

KRAJOWY OŚRODEK REFERENCYJNY DS. DIAGNOSTYKI BAKTERYJNYCH
ZAKAŻEŃ OŚRODKOWEGO UKŁADU NERWOWEGO (KOROUN)
NARODOWY INSTYTUT LEKÓW

Co robimy z materiałem w KOROUN?

Ścieżka postępowania.

Mgr biotechnol. Izabela Wróbel-Pawelczyk



Etap 1

Reidentyfikacja gatunku

**NARODOWY INSTYTUT LEKÓW**
Zakład Epidemiologii i Mikrobiologii Klinicznej
Krajowy Ośrodek Referencyjny
ds. Diagnostyki Bakteryjnych Zakażeń
Ośrodkowego Układu Nerwowego (KOROUN)
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Dyrekcja: (+48-22) 851-43-69
(+48-22) 851-44-96
Fax: (+48-22) 841-06-52


Nr zlecenia 0000000000

RAPORT z BADANIA

Dane osoby/jednostki zlecającej badanie

CENTRUM MEDYCZNE
ULICOWA 1
00-000 MIASTO
DANE DOSTARCZONE PRZEZ ZLECENIODAWCĘ
Miejsce hospitalizacji pacjenta /nazwa szpitala/ domu opieki Oddział ---

SZPITAL WOJEWÓDZKI
ULICZNA 2
00-000 MIASTO

Dane pacjenta
imię i nazwisko/inicjały pacjenta JAN KOWALSKI
pleć pacjenta M

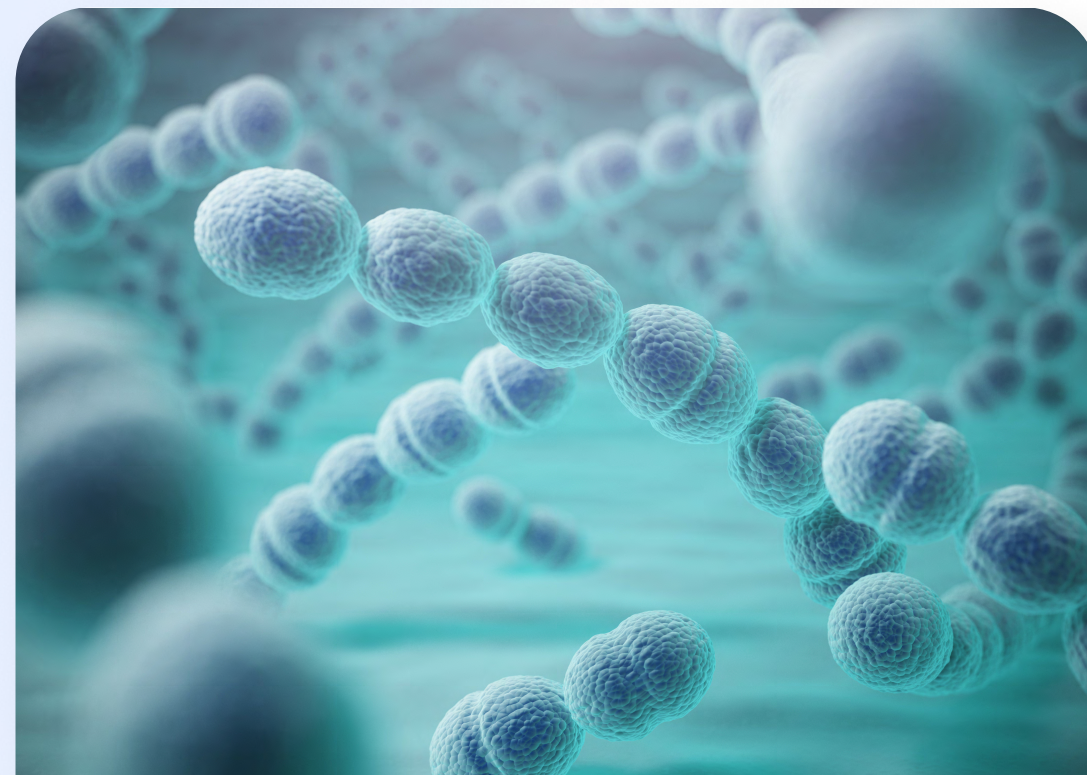
Dane próbki
data pobrania próbki pierwotnej 2023-12-12
rodzaj próbki pierwotnej KREW
identyfikacja szczepu *Streptococcus pneumoniae*

data przyjęcia próbki w NIL 2023-12-12
kod próbki NIL/barcode  0000/23

WYNIK BADANIA

| Kod próbki NIL | Identyfikacja KOROUN | Metoda badawcza (nr procedury / nr i data wydania) | Status metody (A-akredytowana, NA-nieakredytowana, LP- laboratorium podwykonawcy) |
|----------------|------------------------------|--|---|
| | Identyfikacji nie wykonywano | | BRAK |

Kolejne etapy

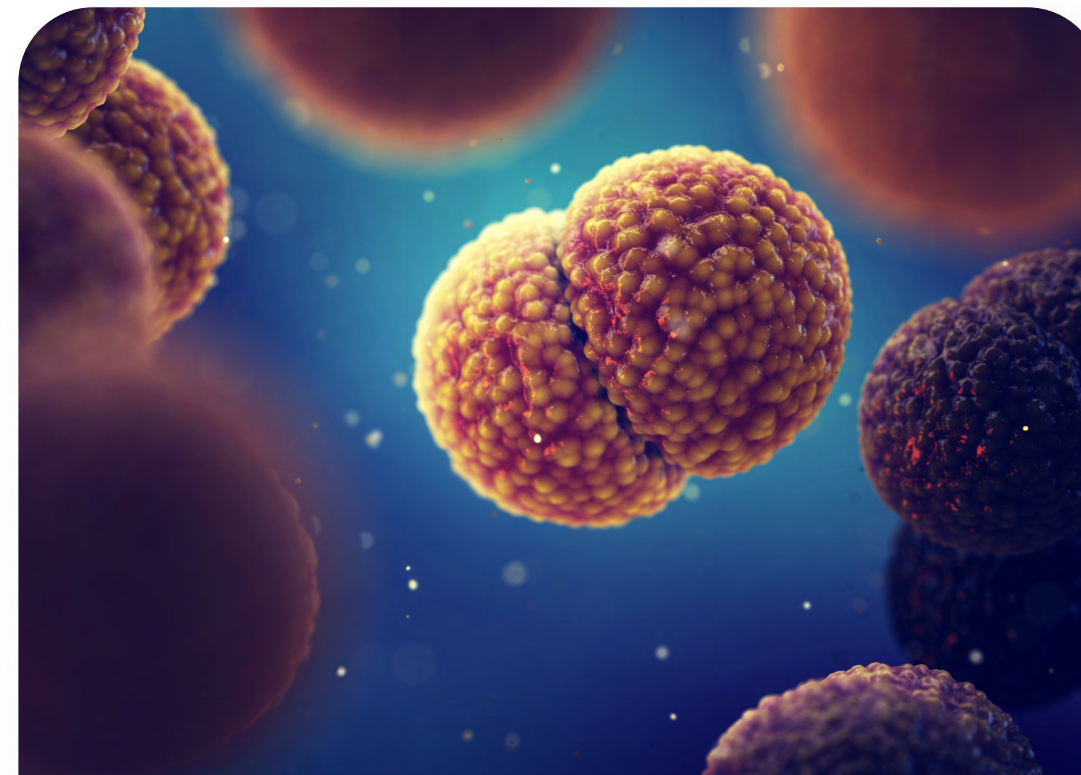


Streptococcus pneumoniae

określenie serotypu

lekowrażliwość

WGS (wybrane)



Neisseria meningitidis

określenie serogrupy

lekowrażliwość

WGS (wszystkie)



