RABIES BULLETIN EUROPE - Vol. 7/No 1/1983

C O N T E N T S

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1. INTRODUCTION

1.1 General Information

This issue describes the reported rabies cases in Europe for the first quarter 1983. The situation in general is described under 2., and in individual countries under 2.1 to 2.26.

Data were not received before going into press this time for the European part of the Union of the Soviet Socialist Republics (USSR).

Miscellaneous rabies issues of current interest are reported in section 3. In view of the results on oral mass vaccination of wildlife in Switzerland some European governments are now considering similar field trials. This calls for international criteria. 3.1 gives a report on WHO consultations in September 1982 with recommendations. 3.2 gives first results on a field trial of fox immunisation in Germany (DEU) and still on the same subject are the WHO discussions (3.3) in Tübingen, aiming at the close cooperation with interested private groups, the industry and the government in Germany (DEU). 3.4 and 3.5 describe rabies issues in the U.S.A., a human case in Michigan and racoon rabies.

The rabies case data are tabulated for the first quarter 1983 under 4.

The last part lists the official contributors to this Bulletin.

The geographical distribution of rabies cases in Europe of the first quarter 1983 is shown on the maps of Europe and Turkey in the Annex.

1.2 Editors Note

To improve our collecting of data as well as the reporting we would like to touch on two subjects.

The first refers to the animal species in our tables. The columns Sheep/Goats, Other Domestic Animals, Other Mustelids, Deer and Other Wild Animals are collective groups. We would like that these animals are specified, if known, for example like this:

Sheep/Goats		
5a	a)	2 sheep, 3 goats
Other Domestic Animals		
3b	b)	2 mules, 1 pig
Other Mustelides		
4c	c)	2 stone marten, 2 mouse weasel
Deer		
6d	d)	4 roe deer, 2 fallow deer
Other Wild Animals		
3e	e)	2 muskrats, 1 hare

We shall add a list of animals used by us, for the contributors, indicating the species in Europe to be expected for rabies examination.

Some countries already report in the above manner, otherwise we would not be able to present our table Rabies Cases 'Other Animal Species', but we would like that all countries be encouraged to join.

The second subject refers to the reporting in the correct term of administrative units, from the larger to the smaller. We would like that all countries supply us with the right term used and which comes nearest to an English appropriate. For example:

English	German
Republics	Länder
Departments	Regierungsbezirke
Districts	Kreise
Communities	Gemeinden

The use of these terms in the individual country contributions could be in such a way that they are mentioned in brackets, e.g. - 12 districts (Kreise) or 12 communities (Gemeinden) were newly infected, etc. Naturally, it would also help us if both terms are used.

1.3 Regular Reporting Schedules

In order not to delay our information to the collaborating countries we kindly remind that the deadline for reporting the previous quarter is not later than the

31 January,
30 April,
31 July and
31 October

of each year, including postal delivery.

If this is not possible please contact us in order to arrange alternative means.

2. RABIES IN EUROPE, 1ST QUARTER 1983

During the first quarter 1982, 6606 cases of rabies were reported in Europe. There were 5412 cases (81.9% of total) in wild animals of which 4993 were foxes (75.6%), 171 mustelids, 203 cervidae and 45 in other species. Of the 1194 cases in domestic animals (18.1% of total) 482 were dogs, 234 cats, 230 cattle, 36 horses, 197 sheep and goats and 15 others.

Compared to the previous quarter (6132 cases) we register a slight increase by 7.7%. Looking at the figures of foxes for the last quarter (3908) and this one (4993) however, we do notice an obvious increase (27.7%). This is the common find caused by increased activities in the fox populations during the mating season. Of course, this does not refer to Turkey, the only country in our reporting system following a different rabies pattern (98.1% of total cases in domestic animals). In comparison with the first quarter 1982 (6694 cases) we notice a slight decrease (88 cases) of reported cases in Europe.

Bulgaria, Finland, Great Britain, Ireland, Portugal and Sweden continued to remain rabies-free. Two countries can be added here, namely Norway and the mainland of Spain, as their last case of rabies was two years ago. There was no case reported from Denmark. For this quarter two countries got newly infected, each with one case: Greece and the Netherlands.

Generally, the geographical situation of rabies distribution in Europe remained as in the previous quarter, though for Yugoslavia (YUG) we can see a trend that the European fox rabies advances southwards.

There were no cases of rabies in man reported.

