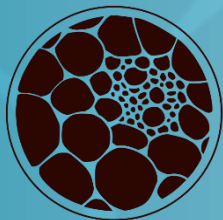


# Hvussu virkar koppseting ímóti millumoyrnabruna?

Tíðarrák... Koppseting fyri *Streptococcus pneumoniae*

Arnfinnur Kallsberg

*M.Sc Medical and Molecular Biology*



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Vísinda) *vøka*



**Pneumokokk sjúka**  
(Noo-muh-kokk)

Orsakað av *Streptococcus  
Pneumoniae*(njú-monía)

**Tíðarrák**

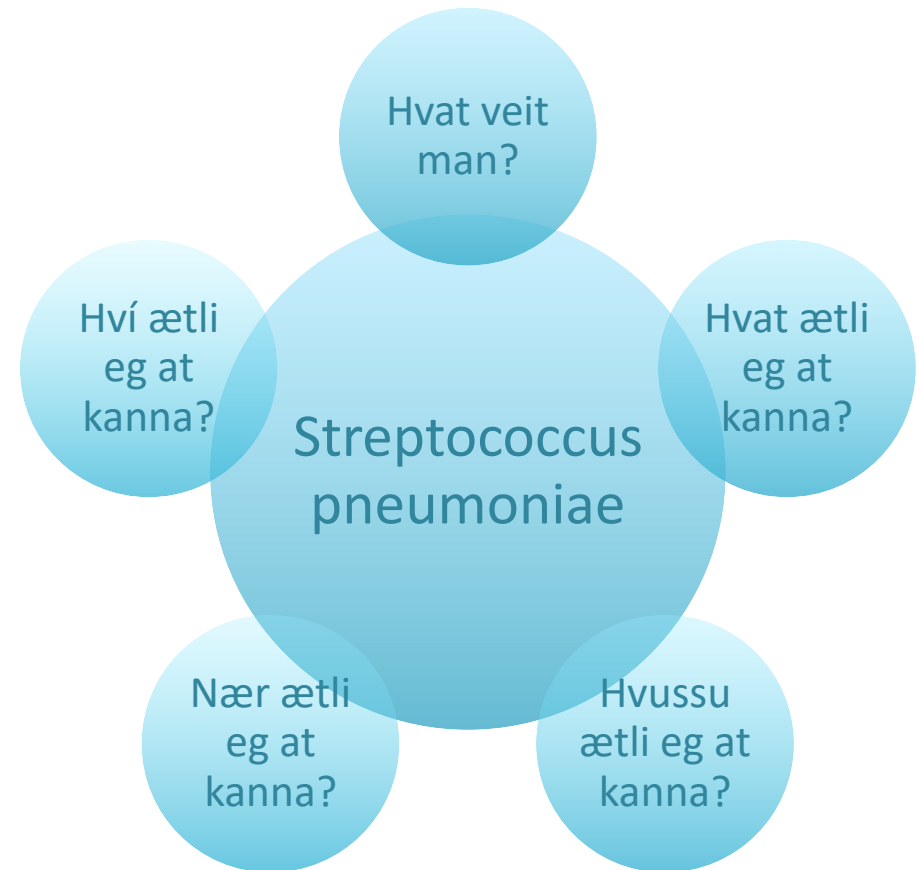
Frá ár 1800 til í dag

**Mín kanning**

Ætlan

**Fyribils úrslit**

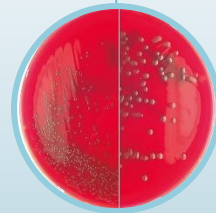
frá 11 dagsstovnum



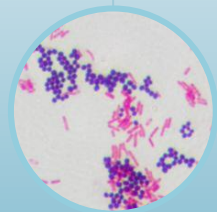
# Hvat eru so Pneumokokkar?