Haemophilus influenzae

określenie serotypu

lekowrażliwość

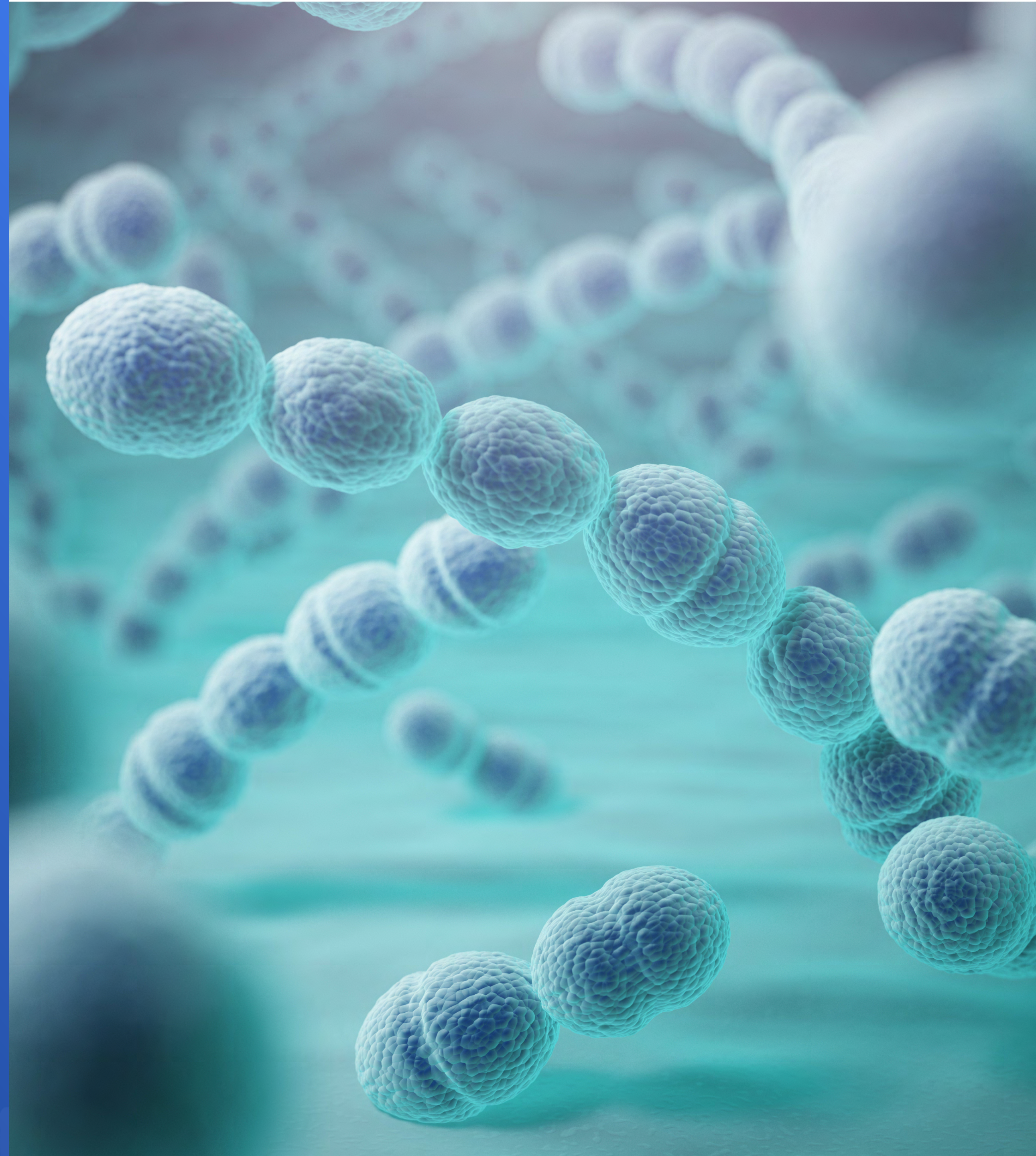
WGS (wybrane)

Streptococcus pneumoniae

określenie serotypu

lekowrażliwość

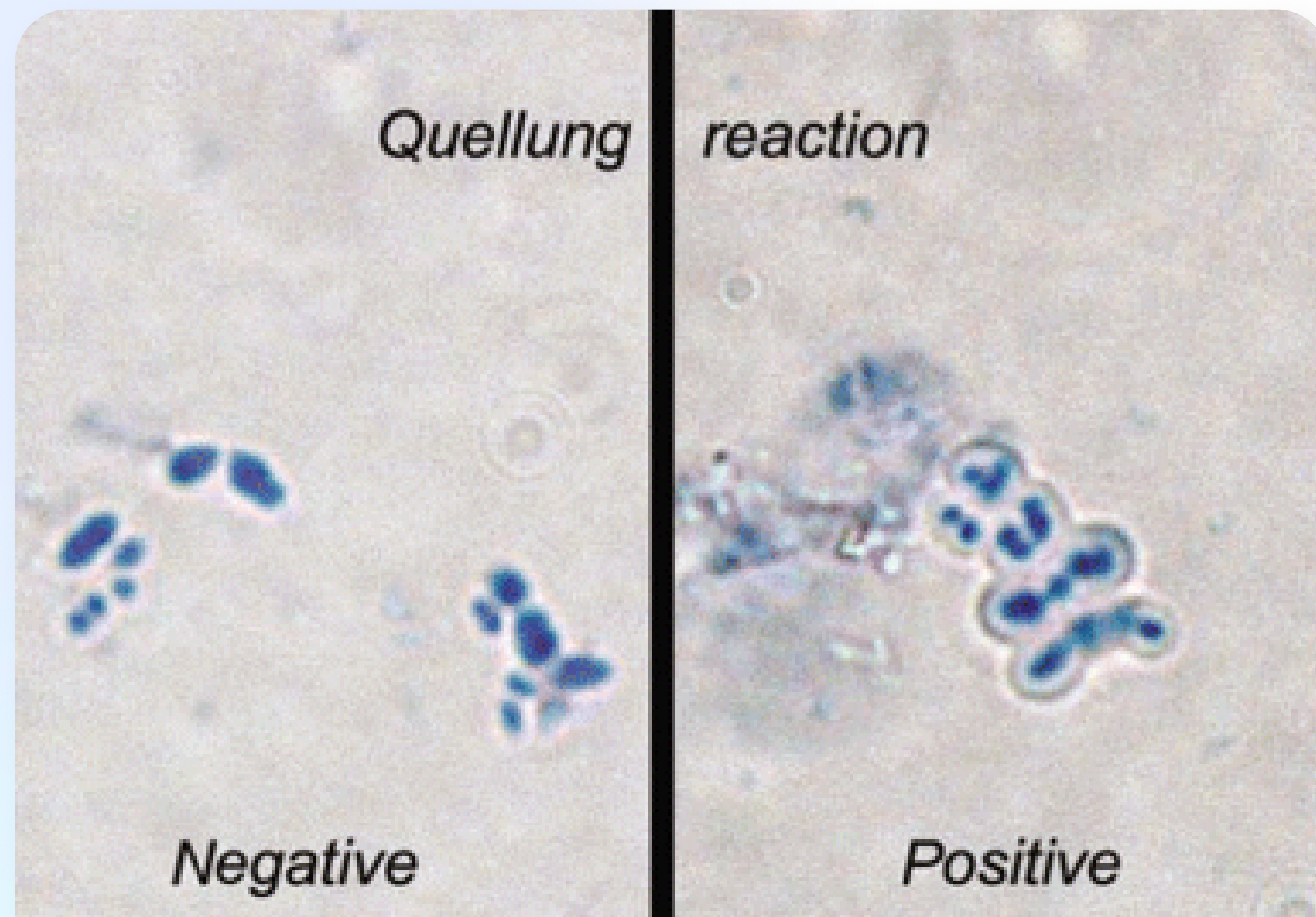
WGS (wybrane)



Streptococcus pneumoniae

Określenie serotypu

- reakcja pęcznienia otoczek (Quellung)



Werno AM, Murdoch DR. Clin Infect Dis. 2008 Mar 15;46(6):926-32. doi: 10.1086/528798. PMID: 18260752.



Streptococcus pneumoniae

Określenie serotypu

- reakcja pęcznienia otoczek (Quellung)
- test lateksowy, PCR

Oznaczenie lekowrażliwości

- paski z gradientem stężeń antybiotyku
- mechanizm MLSb (krążki)

WGS (wybrane izolaty)

- oznaczenie ST/CC/GPSC
- potwierdzenie/weryfikacja serotypu
- analizy genomowe
(geny oporności, stopień pokrewieństwa, czynniki wirulencji)

