Clinical trial results:
Second meningococcal vaccination in Dutch children: Study to compare the tetravalent MenACWY-TT conjugate vaccine with the monovalent MenC-TT conjugate vaccine.

Summary

EudraCT number	2013-001823-38
Trial protocol	NL
Global end of trial date	12 May 2015

Results information

Result version number	v1 (current)
This version publication date	07 October 2026
First version publication date	07 October 2026

Trial information

Trial identification

Sponsor protocol code	IMS-267

Additional study identifiers

ISRCTN number	-
ClinicalTrials.gov id (NCT number)	-
WHO universal trial number (UTN)	-
Other trial identifiers	METC nummer: R13.026, ABR nummer: NL44863.100.13

Notes:

Sponsors

Sponsor organisation name	RIVM
Sponsor organisation address	PO box 1, Bilthoven, Netherlands, 3720 BA
Public contact	Clinical Expertise Centre, National Institute of Public Health and Environment (RIVM, the Netherlands), mensgebonden-onderzoek@rivm.nl
Scientific contact	Clinical Expertise Centre, National Institute of Public Health and Environment (RIVM, the Netherlands), mensgebonden-onderzoek@rivm.nl

Notes:

Paediatric regulatory details

Is trial part of an agreed paediatric investigation plan (PIP)	No
Does article 45 of REGULATION (EC) No 1901/2006 apply to this trial?	No
Does article 46 of REGULATION (EC) No 1901/2006 apply to this trial?	No

Notes:

Results analysis stage

Analysis stage	Final
Date of interim/final analysis	28 March 2017
Is this the analysis of the primary completion data?	Yes
Primary completion date	12 May 2015
Global end of trial reached?	Yes
Global end of trial date	12 May 2015
Was the trial ended prematurely?	No

Notes:

General information about the trial

Main objective of the trial:

The primary objective is to demonstrate non-inferiority of SBA levels against MenC at 1 year (T2) after vaccination in the group vaccinated with tetravalent MenACWY-TT vaccine as compared with the group vaccinated with monovalent MenC-TT conjugate vaccine in 10-, 12-, and 15-years old children.
If non-inferiority is demonstrated, the objective is to compare SBA levels against MenA, MenW and MenY at 1 year (T2) after vaccination between the three age groups that are vaccinated with tetravalent MenACWY-TT vaccine.

Protection of trial subjects:

During this study the subjects will receive one dose of a tetravalent MenACWY-TT or monovalent MenC-TT. Tetravalent MenACWY-TT (registration number: EU/1/12/767/001/-007): Nimenrix. Monovalent MenC-TT (Registration number RVG 26343): NeisVac-C™. The vaccines will only be used in the study if released by the manufacturer and the appropriate authorities.

Nimenrix is a registered vaccine which has already been used in the Netherlands (and other countries). NeisVac-C™ is also a registered vaccine in the Netherlands and has already been used in the Netherlands (and other countries) in the same age group (children 10, 12 and 15 years of age). Mild adverse reactions to one of the vaccine components may occur but they are expected to be mainly local and transient. Severe allergic reactions to one of the vaccine components are unlikely to occur.

The invasive study procedures (vaccination and venapunctures) will be carried out by experienced and qualified persons according to standard operating procedures. A local anesthetic (Xylocainespray) can be used to minimize the pain of the venapuncture.

Background therapy: -

Evidence for comparator: -

Actual start date of recruitment	17 March 2014
Long term follow-up planned	Yes
Long term follow-up rationale	Scientific research
Long term follow-up duration	1 Years
Independent data monitoring committee (IDMC) involvement?	No

Notes:

Population of trial subjects

Subjects enrolled per country

Country: Number of subjects enrolled	Netherlands: 410
Worldwide total number of subjects	410
EEA total number of subjects	410

Notes:

Subjects enrolled per age group	
In utero	0
Preterm newborn - gestational age < 37 wk	0
Newborns (0-27 days)	0
Infants and toddlers (28 days-23 months)	0
Children (2-11 years)	83
Adolescents (12-17 years)	327
Adults (18-64 years)	0
From 65 to 84 years	0
85 years and over	0

Subject disposition

Recruitment

Recruitment details:

Healthy 10-, 12- and 15-year-olds, previously immunized with single MenCTT vaccine between 14 months and 3 years of age, were recruited from the surrounding area of Utrecht, The Netherlands. An additional nonrandomized group of children aged 10 years received the MenACWY-TT vaccine in the TIM study (2011).

Pre-assignment

Screening details:

6899 children were invited, 860 responded and were checked for eligibility. 501 childeren were included, 344 were excluded and 15 were redundant after the enrollment target had been reached.
In- and exclusion criteria were checked by interviewing the parent in a phone call and both parent and child at the first study visit, prior to signing IC.

Period 1

Period 1 title	Overall trial (overall period)
Is this the baseline period?	Yes
Allocation method	Randomised - controlled
Blinding used	Not blinded

Blinding implementation details:

Randomization to either MenACWY-TT or MenC-TT vaccine was done by computer using a random number generator just before the vaccination is given. It was not possible to blind the study as the MenACWY-TT vaccine had to be reconstituted on study location by adding the content of the prefilled syringe of solvent to the vial containing the lyophilized components whereas the MenC-TT vaccine was ready to use.

Arms

Are arms mutually exclusive?	Yes
Arm title	10y MenACWY-TT

Arm description:

Healthy 10 year olds receiving the MenACWY-TT vaccine

Arm type	Experimental
Investigational medicinal product name	Nimenrix
Investigational medicinal product code	EU/1/12/767/001/-007
Other name	
Pharmaceutical forms	Powder and solvent for dispersion for injection
Routes of administration	Injection , Intramuscular use

Dosage and administration details:

Tetravalent MenACWY-TT (registration number: EU/1/12/767/001/-007): Nimenrix. One dose of 0.5 mL for intramuscular injection contains: 5 microgram of Neisseria meningitidis group A polysaccharide, 5 microgram of Neisseria meningitidis group C polysaccharide, 5 microgram of Neisseria meningitidis group W polysaccharide and 5 microgram of Neisseria meningitidis group Y polysaccharide. The polysaccharides are conjugated to 44 microgram of tetanus toxoid. Other additive products are sodium chloride and water for injections.

The Nimenrix vaccine has to be reconstituted by adding the content of the prefilled syringe of solvent to the vial containing the lyophilized components.

The Nimenrix vaccine (0.5 mL) is injected intramuscularly in the upper arm. This is a customary and well-accepted route of administration of this vaccine.

Arm title	12y MenACWY-TT

Arm description:

Healthy 12 year olds receiving MenACWY-TT vaccine

Arm type	Experimental

Investigational medicinal product name	Nimenrix
Investigational medicinal product code	EU/1/12/767/001/-007
Other name	
Pharmaceutical forms	Powder and solvent for dispersion for injection
Routes of administration	Injection , Intramuscular use

Dosage and administration details:

Tetravalent MenACWY-TT (registration number: EU/1/12/767/001/-007): Nimenrix. One dose of 0.5 mL for intramuscular injection contains: 5 microgram of Neisseria meningitidis group A polysaccharide, 5 microgram of Neisseria meningitidis group C polysaccharide, 5 microgram of Neisseria meningitidis group W polysaccharide and 5 microgram of Neisseria meningitidis group Y polysaccharide. The polysaccharides are conjugated to 44 microgram of tetanus toxoid. Other additive products are sodium chloride and water for injections.

The Nimenrix vaccine has to be reconstituted by adding the content of the prefilled syringe of solvent to the vial containing the lyophilized components.

The Nimenrix vaccine (0.5 mL) is injected intramuscularly in the upper arm. This is a customary and well-accepted route of administration of this vaccine.

Arm title	12y MenC-TT

Arm description:

Healthy 12 year olds receiving MenC-TT vaccine

Arm type	Experimental
Investigational medicinal product name	NeisVac-C™
Investigational medicinal product code	RVG 26343
Other name	
Pharmaceutical forms	Suspension for injection in pre-filled syringe
Routes of administration	Injection , Intramuscular use

Dosage and administration details:

One dose of 0.5 ml for intramuscular injection contains 10 microgram of Neisseria meningitidis group C (strain C11) polysaccharide (de-O-acetylated). The polysaccharide is conjugated to 10-20 micrograms of tetanus toxoid and is adsorbed to aluminium hydroxide (0.5 mg). Other additive products are sodium chloride and water for injections.
The NeisVac-C™ vaccine (0.5 ml) is injected intramuscularly in the upper arm. This is a customary and well-accepted route of administration of this vaccine.

Arm title	15y MenACWY-TT

Arm description:

Healthy 15 year olds receiving MenACWY-TT vaccine

Arm type	Experimental
Investigational medicinal product name	Nimenrix
Investigational medicinal product code	EU/1/12/767/001/-007
Other name	
Pharmaceutical forms	Powder and solvent for dispersion for injection
Routes of administration	Injection , Intramuscular use

Dosage and administration details:

Tetravalent MenACWY-TT (registration number: EU/1/12/767/001/-007): Nimenrix. One dose of 0.5 mL for intramuscular injection contains: 5 microgram of Neisseria meningitidis group A polysaccharide, 5 microgram of Neisseria meningitidis group C polysaccharide, 5 microgram of Neisseria meningitidis group W polysaccharide and 5 microgram of Neisseria meningitidis group Y polysaccharide. The polysaccharides are conjugated to 44 microgram of tetanus toxoid. Other additive products are sodium chloride and water for injections.

The Nimenrix vaccine has to be reconstituted by adding the content of the prefilled syringe of solvent to the vial containing the lyophilized components.

The Nimenrix vaccine (0.5 mL) is injected intramuscularly in the upper arm. This is a customary and well-accepted route of administration of this vaccine.

Arm title	15y MenC-TT

Arm description:	
Healthy 15 year olds receiving MenC-TT vaccine	
Arm type	Experimental
Investigational medicinal product name	NeisVac-C™
Investigational medicinal product code	RVG 26343
Other name	
Pharmaceutical forms	Suspension for injection in pre-filled syringe
Routes of administration	Injection , Intramuscular use

Dosage and administration details:

One dose of 0.5 ml for intramuscular injection contains 10 microgram of Neisseria meningitidis group C (strain C11) polysaccharide (de-O-acetylated). The polysaccharide is conjugated to 10-20 micrograms of tetanus toxoid and is adsorbed to aluminium hydroxide (0.5 mg). Other additive products are sodium chloride and water for injections.
The NeisVac-C™ vaccine (0.5 ml) is injected intramuscularly in the upper arm. This is a customary and well-accepted route of administration of this vaccine.

Number of subjects in period 1	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT
Started	83	82	82
T0 (prior to vaccination)	83	82	82
T1 (1 month after vaccination)	79	78	78
T2 (1 year after vaccination)	75	77	76
Completed	73	77	76
Not completed	10	5	6
Lost to follow-up	4	2	4
Protocol deviation	6	3	2

Number of subjects in period 1	15y MenACWY-TT	15y MenC-TT
Started	81	82
T0 (prior to vaccination)	81	82
T1 (1 month after vaccination)	78	81
T2 (1 year after vaccination)	76	79
Completed	75	79
Not completed	6	3
Lost to follow-up	2	3
Protocol deviation	4	-

Baseline characteristics

Reporting groups	
Reporting group title	10y MenACWY-TT
Reporting group description:	
Healthy 10 year olds receiving the MenACWY-TT vaccine	
Reporting group title	12y MenACWY-TT
Reporting group description:	
Healthy 12 year olds receiving MenACWY-TT vaccine	
Reporting group title	12y MenC-TT
Reporting group description:	
Healthy 12 year olds receiving MenC-TT vaccine	
Reporting group title	15y MenACWY-TT
Reporting group description:	
Healthy 15 year olds receiving MenACWY-TT vaccine	
Reporting group title	15y MenC-TT
Reporting group description:	
Healthy 15 year olds receiving MenC-TT vaccine	

Reporting group values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT
Number of subjects	83	82	82
Age categorical Units: Subjects			
In utero Preterm newborn infants (gestational age < 37 wks) Newborns (0-27 days) Infants and toddlers (28 days-23 months) Children (2-11 years) Adolescents (12-17 years) Adults (18-64 years) From 65-84 years 85 years and over			
Age continuous			
Mean age (in years) and standard deviation at the start of the study			
Units: years arithmetic mean standard deviation	 10.1 ± 0.3	 12.0 ± 0.3	 12.0 ± 0.3
Gender categorical			
Gender (male, female)			
Units: Subjects			
Female	48	38	37
Male	35	44	45
Age of priming MenC-TT vaccination			
Age in years at priming MenC-TT vaccination with standard deviation.			
Units: years arithmetic mean standard deviation	 1.2 ± 0.1	 1.2 ± 0.3	 1.2 ± 0.2

Reporting group values	15y MenACWY-TT	15y MenC-TT	Total
Number of subjects	81	82	410
Age categorical Units: Subjects			
In utero			0
Preterm newborn infants (gestational age < 37 wks)			0
Newborns (0-27 days)			0
Infants and toddlers (28 days-23 months)			0
Children (2-11 years)			0
Adolescents (12-17 years)			0
Adults (18-64 years)			0
From 65-84 years			0
85 years and over			0
Age continuous			
Mean age (in years) and standard deviation at the start of the study			
Units: years			
arithmetic mean	15.1	15.2	
standard deviation	± 0.3	± 0.3	-
Gender categorical			
Gender (male, female)			
Units: Subjects			
Female	38	46	207
Male	43	36	203
Age of priming MenC-TT vaccination			
Age in years at priming MenC-TT vaccination with standard deviation.			
Units: years			
arithmetic mean	3.3	3.4	
standard deviation	± 0.4	± 0.4	-

Subject analysis sets

Subject analysis set title	10y MenC-TT from TIM study
Subject analysis set type	Sub-group analysis

Subject analysis set description:

In this study (JIM), the age group 10 years old vaccinated with MenACWY-TT vaccine is compared to data from the TIM study: 10 year old vaccinated with MenC-TT vaccine. For clarity on the data analysis, we will include results from this group from the TIM study in the analsyses.

Subject analysis set title	MenACWY-TT vaccination
Subject analysis set type	Sub-group analysis

Subject analysis set description:

All participants receiving MenACWY-TT vaccination between 10 and 15 years of age.

Subject analysis set title	MenC-TT vaccination
Subject analysis set type	Sub-group analysis

Subject analysis set description:

All participants receiving MenC-TT vaccination between 10 and 15 years of age.

