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Meningitis B vaccination: knowledge and attitudes of pediatricians and parents in Greece

K. Souliotis^{a,b,*}, C. Golna^c, N. Kotsopoulos^b, V. Kapaki^b, C. Dalucas^d

^a Faculty of Social and Political Sciences, University of Peloponnese, Corinth, Greece

^b Health Policy Institute, Athens, Greece

^c Policy Change, Innrowth Ltd, Cyprus

^d Pediatrician, Athens, Greece

* Corresponding author.

E-mail address: soulioti@hol.gr (K. Souliotis).

Abstract

Bexsero®, a meningitis B vaccine, was recently included in the National Immunization Programme (NIP) in Greece, with restricted access to high risk groups only. To map the need to expand coverage, this study assessed pediatricians and parents' perceptions and attitudes towards meningitis B, inclusion of Bexsero® in the NIP and vaccination uptake.

We analyzed data from 201 private practice pediatricians questionnaires and 1003 parents phone interviews. Both (pediatricians 64.7%, parents 88.5%) considered meningitis B a critical challenge. 77.6% of pediatricians would prioritize meningitis B vaccination in the NIP and 90.3% would recommend Bexsero® to parents. Of those who would not, 47% feared civil liability challenges and 11.8% hesitated to impose vaccine cost on parents. Only 28.9% of parents had their child vaccinated. Non-reimbursement constituted a major access hurdle. It is critical to expand immunization coverage in Greece through expanded access in the NIP, in line with pediatrician recommendations.

Keywords: Public health, Health profession, Vaccines

1. Introduction

Neisseria meningitidis is one of the major causes of bacterial invasive disease worldwide with an estimated 1.2 million cases per year and a mortality rate of about 11% [1]. Among the 13 identified capsular types of *N. meningitidis*, six (A, B, C, W135, X, and Y) account for the majority of cases worldwide [2].

The majority of cases reported by European countries to the European Centre for Disease Prevention and Control correspond to serogroup B meningococci [3]. Meningococcal group B disease (also known as meningitis B) is an uncommon but -serious disease caused by a bacterial infection of the lining of the brain and spinal cord. Meningitis B can also cause a severe infection of the blood, called meningococcal septicemia. Initial symptoms may be mild, but it progresses quickly and can be fatal, sometimes within 24 hours. The bacteria that cause meningitis B live within the nose and throat and can be passed through saliva, coughing or sneezing. Teens and young adults have an increased risk for meningitis B due to several factors, such as living in close quarters [4], living in dormitories [5] and having close contact with others [4]. Moreover, a recent study showed an overall poor knowledge, attitudes and behavior towards the meningococcal disease among Greek college students planning to study abroad [6].

In Greece, data from the Hellenic Center for Disease Control and Prevention show that Meningitis B was the most prevalent meningococcal disease (77% of all cases identified as belonging to one of five serotypes) in the period 2004–2014 [7]. Data from the National Center for Meningitis Surveillance indicate that in 2015 children aged 0–4 years old had the highest incidence rate (IR) of meningitis B (IR = 1.64 per 100.000), followed by children aged 10–14 years old (IR = 1.12 per 100.000) [8]. No death associated with Meningitis B was recorded in the same year [8].

The meningitis B vaccine (Bexsero[®]), indicated for active immunization to prevent invasive disease caused by *Neisseria meningitidis* serogroup B, was approved by the European Medicines Authority (EMA) in January 2013 and the U.S. Food and Drug Administration (FDA) in January 2015. Bexsero[®] is the first vaccine against Meningitis B. Prior to its introduction in the Greek health care market, no preventive programmes against Meningitis B were provided in the country. Bexsero[®] has been marketed in Greece since March 2014 and was only very recently (May 2017) included in the National Immunization Programme (NIP) only for a restricted number of high-risk groups [9]. All other groups are required to pay out of pocket for access to the vaccine. At increased risk for meningococcal disease are considered to be persons suffering from certain medical conditions such as anatomic or functional asplenia, persistent complement component deficiency (C3, C5-9, Properdin,

Factor D and Factor H) and HIV infection [9]. Yet, wider access to Bexsero[®] may benefit a greater number of children and adolescents and to that end, it is critical to understand perceptions and attitudes of both health professionals (pediatricians) and parents towards the vaccine. This study investigates perceptions and attitudes of pediatricians and parents towards type B meningococcal infections in Greece and the value of vaccination to prevent them.