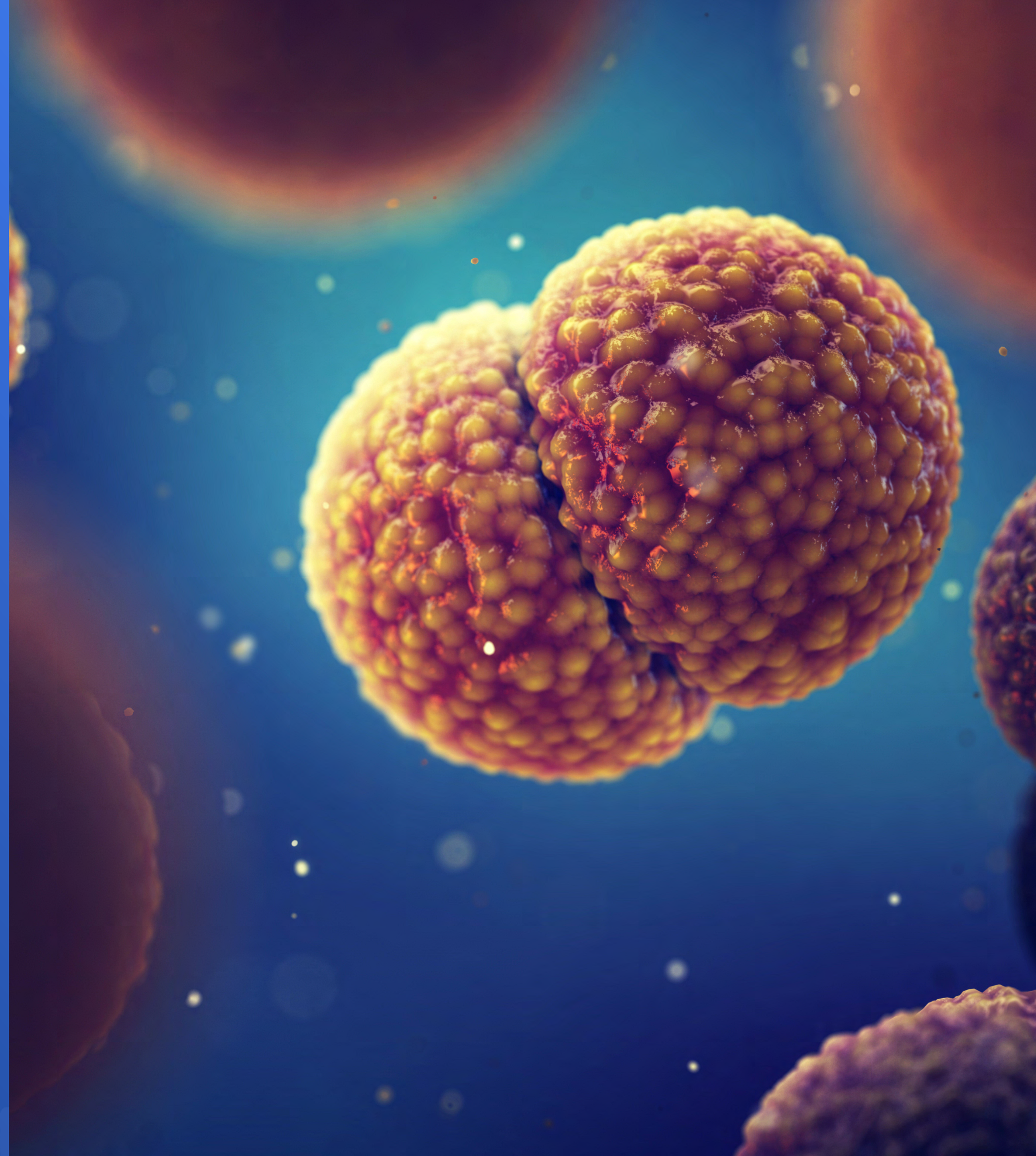


Neisseria meningitidis

określenie serogrupy

lekowrażliwość

WGS (wszystkie)



Neisseria meningitidis

Oznaczenie serogrupy

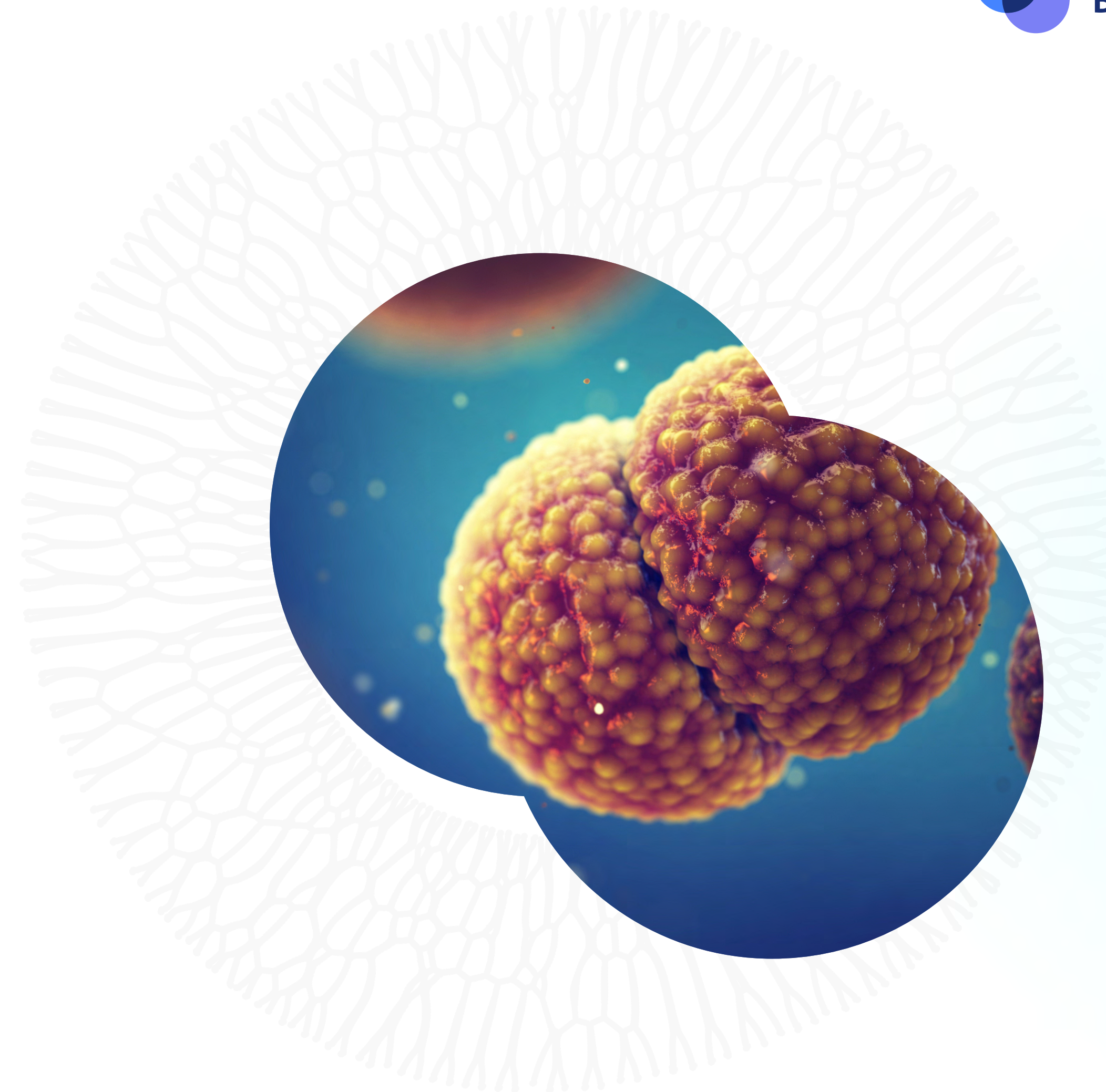
- surowice / PCR

Oznaczenie lekowrażliwości

- paski z gradientem stężeń antybiotyku

WGS (wszystkie izolaty)

- oznaczenie ST/CC
- typowanie BAST
- potwierdzenie/weryfikacja serogrupy
- analizy genomowe
(stopień pokrewieństwa, CC9316)

