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1. Editorial

The first miscellaneous article covers a tragic death of a young girl from Romania following the bite of a rabid cat. Sadly, PEP was not administered and the girl was hospitalized after the first signs of the disease. In the doctors' desperate fight against the inevitable the "Milwaukee protocol" was used, however without success.

The second article is provided by the colleagues from the ANSES, Nancy which was designated as European Reference Laboratory for Rabies in 2008. This article reviews data on rabies diagnoses and follow-up investigations of oral rabies vaccination performed in NRLs in the European Union in 2010.

The rabies data for the 2nd quarter of 2011 is presented in tables and a map. For the first time in recent decades rabies cases were detected in Macedonia. Presumably the cases were noticed as a result of the increased surveillance and awareness activities as part of the EU-funded oral rabies vaccination programme in Macedonia.

Conrad Freuling
Thomas Müller

2. SUMMARY OF RABIES CASES IN EUROPE

RABIES CASES 2nd QUARTER 2011 01.04.11-30.06.11

Name	Code	Total	Wildlife	Domestic animals	Bats	Human
ALBANIA	ALB	0	0	0	0	0
AUSTRIA	AUT	0	0	0	0	0
BELARUS	BLR	355	238	117	0	0
BELGIUM	BEL	0	0	0	0	0
BOSNIA - HERCEGOVINA	BIH	4	2	2	0	0
BULGARIA	BGR	1	1	0	0	0
CROATIA	HRV	85	75	10	0	0
CYPRUS	CYP	0	0	0	0	0
CZECH REPUBLIC	CZH	0	0	0	0	0
DENMARK	DNK	0	0	0	0	0
ESTONIA	EST	0	0	0	0	0
FINLAND	FIN	0	0	0	0	0
FRANCE	FRA	2	0	0	2	0
GERMANY	DEU	3	0	0	3	0
GREECE	GRC	0	0	0	0	0
HUNGARY	HUN	0	0	0	0	0
ICELAND	ISL	0	0	0	0	0
IRELAND	IRE	0	0	0	0	0
ITALY	ITA	0	0	0	0	0
LATVIA	LVA	0	0	0	0	0
LITHUANIA	LTU	4	3	1	0	0
LUXEMBOURG	LUX	0	0	0	0	0
MACEDONIA	MKD	5	5	0	0	0
MALTA	MLT	0	0	0	0	0
MOLDOVA	MDA	3	0	3	0	0
MONTENEGRO	MNE	3	3	0	0	0
NETHERLANDS	NED	4	0	0	4	0
NORWAY	NOR	0	0	0	0	0
POLAND	POL	19	14	4	1	0
PORTUGAL	PRT	0	0	0	0	0
ROMANIA	ROU	45	25	20	0	0
RUSSIAN FEDERATION	RUS	471	236	234	0	1
SERBIA	SRB	12	9	3	0	0
SLOVAK REPUBLIC	SVK	0	0	0	0	0
SLOVENIA	SVN	0	0	0	0	0
SPAIN	ESP	1	0	0	1	0
SWEDEN	SWE	0	0	0	0	0
SWITZERLAND + LIEC.	CHE	0	0	0	0	0
TURKEY	TUR	90	14	76	0	0
UKRAINE	UKR	218	70	148	0	0
UNITED KINGDOM	UNK	0	0	0	0	0
TOTAL		1325	695	618	11	1

Wildlife: excluding bats

* no data

3. Miscellaneous Articles

3. 1 Human Rabies in a Romanian boy – an ante mortem case study

M. Luminos[1], G. Barboi[2], A. Draganescu[1], A. Streinu Cercel[1], F. Staniceanu1, G. Jugulete[1], A. Visan[1], C. Negulescu[1], M.A. Turcitu[2]
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Rabies is endemic in the Balkan region, including Romania, with the main reservoir being the red fox (Vulpes Vulpes). However, a substantial number of wildlife cases other than foxes have also been reported in Romania (Avram et al, 2006). Genetic characterization of rabies viruses characterized showed a high degree of genetic diversity, indicating several introduction from neighbouring countries (Turcitu et al, 2010). Besides wildlife species, most rabies cases in domestic animals are diagnosed in pets, i.e. dogs and cats (WHO Rabies Bulletin Europe), therefore antirabic vaccination is compulsory but only for dog owners. The close contact to these animals and perhaps insufficient public awareness about rabies increases the possibility of human exposure to rabies virus (Barboi et al, 2007)

Rabies is inevitably fatal once clinical symptoms of the disease are observed. Recently, a form of induced-coma is suggested to have contributed to the survival of a teenager infected with rabies and was used as "Milwaukee protocol" in several human rabies patients with limited success (Hunter et al., 2010). Here, we describe a human rabies case in a 11 years old female child from the southern part of Romania, In the doctors' fight to safe the life of the girl a similar protocol was used.

Anamnesis showed that the patient was bitten 6 weeks before developing clinical signs by an unvaccinated domestic cat on the left hand thumb region; in the same day, another 14 years old male child was attacked by the same cat. Following these events, but only for the 14 years old boy, proper antirabic specific therapy was conducted after 48 hours.

Clinical signs were represented by altered general condition, fever (38-39ºC body temperature) and dysfagia starting 48 hours prior to Slatina county hospital submission on 8th of august. During the next day the patient status got worse, with the installation of marked psychomotor agitation, hydrofobia, laringeal spasm and hiperosmia. Imagistic computer thomograph investigation did not revealed any anathomopathologic lesions on the central nervous system (data not shown).

Due to the suspicion of rabies and the rapid deterioration of clinical status, the patient was transferred to Matei Bals National Institute for Infectious Disease, Bucharest, on 10th of august. Here, the following clinical signs were registered: fever (38ºC), marked psychomotor agitation that alternated with somnolent periods, aerophobia, hydrophobia, hiperosmia, hypersalivation, dryness of mucous membranes and skin, tachycardia (AV 170 beats/minute, arterial blood pressure 100/70 mmHg), without signs of inflamatory meningitis.

After 24 hours, the patient condition agravates, showing spontaneous

laryngospasm and respiratory disorders, hipersalivation, tachycardia (170 beats/minute) and mydriasis.

Treatment: Initial treatment consisted of specific antirabic serum administration (Favirab, 40U/kg body weight) and vaccination (Verorab, 6 doses), along with protective antibiotherapy - ceftriaxone 100mg/kgbw/24h, ciprofloxacin 25mg/kgbw/24h and later on meropenem 120mg/kgbw/day with the evidentiation of pulmonary implication (radiographic examination), hydration treatment (glucose and electrolytes – intravenous route), sedation with diazepam and/or phenobarbital.

As the situation got worse, it was decided to swich to orotracheal intubation and assisted ventilation together with drug induced coma (midazolam, thiopental, ketamine), antiviral treatment (amantadine 100mg/dose administered twice per day, ribavirin 16mg/kgbw/dose administered four times per day), symptomatic treatment (anti-inflammatory/antipyretic – ibuprofen, H2 antagonist - ranitidin) and supplements (Q10 coenzyme, magnesium, vitamins B6 and C), according to Milwaukee international protocol guidance.