Individual country reports follow:

2.1 Rabies in Austria (AUT)

by W. Krocza and E. Scharfen

During the first quarter 1983, 404 cases of rabies were diagnosed in Austria. 366 of these were in foxes (90.6%), 33 (8.2%) in other wild animals and 5 (1.2%) in domestic animals.

Compared to the previous quarter, 4/1982, with 259 cases (215 of these foxes), an increase of 56% and in comparison to the first quarter 1982 (261 cases) an increase of 55% is noted.

Only the Bundesländer (Federal Provinces) Vienna and Salzburg were free of rabies during the reporting period.

Isolated cases were stated in Vorarlberg (Bregenz) and Upper Austria (Rohrbach) close to the state border.

Cases were widespread in the Bezirke (districts) Reutte and Kufstein (Tirol), Gmünd and Waidhofen/Thaya (Lower Austria) as well as Oberpullendorf (Burgenland).

The rabies wave stretches from east Tirol (Bezirk Lienz) in a wide but pointed curve directed eastwards through Kärnten and Steiermark to Lower Austria.

2.2 Rabies in Belgium (BEL)

by R. Depierreux

In the first quarter 1983, 208 rabies cases were registered in 118 communities with 134 foxes, 27 cattle, 20 sheep, 9 horses, 1 dog, 13 cats, 2 roe deer, 1 stone marten and 1 polecat.

In comparison to the fourth quarter 1982 (273 cases) the rabies cases have decreased.

One new case north of the river Meuse occured in the community Wellen (Province of Limbourg). As previously, it happened to a bovine kept during the pasture season in the infected region of Marche-en-Famenne.

With regards to the geographical distribution of cases one notes a stabilisation as reported during the fourth quarter 1982.

The disease extends into the province of Namur as in previous epizootics. During the following months an increase of cases is to be expected towards the south-west of this province as well as in the region bordering with the province of Luxembourg.

In the province of Liège rabies develops along the valleys of the rivers Ourthe and Amblève, in an environment particularly favourable for foxes.

2.3 Bulgaria (BUL)

The country remained rabies-free.

2.4 Rabies in Czechoslovakia (CZE)

by J. Neumann

During the first three months of 1983, rabies in the CSSR was diagnosed in 659 animals. The fox accounted for 91% of the cases (a total of 600 cases). In domestic animals rabies was diagnosed in 12 dogs and 21 cats. A remarkable case was the finding of rabies in a muskrat.

In comparison with the same period of 1982, the occurrence of rabies increased in all commonly affected animal species, viz. in foxes by 15.8%, in dogs by 50% and in cats by 200%.

New rabies infections were ascertained in the districts Mladá Boleslav, Ceský Krumlov, Jihlava, Cadca and in the area of Prague, where no case of rabies occurred in 1982.

2.5 Rabies in Denmark (DEN)

by E. Stougaard

Denmark again free from rabies*

After having been free from rabies since 1970, a new epizootic started in Denmark on September 12, 1977. The first case was diagnosed in a fox which was found a few hundred metres north of the Danish-German border at Froeslev.

The red fox has been the source of dissemination of rabies, and especially in 1978 and 1979 a lot of cases of rabies occurred among the foxes located in the south of Jutland (Table below). The last fox infected with rabies was shot on April 8, 1981, and rabies was diagnosed in a cow on March 9, 1982. Thus one year has passed without any case of rabies.

Year	Fox	Marten	Cattle	Sheep	Horse	Roe deer	Total
1977	6	-	-	-	-	-	6
1978	137	7	18	-	-	1	163
1979	134	10	19	1	1	-	165
1980	29	1	3	4	-	-	37
1981	2	-	1	-	-	-	3
1982	-	-	1	-	-	-	1
Total	308	18	42	5	1	1	375

Immediately after the first case of rabies occured in September 1977, a combating area was established in the south of Jutland. The extent of the area was 60 kilometres from the border. Within the area burrows have been gassed, rewards for shooting foxes have been given, and poison has been put down in areas difficult to reach.

All dogs over 3 months have been vaccinated at public expense, and attention is drawn to the fact that there have been no cases of rabies among cats or dogs.

*Editors note: In our reporting system we shall generally consider a country rabies-free when two years have passed after the last case of indigenously acquired rabies is reported (WHO Expert Committe on Rabies, Sixth Report, page 37, 1973). Nevertheless, we assume that after this last case, especially when wildlife rabies occurs, several years of intensive surveillance follow for confirmation.