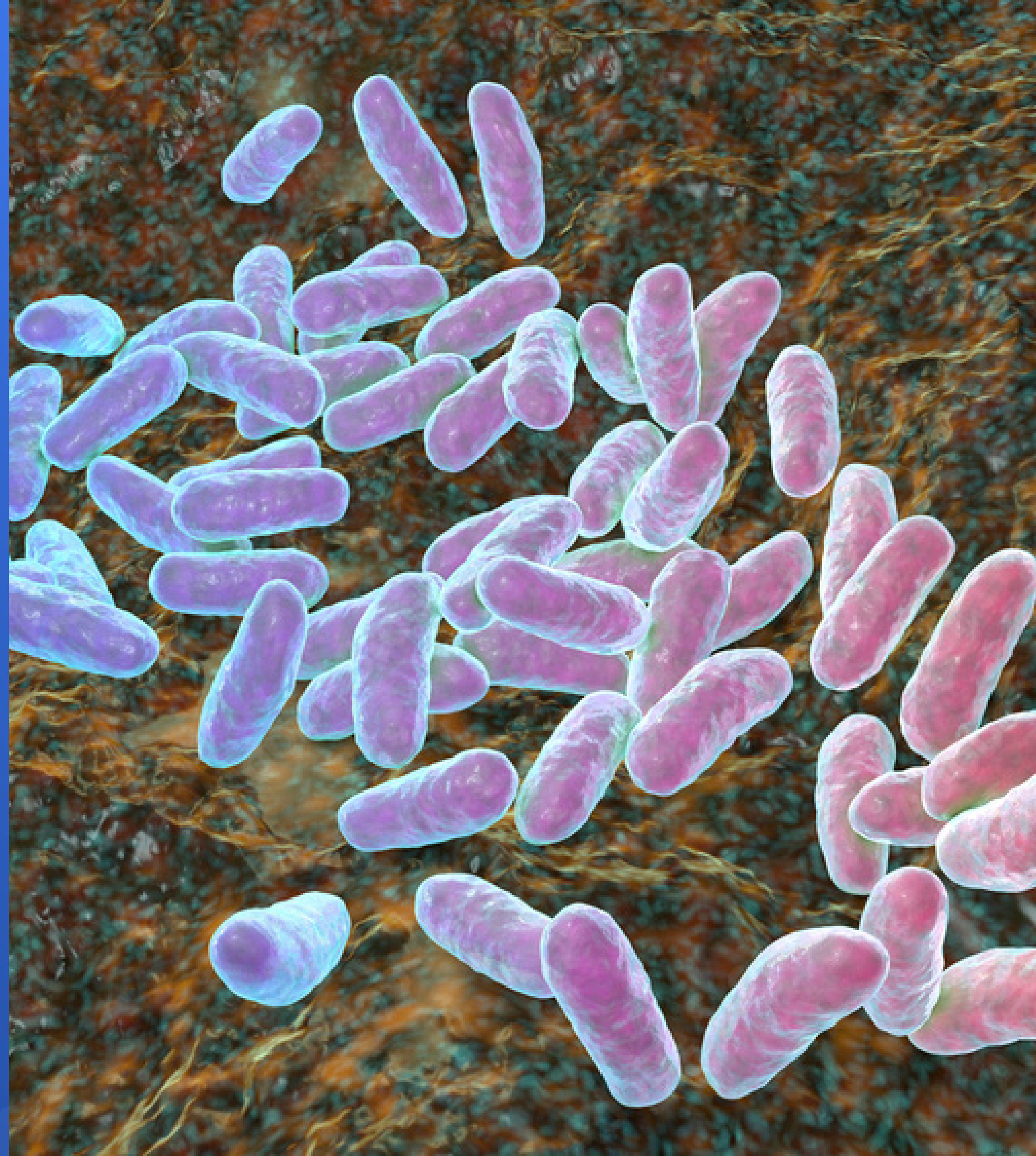


Haemophilus influenzae

określenie serotypu

lekowrażliwość

WGS (wybrane)



Haemophilus influenzae

Określenie serotypu

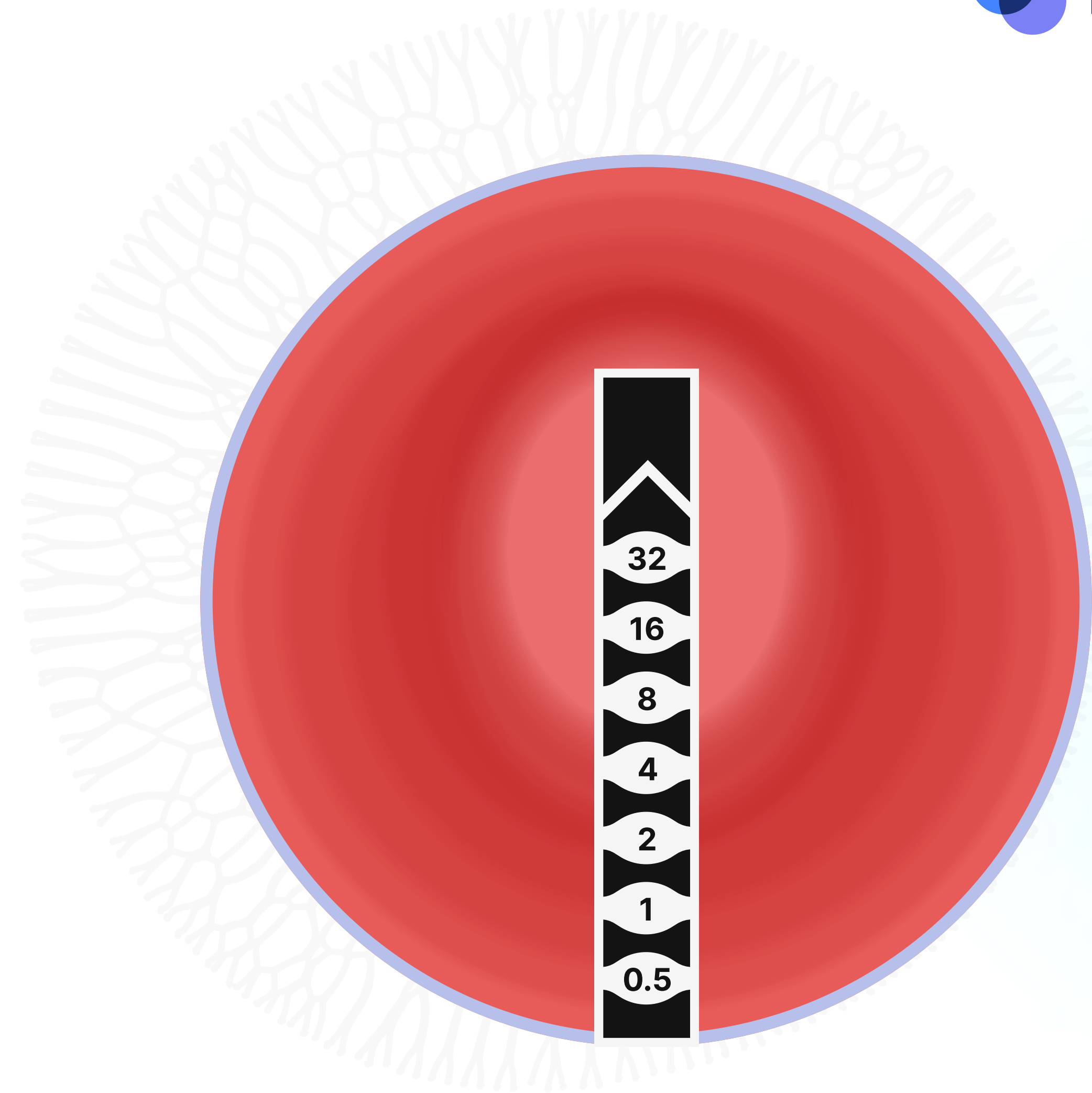
- PCR
(serotypy a, b, c, d, e, f, NTHi)

Oznaczenie lekowrażliwości

- paski z gradientem stężeń antybiotyku
- mechanizmy oporności na antybiotyki β -laktamowe
(krążek P 1U, test cefinazowy)

WGS (wybrane izolaty)

- analizy genów oporności na antybiotyki



Raporty wg danych KOROUN

The screenshot displays the website of the National Reference Center for the Diagnosis of Bacterial Infections of the Central Nervous System (KOROUN). The main content area features a warning about an increase in *Streptococcus pyogenes* cases and a link to reports. A callout box on the right highlights the 'RAPORTY WEDŁUG DANYCH KOROUN' link in the sidebar.

KOROUN Krajowy Ośrodek Referencyjny
ds. Diagnostyki Bakteryjnych Zakażeń Ośrodkowego Układu Nerwowego

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koroun@il.gov.pl

[Formularz ZLECENIE BADANIA DO KOROUN](#)
[Instrukcje wysyłania IZOLATÓW I MATERIAŁÓW DO KOROUN](#)
[Formularz DEKLARACJA PRZYSTĄPIENIA DO BINet](#)
[NEWSLETTER BINet](#)

UWAGA !
KOROUN informuje o wzroście liczby zakażeń *Streptococcus pyogenes* w Polsce i w innych krajach
raport jest dostępny w zakładce RAPORTY WG DANYCH KOROUN

KOROUN

Krajowy Ośrodek Referencyjny ds. Diagnostyki Bakteryjnych Zakażeń Ośrodkowego Układu Nerwowego (KOROUN) został powołany 01.02.1997 r. decyzją Ministra Zdrowia.

Celem działania KOROUN jest monitorowanie pozaszpitalnych bakteryjnych zakażeń ośrodkowego układu nerwowego i innych inwazyjnych zakażeń bakteryjnych nabytych poza szpitalem.

W czerwcu 2008 z inicjatywy KOROUN została utworzona w Polsce sieć BINet. Jej celem jest poprawa standardów diagnostycznych oraz rozpoznania sytuacji epidemiologicznej pozaszpitalnych inwazyjnych zakażeń bakteryjnych w Polsce.

Działalność Ośrodka koncentruje się przede wszystkim na monitorowaniu inwazyjnych zakażeń bakteryjnych spowodowanych przez następujące patogeny:

- *Neisseria meningitidis* (dwoinki zapalenia opon mózgowo-rdzeniowych, meningokokii);
- *Streptococcus pneumoniae* (dwoinki zapalenia płuc, pneumokokii);
- *Haemophilus influenzae* (pałeczki hemofilne);
- *Streptococcus pyogenes* (paciorkowce ropotwórcze grupy A);
- *Streptococcus agalactiae* (paciorkowce grupy B);
- *Listeria monocytogenes*.

