Information sessions UZ Leuven: national reference center activities

30-03-2023

Lize Cuypers PharmD PhD

Coordinator of national reference centers for human pathogens and rare diseases
Laboratory Medicine, UZ Leuven

Laboratory of Clinical Microbiology, KU Leuven

From SARS-CoV-2 to other infectious diseases

- March 2020 – June 2022: **weekly to monthly sessions on COVID-19 testing**
- Large number of participants and positive feedback
- **Format** different compared to lectures of clinical biology or sessions for trainees

- Request to continue initiative and broaden to other infectious diseases
- **Start of serie of information sessions focused on NRC activities** of UZ Leuven (and partners)
- **Accreditation** is requested for these sessions: please enter your name (and RIZIV/INAMI number in case applicable) in the chat box
- **Interactive sessions**: you can speak up by unmuting your microphone to ask questions or raise comments in the chat box

Overview of sessions planned for 2023

- Sessions are organised on **Thursday from 15:30 to 16:30**
- Invites have been sent, communication also trough other channels, broad audience welcome

- 30th **March**: invasive pneumococcal infections
- 27th **April**: wastewater surveillance and enteroviruses
- 8th **June**: mycosis, in collaboration with CHU Liège
- 14th **September**: rotavirus and hantavirus
- 26th **October**: respiratory pathogens, in collaboration with UZA
- 16th **November**: borrelia burgdorferi, in collaboration with UCL St Luc
- NRC antiviral resistance DNA viruses: 2022 – 2023 case discussions during capita selecta

Additional information on NRC website

- Website of UZ Leuven, Laboratory Medicine, page NRC/NRL: https://www.uzleuven.be/nl/laboratoriumgeneeskunde/nationale-referentiecentra-en-referentielaboratoria
- **Website of Sciensano, page NRC human microbiology**: https://www.sciensano.be/nl/nationale-referentiecentra-voor-humane-microbiologie#nrc_nrl-block_1-0
  - Streptococcus pneumoniae (invasive): https://www.sciensano.be/nl/nrc-nrl/nationaal-referentiecentrum-nrc-voor-streptococcus-pneumoniae-invasief

Nationaal Referentiecentrum (NRC) voor Streptococcus pneumoniae (invasief)

Belangrijk bericht

Hoog aantal invasieve pneumokokken stammen in December 2022

Omwille van de maatregelen om de COVID-19 pandemie in te perken, zagen we gedurende de jaren 2020 en 2021 een significante en constante daling van het aantal invasieve pneumokokken stammen die naar het NRC UZ Leuven gestuurd werden. Hoewel het aantal invasieve pneumokokken stammen min of meer genormaliseerd is sinds maart 2022 (in vergelijking met pre-COVID jaren 2018 en 2019), zien we een stijging in het aantal stammen dat naar het NRC gestuurd wordt vanaf oktober 2022. In de maand december 2022 werd een uitzonderlijk hoog aantal stammen geanalyseerd bij het NRC UZ Leuven. Meer dan 300 stammen kwamen toe bij het NRC, dit is het hoogste aantal stammen ooit op één maand tijd sinds de start van de surveillance. De distributie van kapseltypes en leeftijd in december ligt in lijn met de andere maanden van het jaar 2022. In de maand december werd de meerderheid van de infecties gevonden bij volwassenen (>18 jaar), met 35% van de pneumokokken afkomstig van patiënten met een leeftijd tussen 65 en 85 jaar oud. De stijging in het aantal stammen kan niet verklaard worden door een specifiek serotype. Serotypes 3 en 8, die reeds gekenmerkt werden door een hoge prevalentie in de voorbije jaren, werden het meest frequent gedetecteerd (elk 17% van de gevallen).

Op basis van het aantal invasieve pneumokokken stammen reeds aangekomen bij het NRC in de maand januari 2023, wordt er opnieuw een groot aantal stammen verwacht voor deze maand, met in de eerste helft van januari reeds meer dan 150 stammen.

Verantwoordelijke laboratoria

Coördinator

- UZ Leuven/KU Leuven

Erkend door

- National Institute for Health and Disability Insurance (INAMI-RIZIV)

Aanvraagformulieren

- aanvraagform_streptococcus_pneumoniae_nl.pdf

NRC Streptococcus pneumoniae (invasive)

https://www.sciensano.be/nl/nrc-nrl/nationaal-referentiecentrum-nrc-voor-streptococcus-pneumoniae-invasief

- Newsflash: high number of invasive strains for December 2022
- **Application form** (in Dutch and French)
- **Available assays**: capsular typing and antibiotic susceptibility testing
- Instructions for shipment of isolates: preferably non-incubated blood agar plate
- **Year reports** of last 10 years

https://laboboeken.nexuzhealth.com/pboek/internet/GHB/10873

NRC application form: what's new?

https://www.sciensano.be/sites/default/files/aanvraagform_streptococcus_pneumoniae_nl.pdf

- Parts of the application form **highlighted which are crucial for the analysis**, as we are aware that a lot of information is requested to be completed on the form:
  - Information about the laboratory
  - Identification of the patient from whom S. pneumoniae was isolated
  - Vaccination status
  - Identification of the sample: sample ID, sample date, and specimen type

- Preference to use **INSZ/NISS** since linkage with other datasources is possible

- Other data requested on the form is very useful (e.g. hospitalisation, outcome, clinical diagnosis)

National Reference Center (invasive) Pneumococci UZ Leuven

30-03-2023

Stefanie Desmet PharmD PhD

Clinical Biologist - Microbiologist
National Reference Center (invasive) S. pneumoniae
Laboratoriumgeneeskunde UZ Leuven
Laboratory of Clinical Microbiology KU Leuven

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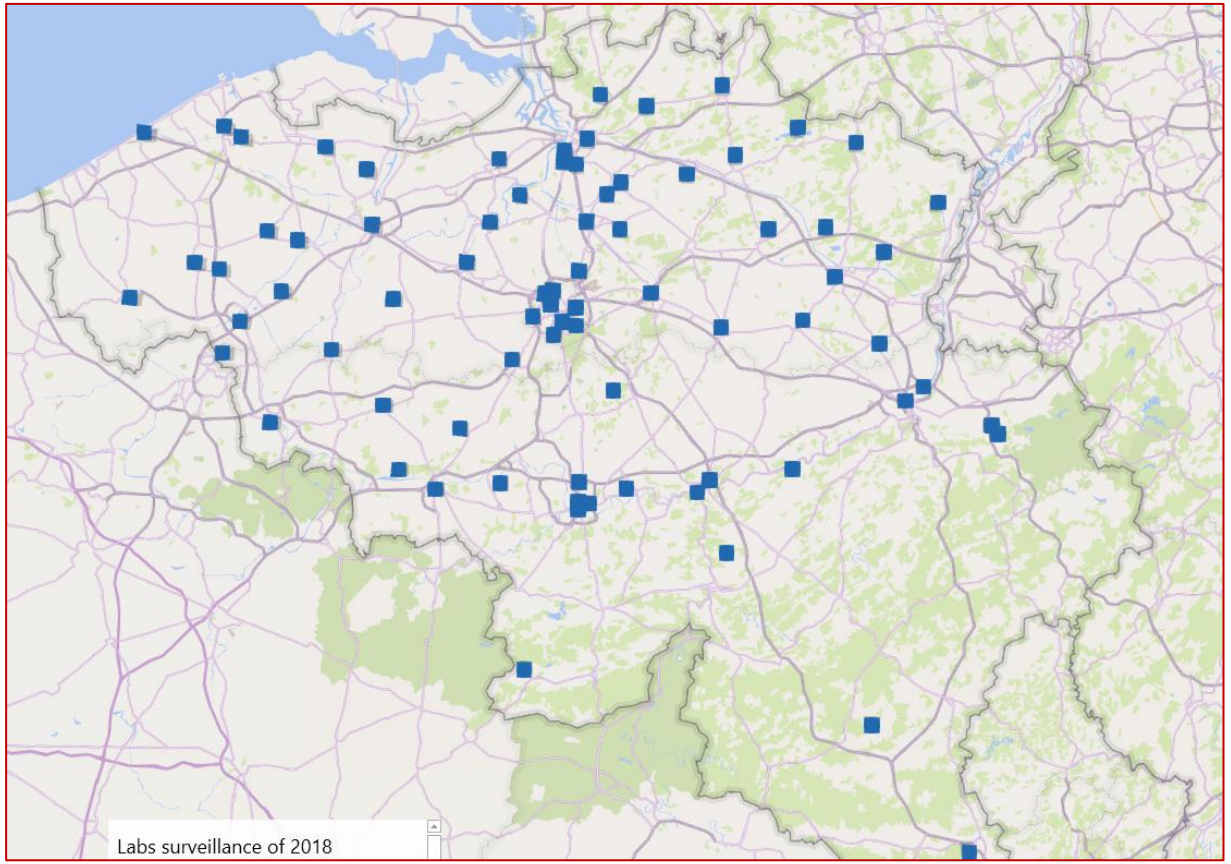
invasive S. pneumoniae

National Reference Center (NRC)

Passive laboratory based surveillance of invasive pneumococcal disease



Mean yearly coverage of surveillance 90.5%

Desmet S. *et al.* Lancet Infect Dis. 2020

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Characteristics of surveillance NRC Pneumococci

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
number of laboratories involved in surveillance															
	all	97	95	95	96	92	92	94	94	91	91	92	93	85	88
	sending more than 5 isolates per year	84	85	81	85	81	74	79	76	76	75	70	55	57	71
	located in Flanders	54	54	53	54	53	52	53	54	53	53	54	55	50	52
	located in Wallonia	34	32	32	33	30	30	32	30	28	29	28	28	26	27
	located in Brussels	9	9	10	9	9	10	9	10	10	9	10	10	9	9
regional distribution of all isolates based on residence of patient (percentage)															
	Flanders	58.20%	59.80%	57.50%	58.10%	58.20%	55.80%	55.60%	62.20%	63.0%	63.8%	66.8%	64.3%	58.2%	57.9%
	Wallonia	27.10%	26.90%	27.30%	28.40%	28.30%	30.50%	31.50%	25.70%	25.5%	26.1%	23.3%	25.4%	24.8%	26.6%
	Brussels	14.00%	12.20%	14.70%	12.60%	12.00%	13.10%	11.60%	10.90%	11.4%	9.9%	9.3%	8.8%	13.9%	11.2%
	other/unknown	0.70%	1.10%	0.50%	0.80%	1.50%	0.70%	1.30%	1.10%	0.1%	0.2%	0.5%	1.5%	3.1%	4.3%

Belgian inhabitants

57,7% in Flanders region
31,6% in Walloon region
10,6% in Brussels region

Data 01/01/2022 https://statbel.fgov.be/nl/themas/bevolking/loop-van-de-bevolking

