Table III1 : Persistence of protective antibodies following immunization with OPV

Population : Immunocompetent individuals
Intervention: ⩾3-4 doses of oral poliovirus vaccine
Comparison: No vaccination
Outcome : Protective antibodies

PICO Question: What is the level of scientific evidence for ⩾80% long-term (>5-10 years) persistence of protective antibodies following ⩾3-4 doses of OPV before school age, according to national schedules?				
			Rating	Adjustment to rating
Quality Assessment	No of studies/starting rating		4 RCTs/ 5 observational[1]	4
	Factors decreasing confidence	Limitation in study design	None serious[2]	0
		Inconsistency	None serious	0
		Indirectness	None serious	0
		Imprecision	None serious	0
		Publication bias	None detected	0
	Factors increasing confidence	Strength of association/ large effect	Not applicable	0
		Dose-response	Not applicable	0
		Antagonistic /mitigated bias and confounding	Not applicable	0
	Final numerical rating of quality of evidence			**4**
Summary of Findings	**Statement on quality of evidence**			Evidence supports a high level of confidence that the true effect lies close to that of the estimate of the effect on the health outcome
	Conclusion			High scientific evidence for ⩾80% long-term (>5-10 years) persistence of protective antibodies following ⩾3-4 doses of OPV.

[1] Nishio O et al (1984) investigated the persistence of neutralizing antibody (NA) against poliovirus after two doses of OPV in 67 children. After 5 years, more than 80% of them retained NA against all three types of poliovirus. Kelley PW et al (1991) using micro-neutralization assay to investigate susceptibility to poliovirus types 1, 2, and 3 among young US Army recruits believed to have received polio vaccination (mainly tivalent OPV (tOPV)) 15-25 years earlier. The seronegativity rates for poliovirus types 1, 2, and 3 were 2.3%, 0.6%, and 14.6%, respectively; deviating trends by age, sex, and race-ethnicity were generally unremarkable.Faden H et al (1993) found that immunization with OPV, eIPV, and combinations of the two vaccines confers long-term (>5 year) immunity. Viviani S et al (2004) studied vaccine-induced antibody prevalences in representative samples of 8–9 year-olds as compared to 3–4 year olds (Fortuin M et al, 1995) in The Gambia. The geometric mean concentration of antibodies in children 8-9 years of age was lower than in the 3–4 year-old children; 88% of 3–4 year-olds and 89% of 8–9 year-olds had detectable antibody levels against poliovirus type 1. Fewer children at 8–9 years of age had antibodies against poliovirus type 3 than 3–4 year-olds (78% vs. 89% $P < 0.001$).

[2] Given the limited time since first use of bOPV in 2009, no long-term data on the duration of protection conferred by bivalent OPV (bOPV) are available(Sutter et al 2010 and 2015, O`Ryan 2015 and Mangal 2014) . Though given the higher initial efficacy of bOPV compared to tOPV, duration of continued protection against polio is assumed non-inferior or even superior to tOPV.

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Table III2 : Persistence of protective antibodies following immunization with IPV

Population : Immunocompetent individuals
Intervention: ⩾3-4 doses of inactivated poliovirus vaccine
Comparison: No vaccination
Outcome : Protective antibodies

PICO Question: What is the level of scientific evidence for ⩾80% long-term (>5-10 years) persistence of protective antibodies following ⩾3-4 doses of IPV before school age, according to national schedules?				
			Rating	Adjustment to rating
Quality Assessment	No of studies/starting rating		5 observational[3]	2
	Factors decreasing confidence	Limitation in study design	None serious	0
		Inconsistency	None serious	0
		Indirectness	None serious	0

[3] Faden H et al (1993) found that all of the 86 children who by one year of age had received 3 doses of OPV and/or eIPV according to one of 4 different schedules (OPV-OPV-OPV, eIPV-eIPV-eIPV, eIPV-OPV-OPV, and eIPV-eIPV-OPV) exhibited an initial 10- to 100-fold decline in neutralizing antibody to poliovirus types 1, 2, and 3 during the first 2 years of follow-up; thereafter antibody titers stabilized. Böttiger M (1990) found persisting neutralizing antibodies against polio in all of the 250 Swedish children who had received 3 doses of killed polio vaccine (IPV) 18 years earlier. Among 64 children who were tested more frequently, a marked fall of antibody titers was observed during the first few years after vaccination, then the decline leveled off to a mean decrease in titer of 0.05-0.10 log10 per year. Children who had a fourth dose of IPV at 10 years of age rather than at the scheduled age of 6 years had significantly higher antibody levels at 18 years of age. Swartz TA et al (1986) showed adequate levels of neutralizing antibody persisting for five years after immunization with a 2 + 1 dose schedule of a combined DTP-IPV vaccine. Carlsson RM et al (2002) found neutralizing antibodies against polioviruses in 96% - 99% of 180 vaccinees who 4.5 years earlier had received IPV-containing combination vaccines. There were no clinically relevant differences between children who had been vaccinated in their infancy according to a 3, 5 plus 13 months schedule versus a 2, 4, 6 plus 12 months schedule. Langue J et al (2004) evaluated the persistence among 5-6 year old French children of antibodies against poliovirus types 1, 2, and 3following primary immunization at 2 and 4 months and subsequent booster doses at 12-16 months and 5-6 years, using an IPV-containing tetravalent vaccine. Before the second booster, more than 90%, and 1 month after the second booster 100% of children had protective antibody titers.

		Imprecision	None serious	0
		Publication bias	None detected	0
	Factors increasing confidence	Strength of association/ large effect	Not applicable	0
		Dose-response	Not applicable	0
		Antagonistic /mitigated bias and confounding	Not applicable	0
	Final numerical rating of quality of evidence			**2**
Summary of Findings	**Statement on quality of evidence**			Our confidence in the estimate of the effect on the health outcome is limited
	Conclusion			Low scientific evidence for ⩾80% long-term (>5-10 years) persistence of protective antibodies following ⩾3-4 doses of IPV.

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