Ministerstwo Zdrowia

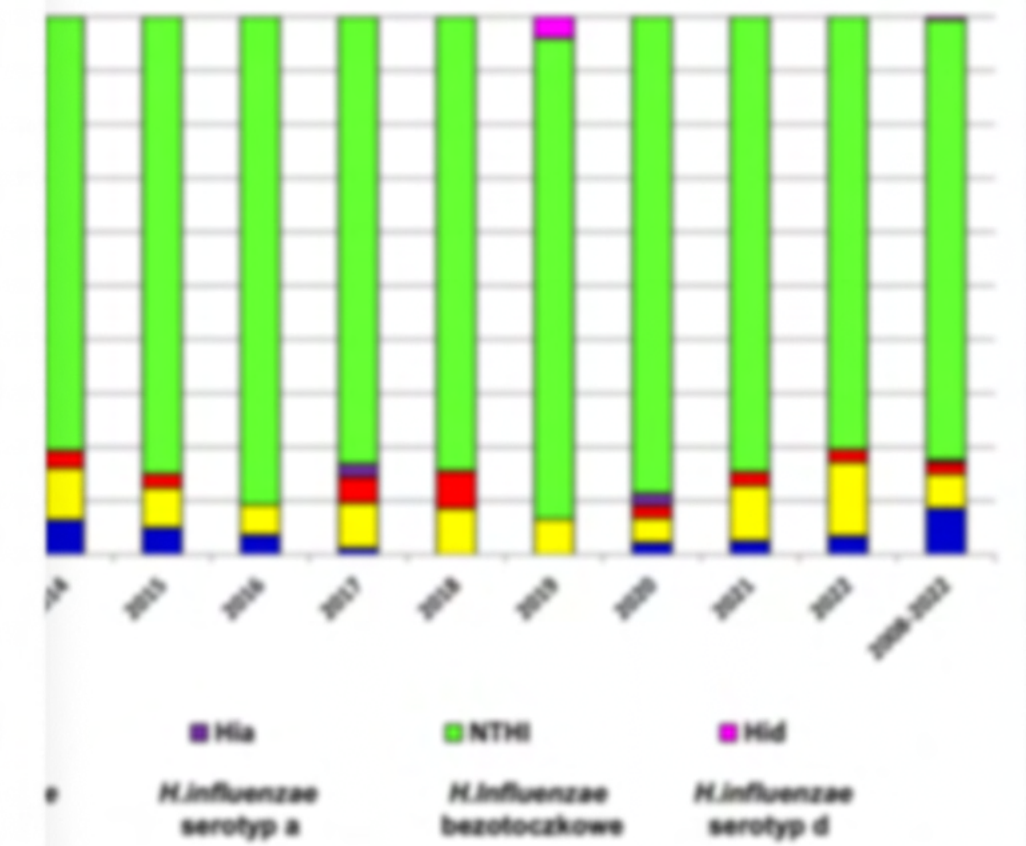
Weryfikacja wyników badań laboratoryjnych wybranych gatunków bakterii odpowiedzialnych za

RAPORTY WEDŁUG DANYCH KOROUN

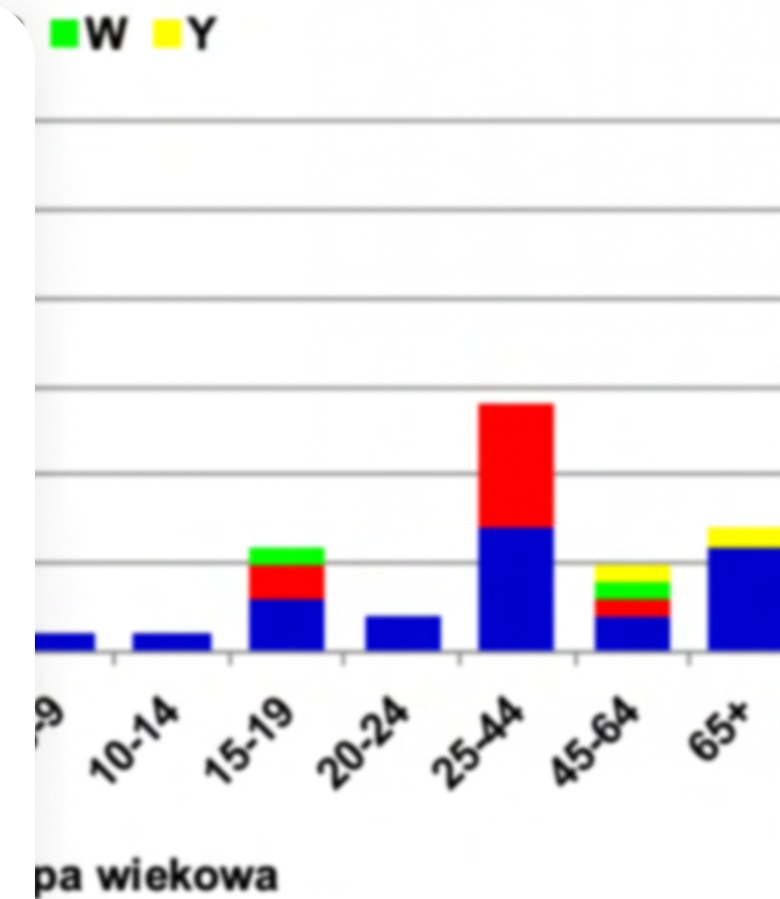
[RAPORTY WEDŁUG DANYCH KOROUN](#)
[REKOMENDACJE](#)
[PROJEKT ALEKSANDER / RESPI-Net](#)

il.gov.pl/dane-epidemiologiczne

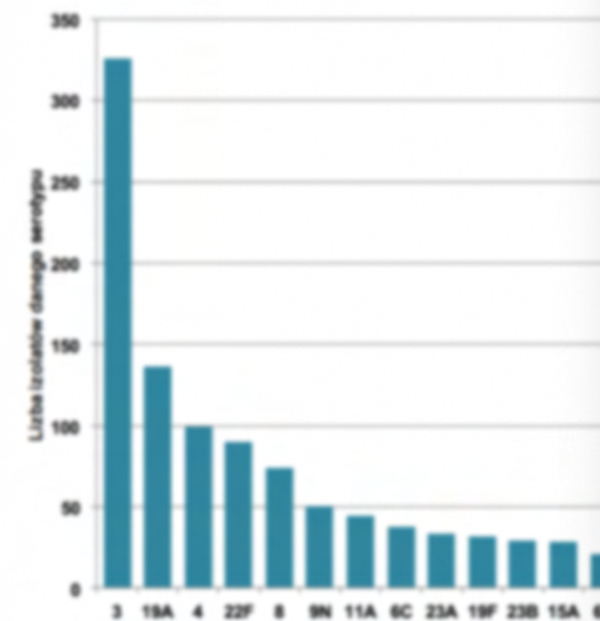
Zakażenia inwazyjne *H. influenzae* dystrybucja serotypów (%), 1997-2022



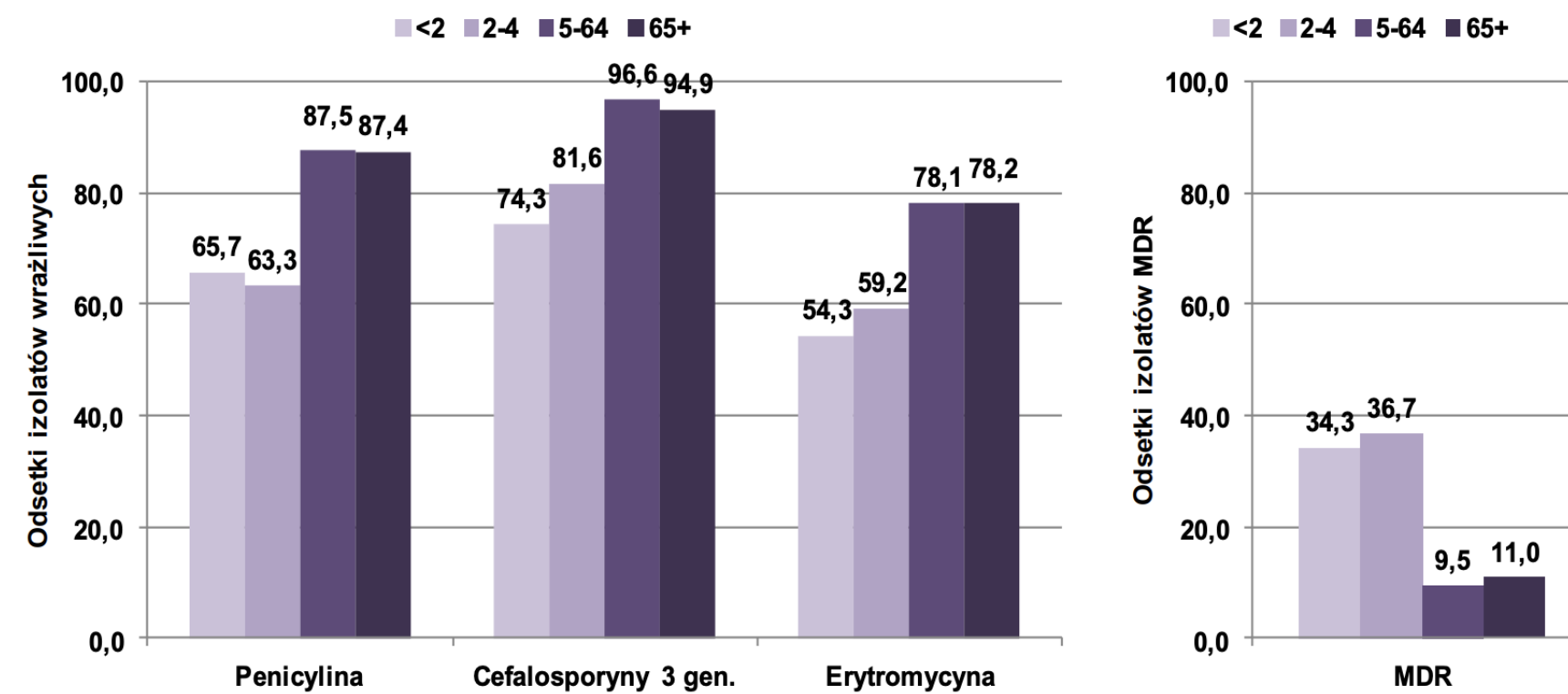
Dystrybucja grup serologicznych meningokoków w grupach wiekowych, 2022(n=80)