Reporting group values	10y MenC-TT from TIM study	MenACWY-TT vaccination	MenC-TT vaccination
Number of subjects	91	225	239

Age categorical Units: Subjects			
In utero Preterm newborn infants (gestational age < 37 wks) Newborns (0-27 days) Infants and toddlers (28 days-23 months) Children (2-11 years) Adolescents (12-17 years) Adults (18-64 years) From 65-84 years 85 years and over			
Age continuous			
Mean age (in years) and standard deviation at the start of the study			
Units: years arithmetic mean standard deviation	 9.9 ± 0.3	 ±	 ±
Gender categorical			
Gender (male, female)			
Units: Subjects Female Male	 53 38		
Age of priming MenC-TT vaccination			
Age in years at priming MenC-TT vaccination with standard deviation.			
Units: years arithmetic mean standard deviation	 1.2 ± 0.1	 ±	 ±

End points

End points reporting groups

Reporting group title	10y MenACWY-TT
Reporting group description:	
Healthy 10 year olds receiving the MenACWY-TT vaccine	
Reporting group title	12y MenACWY-TT
Reporting group description:	
Healthy 12 year olds receiving MenACWY-TT vaccine	
Reporting group title	12y MenC-TT
Reporting group description:	
Healthy 12 year olds receiving MenC-TT vaccine	
Reporting group title	15y MenACWY-TT
Reporting group description:	
Healthy 15 year olds receiving MenACWY-TT vaccine	
Reporting group title	15y MenC-TT
Reporting group description:	
Healthy 15 year olds receiving MenC-TT vaccine	
Subject analysis set title	10y MenC-TT from TIM study
Subject analysis set type	Sub-group analysis
Subject analysis set description:	
In this study (JIM), the age group 10 years old vaccinated with MenACWY-TT vaccine is compared to data from the TIM study: 10 year old vaccinated with MenC-TT vaccine. For clarity on the data analysis, we will include results from this group from the TIM study in the analsyses.	
Subject analysis set title	MenACWY-TT vaccination
Subject analysis set type	Sub-group analysis
Subject analysis set description:	
All participants receiving MenACWY-TT vaccination between 10 and 15 years of age.	
Subject analysis set title	MenC-TT vaccination
Subject analysis set type	Sub-group analysis
Subject analysis set description:	
All participants receiving MenC-TT vaccination between 10 and 15 years of age.	

Primary: Geometric Mean Titers (GMTs) of MenC SBA levels at T2

End point title	Geometric Mean Titers (GMTs) of MenC SBA levels at T2
End point description:	
Geometric Mean Titers (GMTs) of Meningococcal Serogroup C (MenC) Specific Serum Bactericidal Antibody (SBA) 1 Year (T2) after the booster vaccination.	
End point type	Primary
End point timeframe:	
T2	

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[1]	77[2]	76[3]	75[4]
Units: Geometric Mean Titre				
geometric mean (confidence interval 95%)	1181 (827 to 1687)	1773 (1377 to 2284)	2743 (2208 to 3407)	2964 (2340 to 3755)

Notes:

[1] - According to protocol

[2] - According to protocol

[3] - According to protocol

[4] - According to protocol

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[5]	84[6]		
Units: Geometric Mean Titre				
geometric mean (confidence interval 95%)	4169 (3333 to 5214)	1880 (1582 to 2235)		

Notes:

[5] - According to protocol

[6] - According to protocol

Statistical analyses

Statistical analysis title	Ratio GMT MenC SBA MenACWYY vs. MenC 10y at T2

Statistical analysis description:

Ratio of MenC SBA GMT in 10y MenACWY-TT versus MenC-TT vaccine groups. Differences were determined with linear regression analyses, adjusting for titers at T0.
Ratios of GMTs were calculated with one-sided 95% CI using the Wilson score interval with continuity correction.

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.575
Method	Regression, Linear
Parameter estimate	GMT Ratio MenACWY-TT versus MenC-TT
Point estimate	0.64
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.44
upper limit	0.93

Statistical analysis title	Ratio GMT MenC SBA MenACWYY vs. MenC 12y at T2

Statistical analysis description:

Ratio of MenC SBA GMT in 12y MenACWY-TT versus MenC-TT vaccine groups. Differences were determined with linear regression analyses, adjusting for titers at T0.
Ratios of GMTs were calculated with one-sided 95% CI using the Wilson score interval with continuity correction.

Comparison groups	12y MenACWY-TT v 12y MenC-TT

Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.618
Method	Regression, Linear
Parameter estimate	GMT Ratio MenACWY-TT versus MenC-TT
Point estimate	0.63
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.46
upper limit	0.88

Statistical analysis title	Ratio GMT MenC SBA MenACWYY vs. MenC 15y at T2

Statistical analysis description:

Ratio of MenC SBA GMT in 15y MenACWY-TT versus MenC-TT vaccine groups. Differences were determined with linear regression analyses, adjusting for titers at T0.
Ratios of GMTs were calculated with one-sided 95% CI using the Wilson score interval with continuity correction.

Comparison groups	15y MenACWY-TT v 15y MenC-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.326
Method	Regression, Linear
Parameter estimate	GMT Ratio MenACWY-TT versus MenC-TT
Point estimate	0.72
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.52
upper limit	0.98

Statistical analysis title	Differences in GMT MenC SBA 10y at T2

Statistical analysis description:

Difference in Geometric Mean Titers of MenC SBA in 10 year olds receiving MenACWY-TT or MenC-TT booster vaccination 1 year after vaccination (T2).
Differences were analysed with linear regression analysis adjusting for baseline titers.
P values were adjusted for 3 comparisons with the Bonferoni correction.

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Regression, Linear

Statistical analysis title	Differences in GMT MenC SBA 12y at T2

Statistical analysis description:

Difference in Geometric Mean Titers of MenC SBA in 12 year olds receiving MenACWY-TT or MenC-TT booster vaccination 1 year after vaccination (T2).
Differences were analysed with linear regression analysis adjusting for baseline titers.
P values were adjusted for 3 comparisons with the Bonferoni correction.

Comparison groups	12y MenACWY-TT v 12y MenC-TT
Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.01
Method	Regression, Linear

Statistical analysis title	Differences in GMT MenC SBA 15y at T2

Statistical analysis description:

Difference in Geometric Mean Titers of MenC SBA in 15 year olds receiving MenACWY-TT or MenC-TT booster vaccination 1 year after vaccination (T2).
Differences were analysed with linear regression analysis adjusting for baseline titers.
P values were adjusted for 3 comparisons with the Bonferoni correction.

Comparison groups	15y MenACWY-TT v 15y MenC-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Regression, Linear

Primary: Geometric Mean Titers (GMTs) of MenA SBA levels at T2

End point title	Geometric Mean Titers (GMTs) of MenA SBA levels at T2[7]

End point description:

Geometric Mean Titers (GMTs) of Meningococcal Serogroup A (MenA) Specific Serum Bactericidal Antibody (SBA) 1 Year (T2) after the booster vaccination.

End point type	Primary

End point timeframe:

T2

Notes:

[7] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[8]	77[9]	75[10]	
Units: Geometric Mean Titre				
geometric mean (confidence interval 95%)	596 (416 to 854)	863 (626 to 1190)	875 (687 to 1115)	

Notes:

[8] - According to protocol

[9] - According to protocol

[10] - According to protocol

Statistical analyses

Statistical analysis title	GMT MenA SBA levels 10 vs 12 at T2

Statistical analysis description:

Differences in GMT MenA SBA levels between the age groups 10 and 12 years old 1 year after (T2) the booster vaccination were analyzed with linear regression analyses, adjusting for baseline titers. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	150
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 1
Method	Regression, Linear

Statistical analysis title	GMT MenA SBA levels 10 vs 15 at T2

Statistical analysis description:

Differences in GMT MenA SBA levels between the age groups 10 and 15 years old 1 year after (T2) the booster vaccination were analyzed with linear regression analyses, adjusting for baseline titers. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 15y MenACWY-TT
Number of subjects included in analysis	148
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.261
Method	Regression, Linear

Statistical analysis title	GMT MenA SBA levels 12 vs 15 at T2

Statistical analysis description:

Differences in GMT MenA SBA levels between the age groups 12 and 15 years old 1 year after (T2) the booster vaccination were analyzed with linear regression analyses, adjusting for baseline titers. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	152
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.087
Method	Regression, Linear

Primary: Geometric Mean Titers (GMTs) of MenW SBA levels at T2

End point title	Geometric Mean Titers (GMTs) of MenW SBA levels at T2[11]

End point description:

Geometric Mean Titers (GMTs) of Meningococcal Serogroup W (MenW) Specific Serum Bactericidal Antibody (SBA) 1 Year (T2) after the booster vaccination.

End point type	Primary

End point timeframe:

T2

Notes:

[11] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[12]	77[13]	75[14]	
Units: Geometric Mean Titre				
geometric mean (confidence interval 95%)	815 (588 to 1131)	1244 (1014 to 1525)	1546 (1257 to 1903)	

Notes:

[12] - According to protocol cohort

[13] - According to protocol cohort

[14] - According to protocol cohort

Statistical analyses

Statistical analysis title	GMT MenW SBA levels 10 vs 12 at T2

Statistical analysis description:

Differences in GMT MenW SBA levels between the age groups 10 and 12 years old 1 year after (T2) the booster vaccination were analyzed with linear regression analyses, adjusting for baseline titers. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	150
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.029
Method	Regression, Linear

Statistical analysis title	GMT MenW SBA levels 10 vs 15 at T2

Statistical analysis description:

Differences in GMT MenW SBA levels between the age groups 10 and 15 years old 1 year after (T2) the booster vaccination were analyzed with linear regression analyses, adjusting for baseline titers. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 15y MenACWY-TT
Number of subjects included in analysis	148
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.006
Method	Regression, Linear

Statistical analysis title	GMT MenW SBA levels 12 vs 15 at T2

Statistical analysis description:

Differences in GMT MenW SBA levels between the age groups 12 and 15 years old 1 year after (T2) the booster vaccination were analyzed with linear regression analyses, adjusting for baseline titers. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	152
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.459
Method	Regression, Linear

Primary: Geometric Mean Titers (GMTs) of MenY SBA levels at T2

End point title	Geometric Mean Titers (GMTs) of MenY SBA levels at T2[15]

End point description:

Geometric Mean Titers (GMTs) of Meningococcal Serogroup Y (MenY) Specific Serum Bactericidal Antibody (SBA) 1 Year (T2) after the booster vaccination.

End point type	Primary

End point timeframe:

T2

Notes:

[15] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[16]	77[17]	75[18]	
Units: Geometric Mean Titre				
geometric mean (confidence interval 95%)	945 (694 to 1288)	1530 (1153 to 2029)	1611 (1154 to 2247)	

Notes:

[16] - According to protocol cohort

[17] - According to protocol cohort

[18] - According to protocol cohort

Statistical analyses

Statistical analysis title	GMT MenY SBA levels 10 vs 12 at T2

Statistical analysis description:

Differences in GMT MenY SBA levels between the age groups 10 and 12 years old 1 year after (T2) the booster vaccination were analyzed with linear regression analyses, adjusting for baseline titers. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	12y MenACWY-TT v 10y MenACWY-TT

Number of subjects included in analysis	150
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.084
Method	Regression, Linear

Statistical analysis title	GMT MenY SBA levels 10 vs 15 at T2

Statistical analysis description:

Differences in GMT MenY SBA levels between the age groups 10 and 15 years old 1 year after (T2) the booster vaccination were analyzed with linear regression analyses, adjusting for baseline titers. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 15y MenACWY-TT
Number of subjects included in analysis	148
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.057
Method	Regression, Linear

Statistical analysis title	GMT MenY SBA levels 12 vs 15 at T2

Statistical analysis description:

Differences in GMT MenY SBA levels between the age groups 12 and 15 years old 1 year after (T2) the booster vaccination were analyzed with linear regression analyses, adjusting for baseline titers. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	152
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 1
Method	Regression, Linear

Secondary: Geometric Mean Titers (GMTs) of MenC SBA levels at T0

End point title	Geometric Mean Titers (GMTs) of MenC SBA levels at T0

End point description:

Geometric Mean Titers (GMTs) of Meningococcal Serogroup C (MenC) Specific Serum Bactericidal Antibody (SBA) priot to booster vaccination.

End point type	Secondary

End point timeframe:

T0

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[19]	77[20]	76[21]	75[22]
Units: Geometric Mean Titre				
geometric mean (confidence interval 95%)	3.27 (2.3 to 4.4)	3.6 (2.54 to 5.2)	3.2 (2.3 to 4.3)	4.4 (2.9 to 6.8)

Notes:

[19] - According to protocol

[20] - According to protocol

[21] - According to protocol

[22] - According to protocol

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[23]	84[24]		
Units: Geometric Mean Titre				
geometric mean (confidence interval 95%)	4.2 (2.8 to 6.2)	3.9 (2.8 to 5.4)		

Notes:

[23] - According to protocol

[24] - According to protocol

Statistical analyses

Statistical analysis title	Ratio GMT MenC SBA MenACWYY vs. MenC 10y at T0

Statistical analysis description:

Ratio of MenC SBA GMT in 10y MenACWY-TT versus MenC-TT vaccine groups at T0.
Ratios of GMTs were calculated with one-sided 95% CI using the Wilson score interval with continuity correction.

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	non-inferiority
Method	Regression, Linear
Parameter estimate	GMT Ratio MenACWY-TT versus MenC-TT
Point estimate	0.81
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.51
upper limit	1.28

Statistical analysis title	Ratio GMT MenC SBA MenACWYY vs. MenC 12y at T0

Statistical analysis description:

Ratio of MenC SBA GMT in 12y MenACWY-TT versus MenC-TT vaccine groups at T0.
Ratios of GMTs were calculated with one-sided 95% CI using the Wilson score interval with continuity correction.

Comparison groups	12y MenACWY-TT v 12y MenC-TT

Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	non-inferiority
Method	Regression, Linear
Parameter estimate	GMT Ratio MenACWY-TT versus MenC-TT
Point estimate	1.15
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.71
upper limit	1.85

Statistical analysis title	Ratio GMT MenC SBA MenACWYY vs. MenC 15y at T0

Statistical analysis description:

Ratio of MenC SBA GMT in 15y MenACWY-TT versus MenC-TT vaccine groups at T0.
Ratios of GMTs were calculated with one-sided 95% CI using the Wilson score interval with continuity correction.

Comparison groups	15y MenACWY-TT v 15y MenC-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	non-inferiority
Method	Regression, Linear
Parameter estimate	GMT Ratio MenACWY-TT versus MenC-TT
Point estimate	1.06
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.59
upper limit	1.89

Statistical analysis title	Differences in GMT MenC SBA 10y at T0

Statistical analysis description:

Difference in Geometric Mean Titers of MenC SBA in 10 year olds prior to (T0) receiving MenACWY-TT or MenC-TT booster vaccination.
Differences were analysed with linear regression analysis. P values were adjusted for 3 comparisons with the Bonferoni correction.

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Statistical analysis title	Differences in GMT MenC SBA 12y at T0

Statistical analysis description:

Difference in Geometric Mean Titers of MenC SBA in 12 year olds prior to (T0) receiving MenACWY-TT or MenC-TT booster vaccination.
Differences were analysed with linear regression analysis. P values were adjusted for 3 comparisons with the Bonferoni correction.

Comparison groups	12y MenACWY-TT v 12y MenC-TT
Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Statistical analysis title	Differences in GMT MenC SBA 15y at T0

Statistical analysis description:

Difference in Geometric Mean Titers of MenC SBA in 15 year olds prior to (T0) receiving MenACWY-TT or MenC-TT booster vaccination.
Differences were analysed with linear regression analysis. P values were adjusted for 3 comparisons with the Bonferoni correction.

Comparison groups	15y MenACWY-TT v 15y MenC-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Secondary: Geometric Mean Titers (GMTs) of MenC SBA levels at T1

End point title	Geometric Mean Titers (GMTs) of MenC SBA levels at T1

End point description:

Geometric Mean Titers (GMTs) of Meningococcal Serogroup C (MenC) Specific Serum Bactericidal Antibody (SBA) 1 month (T1) after the booster vaccination.