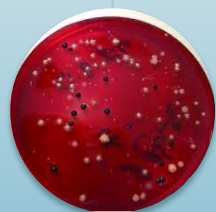
Streptococcus  
Pneumoniae



Bakteria



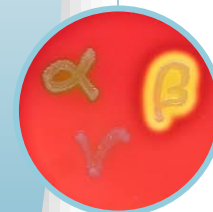
Gram-positiv



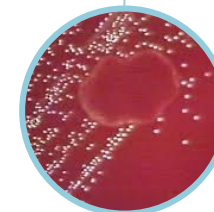
Anaerobe



Aerotolerant



Alpha-  
hemolytisk



Gall-  
upplöysilig



Optochin  
sensitiv

# Hvat eru so Pneumokokkar?

**Polysaccharide**  
Sukurmýli

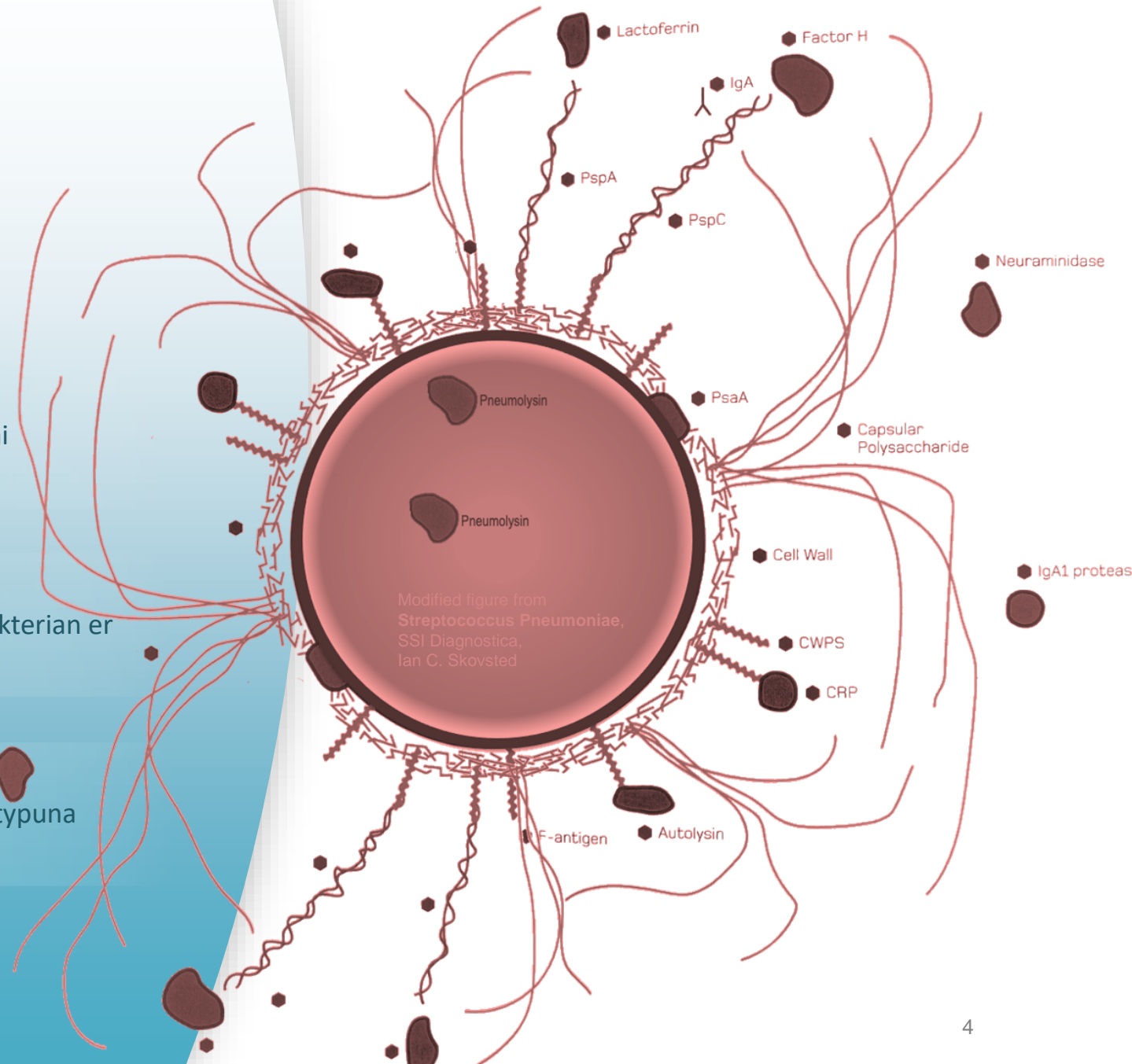
Sum verja ímóti immunverjuni

**Virulens factors**  
Sjúkuelvandi faktorar

Avgera, hvussu vandamikil bakterian er

**Serotypes**  
Undirtypa

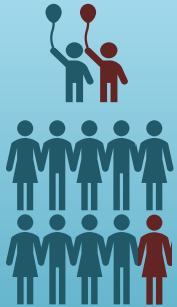
Omanfyrenevndu avgera serotypuna





# Sjúkueyðkenni

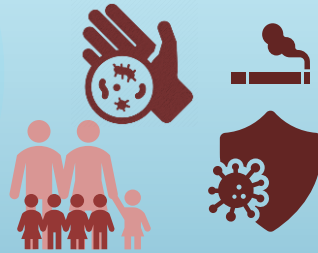
Berarar



Sjúka



Útsett



Pína í oyrum

Ørviti

Svøvnloysi

Fepur

Hosti

Kuldaskjálvti

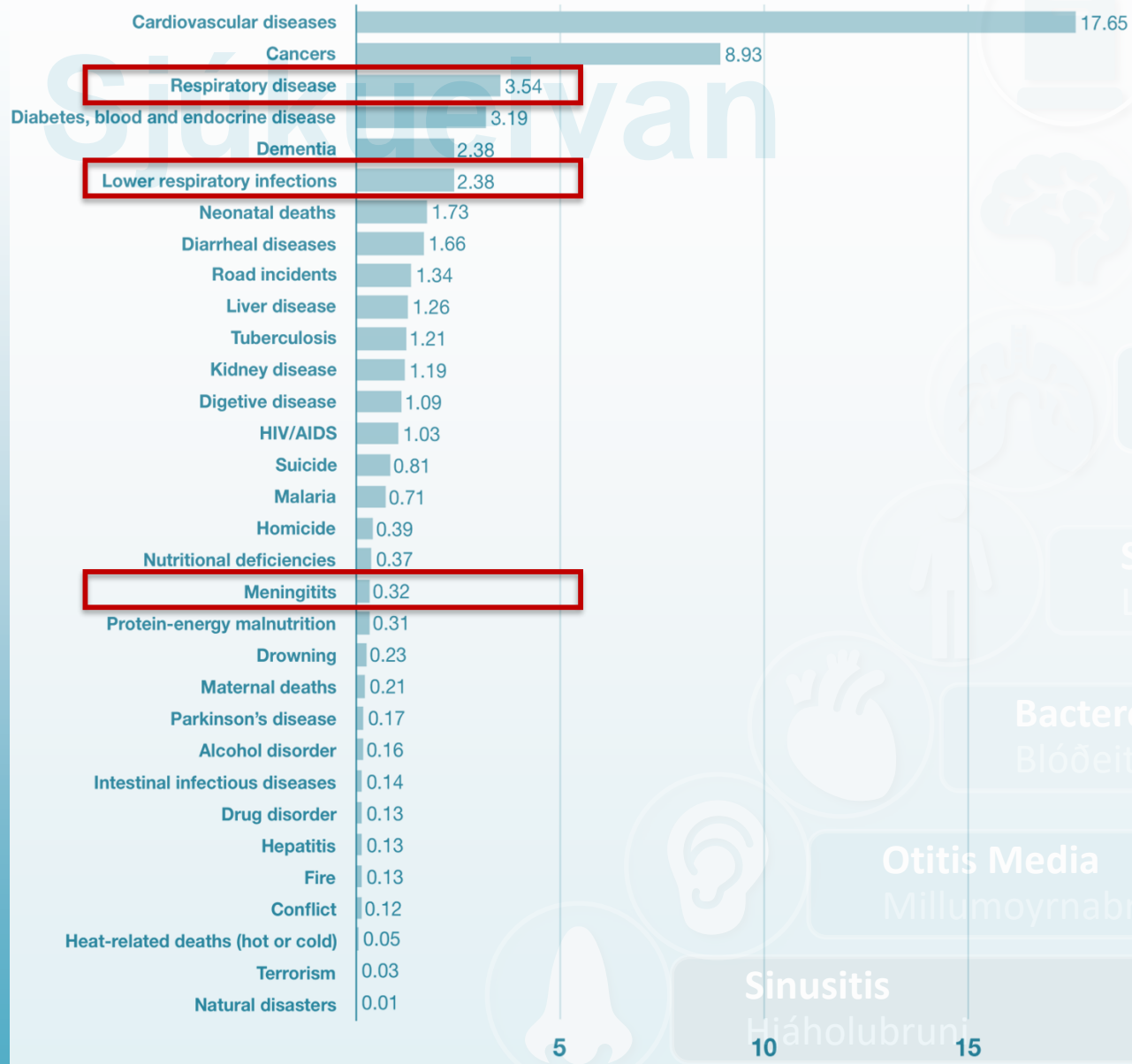
Pína fyri bringuna

Stívir nakki

Pína í liðum

# % Annual Number of Deaths by Cause

(World) (2016)