Laboratory findings:

Biochemical examination:

Hyperuremia identified in the second biochemical screening (102,7mg/dl) seems to be of pre-renal origin; this findings are supported by normal creatinine levels identified in both tests performed but also by normal specific gravity of the urine and absence of proteinuria that can be attributed to kidney failure (acute and/or chronic). Moreover, elevated activity of Creatine Kinase (CK) and Lactate Dehydrogenase (LDH) shows clear implication of the muscle in terms of acute myositis, situation that also supports the elevated levels of BUN (blood urea nitrogen) and clearly indicates an intense catabolic state that occurs in marked psychomotor situations, including rabies.

Another interesting finding is the elevated activity of heart fraction of Creatine Kinase (CKMB, most likely attributed to the inflammation of the myocardium, supported also by clinical findings in terms of tachycardia and in concordance with the evolution of rabies. Regarding serum transaminases (GOT, GPT and GGT), high degree of activity can be observed, situation compatible with severe hepatic injuries, most likely due to the prolonged administration of sedatives and/or anesthetics (diazepam, phenobarbital, ketamine).

Besides the above mentioned biochemical abnormalities, several others were identified, however with low degree of implications in the disease evolution: hypoalbuminemia (2,5g/dl) identified in the second biochemical screening might be a consequence of poor exogenous intake of protein sources, directly chorelated with the imposibility of feeding, hyponatremia observed in the first screening can be atributed to vomiting episodes that might occur at this stage, whereas hypernatremia from the second screening is most likely atributed to the parenteral route administration of electrolytes.

Biochemistry results

Test	Screening date 15.08.2010	03.09.2010	Reference values
Glucose	118	113	65-105 mg/dl
Urea (BUN)	12,1	102,7	15-36 mg/dl
Creatinine	0,3	0,8	0,2-0,7 mg/dl
Natrium	126	154	137-145 mmol/L
Potassium	2,7	3,8	3,6-5 mmol/L
Amylase	73	ND	30-100 U/L
Lipase	364	ND	23-300 U/L
AST/GOT	678	687	10-40 U/L
ALT/GPT	186	968	10-30 U/L
GGT	ND	254	17-28 U/L
Ionised Calcium	3.8	ND	3,36-4,8 mg/dl
LDH	1995	3711	380-700 U/L
CK	22876	544	80-230 U/L
CKMB	122	34	1-16 U/L
Albumin		2,5	3,7-5,6 g/dl
Total Protein	6,3	ND	6,3-8,6 g/dl
Total Calcium	8,2	ND	8,9-10,1 mg/dl
Fe (iron)	58	ND	37-170 µg/dl

ND = not determined

Haematological investigation:

In general, haematological findings seem to be unspecific for the disease evolution, possibly with one single exception of monocytosis in the first screening that can suggest viral implication. Apart from this, and only for the first screening, increase in white blood cells and neutrophiles numbers can orientate to a secondary bacterial infection (neutrophilic leukocytosis), since for the second screening those values were normal again due to the administration of general antibiotherapy.

Interestingly, along with disease evolution, mild to moderate anemia has been detected (second screening, with low number of red blood cells, hemoglobin and hematocrit levels), situation that might be attributed to prolonged infection. Moreover, the chorelation between low number of trombocytes (PLT), fibrinogen decrease and increase in D dimers can be attributed to disseminated intravascular coagulation.

Haematological results

Test	Date 10.08.2010	03.09.2010	Reference values
WBC	20,1	8,2	3,9-9,6 x 10^3/µL
NE %	74,4	55,4	37-73%
LY %	13,9	35,5	20-55%
MO %	10,7	7	2,5-10%
EO %	1	2	0,6-11%
BA %	0	0,3	0-2%
NE #	15	4,5	1,4-6,5 x 10^3/µL
LY #	2,7	2,9	1,2-3,4 x 10^3/µL
MO #	2.2	0,6	0-0,7 x 10^3/µL
EO #	0,2	0,2	0-0,7 x 10^3/µL
BA #	0	0	0-0,2 x 10^3/µL
RBC	4,67	3,6	3,9-5,710^3 x 10^3/µL
HGB	13	11	12,1-17,2 g/dl
HCT	39,6	33,2	36,1-50,3%
MCV	84,8	92,3	82,2-97,4 fL
MCH	27,8	30,6	27,6-33,3pg
MCHC	32,8	33,2	33-34,8 g/dl
RDW	13	16	11,6-13,7%
PLT	309	138	200-400 x 10^3/µL
MPV	4,7	9	7,8-11 fL
PCT	0,15	ND	0-0,99%
PDW	15,9	ND	0-99,9%

ND = not determined

Anatomo-pathological examination:

Macroscopic findings showed meningeal and cerebral hyperaemia, rabies encephalopathy, enlargement (congestion) of liver (correlated with the increased activity of serum transaminases), spleen (possibly due to prolonged anaesthesia and infection) and kidney, pulmonary oedema, enlargement of right atrium and ventricle (correlated with the increased activity of CKMB).

Histopathological findings: vast areas of brain tissue showing disruption of brain substance with marked edema and fragmentation of nerve fibers, sometimes with neuronal necrosis; rare multinucleated astrocytes (gemistocytes), along with the existence of eosionophilic inclusions in basal nuclea and cerebellum (Babes-Negri bodies); moderate inflammatory response through limfoplasmocitary infiltrations, reactive microgliosis, marked microvascular proliferation.

RT-PCR:

Biological material subjected to analysis was represented by cerebrospinal fluid as well as saliva.

RNA isolation was performed from cerebrospinal fluid using commercial kits available – *PureLink RNA Mini Kit* (Invitrogen), protocol recommended by the manufacturer, using 200µl of sample and RNA elution in 50µl of water. For saliva samples, an initial lysis with Trizol reagent (Invitrogen) was performed using 250µl of sample, acording to manufacturer instructions, followed by centrifugation and phases separation. Aproximately 600µl of the upper RNA aqueos phase was further purified and concentrated using *PureLink RNA Mcro Kit* (Invitrogen), with elution in 20µl of water

Revers transcription and amplification

The near complete nucleoprotein open reading frame was amplified using primers described by Bourhy (not published), commercial *OneStep RT-PCR Kit* (Qiagen), protocol recommended by the manufacturer, with final reaction volume of 50µl and primer concentration of 0,6µM. Thermal profile consist of one 50minutes at 50°C for revers - transcription, 15 minutes at 95°C for inactivation of revers transcriptases, initial denaturation and Taq activation, 40 PCR cycles of 95°C for 35 seconds, 55°C for 40 seconds and 72°C for 2 minutes, 8 minutes at 72°C final extension and 4°C upon gel loading (Figure 1).

For cerebrospinal fluid, no specific amplicons were obtained at this stage, due to the low amount of viral RNA; therefore, a second heminested PCR was conducted, using the forward primer JW6 described by Heaton (Figure 2). The partial amplification of the rabies nucleoprotein was performed with the FastStart Taq DNA polymerase kit (Roche Applied Science), following the manufacturer recommendations, in a final concentration of 0.6µM primers, 2mM $MgCl_2$, 200µM of each dNTP and 2 units of DNA polymerase enzyme. A volume of 10µl of first stage PCR was used in a final volume of 50µl per reaction.