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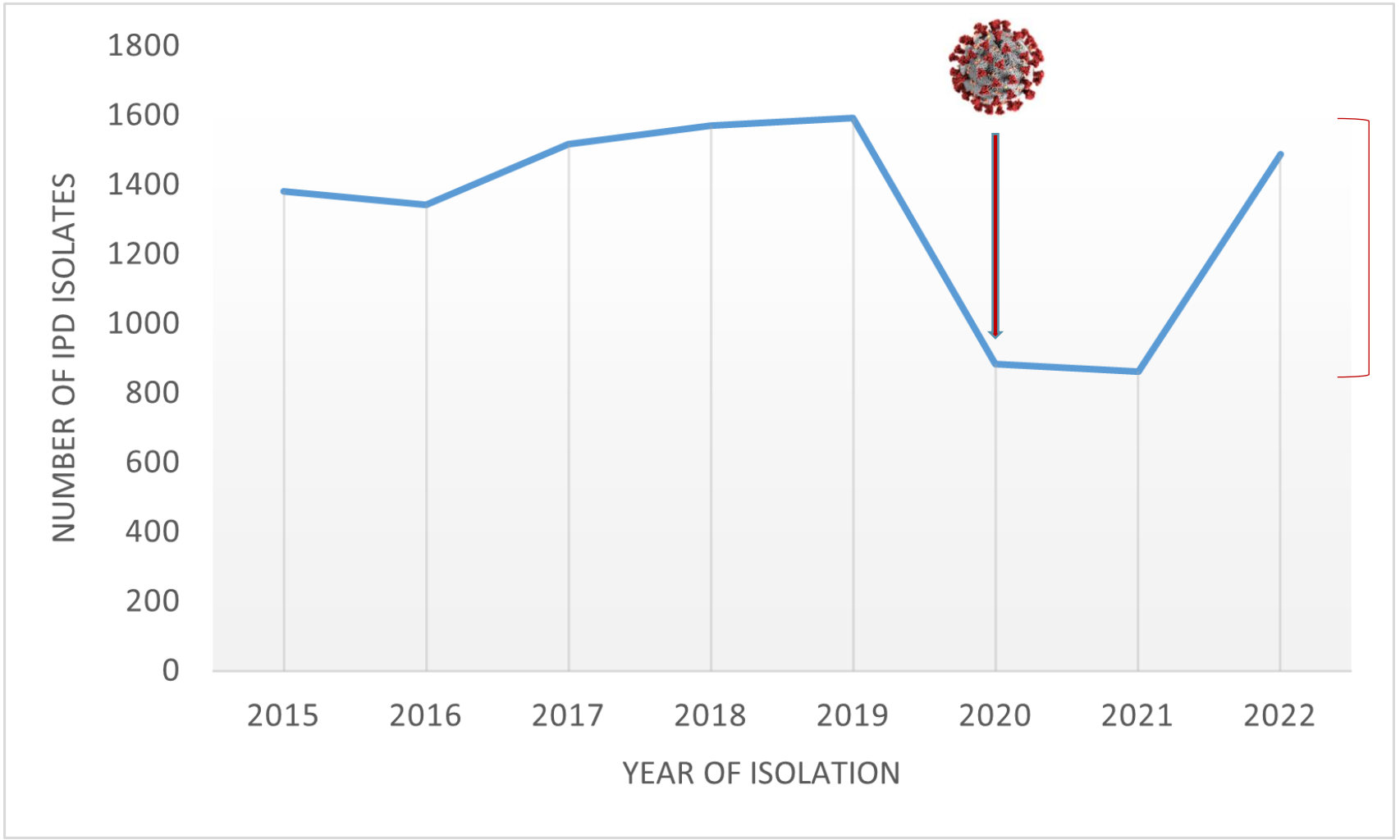
Impact of COVID-19 on IPD surveillance in Belgium



-47% all ages
in 2021 compared to
pre-COVID years

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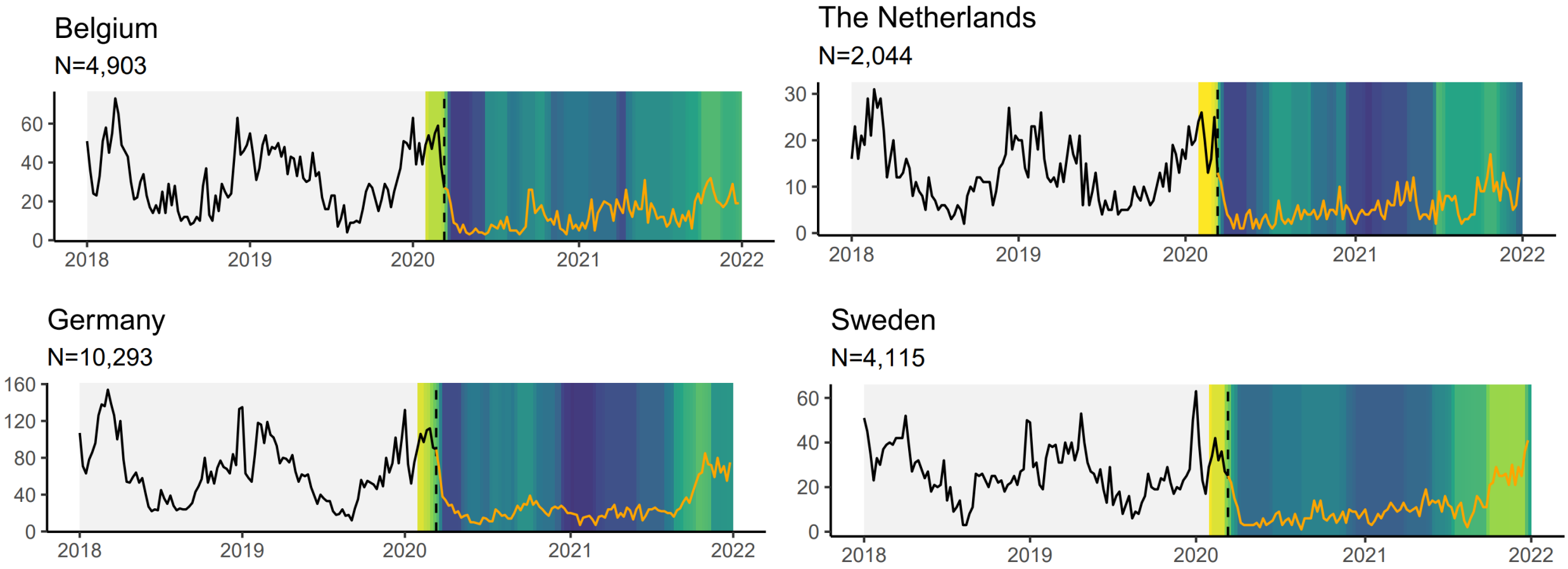
Impact of COVID-19 pandemic on IPD epidemiology



Shaw D *et al.* medRxiv 2022 https://doi.org/10.1101/2022.12.16.22283251

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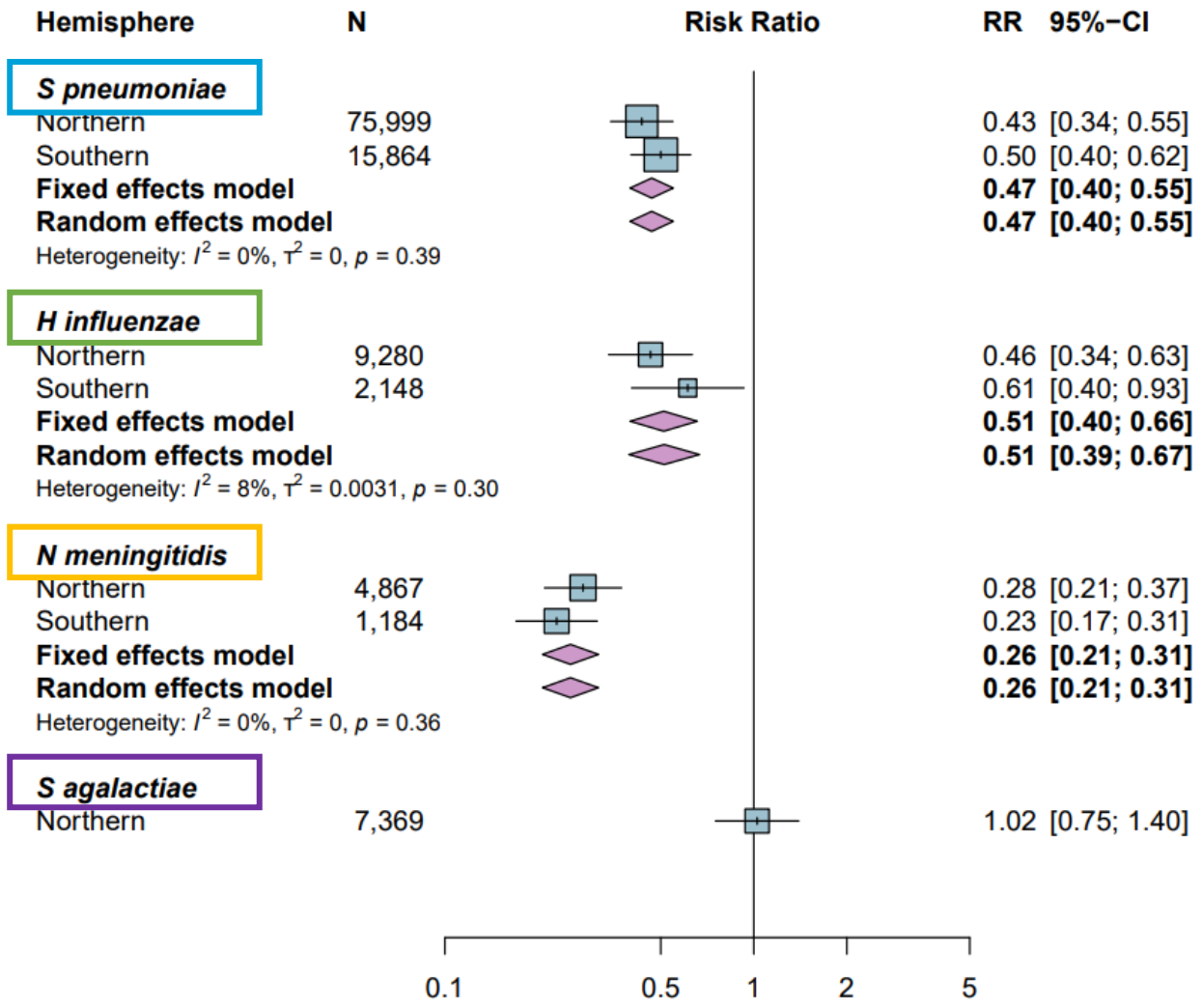
Reduction in risk of disease during pandemic (2020-2021) compared to pre-pandemic (2018-2019)