2. Materials & methods

Electronically structured questionnaires were sent to private practice pediatricians via email. Pediatricians received a phone call and were asked if they were interested to participate in the study. If they agreed, an email with the questionnaire was sent to them. Pediatricians' numbers were retrieved from the national phone catalogue. In total, 296 phone calls were made. 201 responses (target sample 200) were received out of 236 recipients between 10 and 26 May 2016. 1003 phone interviews were conducted with parents of one or more children, using the CATI system and written structured questionnaires on 25, 26 and 27 April and 9 and 10 May 2016. The response rate among parents was 78.4% (1003 out of 1279 parents contacted). Study sample was selected at random from national phone-number databanks. Telephone numbers belonging to individuals only were included and numbers of businesses or public services were excluded. Moreover, if the responders stated that they did not have any children or that their children belonged to high risk groups for Meningitis B, they were excluded from the study sample. The survey was carried out by a market research company with expertise in demographic surveys, with guidance from the authors. Maximum sampling error in the parents' group was 2.9%. Sampling error refers to the difference between an estimate for a population based on data from a sample and the 'true' value for that population which would result if a census were taken.

58.7% of the pediatricians interviewed were female and 52.7% were between 36 and 50 years old. Over 60% had over 11 years of work experience. 85% of those interviewed had their practice in an urban area (population >10,000). Over 60% examined over 151 children per month and almost 50% vaccinated over 75 children per month (Table 1). 73.6% of the 1,003 parents interviewed were female and 73.5% were between 36 and 50 years old. Almost half of the parents had graduated from University and 66% were employed. 29% declared a monthly income of up to €1,000, 32% an income of €1,001- €2,000, and 10% over €2,000. 31% of the interviews were conducted in Attica and 15.5% in Central Macedonia. 65% of interviewees lived in an urban area (population >10000). 45.8% had two children and 43% had one child (Table 2). The study design was approved by the Ethics Committee of the Health Policy Institute. Study sample was paediatricians and general public (not patients), both of whom consented as part of the interview process.

Table 1. Practice details of pediatricians.

Years of work	1–5 years	18.90%
	6–10 years	20.90%
	11–20 years	30.80%
	>20 years	29.40%
	Average	15.20%
Area of practice	Rural area (<2,000 population)	0.50%
	Semi-urban area (2,000–10,000 population)	14.90%
	Urban area (>10,000 population)	84.60%
Number of children I vaccinate on an average month	1–25	13.60%
	26–50	26.30%
	51–75	11.10%
	76–100	21.70%
	101–200	21.20%
	≥201	6.10%
	Average	9.60%
Number of children I vaccinate against meningitis C on an average month	None	10.10%
	1–2	23.20%
	3–5	26.30%
	6–10	21.70%
	11–20	11.60%
	>20	7.10%
Average	9.00%	

Table 2. Demographics of parents.

Age	≤35 years	16%
	36–50 years	74%
	>50 years	11%
Education	Primary school	21%
	High school	48%
	University/Higher education	42%
	Post graduate degree	8%
Employment status	Employed	66%
	Unemployed	19%
	Pensioners/house-keepers	15%
Place of living	Rural area (<2,000 population)	17%
	Semi-urban area (2,000–10,000 population)	18%
	Urban area (>10,000 population)	65%
Monthly income	up to 500 €	6%
	501–1,000 €	23%
	1,001–1,500 €	18%
	1,501–2,000 €	14%
	2,001–3,000 €	7%
	3,001–4,000 €	2%
	Over 4,001 €	2%
	I do not wish to answer	28%

3. Results

64.7% of the pediatricians considered meningitis B a critical challenge to public health. 69.1% agreed that the mortality of children less than one year old due to the infection is very high or high. The vast majority agreed that vaccination

contributes to reducing the clinical and economic burden of infectious diseases (78.6%), and declared that a vaccine against meningitis B needs to be prioritized by the NIP (77.6%). 94.5% of the pediatrician sample considered the non-inclusion of the vaccine in the NIP, and, as a result, its limited reimbursement by social health insurance, to be the main deterrent for parents to vaccinate their children. 78.1% of the pediatrician sample attributed the exclusion of such a vaccine from the NIP to lack of political will, because of its cost.