PCR products purification and sequencing was conducted using *QIAquick Gel Extraction Kit* (Qiagen), protocol recommended by the manufacturer and subjected to direct sequencing using *BigDye Terminator V1.1 Cycle Sequencing Kit* on 3130 Genetic Analyzer (both Applied Bioscience).

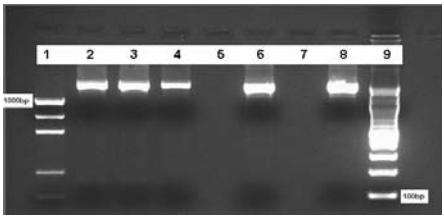

Figure 1. RT-PCR results for saliva samples, Lane 1,9 – molecular ladders, 2-4 – analyzed samples
5,7 – negative controls (NC), 6, 8 - positive controls (PC)

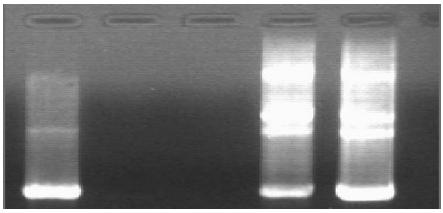

Figure 2. RT-PCR results for cerebrospinal fluid samples, Lane 1– analyzed sample, 2, 3 – NC, 4, 5 – PC

Phylogenetic investigation

Sequence aligning and reconstruction was performed using *Bio Edit* and *Clustal W* softwares, resulting in partial but significant 1308bp (base pairs) fragment length of the nucleoprotein gene. Phylogenetic tree was obtained using *MEGA 4.0* software, Neighbour Joining algorithmic method, bootstrap value of 3000 replicates and Kimura 2 parameter (Figure 3). Results showed that the human sequence falls into previously described lineage RO#2, along with sequences isolated mainly from the south-western part of the country.

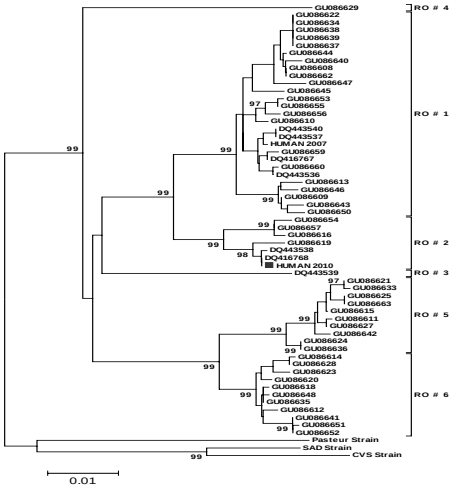

Figure 3. Phylogenetic tree of the Romanian rabies isolates obtained using NJ algorithm, bootstrap support of 3000 replicates. Laboratory strains SAD, Pasteur and CVS were used as an outgroup. Human sequence is marked.

Discussion

Pathological and laboratory diagnostics confirmed the clinical suspicion on rabies as a cause for the disease and death in this girl. Especially molecular tools such as RT-PCR proved their sensitivity in the early ante mortem diagnosis as described before (Hunter et al. 2010). The genetic characterization supported the exposure by a rabies virus from the southeast of Romania.

The case reiterates the need for public health awareness in respect to the risk of contracting rabies, especially for the rural and suburban areas, where probability for domestic animals to come in contact with infected wild animals is higher. Moreover, for this particular areas, aditional effort from the authorities to further emphasize the risk seems to be needed, since not all such events are treated with the same respect – proper PEP was initiated only for the young boy. Finally, by strengthening the response to such cases through early diagnostic methods and

specific measures from the authorities in order to have the same approach in case of rabies suspicion hopefully will conduct in decreasing the period of time from the event to proper treatment. Timely and adequate PEP as recommended by WHO remains the mainstay for the prevention of human rabies. Using the Milwaukee protocol offers clinicians a treatment option, however, this will not prevent the majority of human deaths. Nevertheless, each attempt allows for a discussion on the pros and cons on using this protocol, perhaps providing further insights into rabies pathogenesis and host response to specific and/or symptomatic treatment.

References:

1. Avram M., Ciupescu L., Firuta F., Siposean C., Turcitu M., Gruia M., Stefan N. Rabies in Romania - past, present and future. Rabies Bull. Eur. 30, 5–10, 2006.
2. Barboi Gh., D. Dermengiu, M. Costescu, V. Vuta, N. Alexandru, M. Turcitu, St. Nicolae, Fl. Dumitrescu. Laboratory diagnostic of a human rabies case. Rom J Leg Med 15 (2) – (2007).
3. Paul R. Heaton, Pamela JohnstonE, Lorraine M. MCElhinney, Roy Cowley, Elizabeth O'Sullivan, Janice E. Whitby. Heminested PCR Assay for Detection of Six Genotypes of Rabies and Rabies-Related Viruses. Journal Of Clinical Microbiology, 0095-1137/97/$04.0010 Nov. 1997, p. 2762–2766.
4. Rupprecht CE, Hanlon CA, Hemachudha T. Rabies re-examined. Lancet Infect Dis 2002 Jun;2(6):327-43.
5. Schmiedel S, Panning M, Lohse A, Kreymann KG, Gerloff C, Burchard G, Drosten C. Case report on fatal human rabies infection in Hamburg, Germany, March 2007. Euro Surveill. 2007;12(22):pii=3210.
6. Tamura K., Dudley J., Nei M., Kumar S., 2007. MEGA4: Molecular Evolutionary Genetics Analysis (MEGA) Software Version 4.0. Mol. Biol. Evol. 24(8):1596–1599. 2007.
7. Turcitu M.A., G. Barboi, V. Vuta, I. Mihai, D. Boncea, F. Dumitrescu, M.D. Codreanu, N. Johnson, A.R. Fooks, T. Müller, C.M. Freuling. Molecular epidemiology of rabies virus in Romania provides evidence for a high degree of heterogeneity and virus diversity - Virus Research 150 (2010) 28–33.
8. Willoughby RE Jr, Tieves KS, Hoffman GM, Ghanayem NS, Amlie-Lefond CM, Schwabe MJ, et al. Survival after treatment of rabies with induction of coma. N Engl J Med 2005 Jun 16;352(24):2508-14.

3. 2 Review of the analysis related to rabies diagnosis and follow-up of oral vaccination performed in NRLs in the EU, 2010

E. Robardet and F. Cliquet

Anses, Nancy laboratory for rabies and wildlife, WHO CC for Research and Management in Zoonoses Control, OIE RL for Rabies, EU RL for Rabies and Rabies Serology

An annual activity questionnaire was sent to National Reference laboratories (NRLs) last January 2011 to collect and collate data on methods used and results of test carried out in the Community for rabies control (Commission regulation N° 737/2008). Questionnaires from 22 NRLs were received back. This document reviews the analysis performed at the scale of the European Union in 2010.

GENERAL DATA

Reference laboratory network includes 27 National Reference Laboratories (one of them is the European Union Reference Laboratory) and 127 regional laboratories. For the full year 2010, 75 873 Fluorescent Antibody tests, 3 788 Rabies Tissue Culture Infection Tests, 1 962 Mouse Inoculation Tests, 2 448 RT-PCR and 2157 Real Time PCR were performed for rabies diagnosis.