Shaw D *et al.* medRxiv 2022 https://doi.org/10.1101/2022.12.16.22283251

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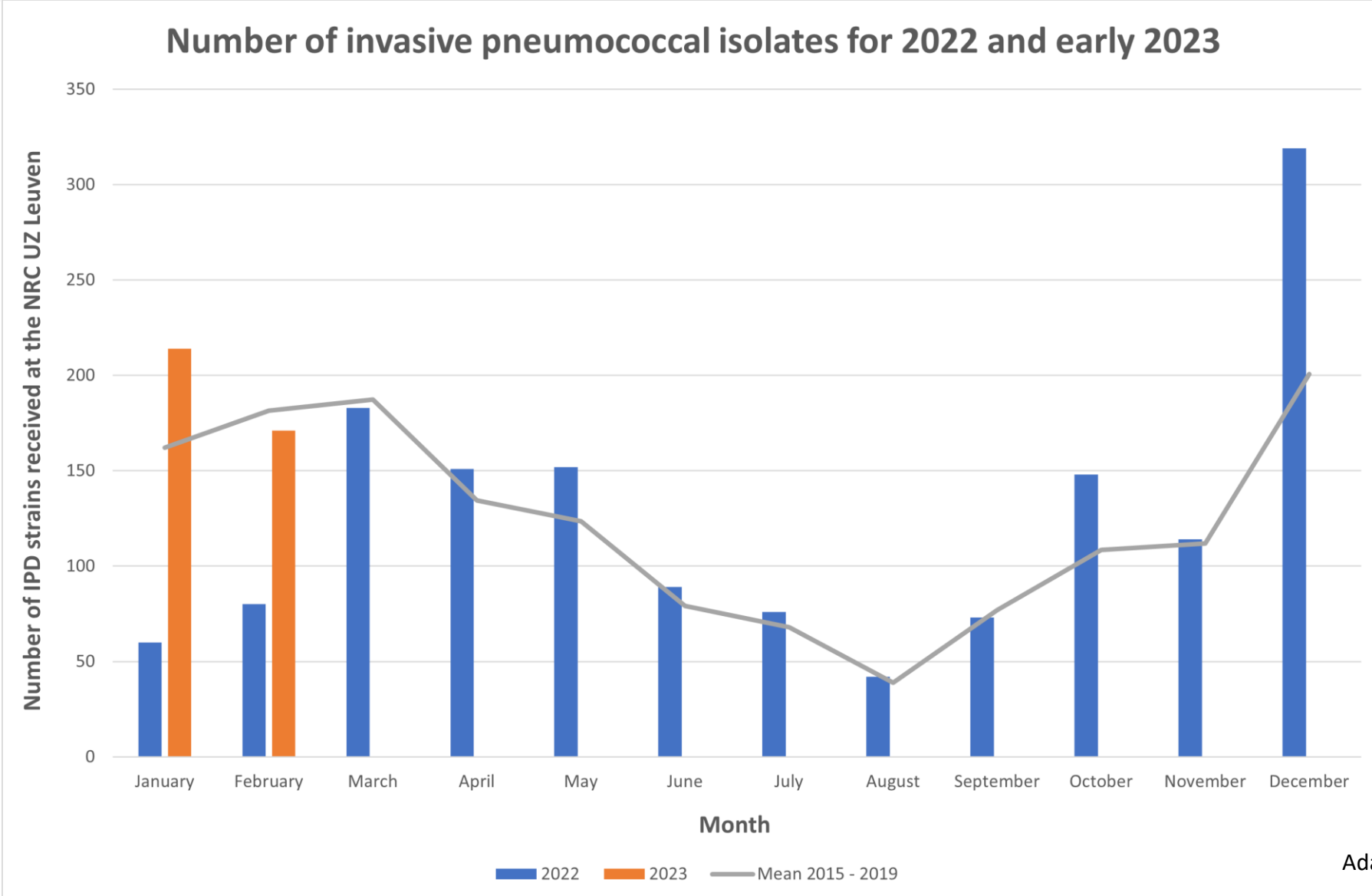
Recent numbers of 2022 and 2023



Adapted from NRC Report 2022

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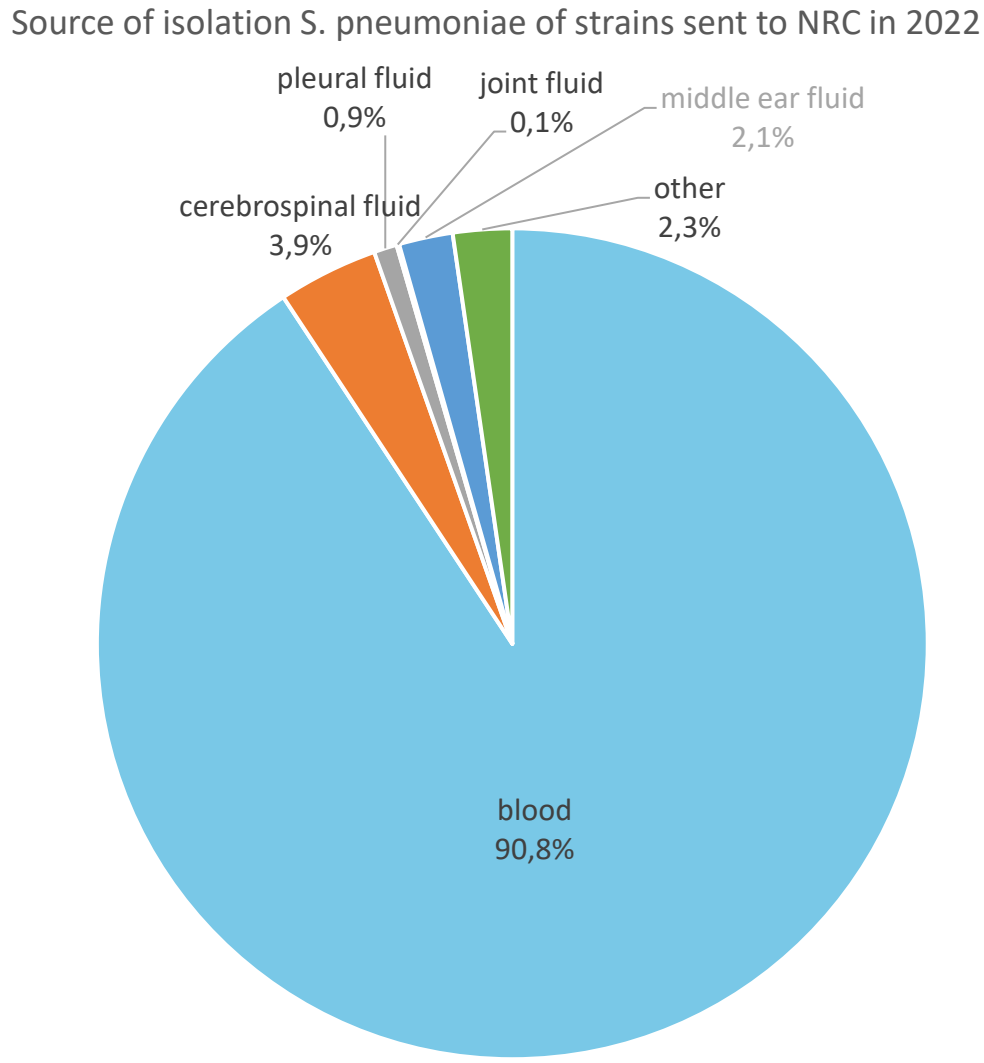
Source of isolation



Adapted from NRC Report 2022

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Poll question 1

Which pneumococcal isolates do you currently send to our NRC?

- All invasive pneumococcal isolates (strains isolated from normally sterile body sites: i.e. blood, CSF, pleural fluid, punction, …)
- Invasive pneumococcal isolates and isolates from middle ear fluid and/or BAL
- Not all invasive isolates, we don’t have a consistent flow in place to send the strains
- We don’t participate to the surveillance

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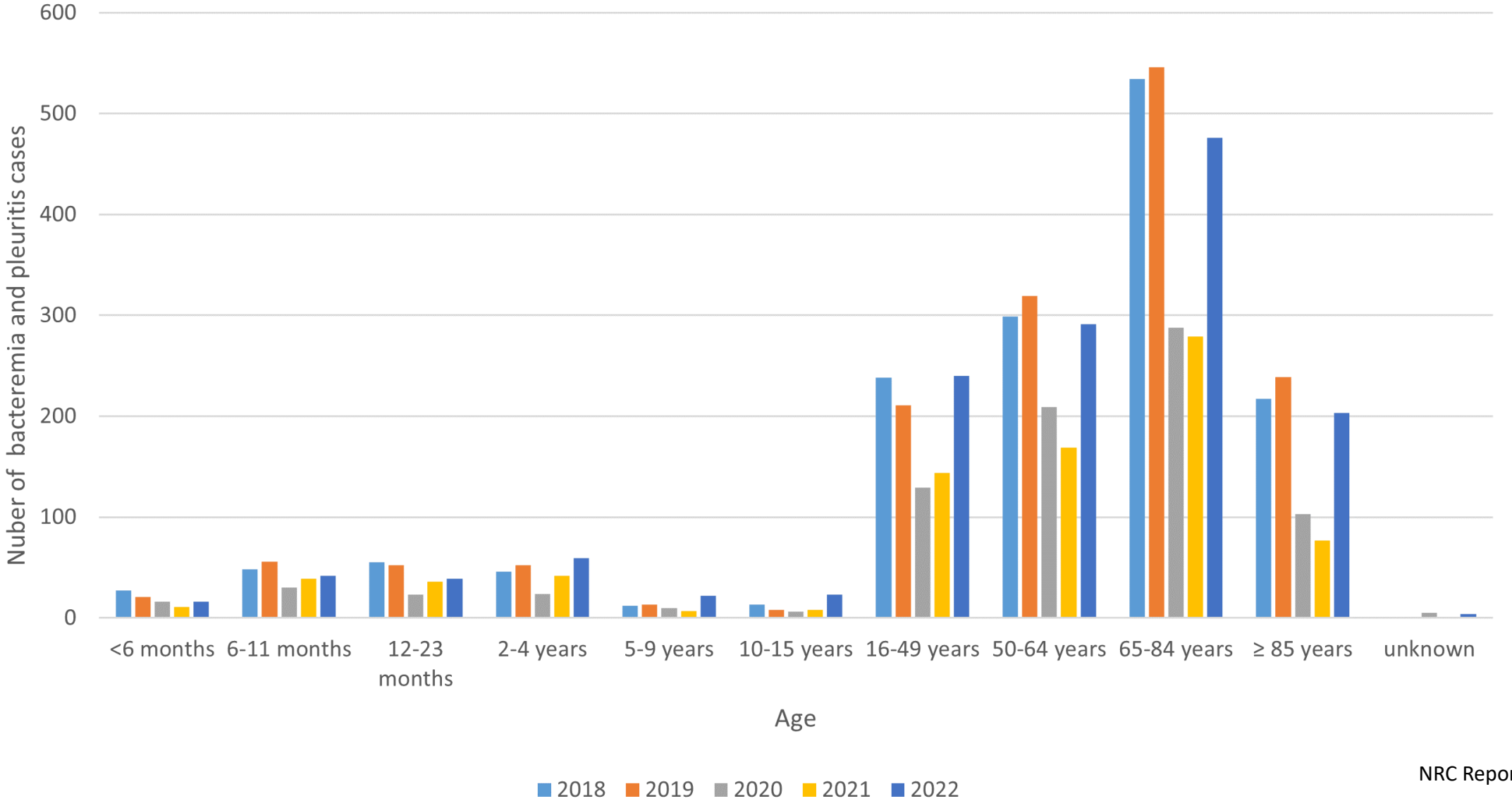
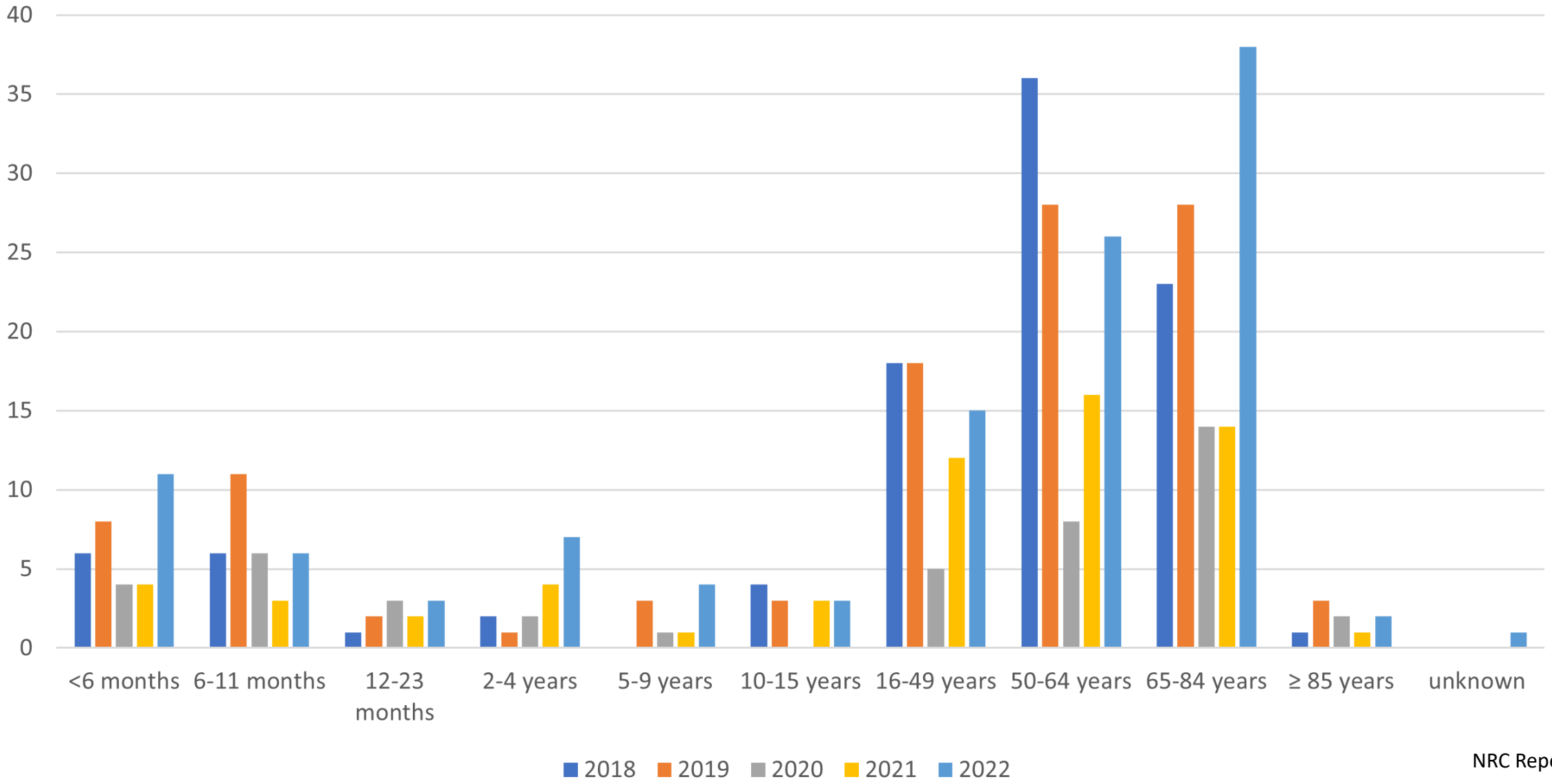
Age distribution of bacteremia and pleuritis cases in 2022



