NATIONAL PUBLIC HEALTH ORGANIZATION

Directorate of Epidemiological Surveillance and Interventions for Infectious Diseases

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EPIDEMIOLOGICAL DATA FOR PERTUSSIS IN GREECE, 2004-2020

(MANDATORY NOTIFICATION SYSTEM)

Key Points

- Although pertussis is a vaccine preventable disease, it continues to be a public health concern in Greece.
- Unvaccinated pockets of population, in combination with the waning immunity after infection and after vaccination, contribute to the occurrence of new pertussis cases.
- Based on data for the period 2004-2020, the disease appears to affect all ages but it presents the highest rate in the age group 0-4 years old (especially among children below the age of one year). The clinical presentation in adolescents and adults may be mild and is often not recognized which contributes to bacteria circulation in the population.

Pertussis is an acute bacterial infection of the respiratory tract, caused by *Bordetella pertussis*. The bacterium mode of transmission is airborne, via droplet spread or by direct contact with excretions from the respiratory tract of an infected person. Indirect contact, via air, or recently infected surfaces-objects, occurs rarely. Pertussis is rather easily transmitted (family members that have no immunoprotection, are affected up to 80%) [1].

Time trend

During the period 2004-2020, the number of reported pertussis cases with known age and gender was 509. The notification rate during the period 2004-2020, ranged between 0.03/100,000 population and 0.8/100,000 (Figure 1). The mean annual notification rate for the period 2004-2020 was 0.27 cases per 100,000 population (mean number of reported cases per year: 30, total number of reported cases for 2004-2020: 510).

Age and gender distribution

During 2004-2020, the number of reported cases with known age and gender was 506. The highest incidence was recorded in the age group 0-4 years old, with a mean annual notification rate of 4.47 cases /100,000 population (number of cases: 394, among which 332 were below one year of age). In the age group 45-64 years old, four (4) cases were reported, while three (3) cases were reported in >65 years old corresponding to a mean annual notification rate of 0.006 and 0.008 cases/ 100,000 population respectively (Figure 2). The mean annual notification rate was 0.29/100,000 population for women and 0.25/100,000 population for men.

Geographical distribution

During the period 2004-2020, the disease presented the highest mean annual notification rate in Attica (0.4/100,000 population) whilst slight smaller was the notification rate in the geographical areas of Central Greece (0.3/100,000 population). The notification rate for the geographical areas of Northern Greece and Aegean Islands – Crete was 0.2 cases / 100,000 population.

Laboratory data

Among 509 reported cases during 2004-2020, 334 (65.6%) were laboratory confirmed, 47 (9.2%) had clinical symptoms of pertussis and an epidemiological link with another case and 128 (25.2%) had only clinical symptoms of the disease.

Vaccination coverage

Among 509 reported cases during 2004-2020, the vaccination coverage was known for 444 cases (87.2%). The majority of the reported cases (309 cases – 60.7%) were not vaccinated at all. In total, 65 cases (12.7%) reported vaccination with at least 3 doses of vaccine, another 25 cases (4.9%) vaccination with 4 doses, 25 cases (4.9%) vaccination with 5 doses, 2 cases (0.4%) vaccination with 6 doses, while 18 cases (3.5%) had no information available regarding the number of doses performed (Figure 3). It is widely known that vaccination against pertussis offers immunoprotection that decreases with time. In Greece, for cases vaccinated with at least 3 doses of vaccine, the disease is probably related to the decreasing over time immunoprotection, in approximately half of the cases (especially in the age group 10-19 years old) [2].

Risk factors – Burden of disease

For the period 2004-2020, a significant proportion of the reported cases belonged to Roma (30.8%, n=157) mainly children 0-14 years old. The number of cases that needed to be hospitalized during the same period reached 388 (76.2%), whilst 57 cases (11.2%) presented complications, mostly from the respiratory system. The outcome for pertussis was usually good. During the period 2004-2020, 3 deaths were notified, corresponding to a mortality rate of 0.6%.

Conclusion

The notification rate of pertussis in Greece is low. The mean annual notification rate for the period 2004-2020 was lower than the mean notification rate for the EU/EEA countries (8.2/100,000 population for the year 2018) [3]. This low rate is related to the high vaccination coverage of the population (89.5% of the population is vaccinated with 5 doses of DTwP or DTaP), whilst 95.8% of preschool children attending nurseries-kindergartens aged 2-3 years old is vaccinated with 4 doses of DTaP) [4,5]. It should be noted, however, that pertussis is a disease that is under-diagnosed, due to difficulties in its clinical diagnosis, as well as due to the frequent unavailability of laboratory confirmation. The fact that vaccination against pertussis offers immunoprotection that decreases over time, as well as the increased proportion of reported cases among non-vaccinated Roma children, underline the need for re-designing the policy for pertussis prevention in Greece. Vaccination of adolescents with Tdap is expected to decrease the high incidence of pertussis in this age group [6]. It is also worth noting that according to the National Vaccination Program for adults [7] a dose of Tdap or Tdap-IPV vaccine is recommended during each pregnancy, preferably between

27 and 36 weeks of gestation, or during the postpartum period regardless of the interval since the last vaccination with Td/Tdap.