Heilaskaði ella deyði

Meningitis  
Heilabruni

Pneumoniae  
Lungnabruni

Sepsis  
Lívsháttandi smittusjúka

Bacteremia  
Blóðeitran

Otitis Media  
Millumoyrnabruni

Sinusitis  
Hjáholubruni

# Tíðarrák Pneumokokksins



1800

Viðurkent sum hævðusorsøk til lungnabruna



1881

Isolerað av Louis Pasteur



1884

Gram-stain hjálpti til eyðmerking



1940

Fleiri enn 80 serotypur



1977

Fyrsta koppsetingin



2000

Pneumococcal conjugate Vaccine - PCV



2020

Yvir 100 serotypur skjalfestar

# Streptococcus Pneumoniae

## Serotypur

1	2	3	4	5	6A 6B 6C 6D	7F 7A 7B 7C	8
9A 9L 9N 9V	10F 10A 10B 10C	11F 11A 11B 11C 11D	12F 12A 12B	13	14	15F 15A 15B 15C	16F 16A
17F 17A	18F 18A 18B 18C	19F 19A 19B 19C	20	21	22F 22A	23F 23A 23B	24F 24A 24B
25F 25A	27	28F 28A	29	31	32F 32A	33F 33A 33B 33C 33D	34
35F 35A 35B 35C	36	37	38	39	40	41F 41A	42
	43	44	45	46	47F 47A	48	