NRC Report 2022

Age distribution of meningitis cases Belgium in 2022



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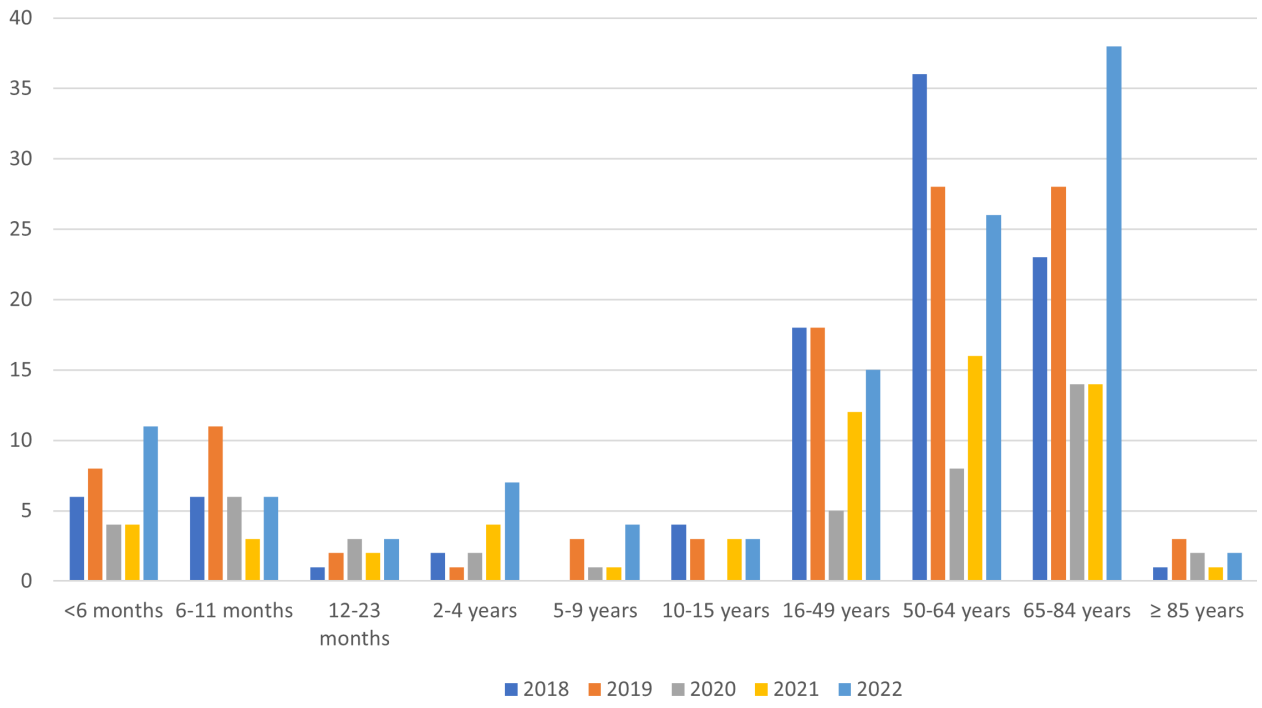
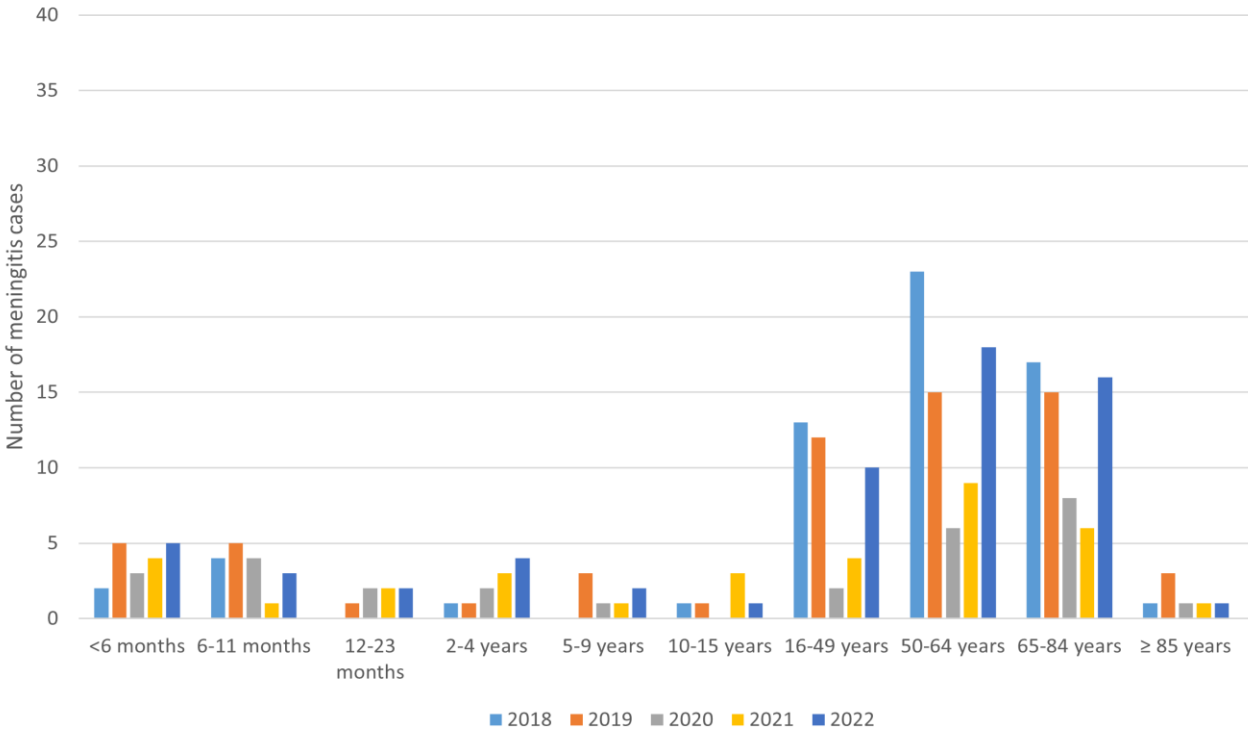
Age distribution of meningitis cases

Number of cases based on **clinical diagnosis** of meningitis

= isolation from CSF + other sample types (with clinical diagnosis of meningitis)



Number of cases based on **isolation of S. pneumoniae from CSF**



53% information on isolation of *S.pneumoniae* from CSF
increase in age group 65-84 years old

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Poll question 2

If there is a patient with pneumococcal meningitis with isolation of S. pneumoniae both from blood and CSF, which strain and information do you send to the NRC

- We send both strains to the NRC with two separate NRC forms
- We send one strain and indicate isolation from blood and CSF
- We send the first isolated strain and if this is the blood culture isolate we send this isolate (without indication of isolation from the CSF)
- Combination of the above situations
- Other

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Routine tests at the NRC

On pneumococcal strains

- Confirmation of identification

- Capsular typing
  phenotypic by means of Quellung reaction

- Antimicrobial susceptibility testing
  disk diffusion
  broth microdilution

Plate Code: **BELKUL1** Date: **5/7/2020**

	1	2	3	4	5	6	7	8	9	10	11	12
A	ERY 0.12	ERY 0.25	ERY 0.5	ERY 1	ERY 2	ERY 4	ERY 8	ERY 16	ERY 32	ERY 64	ERY 128	ERY 256
B	CLI 0.12	CLI 0.25	CLI 0.5	CLI 1	CLI 2	CLI 4	CLI 8	CLI 16	CLI 32	CLI 64	CLI 128	CLI 256
C	TET 0.12	TET 0.25	TET 0.5	TET 1	TET 2	TET 4	TET 8	TET 16	TET 32	TET 64	TET 128	TET 256
D	PEN 0.015	PEN 0.03	PEN 0.06	PEN 0.12	PEN 0.25	PEN 0.5	PEN 1	PEN 2	PEN 4	PEN 8	PEN 16	CHL 2
E	AMOX 0.015	AMOX 0.03	AMOX 0.06	AMOX 0.12	AMOX 0.25	AMOX 0.5	AMOX 1	AMOX 2	AMOX 4	AMOX 8	AMOX 16	CHL 4
F	FOT 0.015	FOT 0.03	FOT 0.06	FOT 0.12	FOT 0.25	FOT 0.5	FOT 1	FOT 2	FOT 4	FOT 8	FOT 16	CHL 8
G	LEVO 0.25	LEVO 0.5	LEVO 1	LEVO 2	LEVO 4	LEVO 8	MXF 0.25	MXF 0.5	MXF 1	MXF 2	MXF 4	CHL 16
H	SXT 0.25/4.75	SXT 0.5/9.5	SXT 1/19	SXT 2/38	SXT 4/76	SXT 8/152	VAN 0.5	VAN 1	VAN 2	VAN 4	VAN 8	POS

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Prevention of pneumococcal disease anno 2023

