

Recommendation

The Health Technology Assessment Council **recommends the inclusion of Two-dose Inactivated Polio Vaccine (IPV)** in the Philippine National Formulary (PNF) for the **prevention of Poliomyelitis** due to the following reasons:

- This is in accordance with the global recommendation from the Global Polio Eradication Initiative (GPEI) and World Health Organization (WHO) to introduce two-dose IPV to all countries that are currently administering one-dose IPV and bivalent oral polio vaccine (bOPV) in their routine immunization schedule. This will pave the way for eventual OPV cessation which is a critical step to stop the occurrence of vaccine-associated paralytic poliomyelitis (VAPP) and to remove the primary risk of the emergence of all types of vaccine-derived poliovirus (VDPVs).
- The Philippines is a high-risk country for type 2 poliovirus, and bOPV does not confer protection against the said virus. Based on the most recent systematic review, two-dose IPV enhances humoral immunity against type 2 poliovirus conferred by one-dose IPV. Thus, this strengthens the need to include two-dose IPV in the program.
- Having just achieved the closure of cVDPV type 1 and 2 outbreaks in the country, the DOH-NIP should build on the success of this campaign and gain momentum by maintaining clearance of cVDPV with two-dose IPV.
- While Kalkowska et al, 2019 modelling results for LMIC have shown that introducing 2-dose IPV versus 1 dose IPV is not cost-effective, it is deemed that the study might have underestimated the value for money of 2-dose IPV for the following reasons:
 - The outbreak response costs for LMIC in Kalkowska et al (2019) is likely underestimated compared to the actual outbreak response cost in the Philippines, as the cost of vaccines per dose and operations cost per dose in the study are lower versus the actual costs in the Philippine setting.
 - Kalkowska et al. (2019) used a lower cost-effectiveness threshold for LMIC compared to the implicit threshold used in the Philippine setting.
- Despite the costly implementation of two-dose IPV due to expected suboptimal coverage in the early years of implementation, the DOH-NIP aims to achieve high coverage in later years. This will result in savings to the healthcare system because of the averted costs of outbreak response. However, the program should consistently achieve at least 95% vaccination coverage to reach the elimination or eradication target.

Moreover, in recognition of the impact of vaccine hesitancy on the overall success of this program, a localized information and education campaign could capacitate key stakeholders to decide for their children/infants to receive the vaccine.