End point type	Secondary

End point timeframe:

T1

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[25]	77[26]	76[27]	75[28]
Units: Geometric Mean Titer				
geometric mean (confidence interval 95%)	24881 (16983 to 36451)	31609 (25126 to 39765)	35571 (30526 to 41450)	30715 (24289 to 38843)

Notes:

[25] - According to protocol

[26] - According to protocol

[27] - According to protocol

[28] - According to protocol

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[29]	84[30]		
Units: Geometric Mean Titer				
geometric mean (confidence interval 95%)	39398 (33554 to 46259)	31312 (26461 to 37053)		

Notes:

[29] - According to protocol

[30] - According to protocol

Statistical analyses

Statistical analysis title	Ratio GMT MenC SBA MenACWYY vs. MenC 10y at T1

Statistical analysis description:

Ratio of MenC SBA GMT in 10y MenACWY-TT versus MenC-TT vaccine groups at T1. Differences were determined with linear regression analyses, adjusting for titers at T0.
Ratios of GMTs were calculated with one-sided 95% CI using the Wilson score interval with continuity correction.

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.187
Method	Regression, Linear
Parameter estimate	GMT Ratio MenACWY-TT versus MenC-TT
Point estimate	0.8
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.54
upper limit	1.18

Statistical analysis title	Ratio GMT MenC SBA MenACWYY vs. MenC 12y at T1

Statistical analysis description:

Ratio of MenC SBA GMT in 12y MenACWY-TT versus MenC-TT vaccine groups at T1. Differences were determined with linear regression analyses, adjusting for titers at T0.
Ratios of GMTs were calculated with one-sided 95% CI using the Wilson score interval with continuity correction.

Comparison groups	12y MenACWY-TT v 12y MenC-TT
Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.023
Method	Regression, Linear
Parameter estimate	GMT Ratio MenACWY-TT versus MenC-TT
Point estimate	0.88

Confidence interval	
level	95 %
sides	2-sided
lower limit	0.67
upper limit	1.15

Statistical analysis title	Ratio GMT MenC SBA MenACWYY vs. MenC 15y at T1

Statistical analysis description:

Ratio of MenC SBA GMT in 15y MenACWY-TT versus MenC-TT vaccine groups at T1. Differences were determined with linear regression analyses, adjusting for titers at T0.
Ratios of GMTs were calculated with one-sided 95% CI using the Wilson score interval with continuity correction.

Comparison groups	15y MenACWY-TT v 15y MenC-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.09
Method	Regression, Linear
Parameter estimate	GMT Ratio MenACWY-TT versus MenC-TT
Point estimate	0.81
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.61
upper limit	1.06

Statistical analysis title	Differences in GMT MenC SBA 10y at T1

Statistical analysis description:

Difference in Geometric Mean Titers of MenC SBA in 10 year olds receiving MenACWY-TT or MenC-TT booster vaccination 1 month after vaccination (T1).
Differences were analysed with linear regression analysis adjusting for baseline titers.
P values were adjusted for 3 comparisons with the Bonferoni correction.

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Statistical analysis title	Differences in GMT MenC SBA 12y at T1

Statistical analysis description:

Difference in Geometric Mean Titers of MenC SBA in 12 year olds receiving MenACWY-TT or MenC-TT booster vaccination 1 month after vaccination (T1).
Differences were analysed with linear regression analysis adjusting for baseline titers.
P values were adjusted for 3 comparisons with the Bonferoni correction.

Comparison groups	12y MenACWY-TT v 12y MenC-TT

Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Statistical analysis title	Differences in GMT MenC SBA 15y at T1

Statistical analysis description:

Difference in Geometric Mean Titers of MenC SBA in 15 year olds receiving MenACWY-TT or MenC-TT booster vaccination 1 month after vaccination (T1).
Differences were analysed with linear regression analysis adjusting for baseline titers.
P values were adjusted for 3 comparisons with the Bonferoni correction.

Comparison groups	15y MenACWY-TT v 15y MenC-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Secondary: Proportion of participants MenC SBA titer >=8 at T0

End point title	Proportion of participants MenC SBA titer >=8 at T0

End point description:

Proportion of participants (in percentages) with a MenC SBA titer >=8 measured before (T0) the booster vaccination.
Proportions with two-sided 95% CI of participants were calculated using the Wilson score interval with continuity correction.

End point type	Secondary

End point timeframe:

T0

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[31]	77[32]	76[33]	75[34]
Units: Percentage				
number (confidence interval 95%)	11.0 (5.2 to 21.0)	17.9 (10.7 to 28.1)	9.2 (4.1 to 18.6)	18.9 (11.1 to 30.0)

Notes:

[31] - According to protocol

[32] - According to protocol

[33] - According to protocol

[34] - According to protocol

End point values	15y MenC-TT	10y MenC-TT from TIM study		

Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[35]	84[36]		
Units: Percentage				
number (confidence interval 95%)	12.7 (6.6 to 22.5)	17.9 (10.7 to 28.1)		

Notes:

[35] - According to protocol

[36] - According to protocol

Statistical analyses

No statistical analyses for this end point

Secondary: Proportion of participants MenC SBA titer >=8 at T1

End point title	Proportion of participants MenC SBA titer >=8 at T1

End point description:

Proportion of participants with a menC SBA titer>=8 one month (T1) after the booster vaccination. Proportions with two-sided 95% CI of participants were calculated using the Wilson score interval with continuity correction.

End point type	Secondary

End point timeframe:

T1

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[37]	77[38]	76[39]	75[40]
Units: Percentage				
number (confidence interval 95%)	98.6 (91.6 to 99.9)	100 (94.6 to 100)	100 (94.0 to 100)	100 (93.9 to 100)

Notes:

[37] - According to protocol

[38] - According to protocol

[39] - According to protocol

[40] - According to protocol

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[41]	84[42]		
Units: Percentage				
number (confidence interval 95%)	100 (94.2 to 100)	100 (94.6 to 100)		

Notes:

[41] - According to protocol

[42] - According to protocol

Statistical analyses

No statistical analyses for this end point

Secondary: Proportion of participants MenC SBA titer >=8 at T2

End point title	Proportion of participants MenC SBA titer >=8 at T2

End point description:

Proportion of participants with a menC SBA titer>=8 one year (T2) after the booster vaccination. Proportions with two-sided 95% CI of participants were calculated using the Wilson score interval with continuity correction.

End point type	Secondary

End point timeframe:

T2

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[43]	77[44]	76[45]	75[46]
Units: Percentage				
number (confidence interval 95%)	97.3 (89.6 to 99.5)	100 (94.6 to 100)	100 (94.0 to 100)	100 (93.9 to 100)

Notes:

[43] - According to protocol

[44] - According to protocol

[45] - According to protocol

[46] - According to protocol

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[47]	84[48]		
Units: Percentage				
number (confidence interval 95%)	100 (94.2 to 100)	100 (94.6 to 100)		

Notes:

[47] - According to protocol

[48] - According to protocol

Statistical analyses

No statistical analyses for this end point

Secondary: Decay of Geometric Mean Titer (GMT) of MenC SBA (T1/T2)

End point title	Decay of Geometric Mean Titer (GMT) of MenC SBA (T1/T2)

End point description:

Decay of MenC SBA geometric mean titers (T1 / T2).

End point type	Secondary

End point timeframe:

T1 / T2

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[49]	77[50]	76[51]	75[52]
Units: T1 / T2				
geometric mean (confidence interval 95%)	21.1 (16.1 to 27.7)	17.8 (14.0 to 22.7)	13.0 (10.7 to 15.7)	10.4 (8.4 to 12.7)

Notes:

[49] - According to protocol

[50] - According to protocol

[51] - According to protocol

[52] - According to protocol

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[53]	84[54]		
Units: T1 / T2				
geometric mean (confidence interval 95%)	9.5 (7.9 to 11.3)	16.7 (14.1 to 19.7)		

Notes:

[53] - According to protocol

[54] - According to protocol

Statistical analyses

No statistical analyses for this end point

Secondary: Geometric Mean Concentration (GMC) of MenC-PS IgG levels at T0

End point title	Geometric Mean Concentration (GMC) of MenC-PS IgG levels at T0

End point description:

Meningococcal serogroup C antibody geometric mean concentrations (GMCs) measured before (T0) the booster vaccination.

End point type	Secondary

End point timeframe:

T0

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[55]	77[56]	76[57]	75[58]
Units: ug/mL				
geometric mean (confidence interval 95%)	0.23 (0.18 to 0.29)	0.18 (0.14 to 0.23)	0.28 (0.22 to 0.35)	0.34 (0.25 to 0.46)

Notes:

[55] - According to protocol

[56] - According to protocol

[57] - According to protocol

[58] - According to protocol

End point values	15y MenC-TT	10y MenC-TT		

		from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[59]	84[60]		
Units: ug/mL				
geometric mean (confidence interval 95%)	0.30 (0.24 to 0.38)	0.26 (0.22 to 0.31)		

Notes:

[59] - According to protocol

[60] - According to protocol

Statistical analyses

Statistical analysis title	Ratio GMC MenC-PS IgG MenACWY vs. MenC 10y at T0

Statistical analysis description:

Ratio of MenC-PS GMCs in 10years olds MenACWY-TT versus MenC-TT vaccine groups at T0. Differences were determined with linear regression analyses.
Ratios of GMCs were calculated with one-sided 95% CI using the Wilson score interval with continuity correction.

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	non-inferiority
Method	Regression, Linear
Parameter estimate	GMC Ratio MenACWY-TT versus MenC-TT
Point estimate	0.88
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.65
upper limit	1.17

Statistical analysis title	Ratio GMC MenC-PS IgG MenACWY vs. MenC 12y at T0

Statistical analysis description:

Ratio of MenC-PS GMCs in 12years olds MenACWY-TT versus MenC-TT vaccine groups at T0. Differences were determined with linear regression analyses.
Ratios of GMCs were calculated with one-sided 95% CI using the Wilson score interval with continuity correction.

Comparison groups	12y MenACWY-TT v 12y MenC-TT
Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	non-inferiority
Method	Regression, Linear
Parameter estimate	GMC Ratio MenACWY-TT versus MenC-TT
Point estimate	0.64
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.46
upper limit	0.9

Statistical analysis title	Ratio GMC MenC-PS IgG MenACWY vs. MenC 15y at T0

Statistical analysis description:

Ratio of MenC-PS GMCs in 15years olds MenACWY-TT versus MenC-TT vaccine groups at T0. Differences were determined with linear regression analyses.
Ratios of GMCs were calculated with one-sided 95% CI using the Wilson score interval with continuity correction.

Comparison groups	15y MenACWY-TT v 15y MenC-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	non-inferiority
Method	Regression, Linear
Parameter estimate	GMC Ratio MenACWY-TT versus MenC-TT
Point estimate	1.13
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.77
upper limit	1.65

Statistical analysis title	Differences in GMC MenC-PS IgG 10y at T0

Statistical analysis description:

Difference in Geometric Mean Concentration of MenC-PS specific IgG in 10 year olds prior booster vaccination (T0).
Differences were analysed with linear regression analysis adjusting for baseline titers.
P values were adjusted for 3 comparisons with the Bonferoni correction.

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Statistical analysis title	Differences in GMC MenC-PS IgG 12y at T0

Statistical analysis description:

Difference in Geometric Mean Concentration of MenC-PS specific IgG in 12 year olds prior booster vaccination (T0).
Differences were analysed with linear regression analysis adjusting for baseline titers.
P values were adjusted for 3 comparisons with the Bonferoni correction.

Comparison groups	12y MenACWY-TT v 12y MenC-TT

Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Regression, Linear

Statistical analysis title	Differences in GMC MenC-PS IgG 15y at T0

Statistical analysis description:

Difference in Geometric Mean Concentration of MenC-PS specific IgG in 15 year olds prior booster vaccination (T0).
Differences were analysed with linear regression analysis adjusting for baseline titers.
P values were adjusted for 3 comparisons with the Bonferoni correction.

Comparison groups	15y MenACWY-TT v 15y MenC-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenC-PS IgG levels at T1

End point title	Geometric Mean Concentration (GMC) of MenC-PS IgG levels at T1

End point description:

Meningococcal serogroup C antibody geometric mean concentrations (GMCs) measured 1 month (T1) after the booster vaccination.

End point type	Secondary

End point timeframe:

T1

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[61]	77[62]	76[63]	75[64]
Units: ug/mL				
geometric mean (confidence interval 95%)	109.7 (80.6 to 149.3)	147.7 (122.2 to 178.6)	177.4 (153.9 to 204.6)	143.6 (119.3 to 172.7)

Notes:

[61] - According to protocol

[62] - According to protocol

[63] - According to protocol

[64] - According to protocol

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[65]	84[66]		

Units: ug/mL				
geometric mean (confidence interval 95%)	174.9 (151.8 to 201.4)	133.4 (115.6 to 153.9)		

Notes:

[65] - According to protocol

[66] - According to protocol

Statistical analyses

Statistical analysis title	Ratio GMC MenC-PS IgG MenACWY vs. MenC 10y at T1

Statistical analysis description:

Ratio of MenC-PS GMCs in 10years olds MenACWY-TT versus MenC-TT vaccine groups at T1. Differences were determined with linear regression analyses, adjusting for concentrations at T0.
Ratios of GMCs were calculated with one-sided 95% CI using the Wilson score interval with continuity correction.

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.094
Method	Regression, Linear
Parameter estimate	GMC Ratio MenACWY-TT versus MenC-TT
Point estimate	0.83
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.6
upper limit	1.14

Statistical analysis title	Ratio GMC MenC-PS IgG MenACWY vs. MenC 12y at T1

Statistical analysis description:

Ratio of MenC-PS GMCs in 12years olds MenACWY-TT versus MenC-TT vaccine groups at T1. Differences were determined with linear regression analyses, adjusting for concentrations at T0.
Ratios of GMCs were calculated with one-sided 95% CI using the Wilson score interval with continuity correction.

Comparison groups	12y MenACWY-TT v 12y MenC-TT
Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.018
Method	Regression, Linear
Parameter estimate	GMC Ratio MenACWY-TT versus MenC-TT
Point estimate	0.87
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.69
upper limit	1.11

Statistical analysis title	Ratio GMC MenC-PS IgG MenACWY vs. MenC 15y at T1

Statistical analysis description:

Ratio of MenC-PS GMCs in 15years olds MenACWY-TT versus MenC-TT vaccine groups at T1. Differences were determined with linear regression analyses, adjusting for concentrations at T0.
Ratios of GMCs were calculated with one-sided 95% CI using the Wilson score interval with continuity correction.

Comparison groups	15y MenC-TT v 15y MenACWY-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.022
Method	Regression, Linear
Parameter estimate	GMC Ratio MenACWY-TT versus MenC-TT
Point estimate	0.82
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.65
upper limit	1.03

Secondary: Geometric Mean Concentration (GMC) of MenC-PS IgG levels at T2

End point title	Geometric Mean Concentration (GMC) of MenC-PS IgG levels at T2

End point description:

Meningococcal serogroup C antibody geometric mean concentrations (GMCs) measured 1 year (T2) after the booster vaccination.

End point type	Secondary

End point timeframe:

T2

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[67]	77[68]	76[69]	75[70]
Units: ug/mL				
geometric mean (confidence interval 95%)	7.3 (5.7 to 9.3)	9.3 (7.6 to 11.3)	15.9 (13.1 to 19.4)	16.9 (14.0 to 20.4)

Notes:

[67] - According to protocol

[68] - According to protocol

[69] - According to protocol

[70] - According to protocol

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[71]	84[72]		
Units: ug/mL				

geometric mean (confidence interval 95%)	23.2 (19.1 to 28.1)	12.1 (10.1 to 14.4)		

Notes:

[71] - According to protocol

[72] - According to protocol

Statistical analyses

Statistical analysis title	Ratio GMC MenC-PS IgG MenACWY vs. MenC 10y at T2

Statistical analysis description:

Ratio of MenC-PS GMCs in 10years olds MenACWY-TT versus MenC-TT vaccine groups at T2. Differences were determined with linear regression analyses, adjusting for concentrations at T0.
Ratios of GMCs were calculated with one-sided 95% CI using the Wilson score interval with continuity correction.