2.6 Rabies in Germany, Democratic Republic (DDR)

During the first quarter 1983, 680 cases of rabies were reported. 603 of these (88.7%) were in wild animals (560 foxes, 2 badgers, 13 stone marten, 1 polecat, 21 roe deer, 1 fallow deer, 1 mouflon, 3 wild boar, 1 hare) and 77 (11.3%) in domestic animals (19 dogs, 33 cats, 11 cattle, 1 horse, 10 sheep, 2 goats, 1 pig).

Compared to the previous quarter we notice an increase by 45 cases. Foxes show the marked spring peak from 436 cases of the last quarter (68.7% of total) to 560 cases (82.4% of total) this time. In comparison to the first quarter 1982 (504 cases) we state an increase by 34.9%.

Although there is an increase on the total compared to the previous quarter there are four Bezirke (departments), namely Dresden, Karl-Marx-Stadt, Magdeburg and Schwerin with a decrease of cases between 11 and 25. Generally, the geographical distribution remains as in the fourth quarter 1982.

2.7 Rabies in Germany, Federal Republic (DEU)

A total of 2074 rabies cases were reported during the first quarter 1983. 1816 of these (87.6%) were in wild animals (1608 -77.5%- foxes, 33 badgers, 59 other mustelids, 114 deer and 2 wild boars) and 258 (12.4%) in domestic animals (28 dogs, 66 cats, 64 cattle, 17 horses, 81 sheep and goats, one pig and one donkey).

There has been a slight increase by 64 cases compared with the previous quarter (2010 cases). In comparison to the first quarter 1982 (1738 cases) we notice an increase by 19.3%.

Two common features of the fox rabies can be read from the cattle and fox figures of the first quarter of the year. Cattle figures are lower (64 or 3.1% of total for this quarter) compared to the previous quarter (297 or 14.8% of total) due to the indoor keeping of cattle during the winter. On the other hand the fox figures increase as the animal becomes more active during its mating season - 1608 cases or 77.5% of total this quarter compared with 1300 cases or 64.7% of total in the previous one.

Areas of the country currently heavily infected are Hessen, the Regierungsbezirke (departments) Darmstadt (274) and Kassel (341), Nord-rhein-Westfalen, the Regeriungsbezirk Köln (109), Rheinland-Pfalz, the Regierungsbezirk Koblenz (142), Baden-Württemberg with all four Regierungs-bezirke: Stuttgart (144), Karlsruhe (66), Freiburg (142) and Tübingen (128) and Bayern with the Regierungsbezirke Oberbayern (137) and Schwaben (91).

From a small focus in Niedersachsen, in the Regierungsbezirk Weser-Ems, west of the river Ems, rabies crossed the border to the Netherlands (see under 2.16).

2.8 Finland (FIN)

The country remained rabies-free.

2.9 Rabies in France (FRA)
by J. Blancou

802 rabies cases were reported during the first quarter 1983, 64 cases more than the last quarter (8.7% increase). Of the total, 633 cases were accounted for by the fox (78.9%), 35 in other wild animals and 134 in domestic animals (26 dogs, 26 cats, 41 cattle, 37 small ruminants and 4 horses). The departments with the highest figures are again Doubs with 86 and Jura with 125 cases registered.

The general tendency remains as described for the previous quarter, the disease advances slowly southwards in the direction of the department Isère and from the northern front a single case is reported in the department Oise.

2.10 Rabies in Greece (GRE)

A single case of dog rabies is reported in the north of Greece close to the state borders with Bulgaria (BUL) and Turkey (TUR).

2.11 United Kingdom (GBR)

The country remained rabies-free.

2.12 Rabies in Hungary (HUN)

A total of 413 cases of rabies were diagnosed in Hungary during the first quarter 1983. There were 373 cases (90.3%) in foxes, 4 in roe deer, one in a polecat and one in a wild cat, and 34 cases in domestic animals (11 dogs, 18 cats and 5 cattle). Compared with the previous quarter (339) there has been an increase by 21.8%, compared with the first quarter 1982 (601) a decrease by 31.3%.

The geographical distribution of cases is unchanged in comparison with the previous quarter, though one Komitat (department) registers a drastic increase. Komarom, bordering with Czechoslowakia (CZE), reported in the last quarter 14 cases and this time 58.

2.13 Ireland (IRE)

The country remained rabies-free.

2.14 Rabies in Italy (ITA)
by S. Prosperi

During the first quarter 1983, no cases of rabies were reported in domestic animals, whereas 93 cases were diagnosed in wild animals (90 foxes and 3 badgers).