90.5% of pediatricians would recommend meningitis B vaccination to parents and 72.7% believed that parents would vaccinate their children, if their doctor recommended it. Of the 8.5% that would not, almost half (47%) would do so because they feared their civil liability might be challenged, as the vaccine is not included in the NIP, and 11.8% would hesitate due to the financial burden vaccination would impose on the family budget.

The vast majority (95.9%) of parents interviewed agreed that vaccination has a positive/very positive impact on prevention of infectious diseases. 88.5% were generally informed about vaccination. 93.9% of them had got information primarily from their pediatrician and 22.2% from the internet. Despite these high vaccination awareness numbers, only 39.7% of parents interviewed were informed about meningitis B, 29.7% “had just heard something” and 29.6% were completely unaware (Fig. 1). Nonetheless, 88.5% of parents believed that meningitis B is a serious/life threatening infection with serious complications, 70.5% knew of the meningitis B vaccine and 83% of those who knew had received such information from their pediatricians.

Only 28.9% of the parents had their children vaccinated against meningitis B. Most of them did so on their pediatrician’s recommendation (60.3%) or their own initiative (22.8%). Almost two thirds (63,3%) of the parents who had not had their children vaccinated (62.5% of total) confirmed that paying out of pocket for vaccination constitutes a major access hurdle (Fig. 2). Still, 59.7% of them stated that they intended

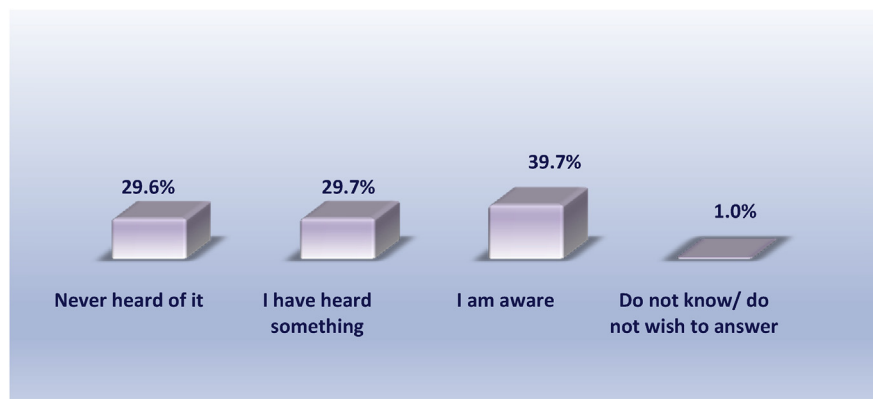


Fig. 1. Awareness of meningitis B, Parents.

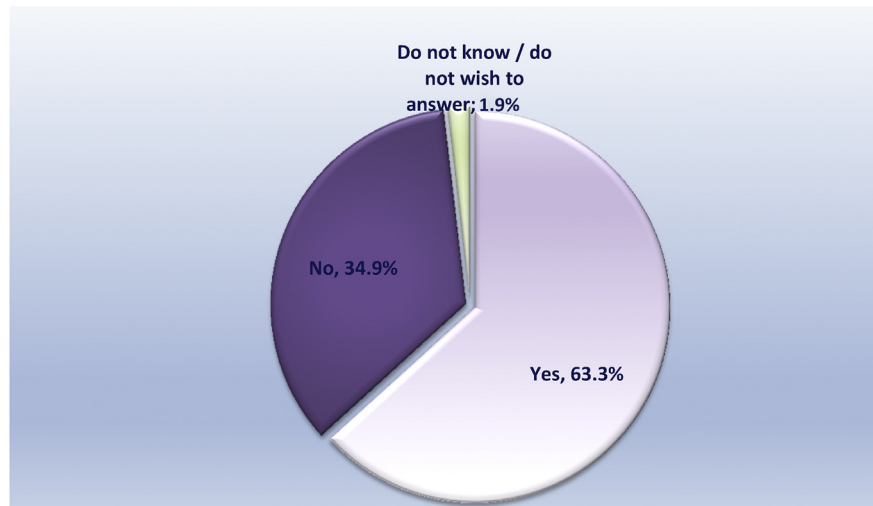


Fig. 2. Is non reimbursement of vaccine cost by social insurance a hurdle in having your child vaccinated?, Parents.

