

## Rapid communications

# AN INCREASE IN REPORTED CASES OF HAEMORRHAGIC FEVER WITH RENAL SYNDROME IN SLOVENIA IN EARLY 2008

N Koren<sup>1</sup>, Eva Grilc<sup>1</sup>, M Blaško<sup>1</sup>, T Avsic<sup>2</sup>, Alenka Kraigher (aLenka.kraigher@ivz-rs.si)<sup>1</sup>

1. Communicable Disease Centre, National Institute of Public Health, Ljubljana, Slovenia

2. Institute of Microbiology and Immunology, Faculty of Medicine, University of Ljubljana, Slovenia

Haemorrhagic fever with renal syndrome (HFRS) is an acute zoonotic viral disease, caused by hantaviruses. Hantaviruses infect rodents worldwide. They are transmitted to humans by aerosol from rodent excreta. Several hantaviruses are known to infect humans with varying severity.

In Europe, three hantaviruses pathogenic for humans are well documented. Puumala virus (PUUV) carried by *C. glareolus* (bank vole) and causing a milder form of HFRS (Nephropathia epidemica) is reported throughout Europe and western Russia [1]. Dobrava virus (DOBV) is carried by *Apodemus flavicollis*, the yellow-necked field mouse, and is associated with a severe form of a disease with up to 12 % mortality in the Balkans [2,3]. Saaremaa virus (SAAV) is carried by *Apodemus agrarius*, the striped field mouse, and is found in the Baltic and Central Europe causing mild HFRS similar to PUUV infection [4,5,6].

The first hantavirus infection was diagnosed in Slovenia in 1952. Both severe and mild clinical courses of the disease have been observed, with an overall lethality rate of 4.5 percent [7]. We have demonstrated that DOBV and PUUV co-exist in a single endemic region of Slovenia and are capable of causing HFRS with significant differences in severity [2]. Earlier epidemiological surveys indicated that *A. flavicollis* and *C. glareolus*, which are common rodent species throughout central Europe, were most often infected with hantaviruses [8,9,10].

Notification of all hantavirus infections has been mandatory in Slovenia since 1978. They are reported to regional institutes of public health as HFRS (in the following text, all hantavirus infections caused by PUUV or DOBV will be addressed as HFRS). As of 16 April, 11 sporadic cases of HFRS have been reported in Slovenia (two in January, one in February, five in March, and three more until 16 April). This represents an early increase of reported HFRS cases (Figure 3). There were 14 cases of HFRS in the whole of 2007, and only two cases were reported in the same period last year (both in April).

All the cases reported this year have been from five of Slovenia's nine health regions: Ljubljana, Celje, Kranj, Maribor and Novo mesto (Figure 1). Two patients are women, nine are men. They are 34 to 75 years old.

Laboratory diagnosis (indirect immunofluorescent antibody (IFA) test for the detection of human serum IgG antibodies and ELISA for the detection of human serum IgM antibodies) of all

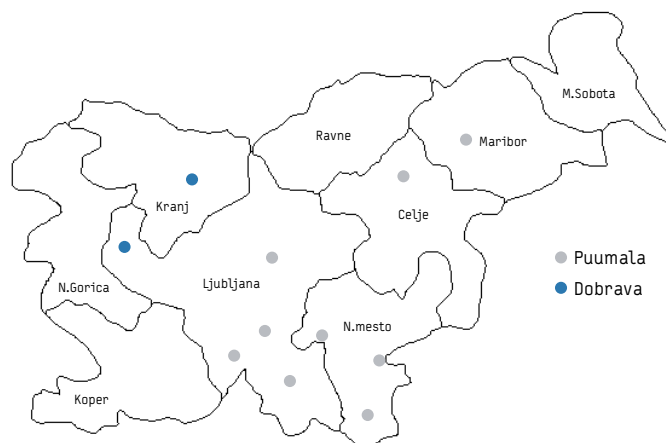
HFRS cases was performed by the Institute of Microbiology and Immunology at the Medical Faculty in Ljubljana. In nine cases, the infectious agent was Puumala and in two Dobrava. The causative virus was identified by using RT-PCR method in acute serum samples [11,12].

Some information about possible exposure is available for nine cases of HFRS (9/25 (25 = 14 from 2007 and 11 from 2008) = 36%) reported in 2007 and 2008: three of them worked in the field, four had contact with rodent excreta or direct contact with rodents at home and two patients had direct contact with rodents at their workplace.

In the last 10 years, zero to 27 HFRS cases were reported annually. Figure 2 shows the number of reported HFRS cases between 1999 and 2008.

More cases than usual are expected this year due to an early increase of cases in the first three months of 2008 and because the usual season of HFRS in Slovenia has only just begun. In previous years, most cases were reported in late spring and summer (Figure 3). The increase of cases in early 2008 has probably been as a result of a mild winter and its impact on the rodent population [13,14].

**FIGURE 1**  
Geographic distribution of reported hantavirus infections caused by Dobrava and Puumala, Slovenia, 1 January to 16 April 2008



### Control measures

Information about this increased occurrence of HFRS cases has been sent to regional public health doctors, general practitioners, infectologists, nephrologists and pediatricians. Rodent control in and around the home remains the primary strategy in preventing hantavirus infection. Therefore, general precautions to limit exposure to rodents have been stressed in communications with the media.

Precautions to limit exposure to rodents include:

- Interiors and exteriors of houses should be carefully inspected at least twice a year for any openings in which rodents could enter and for conditions that could support rodent activity [15], such as the possibility to store food or organic waste not kept in a rodent-proof manner;
- Inside the home, food, including pet food and water, should be kept in rodent-proof containers, while dishes and cooking utensils should be washed immediately after use.

- Leftover food should be cleaned up;
- Trash and garbage should be disposed on a frequent and regular basis;
- Safe methods to dispose of rodents' excreta and dead animals should be used.

If rodent infestation is severe or persistent, a pest control professional for rodent eradication should be called.

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FIGURE 2

Monthly distribution of reported hantavirus infections caused by Dobrava and Puumala in Slovenia in 2008\* (n=11), monthly distribution for 10 years (n=100) and 5 years (n=55) average and monthly distribution of average of two years with highest number of reported cases since the 1990s, when the electronic database was launched\*\*

\*1 January to 16 April 2008

\*\* 2002 (n=20) and 2005 (n=27) reported cases

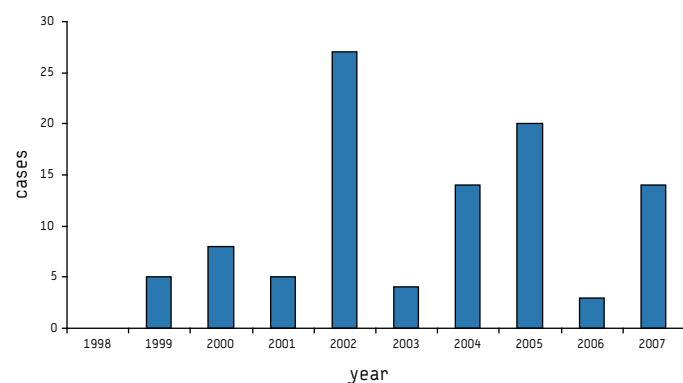


FIGURE 3

Number of reported hantavirus infections caused by Dobrava and Puumala in Slovenia (1999-2008\*; n = 111)

\*1 January to 16 April 2008