Serotype	4	6B	9V	14	18C	19F	23F	1	5	7F	3	6A	19A	22F	33F	8	10A	11A	12F	15B	2	9N	17F	20		
PCV7	eerste PCV – niet meer op de markt																								✓	
PCV10																									✓	
PCV13																									✓	✓
PPV23																										✓
new PCV15																									✓	✓
new PCV20																										✓

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Pneumococcal vaccines in childhood immunisation programmes

Children

- PCV recommended for all young children (2+1)
- Included in immunization programmes since 2007
- High vaccination rate
  - Flanders 2020: 95,4%; Wallonia 2015: 92,2% (3rd dose)

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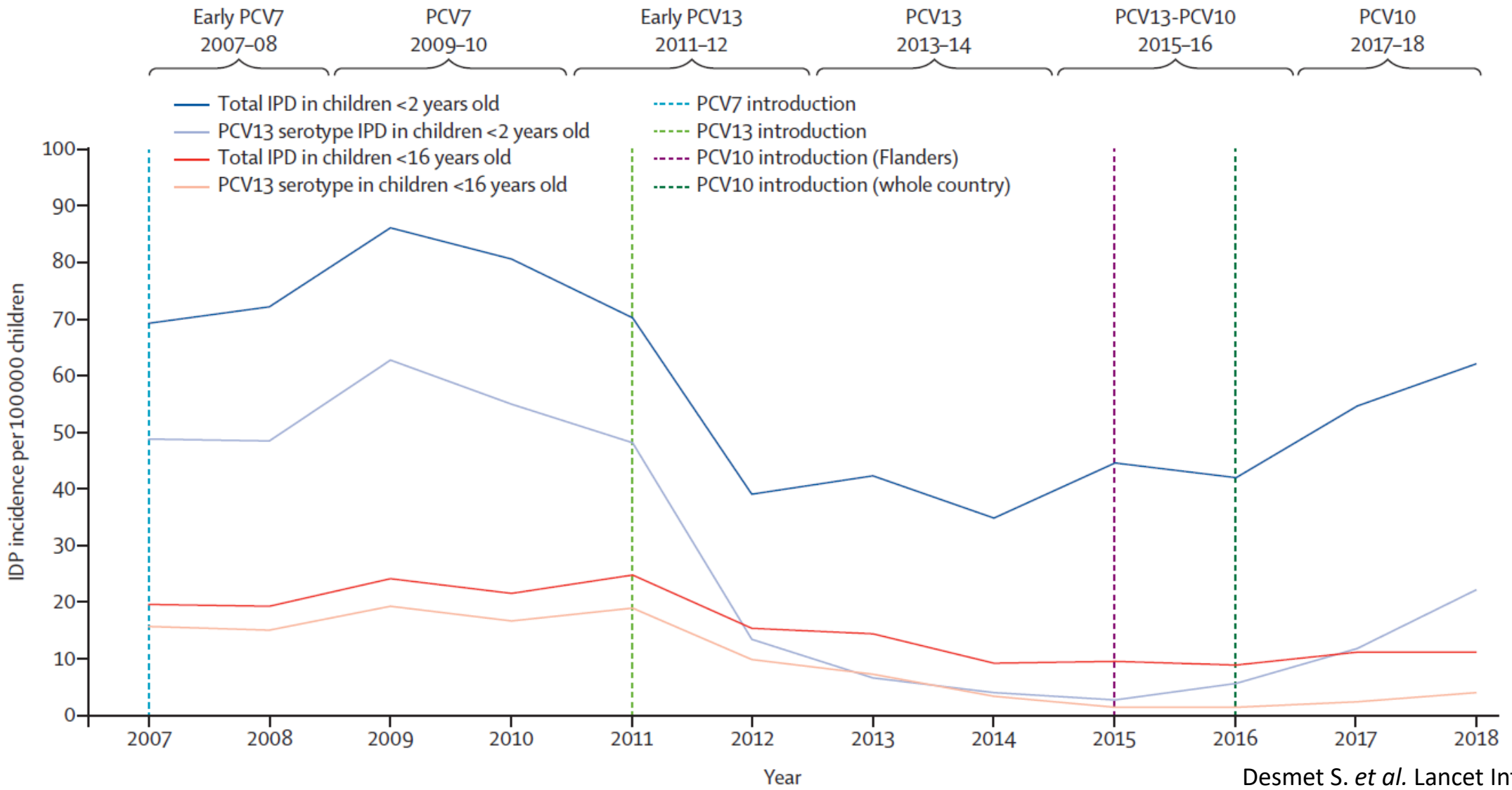
Impact of PCV on IPD epidemiology in children



Desmet S. *et al.* Lancet Infect Dis. 2020

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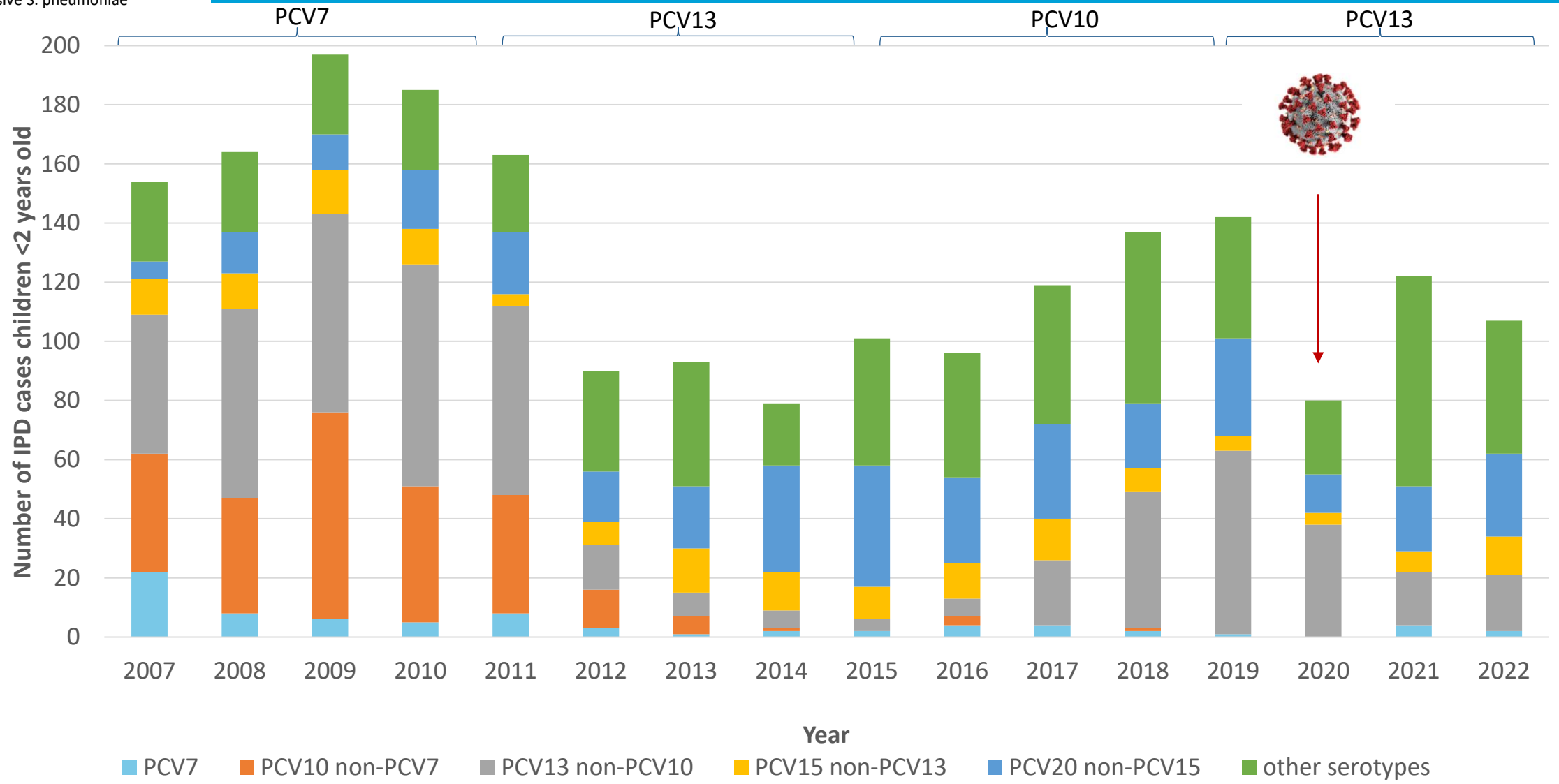
Serotype distribution IPD children <2 years old



Data NRC S. pneumoniae UZ Leuven

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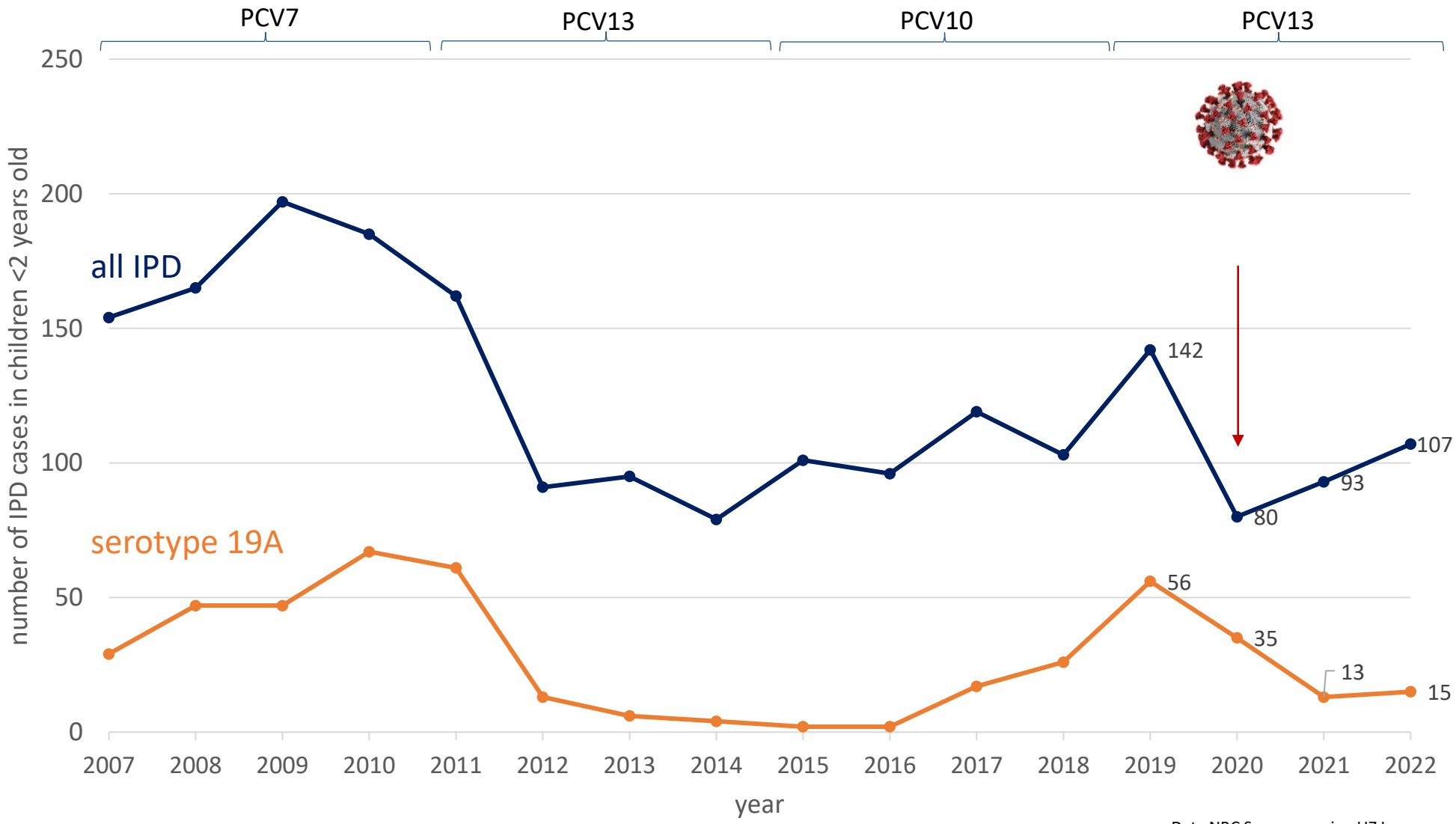
Evolution of IPD and serotype 19 IPD in children < 2 years old



Data NRC S. pneumoniae UZ Leuven

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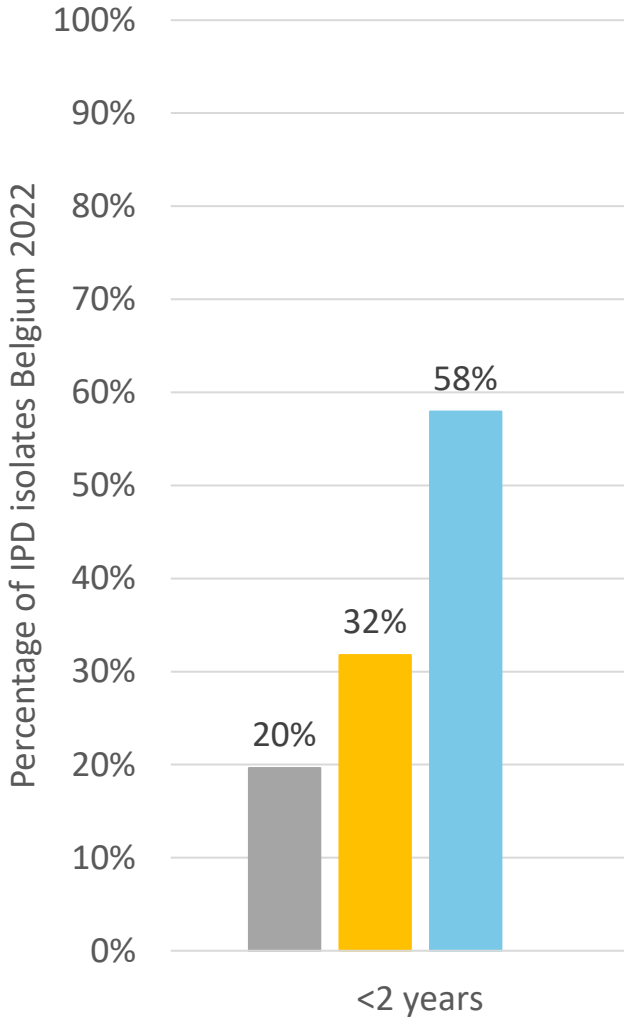
Serotypes distribution children <2 years old



Rank	Serotype	% IPD <2 years	Inclusion in PCV
1	19A	14.0%	PCV13/PCV15/PCV20
2	33F	10.3%	PCV15/PCV20
3	10A	9.3%	PCV20
4	11A	8.4%	PCV20
5	23B	7.5%	-
6	12F	5.6%	PCV20
7	24F	5.6%	-

Hoge Gezondheidsraad

https://www.health.belgium.be/nl/advies-9746-vaccinatie-van-kinderen-en-adolescenten-tegen-pneumokokken

PCV13
or
PCV15
PCV20 not yet on the market for the children

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Predominant serotypes in adults in 2022

serotype		<16 years (n=222)	16-49 years (n=251)	50-64 years (n=311)	65-84 years (n=493)	>85 years (n=206)	all ages (n=1487)	compared to 2021
8	PCV20	4,1%	30,7%	20,6%	14,0%	6,8%	15,7%	
3	PCV13	5,0%	13,1%	14,8%	18,1%	18,0%	14,5%	+4%
19A	PCV13	13,1%	5,2%	10,0%	7,9%	12,1%	9,2%	-4%
4	PCV7	0,9%	19,5%	8,7%	4,7%	0,5%	6,9%	+3%
22F	PCV15	2,7%	2,8%	6,1%	5,1%	1,9%	4,1%	
6C	NVT	3,2%	0,4%	2,9%	6,5%	5,8%	4,1%	
12F	PCV20	7,2%	5,6%	3,5%	2,6%	1,0%	3,8%	
9N	PPV23	1,4%	3,2%	1,6%	4,5%	4,4%	3,2%	
23B	NVT	9,5%	1,6%	2,6%	1,8%	1,5%	3,0%	-2%
10A	PCV20	7,2%	0,8%	2,9%	2,0%	3,4%	3,0%	
33F	PCV15	5,9%	0,8%	2,9%	2,8%	2,4%	2,9%	
11A	PCV20	5,4%	1,2%	2,3%	2,2%	4,4%	2,8%	
15A	NVT	1,8%	0,8%	2,3%	3,9%	4,9%	2,8%	
23A	NVT	2,3%	1,2%	1,9%	2,0%	5,3%	2,4%	
24F	NVT	5,9%	0,4%	1,3%	2,2%	1,5%	2,2%	

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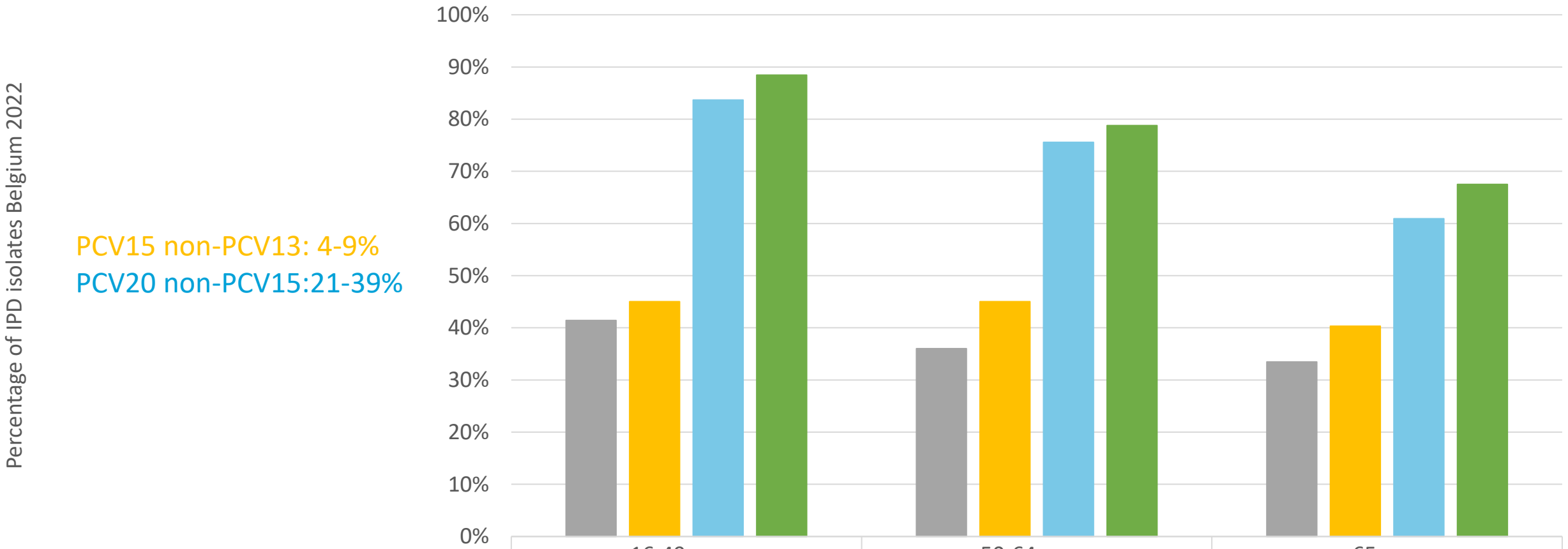
Serotype distribution based on inclusion in PCV in 2022

PCV15 non-PCV13: 4-9%
PCV20 non-PCV15:21-39%



	16-49 years	50-64 years	>65 years
PCV13 serotypes	41%	36%	33%
PCV15 (PCV13 + 22F + 33F) serotypes	45%	45%	40%
PCV20 (PCV15 + 8, 10A, 11A, 12F, 15B) serotypes	84%	76%	61%
PPV23	88%	79%	68%

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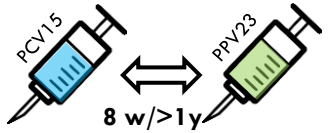
Prevention pneumococcal disease Belgium

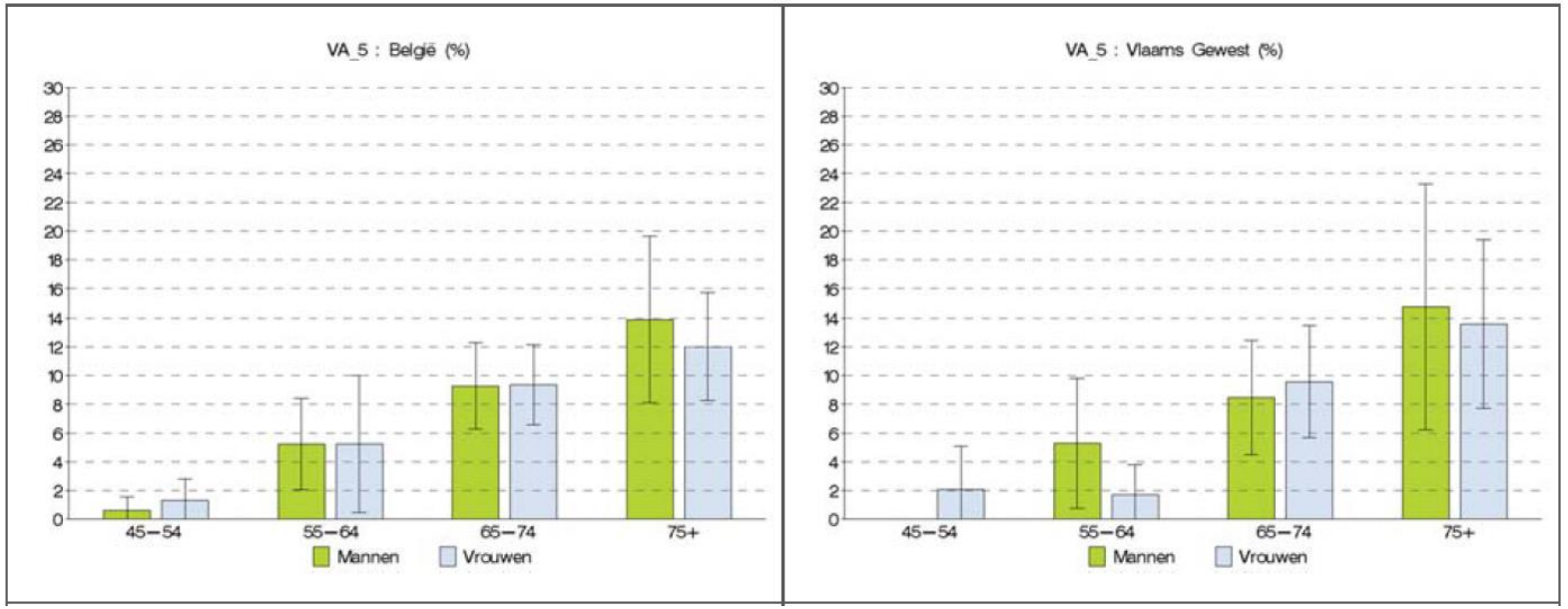
Hoge Gezondheidsraad

https://www.health.belgium.be/sites/default/files/uploads/fields/fpshealth_theme_file/20220908_hgr-9674_pneumo_vweb.pdf