In the frame of oral vaccination campaign follow-up, 27 221 wildlife serology tests and 39 366 tetracycline (TTC) detection tests were carried out.

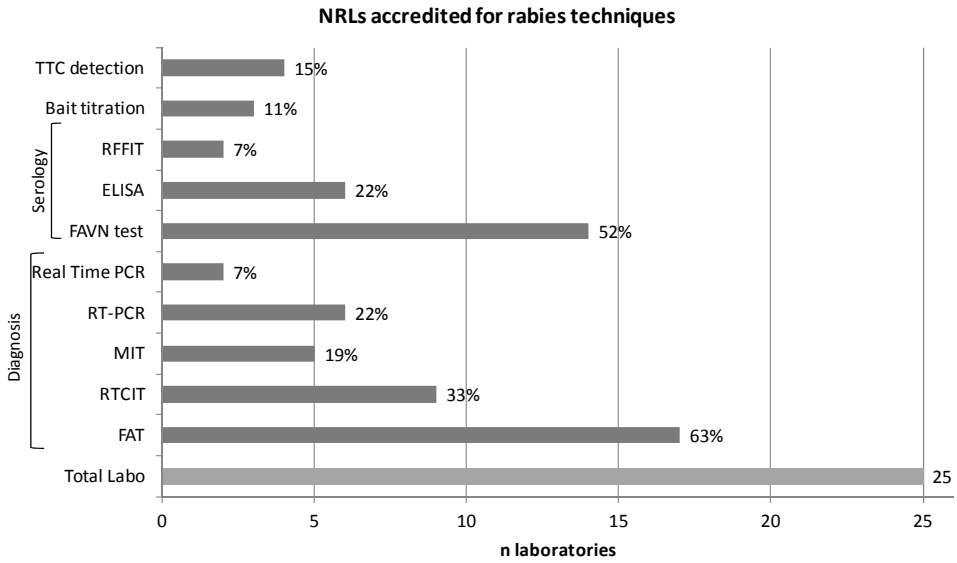

Figure 1: Accreditation in the field of rabies in NRLs

QUALITY ASSURANCE

Twenty two on 25 laboratories (2 NRLs not included in the data set) have at least an accreditation for one of the techniques relatives to rabies.Fluorescent Antibody test (FAT) harbours the highest frequency of laboratories with accreditations among rabies techniques in European Union level (63%) (Figure1) as this method is the gold standard for rabies diagnosis. FAT is followed by FAVN test with 52% of accredited laboratories. Rabies Tissue Culture Infection Test (RTCIT) and RT-PCR are also well represented with respectively 33% and 22% of accredited laboratories.

RABIES DIAGNOSIS TESTS

All laboratories (except one laboratory not allowed to work with live rabies virus and acquiring BSL3 laboratory) currently use FAT (Table 1). RTCIT and Mouse Inoculation Test (MIT) are not systematically performed as confirmatory test. Six laboratories use neither of these two techniques. Molecular biology techniques are more frequently used than MIT (32% of laboratories perform MIT while 44% perform RT-PCR and 56% perform Real Time PCR) and typing is undertaken in 28% of laboratories.

Table 1: Rabies diagnosis tests performed in 2010 in the frame of rabies surveillance

	References methods			Molecular Biology		
Country	**FAT**	**RTCIT**	**MIT**	**RT-PCR**	**Real-Time**	**Typing**
Austria	x (2613)	x (99)	not done	x (13)	x (13)	not done
Belgium	x (604)	x (14)	not done	not done	x (60)	x (1)
Bulgaria	x (288)	not done	x (11)	not done	not done	not done
Cyprus	x	not done	not done	x	not done	not done
Czech Republic	x (5984)	not done	x (264)	not done	not done	not done
Denmark	x (14)	x (4)	not done	not done	x (12)	not done
Estonia	x (239)	x (86)	not done	not done	x (86)	not done
Finland	x (490)	x (53)	not done	x (9)	x (459)	not done
France	x (281)	x (281)	x (3)	x (281)	not done	x (6)
Germany	x (11992)	x	not done	x (10)	x (247)	x (50)
Greece	x (22)	x (7)	x (7)	not done	not done	not done
Hungary	x (5766)	not done	not done	x (8)	not done	not done
Ireland	not done	not done	not done	x (4)	x (4)	not done
Italy	x (9490)	x (1450)	not done	x (1338)	x (907)	x (208)
Latvia	x (2387)	x (484)	not done	x (39)	not done	x (16)
Lithuania	x (1166)	x (541)	not done	not done	not done	not done
Poland	x (26119)	x (402)	x (16)	x (139)	x (139)	x (127)
Portugal	x (2)	x (2)	not done	x (2)	x (2)	not done
Romania	x (1593)	not done	x (1119)	not done	not done	not done
Slovakia	x (3304)	not done	x (536)	not done	x (5)	not done
Slovenia	x (2587)	not done	not done	x (234)	not done	x (16)
Spain	x (147)	x (9)	x (6)	x (223)	not done	x (4)
Sweden	x (45)	not done	not done	not done	x (83)	not done
The Netherlands	x (171)	not done	not done	not done	x (171)	not done
United Kingdom	x (619)	x (356)	not done	x (148)	x (33)	not done
Total	24/25 (**96%**)	15/25 (**60%**)	8/25 (**32%**)	11/25 (**44%**)	14/25 (**56%**)	8/25 (**32%**)

TECHNIQUES USED FOR ORV MONITORING IN 2010

Eleven EU countries were involved in oral vaccination programmes in 2010. Bait titration were carried out in NRLs of involved countries except for four countries where the titration was undertaken in another laboratory. Three different techniques of serology are used for

monitoring efficacy of oral vaccination campaigns: ELISA, RFFIT and FAVN test. ELISA is the test the most frequently used (73% of laboratories performing serology tests) followed by RFFIT (18%). Only one laboratory (9%) performs FAVN test. Tetracycline detection was undertaken in every country either by NRL or regional laboratories.

RESULTS OF ORV MONITORING

It should be noted that data of rabies antibody and tetracycline determination percentages should be interpreted taking into account the strategy of oral vaccination adopted.

Levels of tetracycline detection in fox teeth were found highly heterogeneous among countries varying from 12% to 91% (Figure 3). Same trends were observed in seroconversion rates varying from 17% to 73% when using ELISA test and from 45% to 82% for RFFIT (Figure 2). The country performing FAVN test obtained 65% of seroconverstion.