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Figure 1. Time trend of pertussis reported cases and annual notification rate /100,000 population in Greece, 2004-2020

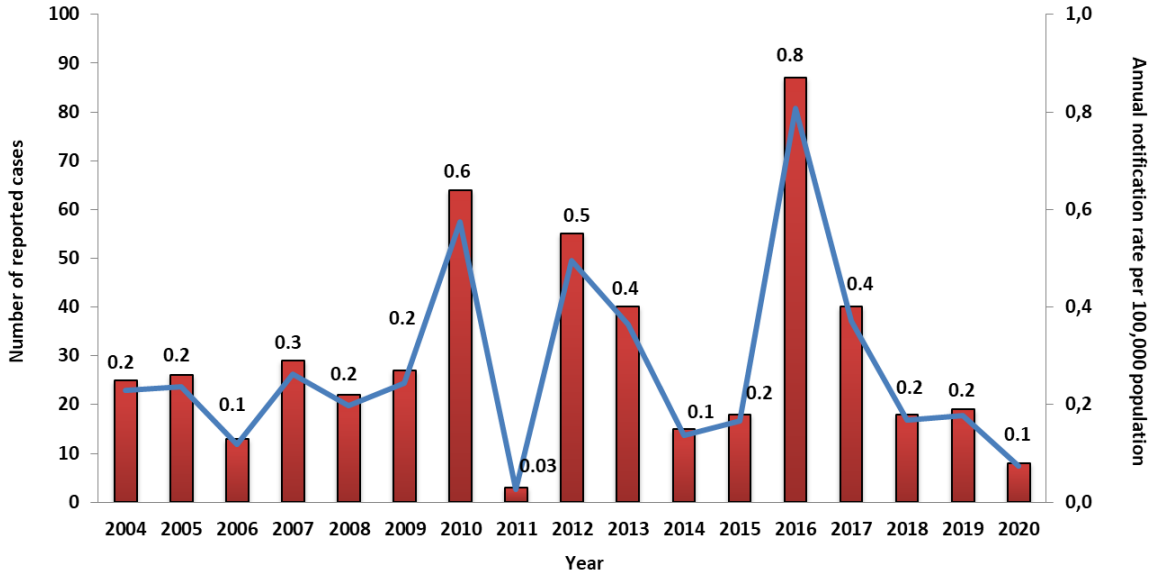

Figure 2. Age distribution of the mean annual notification rate of pertussis (cases/100,000 population), Greece, 2004-2020

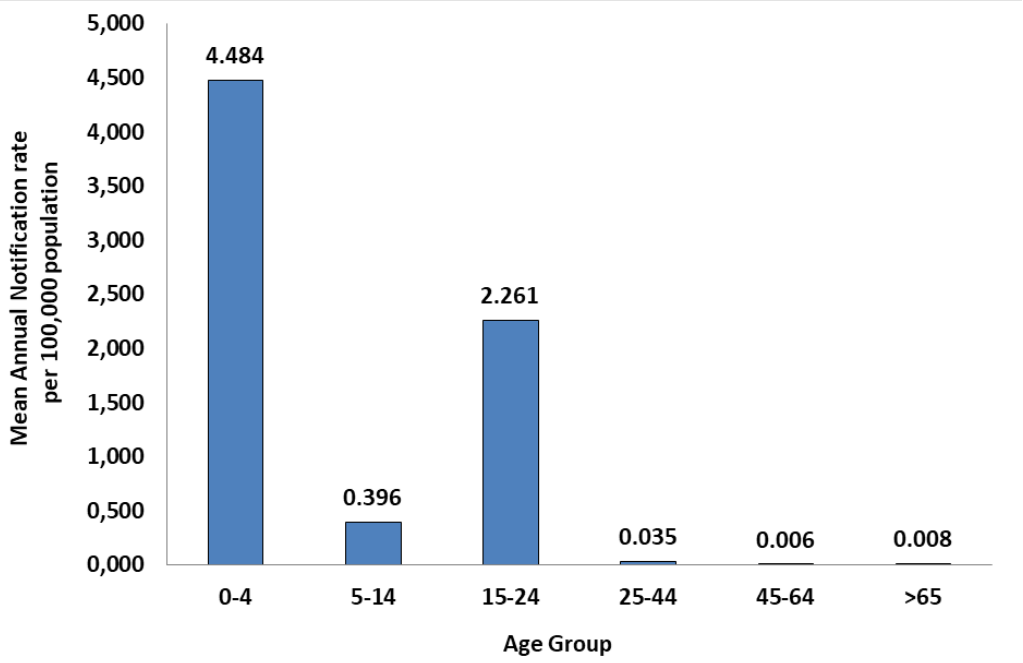

Figure 3. Frequency distribution of pertussis notified cases by number of vaccine doses, Greece, 2004-2020