

# Meningococcal Disease Outbreak in a Refugee Reception Identification Center in Greece and Administration of Mass Antibiotic Prophylaxis

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## ABSTRACT

**Background** An increased likelihood of transmission of communicable diseases such as invasive meningococcal disease (IMD) exists in refugee camps. Herein, we describe an outbreak investigation of 5 IMD cases among immigrants in Greece.

**Methods** Epidemiological, clinical and laboratory data (culture and molecular identification) as well as the public health management concerning an outbreak of meningococcal disease in a refugee Reception Identification Center (RIC), are described.

**Results** During the period 17th January - 17th February 2020, five cases of IMD in refugees were reported to the National Public Health Organization (NPHO). Four cases were from Afghanistan and resided in the RIC of Lesbos Island; two females aged 2 yo and 21 yo and two males 13 yo and 6 yo. The fifth case, a 4 month old male of Syrian nationality, exhibited symptoms after moving to an inland accommodation center (AC) from Lesbos RIC, on December 2019. Four of the cases presented with meningitis and septicemia. All cases recovered and had no common exposure other than shared geographic space. *Neisseria meningitidis* was identified by molecular typing (mPCR, PorA, MLST, WGS) in all cases at the National Meningitis Reference Laboratory; 3/5 cases were identified as MenB, porA 7-2,4, and ST-3129 (new clone) while 2/5 (21 yo female, 13 yo male) as MenY, porA: 5.2, ST22CC. To prevent secondary cases, antimicrobial chemoprophylaxis via Directly Observed Therapy (DOT) was administered to 4.024 Afghan close contacts (26.7% of the total Afghan population). MenACWY and MenB vaccination was recommended in response to outbreak among persons aged <20 years old. No new IMD case occurred in the RIC during a follow-up period of 4 months.

**Conclusions** The detection of a new clone in Greece of Chinese and Taiwanese origin through migrants, further underlines the need of enhanced surveillance for early detection, molecular typing, immediate intervention with antibiotic prophylaxis and/or supplemental vaccination in order to prevent IMD in refugee camps.

## INTRODUCTION

- ❖ Meningococcal disease (MD) remains an important public health problem worldwide, associated with high fatality rate and long-term sequelae among survivors. It is an important threat for refugees and immigrants [1].
- ❖ The unpredictability of sporadic cases and outbreaks contributes to ongoing changes in MD epidemiology
- ❖ Migration influx could transfer clones in Europe from countries of origin
- ❖ An increased likelihood of transmission of MD exists in refugee camps
- ❖ We describe an outbreak investigation of 5 MD cases among immigrants in Greece

## METHODS

- ❖ Epidemiological and clinical information was collected in a structured CRF (e.g. date of onset, country of origin, sex, age, clinical manifestations, outcome) by epidemiologists of the National Public Health Organization in Greece (NPHO)
- ❖ Laboratory data (culture and molecular identification) were collected and are analytically presented (e.g. MIC to Ciprofloxacin, presence of gyr A allele mutation in the quinolone resistance- determining region, MIC to Penicillin)
- ❖ The public health intervention concerning the outbreak in the refugee Reception Identification Center (RIC), and the use of chemoprophylaxis targeting MD is described and discussed.
- ❖ Furthermore, recommendations for immunization against MD are presented.

