

GRADE Table. Duration of protection conferred by diphtheria vaccination.

**Population** : Immunocompetent children and adults  
**Intervention** : Vaccination with diphtheria toxoid (-containing) vaccination  
**Comparison** : No vaccine or control  
**Outcome** : Diphtheria serum antibody levels/ seroprevalence

<i>What is the duration of continued seroprotection of diphtheria vaccination (<math>\geq 10</math> years) conveyed by a specific schedule of diphtheria toxoid (-containing) vaccination which is comprised of at least 3 vaccine doses (primary series) and 3 booster doses until adulthood?</i>				
			Rating	Adjustment to rating
Quality Assessment	No. of studies/starting rating		1 observational <sup>1</sup>	2
	Factors decreasing confidence	Limitation in study design	None serious	0
		Inconsistency	None serious	0
		Indirectness	None serious	0
		Imprecision	None serious	0
		Publication Bias	None serious	0
	Factors increasing confidence	Large effect <sup>2</sup>	Applicable	+2
		Dose-response	Not applicable	0
		Antagonistic 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		Evidence supports a high degree of confidence that 3 primary doses and 3 booster doses until adulthood confer high levels of seroprotection, at least up to age 39 and likely longer. These data suggest, that the immediate administration of decennial booster doses following a 3 dose primary and 3 dose booster schedule may not be needed, however this needs to be monitored in the long-term with increasing life expectancy in large parts of the world.	

## References

1. Swart et al. Long-Term Protection against Diphtheria in the Netherlands after 50 Years of Vaccination: Results from a Seroepidemiological Study. PLoS ONE 11(2): e0148605

<sup>1</sup> This grading is based on evidence retrieved from a systematic review of literature ([http://www.who.int/immunization/sage/meetings/2017/april/2\\_Review\\_Diphtheria\\_results\\_April2017\\_final\\_clean.pdf?ua=1](http://www.who.int/immunization/sage/meetings/2017/april/2_Review_Diphtheria_results_April2017_final_clean.pdf?ua=1), accessed April 2017). The literature review retrieved one large population-based cross-sectional representative seroepidemiological study (Swart et al. 2016) which suggests that 95% of the oldest age group included in the trial (35-39 years) continue to have diphtheria seroprevalence above the protective threshold ( $\geq 0.01$  IU/ml).

<sup>2</sup> Quality rating was upgraded by two levels as there is strong evidence of high levels of seroprotection, even in the older age-groups (up to 39 years of age).