Preference 

Alternative 

Percentage van de risicogroep dat gevaccineerd werd tegen pneumokokken in de afgelopen vijf jaar, volgens geslacht, leeftijd en Gewest, Gezondheidsenquête, België 2018



Berete F *et al.* Sciensano Gezondheidsenquete 2018

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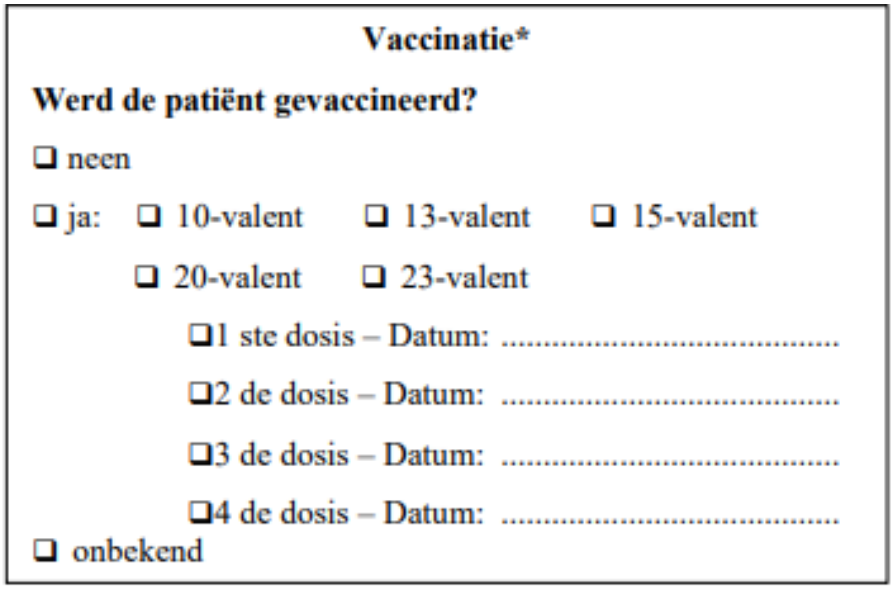
Poll question 3

Application form of the NRC: information on vaccination status?

- We do already complete the information when available
- We do already complete the information when available, however we often don't know
- We don't complete it but we could access the information
- We don't have (easy) access to this information, but we could share INSZ/NISS
- We don't have (easy) access and don't see why it is necessary to complete this information



Vaccinatie*

Werd de patiënt gevaccineerd?

❑ neen

❑ ja: ❑ 10-valent ❑ 13-valent ❑ 15-valent

❑ 20-valent ❑ 23-valent

❑1 ste dosis – Datum: .....

❑2 de dosis – Datum: .....

❑3 de dosis – Datum: .....

❑4 de dosis – Datum: .....

❑ onbekend

https://www.sciensano.be/sites/default/files/aanvraagform_streptococcus_pneumoniae_nl.pdf

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Routine tests at the NRC

On pneumococcal strains

- Confirmation of identification

- Capsular typing
  phenotypic by means of Quellung reaction

- Antimicrobial susceptibility testing
  disk diffusion
  broth microdilution

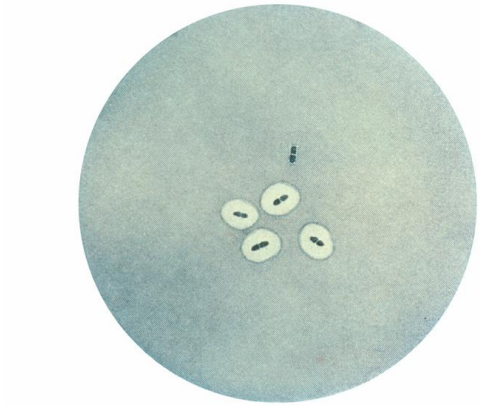

Plate Code: **BELKUL1** Date: **5/7/2020**

	1	2	3	4	5	6	7	8	9	10	11	12
A	ERY	ERY	ERY	ERY	ERY	ERY	ERY	ERY	ERY	ERY	ERY	ERY
	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256
B	CLI	CLI	CLI	CLI	CLI	CLI	CLI	CLI	CLI	CLI	CLI	CLI
	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256
C	TET	TET	TET	TET	TET	TET	TET	TET	TET	TET	TET	TET
	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256
D	PEN	PEN	PEN	PEN	PEN	PEN	PEN	PEN	PEN	PEN	PEN	CHL
	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	2
E	AMOX	AMOX	AMOX	AMOX	AMOX	AMOX	AMOX	AMOX	AMOX	AMOX	AMOX	CHL
	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	4
F	FOT	FOT	FOT	FOT	FOT	FOT	FOT	FOT	FOT	FOT	FOT	CHL
	0.015	0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	8
G	LEVO	LEVO	LEVO	LEVO	LEVO	LEVO	MXF	MXF	MXF	MXF	MXF	CHL
	0.25	0.5	1	2	4	8	0.25	0.5	1	2	4	16
H	SXT	SXT	SXT	SXT	SXT	SXT	VAN	VAN	VAN	VAN	VAN	POS
	0.25/4.75	0.5/9.5	1/19	2/38	4/76	8/152	0.5	1	2	4	8	

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Antibiotic resistance of invasive *S. pneumoniae*

change of method mid 2020 for penicillin and cefotaxime

antibiotic	2018	2019	2020	2021	2022
	n=1571	n=1592	n=884	n=863	n=1487
	(%)	(%)	(%)	(%)	(%)
penicillin R					
penicilline MIC > 0.06 mg/L	10.2%	9.9%	15.0%	18.4%	14.3%
penicilline MIC > 2 mg/L	0.0%	0.0%	1.2%	3.6%	2.0%
cefotaxime R					
cefotaxime MIC > 0.5 mg/L	0.2%	0.6%	2.1%	4.9%	3.5%
cefotaxime MIC > 2 mg/L	0.0%	0.1%	0.2%	0.7%	0.2%
tetracycline R	14.0%	14.4%	18.8%	15.1%	14.1%
levofloxacin R	0.1%	0.1%	0.1%	0.1%	0.1%
erythromycin R	15.3%	15.8%	19.8%	16.5%	14.7%

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EUCAST EUROPEAN COMMITTEE ON ANTIMICROBIAL SUSCEPTIBILITY TESTING
European Society of Clinical Microbiology and Infectious Diseases

21 November, 2019

Warning against the use of gradient tests for benzylpenicillin MIC in *Streptococcus pneumoniae*.

EUCAST benzylpenicillin breakpoints in *Streptococcus pneumoniae* are S≤0.06 mg/L, R>2 mg/L for indications other than meningitis. Isolates which are positive in the screen for beta-lactam resistance (with the oxacillin 1 µg disk) have benzylpenicillin MIC values above 0.06 mg/L and are categorized either "Susceptible, increased exposure", in which case isolates can be treated with benzylpenicillin if dosing is adjusted according to the MIC value, or resistant (R>2 mg/L), in which case benzylpenicillin, and often many other beta-lactam agents, should be avoided for treatment. Laboratories must be able to perform correct MIC determination on screen positive isolates and this is especially important in isolates for which benzylpenicillin MICs are in the range 0.5 – 4 mg/L.

Following questions from NEQAS, EARS-Net and EUCAST users, the EDL investigated the accuracy of benzylpenicillin gradient tests (Etest™, bioMerieux; MTS™, Liofilchem). Both gradient tests were tested on in-house prepared MH-F agar from Oxoid (Thermo Fisher Scientific) och BBL (BD). Broth microdilution using Mueller-Hinton-F (MH-F) broth was used as the reference.

Both gradient tests were found to frequently underestimate MIC values by one or more doubling dilutions. In the area around the R breakpoint (0.5 – 4 mg/L), and with some variation between the MH-F media and the two tests, 0 – 37% of values were on the reference MIC, 63 – 100 % were below and 0-10 % of the values above the reference MIC.

Conclusion: Available gradient tests (Etest™ and MTS™) systematically underestimate benzylpenicillin MIC values in *S. pneumoniae*. This is especially detrimental in the important area close to the R breakpoint. Laboratories using gradient tests must be aware of this and MIC values of 0.5 - 2 mg/L should be checked with broth microdilution.
A beta-lactam intended for use in meningitis should always be tested using broth microdilution if the oxacillin screen is positive.

https://www.eucast.org/fileadmin/src/media/PDFs/EUCAST_files/Warnings/Warnings_docs/Warning_-_gradient_for_benzyl_and_pnc_21nov2019b.pdf

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Antibiotic resistance of invasive *S. pneumoniae*

change of method mid 2020 for penicillin and cefotaxime

antibiotic	2018	2019	2020	2021	2022
	n=1571	n=1592	n=884	n=863	n=1487
	(%)	(%)	(%)	(%)	(%)
penicillin R					
penicilline MIC > 0.06 mg/L	10.2%	9.9%	15.0%	18.4%	14.3%
penicilline MIC > 2 mg/L	0.0%	0.0%	1.2%	3.6%	2.0%
cefotaxime R					
cefotaxime MIC > 0.5 mg/L	0.2%	0.6%	2.1%	4.9%	3.5%
cefotaxime MIC > 2 mg/L	0.0%	0.1%	0.2%	0.7%	0.2%
tetracycline R	14.0%	14.4%	18.8%	15.1%	14.1%
levofloxacin R	0.1%	0.1%	0.1%	0.1%	0.1%
erythromycin R	15.3%	15.8%	19.8%	16.5%	14.7%

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Poll question 4

How do you perform MIC testing of beta-lactam antibiotics in your laboratory?

