Measles Outbreak Investigation

WHO European Region Vaccine-Preventable Diseases and Immunization Programme

Vaccination Strategy Workshop
Luxembourg
13 February 2008
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Number of Measles Cases by year, WHO European Region, 1990-2007

- 90% from 6 countries
- 93% from 7 countries
- 82% from one country

Updated: Feb 2008
Reported and Laboratory Confirmed Measles Cases European Region, 2003-2007

Reported Cases
Lab Confirmed
Measles – 2007

- Overall incidence dropped 89%: 55,000 cases in 2006 vs. 6,409 reported cases in 2007
- Predominantly in hard-to-reach populations:
- Priority countries remain: Ukraine, Romania, Germany, UK, Switzerland, Italy, Balkans, Spain, Israel, Uzbekistan
- Sporadic cases throughout region due to importations from endemic countries outside European Region

Update: Feb 2008
Outbreak Investigation - Objectives

• Review and analyze available data
• Identify risk factors for measles infection and define high-risk populations in selected oblasts
• Assess measles vaccine effectiveness
• Develop recommendations for control strategies
Measles Outbreak Investigation

Romania: 2004-2006

Number of cases: > 8 000
Age characteristics: 75% ≤ 7 years; 21% < 1 year
Genotype: D4
Investigations: WHO/ ECDC teams
  • 1-27 May – case investigation and surveillance assessment
  • 6-26 June – case-control study
Regional Advisor visit: 24-26 June
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Romania: 2004-2006

Key points from case-control study:

• 128 cases/ 254 controls; 7 districts
• 28%/ 10% spoke Romany at home; 18%/ 8% had 2 addresses in last two years
• 32%/ 9% mothers had not attended school; 28%/ 10% had no antenatal care
• 75%/ 44% fathers unemployed
• 58%/ 92% had 1 dose of measles vaccine; 44%/ 73% on time
• 20%/ 4% had no polio vaccine
Measles Virus D4 Genotype Circulation in WHO European Region, 2004-2006
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*Romania: 2004-2006*

**Recommendations:**

- Increase coverage for all vaccines in all marginalized communities
- Identify high risk groups for targeted interventions
- Better integration of marginalized groups into the national routine health system
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_Ukraine: 2005 -2006_

Number of cases: > 44 000
Age characteristics: 58% 15+ years; 4% < 1 year
Genotype: D6

Investigations:
• CDC/ WHO team – 13-31 March (Kyiv)
• ECDC/ WHO team – 2-26 May (Donetsk and Dnepropetrovsk)

Regional Advisor visit: 3-7 July
### Vaccine Effectiveness Study

#### Results 1

**Distribution by vaccination status, n = 714**

<table>
<thead>
<tr>
<th>Vaccination status</th>
<th>Cases</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percentage, %</td>
</tr>
<tr>
<td>1 dose only</td>
<td>14</td>
<td>9.6</td>
</tr>
<tr>
<td>2 doses</td>
<td>116</td>
<td>79.5</td>
</tr>
<tr>
<td>0 doses</td>
<td>16</td>
<td>11.0</td>
</tr>
<tr>
<td>Total</td>
<td>146</td>
<td>100</td>
</tr>
</tbody>
</table>
Vaccine Effectiveness Study

Results 2

One dose
- 50.0 % matched (95%CI: -5.6 to 98.3)
- 73.1 % unmatched (95%CI: 15.1 to 92.1)

Two doses
- 93.1 % matched (95%CI: 80.5 to 98.0)
- 91.9 % unmatched (95%CI: 79.4 to 97.2)
Measles virus genotype D6 circulation, WHO European Region, 2006
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**Ukraine: 2005 -2006**

**Recommendations:**

- Increase routine MMR vaccination
- A national supplemental immunization activity targeting all population aged 15-29 years
- High quality measles and rubella surveillance
Population Groups At Risk

Roma and travellers – *younger age groups*
Albania, Bosnia & Herzegovina, Germany, Greece, Italy, Portugal, Romania, Serbia, Spain, United Kingdom

Low vaccine effectiveness – *older age groups*
Belarus, Russian Federation, Ukraine, other NIS

Other unimmunized groups – *mixed age groups*
Armenia, Bosnia & Herzegovina, Denmark, Georgia, Germany, Greece, Italy, Russian Federation, Spain, United Kingdom
Targeting susceptible populations to measles

• Broad and/or older age groups for SIA
  – Kyrgyzstan (2001) 7-25 years
  – Moldova (2002) 8-23 years
  – Tajikistan (2004) 1-18 years + 19-29 years in Sogd
  – Kazakhstan (2005) 15-25 years
  – Azerbaijan (2006) 7-23 years + 24-29 years in Baku
  – Armenia (2007) 6-26 years
  – Uzbekistan (2007) 11-25 years
  – Turkmenistan (2007) 7-23 years
In countries approaching disease elimination, high-quality surveillance plays a critical role in identifying susceptible persons and groups. Once cases are identified, thorough case investigation and/or outbreak investigation allows one to define high-risk groups needing special attention and reasons for non-vaccination.
WHO/EURO/CISID Outbreak Manager