Dystrybucja serotypów pneumokoków odpowiedzialnych za IChP, cała populacja, 2022 (n=1252)



Odsetki izolatów wrażliwych na wybrane antybiotyki i MDR u dzieci i w pozostałej populacji, 2022



Publikacje KOROUN

The screenshot displays the KOROUN website interface. At the top, the logo 'KOROUN' is followed by the text 'Krajowy Ośrodek Referencyjny ds. Diagnostyki Bakteryjnych Zakażeń Ośrodkowego Układu Nerwowego'. A navigation bar includes links for 'O KOROUN', 'Aktualności/Ogłoszenia', 'Dla Pacjenta', and 'Kontakt'. On the left sidebar, there are buttons for 'Formularz ZLECENIE BADANIA DO KOROUN', 'Instrukcje wysyłania IZOLATÓW I MATERIAŁÓW DO KOROUN', 'Formularz DEKLARACJA PRZYSTĄPIENIA DO BINet', the 'BINet' logo, and 'NEWSLETTER BINet'. The main content area features a 'UWAGA!' section with the KOROUN logo, stating that the number of *Streptococcus pyogenes* infections in Poland and other countries has increased, and that a report is available in the 'RAPORTY WG DANYCH KOROUN' section. Below this, it describes the center's mission and lists the pathogens it monitors: *Neisseria meningitidis*, *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Streptococcus pyogenes*, *Streptococcus agalactiae*, and *Listeria monocytogenes*. The footer includes the 'Ministerstwo Zdrowia' logo and a URL 'il.gov.pl/publikacje'. On the right side of the laptop, a separate panel titled 'PUBLIKACJE KOROUN' contains a vertical list of menu items: 'PUBLIKACJE KOROUN', 'RAPORTY WEDŁUG DANYCH KOROUN', 'REKOMENDACJE', and 'PROJEKT ALEKSANDER / RESPI-Net'.

Publikacje KOROUN



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Outline
Abstract
Keywords
1. Introduction
2. Materials and methods
3. Results
4. Discussion

ELSEVIER Vaccine Volume 38, Issue 8, 18 February 2020, Pages 1943-1952

Genetic variability of Polish serogroup B meningococci (2010–2016) including the 4CMenB vaccine component genes

Substances (1)
Generated by Reaxys, an expert-curated chemistry database.

O=C(O)C1=CC=C(Cl)C=C1Cl

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ARTICLES | VOLUME 3, ISSUE 6, E360-E370, JUNE 2021 Download Full Issue

Changes in the incidence of invasive disease due to *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Neisseria meningitidis* during the COVID-19 pandemic in 26 countries and territories in the Invasive Respiratory Infection Surveillance Initiative: a prospective analysis of surveillance data

PDF (587 KB) Figures Save Share Reprints Request

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Home > Infectious Diseases and Therapy > Article

Highly Resistant Serotype 19A *Streptococcus pneumoniae* of the GPSC1/CC320 Clone from Invasive Infections in Poland Prior to Antipneumococcal Vaccination of Children

Original Research | Open access | Published: 13 July 2023 | 12, 2017–2037 (2023)

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Infectious Diseases and Therapy

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Doniesienia konferencyjne 2023

Characterization of serotypes and resistance patterns of *Streptococcus pneumoniae* responsible for lower respiratory tract infections in Polish adults

Poster number: P1305

Kinga Błaszczyk*, Izabela Wróbel-Pawelczyk, Agnieszka Gołębiewska, Patrycja Ronkiewicz, Marlena Kiedrowska, Alicja Kuch, Waleria Hryniewicz, Anna Skoczyńska

National Reference Centre for Bacterial Meningitis, Department of Epidemiology and Clinical Microbiology, National Medicines Institute, Warsaw, Poland

Background: *Streptococcus pneumoniae* is a common upper airway tract infection. Lower respiratory tract infections (LRTIs) are a significant cause of morbidity and mortality. LRTIs were included in the scope of the National Reference Centre for Bacterial Meningitis (NRCBM) in 2017.

Materials: Out of 1,008 LRTIs confirmed in 2014-2022 in Poland, 763 (76.2%) were included in the study. The majority (34.2%) of isolates were from children under 5 years of age, followed by adults aged 5-17 years (27.2%) and elderly aged 65+ years (38.6%).

Results: Serotypes 3 and 4 were the most common overall (11.2% and 7.4%, respectively) and in all study periods: 2014-16, 2017-19, and 2020-22 (Fig. 1). The distribution of serotypes differed significantly between periods. The percentage of serotype 3 increased from 8% to 11.2% and was mainly related to serotype 3 and 23F responsible for 45.2% and 34.4% of pneumococci resistance. Serotype 4 resistance was comparable (10.3% and 10.4%) with the most prevalent 9V, 9A, 23F, and 23A serotypes. The MDR phenotype was more common among non-invasive isolates (18.2% vs 12.0%, p<0.05). There were no significant differences in the prevalence of GPCSC serotypes and MDR between serotypes for children in patients 16-18 years old.

Conclusions: Antimicrobial resistance was more common among GPCSC isolates compared to invasive ones. Five years after the introduction of anti-pneumococcal vaccination of children into the NIS, there is no significant reduction in serotype prevalence and the frequency of resistance among isolates from LRTIs of Polish patients aged 16-18.

Characterisation of invasive pneumococci isolated from children under two years of age prior to and after PCV implementation in Poland

Izabela Wróbel-Pawelczyk, Patrycja Ronkiewicz, Alicja Kuch, Marlena Kiedrowska, Agnieszka Gołębiewska, Kinga Błaszczyk, Waleria Hryniewicz, Anna Skoczyńska

National Reference Centre for Bacterial Meningitis, Department of Epidemiology and Clinical Microbiology, National Medicines Institute, Warsaw, Poland

Background: We aimed to characterise pneumococcal population causing invasive disease in children under two years of age prior to and after implementation of pneumococcal conjugate vaccine in Poland (PCV10 in 2017).

Methods: All invasive isolates from Polish children under two years of age collected in pre-vaccine (2014-2016, n=102) and post-vaccine period (2017-2020, n=105) were sequenced (WGS) and analysed using Pangenome, Serotype, Pathogenwatch. Susceptibility testing was performed according to the EUCAST guideline.

Results: The population of invasive streptococci from children under two years old in pre- and post-vaccine periods is shown in Figure 1.

In the pre-vaccine period (pre-VP) the most frequent serotypes were 6B (11.7%), 19A (12.7%) and 14 (11.8%) (Table 1). Figure 2 presents the prevalence of serotypes included in conjugate vaccines approved for use in youngest children. In the pre-VP the most frequent were GPSC1 (n=18, 17.6%) and GPSC8 (n=12, 11.8%) (Figure 3). In the GPSC1 group the most prevalent was ST320 (66.7%) (Table 1). The GPSC1 group consists of 11 (61.1%) isolates of serotype 19A, six (33.3%) of 19F, and one (5.6%) of 23F (possible capsule switching). Among the pre-VP isolates, 11 (10.8%) and 10 (9.8%) showed resistance (MIC > 2 mg/L) to penicillin and cefotaxime respectively. 45 of pre-VP isolates (44.1%) were MDR (Figure 4).

In the post-vaccine period (post-VP) the most frequent serotypes were: 3 (11.4%), 19A and 14 (10.4% each) (Table 1). The percentage of serotypes included in conjugate vaccines approved for use in youngest children in post-VP is shown in Figure 2. After PCV implementation, the most common GPSCs were GPSC12 (n=11, 10.4%) and GPSC1 (n=9, 8.6%) (Figure 3). All GPSC12 isolates were of serotype 3 and were sensitive to all antibiotics tested, the majority (81.8%) belonged to ST180 (Table 1). Of all post-VP isolates, three (2.9%) and two (1.9%) showed resistance (MIC > 2 mg/L) to penicillin and cefotaxime respectively. 30 (28.6%) of post-VP isolates were MDR. The decrease of serotypes included in four conjugate vaccines and MDR isolates was significant (Figures 2 and 4).

Conclusions: The PCV implementation in Poland had an effect on the epidemiology of invasive pneumococci in children under two years of age. There was a noticeable difference in GPSC distribution in the pre- and post-VP. We also observed a significant decrease in serotypes included in conjugate vaccines, which had an impact on antibiotic resistance levels though a decrease of highly resistant serotypes.

