RUBELLA IMMUNITY OF WOMEN OF REPRODUCTIVE AGE OF NORTHERN GREECE AND CONGENITAL RUBELLA’S INCIDENCE DURING 1993 AND 1999 RUBELLA OUTBREAKS

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Introduction

• 2005–2010 European Union strategic plan of elimination of measles and rubella and prevention of congenital rubella

• regional elimination, distant goal

• hereby: focus on congenital rubella: two ways of prevention

1. direct: vaccination of reproductive age women

2. indirect: sufficient vaccination coverage among children and elimination of the chance of infection
MMR history in Greece

- 1975: MMR commercially available in Greece
- 1975-1989: MMR recommended by the private sector pediatricians at the first year of age
- 1989: MMR included at the National Immunization Program: one dose scheme at the age of 12-15 months
- 1999: current immunization scheme: 1st dose at 12-15 months and 2nd at the age of 4-6 years
- no nationwide surveillance policies in order to estimate the population’s serological coverage
- no surveillance policies to assure that the compulsory vaccination scheme is being followed among immigrants and low socioeconomic groups
- direct immunization of reproductive age women, or postpartum women remains a recommendation by the Greek Ministry of Health
- although rubella is a notifiable disease since 1950, only since 2003 sufficient data about age and gender of reported cases are available
Purpose of this study- Materials and Methods used

**Purpose:**
- evaluate the effect of 1993 and 1999 rubella epidemics’ on congenital rubella’s incidence
- specify present seroprevalence of women of childbearing age in a small provincial town of Northern Greece

**Materials and Methods:**
- systemic review of Greek medical literature and official figures gathered by the Greek Centre of Disease Control and Prevention
- 72 healthy women of childbearing age, who were tested at a private microbiological-virological lab, after their physician’s (private sector doctor) recommendation, to check their immunological status before getting pregnant or during the first semester of their pregnancy
- age range: 22- 38 years of age
- VIDAS (BIOMERIEUX) automatic analyzer used, and kits of the same company (ELFA)
- cut-off value: for IgG= 10IU/ml, for IgM=0.8IU/ml, as manufacturer recommends
- Protective Ab titer was set at 20IU/ml- two times higher than the manufacturer's cut-off value.
1993 and 1999 rubella outbreaks

1 hospital and 3 health care centers at Attiki reported:
- 64% of diagnosed cases were older than 15 years old
- average age of people at infection: 17 years

Cause: low vaccination rates among children the previous years:
- vaccination coverage remained below 50% until 1980
- no compulsory vaccination scheme was introduced until 1989
- previous years’ MMR vaccination at the private sector was addressed at 1st year old children, so during the outbreaks, children at school-age were the most likely to be immune
- a late vaccination scheme for adolescents and young adults was not introduced, so the only chance for them to be immune was past infection.

High rates observed among young adults, based on demographic surveys conducted in big city centers-Athens.
1993 and 1999 congenital rubella incidence

- Rubella's distribution shift towards older ages resulted in high rates of CRS.
- During those two outbreaks, it is also supported that there has been a slight increase in the number of dead born fetuses, due to congenital rubella infection.

### Graph

**Congenital rubella incidence per 100000**

- 0.2389/100000, 25 babies with serologically confirmed CRS, the highest ever reported in Greece.
- 0.0368/100000, 5 babies with serologically confirmed CRS.
We report:
• 76.4% of women of reproductive age studied, were sufficiently immune
• 8.3% had a non-protective antibody titer
• 15.3% had no immunity at all
• None had IgM (+) recent infection

Drawbacks:
• the sample studied (22-38 years of age) does not represent the whole age group of women of reproductive age
• the survey is run at the private sector health care, so this sample may represent a high socioeconomic and easy to reach the town centre population
• the sample may not be representative of low socioeconomic, immigrant and hard to reach the town centre communities.

Table 1: Serological status of 72 women studied

<table>
<thead>
<tr>
<th>Rubella Serological status</th>
<th>Number of women (%)</th>
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<tbody>
<tr>
<td>IgG(+) and protective immunity (≥20 IU/ml)</td>
<td>55 (76.4%)</td>
</tr>
<tr>
<td>IgG(+) but non-protective titer (&gt;10 and &lt;20 IU/ml)</td>
<td>6 (8.3%)</td>
</tr>
<tr>
<td>IgG(-) and no immunity at all (≤10 IU/ml)</td>
<td>11 (15.3%)</td>
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Analysis and Comparison

Comparison with recent studies conducted in Northern Greece among women of reproductive age:

- Very low vaccination coverage
- Protective IgG Ab titers were most prevalent among people born before 1989 (1989: introduction of MMR)

Percentage reported hereby is lower

- Hypothesis: our sample consists of more women inadequately immunized between the years 1975-1989 than the previous studies.
- Even if they had received the one dose vaccine it may had protected them through childhood, but didn’t achieve high levels of immunity during adulthood.
What needs to be done to reach rubella elimination and congenital rubella prevention I

- Supervision of children MMR vaccination
- Special policies concerning immunization of minorities, immigrant communities and low socioeconomic groups
What needs to be done to reach rubella elimination and congenital rubella prevention II

- Immunization scheme should be extended to all susceptible individuals
- Vaccination at early adulthood should at least be approved for high risk groups: teachers, soldiers, students, healthcare workers
- Women of childbearing age with no proven immunity should receive another dose of MMR vaccine
- Prenatal serological screening is indicative of women serological status, if proven susceptible they should be immunized upon completion or termination of pregnancy