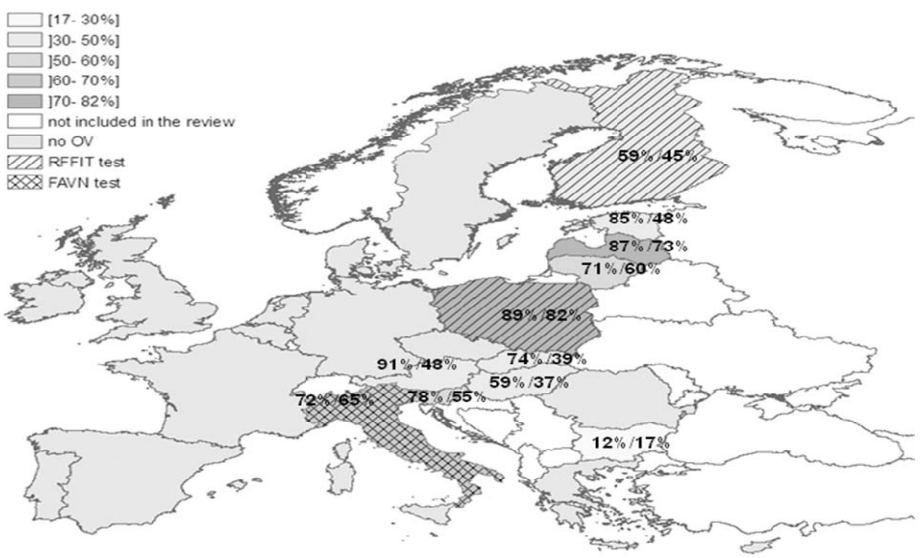

Fig 2: Level of tetracycline detection and seroconversion rate in target population in 2010

CONCLUSION

- A low level of typing was observed on isolates currently found positive for rabies. As recommended by EC, OIE and WHO, every positive sample should be typed. If technique is not available in a NRL, contact should be taken to perform analysis in specialised NRLs.
- RTCIT and MIT are not systematically used as confirmatory test for FAT while molecular biology techniques (RT-PCR and Real Time PCR) are more frequently used. Inter-laboratory tests on diagnosis techniques ensure comparability of rabies data within Members States and should continue. Participation in

proficiency testing is also part of quality assurance issues.

- In EU, evaluation of fox seroconversion levels is performed using three different tests (FAVN test, RFFIT and ELISA. A high variability in serology and tetracycline detection results is observed.

These data should be interpreted in view of oral vaccination strategy used. However, these data suggest the need to harmonize the technique used for TTC detection and for serology. Particularly for serology, the technique of choice for serology follow-up should be stated to obtain more comparable results for monitoring oral vaccination campaigns.

4 DISTRIBUTION OF RABIES IN EUROPE

4.1 Country summaries of rabies cases, 2nd quarter 2011

01.04.11-30.06.11

Country			*Domestic animals*									*Wildlife*																		
Name	Code		dog	cat	cattle	equine	goat sheep	pig	stray dog	other	subtotal	fox	racoon dog	racoon	wolf	badger	marten	other mustelides	other carnivores	wild boar	roe deer	red deer	fallow deer	other	subtotal	bat	Human cases	total
Albania	ALB	*									0														0			0
Austria	AUT	*									0														0			0
Belarus	BLR		57	37	19	3		1			117	190	28		2	1	10							7	238			355
Belgium	BEL	*									0														0			0
Bosnia - Hercegovina	BIH		2								2	2													2			4
Bulgaria	BGR										0	1													1			1
Croatia	HRV		3	4		2	1				10	74					1								75			85
Cyprus	CYP	*									0														0			0
Czech Republic	CZH	*									0														0			0
Denmark	DNK	*									0														0			0
Estonia	EST	*									0														0			0
Finland	FIN	*									0														0			0
France	FRA										0														0	2		2
Germany	DEU										0														0	3		3
Greece	GRC	*									0														0			0
Hungary	HUN	*									0														0			0
Iceland	ISL	*									0														0			0
Ireland	IRE	*									0														0			0
Italy	ITA	*									0														0			0
Latvia	LVA	*									0														0			0
Lithuania	LTU				1						1	1	2												3			4
Luxembourg	LUX	*									0														0			0
Macedonia	MKD										0	3			2										5			5
Malta	MLT	*									0														0			0
Moldova	MDA		2					1			3														0			3
Montenegro	MNE										0	2												1	3			3
Norway	NOR	*									0														0			0
Poland	POL		3		1						4	11				2	1								14	1		19
Portugal	PRT	*									0														0			0
Romania	ROU		7	5	5	1	2				20	23											2		25			45
Russian Federation	RUS		98	73	32		27		4		234	186	29		2		3	5	1	2	1		1	6	236		1	471
Serbia	SRB		1	1	1						3	9													9			12
Slovak Republic	SVK	*									0														0			0
Slovenia	SVN	*									0														0			0
Spain	ESP										0														0	1		1
Sweden	SWE	*									0														0			0
Switzerland + Lichtenstein	CHE	*									0														0			0
The Netherlands	NED										0														0	4		4
Turkey	TUR		29	1	41	3	2				76	11			3										14			90
Ukraine	UKR		50	71	21		5	1			148	60	4			2	3							1	70			218
United Kingdom	UNK	*									0														0			0
TOTAL			252	192	121	9	37	3	4	0	618	573	63	0	9	5	18	5	1	2	1	0	3	15	695	11	1	1325
PER CENT			19,0%	14,5%	9,1%	0,7%	2,8%	0,2%	0,3%	0,0%	46,6%	43,2%	4,8%	0,0%	0,7%	0,4%	1,4%	0,4%	0,1%	0,2%	0,1%	0,0%	0,2%	1,1%	52,5%	0,8%	0,1%	100%

* NO CASES ** NO DATA

4.2 Rabies cases per country and administrative units, 2nd quarter 2011 **01.04.11-30.06.11**

Location	*Domestic animals*									*Wildlife*																	
	dog	cat	cattle	equine	goat sheep	pig	stray dog	other	subtotal	fox	racoon dog	racoon	wolf	badger	marten	other mustelides	other carnivores	wild boar	roe deer	red deer	fallow deer	other	subtotal	bat	Human cases	total
BELARUS																											
Brest	3			1					4	26	2				2							1	31			35
Gomel	23	10	8						41	32	3		1		3								39			80
Grodno	13	14	5			1			33	39	7			1	4								51			84
Minsk	6	9	2	1					18	16	2											3	21			39
Mogelev	8	2	1						11	59	8		1		1							3	72			83
Vitebsk	4	2	3	1					10	18	6												24			34
TOTAL	57	37	19	3	0	1	0	0	117	190	28	0	2	1	10	0	0	0	0	0	0	7	238	0	0	355
PER CENT	16,1%	10,4%	5,4%	0,8%	0,0%	0,3%	0,0%	0,0%	33,0%	53,5%	7,9%	0,0%	0,6%	0,3%	2,8%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	2,0%	67,0%	0,0%	0,0%	100%
BULGARIA																											
Kyustendil									0	1													1			1
TOTAL	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
PER CENT	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	100,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	100,0%	0,0%	0,0%	100%
CROATIA																											
Bjelovarsko - Bilogorska									0	6													6			6
Istarska									0	14													14			14
Karlovacka		1							1	8													8			9
Koprivnisko - Krizevaska				1					1														0			1
Krapinsko - Zagorska									0	2													2			2
Osjesko - Baranjska	1								1	3													3			4
Pozesko - Slovanska				1	1				2	2													2			4
Primorsko - Goranska									0	4													4			4
Sisacko - Moslovacka	2	1							3	15													15			18
Splitsko - Dalmatinska									0	5													5			5
Varazdinska									0	7					1								8			8
Viroticko - Podravska									0	2													2			2
Vukovarsko - Srijemska									0	4													4			4
Zagrebacka		2							2	2													2			4
TOTAL	3	4	0	2	1	0	0	0	10	74	0	0	0	0	1	0	0	0	0	0	0	0	75	0	0	85
PER CENT	3,5%	4,7%	0,0%	2,4%	1,2%	0,0%	0,0%	0,0%	11,8%	87,1%	0,0%	0,0%	0,0%	0,0%	1,2%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	88,2%	0,0%	0,0%	100%
POLAND																											
Lubelskie									0	1													1			1
Malopolskie			1						1	1				1	1								3			4
Mazowieckie									0														0	1		1
Podkarpackie	3								3	7				1									8			11
Podlaskie									0	1													1			1
Warminsko-Mazurskie									0	1													1			1
TOTAL	3	0	1	0	0	0	0	0	4	11	0	0	0	2	1	0	0	0	0	0	0	0	14	1	0	19
PER CENT	15,8%	0,0%	5,3%	0,0%	0,0%	0,0%	0,0%	0,0%	21,1%	57,9%	0,0%	0,0%	0,0%	10,5%	5,3%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	73,7%	5,3%	0,0%	100%

