016/S2214-109X(19)30444-9.

WHO continues to monitor the situation closely for any changes that may affect this interim guidance. Should any factors change, WHO will issue a further update. Otherwise, this scientific brief will expire 2 years after the date of publication.

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