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.667
Method	Regression, Linear
Parameter estimate	GMC Ratio MenACWY-TT versus MenC-TT
Point estimate	0.63
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.47
upper limit	0.83

Statistical analysis title	Ratio GMC MenC-PS IgG MenACWY vs. MenC 12y at T2

Statistical analysis description:

Ratio of MenC-PS GMCs in 12years olds MenACWY-TT versus MenC-TT vaccine groups at T2. Differences were determined with linear regression analyses, adjusting for concentrations at T0.
Ratios of GMCs were calculated with one-sided 95% CI using the Wilson score interval with continuity correction.

Comparison groups	12y MenACWY-TT v 12y MenC-TT
Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.954
Method	Regression, Linear
Parameter estimate	GMC Ratio MenACWY-TT versus MenC-TT
Point estimate	0.65
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.5
upper limit	0.85

Statistical analysis title	Ratio GMC MenC-PS IgG MenACWY vs. MenC 15y at T2

Statistical analysis description:

Ratio of MenC-PS GMCs in 15years olds MenACWY-TT versus MenC-TT vaccine groups at T2. Differences were determined with linear regression analyses, adjusting for concentrations at T0.
Ratios of GMCs were calculated with one-sided 95% CI using the Wilson score interval with continuity correction.

Comparison groups	15y MenACWY-TT v 15y MenC-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.802
Method	Regression, Linear
Parameter estimate	GMC Ratio MenACWY-TT versus MenC-TT
Point estimate	0.71
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.55
upper limit	0.92

Statistical analysis title	Differences in GMC MenC-PS IgG 10y at T2

Statistical analysis description:

Difference in Geometric Mean Concentrations of MenC-PS specific IgG in 10 year olds receiving MenACWY-TT or MenC-TT booster vaccination 1 year after vaccination (T2).
Differences were analysed with linear regression analysis adjusting for baseline titers.
P values were adjusted for 3 comparisons with the Bonferoni correction.

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Regression, Linear

Statistical analysis title	Differences in GMC MenC-PS IgG 12y at T2

Statistical analysis description:

Difference in Geometric Mean Concentrations of MenC-PS specific IgG in 12 year olds receiving MenACWY-TT or MenC-TT booster vaccination 1 year after vaccination (T2).
Differences were analysed with linear regression analysis adjusting for baseline titers.
P values were adjusted for 3 comparisons with the Bonferoni correction.

Comparison groups	12y MenACWY-TT v 12y MenC-TT
Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Regression, Linear

Statistical analysis title	Differences in GMC MenC-PS IgG 15y at T2

Statistical analysis description:

Difference in Geometric Mean Concentrations of MenC-PS specific IgG in 15 year olds receiving MenACWY-TT or MenC-TT booster vaccination 1 year after vaccination (T2).
Differences were analysed with linear regression analysis adjusting for baseline titers.
P values were adjusted for 3 comparisons with the Bonferoni correction.

Comparison groups	15y MenACWY-TT v 15y MenC-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenC-PS IgG1 levels at T0

End point title	Geometric Mean Concentration (GMC) of MenC-PS IgG1 levels at T0

End point description:

Meningococcal serogroup C serum polysaccharide specific IgG1 levels measured before (T0) the booster vaccination.

End point type	Secondary

End point timeframe:

T0

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[73]	77[74]	76[75]	75[76]
Units: ug/mL				
geometric mean (confidence interval 95%)	0.23 (0.17 to 0.31)	0.20 (0.15 to 0.27)	0.29 (0.19 to 0.44)	0.32 (0.22 to 0.46)

Notes:

[73] - According to protocol

[74] - According to protocol

[75] - According to protocol

[76] - According to protocol

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[77]	84[78]		
Units: ug/mL				
geometric mean (confidence interval 95%)	0.24 (0.15 to 0.38)	0.35 (0.29 to 0.42)		

Notes:

[77] - According to protocol

[78] - According to protocol

Statistical analyses

Statistical analysis title	GMC MenC-PS IgG1 10y at T0

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide specific IgG1 in 10 year olds measured before (T0) the booster vaccination. Differences were analysed with linear regression analysis. P-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Regression, Linear

Statistical analysis title	GMC MenC-PS IgG1 12y at T0

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide specific IgG1 in 12 year olds measured before (T0) the booster vaccination. Differences were analysed with linear regression analysis. P-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	12y MenC-TT v 12y MenACWY-TT
Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Statistical analysis title	GMC MenC-PS IgG1 15y at T0

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide specific IgG1 in 15 year olds measured before (T0) the booster vaccination. Differences were analysed with linear regression analysis. P-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenC-TT v 15y MenACWY-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenC-PS IgG1 levels at T1

End point title	Geometric Mean Concentration (GMC) of MenC-PS IgG1 levels at T1

End point description:

Meningococcal serogroup C serum polysaccharide specific IgG1 levels 1 month (T1) after the booster vaccination.

End point type	Secondary

End point timeframe:

T1

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[79]	77[80]	76[81]	75[82]
Units: ug/mL				
geometric mean (confidence interval 95%)	223.1 (163.3 to 304.7)	292.7 (240.2 to 356.9)	310.5 (269.0 to 358.5)	256.8 (213.2 to 309.4)

Notes:

[79] - According to protocol

[80] - According to protocol

[81] - According to protocol

[82] - According to protocol

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[83]	84[84]		
Units: ug/mL				
geometric mean (confidence interval 95%)	271.1 (229.7 to 319.9)	156.3 (135.3 to 180.6)		

Notes:

[83] - According to protocol

[84] - According to protocol

Statistical analyses

Statistical analysis title	GMC MenC-PS IgG1 10y at T1

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide specific IgG1 in 10 year olds measured 1 month after (T1) the booster vaccination. Differences were analysed with linear regression analysis, adjusting for baseline concentrations. P-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Regression, Linear

Statistical analysis title	GMC MenC-PS IgG1 12y at T1

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide specific IgG1 in 12 year olds measured 1 month after (T1) the booster vaccination. Differences were analysed with linear regression analysis, adjusting for baseline concentrations. P-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	12y MenACWY-TT v 12y MenC-TT

Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Statistical analysis title	GMC MenC-PS IgG1 15y at T1

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide specific IgG1 in 15 year olds measured 1 month after (T1) the booster vaccination. Differences were analysed with linear regression analysis, adjusting for baseline concentrations. P-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 15y MenC-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenC-PS IgG1 levels at T2

End point title	Geometric Mean Concentration (GMC) of MenC-PS IgG1 levels at T2

End point description:

Meningococcal serogroup C serum polysaccharide specific IgG1 imeasured 1 year after (T2) the booster vaccination.

End point type	Secondary

End point timeframe:

T2

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[85]	77[86]	76[87]	75[88]
Units: ug/mL				
geometric mean (confidence interval 95%)	10.40 (8.00 to 13.53)	13.86 (11.25 to 17.07)	17.25 (14.35 to 20.73)	22.38 (18.06 to 27.74)

Notes:

[85] - According to protocol

[86] - According to protocol

[87] - According to procol

[88] - According to protocol

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[89]	84[90]		
Units: ug/mL				

geometric mean (confidence interval 95%)	22.56 (18.80 to 27.06)	13.57 (11.60 to 15.88)		

Notes:

[89] - According to protocol

[90] - According to protocol

Statistical analyses

Statistical analysis title	GMC MenC-PS IgG1 10y at T2

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide specific IgG1 in 10 year olds measured 1 year after (T2) the booster vaccination. Differences were analysed with linear regression analysis, adjusting for baseline concentrations. P-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Statistical analysis title	GMC MenC-PS IgG1 12y at T2

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide specific IgG1 in 12 year olds measured 1 year after (T2) the booster vaccination. Differences were analysed with linear regression analysis, adjusting for baseline concentrations. P-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	12y MenACWY-TT v 12y MenC-TT
Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Statistical analysis title	GMC MenC-PS IgG1 15y at T2

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide specific IgG1 in 15 year olds measured 1 year after (T2) the booster vaccination. Differences were analysed with linear regression analysis, adjusting for baseline concentrations. P-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 15y MenC-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenC-PS IgG2 levels at T0

End point title	Geometric Mean Concentration (GMC) of MenC-PS IgG2 levels at T0

End point description:

Meningococcal serogroup C serum polysaccharide specific IgG2 measured prior to (T0) the booster vaccination.

End point type	Secondary

End point timeframe:

T0

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[91]	77[92]	76[93]	75[94]
Units: ug/mL				
geometric mean (confidence interval 95%)	0.011 (0.007 to 0.016)	0.009 (0.005 to 0.013)	0.007 (0.004 to 0.011)	0.036 (0.023 to 0.056)

Notes:

[91] - According to protocol

[92] - According to protocol

[93] - According to protocol

[94] - According to protocol

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[95]	84[96]		
Units: ug/mL				
geometric mean (confidence interval 95%)	0.017 (0.011 to 0.028)	0.061 (0.044 to 0.084)		

Notes:

[95] - According to protocol

[96] - According to protocol

Statistical analyses

Statistical analysis title	GMC MenC-PS IgG2 10y at T0

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide specific IgG2 in 10 year olds measured prior to (T0) the booster vaccination. Differences were analysed with linear regression analysis. P-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.001
Method	Regression, Linear

Statistical analysis title	GMC MenC-PS IgG2 12y at T0

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide specific IgG2 in 12 year olds measured prior to (T0) the booster vaccination. Differences were analysed with linear regression analysis. P-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	12y MenACWY-TT v 12y MenC-TT
Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Statistical analysis title	GMC MenC-PS IgG2 15y at T0

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide specific IgG2 in 15 year olds measured prior to (T0) the booster vaccination. Differences were analysed with linear regression analysis. P-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 15y MenC-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenC-PS IgG2 levels at T1

End point title	Geometric Mean Concentration (GMC) of MenC-PS IgG2 levels at T1

End point description:

Meningococcal serogroup C serum polysaccharide specific IgG2 measured 1 month after (T1) the booster vaccination.

End point type	Secondary

End point timeframe:

T1

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[97]	77[98]	76[99]	75[100]
Units: ug/mL				
geometric mean (confidence interval 95%)	9.90 (6.89 to 14.23)	9.50 (7.01 to 12.88)	9.42 (7.36 to 12.05)	13.49 (9.92 to 18.34)

Notes:

[97] - According to protocol

[98] - According to protocol

[99] - According to protocol

[100] - According to protocol

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[101]	84[102]		
Units: ug/mL				
geometric mean (confidence interval 95%)	15.93 (12.06 to 21.05)	13.54 (10.61 to 17.26)		

Notes:

[101] - According to protocol

[102] - According to protocol

Statistical analyses

Statistical analysis title	GMC MenC-PS IgG2 10y at T1

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide specific IgG2 in 10 year olds measured 1 month after (T1) the booster vaccination. Differences were analysed with linear regression analysis, adjusting for baseline concentrations. P-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Statistical analysis title	GMC MenC-PS IgG2 12y at T1

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide specific IgG2 in 12 year olds measured 1 month after (T1) the booster vaccination. Differences were analysed with linear regression analysis, adjusting for baseline concentrations. P-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	12y MenACWY-TT v 12y MenC-TT
Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Statistical analysis title	GMC MenC-PS IgG2 15y at T1

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide specific IgG2 in 15 year olds measured 1 month after (T1) the booster vaccination. Differences were analysed with linear regression analysis, adjusting for baseline concentrations. P-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 15y MenC-TT

Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Secondary: Ratio of Geometric Mean Concentration MenC-PS specific IgG1 / IgG2 at T0

End point title	Ratio of Geometric Mean Concentration MenC-PS specific IgG1 / IgG2 at T0

End point description:

Ratio of Meningococcal serogroup C serum polysaccharide specific IgG1 and IgG2 measured prior to (T0) booster vaccination.

End point type	Secondary

End point timeframe:

T0

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[103]	77[104]	76[105]	75[106]
Units: ug/mL				
geometric mean (confidence interval 95%)	21.74 (15.09 to 31.30)	22.64 (16.52 to 31.03)	43.71 (28.04 to 68.15)	8.81 (6.44 to 12.04)

Notes:

[103] - According to protocol

[104] - According to protocol

[105] - According to protocol

[106] - According to protocol

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[107]	84[108]		
Units: ug/mL				
geometric mean (confidence interval 95%)	13.72 (8.05 to 23.37)	5.75 (4.18 to 7.92)		

Notes:

[107] - According to protocol

[108] - According to protocol

Statistical analyses

Statistical analysis title	Ratio GMC MenC-PS IgG1 / IgG2 10y at T0

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide (PS) specific IgG1/IgG2 measured before (T0) booster vaccination. Differences were analysed using linear regression. P values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study

Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.001
Method	Regression, Linear

Statistical analysis title	Ratio GMC MenC-PS IgG1 / IgG2 12y at T0

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide (PS) specific IgG1/IgG2 measured before (T0) booster vaccination. Differences were analysed using linear regression. P values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	12y MenACWY-TT v 12y MenC-TT
Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Regression, Linear

Statistical analysis title	Ratio GMC MenC-PS IgG1 / IgG2 15y at T0

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide (PS) specific IgG1/IgG2 measured before (T0) booster vaccination. Differences were analysed using linear regression. P values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 15y MenC-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Secondary: Ratio of Geometric Mean Concentration MenC-PS specific IgG1 / IgG2 at T1

End point title	Ratio of Geometric Mean Concentration MenC-PS specific IgG1 / IgG2 at T1

End point description:

Meningococcal serogroup C serum polysaccharide (PS) specific IgG1/IgG2 measured 1 month after (T1) booster vaccination.

End point type	Secondary

End point timeframe:

T1

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[109]	77[110]	76[111]	75[112]
Units: ug/mL				
geometric mean (confidence interval 95%)	22.53 (17.02 to 29.83)	30.81 (23.06 to 41.17)	32.97 (26.41 to 41.16)	19.04 (13.81 to 26.26)

Notes:

[109] - According to protocol

[110] - According to protocol

[111] - According to protocol

[112] - According to protocol

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[113]	84[114]		
Units: ug/mL				
geometric mean (confidence interval 95%)	17.01 (12.39 to 23.36)	11.40 (9.46 to 13.74)		

Notes:

[113] - According to protocol

[114] - According to protocol

Statistical analyses

Statistical analysis title	Ratio GMC MenC-PS IgG1 / IgG2 10y at T1

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide (PS) specific IgG1/IgG2 measured 1 month (T1) after booster vaccination. Differences were analysed using linear regression, adjusting for baseline concentrations. P values were adjusted for 3 comparisons with the Bonferroni correction

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Regression, Linear

Statistical analysis title	Ratio GMC MenC-PS IgG1 / IgG2 12y at T1

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide (PS) specific IgG1/IgG2 measured 1 month (T1) after booster vaccination. Differences were analysed using linear regression, adjusting for baseline concentrations. P values were adjusted for 3 comparisons with the Bonferroni correction

Comparison groups	12y MenACWY-TT v 12y MenC-TT
Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Statistical analysis title	Ratio GMC MenC-PS IgG1 / IgG2 15y at T1

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide (PS) specific IgG1/IgG2 measured 1 month (T1) after booster vaccination. Differences were analysed using linear regression, adjusting for baseline concentrations. P values were adjusted for 3 comparisons with the Bonferroni correction

Comparison groups	15y MenACWY-TT v 15y MenC-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Secondary: Ratio of Geometric Mean Concentration MenC-PS specific IgG1 / IgG2 at T2

End point title	Ratio of Geometric Mean Concentration MenC-PS specific IgG1 / IgG2 at T2

End point description:

Meningococcal serogroup C serum polysaccharide (PS) specific IgG1/IgG2 measured 1 year (T2) after booster vaccination.

