Measles outbreak in the Ukraine, 2005-2006

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An increase in the number of measles cases has been reported from Ukraine to the World Health Organization (WHO) since February 2005. By the end of February 2006, 19,673 cases of measles had been reported; 17,281 (88%) occurred during January and February 2006.

Figure. Epicurve of measles outbreak in the Ukraine, 2005-2006

While 7,415 (38%) of the total cases have been reported from Kyiv city (also known as Kiev) and Kyiv Oblast, where the outbreak appears to have started, all 27 administrative territories of the country are now reporting cases. All but five of these territories have reported at least 100 cases each.

Based on more complete information received on 7,136 cases reported up to the end of January 2006, 6,014 (84%) cases were in people aged 15 years and older, 1,110 (16%) were in adults aged 30+ years, and 493 (7%) were children aged under 5 years.

Of these 7,136 cases, 3,784 (53%) were reported as requiring hospital admission, and at least two deaths are known to have occurred. The age profile of 340 laboratory confirmed cases reported during 2005 was similar to that of the cases reported up to January 2006.

Measles cases from the current outbreak in Ukraine have been imported into Belarus (2 cases), the Russian Federation (9 cases), Spain (1 case) and the United States (2 cases). Measles virus of D6 genotype has been identified from cases in Ukraine and from imported cases. These D6 viruses have 99.7% sequence homology in the 450 nucleotides of the N gene based on data received from two of the three WHO European regional measles and rubella reference laboratories and one of the three WHO global specialised laboratories.
Vaccination status of patients
For 7136 cases for which detailed information is known, 1103 (15%) were identified as having received no measles vaccine, 1127 (16%) had received one dose, 2566 (36%) had received two doses, and the vaccination status of the remaining 2340 (33%) cases is unknown.

Of cases in patients aged 15 years or older, 2916 (48%) had had no doses or status was unknown, and 2144 (30%) had received two doses. Among 268 cases in patients aged 1-4 years, 112 (42%) had received one dose of measles vaccine, 141 (53%) had received no doses, and for 15 (6%) vaccination status was unknown.

Measles vaccination schedule in Ukraine
Ukraine introduced measles vaccine in 1968 (using monovalent Leningrad strain) and a two-dose schedule for measles was introduced in 1986. First dose measles vaccine coverage has been reported as >90% since 1992, but until 2000, coverage was based on the proportion of children vaccinated among those due to be vaccinated during a given year. Implementation rates by territory of between <20% and >150% were due to frequent vaccine shortages followed by catch up activities when vaccine became available. Mumps, measles and rubella (MMR) vaccine was introduced in 2000 as a two dose programme at 12-15 months and 6 years; however, monovalent measles vaccine continued to be used and coverage with MMR vaccine was low until 2003.

The most recent measles outbreak in Ukraine before the current one occurred during 2001-2002, when about 25 000 cases and 14 deaths were reported. This outbreak affected western, southern and central regions, but a third of regions reported relatively few cases. Over half the cases in this outbreak affected people aged 15 and over.

Discussion
The reasons for the outbreak and the predominance of illness among people aged 15 years and older are unclear, but it is consistent with what has been observed in Belarus, Kazakhstan and the Russian Federation, where a high proportion of measles cases are among persons 20-30 years of age. This older age profile could be due to lack of previous vaccination as a result of the extensive number of contraindications accepted in the former Soviet Union; falsified records; ineffective vaccine due to inadequate cold chain or poor quality control during vaccine production; a duration of immunity that is shorter than vaccines used in western Europe; or some other factor.

A thorough epidemiological investigation is planned which may make the reasons clearer. This investigation will also provide the Ministry of Health with better information with which to plan an appropriate response.

The WHO Regional Office for Europe (WHO EURO) has published a strategic plan for the elimination of measles and rubella in the European region [1,2]. New surveillance guidelines for measles, rubella and congenital rubella infection will be published in 2006.

WHO EURO would like to be notified of measles cases in other countries that may be linked to the current outbreak in Ukraine. The European Regional Measles/Rubella Laboratory Network would also like to receive specimens for virus detection/isolation or viral genetic sequence data on cases linked to this outbreak. This information can be communicated to Dr Mick Mulders at mmu@euro.who.int.

Acknowledgements:
Sequencing of measles viruses obtained from samples was done at two of the three WHO regional measles and rubella reference laboratories located at the G.N. Gabrichevsky Institute in Moscow and the Institute of Immunology in Luxembourg, and at one of the three global specialised measles laboratories that is located at the Centers for Disease Control and Prevention, United States.

References: