Rubella immunization and surveillance of rubella in pregnant women in France

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Progress toward rubella elimination and CRS prevention in Europe
8-10 February 2012 – Rome, Italy
Immunization and surveillance strategies

Surveillance of rubella during pregnancy

Rubella susceptibility in general population

Perspective for rubella surveillance
Immunization and surveillance strategies in France

- **1970**: Selective rubella vaccination of adolescent females
- **1976**: National lab-based surveillance of rubella infection during pregnancy (« Renarub »)
- **1983**: Introduction of MR vaccine into the routine immunization program (MMR in 1986)
- **1992**: Mandatory antenatal rubella-IgG testing
  - Determine susceptibility
  - Post-partum vaccination
- **1996**: 2nd dose of MMR
- **2005**: National plan for elimination of measles and congenital rubella
  - MMR1 at 12 months of age - MMR2 before 24 months of age
  - Catch up: 2 doses for anyone born in 1980 and later
    - Women born before 1980 and not vaccinated against rubella: 1 dose MMR
    - Use any opportunity to vaccinate women of childbearing age
- **No post-natal rubella surveillance in France**
MMR coverage « 1 dose » and « 2 doses »

Children at 24 months of age
(Permanent sample of health insurance beneficiaries, CnamTS/InVS)
MMR1 = 89.9 %  MMR2 = 52.1% for children born in 2008

6 to 15 years old, school surveys

<table>
<thead>
<tr>
<th>Date of survey</th>
<th>School grade</th>
<th>Birth cohorts</th>
<th>Coverage « 1 dose »</th>
<th>Coverage « 2 doses »</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-2002</td>
<td>5th grade (11 yo)</td>
<td>1990-1991</td>
<td>94%</td>
<td>57%</td>
</tr>
<tr>
<td>2002-2003</td>
<td>Preschool (6 yo)</td>
<td>1996-1997</td>
<td>93%</td>
<td>28%</td>
</tr>
<tr>
<td>2003-2004</td>
<td>9th grade (15 yo)</td>
<td>1988-1989</td>
<td>94%</td>
<td>66%</td>
</tr>
<tr>
<td>2004-2005</td>
<td>5th grade (11 yo)</td>
<td>1993-1994</td>
<td>96%</td>
<td>74%</td>
</tr>
<tr>
<td>2005-2006</td>
<td>Preschool (6 yo)</td>
<td>1999-2000</td>
<td>93%</td>
<td>44%</td>
</tr>
<tr>
<td>2007-2008</td>
<td>5th grade (11 yo)</td>
<td>1996-1997</td>
<td>97%</td>
<td>85%</td>
</tr>
</tbody>
</table>
Almost all public and private laboratories performing IgM ± PCR in France (n~300)

Half-yearly report
“0 reporting”

Notification criteria
• Pregnant women: IgM+,
• Amniotic fluid: PCR+; Foetal blood: IgM+
• Product of pregnancy termination or at birth: PCR+, IgM+

Clinicians in charge of the case management
Gynaecologists, GPs, paediatricians

InVS
French institute for public health surveillance

Individual questionnaires

• Demographic and clinical data
• Vaccination status
• Complementary lab. results (IgG avidity…)
• Pregnancy outcomes
• Clinical data and lab results on newborns or foetuses

Participation rate=98% in 2010

Case classification
Maternal primary infection/reinfection
CRI
CRS

Yearly analysis

Participation rate=92% in 2010
Ratio “primary infections/live births” and CRS in France from 1976 to 2010

- Maternal primary infections (confirmed and probable)
- CRS(newborns)

MMR
Antenatal IgG screening
Number of rubella infections during pregnancy, CRS/CRI and rubella-associated terminations in France from 2001 to 2010
Circumstances of diagnosis of rubella infection during pregnancy, 2001-2010 (n=127)

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Count (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antenatal serological testing + follow-up</td>
<td>54 (42%)</td>
</tr>
<tr>
<td>Febrile rash</td>
<td>39 (31%)</td>
</tr>
<tr>
<td>Infectious contact and febrile rash illness</td>
<td>21 (16%)</td>
</tr>
<tr>
<td>Suspected infectious contact</td>
<td>5 (4%)</td>
</tr>
<tr>
<td>US abnormalities</td>
<td>6 (5%)</td>
</tr>
<tr>
<td>Infection not detected during pregnancy and CRS detected at birth</td>
<td>2 (2%)</td>
</tr>
</tbody>
</table>
Proportion of susceptible population by gender and age group in France Mainland, 2009-2010 (n=5,000)

Negative threshold: 10 IU / mL

Source = InVS

** : p< 0.05
Number of rubella IgM+ tests provided by two private laboratories, 2006-2010
Results from the measles National Reference Laboratory

Clinical suspicion of measles

95 % of the oral fluid samples are collected <7 days after rash onset

<table>
<thead>
<tr>
<th>Year</th>
<th># oral fluid samples</th>
<th>+ Measles</th>
<th>+ Rubella</th>
<th>Rubella cases Gender (age in years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>588</td>
<td>316 (54%)</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>2010</td>
<td>1975</td>
<td>1357 (67%)</td>
<td>4 (0.2%)</td>
<td>M (39, 23, 20) F (18)</td>
</tr>
<tr>
<td>2011</td>
<td>3105</td>
<td>1990 (64%)</td>
<td>5 (0.2%)</td>
<td>M (34, 31, 23) F (60, 34)</td>
</tr>
</tbody>
</table>

Source: F Freymuth. Centre national de référence pour la rougeole – CHU Caen, France
Perspectives for the French rubella surveillance (1)

• **Context**
  - Commitment for rubella elimination and prevention of CRS by 2015
  - MMR1 coverage at 24 months of age is 89% at 24 months and 97% at 11 years
    - 93% of the 6-49 years old population is protected against rubella
  - The level of the rubella virus circulation is low
  - But localised outbreaks could occur in specific susceptible population
    - Rubella benefited from the enhanced MMR immunization activities during the nationwide measles outbreak
Perspectives for the French rubella surveillance (2)

- A “National Reference Laboratory for maternal and congenital infections” has been nominated for 2012-2015
  - Network of laboratories involved in rubella and congenital rubella diagnosis
  - Microbiological expertise (eg. IgG avidity) and contribution to epidemiological surveillance in relationship with the Measles reference laboratory and InVS

- The surveillance of rubella among pregnant women is operational but
  - the low incidence of rubella leads to a high proportion of IgM+ reports that are not considered as maternal infections after investigation
  - is restricted to a sub-group population
  - CRS detected at birth only
  - will not allow for certification of rubella elimination (no case-based data in general pop)

- A mandatory notification system is being considered
  - Several steps have to be considered before a decision is taken
Thank you for your attention