Increased number of cases of haemorrhagic fever with renal syndrome in Slovenia, January to April 2012

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Haemorrhagic fever with renal syndrome is endemic in parts of Slovenia. Since 1999, in January to April each year, the number of notified cases has generally been low (n=0–6). A high number of cases (n=26) in the first four months of 2012 has been observed, similar to that seen in the same period in 2008 (n=14). Given the increase in the number of cases at the start of 2012, we can expect a high number of cases this year.

Situation at the beginning of 2012

From 1 January to 18 April 2012, 26 cases of haemorrhagic fever with renal syndrome (HFRS) were notified in Slovenia: 7 in January, 6 in February, 3 in March and 10 in April. The patients (19 male, 7 female) ranged in age from 21 years to 75 years (interquartile range: 33–57 years). This number of cases for the four-month period is unusually high and may herald an increased number of cases this year.

Background

Viruses of the genus *Hantavirus*, family *Bunyaviridae*, are the causative agents of HFRS. They are most commonly acquired from inhalation of aerosolised excreta from acute and chronically infected rodent hosts [1]. The disease is characterised clinically by the triad of fever, haemorrhage and renal insufficiency. A person with mild disease presents non-specific symptoms: headache, back and abdominal pain, fever, chills and nausea. Severe disease might involve severe pulmonary impairment, disseminated encephalomyelitis and renal dysfunction; in cases with severe disease, the case fatality rate is high, varying from less than 1% to 12%, depending on the causative viruses [2].

The disease was first reported in Slovenia in 1954 [3]. Since then, cases have occurred sporadically or in small epidemics [3]. Mandatory reporting of laboratory-confirmed HFRS cases is enforced by the Contagious Diseases Act issued in 1995. Both mild and severe clinical courses of the disease have been observed, with an overall mortality rate of 3.3% [4].

Dobrava and Puumala viruses – two hantaviruses that cause HRFS – have been shown to coexist in Slovenia [3]. There are considerable differences in disease severity as well as mortality due to infection with these viruses: all fatal HFRS cases in the country to date have been caused by infection with Dobrava virus, giving an 8.3% mortality rate for Dobrava virus-associated HFRS [4]. Infection with Puumala virus usually results in a milder disease course [5].

Since 1999, all HFRS cases have been laboratory confirmed at the National Reference Laboratory (at the Institute of Microbiology and Immunology, in the Faculty of Medicine at the University of Ljubljana): the laboratory notifies clinicians of the cases (immediately), as well as the regional epidemiologist (within three days) and the National Institute of Public Health (on a weekly basis).

Although HFRS patients have been found throughout the country, most of them have been reported in the endemic regions of Novo Mesto, Murska Sobota and Ljubljana. The Figure shows the mean annual incidence of notified HFRS cases from 1999 to 2011 by region.

Surveillance data show that in 1999–2007 and 2009–2011) the number of cases was low (n=0–6) in the first four months of each year (Table). In 2008 [6] and 2012, the number of cases in the first four months of the year was higher (14 and 26, respectively).

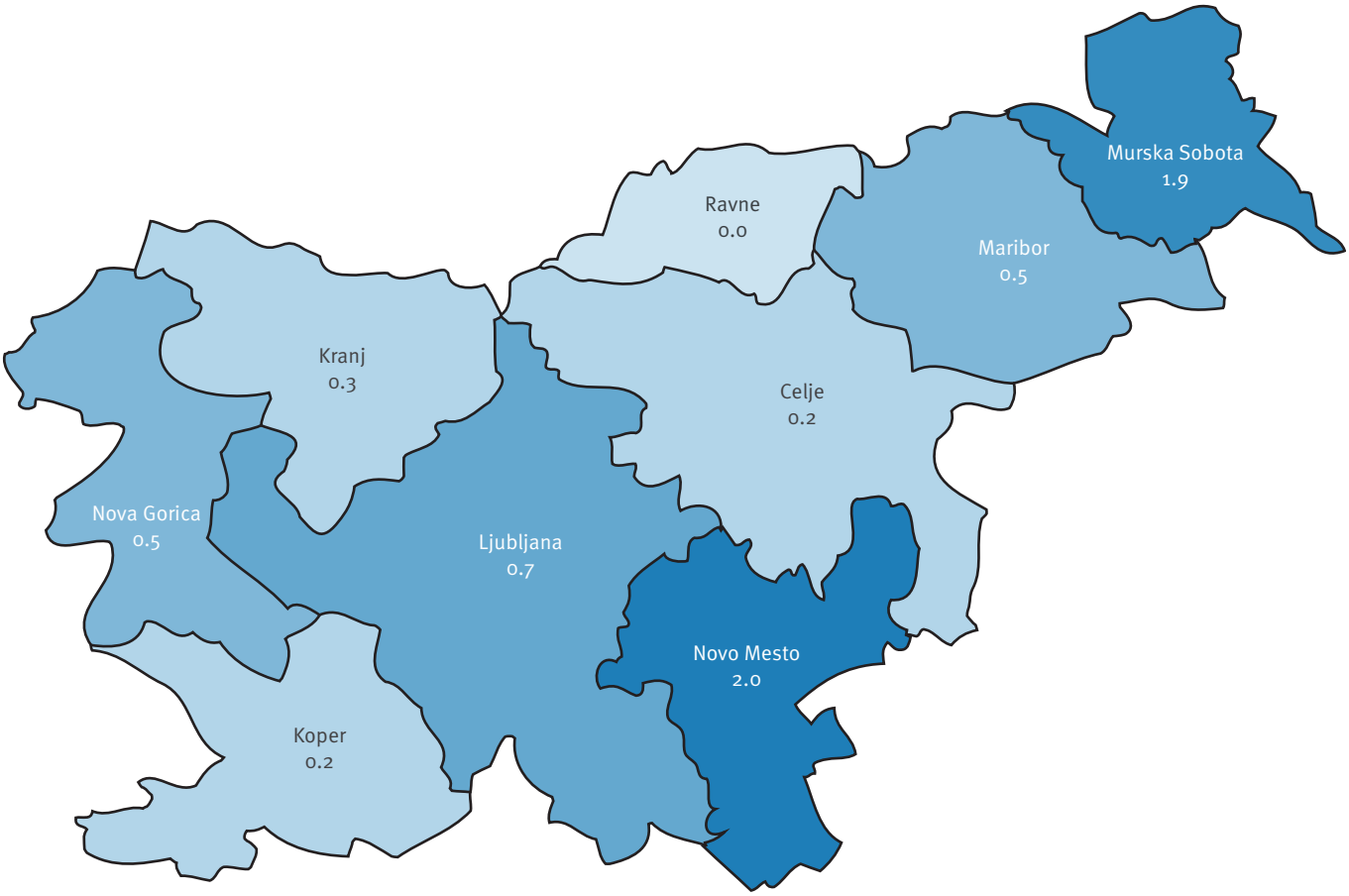
Epidemiological investigation of cases notified in 2012