References

1. Centers for Disease Control and Prevention. (2017). Morbidity and Mortality Weekly Report (MMWR): Introduction of Inactivated Poliovirus Vaccine and Impact on Vaccine-Associated Paralytic Poliomyelitis – Beijing, China, 2014–2016. <https://www.cdc.gov/mmwr/volumes/66/wr/mm6649a4.htm>
2. Child Health Division, Department of Health Services, UNICEF Nepal Country Office, & WHO Nepal Country Office. (2015). Introduction of inactivated polio vaccine (IPV) in Nepal: A public health milestone for polio free Nepal. Retrieved last 12 April 2021 from https://www.who.int/immunization/diseases/poliomyelitis/endgame_objective2/inactivated_polio_vaccine/Documentation_on_IPV_Introduction_in_Nepal_Final_lightversion.pdf?ua=1
3. Department of Health. (2002). Annual Report 2002. Retrieved on 14 April 2021 from <https://doh.gov.ph/sites/default/files/publications/DOHAnnualReport2002.pdf>
4. Department of Health (2015). Department Memorandum 2015-0164. Retrieved on 14 April 2021 from https://dohcalabarzonepi.weebly.com/uploads/4/8/4/2/48426749/dm2015-0164_administration_of_inactivated_poliomyelitis_virus_vaccine.pdf
5. Department of Health. (2019). DOH Intensifies efforts to prevent polio. Retrieved on 12 April 2021 from <https://doh.gov.ph/press-release/DOH-INTENSIFIES-EFFORTS-TO-PREVENT-POLIO>
6. Department of Health - National Immunization Program. (personal communication, 2021). EPI Coverage Report, Philippine 2015 to 2020.
7. Department of Health - National Immunization Program. (personal communication, 2021). Philippines Polio Outbreak Response Progress Report.
8. Department of Health - National Immunization Program (personal communication, 2021). Responses to the Feedback on the Polio Outbreak Response Progress Report.
9. Falleiros-Arlant, L. H., Avila-Agüero, M. L., Brea del Castillo, J., & Marino, C. (2014). El desafío del cambio de la vacuna inactivada contra poliomiélitis en América Latina: Declaración de la Sociedad Latinoamericana de Infectología Pediátrica (SLIPE). *Revista Chilena De Infectología*, 31(5), 590–596. <https://doi.org/10.4067/s0716-10182014000500012>
10. Global Alliance for Vaccines and Immunization. (2021). *Inactivated polio vaccine support*. Retrieved from <https://www.gavi.org/types-support/vaccine-support/inactivated-polio-vaccine>
11. Global Polio Eradication Initiative. (n.d.a). Where We Work. Retrieved on 12 April 2021 from <https://polioeradication.org/where-we-work/>
12. Global Polio Eradication Initiative. (n.d.b). Philippines. Retrieved on 12 April 2021 from <https://polioeradication.org/where-we-work/philippines/>
13. Global Polio Eradication Initiative. (n.d.c). Philippines. Retrieved on 12 April 2021 from <https://polioeradication.org/polio-today/polio-prevention/the-virus/vaccine-derived-polio-viruses/>
14. Global Polio Eradication Initiative. (n.d.d). Philippines. Retrieved on 12 April 2021 from <https://polioeradication.org/wp-content/uploads/2018/07/GPEI-cVDPV-Fact-Sheet-20191115.pdf>
15. Global Polio Eradication Initiative. (2019a). 2019 Annual Report. Retrieved on 12 April 2021 from <https://polioeradication.org/wp-content/uploads/2020/11/GPEI-2019-Annual-report.pdf>
16. Global Polio Eradication Initiative. (2019b). Polio Endgame Strategy 2019-2023. Retrieved on 12 April 2021 from <https://polioeradication.org/wp-content/uploads/2019/06/english-polio-endgame-strategy.pdf>
17. Global Polio Eradication Initiative. (2019c). Standard Operating Procedures: Responding to Poliovirus event or outbreak. Retrieved from: <https://polioeradication.org/wp-content/uploads/2016/07/sop-polio-outbreak-response-version-20193101.pdf>
18. Healy, M.C., Montesinos, D.O. & Middleman, A.B. (2014). Parent and provider perspectives on immunization: Are providers overestimating parental concerns? *Vaccine* 32(5) 579-584. <https://doi.org/10.1016/j.vaccine.2013.11.076>
19. Husereau D., Drummond M., Petrou S., et al. (2013) Consolidated health economic evaluation reporting standards (CHEERS)—explanation and elaboration: a report of the ISPOR Health Economic Evaluations Publication Guidelines Good Reporting Practices Task Force. *Value Health*. 16(2):231-250.
20. Idoko, O.T., Hampton, L.M., Mboizi, R.B., Agbla, S.C., Wallace, A.S., Harris, J.B., Sowe, D., Ehlman, D.C., Kampmann, B., Ota, M.O., & Hyde, T.B. (2016). Acceptance of multiple injectable vaccines in a single immunization visit in The Gambia pre and post introduction of inactivated polio vaccine. *Vaccine*, 34(41), 5034–5039. <https://doi.org/10.1016/j.vaccine.2016.07.021>