- Broth microdilution method
- E-test
- Vitek
- Phoenix
- Other
- We don’t perform this analysis in our laboratory

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NAC study: methodology

- **Multicenter study**
- **60 *S. pneumoniae*** strains
  - 11 reference strains (ATCC, CCUG)
  - 49 clinical strains (NRC-library)
- Antibiotics: **penicillin**, **amoxicillin** and **cefotaxime**
- Reference method: **BMD** (Sensititre™ BELKUL1)
- Interpretation: **EUCAST** breakpoints **non-meningitis**

Laboratory A	Laboratory B	Laboratory C	Laboratory D
BMD	N/A	N/A	N/A
Vitek 2	Phoenix BD	Phoenix BD	Vitek 2
Etest (Oxoid)	Etest (Oxoid)	Etest (BBL)	Etest (BBL)

CHU UCL NAMUR Dinant Godinne Sainte-Elisabeth
azsintlucasgent
Jessa Ziekenhuis
SAMEN GRENZEN VERLEGGEN

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Etest® penicillin

Penicillin Etest lab A (Oxoid)	Penicillin BMD									
	<= 0.016	0.03	0.06	0.125	0.25	0.5	1	2	4	8
<= 0.016		1	4							
0.03			4							
0.06			3	3						
0.125				1	1	1				
0.25					4	2	1			
0.5					1	3	1	2		
1						1	4	3	4	1
2							1	2	4	5
4									2	1
8										

Penicillin Etest lab D (BBL)	Penicillin BMD									
	<= 0.016	0.03	0.06	0.125	0.25	0.5	1	2	4	8
<= 0.016		1	1							
0.03			6		1					
0.06			2	1						
0.125			2	3	1		1			
0.25					4	1				
0.5						4	2			
1						2	3	7	3	
2							1		3	1
4									4	5
8										1

Testing method	Laboratory	EA (%)	CA (%)
Etest (Oxoid)	A	70	73
	B	47	60
Etest (BBL)	C	100	87
	D	88	82

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Vitek / Phoenix penicillin

Penicillin Vitek lab A	Penicillin BMD									
	<= 0.016	0.03	0.06	0.125	0.25	0.5	1	2	4	8
-										
-										
<= 0.06		1	8							
0.125			2		1					
0.25			1	4	5	2				
0.5						1	1			
1						2	6	5		
2						1	1	2	3	1
4									7	4
>= 8										2

Penicillin Phoenix lab B	Penicillin BMD									
	<= 0.016	0.03	0.06	0.125	0.25	0.5	1	2	4	8
-										
<= 0.03		1	2							
0.06			9	2						
0.125				1	1					
0.25				1	1					
0.5					3	4	2			
1					1	1	1	1		
2						1	2	1		
4						1	2	5	7	3
> 4									3	4

Testing method	Laboratory	EA (%)	CA (%)
Vitek	A	95	88
	D	98	92
Phoenix	B	92	83
	C	90	82

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Vitek / Phoenix amoxicillin

Ampicillin Vitek lab D	Amoxicillin BMD											
	<= 0.016	0.03	0.06	0.125	0.25	0.5	1	2	4	8	16
-											
-											
-											
-											
<= 0.25		6	8	5	6	4					
0.5						1					
1							1				
2						1	3	2			
4							4	5	3		
8										1	5
>= 16										3	2

Amoxicillin Phoenix lab C	Amoxicillin BMD											
	<= 0.016	0.03	0.06	0.125	0.25	0.5	1	2	4	8	16
-											
-											
-											
-											
<= 0.25		5	8	5	3	1					
0.5					4	4					
1						1	2				
2							6	7	2		
4									1		2
> 4										4	5

Testing method	Laboratory	EA (%)	CA (%)
Vitek	A	92	87
	D	92	87
Phoenix	B	98	88
	C	100	88

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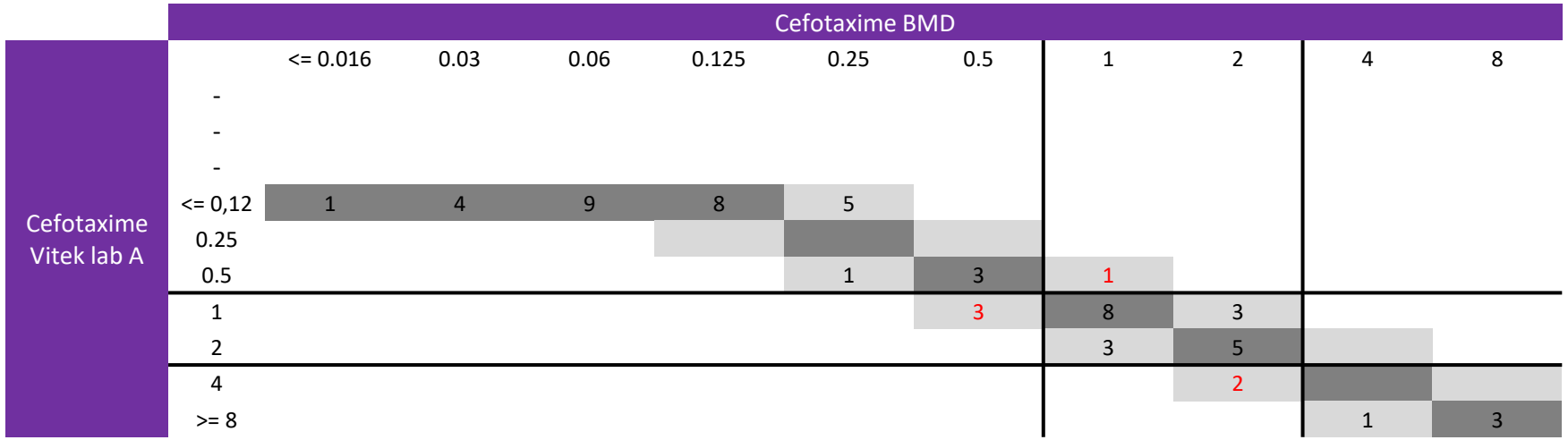
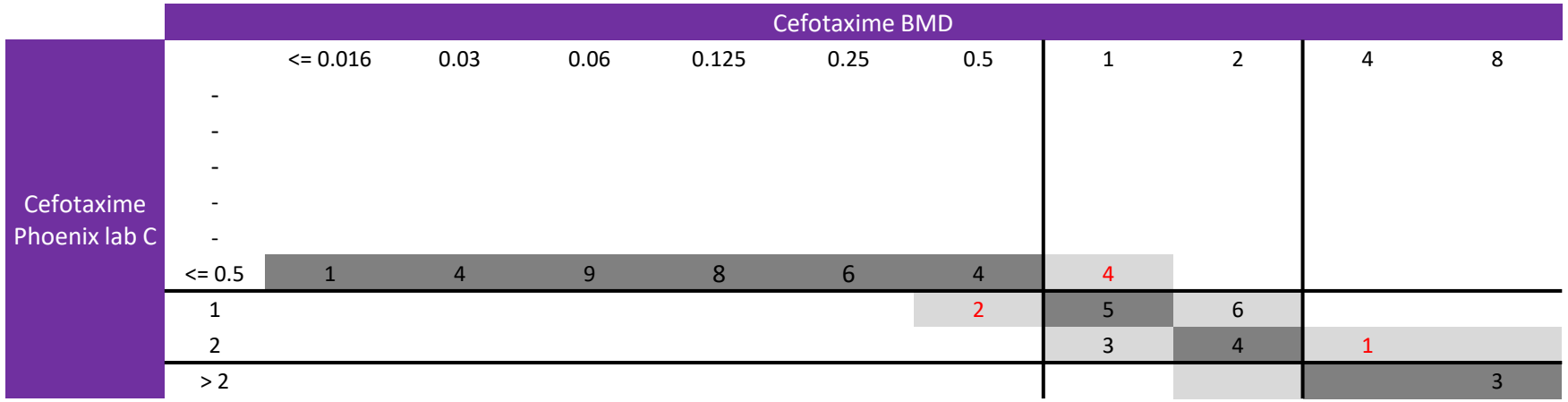
Vitek / Phoenix cefotaxime





Testing method	Laboratory	EA (%)	CA (%)
Vitek	A	100	90
	D	98	90
Phoenix	B	98	87
	C	100	88

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TAKE HOME MESSAGES

- Lower inter lab variation with automated systems compared to testing with Etest

- MIC determination by **Etest** gives **underestimation** (≥ 2 dilutions lower) compared to BMD in a significant number of tested strains
  - This phenomenon is **more pronounced** with **penicillin** and ampicillin than cefotaxime
  - This phenomenon results in **different susceptibility categorization** (!!! R -> I/S)
  - This phenomenon is **more observed** when using the **Oxoid** agar versus de **BBL** agar

TRUST IN AUTOMATE > ETEST®

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NRC activities

On pneumococcal strains
- Identification
- Capsular typing
- Antimicrobial susceptibility testing

Implementation of new diagnostic methods: expanding activities to the direct detection of *S pneumoniae* in **normale sterile fluids**

Studies/Research

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NRC associated research activities

Investigation of evolutions in IPD epidemiology

WGS of pneumococcal strains

-serotype

-MLST

-GPSC

-prediction of AST

-virulence genes

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EMERGING INFECTIOUS DISEASES®

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EID Journal > Volume 28 > Number 8—August 2022 > Main Article

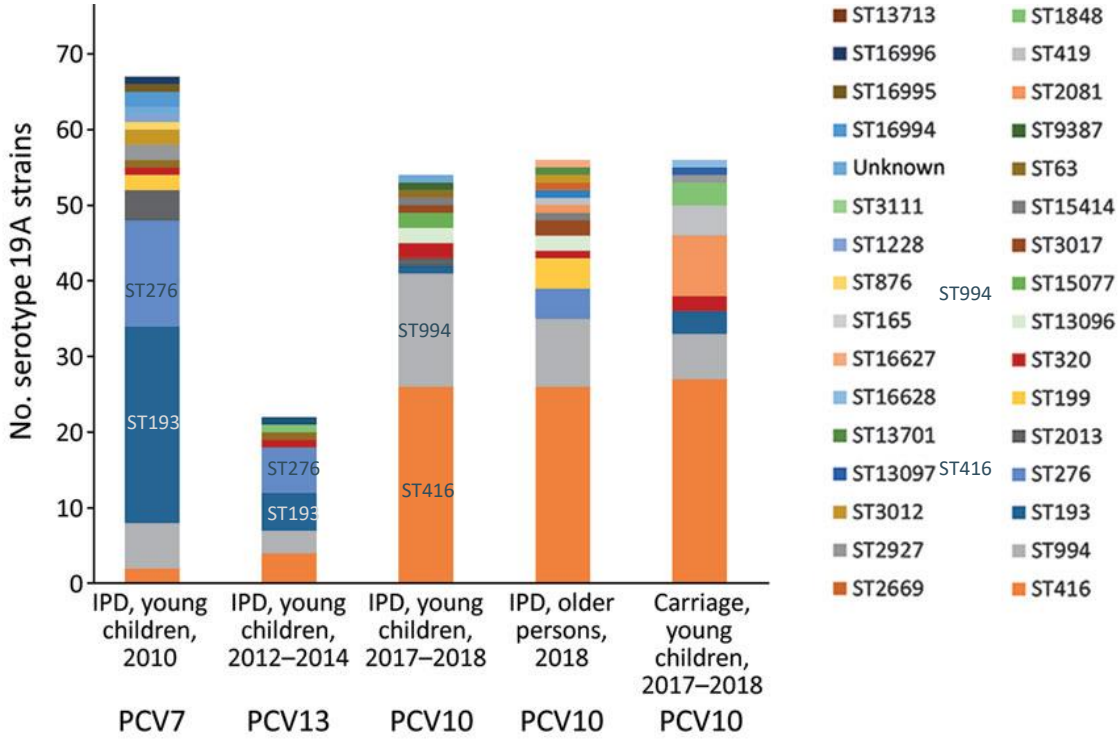
Volume 28, Number 8—August 2022

Research

Characterization of Emerging Serotype 19A Pneumococcal Strains in Invasive Disease and Carriage, Belgium

Stefanie Desmet✉, Heidi Theeten, Lies Laenen, Lize Cuypers, Piet Maes, Wouter Bossuyt, Liesbet Van Heirstraeten, Willy E. Peetermans, and Katrien Lagrou

Author affiliations: University Hospitals Leuven, Leuven, Belgium (S. Desmet, L. Laenen, L. Cuypers, W. Bossuyt, W.E. Peetermans, K. Lagrou); Katholieke Universiteit Leuven, Leuven (S. Desmet, P. Maes, W. Bossuyt, W.E. Peetermans, K. Lagrou); University of Antwerp, Antwerp, Belgium (H. Theeten, L. Van Heirstraeten); Katholieke Universiteit Leuven–University Hospitals Leuven, Leuven (W. Bossuyt)



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Studies with national and international collaborators

Johns Hopkins Bloomberg School of Public Health

Centre for the Evaluation of Vaccination
Vaccine & Infectious Disease Institute
University of Antwerp

University of Oxford

UHASSELT

Agentschap Zorg & Gezondheid

ULB

sciensano

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Scientific publications NRC invasive S. pneumoniae (2018-2022)

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