4.2 Rabies cases per country and administrative units, 2nd quarter 2011 **01.04.11-30.06.11**

Location	*Domestic animals*									*Wildlife*																	
	dog	cat	cattle	equine	goat sheep	pig	stray dog	other	subtotal	fox	racoon dog	racoon	wolf	badger	marten	other mustelides	other carnivores	wild boar	roe deer	red deer	fallow deer	other	subtotal	bat	Human cases	total
GERMANY																											
Cuxhaven									0														0	1		1
Frankfurt (Oder),Stadt									0														0	1		1
Hannover (Region)									0														0	1		1
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
PER CENT	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	100,0%	0,0%	100%
LITHUANIA																											
Panevezio			1						1														0			1
Utenos									0		2												2			2
Vilniaus									0	1													1			1
TOTAL	0	0	1	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	3	0	0	4
PER CENT	0,0%	0,0%	25,0%	0,0%	0,0%	0,0%	0,0%	0,0%	25,0%	25,0%	50,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	75,0%	0,0%	0,0%	100%
MACEDONIA																											
Makedonija									0	3			2										5			5
TOTAL	0	0	0	0	0	0	0	0	0	3	0	0	2	0	0	0	0	0	0	0	0	0	5	0	0	5
PER CENT	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	60,0%	0,0%	0,0%	40,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	100,0%	0,0%	0,0%	100%
MOLDOVA																											
Moldova	2					1			3														0			3
TOTAL	2	0	0	0	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
PER CENT	66,7%	0,0%	0,0%	0,0%	0,0%	33,3%	0,0%	0,0%	100,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	100%
MONTENEGRO																											
Montenegro									0	2												1	3			3
TOTAL	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	3
PER CENT	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	66,7%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	33,3%	100,0%	0,0%	0,0%	100%
FRANCE																											
Bourgogne									0														0	1		1
Centre									0														0	1		1
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
PER CENT	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	100,0%	0,0%	100%

4.2 Rabies cases per country and administrative units, 2nd quarter 2011 **01.04.11-30.06.11**

Location	*Domestic animals*									*Wildlife*																	
	dog	cat	cattle	equine	goat sheep	pig	stray dog	other	subtotal	fox	racoon dog	racoon	wolf	badger	marten	other mustelides	other carnivores	wild boar	roe deer	red deer	fallow deer	other	subtotal	bat	Human cases	total
RUSSIAN FEDERATION																											
Astrahanskja obl.	5	4	3		16		2		30		1		1										2			32
Belgorodskja obl.	5	1							6	2					1								3			9
Brjanskaja obl.	5	3	3		1				12	14	1												15			27
Cecenskaja resp.			1						1														0			1
Cuvasskaja resp.		1							1	2													2			3
Dagestan resp.			5		1				6														0			6
Ivanovskaja obl.									0	2													2			2
Jaroslavskaja obl.	4								4	13													13			17
Kabardino-Balkanskaja resp.	1								1														0			1
Kaliningradskaja obl.		2							2	2						1							3			5
Kalmykija resp.		2							2														0			2
Kaluzskaja obl.	5	1	2						8	18	2											1	21			29
Karacaevo-Cerkesskaja resp.			2						2						1								1			3
Krasnodarskij kr.	2	4					1		7														0			7
Kurskaja obl.	3	2							5	2													2			7
Lipeckaja obl.	3	3	1						7	7	1										1		9			16
Marij El resp.									0	6													6			6
Mordovija resp.	1	2	2		3				8	7													7			15
Moskovskaja obl.	9	5	1		1				16	33	8							1					42			58
Moskva g.									0														0		1	1
Nizegorodskaja obl.	2	1							3	4													4			7
Orlovskaja obl.	5	1	1						7							2							2			9
Penzenskaja obl.	3	4	2		3				12	5									1			1	7			19
Pskovskaja obl.	4								4	4	1												5			9
Rjazanskaja obl.	1								1														0			1
Rostovskaja obl.	2	3							5	1												1	2			7
Saratovskaja obl.	4	3	1						8	6	1		1										8			16
Severnaja Osetija-Alanija resp.	2		1						3														0			3
Smolenskaja obl.	10	13							23	34	13												47			70
Stavropol'skij kr.	2		4						6													2	2			8
Tambovskaja obl.									0	3													3			3
Tul'skaja obl.	4	2							6	4					1	1							6			12
Tverskaja obl.	3	5							8	5	1					1	1	1					9			17
Ul'janovskaja obl.	2								2	2													2			4
Vladimirskja obl.	4	1							5	8													8			13
Volgogradskaja obl.	4	1	2						7	1													1			8
Voronezskaja obl.	3	9	1		2		1		16	1												1	2			18
TOTAL	98	73	32	0	27	0	4	0	234	186	29	0	2	0	3	5	1	2	1	0	1	6	236	0	1	471
PER CENT	20,8%	15,5%	6,8%	0,0%	5,7%	0,0%	0,8%	0,0%	49,7%	39,5%	6,2%	0,0%	0,4%	0,0%	0,6%	1,1%	0,2%	0,4%	0,2%	0,0%	0,2%	1,3%	50,1%	0,0%	0,2%	100%

4.2 Rabies cases per country and administrative units, 2nd quarter 2011 **01.04.11-30.06.11**

Location	*Domestic animals*									*Wildlife*														bat	Human cases	total
	dog	cat	cattle	equine	goat sheep	pig	stray dog	other	subtotal	fox	racoon dog	racoon	wolf	badger	marten	other mustelides	other carnivores	wild boar	roe deer	red deer	fallow deer	other	subtotal			
TURKEY																										
Adiyaman		1	1						2														0			2
Antalya			7		1				8														0			8
Artvin			3						3														0			3
Aydin			7						7	1													1			8
Balikesir			1						1	1													1			2
Bilecik	1								1	2													2			3
Bingöl	2								2				1										1			3
Bursa	1								1	2													2			3
Çanakkale	1		3						4	1													1			5
Diyarbakir	2		1	1					4														0			4
Elazig	1				1				2														0			2
Erzincan	1								1														0			1
Erzurum	1								1														0			1
Eskisehir			2						2	1			1										2			4
Gaziantep				1					1														0			1
Hatay	3			1					4														0			4
Istanbul	1								1														0			1
Izmir	1		5						6														0			6
K.Maras	3								3														0			3
Kars	1								1														0			1
Konya			1						1														0			1
Kütahya			2						2				1										1			3
Manisa									0	1													1			1
Mardin	3		1						4														0			4
Mugla			1						1														0			1
Mus	3								3														0			3
Sanliurfa	4		3						7	1													1			8
Sirnak			1						1														0			1
Usak			1						1	1													1			2
Van			1						1														0			1
TOTAL	29	1	41	3	2	0	0	0	76	11	0	0	3	0	0	0	0	0	0	0	0	0	14	0	0	90
PER CENT	32,2%	1,1%	45,6%	3,3%	2,2%	0,0%	0,0%	0,0%	84,4%	12,2%	0,0%	0,0%	3,3%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	15,6%	0,0%	0,0%	100%
THE NETHERLANDS																										
Drenthe									0														0	2		2
Gelderland									0														0	1		1
Noord-Holland									0														0	1		1
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
PER CENT	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	100,0%	0,0%	100%

