Supplementary material

Paper Title: Recurrent bacterial meningitis in children in the Netherlands: a nationwide surveillance study

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STROBE checklist

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract (*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	1-3
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	5
Objectives	3	State specific objectives, including any prespecified hypotheses	5-6
Methods			
Study design	4	Present key elements of study design early in the paper	6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up (*b*) For matched studies, give matching criteria and number of exposed and unexposed	6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6-7
Bias	9	Describe any efforts to address potential sources of bias	7-8
Study size	10	Explain how the study size was arrived at	6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6-8
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding (*b*) Describe any methods used to examine subgroups and interactions (*c*) Explain how missing data were addressed (*d*) If applicable, explain how loss to follow-up was addressed (*e*) Describe any sensitivity analyses	7-8
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed (b) Give reasons for non-participation at each stage (c) Consider use of a flow diagram	8
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders (b) Indicate number of participants with missing data for each variable of interest (c) Summarise follow-up time (eg, average and total amount)	8-11
Outcome data	15*	Report numbers of outcome events or summary measures over time	8-11

Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included (*b*) Report category boundaries when continuous variables were categorized (*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	8-11
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	10-12
Discussion			
Key results	18	Summarise key results with reference to study objectives	12-13
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	14-15
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	15
Generalisability	21	Discuss the generalisability (external validity) of the study results	12-14
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	15

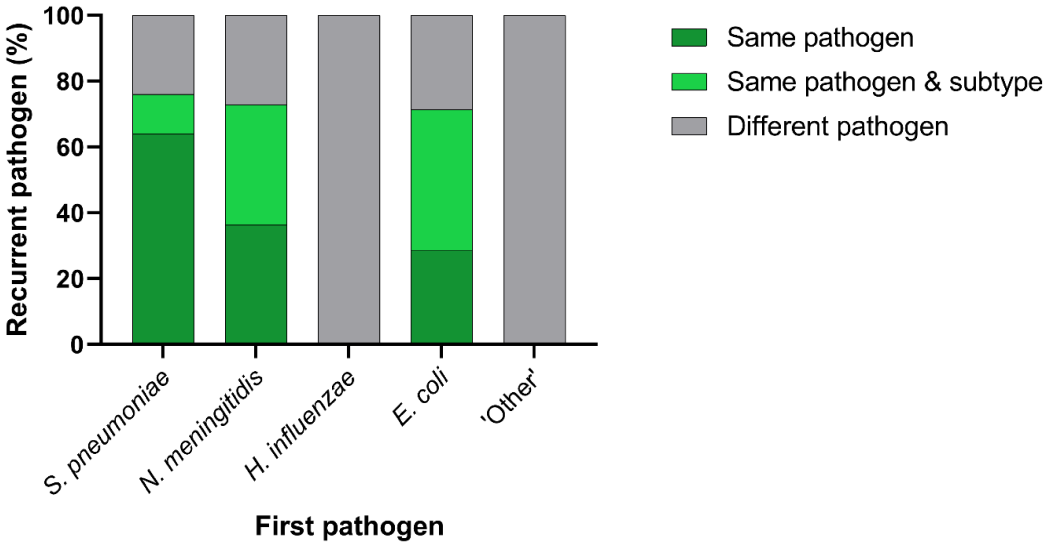
*Give information separately for exposed and unexposed groups.

Supplemental Table 1. Dutch National Immunisation Programme

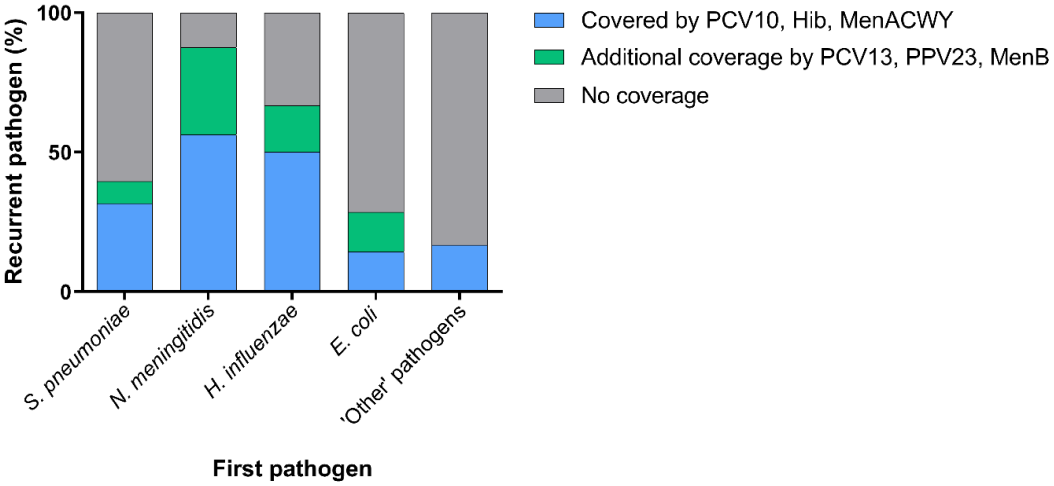
Pathogen	Subtype	Modification	Eligible population	Age schedule
H. influenzae	type b	Introduction	Born ≥ April 1st 1993	3, 4, 5 and 11 months
	type b	Change	Born ≥ January 1st 1999	2, 3, 4 and 11 months
N. meningitidis	C	Introduction	Born ≥ June 1st 2001	14 months
	C	Catch up (June-Nov)	Born ≥ June 1st 1983	1-18 years
	A, C, W, Y	Introduction	Born ≥ May 1st 2018 Born between May 1st and December 31st 2004	14 months 14 years
S. pneumoniae	PCV7	Introduction	Born ≥ April 1st 2006	2, 3, 4 and 11 months
	PCV10	Introduction	Born ≥ March 1st 2011	2, 3, 4 and 11 months
	PCV10	Change	Born ≥ January 1st 2020	3, 5 and 11 months

PCV7: covering serotype 4, 6B, 9V, 14, 18C, 19F and 23F; PCV10: additionally, covering serotype 1, 5 and 7F[1-3]

Supplemental Figure 1. Causative pathogen of first and recurrent meningitis episodes



Supplemental Figure 2. Causative pathogens of recurrent and previous episodes in pathogen covered by different vaccines



References

1. Richtlijn Uitvoering Rijksvaccinatieprogramma 2023. Rijksinstituut voor Volksgezondheid en Milieu; 2023. p. 16-21.
2. van Alphen L, Spanjaard L, van der Ende A, Schuurman I, Dankert J. Effect of nationwide vaccination of 3-month-old infants in The Netherlands with conjugate Haemophilus influenzae type b vaccine: high efficacy and lack of herd immunity. *J Pediatr* 1997; **131**(6): 869-73.
3. van Oosten M, de Greeff SC, Spanjaard L, Schouls LM. Introduction of pneumococcal conjugate vaccine into the Dutch national immunisation programme. *Euro Surveill* 2006; **11**(6): E060608 2.