End point type	Secondary

End point timeframe:

T2

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[115]	77[116]	76[117]	75[118]
Units: ug/mL				
geometric mean (confidence interval 95%)	13.05 (9.79 to 17.40)	17.90 (13.53 to 23.70)	14.50 (11.00 to 19.11)	13.38 (9.32 to 19.21)

Notes:

[115] - According to protocol

[116] - According to protocol

[117] - According to protocol

[118] - According to protocol

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[119]	84[120]		
Units: ug/mL				
geometric mean (confidence interval 95%)	11.69 (7.71 to 17.72)	11.37 (8.90 to 14.53)		

Notes:

[119] - According to protocol

[120] - According to protocol

Statistical analyses

Statistical analysis title	Ratio GMC MenC-PS IgG1 / IgG2 10y at T2

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide (PS) specific IgG1/IgG2 measured 1 year (T2) after booster vaccination. Differences were analysed using linear regression, adjusting for baseline concentrations. P values were adjusted for 3 comparisons with the Bonferroni correction

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Statistical analysis title	Ratio GMC MenC-PS IgG1 / IgG2 12y at T2

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide (PS) specific IgG1/IgG2 measured 1 year (T2) after booster vaccination. Differences were analysed using linear regression, adjusting for baseline concentrations. P values were adjusted for 3 comparisons with the Bonferroni correction

Comparison groups	12y MenACWY-TT v 12y MenC-TT
Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Statistical analysis title	Ratio GMC MenC-PS IgG1 / IgG2 15y at T2

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide (PS) specific IgG1/IgG2 measured 1 year (T2) after booster vaccination. Differences were analysed using linear regression, adjusting for baseline concentrations. P values were adjusted for 3 comparisons with the Bonferroni correction

Comparison groups	15y MenC-TT v 15y MenACWY-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenC-PS IgG2 levels at T2

End point title	Geometric Mean Concentration (GMC) of MenC-PS IgG2 levels at T2

End point description:

Meningococcal serogroup C serum polysaccharide specific IgG2 measured 1 year after (T2) the booster vaccination.

End point type	Secondary

End point timeframe:

T2

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73[121]	77[122]	76[123]	75[124]
Units: ug/mL				
geometric mean (confidence interval 95%)	0.80 (0.57 to 1.11)	0.770 (0.58 to 1.03)	1.19 (0.97 to 1.47)	1.67 (1.20 to 2.34)

Notes:

[121] - According to protocol

[122] - According to protocol

[123] - According to protocol

[124] - According to protocol

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79[125]	84[126]		
Units: ug/mL				
geometric mean (confidence interval 95%)	1.93 (1.40 to 2.67)	1.19 (0.94 to 1.52)		

Notes:

[125] - According to protocol

[126] - According to protocol

Statistical analyses

Statistical analysis title	GMC MenC-PS IgG2 10y at T2

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide specific IgG2 in 10 year olds measured 1 year after (T2) the booster vaccination. Differences were analysed with linear regression analysis, adjusting for baseline concentrations. P-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 10y MenC-TT from TIM study
Number of subjects included in analysis	157
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Statistical analysis title	GMC MenC-PS IgG2 12y at T2

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide specific IgG2 in 12 year olds measured 1 year after (T2) the booster vaccination. Differences were analysed with linear regression analysis, adjusting for baseline concentrations. P-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	12y MenACWY-TT v 12y MenC-TT

Number of subjects included in analysis	153
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Regression, Linear

Statistical analysis title	GMC MenC-PS IgG2 15y at T2

Statistical analysis description:

Meningococcal serogroup C serum polysaccharide specific IgG2 in 15 year olds measured 1 year after (T2) the booster vaccination. Differences were analysed with linear regression analysis, adjusting for baseline concentrations. P-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 15y MenC-TT
Number of subjects included in analysis	154
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	> 0.05
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of Tetatnus Toxoid IgG levels at T0

End point title	Geometric Mean Concentration (GMC) of Tetatnus Toxoid IgG levels at T0

End point description:

Tetanus Toxoid specific IgG measured prior to (T0) the booster vaccination.

End point type	Secondary

End point timeframe:

T0

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73	77	80	74
Units: ug/mL				
geometric mean (confidence interval 95%)	3.88 (3.18 to 4.73)	1.51 (1.22 to 1.86)	1.82 (1.45 to 2.28)	0.77 (0.63 to 0.94)

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	82	91		
Units: ug/mL				
geometric mean (confidence interval 95%)	0.73 (0.59 to 0.90)	5.06 (4.27 to 5.99)		

Statistical analyses

No statistical analyses for this end point

Secondary: Geometric Mean Concentration (GMC) of Tetatnus Toxoid IgG levels at T1

End point title	Geometric Mean Concentration (GMC) of Tetatnus Toxoid IgG levels at T1

End point description:

Tetanus Toxoid specific IgG measured 1 month after (T1) the booster vaccination.

End point type	Secondary

End point timeframe:

T1

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73	77	78	74
Units: ug/mL				
geometric mean (confidence interval 95%)	8.88 (7.70 to 10.24)	9.97 (8.10 to 11.83)	5.14 (4.19 to 6.30)	10.81 (9.11 to 12.83)

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	81	88		
Units: ug/mL				
geometric mean (confidence interval 95%)	3.87 (3.30 to 4.54)	7.40 (6.45 to 8.50)		

Statistical analyses

No statistical analyses for this end point

Secondary: Geometric Mean Concentration (GMC) of Tetatnus Toxoid IgG levels at T2

End point title	Geometric Mean Concentration (GMC) of Tetatnus Toxoid IgG levels at T2

End point description:

Tetanus Toxoid specific IgG measured 1 year after (T2) the booster vaccination.

End point type	Secondary

End point timeframe:

T2

End point values	10y MenACWY-TT	12y MenACWY-TT	12y MenC-TT	15y MenACWY-TT
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	73	77	76	74
Units: ug/mL				
geometric mean (confidence interval 95%)	3.64 (3.12 to 4.25)	3.08 (2.54 to 3.74)	2.00 (1.61 to 2.47)	3.15 (2.68 to 3.69)

End point values	15y MenC-TT	10y MenC-TT from TIM study		
Subject group type	Reporting group	Subject analysis set		
Number of subjects analysed	79	84		
Units: ug/mL				
geometric mean (confidence interval 95%)	1.23 (1.03 to 1.48)	3.63 (3.13 to 4.21)		

Statistical analyses

No statistical analyses for this end point

Secondary: Geometric Mean Titers (GMTs) of MenA SBA levels at T0

End point title	Geometric Mean Titers (GMTs) of MenA SBA levels at T0[127]

End point description:

Geometric Mean Titers (GMTs) of Meningococcal Serogroup A (MenA) Specific Serum Bactericidal Antibody (SBA) prior to (T0) the booster vaccination.

End point type	Secondary

End point timeframe:

T0

Notes:

[127] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[128]	77[129]	75[130]	
Units: Geometric Mean Titre				
geometric mean (confidence interval 95%)	4.4 (3.0 to 6.5)	10.2 (6.2 to 16.9)	4.6 (3.1 to 6.9)	

Notes:

[128] - According to protocol cohort

[129] - According to protocol cohort

[130] - According to protocol cohort

Statistical analyses

Statistical analysis title	GMT MenA SBA levels 10 vs 12 at T0

Statistical analysis description:

Differences in GMT MenA SBA levels between the age groups 10 and 12 years old prior to (T0) the booster vaccination were analyzed with linear regression analyses. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	150
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.009
Method	Regression, Linear

Statistical analysis title	GMT MenA SBA levels 10 vs 15 at T0

Statistical analysis description:

Differences in GMT MenA SBA levels between the age groups 10 and 15 years old prior to (T0) the booster vaccination were analyzed with linear regression analyses. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 15y MenACWY-TT
Number of subjects included in analysis	148
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 1
Method	Regression, Linear

Statistical analysis title	GMT MenA SBA levels 12 vs 15 at T0

Statistical analysis description:

Differences in GMT MenA SBA levels between the age groups 12 and 15 years old prior to (T0) the booster vaccination were analyzed with linear regression analyses. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 12y MenACWY-TT

Number of subjects included in analysis	152
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.027
Method	Regression, Linear

Secondary: Geometric Mean Titers (GMTs) of MenA SBA levels at T1

End point title	Geometric Mean Titers (GMTs) of MenA SBA levels at T1[131]

End point description:

Geometric Mean Titers (GMTs) of Meningococcal Serogroup A (MenA) Specific Serum Bactericidal Antibody (SBA) 1 month after (T1) the booster vaccination.

End point type	Secondary

End point timeframe:

T1

Notes:

[131] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[132]	77[133]	75[134]	
Units: Geometric Mean Titre				
geometric mean (confidence interval 95%)	2795 (1792 to 4359)	4919 (4191 to 5774)	4507 (3836 to 5295)	

Notes:

[132] - According to protocol cohort

[133] - According to protocol cohort

[134] - According to protocol cohort

Statistical analyses

Statistical analysis title	GMT MenA SBA levels 10 vs 12 at T1

Statistical analysis description:

Differences in GMT MenA SBA levels between the age groups 10 and 12 years old 1 month after (T1) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline titers. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	150
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.048
Method	Regression, Linear

Statistical analysis title	GMT MenA SBA levels 10 vs 15 at T1

Statistical analysis description:

Differences in GMT MenA SBA levels between the age groups 10 and 15 years old 1 month after (T1) the

booster vaccination were analyzed with linear regression analysis, adjusting for baseline titers. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 15y MenACWY-TT
Number of subjects included in analysis	148
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.117
Method	Regression, Linear

Statistical analysis title	GMT MenA SBA levels 12 vs 15 at T1

Statistical analysis description:

Differences in GMT MenA SBA levels between the age groups 12 and 15 years old 1 month after (T1) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline titers. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	152
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 1
Method	Regression, Linear

Secondary: Geometric Mean Titers (GMTs) of MenW SBA levels at T0

End point title	Geometric Mean Titers (GMTs) of MenW SBA levels at T0[135]

End point description:

Geometric Mean Titers (GMTs) of Meningococcal Serogroup W (MenW) Specific Serum Bactericidal Antibody (SBA) prior to (T0) the booster vaccination.

End point type	Secondary

End point timeframe:

T0

Notes:

[135] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[136]	77[137]	75[138]	
Units: Geometric Mean Titre				
geometric mean (confidence interval 95%)	4.0 (2.7 to 5.7)	4.2 (2.8 to 6.2)	4.8 (3.1 to 7.3)	

Notes:

[136] - Accoring to protocol cohort

[137] - Accoring to protocol cohort

[138] - Accoring to protocol cohort

Statistical analyses

Statistical analysis title	GMT MenW SBA levels 10 vs 12 at T0

Statistical analysis description:

Differences in GMT MenW SBA levels between the age groups 10 and 12 years old prior to (T0) the booster vaccination were analyzed with linear regression analyses. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	150
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 1
Method	Regression, Linear

Statistical analysis title	GMT MenW SBA levels 10 vs 15 at T0

Statistical analysis description:

Differences in GMT MenW SBA levels between the age groups 10 and 15 years old prior to (T0) the booster vaccination were analyzed with linear regression analyses. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 15y MenACWY-TT
Number of subjects included in analysis	148
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 1
Method	Regression, Linear

Statistical analysis title	GMT MenW SBA levels 12 vs 15 at T0

Statistical analysis description:

Differences in GMT MenW SBA levels between the age groups 12 and 15 years old prior to (T0) the booster vaccination were analyzed with linear regression analyses. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	152
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 1
Method	Regression, Linear

Secondary: Geometric Mean Titers (GMTs) of MenW SBA levels at T1

End point title	Geometric Mean Titers (GMTs) of MenW SBA levels at T1[139]

End point description:

Geometric Mean Titers (GMTs) of Meningococcal Serogroup W (MenW) Specific Serum Bactericidal Antibody (SBA) 1 month after (T1) the booster vaccination.

End point type	Secondary

End point timeframe:

T1

Notes:

[139] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[140]	77[141]	75[142]	
Units: Geometric Mean Titre				
geometric mean (confidence interval 95%)	3796 (2377 to 6062)	6600 (5362 to 8124)	7632 (6274 to 9283)	

Notes:

[140] - According to protocol cohort

[141] - According to protocol cohort

[142] - According to protocol cohort

Statistical analyses

Statistical analysis title	GMT MenW SBA levels 10 vs 12 at T1

Statistical analysis description:

Differences in GMT MenW SBA levels between the age groups 10 and 12 years old 1 month after (T1) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline titers. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	150
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.093
Method	Regression, Linear

Statistical analysis title	GMT MenW SBA levels 10 vs 15 at T1

Statistical analysis description:

Differences in GMT MenW SBA levels between the age groups 10 and 15 years old 1 month after (T1) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline titers. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 15y MenACWY-TT
Number of subjects included in analysis	148
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.027
Method	Regression, Linear

Statistical analysis title	GMT MenW SBA levels 12 vs 15 at T1

Statistical analysis description:

Differences in GMT MenW SBA levels between the age groups 12 and 15 years old 1 month after (T1) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline titers. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 12y MenACWY-TT

Number of subjects included in analysis	152
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 1
Method	Regression, Linear

Secondary: Geometric Mean Titers (GMTs) of MenY SBA levels at T0

End point title	Geometric Mean Titers (GMTs) of MenY SBA levels at T0[143]

End point description:

Geometric Mean Titers (GMTs) of Meningococcal Serogroup Y (MenY) Specific Serum Bactericidal Antibody (SBA) prior to (T0) the booster vaccination.

End point type	Secondary

End point timeframe:

T0

Notes:

[143] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[144]	77[145]	75[146]	
Units: Geometric Mean Titre				
geometric mean (confidence interval 95%)	11.2 (6.4 to 19.5)	11.1 (6.6 to 18.7)	9.7 (5.4 to 17.6)	

Notes:

[144] - According to protocol cohort

[145] - According to protocol cohort

[146] - According to protocol cohort

Statistical analyses

Statistical analysis title	GMT MenY SBA levels 10 vs 12 at T0

Statistical analysis description:

Differences in GMT MenY SBA levels between the age groups 10 and 12 years old prior to (T0) the booster vaccination were analyzed with linear regression analyses. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	150
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 1
Method	Regression, Linear

Statistical analysis title	GMT MenY SBA levels 10 vs 15 at T0

Statistical analysis description:

Differences in GMT MenY SBA levels between the age groups 10 and 15 years old prior to (T0) the

booster vaccination were analyzed with linear regression analyses. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 15y MenACWY-TT
Number of subjects included in analysis	148
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 1
Method	Regression, Linear

Statistical analysis title	GMT MenY SBA levels 12 vs 15 at T0

Statistical analysis description:

Differences in GMT MenY SBA levels between the age groups 12 and 15 years old prior to (T0) the booster vaccination were analyzed with linear regression analyses. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	152
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 1
Method	Regression, Linear

Secondary: Geometric Mean Titers (GMTs) of MenY SBA levels at T1

End point title	Geometric Mean Titers (GMTs) of MenY SBA levels at T1[147]

End point description:

Geometric Mean Titers (GMTs) of Meningococcal Serogroup Y (MenY) Specific Serum Bactericidal Antibody (SBA) 1 month after (T1) the booster vaccination.