A total of 75 municipalities were involved belonging to 9 different provinces of four regions (Lombardy, Alto Adige, Veneto, Friuli). Some municipalities in the province of Como were involved for the first time; these territories are a geographical continuation of the valley (Valtellina, in the province of Sondrio) which has been already widely affected for some years by the sylvatic rabies epidemic.

During this quarter, altogether 22 municipalities were affected by rabies for the first time, adding to the previously infected area in Italy a total of 537 km^2.

2.15 Rabies in Luxembourg (LUX)
by R. Frisch

During the first quarter 1983, a total of 35 rabies cases are reported. Of these are 19 cases in foxes and 16 cases in domestic animals (2 cats, 6 cattle, 1 horse, 7 small ruminants).

If this tendency continues (during the first quarter 1982 there were 33 cases) 1983 could account again for a high number of rabies cases.

As means of control one goes on reducing the fox population though for ecological reasons gassing of fox dens is only practiced in heavily infected areas.

2.16 Rabies in the Netherlands (NET)
by C.J. Vermeulen

After a long period of almost six years there has been a new case of wildlife rabies in the Netherlands.

On the 4th March 1983 one fox was diagnosed positive rabies. A farmer found the fox dead on his yard at Ter Apel in the south-east part of the province of Groningen very close to the German (DEU) border.

2.17 Norway (NOR)

The mainland of Norway is rabies-free for some time.

The last case of rabies from the Island of Svalbard was reported two years ago.*

*Editors note under 2.5 this Bulletin applies accordingly.

2.18 Rabies in Poland (POL)

A total of 138 rabies cases were reported during the first quarter 1983. Of these are 109 (79%) in wild animals (91 foxes, 1 badger, 9 roe deer, 1 red deer, 2 racoon dogs, 2 squirrels, 2 muskrats, 1 roof rat) and 29 (21%) in domestic animals (11 dogs, 13 cats, 5 cattle).

Compared to the previous quarter we notice a reduction of 52 cases (37.7%). The figure of the first quarter 1982 (143) is approximately the same as this quarter.

The geographical distribution too resembles previous recordings. There is a concentration of cases in the southwest of the country and to a less degree in the north. The rest of the provinces report isolated cases.

2.19 Portugal (POR)

The country remained rabies-free.

2.20 Rabies in Rumania (RUM)

During the first quarter 1983, 21 rabies cases were diagnosed in Rumania. Of these were 11 in wild animals (10 foxes and one other) and 10 domestic animals (2 dogs, 3 cats, 4 cattle, one other).

Compared to the previous quarter (19 cases) 7 provinces did not report new cases, but then 4 new provinces report isolated cases.

In comparison to the first quarter 1982 (32 cases) we note a decrease by 11 cases.

2.21 Spain (SPA)

The mainland of the country remained rabies-free.

There was one case of rabies reported from North Africa one year ago.*

*Editors note under 2.5 this Bulletin applies accordingly.

2.22 Sweden (SWE)

The country remained rabies-free.

2.23 Rabies in Switzerland (SWI)
by A. Wandeler

During the 1st quarter of 1983, the Swiss rabies diagnostic center received 1352 animals for examination. 195 of these (15%) were positive for rabies, compared with 258 (19% of 1373) in the previous quarter and with 273 (23% of 1098) in the 1st quarter of 1982. 73% were in foxes and 14% in domestic animals. An additional 17 foxes were diagnosed histologically in canton Vaud. They bring the total of proven rabies cases to 212 (285 in the previous quarter).

The absolute and relative decrease in the number of diagnosed animal rabies cases is partially due to reduced submissions of suspicious animals from epizootic areas and to an increased sending of animals killed by hunters in zones of experimental oral vaccination against rabies.

During the period of observation the density of diagnosed rabies cases decreased in the western part of Switzerland, namely in the cantons Vaud and Fribourg. The incidence clearly increased in northeastern Switzerland between the Lake of Zürich and the Lake of Constance.

During the first 3 months of 1983 only 4 persons were bitten by proven rabid animals, 3 by cats and 1 by a stone marten.

2.24 Rabies in Turkey (TUR)

During the first quarter 1983, a total of 483 cases of rabies were diagnosed in Turkey. There were 474 cases (98.1%) in domestic animals: 355 dogs, 14 cats, 60 cattle, 2 horses, 8 donkeys, 2 mules, 26 sheep and 7 goats; and 9 cases (1.9%) in wild animals: 2 foxes, 1 badger, 1 wolf, 5 house mice.