All notified HFRS cases in 2012 were hospitalised. The infections were laboratory confirmed by indirect immunofluorescent antibody (IFA) test for detection of serum IgG antibodies and by enzyme-linked immunosorbent assay (ELISA) for detection of serum IgM antibodies [4]. The tests were performed by the National Reference Laboratory: the diagnostic procedures carried out have not changed since 1999.

In all 26 cases, the infectious agent was Puumala virus: it was identified in blood samples taken during the acute phase of disease by reverse transcription-PCR followed by direct sequencing of the PCR product [7,8].

Figure

Mean annual incidence of notified cases of haemorrhagic fever with renal syndrome, by region, Slovenia, 1999–2011 (n=182)



Mean annual incidence per 100,000 population per region is shown. The shading illustrates the regional variation in incidence.

Epidemiological investigation of the 26 cases involved visiting and interviewing them using a standardised questionnaire on exposure possibilities (including demographic data, epidemiological exposure history, sign and symptoms, laboratory tests, complications and outcome). This revealed that the work activities carrying potential risk for 18 of the patients living in the countryside were cleaning and working in barns and woodsheds, stocking corn and woodcutting. The work activities carrying potential risk for eight patients living in urban areas were cleaning basements and gathering firewood.

Eight of the patients (in rural and urban areas) reported having seen mice excreta.

Discussion

Since 1999, with the exception of 2008, the majority of HFRS cases each year have been reported in late spring and summer. Probable reasons for the increase in the number of HFRS cases in the first four months of 2012, as in 2008, are the mild winter and an abundance of available oak and beech seeds in the preceding summer and autumn. The bank vole (*Myodes glareolus*), the principle vertebrate host for Puumala virus, and the yellow-necked field mouse *(Apodemus flavicollis)*, the principle vertebrate host for Dobrava virus, are predominantly seed eaters [9].

Given the viral hosts and mode of transmission, one of the most important preventive measures is rodent control (use of traps, deratisation) in and around human dwellings [10]. In addition, minimising food available to rodents around residential areas is known to effectively reduce the rodent population [10]. To date, no systematic deratisation has been necessary.

Information on the increased occurrence of HFRS cases in 2012 has been provided to general practitioners, infectologists and nephrologists by regional epidemiologists by email.

TABLE

Notified cases and annual incidence of haemorrhagic fever with renal syndrome, by month, Slovenia, 1 January 1999–18 April 2012 (n=208)

Year	Month												Total	Annual incidence[a] per 100,000 population
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
1999	0	0	0	0	2	2	0	1	0	0	0	0	**5**	0.3
2000	1	0	1	1	2	1	1	1	0	0	0	0	**8**	0.4
2001	1	0	0	1	1	0	0	2	0	0	0	0	**5**	0.3
2002	1	1	0	4	3	8	5	3	1	1	0	0	**27**	1.4
2003	1	0	0	0	0	0	0	1	0	0	1	1	**4**	0.2
2004	2	0	0	2	1	1	2	3	0	1	0	2	**14**	0.7
2005	1	0	2	1	2	2	7	2	2	1	0	0	**20**	1.0
2006	1	0	0	0	1	0	0	0	0	0	0	1	**3**	0.1
2007	0	0	0	2	1	1	2	1	5	2	0	0	**14**	0.7
2008	2	1	5	6	6	11	6	4	1	3	0	0	**45**	2.2
2009	0	0	0	1	1	2	0	0	0	0	1	0	**5**	0.2
2010	2	0	0	0	1	1	2	2	5	1	1	2	**17**	0.8
2011	0	0	0	0	1	1	2	1	1	3	4	2	**15**	0.7
2012	7	6	3	10	–	–	–	–	–	–	–	–	**26**	1.3
Total	**19**	**8**	**11**	**28**	**22**	**30**	**27**	**21**	**15**	**12**	**7**	**8**	**208**	–

[a] For 2012, from 1 January to 18 April only.

Information on general hygiene and how to avoid contact with rodent urine, droppings, saliva and nesting materials, and the safety measures to be followed when cleaning rodent-infested areas has been widely spread through the local media and Internet [11].

In the light of our experience since 1999 – and in particular, the increased number of HFRS cases in 2008, with 14 cases in the first four months and a total of 45 cases at the end of the year – we can also expect a high number of cases by the end of 2012.

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