End point type	Secondary

End point timeframe:

T1

Notes:

[147] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[148]	77[149]	75[150]	
Units: Geometric Mean Titre				
geometric mean (confidence interval 95%)	2817 (2029 to 3911)	4731 (3940 to 5680)	4576 (3781 to 5539)	

Notes:

[148] - According to protocol cohort

[149] - According to protocol cohort

[150] - According to protocol cohort

Statistical analyses

Statistical analysis title	GMT MenY SBA levels 10 vs 12 at T1

Statistical analysis description:

Differences in GMT MenY SBA levels between the age groups 10 and 12 years old 1 month after (T1) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline titers. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	150
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.027
Method	Regression, Linear

Statistical analysis title	GMT MenY SBA levels 10 vs 15 at T1

Statistical analysis description:

Differences in GMT MenY SBA levels between the age groups 10 and 15 years old 1 month after (T1) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline titers. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 15y MenACWY-TT
Number of subjects included in analysis	148
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.045
Method	Regression, Linear

Statistical analysis title	GMT MenY SBA levels 12 vs 15 at T1

Statistical analysis description:

Differences in GMT MenY SBA levels between the age groups 12 and 15 years old 1 month after (T1) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline titers. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	152
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 1
Method	Regression, Linear

Secondary: Proportion of participants MenA rSBA titer >=8 at T0

End point title	Proportion of participants MenA rSBA titer >=8 at T0[151]

End point description:

Proportion of participants with an rSBA titer ≥8 for meningococcal serogroup A prior to (T0) the vaccination.

End point type	Secondary

End point timeframe:

T0

Notes:

[151] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[152]	77[153]	75[154]	
Units: Proportion				
number (confidence interval 95%)	13.7 (7.1 to 24.2)	27.3 (18.0 to 38.8)	13.3 (6.9 to 23.6)	

Notes:

[152] - According to protocol cohort

[153] - According to protocol cohort

[154] - According to protocol cohort

Statistical analyses

No statistical analyses for this end point

Secondary: Proportion of participants MenA rSBA titer >=8 at T1

End point title	Proportion of participants MenA rSBA titer >=8 at T1[155]

End point description:

Proportion of participants with an rSBA titer ≥8 for meningococcal serogroup A 1 month after (T1) the vaccination.

End point type	Secondary

End point timeframe:

T1

Notes:

[155] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[156]	77[157]	75[158]	
Units: Proportion				
number (confidence interval 95%)	94.5 (85.8 to 98.2)	100 (94.1 to 100)	100 (93.9 to 100)	

Notes:

[156] - According to protocol cohort

[157] - According to protocol cohort

[158] - According to protocol cohort

Statistical analyses

No statistical analyses for this end point

Secondary: Proportion of participants MenA rSBA titer >=8 at T2

End point title	Proportion of participants MenA rSBA titer >=8 at T2[159]

End point description:

Proportion of participants with an rSBA titer ≥8 for meningococcal serogroup A 1 year after (T2) the vaccination.

End point type	Secondary

End point timeframe:

T2

Notes:

[159] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[160]	77[161]	75[162]	
Units: Proportion				
number (confidence interval 95%)	94.5 (85.8 to 98.2)	96.1 (88.3 to 99.0)	98.7 (91.8 to 99.9)	

Notes:

[160] - According to protocol

[161] - According to protocol

[162] - According to protocol

Statistical analyses

No statistical analyses for this end point

Secondary: Proportion of participants MenW rSBA titer >=8 at T0

End point title	Proportion of participants MenW rSBA titer >=8 at T0[163]

End point description:

Proportion of participants with an rSBA titer ≥8 for meningococcal serogroup W prior to (T0) the vaccination.

End point type	Secondary

End point timeframe:

T0

Notes:

[163] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[164]	77[165]	75[166]	
Units: Proportion				
number (confidence interval 95%)	13.7 (7.1 to 24.2)	14.3 (7.7 to 24.6)	18.7 (10.9 to 29.7)	

Notes:

[164] - According to protocol cohort

[165] - According to protocol cohort

[166] - According to protocol cohort

Statistical analyses

No statistical analyses for this end point

Secondary: Proportion of participants MenW rSBA titer >=8 at T1

End point title	Proportion of participants MenW rSBA titer >=8 at T1[167]

End point description:

Proportion of participants with an rSBA titer ≥8 for meningococcal serogroup W 1 month after (T1) the vaccination.

End point type	Secondary

End point timeframe:

T1

Notes:

[167] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[168]	77[169]	75[170]	
Units: Proportion				
number (confidence interval 95%)	94.5 (85.8 to 98.2)	100 (94.1 to 100)	100 (93.9 to 100)	

Notes:

[168] - According to protocol cohort

[169] - According to protocol cohort

[170] - According to protocol cohort

Statistical analyses

No statistical analyses for this end point

Secondary: Proportion of participants MenW rSBA titer >=8 at T2

End point title	Proportion of participants MenW rSBA titer >=8 at T2[171]

End point description:

Proportion of participants with an rSBA titer ≥8 for meningococcal serogroup W 1 year after (T2) the vaccination.

End point type	Secondary

End point timeframe:

T2

Notes:

[171] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[172]	77[173]	75[174]	
Units: Proportion				
number (confidence interval 95%)	95.9 (87.7 to 98.9)	100 (94.1 to 100)	100 (93.9 to 100)	

Notes:

[172] - According to protocol cohort

[173] - According to protocol cohort

[174] - According to protocol cohort

Statistical analyses

No statistical analyses for this end point

Secondary: Proportion of participants MenY rSBA titer >=8 at T0

End point title	Proportion of participants MenY rSBA titer >=8 at T0[175]

End point description:

Proportion of participants with an rSBA titer ≥8 for meningococcal serogroup Y prior to (T0) the vaccination.

End point type	Secondary

End point timeframe:

T0

Notes:

[175] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[176]	77[177]	75[178]	
Units: Proportion				
number (confidence interval 95%)	35.6 (25.0 to 47.8)	33.8 (23.6 to 45.5)	28.0 (18.5 to 39.7)	

Notes:

[176] - According to protocol cohort

[177] - According to protocol cohort

[178] - According to protocol cohort

Statistical analyses

No statistical analyses for this end point

Secondary: Proportion of participants MenY rSBA titer >=8 at T1

End point title	Proportion of participants MenY rSBA titer >=8 at T1[179]

End point description:

Proportion of participants with an rSBA titer ≥8 for meningococcal serogroup Y 1 month after (T1) the vaccination.

End point type	Secondary

End point timeframe:

T1

Notes:

[179] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[180]	77[181]	75[182]	
Units: Proportion				
number (confidence interval 95%)	98.6 (91.6 to 99.9)	100 (94.1 to 100)	100 (93.9 to 100)	

Notes:

[180] - According to protocol cohort

[181] - According to protocol cohort

[182] - According to procotol cohort

Statistical analyses

No statistical analyses for this end point

Secondary: Proportion of parcitipants MenY rSBA titer >=8 at T2

End point title	Proportion of parcitipants MenY rSBA titer >=8 at T2[183]

End point description:

Proportion of participants with an rSBA titer ≥8 for meningococcal serogroup Y 1 year after (T2) the vaccination.

End point type	Secondary

End point timeframe:

T2

Notes:

[183] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[184]	77[185]	75[186]	
Units: Proportion				
number (confidence interval 95%)	97.3 (89.6 to 99.5)	98.7 (92.0 to 99.9)	97.3 (89.9 to 99.5)	

Notes:

[184] - According to protocol cohort

[185] - According to protocol cohort

[186] - According to protocol cohort

Statistical analyses

No statistical analyses for this end point

Secondary: Geometric Mean Concentration (GMC) of MenA-PS IgG levels at T0

End point title	Geometric Mean Concentration (GMC) of MenA-PS IgG levels at T0[187]

End point description:

Meningococcal serogroup A antibody geometric mean concentrations (GMCs) measured before (T0) the booster vaccination.

End point type	Secondary

End point timeframe:

T0

Notes:

[187] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[188]	77[189]	75[190]	
Units: ug/ml				
geometric mean (confidence interval 95%)	0.59 (0.45 to 0.77)	0.48 (0.39 to 0.59)	0.64 (0.49 to 0.85)	

Notes:

[188] - According to protocol cohort

[189] - According to protocol cohort

[190] - According to protocol cohort

Statistical analyses

Statistical analysis title	GMC MenA-PS IgG 10y vs. 12y at T0

Statistical analysis description:

Differences in GMC MenA-PS IgG levels between the age groups 10 and 12 years old prior to (T0) the booster vaccination were analyzed with linear regression analyses. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	150
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.357
Method	Regression, Linear

Statistical analysis title	GMC MenA-PS IgG 10y vs. 15y at T0

Statistical analysis description:

Differences in GMC MenA-PS IgG levels between the age groups 10 and 15 years old prior to (T0) the booster vaccination were analyzed with linear regression analyses. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 15y MenACWY-TT
Number of subjects included in analysis	148
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 1
Method	Regression, Linear

Statistical analysis title	GMC MenA-PS IgG 12y vs. 15y at T0

Statistical analysis description:

Differences in GMC MenA-PS IgG levels between the age groups 12 and 15 years old prior to (T0) the booster vaccination were analyzed with linear regression analyses. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 12y MenACWY-TT

Number of subjects included in analysis	152
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.405
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenA-PS IgG levels at T1

End point title	Geometric Mean Concentration (GMC) of MenA-PS IgG levels at T1[191]

End point description:

Meningococcal serogroup A antibody geometric mean concentrations (GMCs) measured 1 month after (T1) the booster vaccination.

End point type	Secondary

End point timeframe:

T1

Notes:

[191] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[192]	77[193]	75[194]	
Units: ug/ml				
geometric mean (confidence interval 95%)	21.9 (16.1 to 29.9)	24.9 (18.8 to 33.0)	35.8 (27.5 to 46.5)	

Notes:

[192] - According to protocol cohort

[193] - According to protocol cohort

[194] - According to protocol cohort

Statistical analyses

Statistical analysis title	GMC MenA-PS IgG 10y vs. 12y at T1

Statistical analysis description:

Differences in GMC MenA-PS IgG levels between the age groups 10 and 12 years old 1 month after (T1) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline concentrations. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	150
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.819
Method	Regression, Linear

Statistical analysis title	GMC MenA-PS IgG 10y vs. 15y at T1

Statistical analysis description:	
Differences in GMC MenA-PS IgG levels between the age groups 10 and 15 years old 1 month after (T1) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline concentrations. The p-values were adjusted for 3 comparisons with the Bonferroni correction.	
Comparison groups	10y MenACWY-TT v 15y MenACWY-TT
Number of subjects included in analysis	148
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.036
Method	Regression, Linear

Statistical analysis title	GMC MenA-PS IgG 12y vs. 15y at T1
Statistical analysis description:	
Differences in GMC MenA-PS IgG levels between the age groups 12 and 15 years old 1 month after (T1) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline concentrations. The p-values were adjusted for 3 comparisons with the Bonferroni correction.	
Comparison groups	15y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	152
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.567
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenA-PS IgG levels at T2

End point title	Geometric Mean Concentration (GMC) of MenA-PS IgG levels at T2[195]
End point description:	
Meningococcal serogroup A antibody geometric mean concentrations (GMCs) measured 1 year after (T2) the booster vaccination.	
End point type	Secondary
End point timeframe:	
T2	

Notes:

[195] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[196]	77[197]	75[198]	
Units: ug/ml				
geometric mean (confidence interval 95%)	6.34 (5.04 to 7.98)	5.56 (4.41 to 7.01)	8.23 (6.53 to 10.36)	

Notes:

[196] - According to protocol cohort

[197] - According to protocol cohort

[198] - According to protocol cohort

Statistical analyses

Statistical analysis title	GMC MenA-PS IgG 10y vs. 12y at T2
Statistical analysis description:	
Differences in GMC MenA-PS IgG levels between the age groups 10 and 12 years old 1 year after (T2) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline concentrations. The p-values were adjusted for 3 comparisons with the Bonferroni correction.	
Comparison groups	10y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	150
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 1
Method	Regression, Linear

Statistical analysis title	GMC MenA-PS IgG 10y vs. 15y at T2
Statistical analysis description:	
Differences in GMC MenA-PS IgG levels between the age groups 10 and 15 years old 1 year after (T2) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline concentrations. The p-values were adjusted for 3 comparisons with the Bonferroni correction.	
Comparison groups	10y MenACWY-TT v 15y MenACWY-TT
Number of subjects included in analysis	148
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.243
Method	Regression, Linear

Statistical analysis title	GMC MenA-PS IgG 12y vs. 15y at T2
Statistical analysis description:	
Differences in GMC MenA-PS IgG levels between the age groups 12 and 15 years old 1 year after (T2) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline concentrations. The p-values were adjusted for 3 comparisons with the Bonferroni correction.	
Comparison groups	15y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	152
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.273
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenW-PS IgG levels at T0

End point title	Geometric Mean Concentration (GMC) of MenW-PS IgG levels at T0[199]

End point description:

Meningococcal serogroup W antibody geometric mean concentrations (GMCs) measured before (T0) the booster vaccination.

End point type	Secondary

End point timeframe:

T0

Notes:

[199] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[200]	77[201]	75[202]	
Units: ug/ml				
geometric mean (confidence interval 95%)	0.09 (0.06 to 0.12)	0.11 (0.08 to 0.15)	0.20 (0.14 to 0.30)	

Notes:

[200] - According to protocol cohort

[201] - According to protocol cohort

[202] - According to protocol cohort

Statistical analyses

Statistical analysis title	GMC MenW-PS IgG 10y vs. 12y at T0

Statistical analysis description:

Differences in GMC MenW-PS IgG levels between the age groups 10 and 12 years old prior to (T0) the booster vaccination were analyzed with linear regression analyses. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	150
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.867
Method	Regression, Linear

Statistical analysis title	GMC MenW-PS IgG 10y vs. 15y at T0

Statistical analysis description:

Differences in GMC MenW-PS IgG levels between the age groups 10 and 15 years old prior to (T0) the booster vaccination were analyzed with linear regression analyses. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 15y MenACWY-TT
Number of subjects included in analysis	148
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.003
Method	Regression, Linear

Statistical analysis title	GMC MenW-PS IgG 12y vs. 15y at T0

Statistical analysis description:

Differences in GMC MenW-PS IgG levels between the age groups 12 and 15 years old prior to (T0) the booster vaccination were analyzed with linear regression analyses. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	152
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.036
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenW-PS IgG levels at T1

End point title	Geometric Mean Concentration (GMC) of MenW-PS IgG levels at T1[203]

End point description:

Meningococcal serogroup W antibody geometric mean concentrations (GMCs) measured 1 month after (T1) the booster vaccination.