Increase in invasive *Streptococcus pneumoniae* 19A infections in Polish children up to 5 years of age

Agnieszka Gołębiewska, Waleria Hryniewicz, Kinga Błaszczyk, Patrycja Ronkiewicz, Alicja Kuch, Marlena Kiedrowska, Izabela Wróbel-Pawelczyk, Anna Skoczyńska

National Reference Centre for Bacterial Meningitis, Department of Epidemiology and Clinical Microbiology, National Medicines Institute, Warsaw, Poland

Background: Between 2014 and 2021 the NRCBM collected 452 invasive isolates of *S. pneumoniae* from children <5 of whom 67 (14.7%) were of serotype 19A. All 19A pneumococci were sequenced by the Genotyping and Resistance (GR) group using Pangenome, Serotype, Pathogenwatch. The susceptibility testing was performed according to the EUCAST guideline.

Materials: Between 2014 and 2021 the NRCBM collected 452 invasive isolates of *S. pneumoniae* from children <5 of whom 67 (14.7%) were of serotype 19A. All 19A pneumococci were sequenced by the Genotyping and Resistance (GR) group using Pangenome, Serotype, Pathogenwatch. The susceptibility testing was performed according to the EUCAST guideline.

Results: In the pre-vaccine period (2014-2016) and early post-vaccine period (2017-2019) similar percentages of 19A isolates among all pneumococci from children <5 were notified: 13.9% (25/180) and 8.9% (17/178) (Fig. 1, 2), respectively. In both periods the most common were multi-resistant (MDR) isolates of GPSC1 (88.0% vs 84.7%) and GPSC10 (24.0% vs 23.3%) (Fig. 2). In 2021 (2021 of 164) there was a 2-fold increase of 19A infections in children under 5 compared to 2020 (35.3% vs 11.5%, p<0.05) and a 5-fold increase compared to pre-pandemic 2018 (35.3% vs 6.7%, p<0.05) (Fig. 4). Although isolates of GPSC1 and GPSC10 were still the most prevalent in 2021 (35.3% each), beside GPSC1 new non-MDR GPSCs emerged (GPSC17, GPSC18 and GPSC27) (Fig. 3).

Conclusions: A significant increase of invasive *S. pneumoniae* 19A infections in Polish children up to 5 years of age was observed in 2021, mainly due to a significantly higher number of MDR GPSC10 and GPSC1 isolates. Further such an increase of MDR 19A isolates may severely limit the positive impact of PCV used to date in reducing not only overall pneumococcal incidence but also resistance levels.

Characterisation of invasive pneumococci isolated from children under two years of age prior to and after PCV implementation in Poland

Izabela Wróbel-Pawelczyk, Patrycja Ronkiewicz, Alicja Kuch, Marlena Kiedrowska, Agnieszka Gołębiewska, Kinga Błaszczyk, Waleria Hryniewicz, Anna Skoczyńska

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In the post-vaccine period (post-VP) the most frequent serotypes were: 3 (11.4%), 19A and 14 (10.4% each) (Table 1). The percentage of serotypes included in conjugate vaccines approved for use in youngest children in post-VP is shown in Figure 2. After PCV implementation, the most common GPSCs were GPSC12 (n=11, 10.4%) and GPSC1 (n=9, 8.6%) (Figure 3). All GPSC12 isolates were of serotype 3 and were sensitive to all antibiotics tested, the majority (81.8%) belonged to ST180 (Table 1). Of all post-VP isolates, three (2.9%) and two (1.9%) showed resistance (MIC > 2 mg/L) to penicillin and cefotaxime respectively. 30 (28.6%) of post-VP isolates were MDR. The decrease of serotypes included in four conjugate vaccines and MDR isolates was significant (Figures 2 and 4).

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| | Pre-vaccine period (2014-2016) | Post-vaccine period (2017-2020) |
|----------------------------------|--|--|
| Name | PCV10 (2017) | PCV15 (2021) |
| Number of serotypes | 10 | 15 |
| Real resistance serotypes | GPSC1 (11.7%), GPSC8 (11.8%), GPSC10 (24.0%), GPSC17 (1.0%), GPSC18 (1.0%), GPSC27 (1.0%) | GPSC1 (8.6%), GPSC12 (10.4%), GPSC17 (1.0%), GPSC18 (1.0%), GPSC27 (1.0%), GPSC29 (1.0%), GPSC30 (1.0%), GPSC31 (1.0%), GPSC32 (1.0%), GPSC33 (1.0%), GPSC34 (1.0%), GPSC35 (1.0%), GPSC36 (1.0%), GPSC37 (1.0%), GPSC38 (1.0%), GPSC39 (1.0%), GPSC40 (1.0%), GPSC41 (1.0%), GPSC42 (1.0%), GPSC43 (1.0%), GPSC44 (1.0%), GPSC45 (1.0%), GPSC46 (1.0%), GPSC47 (1.0%), GPSC48 (1.0%), GPSC49 (1.0%), GPSC50 (1.0%), GPSC51 (1.0%), GPSC52 (1.0%), GPSC53 (1.0%), GPSC54 (1.0%), GPSC55 (1.0%), GPSC56 (1.0%), GPSC57 (1.0%), GPSC58 (1.0%), GPSC59 (1.0%), GPSC60 (1.0%), GPSC61 (1.0%), GPSC62 (1.0%), GPSC63 (1.0%), GPSC64 (1.0%), GPSC65 (1.0%), GPSC66 (1.0%), GPSC67 (1.0%), GPSC68 (1.0%), GPSC69 (1.0%), GPSC70 (1.0%), GPSC71 (1.0%), GPSC72 (1.0%), GPSC73 (1.0%), GPSC74 (1.0%), GPSC75 (1.0%), GPSC76 (1.0%), GPSC77 (1.0%), GPSC78 (1.0%), GPSC79 (1.0%), GPSC80 (1.0%), GPSC81 (1.0%), GPSC82 (1.0%), GPSC83 (1.0%), GPSC84 (1.0%), GPSC85 (1.0%), GPSC86 (1.0%), GPSC87 (1.0%), GPSC88 (1.0%), GPSC89 (1.0%), GPSC90 (1.0%), GPSC91 (1.0%), GPSC92 (1.0%), GPSC93 (1.0%), GPSC94 (1.0%), GPSC95 (1.0%), GPSC96 (1.0%), GPSC97 (1.0%), GPSC98 (1.0%), GPSC99 (1.0%), GPSC100 (1.0%) |
| Real resistance serotypes | GPSC12 (10.4%), GPSC1 (8.6%), GPSC17 (1.0%), GPSC18 (1.0%), GPSC27 (1.0%), GPSC29 (1.0%), GPSC30 (1.0%), GPSC31 (1.0%), GPSC32 (1.0%), GPSC33 (1.0%), GPSC34 (1.0%), GPSC35 (1.0%), GPSC36 (1.0%), GPSC37 (1.0%), GPSC38 (1.0%), GPSC39 (1.0%), GPSC40 (1.0%), GPSC41 (1.0%), GPSC42 (1.0%), GPSC43 (1.0%), GPSC44 (1.0%), GPSC45 (1.0%), GPSC46 (1.0%), GPSC47 (1.0%), GPSC48 (1.0%), GPSC49 (1.0%), GPSC50 (1.0%), GPSC51 (1.0%), GPSC52 (1.0%), GPSC53 (1.0%), GPSC54 (1.0%), GPSC55 (1.0%), GPSC56 (1.0%), GPSC57 (1.0%), GPSC58 (1.0%), GPSC59 (1.0%), GPSC60 (1.0%), GPSC61 (1.0%), GPSC62 (1.0%), GPSC63 (1.0%), GPSC64 (1.0%), GPSC65 (1.0%), GPSC66 (1.0%), GPSC67 (1.0%), GPSC68 (1.0%), GPSC69 (1.0%), GPSC70 (1.0%), GPSC71 (1.0%), GPSC72 (1.0%), GPSC73 (1.0%), GPSC74 (1.0%), GPSC75 (1.0%), GPSC76 (1.0%), GPSC77 (1.0%), GPSC78 (1.0%), GPSC79 (1.0%), GPSC80 (1.0%), GPSC81 (1.0%), GPSC82 (1.0%), GPSC83 (1.0%), GPSC84 (1.0%), GPSC85 (1.0%), GPSC86 (1.0%), GPSC87 (1.0%), GPSC88 (1.0%), GPSC89 (1.0%), GPSC90 (1.0%), GPSC91 (1.0%), GPSC92 (1.0%), GPSC93 (1.0%), GPSC94 (1.0%), GPSC95 (1.0%), GPSC96 (1.0%), GPSC97 (1.0%), GPSC98 (1.0%), GPSC99 (1.0%), GPSC100 (1.0%) | |
| Real resistance serotypes | GPSC1 (11.7%), GPSC8 (11.8%), GPSC10 (24.0%), GPSC17 (1.0%), GPSC18 (1.0%), GPSC27 (1.0%) | GPSC1 (8.6%), GPSC12 (10.4%), GPSC17 (1.0%), GPSC18 (1.0%), GPSC27 (1.0%), GPSC29 (1.0%), GPSC30 (1.0%), GPSC31 (1.0%), GPSC32 (1.0%), GPSC33 (1.0%), GPSC34 (1.0%), GPSC35 (1.0%), GPSC36 (1.0%), GPSC37 (1.0%), GPSC38 (1.0%), GPSC39 (1.0%), GPSC40 (1.0%), GPSC41 (1.0%), GPSC42 (1.0%), GPSC43 (1.0%), GPSC44 (1.0%), GPSC45 (1.0%), GPSC46 (1.0%), GPSC47 (1.0%), GPSC48 (1.0%), GPSC49 (1.0%), GPSC50 (1.0%), GPSC51 (1.0%), GPSC52 (1.0%), GPSC53 (1.0%), GPSC54 (1.0%), GPSC55 (1.0%), GPSC56 (1.0%), GPSC57 (1.0%), GPSC58 (1.0%), GPSC59 (1.0%), GPSC60 (1.0%), GPSC61 (1.0%), GPSC62 (1.0%), GPSC63 (1.0%), GPSC64 (1.0%), GPSC65 (1.0%), GPSC66 (1.0%), GPSC67 (1.0%), GPSC68 (1.0%), GPSC69 (1.0%), GPSC70 (1.0%), GPSC71 (1.0%), GPSC72 (1.0%), GPSC73 (1.0%), GPSC74 (1.0%), GPSC75 (1.0%), GPSC76 (1.0%), GPSC77 (1.0%), GPSC78 (1.0%), GPSC79 (1.0%), GPSC80 (1.0%), GPSC81 (1.0%), GPSC82 (1.0%), GPSC83 (1.0%), GPSC84 (1.0%), GPSC85 (1.0%), GPSC86 (1.0%), GPSC87 (1.0%), GPSC88 (1.0%), GPSC89 (1.0%), GPSC90 (1.0%), GPSC91 (1.0%), GPSC92 (1.0%), GPSC93 (1.0%), GPSC94 (1.0%), GPSC95 (1.0%), GPSC96 (1.0%), GPSC97 (1.0%), GPSC98 (1.0%), GPSC99 (1.0%), GPSC100 (1.0%) |