In comparison with the previous quarter (495 cases) there has been a reduction by 12 cases, compared with the first quarter 1982 (503 cases) a reduction by 20 cases.

The overall geographical distribution of cases remains as previously reported: in the south and east of the country cases are more scattered, in the west and north more densely.

2.25 Rabies in Yugoslavia (YUG)

During the first quarter 1983, a total of 381 cases of rabies were reported in Yugoslavia. There were 356 cases in wildlife of which 346 were in foxes, 10 in other wild animals, and 25 in domestic animals (13 dogs, 9 cats, 3 cattle).

There has been an increase of cases from the previous quarter (210) by 81.4%. This increase is due to the seasonal activities of foxes whilst mating and on the other hand several new areas are newly infected. In Bosnia we have isolated reports in 12 newly infected districts. These districts show the link between the SAP Wojwodina in southwestern direction to the focus reported during the last quarter in Bosnia.

In comparison to the first quarter 1982 (674 cases) though we notice a reduction of cases by 76.9%. In spite of the larger area of the country infected at the moment, the number of cases has decreased.

Altogether we must conclude that the European fox rabies is now progressing further south.

Only one positive dog was reported in SAP Kosovo, usually considered an area with urban or dog rabies.

2.26 Rabies in the Union of Soviet Socialist Republics (USSR)

Data not received before going into press.

3. MISCELLANEOUS

3.1 Information on WHO Consultations

Report of consultations on oral and enteric mass immunization of wildlife - 20-22 September 1982

Introduction and summary:

Attempts have been made to orally immunize foxes against rabies for 20 years, with WHO coordinating research in this field. Projects have been carried out by national services to examine the potency and safety of modified, live rabies vaccine strains applied orally, and methods of maintaining the stability of vaccine virus in baits. Research projects have also dealt with bait distribution and acceptance.

Much emphasis has been placed in the past on the development of vaccine strains which are able to satisfy all requirements regarding safety and potency, since some strains, although safe after oral application for the target species (foxes) and other wildlife and domestic carnivores, showed residual virulence for small wildlife species or a tendency towards latency under laboratory conditions.

Extensive laboratory and initial field studies with one strain did not reveal any tendency of the vaccine virus to spread or to become virulent even under the most stringent conditions.

In view of these findings, large-scale field trials were begun in Switzerland in 1978. These first mass applications of modified, live virus to wild animals also showed positive results:

- The vaccine appeared to be effective, and reached up to 60% of the fox population in the treated areas within a few days.
- Rabies came to a standstill, or even disappeared, from those areas.
- No evidence was obtained for vaccine-induced rabies in any wild or domestic animals during the four-year period since 1978.

In view of the observations made in the laboratory and in the field, some European governments are now considering field trials similar to those carried out in Switzerland. This calls for international criteria for the field application of oral vaccine in foxes. The following report of the WHO not only concern the properties of the vaccine virus strain (e.g. its attenuation and potency) but also additional measures for its safe and effective field application.

The trials with oral and enteric rabies vaccines for foxes began a decade ago, and showed quite clearly that a number of attenuated strains are highly effective when applied on the tongue and buccal mucosa. Although trials with strictly enteric vaccination showed early promise, recent studies have been disappointing. It should be emphasized that insufficient efficacy has been shown with the oral or enteric administration of inactivated vaccine. The recent Swiss trials show much promise after the mass application of a particular SAD vaccine in chickenhead baits. This in no way should interfere with further research on mass oral rabies vaccination in foxes and other wildlife species, including the development of other vaccine strains.

Recommendations for potency of oral vaccine strains

1. A high titre of virus (e.g., 10^7 TCID/ml for SAD-BHK_{21}) is needed to provide a good percentage of sero-conversions in foxes.

2. There should be good correlation between laboratory trials with baits and field trials with baits (at least 80% conversion in those foxes taking up the baits.

3. The vaccine should be titrated before, during and after bait application.

4. Stabilizers are critical to survival of the vaccine in the field. The remaining virus titre after 3 days at 37°C should be at least 3 times the 50% protective dose (0.5 $\log_{10}$ above the 50% protective dose).