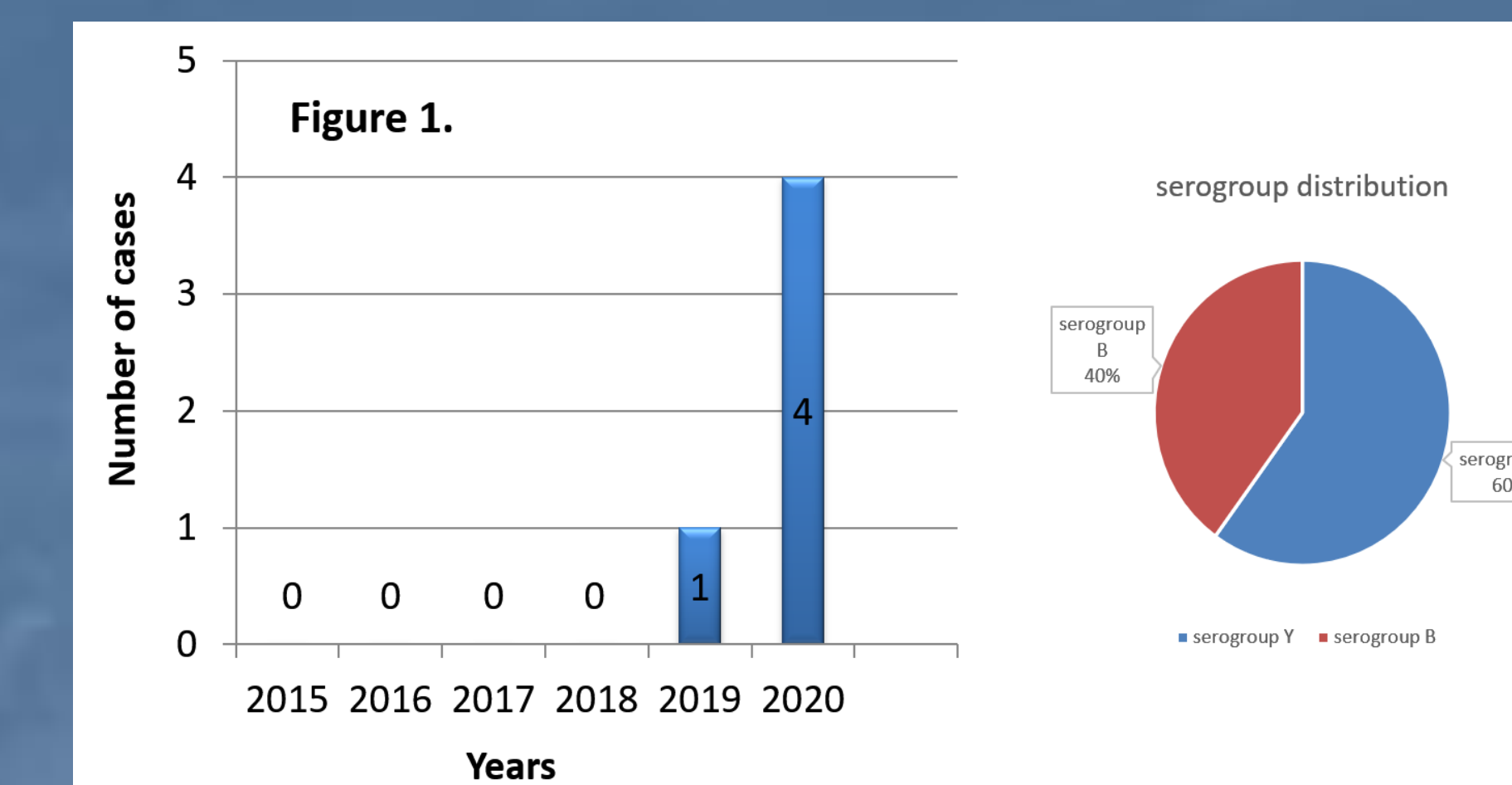
## RESULTS

- ❖ During the period 17th January - 17th February 2020, five cases of IMD in refugees were reported to the NPHO, 4 cases from Afghanistan (all in the RIC of Lesbos Island; two females aged 2 yo and 21 yo and two males 13 yo and 6 yo).
- ❖ A 5<sup>th</sup> case, a 4 month old male of Syrian nationality, was retrospectively identified (he had been moved to an inland accommodation center from Lesbos RIC, on December 2019).
- ❖ The outbreak affected an area of 19500 residents (77.4% of Afghan origin, Table 1, Figures 1, 2 and Tables 1,2)
- ❖ 4 (80%) of the cases presented with signs of meningitis & septicemia. All recovered; no common exposure other than shared geographic space was identified.
- ❖ *Neisseria meningitidis* was identified by molecular typing (mPCR, PorA, MLST, WGS) in all cases at the National Meningitis Reference Laboratory;
- ❖ 3/5 cases were identified as MenB, porA 7-2,4, and ST-3129 (new clone) while 2/5 (21 yo female, 13 yo male) as MenY, porA: 5.2, ST22cc.
- ❖ To prevent secondary cases, antimicrobial chemoprophylaxis via Directly Observed Therapy (DOT) was administered to 4.024 Afghan close contacts (26.7% of the total Afghan population).
- ❖ MenACWY and MenB vaccination was recommended in response to outbreak among persons aged <20 years old.
- ❖ No new IMD case occurred in the RIC during a follow-up period of 4 months.