Invasive meningococcal disease in Poland

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Background: The aim of the study was to characterise invasive meningococcal disease (IMD) epidemiology in Poland during last years, based on laboratory confirmed cases.

Methods: All invasive meningococcal cases confirmed by the National Reference Centre for Bacterial Meningitis (NRCBM) between 2014 and 2022 were studied. Serotyping, antimicrobial susceptibility testing and whole genome sequencing were performed for all isolates. A PCR technique was used for meningococcal identification directly from clinical materials in the case of a negative culture.

Results: Between 2014 and 2022, the NRCBM identified 432 laboratory confirmed IMD cases (327 by culture and 105 by WGS). In 2014, 96.9% and 100% of cases in consecutive years respectively. In 2014 the overall IMD incidence was 0.42/100,000 and in patients under one year of age, 10.63, ranging between regions from 4.1 to 22.47/100,000. A serogroup was defined for 432 (100%) cases. The results of infection were caused by meningococci of serogroup 8 (28.2%), 4 (21.9%), 23 (14.8%), and 1 (0.2%). The percentage of meningococci isolated in 2014 to 2022 in 2020 and then decreased by 14.8% in 2021 and 1.8% in 2022. According to the 2022 EUCAST criteria only one isolate of serogroup C, ST-11 was resistant to penicillin with MIC 32 mg/L. All meningococci were susceptible to rifampicin, chloramphenicol, ceftriaxone and cefepime. Among 432 meningococci 111 (25.7%) were found, although 41 of them were represented by one isolate only. 39% of isolates represented 21 clonal complexes (CC), with the most common, represented the one CC19 (18.4%), CC12 (16.4%), CC14 (16.4%), and CC11 (16.4%). The remaining meningococci (32.1%) did not belong to any known CC. Among 39 clonal complexes 19 CC were found, the most common were CC19 (18.4%), CC14 (16.4%), CC12 (16.4%), and CC11 (16.4%). Among 19 CC, 11 (57.9%) were represented by one isolate only, the most common were CC19 (18.4%), CC14 (16.4%), CC12 (16.4%), and CC11 (16.4%).

Conclusions: Poland, where population-based vaccination against meningococci was not introduced so far, belongs to European countries with a low IMD incidence rate. In the COVID-19 pandemic years, 2020-2022, in Poland as in other countries, about 90% fewer IMD cases were confirmed. Clonal complexes CC19, CC12 and CC14 are well established in our country.

Meningococcal disease caused by *Neisseria meningitidis* serogroup W in Poland, 2014-2022

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Introduction: *Neisseria meningitidis* serogroup W (MenW) has for many decades been an infrequent cause of meningococcal disease; however, following a MenW outbreak after the Hajj in 2000, and recently, MenW disease started to be common in some regions, including Europe.

AIMS: The objective of the study was to characterise invasive meningococcal disease epidemiology caused by MenW in Poland, between 2014 and 2022.

Materials and methods: The study included all invasive meningococcal cases confirmed by the National Reference Centre for Bacterial Meningitis (NRCBM) between 2014 and 2022. For all isolates serotyping and whole genome sequencing were performed. A PCR technique was used for meningococcal identification directly from clinical materials in the case of a negative culture.

Results: Between 2014 and 2022, 1349 IMD cases were reported to the NRCBM. Among them, 99.5% had a serogroup identified including 99 (7.3%) MenW. Initially (2014-2017) MenW was responsible for 3.5% (range from 2.2 to 4.4%) infections, however in 2018, 2019 and 2020 the percentage increased significantly to 9.8%, 11.4% and 20.2%, respectively. In 2021 MenW accounted for 11.1% of cases and in 2022 for 7.5% (Fig. 1). Over half of the cases occurred in children under four years old (52.5%) and the median age was 2 years. The overall male to female ratio was 1.58 (60/38). MLST results were available for 83 isolates. Among them 20 sequence types (ST) were identified, of which 62.6% belonged to 9316 clonal complex (CC9316) (Fig. 2). Almost all of these isolates had VR1/VR2 porA combination of 5-2/10-1 and feta variant FS-8. Twenty five isolates (25.2%) belonged to CC11 (Fig. 2). In infants, most of cases the MenW were caused by meningococci of CC9316 (86.9%), (Fig. 3). Case fatality ratio (CFR) of MenW cases with known outcome was 34.9% (22/63). CFR of CC9316 with known outcome was 30.6%, whereas for ST-11CC cases – 36.8% (Fig. 4).

Conclusions: Between 2018 and 2020 the NRCBM notified a significant increase of MenW disease in Poland, with high CFR. Despite the observed decrease in MenW in the last two years, IMD should be closely monitored since changes in meningococcal epidemiology may occur rapidly.

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Changes in invasive pneumococcal disease in patients over 65 years of age after introduction of antipneumococcal vaccination for Polish children

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Background: Invasive pneumococcal disease in the oldest age groups of community-dwelling individuals is increasing due to both demographic changes and the increasing prevalence of very resistant pneumococci (VDR) in bacterial pneumonia, septicaemia, and meningitis. These infections, common especially in the oldest age group, including adults over 65, can be largely prevented by pneumococcal vaccine. Studies in order to assess potential prophylactic and therapeutic effects, benefits of the administration of the vaccine responsible for infection in regard, which include their coexistence monitoring.

Methods: We used an observational cohort study to assess the impact of the introduction of the Polish National Vaccination Programme (PNV) on the incidence of invasive pneumococcal disease in patients over 65 years old.

Results: For all VDR pneumococci confirmed between 2014 and 2021 in the National Reference Centre for Bacterial Meningitis from patients 65+ years old, multiresistant, serotyping and susceptibility testing was performed. The results are related to their genetic profile resistance (2021-2022), early resistance (2017-2020), and being GPCSC (2014-2016).

Conclusions: The introduction of antipneumococcal vaccination for Polish children led to a significant decrease in the incidence of invasive pneumococcal disease in patients over 65 years of age. The results are related to their genetic profile resistance (2021-2022), early resistance (2017-2020), and being GPCSC (2014-2016).

Raportowanie, współpraca krajowa i międzynarodowa

European Centre for Disease Prevention and Control (ECDC)

- **EMERT I**
inwazyjna choroba meningokokowa - liczba przypadków, serogrupy
- **EMERT II**
dodatkowo WGS
- **Tessy (KOROUN+NIZP PZH-PIB)**
dane dotyczące inwazyjnej choroby pneumokokowej, meningokokowej,
wywoływanej przez *H. influenzae* i izolatów je wywołujących



Raportowanie, współpraca krajowa i międzynarodowa

Ministerstwo Zdrowia

- coroczne raporty merytoryczne z badań KOROUN

Projekt IRIS

- ogólnoświatowe monitorowanie przypadków chorób inwazyjnych wywoływanych przez *S. pneumoniae*, *N. meningitidis*, *H. influenzae*, *S. agalactiae* w trakcie i po pandemii COVID-19

Współpraca w sieci europejskich ośrodków referencyjnych



Dziękuję za uwagę!



mgr Izabela Wróbel-Pawelczyk