4.2 Rabies cases per country and administrative units, 2nd quarter 2011 **01.04.11-30.06.11**

Location	*Domestic animals*									*Wildlife*															bat	Human cases	total
	dog	cat	cattle	equine	goat sheep	pig	stray dog	other	subtotal	fox	racoon dog	racoon	wolf	badger	marten	other mustelides	other carnivores	wild boar	roe deer	red deer	fallow deer	other	subtotal			
UKRAINE																											
Bolynskaja o.	1	2							3	4													4			7
Cherkasskaja o.	6	7				1			14	3				1	1								5			19
Chernigovskaja o.	4	4			1				9	3	2											1	6			15
Chernovitskaja o.	2								2						1								1			3
Dnepropetrovskaja o.	3	4	1		1				9	4													4			13
Donetskskaja o.	1	6	3						10	2	1												3			13
Ivano-Frankovskaja o.			2						2	1													1			3
Khar'kovskaja o.	2	3							5	2													2			7
Khersonskaja o.	1	4							5														0			5
Khmel'nitskaja o.	3	3	2						8	5													5			13
Kirovogradskaja o.	3	3	3		2				11	5													5			16
Kiyevskaja o.		1	1						2	2													2			4
Luganskaja o.	2		2						4														0			4
L'vovskaja o.		1							1	3													3			4
Nikolayevskaja o.	1								1	2													2			3
Odesskaja o.		2							2	1													1			3
Poltavskaja o.		3							3	1													1			4
Rovenskaja o.		2							2	2													2			4
Sumskaya o.	8	8	3						19	3													3			22
Ternopol'skaja o.	4	2	2		1				9	3													3			12
Vinnitskaja o.	5	5	1						11	5				1	1								7			18
Zakarpatskaja o.		1							1	1													1			2
Zaporozhskaja o.	2	7	1						10	3	1												4			14
Zhitomirskaja o.	2	3							5	5													5			10
TOTAL	50	71	21	0	5	1	0	0	148	60	4	0	0	2	3	0	0	0	0	0	0	1	70	0	0	218
PER CENT	22,9%	32,6%	9,6%	0,0%	2,3%	0,5%	0,0%	0,0%	67,9%	27,5%	1,8%	0,0%	0,0%	0,9%	1,4%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,5%	32,1%	0,0%	0,0%	100%
SERBIA																											
Central Serbia	1	1	1						3	9													9			12
TOTAL	1	1	1	0	0	0	0	0	3	9	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	12
PER CENT	8,3%	8,3%	8,3%	0,0%	0,0%	0,0%	0,0%	0,0%	25,0%	75,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	75,0%	0,0%	0,0%	100%
SPAIN																											
Sevilla									0														0	1		1
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
PER CENT	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	100,0%	0,0%	100%

4.2 Rabies cases per country and administrative units, 2nd quarter 2011 **01.04.11-30.06.11**

Location	*Domestic animals*									*Wildlife*															bat	Human cases	total
	dog	cat	cattle	equine	goat sheep	pig	stray dog	other	subtotal	fox	racoon dog	racoon	wolf	badger	marten	other mustelides	other carnivores	wild boar	roe deer	red deer	fallow deer	other	subtotal			
ROMANIA																											
Bistrita-Nasaud		1							1	3													3			4
Botosani			1						1														0			1
Buzau									0	2													2			2
Calarasi	1	1							2														0			2
Caras-Severin			2						2														0			2
Cluj									0	1													1			1
Constanta									0	1													1			1
Covasna	1								1	1													1			2
Dambovita									0	1													1			1
Giurgiu	1								1														0			1
Harghita									0	2													2			2
Hunedoara	1								1	2													2			3
Ialomita									0	1													1			1
Iasi		1							1														0			1
Maramures		1							1	2											1		3			4
Mures			1						1	1													1			2
Olt					2				2	2													2			4
Prahova	1								1														0			1
Salaj				1					1														0			1
Satu Mare			1						1														0			1
Sibiu									0	1													1			1
Suceava	1								1	3											1		4			5
Teleorman	1								1														0			1
Timis		1							1														0			1
TOTAL	7	5	5	1	2	0	0	0	20	23	0	0	0	0	0	0	0	0	0	0	2	0	25	0	0	45
PER CENT	15,6%	11,1%	11,1%	2,2%	4,4%	0,0%	0,0%	0,0%	44,4%	51,1%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	4,4%	0,0%	55,6%	0,0%	0,0%	100%
BOSNIA-HERCEGOVINA																										
Sarajevo									0	1													1			1
Unsko-sanski	1								1	1													1			2
Tuzlanski	1								1														0			1
TOTAL	2	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	4
PER CENT	50,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	50,0%	50,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	50,0%	0,0%	0,0%	100%

4.3 Trend tables

4.3.1 Comparison of the reporting quarter (II/2011) with the previous quarter (I/2011)

NAME	Total			Wildlife			Domestic animals			Bats			Human		
	II 2011 (no.)	I 2011 (no.)	Difference	II 2011 (no.)	I 2011 (no.)	Difference	II 2011 (no.)	I 2011 (no.)	Difference	II 2011 (no.)	I 2011 (no.)	Difference	II 2011 (no.)	I 2011 (no.)	Difference
Albania															
Austria															
Belarus	355	346	9	238	259	-21	117	87	30						
Belgium															
Bosnia - Hercegovina	4	3	1	2	1	1	2	2		*			*		
Bulgaria	1		1	1		1									
Croatia	85	137	-52	75	132	-57	10	5	5						
Cyprus															
Czech Republic															
Denmark															
Estonia		1	-1		1	-1									
Finland															
France	2		2							2		2			
Germany	3		3							3		3			
Greece															
Hungary															
Iceland															
Ireland															
Italy		1	-1		1	-1									
Latvia															
Lithuania	4	5	-1	3	5	-2	1		1						
Luxembourg															
Macedonia	5		5	5		5									
Malta															
Moldova	3	17	-14		6	-6	3	11	-8						
Montenegro	3	*		3	*			*			*			*	
Norway															
Poland	19	54	-35	14	44	-30	4	10	-6	1		1			
Portugal															
Romania	45	83	-38	25	60	-35	20	23	-3	*			*		
Russian Federation	471	674	-203	236	374	-138	234	298	-64				1	2	-1
Serbia	12	20	-8	9	18	-9	3	2	1						
Slovak Republic															
Slovenia															
Spain	1		1							1		1			
Sweden															
Switzerland + Lichtenstein															
The Netherlands	4		4							4		4			
Turkey	90	55	35	14	9	5	76	46	30						
Ukraine	218	338	-120	70	128	-58	148	210	-62						
United Kingdom															
TOTAL	1325	1734	-412	695	1038	-346	618	694	-76	11	0	11	1	2	-1