**Table 2. Meningococcal characteristics of the 5 cases involved in the outbreak**

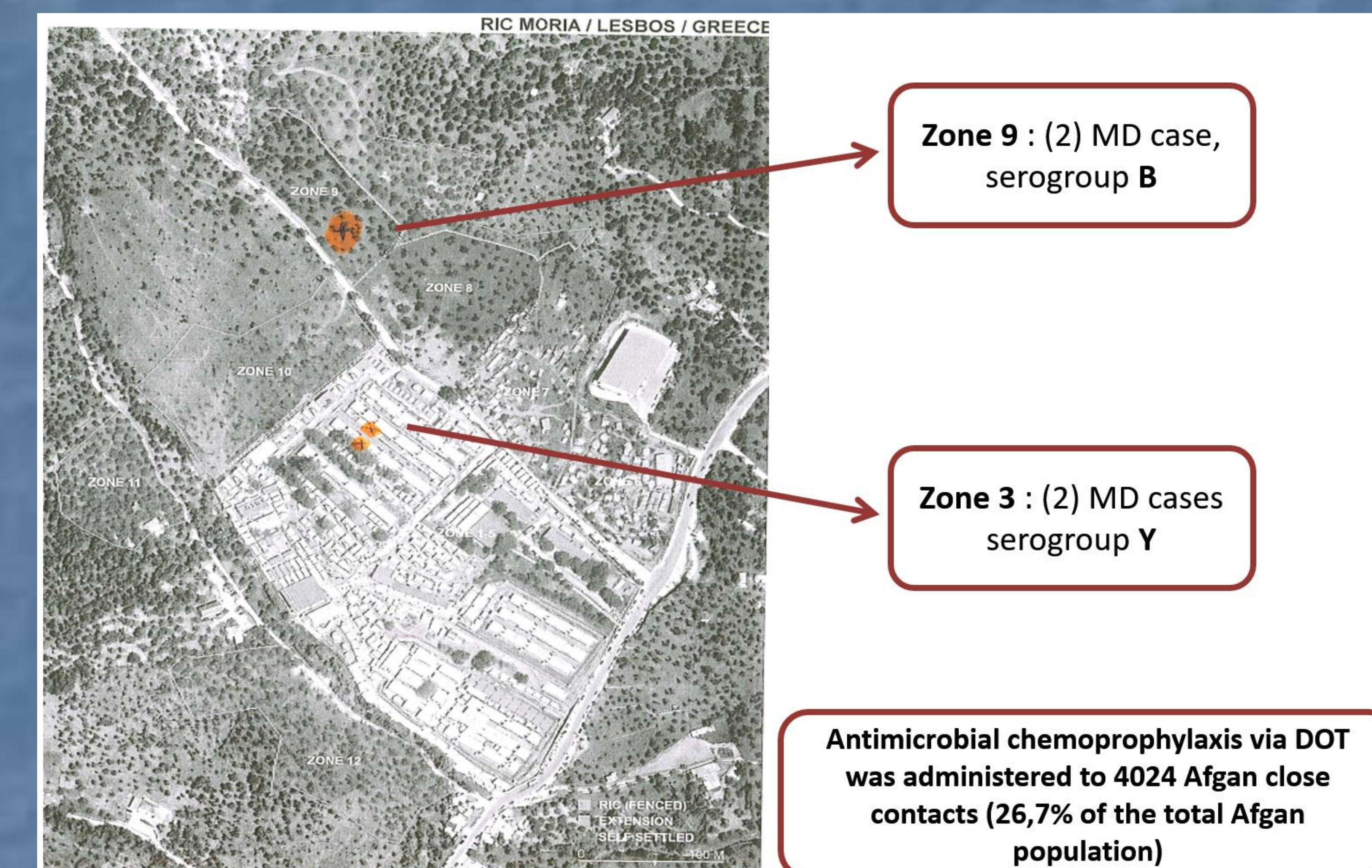
	Case 1	Case 2	Case 3	Case 4	Case 5
<b>Date of onset</b>	17/1/2020	21/1/2020	30/1/2020	15/2/2020	17/2/2020
<b>Country of origin</b>	Afghanistan	Afghanistan	Afghanistan	Afghanistan	Syria
<b>Sex</b>	F	M	M	F	F
<b>Age</b>	2 years	13 years	6 years	22 years	4 months*
<b>Clinical manifestation</b>	meningitis / septicemia	meningitis	meningitis / septicemia	meningitis / septicemia	meningitis / septicemia
<b>Identification</b>	PCR (+)/culture (+)	PCR (+)	PCR (+)	PCR (+)/culture (+)	PCR (+)/culture (+)
<b>Sero/geno group</b>	B	Y	B	Y	B
<b>Por A</b>	7-2, 4	5, 2	7-2, 4	5, 2	7-2, 4
<b>Fet A</b>	F1-5			F3-4	F1-5
<b>MLST</b>	ST-3129	NA	NA	ST-12009 (cc22)	ST-3129
<b>MIC Ciprofloxacin</b>	0.25	NA	NA	0.003	0.25
<b>gyr A allele</b>	gyr A346	NA	NA		gyr A346
<b>Mutation in the quinolone resistance-determining region</b>	T911				T911
<b>MIC Penicillin</b>	0.50			0.064	0.5

\*born on 15/10/2019 in the island of Lesbos



Age distribution	Number of residents of Afghan origin
0-4	1,642
5-14	3,329
15-24	4,790
25-44	4,337
>45	986
<b>Total</b>	<b>15,084</b>

**Table 1. Total n of RIC residents = 19,500**



**Figure 2.**

## CONCLUSIONS

- ❖ A meningitis outbreak in a refugee population is described
- ❖ The detection of a new clone in Greece of Chinese and Taiwanese origin underlines the potential of refugee related introduction in foreign countries
- ❖ The current outbreak highlights the need of enhanced surveillance for early detection, molecular typing, immediate intervention with antibiotic prophylaxis and/or supplemental vaccination in order to prevent IMD in refugee camps.

## REFERENCES

1. Dinleyici EC, Borrow R. Meningococcal infections among refugees and immigrants: silent threats of past, present and future. Hum Vaccin Immunother. 2020 Apr 29:1-6.