End point type	Secondary

End point timeframe:

T1

Notes:

[203] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[204]	77[205]	75[206]	
Units: ug/ml				
geometric mean (confidence interval 95%)	2.86 (2.06 to 3.96)	4.74 (3.34 to 6.72)	9.19 (6.27 to 13.48)	

Notes:

[204] - According to protocol cohort

[205] - According to protocol cohort

[206] - According to protocol cohort

Statistical analyses

Statistical analysis title	GMC MenW-PS IgG 10y vs. 12y at T1

Statistical analysis description:

Differences in GMC MenW-PS IgG levels between the age groups 10 and 12 years old 1 month after (T1) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline concentrations. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 12y MenACWY-TT

Number of subjects included in analysis	150
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.177
Method	Regression, Linear

Statistical analysis title	GMC MenW-PS IgG 10y vs. 15y at T1

Statistical analysis description:

Differences in GMC MenW-PS IgG levels between the age groups 10 and 15 years old 1 month after (T1) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline concentrations. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 15y MenACWY-TT
Number of subjects included in analysis	148
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.003
Method	Regression, Linear

Statistical analysis title	GMC MenW-PS IgG 12y vs. 15y at T1

Statistical analysis description:

Differences in GMC MenW-PS IgG levels between the age groups 12 and 15 years old 1 month after (T1) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline concentrations. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	152
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.216
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenW-PS IgG levels at T2

End point title	Geometric Mean Concentration (GMC) of MenW-PS IgG levels at T2[207]

End point description:

Meningococcal serogroup W antibody geometric mean concentrations (GMCs) measured 1 year after (T2) the booster vaccination.

End point type	Secondary

End point timeframe:

T2

Notes:

[207] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[208]	77[209]	75[210]	
Units: ug/ml				
geometric mean (confidence interval 95%)	2.59 (1.91 to 3.51)	2.85 (2.15 to 3.79)	4.54 (3.28 to 6.29)	

Notes:

[208] - According to protocol cohort

[209] - According to protocol cohort

[210] - According to protocol cohort

Statistical analyses

Statistical analysis title	GMC MenW-PS IgG 10 vs. 12y at T2

Statistical analysis description:

Differences in GMC MenW-PS IgG levels between the age groups 10 and 12 years old 1 year after (T2) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline concentrations. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	150
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 1
Method	Regression, Linear

Statistical analysis title	GMC MenW-PS IgG 10 vs. 15y at T2

Statistical analysis description:

Differences in GMC MenW-PS IgG levels between the age groups 10 and 15 years old 1 year after (T2) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline concentrations. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 15y MenACWY-TT
Number of subjects included in analysis	148
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.399
Method	Regression, Linear

Statistical analysis title	GMC MenW-PS IgG 12 vs. 15y at T2

Statistical analysis description:

Differences in GMC MenW-PS IgG levels between the age groups 12 and 15 years old 1 year after (T2) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline concentrations. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 12y MenACWY-TT

Number of subjects included in analysis	152
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.612
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenY-PS IgG levels at T0

End point title	Geometric Mean Concentration (GMC) of MenY-PS IgG levels at T0[211]

End point description:

Meningococcal serogroup Y antibody geometric mean concentrations (GMCs) measured before (T0) the booster vaccination.

End point type	Secondary

End point timeframe:

T0

Notes:

[211] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[212]	77[213]	75[214]	
Units: ug/ml				
geometric mean (confidence interval 95%)	0.06 (0.05 to 0.08)	0.05 (0.04 to 0.07)	0.08 (0.06 to 0.11)	

Notes:

[212] - According to protocol cohort

[213] - According to protocol cohort

[214] - According to protocol cohort

Statistical analyses

Statistical analysis title	GMC MenY-PS IgG 10 vs. 12y at T0

Statistical analysis description:

Differences in GMC MenY-PS IgG levels between the age groups 10 and 12 years old prior to (T0) the booster vaccination were analyzed with linear regression analyses. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	150
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.258
Method	Regression, Linear

Statistical analysis title	GMC MenY-PS IgG 10 vs. 15y at T0

Statistical analysis description:

Differences in GMC MenY-PS IgG levels between the age groups 10 and 15 years old prior to (T0) the booster vaccination were analyzed with linear regression analyses. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 15y MenACWY-TT
Number of subjects included in analysis	148
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 1
Method	Regression, Linear

Statistical analysis title	GMC MenY-PS IgG 12 vs. 15y at T0

Statistical analysis description:

Differences in GMC MenY-PS IgG levels between the age groups 12 and 15 years old prior to (T0) the booster vaccination were analyzed with linear regression analyses. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	152
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.081
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenY-PS IgG levels at T1

End point title	Geometric Mean Concentration (GMC) of MenY-PS IgG levels at T1[215]

End point description:

Meningococcal serogroup Y antibody geometric mean concentrations (GMCs) measured 1 month after (T1) the booster vaccination.

End point type	Secondary

End point timeframe:

T1

Notes:

[215] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[216]	77[217]	75[218]	
Units: ug/ml				
geometric mean (confidence interval 95%)	4.11 (2.92 to 5.77)	5.17 (3.74 to 7.15)	8.75 (6.21 to 12.33)	

Notes:

[216] - According to protocol cohort

[217] - According to protocol cohort

Statistical analyses

Statistical analysis title	GMC MenY-PS IgG 10 vs. 12y at T1
Statistical analysis description:	
Differences in GMC MenY-PS IgG levels between the age groups 10 and 12 years old 1 month after (T1) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline concentrations. The p-values were adjusted for 3 comparisons with the Bonferroni correction.	
Comparison groups	10y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	150
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.468
Method	Regression, Linear

Statistical analysis title	GMC MenY-PS IgG 10 vs. 15y at T1
Statistical analysis description:	
Differences in GMC MenY-PS IgG levels between the age groups 10 and 15 years old 1 month after (T1) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline concentrations. The p-values were adjusted for 3 comparisons with the Bonferroni correction.	
Comparison groups	10y MenACWY-TT v 15y MenACWY-TT
Number of subjects included in analysis	148
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.012
Method	Regression, Linear

Statistical analysis title	GMC MenY-PS IgG 12 vs. 15y at T1
Statistical analysis description:	
Differences in GMC MenY-PS IgG levels between the age groups 12 and 15 years old 1 month after (T1) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline concentrations. The p-values were adjusted for 3 comparisons with the Bonferroni correction.	
Comparison groups	15y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	152
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.336
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenY-PS IgG levels at T2

End point title	Geometric Mean Concentration (GMC) of MenY-PS IgG levels at T2[219]

End point description:

Meningococcal serogroup Y antibody geometric mean concentrations (GMCs) measured 1 year after (T2) the booster vaccination.

End point type	Secondary

End point timeframe:

T2

Notes:

[219] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Only measured in participants receiving MenACWY-TT vaccination.

End point values	10y MenACWY-TT	12y MenACWY-TT	15y MenACWY-TT	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	73[220]	77[221]	75[222]	
Units: ug/ml				
geometric mean (confidence interval 95%)	1.20 (0.85 to 1.70)	1.51 (1.05 to 2.18)	2.54 (1.72 to 3.76)	

Notes:

[220] - According to protocol cohort

[221] - According to protocol cohort

[222] - According to protocol cohort

Statistical analyses

Statistical analysis title	GMC MenY-PS IgG 10 vs. 12y at T2

Statistical analysis description:

Differences in GMC MenY-PS IgG levels between the age groups 10 and 12 years old 1 year after (T2) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline concentrations. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	150
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.462
Method	Regression, Linear

Statistical analysis title	GMC MenY-PS IgG 10 vs. 15y at T2

Statistical analysis description:

Differences in GMC MenY-PS IgG levels between the age groups 10 and 15 years old 1 year after (T2) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline concentrations. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	10y MenACWY-TT v 15y MenACWY-TT
Number of subjects included in analysis	148
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.03
Method	Regression, Linear

Statistical analysis title	GMC MenY-PS IgG 12 vs. 15y at T2

Statistical analysis description:

Differences in GMC MenY-PS IgG levels between the age groups 12 and 15 years old 1 year after (T2) the booster vaccination were analyzed with linear regression analysis, adjusting for baseline concentrations. The p-values were adjusted for 3 comparisons with the Bonferroni correction.

Comparison groups	15y MenACWY-TT v 12y MenACWY-TT
Number of subjects included in analysis	152
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.759
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenC-PS specific IgA in serum at T0

End point title	Geometric Mean Concentration (GMC) of MenC-PS specific IgA in serum at T0

End point description:

Geometric mean concentration (GMC) of meningococcal serogroup C polysaccharide (MenC-PS) specific IgA in serum before (T0) vaccination.

End point type	Secondary

End point timeframe:

T0

End point values	MenACWY-TT vaccination	MenC-TT vaccination		
Subject group type	Subject analysis set	Subject analysis set		
Number of subjects analysed	205[223]	216[224]		
Units: ng/ml				
geometric mean (confidence interval 95%)	24.1 (19.7 to 29.6)	22.6 (18.8 to 27.1)		

Notes:

[223] - Analysed for MenC IgA in serum

[224] - Analysed for MenC IgA in serum

Statistical analyses

Statistical analysis title	GMC MenC-PS IgA in serum MenACWY-TT vs. MenC-TT T0

Statistical analysis description:

Difference in Geometric mean concentration (GMC) of meningococcal serogroup C-polysaccharide (MenC-PS) specific IgA in serum between participants vaccinated with MenACWY-TT vaccine and MenC-TT vaccine before (T0) the vaccination analysed with linear regression.

Comparison groups	MenC-TT vaccination v MenACWY-TT vaccination

Number of subjects included in analysis	421
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.584
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenC-PS specific IgA in serum at T1

End point title	Geometric Mean Concentration (GMC) of MenC-PS specific IgA in serum at T1

End point description:

Geometric mean concentration (GMC) of meningococcal serogroup C polysaccharide (MenC-PS) specific IgA in serum 1 month after(T1) vaccination.

End point type	Secondary

End point timeframe:

T1

End point values	MenACWY-TT vaccination	MenC-TT vaccination		
Subject group type	Subject analysis set	Subject analysis set		
Number of subjects analysed	205[225]	216[226]		
Units: ng/ml				
geometric mean (confidence interval 95%)	9786 (8355 to 11462)	10939 (9523 to 12564)		

Notes:

[225] - Analysed for MenC-PS specific IgA in serum

[226] - Analysed for MenC-PS specific IgA in serum

Statistical analyses

Statistical analysis title	GMC MenC-PS IgA in serum MenACWY-TT vs. MenC-TT T1

Statistical analysis description:

Difference in Geometric mean concentration (GMC) of meningococcal serogroup C-polysaccharide (MenC-PS) specific IgA in serum between participants vaccinated with MenACWY-TT vaccine and MenC-TT vaccine 1 month after (T1) the vaccination analysed with linear regression adjusted for baseline concentrations.

Comparison groups	MenC-TT vaccination v MenACWY-TT vaccination
Number of subjects included in analysis	421
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.261
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenC-PS specific IgA in serum at T2

End point title	Geometric Mean Concentration (GMC) of MenC-PS specific IgA in serum at T2

End point description:

Geometric mean concentration (GMC) of meningococcal serogroup C polysaccharide (MenC-PS) specific IgA in serum 1 year after (T2) vaccination.

End point type	Secondary

End point timeframe:

T2

End point values	MenACWY-TT vaccination	MenC-TT vaccination		
Subject group type	Subject analysis set	Subject analysis set		
Number of subjects analysed	205[227]	216[228]		
Units: ng/ml				
geometric mean (confidence interval 95%)	1085 (913 to 1290)	1424 (1214 to 1670)		

Notes:

[227] - Analysed for MenC-PS specific IgA in serum

[228] - Analysed for MenC-PS specific IgA in serum

Statistical analyses

Statistical analysis title	GMC MenC-PS IgA in serum MenACWY-TT vs. MenC-TT T2

Statistical analysis description:

Difference in Geometric mean concentration (GMC) of meningococcal serogroup C-polysaccharide (MenC-PS) specific IgA in serum between participants vaccinated with MenACWY-TT vaccine and MenC-TT vaccine 1 year (T2) after the vaccination analysed with linear regression adjusted for baseline concentrations.

Comparison groups	MenACWY-TT vaccination v MenC-TT vaccination
Number of subjects included in analysis	421
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.005
Method	Regression, Linear

Secondary: Ratio GMC of MenC-PS specific IgA in serum T1/T0

End point title	Ratio GMC of MenC-PS specific IgA in serum T1/T0

End point description:

Ratio of Geometric mean concentration (GMC) of meningococcal serogroup C-polysaccharide (MenC-PS) specific IgA in serum one month (T1) after vaccination and before (T0) vaccination.

End point type	Secondary

End point timeframe:

T1, T0

End point values	MenACWY-TT vaccination	MenC-TT vaccination		
Subject group type	Subject analysis set	Subject analysis set		
Number of subjects analysed	205[229]	216[230]		
Units: Ratio				
number (confidence interval 95%)	415 (335 to 514)	485 (411 to 573)		

Notes:

[229] - Analysed for MenC-PS specific IgA in serum

[230] - Analysed for MenC-PS specific IgA in serum

Statistical analyses

Statistical analysis title	Ratio T1/T0 GMC MenC-PS IgA MenACWY-TT vs MenC-TT

Statistical analysis description:

Difference in GMC Ratio T1/T0 of MenC-PS specific IgA in serum between participants vaccinated with MenACWY-TT vaccine and MenC-TT vaccine analysed with linear regression.

Comparison groups	MenC-TT vaccination v MenACWY-TT vaccination
Number of subjects included in analysis	421
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.26
Method	Regression, Linear

Secondary: Ratio GMC of MenC-PS specific IgA in serum T2/T0

End point title	Ratio GMC of MenC-PS specific IgA in serum T2/T0

End point description:

Ratio of Geometric mean concentration (GMC) of meningococcal serogroup C-polysaccharide (MenC-PS) specific IgA in serum one year (T2) after vaccination and before (T0) vaccination.

End point type	Secondary

End point timeframe:

T2, T0

End point values	MenACWY-TT vaccination	MenC-TT vaccination		
Subject group type	Subject analysis set	Subject analysis set		
Number of subjects analysed	205[231]	216[232]		
Units: Ratio				
number (confidence interval 95%)	45.07 (36.78 to 55.23)	63.43 (53.19 to 75.64)		

Notes:

[231] - Analysed for MenC-PS specific IgA in serum

[232] - Analysed for MenC-PS specific IgA in serum

Statistical analyses

Statistical analysis title	Ratio T2/T0 GMC MenC-PS IgA MenACWY-TT vs. MenC-TT

Statistical analysis description:

Difference in GMC Ratio T2/T0 of MenC-PS specific IgA in serum between participants vaccinated with

MenACWY-TT vaccine and MenC-TT vaccine analysed with linear regression.

Comparison groups	MenACWY-TT vaccination v MenC-TT vaccination
Number of subjects included in analysis	421
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.154
Method	Regression, Linear

Secondary: Ratio GMC of MenC-PS specific IgA in serum T1/T2

End point title	Ratio GMC of MenC-PS specific IgA in serum T1/T2

End point description:

Ratio of Geometric mean concentration (GMC) of meningococcal serogroup C-polysaccharide (MenC-PS) specific IgA in serum one month (T1) after vaccination and 1 year (T2) after vaccination.