# Streptococcus Pneumoniae Serotypur

● PCV-13

● PPSV23

1	2	3	4	5	6A 6B 6C 6D	7F 7A 7B 7C	8
9A 9L 9N 9V	10F 10A 10B 10C	11F 11A 11B 11C 11D	12F 12A 12B	13	14	15F 15A 15B 15C	16F 16A
17F 17A	18F 18A 18B 18C	19F 19A 19B 19C	20	21	22F 22A	23F 23A 23B	24F 24A 24B
25F 25A	27	28F 28A	29	31	32F 32A	33F 33A 33B 33C 33D	34
35F 35A 35B 35C	36	37	38	39	40	41F 41A	42
	43	44	45	46	47F 47A	48	

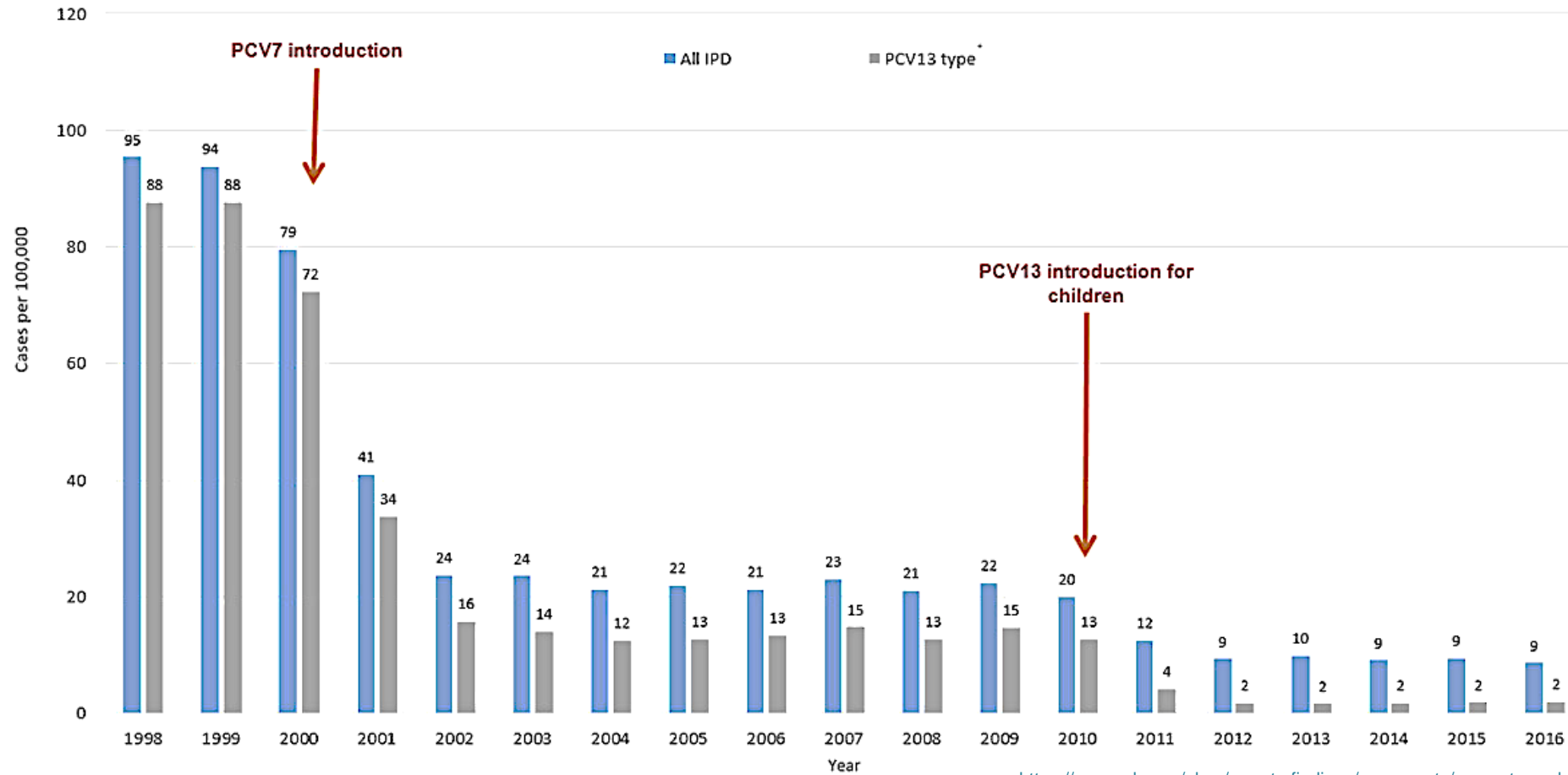
# Pneumokokk koppseting

## Serotypur

### Pneumococcal immunization

Pneumococcal conjugate Vaccine (PCV)				Pneumococcal Polysaccharide Vaccine (PPSV)	
PCV-7	PCV-10	PCV-13	PCV-20	PPSV23	
4	1	3	22F	-6A	2
6B	5	19A	33F		8
9V	7F	6A	8		9N
14	<p>Graph showing the number of pneumococcal serotypes covered by different PCV formulations. The x-axis lists serotypes (1, 3, 4, 5, 6A, 6B, 7F, 8, 9V, 10A, 11A, 12F, 14, 15B, 18C, 19A, 19F, 20, 22F, 23F, 33F) and the y-axis shows the number of serotypes covered. PCV-13 covers the most serotypes, followed by PCV-20, PCV-10, and PCV-7.</p>	10A		10A	
18C		11A		11A	
19F		12F		12F	
23F		15B		15B	
				17F	
				20	
				22f	
				33f	

Trends in invasive pneumococcal disease among children aged <5 years old, 1998–2016