Wildlife: excluding bats

II/2011 (no.), I/2011 (no.): number of cases

Difference: no. of cases in II/2011 minus cases in I/2011

* no data

4.3.2 Comparison of the reporting quarter (II/2011) with the same quarter of the previous year (II/2010)

NAME	Total			Wildlife			Domestic animals			Bats			Human		
	II 2011 (no.)	II 2010 (no.)	Difference	II 2011 (no.)	II 2010 (no.)	Difference	II 2011 (no.)	II 2010 (no.)	Difference	II 2011 (no.)	II 2010 (no.)	Difference	II 2011 (no.)	II 2010 (no.)	Difference
Albania															
Austria															
Belarus	355	168	187	238	102	136	117	66	51						
Belgium															
Bosnia - Hercegovina	4	4		2	3		2	1		*			*		
Bulgaria	1	1		1		1		1	-1						
Croatia	85	148	-63	75	137	-62	10	11	-1						
Cyprus															
Czech Republic															
Denmark															
Estonia															
Finland															
France	2		2							2		2			
Germany	3	1	2							3	1	2			
Greece															
Hungary		2	-2		1	-1					1	-1			
Iceland															
Ireland															
Italy		67	-67		67	-67									
Latvia		6	-6		5	-5		1	-1						
Lithuania	4	8	-4	3	8	-5	1		1						
Luxembourg															
Macedonia	5		5	5		5									
Malta															
Moldova	3	68	-65		23	-23	3	45	-42						
Montenegro	3	22	-19	3	16	-13		6	-6						
Norway															
Poland	19	2	17	14	1	13	4	1	3	1		1			
Portugal															
Romania	45	107	-62	25	62	-37	20	45	-25						
Russian Federation	471	638	-167	236	303	-67	234	335	-101				1		1
Serbia	12	19	-7	9	16	-7	3	3							
Slovak Republic															
Slovenia		2	-2		2	-2									
Spain	1	1						1	-1	1		1			
Sweden															
Switzerland + Lichtenstein															
The Netherlands	4	3	1							4	3	1			
Turkey	90		90	14		14	76		76						
Ukraine	218	454	-236	70	161	-91	148	293	-145						
United Kingdom															
TOTAL	1325	1721	-396	695	907	-211	618	809	-192	11	5	6	1	0	1

Wildlife: excluding bats

II/2011 (no.), II/2010 (no.): number of cases

Difference: no. of cases in II/2011 minus cases in II/2010

* no data

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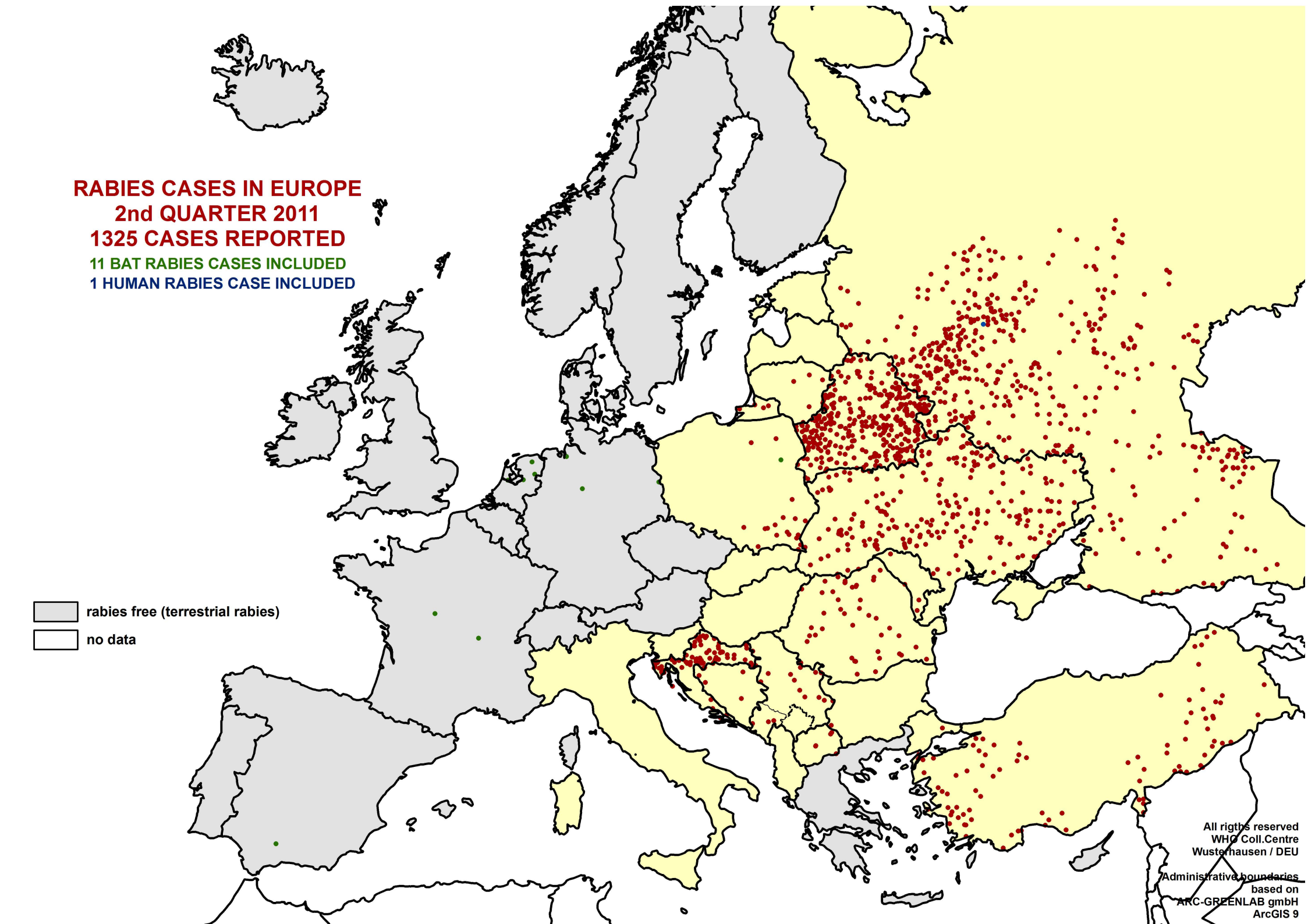
RABIES CASES IN EUROPE
2nd QUARTER 2011
1325 CASES REPORTED
11 BAT RABIES CASES INCLUDED
1 HUMAN RABIES CASE INCLUDED
rabies free (terrestrial rabies)
no data
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Wusterhausen / DEU
Administrative boundaries
based on
ARC-GREENLAB gmbH
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