to have their child vaccinated in the future. When exposed to the epidemiological data on the infection, 56.5% of the parents who initially stated that they did not intend to have their children vaccinated in the future changed their mind. Willingness to pay out of pocket did not exceed €100 for the majority of parents who had not had their children vaccinated.

4. Discussion

To successfully introduce a vaccination programme to prevent infectious disease, health systems should carefully weigh public health priorities (such as burden of disease, efficacy, quality and safety of the vaccine, economic and financial issues), availability of vaccine on the market and adequacy of supply [10]. Once a vaccination programme is set up, health systems need to ensure optimal uptake of immunization. To this end, they need to a) understand community perception and attitudes (namely acceptance) towards vaccination, given that vaccine safety has become a predominant concern for parents [11] and b) ensure substantial coverage is achieved, also through reimbursement of vaccination costs.

In Greece, when a new vaccine becomes available on the market, it has to go through a detailed evaluation to be included in the NIP. The evaluation Committee decides whether there is sufficient evidence in terms of cost effectiveness to recommend its inclusion or whether additional evidence is needed or time should lapse for circumstances to change (price, financial resources, supply, program strength) prior to re-evaluation. If a vaccine is not included in the NIP, the National Organisation for the Provision of Health Services (EOPYY) will not reimburse its cost – parents

will have to pay out of their pocket to purchase the vaccine and bear the pediatrician visit cost. In addition to NIP evaluation, approval from the Ministry of Health and the National Pharmaceutical Organization (EOF) are also required for the vaccine to be made available to the Greek pharmaceutical market.

In this light, the limited (to high risk groups) inclusion of the meningitis B vaccine (Bexsero[®]) in the NIP, and as a result, its restricted reimbursement by EOPYY has maintained inequalities in access to the specific vaccination. Children of those aware and financially able to cover the expense are vaccinated against this potentially life-threatening infection, whereas the less “able” skip the vaccination that sets the family budget back by more than €300 euros per child.

Understanding the perceptions and attitudes of both pediatricians and parents towards meningitis B vaccination is critical in assessing not only the extent of the need but also the extent of actual responsiveness to a future initiative that would potentially open up access to vaccination to wider groups of children.

Our survey confirms that pediatricians in private practice in Greece, believe that vaccination contributes to reducing the clinical and economic burden of infectious diseases, critically meningitis B, and are prepared in their vast majority (over 90%) to recommend vaccination to parents. Still, limited inclusion of the vaccine in the NIP creates additional hurdles at the pediatrician level, both because they fear their civil liability may be challenged and because they hesitate to recommend vaccination to parents that is to be covered out of pocket in poverty stricken Greece.

Their fears are reflected in the findings of the parents’ sample. For those who have yet to have their children vaccinated, cost is a critical hurdle and willingness to pay out of pocket is substantially lower than actual vaccination cost. This may be especially relevant in children from ethnic minorities or vulnerable groups, which tend to face additional access constraints [12].

5. Conclusion

Despite very high acceptance and recommendation rates by pediatricians (over 90%), still only one third of parents have had their children vaccinated against meningitis B infection in Greece, primarily due to financial constraints related to lack of reimbursement of the cost of the vaccine. Given the serious and potentially life-threatening consequences of meningitis B infection, it is critical to expand coverage of meningitis B vaccination. Moreover, public health authorities should implement policy interventions for the promotion of vaccination against meningitis B both to the public and health professionals.

Declarations

Author contribution statement

Kyriakos Souliotis: Conceived and designed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Christina Golna, Nikolaos Kotsopoulos, Vasiliki Kapaki, Constantinos Dalucas: Conceived and designed the experiments; Analyzed and interpreted the data; Wrote the paper.

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Competing interest statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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