\*PCV13 serotype: 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, and 23F

<https://www.cdc.gov/abcs/reports-findings/surveys/spneu-types.html>

# Pneumokokk koppseting PCV-13

Pfizer

Prevenar-13

PCV-13  
Serotypes

19A

18C

14

9V

7F

6B

6A

5

4

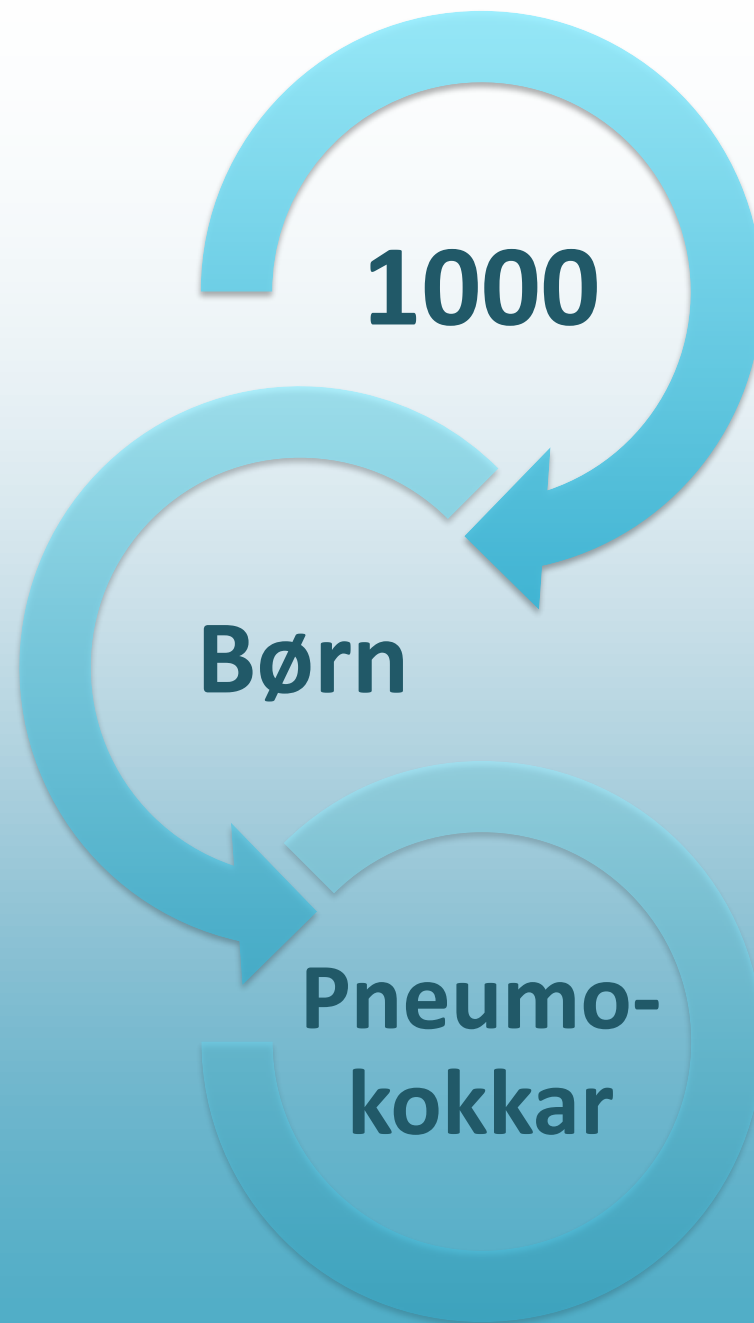
3

1

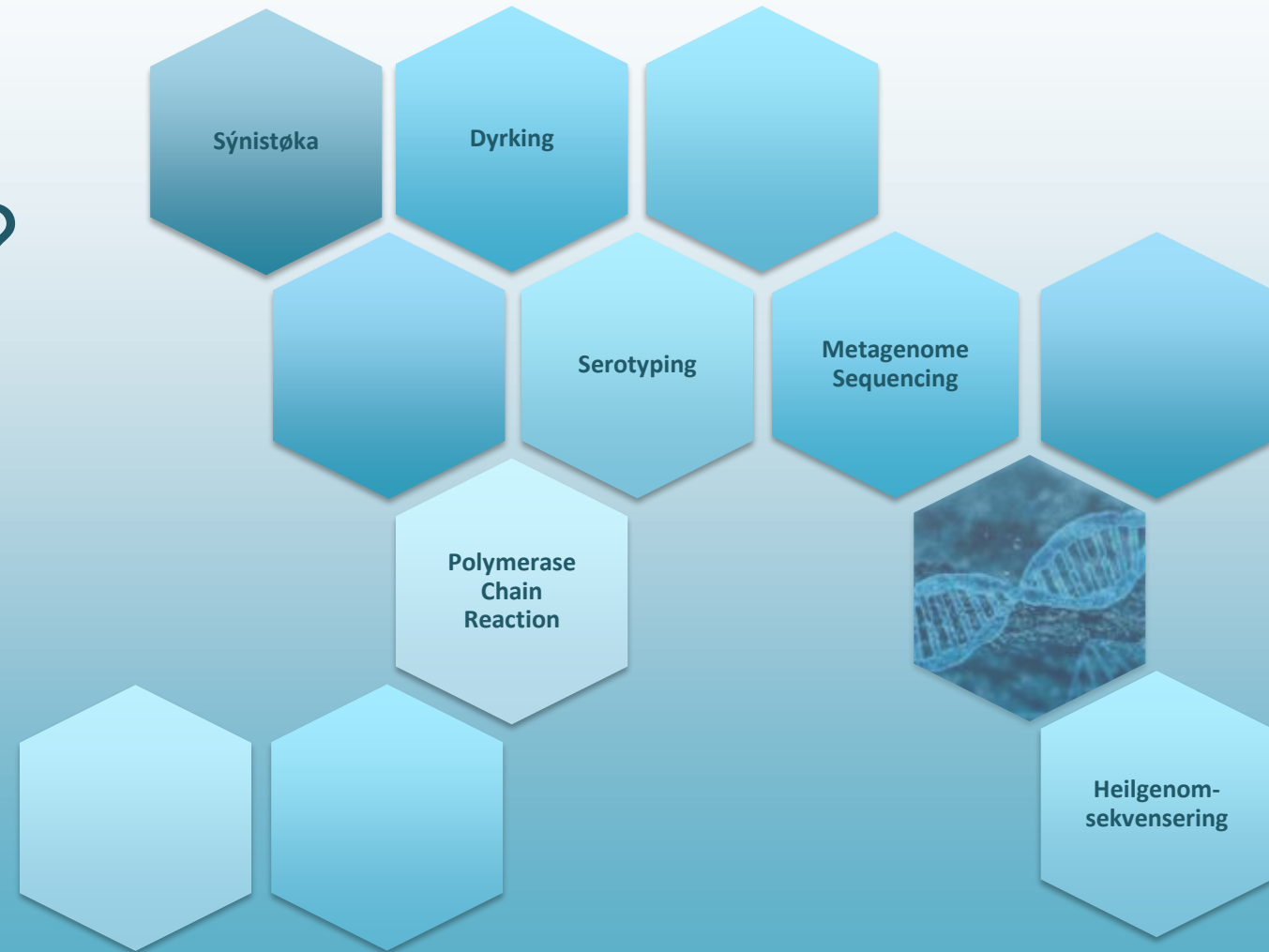
23F

19F

Hvat ætli eg  
at kannar?