21. International Vaccine Access Center (IVAC) Johns Hopkins Bloomberg School of Public Health. (2018). Case studies of IPV introduction: Albania, Nigeria, and Tunisia. Retrieved on 12 April 2021 from <https://www.jhsph.edu/ivac/wp-content/uploads/2018/04/IPV-Case-Studies-in-Albania-Tunisia-and-Nigeria-FINAL.pdf>
22. Jonville-Bera, A. P., Autret-Leca, E., & Radal, M. (1999). Adverse effects of the vaccines Tetracoq, IPAD/DTCP and DTCP. A French study of regional drug monitoring centers. *Archives de Pediatrie*, 6(5): 510-5. 10.1016/s0929-693x(99)80556-9
23. Kalkowska, D.A., & Thompson, K.M. (2021). Health and economic outcomes associated with polio vaccine policy options: 2019-2029. *Risk Analysis*, 41(2), 364-375. doi: 10.1111/risa.13664
24. Kwak, B. O., Ma, S. H., Park, S. E., Shin, S. H., Choi, K. M., Lee, T. J. ... Kim, D. H. (2020). Comparison of the Immunogenicity and Safety of Three Enhanced Inactivated Poliovirus Vaccines from Different Manufacturers in Healthy Korean Infants: A Prospective Multicenter Study. *Vaccines*, 8(2). <https://doi.org/10.3390/vaccines8020200>
25. Larson, H. J., Hartigan-Go, K., & de Figueiredo, A. (2019). Vaccine confidence plummets in the Philippines following dengue vaccine scare: why it matters to pandemic preparedness. *Human vaccines & immunotherapeutics*, 15(3), 625-627.
26. Lopez A. L., Haris, J.B., Raguindin, P.F., Aldaba, J., Morales, M., Sylim, P., Wannemuehler, K., Wallace, A., Ehlman, D.C., Hyde, T.B., Fox, K, Nyambat, B., Ducisin, M.J., Hampton, L.M. (2019). Introduction of inactivated poliovirus vaccine in the Philippines: Effect on health care provider and infant caregiver attitudes and practices. *Vaccine* 36(48), 7399-7407. <https://dx.doi.org/10.1016%2Fj.vaccine.2018.09.028>
27. Macklin, G.R., Grassly, N.C., Sutter, R.W., Mach, O., Bandyopadhyay, A.S., Edmunds, W.J., & O'Reilly, K.M. (2019). Vaccine schedules and the effect on humoral and intestinal immunity against poliovirus: a systematic review and network meta-analysis. *The Lancet Infectious Diseases*, 19(10), 1121–1128. [https://doi.org/10.1016/s1473-3099\(19\)30301-9](https://doi.org/10.1016/s1473-3099(19)30301-9)
28. Ministry of Health, Malaysia. (2001). *Health Technology Assessment Report on Childhood Immunisation*. Health Technology Assessment Unit, Medical Development Division. MOH/P/PAK/47.02 (TR) 2001. Retrieved April 14, 2021, from <https://www.moh.gov.my/moh/resources/auto%20download%20images/587f137c11dcf.pdf>
29. Pediatric Infectious Disease Society of the Philippines. (2021). Childhood Immunization Schedule 2021. Retrieved on 12 April 2021 from <http://www.pidsphil.org/home/themencode-pdf-viewer/?file=http://www.pidsphil.org/home/wp-content/uploads/2021/02/CHILDHOOD-IMMUNIZATION-SCHEDULE-2021-edited.pdf>
30. Platt, L. Gorham, K., & Privor-Dumm, L. (2015.) Case studies of IPV introductions: Albania, Nigeria, and Tunisia. Retrieved from <https://www.jhsph.edu/ivac/wp-content/uploads/2018/04/IPV-Case-Studies-in-Albania-Tunisia-and-Nigeria-FINAL.pdf>
31. Tagbo, B.N., Uhasoro, M.D., Esangbedo, D.O. (2014). Parental acceptance of inactivated polio vaccine in Southeast Nigeria: A qualitative cross-sectional interventional study. *Vaccine* 32(46) 6157-6162. <https://doi.org/10.1016/j.vaccine.2014.08.053>
32. Thacker, N., Thacker, D., & Pathak, A. (2016). Role of Global Alliance for Vaccines and Immunization (GAVI) in accelerating inactivated polio vaccine introduction. *Indian Pediatrics*, 53(1), 57-60. PMID: 27771641
33. Thompson, K.M., & Kalkowska, D.A. (2020). Potential future use, costs, and value of poliovirus vaccines. *Risk Analysis*, 41(2), 349-363. doi: 10.1111/risa.13557
34. UNICEF Kenya. (2013). Focus group discussion - key findings on the co-administration of IPV with OPV in polio outbreak response in the refugee camps and the host community of Dadaab district. Retrieved last 12 April 2021 from https://www.who.int/immunization/diseases/poliomyelitis/inactivated_polio_vaccine/case_study_kenya_en.pdf?ua=1
35. World Health Organization. (2007). Introducing IPC: The experience in Yogyakarta, Indonesia. Retrieved last 12 April 2021 from https://www.who.int/immunization/diseases/poliomyelitis/inactivated_polio_vaccine/case_study_indonesia_en.pdf?ua=1
36. World Health Organization. (2016). State of Inequality: Childhood Immunization. Retrieved 14 April 2021 from https://www.who.int/gho/health_equity/report_2016_immunization/en/
37. World Health Organization. (2019a). Poliomyelitis. Retrieved on 12 April 2021 from <https://www.who.int/news-room/fact-sheets/detail/poliomyelitis>

38. World Health Organization. (2019b). Polio Outbreak Situation Report 1. Retrieved on 12 April 2021 from https://www.who.int/docs/default-source/wpro—documents/countries/philippines/emergencies/polio/unicef-who-phl-sitrep1-polio-outbreak-19sep2019.pdf?sfvrsn=c8916d37_2
39. World Health Organization. (2020a). Polio Outbreak Situation Report 24. Retrieved on 12 April 2021 from https://reliefweb.int/sites/reliefweb.int/files/resources/PolioSitRep24_16July2020_final.pdf
40. World Health Organization. (2020b). Weekly Epidemiological Record: Meeting of the Strategic Advisory Group of Experts on Immunization, October 2020—conclusions and recommendations. Retrieved on 12 April 2021 from <https://apps.who.int/iris/bitstream/handle/10665/337100/WER9548-eng-fre.pdf?ua=1>
41. World Health Organization. (2020c). Introducing 2nd IPV dose in Routine Immunization: Systematic review and Meta-analysis of immunogenicity SAGE Working Group Meeting September 2020 [Powerpoint Slides].
42. World Health Organization Western Pacific Region. (2015). 24th Meeting of the Technical Advisory Group on Immunization and Vaccine-preventable Diseases. Retrieved on 14 April 2021 from https://apps.who.int/iris/bitstream/handle/10665/208792/RS_2015_GE_16_PHL_eng.pdf?sequence=1&isAllowed=y
43. Zimmerman, R. K., & Spann, S. J. (1999). Poliovirus vaccine options. *American Family Physician*, 59(1): 113-8, 125-6. PMID: 9917578.