End point type	Secondary

End point timeframe:

T1, T2

End point values	MenACWY-TT vaccination	MenC-TT vaccination		
Subject group type	Subject analysis set	Subject analysis set		
Number of subjects analysed	205[233]	216[234]		
Units: Ratio				
number (confidence interval 95%)	9.0 (8.1 to 10.0)	7.7 (7.1 to 8.3)		

Notes:

[233] - Analysed for MenC-PS specific IgA in serum

[234] - Analysed for MenC-PS specific IgA in serum

Statistical analyses

Statistical analysis title	Ratio T1/T2 GMC MenC-PS IgA MenACWY-TT vs. MenC-TT

Statistical analysis description:

Difference in GMC Ratio T1/T2 of MenC-PS specific IgA in serum between participants vaccinated with MenACWY-TT vaccine and MenC-TT vaccine analysed with linear regression.

Comparison groups	MenACWY-TT vaccination v MenC-TT vaccination
Number of subjects included in analysis	421
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.017
Method	Regression, Linear

Secondary: Geometric Mean Concentration (GMC) of MenA-PS specific IgA in serum at T0

End point title	Geometric Mean Concentration (GMC) of MenA-PS specific IgA in serum at T0

End point description:

Geometric mean concentration (GMC) of meningococcal serogroup A polysaccharide (MenA-PS) specific IgA in serum before (T0) vaccination.

End point type	Secondary

End point timeframe:

T0

End point values	MenACWY-TT vaccination			
Subject group type	Subject analysis set			
Number of subjects analysed	201[235]			
Units: ng/ml				
geometric mean (confidence interval 95%)	61 (52 to 72)			

Notes:

[235] - Analysed for MenA-PS specific IgA in serum

Statistical analyses

No statistical analyses for this end point

Secondary: Geometric mean concentration (GMC) of MenA-PS specific IgA in serum at T1

End point title	Geometric mean concentration (GMC) of MenA-PS specific IgA in serum at T1

End point description:

Geometric mean concentration (GMC) of meningococcal serogroup A polysaccharide (MenA-PS) specific IgA in serum 1 month (T1) after vaccination.

End point type	Secondary

End point timeframe:

T1

End point values	MenACWY-TT vaccination			
Subject group type	Subject analysis set			
Number of subjects analysed	201[236]			
Units: ng/ml				
geometric mean (confidence interval 95%)	1427 (1225 to 1662)			

Notes:

[236] - Analysed for MenA-PS specific IgA in serum

Statistical analyses

No statistical analyses for this end point

Secondary: Geometric mean concentration (GMC) of MenA-PS specific IgA in serum at T2

End point title	Geometric mean concentration (GMC) of MenA-PS specific IgA in serum at T2

End point description:

Geometric mean concentration (GMC) of meningococcal serogroup A polysaccharide (MenA-PS) specific IgA in serum 1 year (T2) after vaccination.

End point type	Secondary

End point timeframe:

T2

End point values	MenACWY-TT vaccination			
Subject group type	Subject analysis set			
Number of subjects analysed	201[237]			
Units: ng/ml				
geometric mean (confidence interval 95%)	330 (282 to 386)			

Notes:

[237] - Analysed for MenA-PS specific IgA in serum

Statistical analyses

No statistical analyses for this end point

Secondary: Ratio GMC of MenA-PS specific IgA in serum T1/T0

End point title	Ratio GMC of MenA-PS specific IgA in serum T1/T0

End point description:

Ratio of Geometric mean concentration (GMC) of meningococcal serogroup A-polysaccharide (MenA-PS) specific IgA in serum one month (T1) after vaccination and before (T0) vaccination.

End point type	Secondary

End point timeframe:

T1, T0

End point values	MenACWY-TT vaccination			
Subject group type	Subject analysis set			
Number of subjects analysed	201[238]			
Units: Ratio				
number (confidence interval 95%)	23 (18 to 28)			

Notes:

[238] - Analysed for MenA-PS specific IgA in serum

Statistical analyses

No statistical analyses for this end point

Secondary: Ratio GMC of MenA-PS specific IgA in serum T2/T0

End point title	Ratio GMC of MenA-PS specific IgA in serum T2/T0

End point description:

Ratio of Geometric mean concentration (GMC) of meningococcal serogroup A-polysaccharide (MenA-PS) specific IgA in serum one year (T2) after vaccination and before (T0) vaccination.

End point type	Secondary

End point timeframe:

T2, T0

End point values	MenACWY-TT vaccination			
Subject group type	Subject analysis set			
Number of subjects analysed	201[239]			
Units: Ratio				
number (confidence interval 95%)	5.35 (4.39 to 6.50)			

Notes:

[239] - Analysed for MenA-PS specific IgA in serum

Statistical analyses

No statistical analyses for this end point

Secondary: Ratio GMC of MenA-PS specific IgA in serum T1/T2

End point title	Ratio GMC of MenA-PS specific IgA in serum T1/T2

End point description:

Ratio of Geometric mean concentration (GMC) of meningococcal serogroup C-polysaccharide (MenC-PS) specific IgA in serum one month (T1) after vaccination and 1 year (T2) after vaccination.

End point type	Secondary

End point timeframe:

T1, T2

End point values	MenACWY-TT vaccination			
Subject group type	Subject analysis set			
Number of subjects analysed	201[240]			
Units: Ratio				
number (confidence interval 95%)	4.3 (3.8 to 4.9)			

Notes:

[240] - Analysed for MenA-PS specific IgA in serum

Statistical analyses

No statistical analyses for this end point

Secondary: Geometric Mean Concentration (GMC) of MenW-PS specific IgA in serum at T0

End point title	Geometric Mean Concentration (GMC) of MenW-PS specific IgA in serum at T0

End point description:

Geometric mean concentration (GMC) of meningococcal serogroup W polysaccharide (MenW-PS) specific IgA in serum before (T0) vaccination.

End point type	Secondary

End point timeframe:

T0

End point values	MenACWY-TT vaccination			
Subject group type	Subject analysis set			
Number of subjects analysed	202[241]			
Units: ng/ml				
geometric mean (confidence interval 95%)	15.6 (13.0 to 18.8)			

Notes:

[241] - Analysed for MenW-PS specific IgA in serum

Statistical analyses

No statistical analyses for this end point

Secondary: Geometric Mean Concentration (GMC) of MenW-PS specific IgA in serum at T1

End point title	Geometric Mean Concentration (GMC) of MenW-PS specific IgA in serum at T1

End point description:

Geometric mean concentration (GMC) of meningococcal serogroup W polysaccharide (MenW-PS) specific IgA in serum 1 month (T1) after vaccination.

End point type	Secondary

End point timeframe:

T1

End point values	MenACWY-TT vaccination			
Subject group type	Subject analysis set			
Number of subjects analysed	202[242]			
Units: ng/ml				
geometric mean (confidence interval 95%)	877 (736 to 1045)			

Notes:

[242] - Analysed for MenW-PS specific IgA in serum

Statistical analyses

No statistical analyses for this end point

Secondary: Geometric Mean Concentration (GMC) of MenW-PS specific IgA in serum at T2

End point title	Geometric Mean Concentration (GMC) of MenW-PS specific IgA in serum at T2

End point description:

Geometric mean concentration (GMC) of meningococcal serogroup W polysaccharide (MenW-PS) specific IgA in serum 1 year (T2) after vaccination.

End point type	Secondary

End point timeframe:

T2

End point values	MenACWY-TT vaccination			
Subject group type	Subject analysis set			
Number of subjects analysed	202[243]			
Units: ng/ml				
geometric mean (confidence interval 95%)	403 (350 to 464)			

Notes:

[243] - Analysed for MenW-PS specific IgA in serum

Statistical analyses

No statistical analyses for this end point

Secondary: Ratio GMC of MenW-PS specific IgA in serum T1/T0

End point title	Ratio GMC of MenW-PS specific IgA in serum T1/T0

End point description:

Ratio of Geometric mean concentration (GMC) of meningococcal serogroup W-polysaccharide (MenW-PS) specific IgA in serum one month (T1) after vaccination and before (T0) vaccination.

End point type	Secondary

End point timeframe:

T1, T0

End point values	MenACWY-TT vaccination			
Subject group type	Subject analysis set			
Number of subjects analysed	202[244]			
Units: Ratio				
number (confidence interval 95%)	58 (46 to 73)			

Notes:

[244] - Analysed for MenW-PS specific IgA in serum

Statistical analyses

No statistical analyses for this end point

Secondary: Ratio GMC of MenW-PS specific IgA in serum T2/T0

End point title	Ratio GMC of MenW-PS specific IgA in serum T2/T0

End point description:

Ratio of Geometric mean concentration (GMC) of meningococcal serogroup W-polysaccharide (MenW-PS) specific IgA in serum one year (T2) after vaccination and before (T0) vaccination.

End point type	Secondary

End point timeframe:

T2, T0

End point values	MenACWY-TT vaccination			
Subject group type	Subject analysis set			
Number of subjects analysed	202[245]			
Units: Ratio				
geometric mean (confidence interval 95%)	26.12 (21.35 to 31.98)			

Notes:

[245] - Analysed for MenW-PS specific IgA in serum

Statistical analyses

No statistical analyses for this end point

Secondary: Ratio GMC of MenW-PS specific IgA in serum T1/T2

End point title	Ratio GMC of MenW-PS specific IgA in serum T1/T2

End point description:

Ratio of Geometric mean concentration (GMC) of meningococcal serogroup W-polysaccharide (MenW-PS) specific IgA in serum one month (T1) after vaccination and 1 year (T2) after vaccination.

End point type	Secondary

End point timeframe:

T1, T2

End point values	MenACWY-TT vaccination			
Subject group type	Subject analysis set			
Number of subjects analysed	202[246]			
Units: Ratio				
number (confidence interval 95%)	2.2 (1.9 to 2.5)			

Notes:

[246] - Analysed for MenW-PS specific IgA in serum

Statistical analyses

No statistical analyses for this end point

Secondary: Geometric Mean Concentration (GMC) of MenY-PS specific IgA in serum at T0

End point title	Geometric Mean Concentration (GMC) of MenY-PS specific IgA in serum at T0

End point description:

Geometric mean concentration (GMC) of meningococcal serogroup Y polysaccharide (MenY-PS) specific IgA in serum before (T0) vaccination.

End point type	Secondary

End point timeframe:

T0

End point values	MenACWY-TT vaccination			
Subject group type	Subject analysis set			
Number of subjects analysed	202[247]			
Units: ng/ml				
geometric mean (confidence interval 95%)	31 (25 to 38)			

Notes:

[247] - Analysed for MenY-PS specific IgA in serum

Statistical analyses

No statistical analyses for this end point

Secondary: Geometric Mean Concentration (GMC) of MenY-PS specific IgA in serum at T1

End point title	Geometric Mean Concentration (GMC) of MenY-PS specific IgA in serum at T1

End point description:

Geometric mean concentration (GMC) of meningococcal serogroup Y polysaccharide (MenY-PS) specific IgA in serum 1 month (T1) after vaccination.

End point type	Secondary

End point timeframe:

T1

End point values	MenACWY-TT vaccination			
Subject group type	Subject analysis set			
Number of subjects analysed	202[248]			
Units: ng/ml				
geometric mean (confidence interval 95%)	1985 (1658 to 2376)			

Notes:

[248] - Analysed for MenY-PS specific IgA in serum

Statistical analyses

No statistical analyses for this end point

Secondary: Geometric Mean Concentration (GMC) of MenY-PS specific IgA in serum at T2

End point title	Geometric Mean Concentration (GMC) of MenY-PS specific IgA in serum at T2

End point description:

Geometric mean concentration (GMC) of meningococcal serogroup Y polysaccharide (MenY-PS) specific IgA in serum 1 year (T2) after vaccination.

End point type	Secondary

End point timeframe:

T2

End point values	MenACWY-TT vaccination			
Subject group type	Subject analysis set			
Number of subjects analysed	202[249]			
Units: ng/ml				
geometric mean (confidence interval 95%)	797 (662 to 960)			

Notes:

[249] - Analysed for MenY-PS specific IgA in serum

Statistical analyses

No statistical analyses for this end point

Secondary: Ratio GMC of MenY-PS specific IgA in serum T1/T0

End point title	Ratio GMC of MenY-PS specific IgA in serum T1/T0

End point description:

Ratio of Geometric mean concentration (GMC) of meningococcal serogroup Y-polysaccharide (MenY-PS) specific IgA in serum one month (T1) after vaccination and before (T0) vaccination.

End point type	Secondary

End point timeframe:

T1, T0

End point values	MenACWY-TT vaccination			
Subject group type	Subject analysis set			
Number of subjects analysed	202[250]			
Units: Ratio				
number (confidence interval 95%)	64 (50 to 82)			

Notes:

[250] - Analysed for MenY-PS specific IgA in serum

Statistical analyses

No statistical analyses for this end point

Secondary: Ratio GMC of MenY-PS specific IgA in serum T2/T0

End point title	Ratio GMC of MenY-PS specific IgA in serum T2/T0

End point description:

Ratio of Geometric mean concentration (GMC) of meningococcal serogroup Y-polysaccharide (MenY-PS) specific IgA in serum one year (T2) after vaccination and before (T0) vaccination.

End point type	Secondary

End point timeframe:

T2, T0

End point values	MenACWY-TT vaccination			
Subject group type	Subject analysis set			
Number of subjects analysed	202[251]			
Units: Ratio				
number (confidence interval 95%)	25.80 (20.32 to 32.78)			

Notes:

[251] - Analysed for MenY-PS specific IgA in serum

Statistical analyses

No statistical analyses for this end point

Secondary: Ratio GMC of MenY-PS specific IgA in serum T1/T2

End point title	Ratio GMC of MenY-PS specific IgA in serum T1/T2

End point description:

Ratio of Geometric mean concentration (GMC) of meningococcal serogroup Y-polysaccharide (MenY-PS) specific IgA in serum one month (T1) after vaccination and 1 year (T2) after vaccination.

End point type	Secondary

End point timeframe:

T1, T2

End point values	MenACWY-TT vaccination			
Subject group type	Subject analysis set			
Number of subjects analysed	202[252]			
Units: Ratio				
number (confidence interval 95%)	2.5 (2.2 to 2.8)			

Notes:

[252] - Analysed for MenY-PS specific IgA in serum

Statistical analyses

No statistical analyses for this end point

Adverse events

Adverse events information[1]	
Timeframe for reporting adverse events:	
Adverse events are defined as any undesirable experience occurring to a participant during the study, whether or not considered related to the vaccine, the vaccination or the venapuncture, reported spontaneously by the particpant, parent or study staff.	
Adverse event reporting additional description:	
There were no SAEs, AEs and SUSARs.	
Assessment type	Non-systematic

Dictionary used	
Dictionary name	MedDRA
Dictionary version	28.1

Frequency threshold for reporting non-serious adverse events: 0.05 %

Notes:

[1] - There are no non-serious adverse events recorded for these results. It is expected that there will be at least one non-serious adverse event reported.

Justification: Nimenrix and NeisVac-C™ are registered vaccines which have already been used in the Netherlands (and other countries) in the same age group (children 10, 12 and 15 years of age). No adverse events were expected.

More information

Substantial protocol amendments (globally)

Were there any global substantial amendments to the protocol? Yes

Date	Amendment
27 February 2014	Minor linguistic and grammatical changes to patient information form and other letters to participants. No changes were made to the study protocol.

Notes:

Interruptions (globally)

Were there any global interruptions to the trial? No

Limitations and caveats

None reported

Online references

http://www.ncbi.nlm.nih.gov/pubmed/28668575

http://www.ncbi.nlm.nih.gov/pubmed/28647167

http://www.ncbi.nlm.nih.gov/pubmed/29672552