# Hvussu ætli eg at kannna?





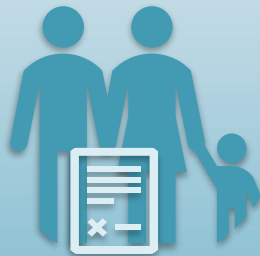
# Á dagstovninum

1-4 vikur



Dagstovnaleiðarin

7 dagar



Foreldur/verji

Á  
degnum



Barn

Á degnum



07:30-10:00

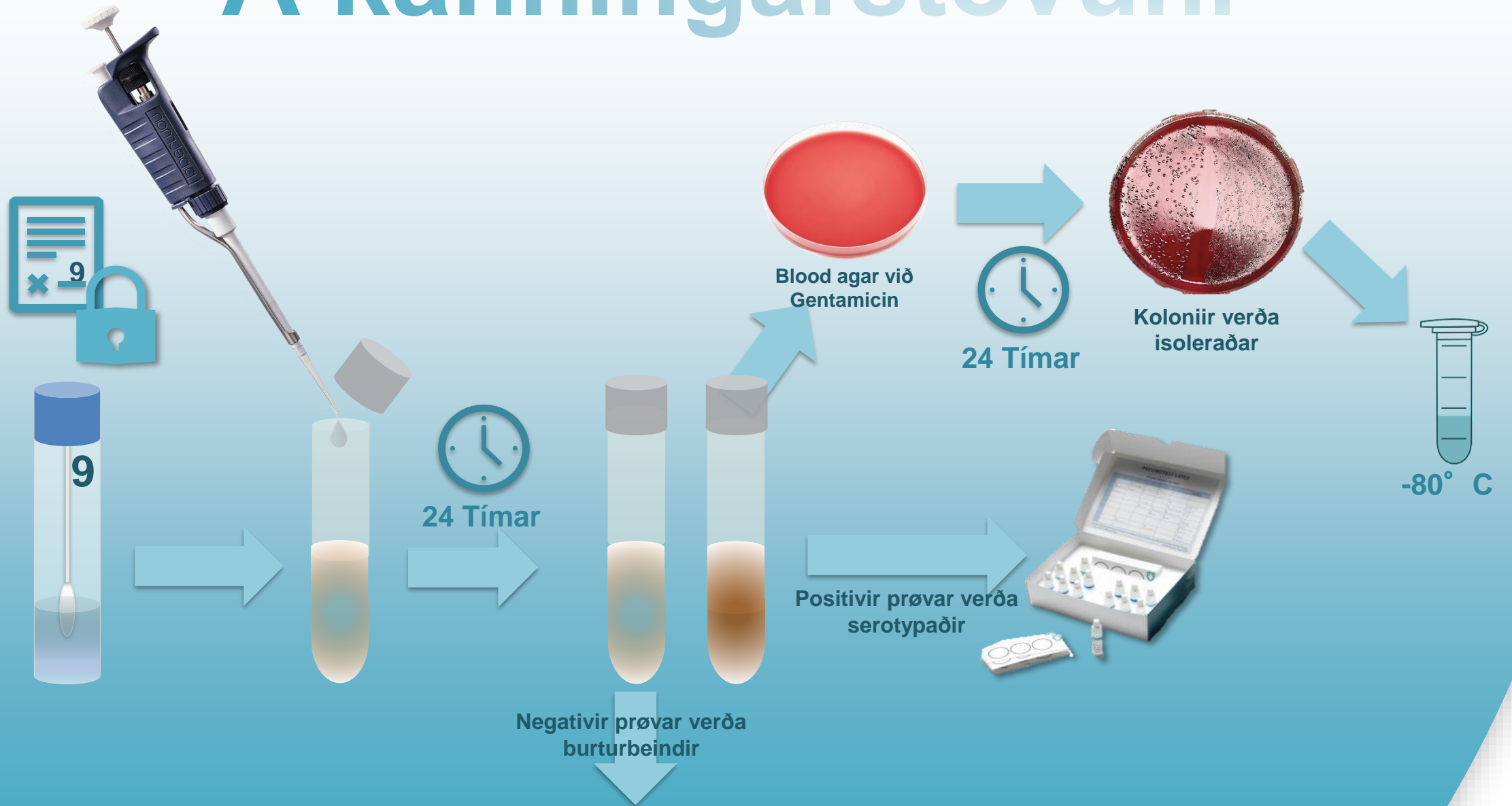


Samtykki



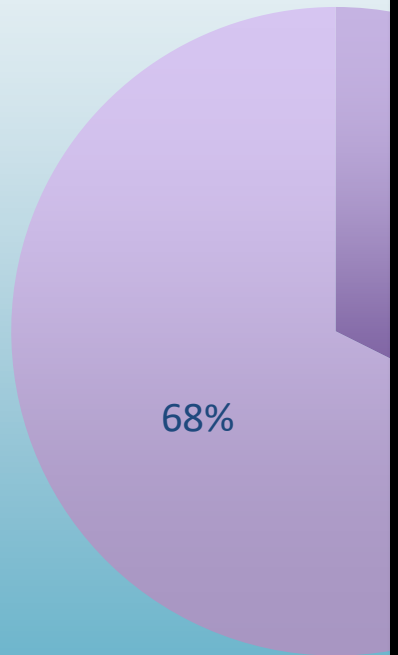
Poting

# Á kanningarstovuni



# Fyribils úrslit

Børn, ið luttóku í verkætlan



■ Børn, ið luttaka

■ Børn, ið ikki luttaka

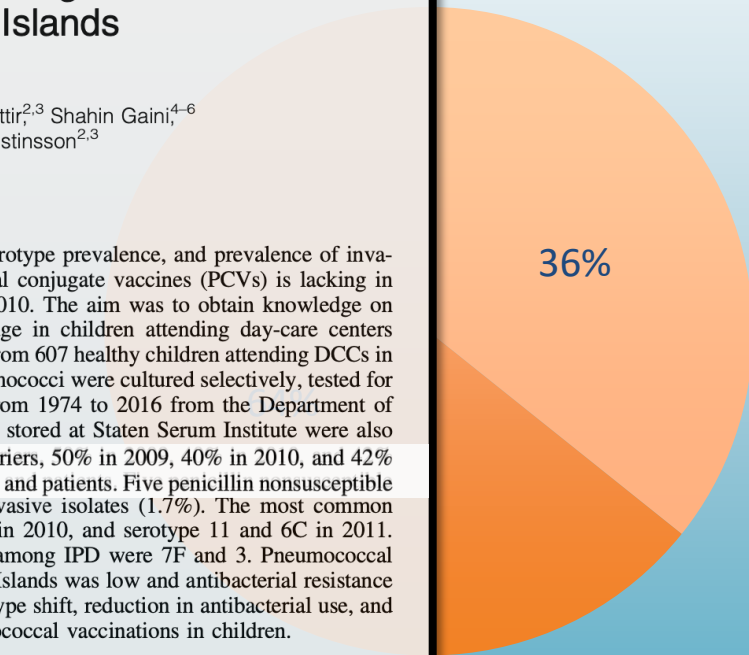
## *Streptococcus pneumoniae*: Antimicrobial Resistance and Serotypes of Strains Carried by Children and Causing Invasive Disease in the Faroe Islands

Marita Debess Magnussen,<sup>1,2</sup> Helga Erlendsdóttir,<sup>2,3</sup> Shahin Gaini,<sup>4-6</sup>  
Thorolfur Gudnason,<sup>7</sup> and Karl G. Kristinsson<sup>2,3</sup>

Knowledge about pneumococcal carriage, antibacterial resistance, serotype prevalence, and prevalence of invasive pneumococcal disease (IPD) after introduction of pneumococcal conjugate vaccines (PCVs) is lacking in the Faroe Islands. PCV-7 was introduced in 2008 and PCV-13 in 2010. The aim was to obtain knowledge on serotypes and antimicrobial resistance in pneumococci from carriage in children attending day-care centers (DCCs) and invasive isolates. Nasopharyngeal swabs were collected from 607 healthy children attending DCCs in the Faroe Islands in January to March in 2009, 2010, and 2011. Pneumococci were cultured selectively, tested for antibacterial susceptibility, and serotyped. Data from IPD isolates from 1974 to 2016 from the Department of Microbiology, National Hospital of the Faroe Islands, and typed and stored at Staten Serum Institute were also analyzed. Of the 607 screened children, 45% were pneumococcal carriers, 50% in 2009, 40% in 2010, and 42% in 2011. Antibiotic resistance in pneumococci was rare both in carriers and patients. Five penicillin nonsusceptible pneumococci were found in carriers (1.8%) and one among the invasive isolates (1.7%). The most common serotypes in carriage were 6B and 6A in 2009, serotype 3 and 6C in 2010, and serotype 11 and 6C in 2011. Serotype 6B was not found in 2011. The most common serotypes among IPD were 7F and 3. Pneumococcal carriage prevalence in healthy children attending DCCs in the Faroe Islands was low and antibacterial resistance was rare, compared with Iceland. The results suggest a possible serotype shift, reduction in antibacterial use, and PCV-7/13 serotype decrease in IPD after the introduction of pneumococcal vaccinations in children.

**Keywords:** *Streptococcus pneumoniae*, serotypes, carriage, resistance

Berari av pneumokokkum hjá børnum 1-7 ár



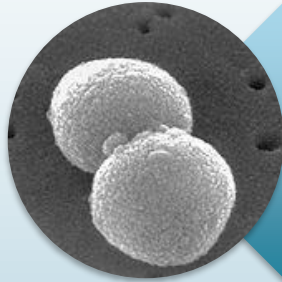
■ Berari av pneumokokkum

■ Ikki berari av pneumokokkum

# Framtíðar væntanir



# Samanumtøka



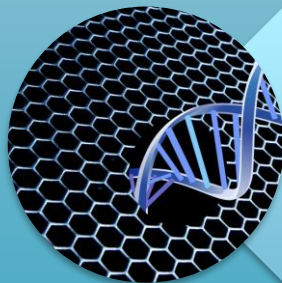
## Pneumokokkar verða verandi

Vanligt í microbiome (Smáverulívfrøðini)  
Sjúkuelvandi



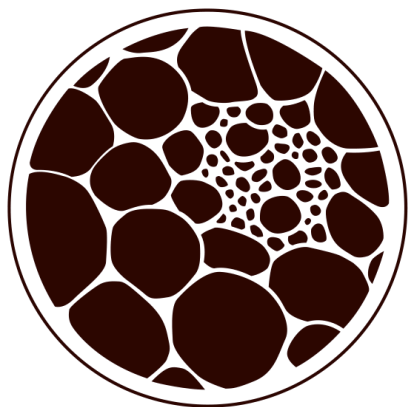
## Koppseting

Sjúkulinnandi  
Eliminerar vandamiklar serotypur



## Nýggj tøkni

Kann svara fleiri spurningum, ið eldri mannagongdir ikki kunnu



THETIS

Vísinda) *vøka*