5. Much work needs to be done on final stabilizer and bait formulations, especially for mass production methods.

Innocuity of oral vaccine strains in laboratory trials

1. Only carefully selected and highly immunogenic vaccine strains should be chosen as seed virus.

2. Enough master seed virus should be maintained by the manufacturer to produce sufficient vaccine stock.

3. No trials should be carried out with any vaccine passage beyond the fifth past the master seed.

4. Quality control for live oral rabies vaccines for foxes should conform to national standards for oral animal vaccines.

5. Before licensing, the vaccine evaluation of innocuity should be carried out in foxes, then in as many representatives as possible of each order or species which share the ecosystem with the fox and could possibly pick up the bait. The schedule for these tests should be as follows:

5.1 Vaccinate orally (at least 4) animals with the highest dose of vaccine virus and keep them under observation for 7 to 100 days. Vaccination can be performed either by direct deposit of liquid vaccine in the mouth (small animals) or by distribution of vaccine in bait (large animals).

5.2 In case of clinical symptoms and/or at days 7, 15, 30 and 100 after vaccination, analyze animals (at least one) and try to reisolate the virus (in mice or tissue culture) or to show rabies antigen by fluorescent antibody technique. Tissues to be tested (without pooling) should be brain, salivary gland and brown fat (if present). If necessary differentiate between vaccine virus and possible naturally occurring wild rabies virus (monoclonal antibodies).

5.3 If evidence is found of any rabies infection after this oral vaccination application, serial intramuscular passages of the reisolated material undiluted and at a 10^{-3} dilution should be performed in order to detect any possible auto-interference simulating bite transmission.

6. Identification of vaccine virus strain (either before use for experiment, or after recovery from animals found dead or killed during these experiments) should be ensured by all techniques available at the moment, including growth pattern in tissue culture and monoclonal antibody profiles.

7. Possible reversion to virulence should be assessed by serial passages in susceptible species inoculated orally, intramuscularly, or intra-cerebrally with virulent material obtained from animals dead after oral vaccination. In some instances reisolated strains should be analyzed for anti-glycoprotein monoclonal antibody characteristics.

8. Determination of the transmission rate of possible vaccine virus, infection in susceptible animals should be done by attempted contact transmission between infected animals and a suitable number of cage mates.

Innocuity of oral vaccine strains in field trials

1. Oral rabies vaccine should not cause disease in foxes vaccinated orally with field baits, nor in domestic animals (dogs and cats) that might accidentally ingest baits.

2. The pathogenicity of the vaccine for other non-target species should be no more than with the vaccine currently in use in Switzerland (Steck, F. and Wandeler, A., Zbl. Bakt. I Orig., in press, 1983).

3. The vaccine strains selected should be easily identifiable and capable of being differentiated from field strains as determined by common laboratory techniques, such as monoclonal antibodies, etc.

4. Surveillance activities are of the utmost importance in these vaccination trials.

5. The brain of any rabies positive fox from an oral vaccination area should be tested for possible vaccine rabies by fluorescent antibody staining with a selected panel of monoclonal antibody conjugate (anti-nucleoprotein) and growth on BHK cells.

6. Special efforts should be made to examine, in a similar way, abnormally behaving or dead wild mammals from those areas involved in oral vaccination trials.

7. Any person involved in vaccine production and bait preparation should be immunized against rabies.

8. The public should be made aware that an oral vaccination programme will be conducted in a given area.

9. Any non-immunized person becoming exposed to liquid vaccine should consult the medical authorities for possible post-exposure treatment.

10. Normal vaccination programmes for dogs and cats should be maintained. House and leash confinement of dogs and cats during bait distribution should reduce the uptake of bait by these species (3 days).

This report will be continued in the next issue of RABIES BULLETIN EUORPE.

3.2 A Field Trial for the Oral Immunisation of Foxes Against Rabies in the Federal Republic of Germany (DEU)

For the last 20 years WHO is coordinating research work to develop an oral vaccine for foxes. Much emphasis has been placed to satisfy all requirements regarding safety, efficacy and stability.

Switzerland started 1978 the first large-scale field trials with mass applications of modified live virus to wild animals with very encouraging results.

Today several other countries are on the verge of starting their own field trials.

In the Federal Republic of Germany one area in Hessen and one in Bavaria were chosen for a long-term immunisation trial of foxes starting in March 1983.

The Vaccine

The goal of the present work was the development and testing of a vaccine to be used under field conditions. This vaccine must be stable, effective and show a low residual pathogenicity for non-target species.

The SAD-strain of rabies virus adapted to and grown on BHK cells is the base for the vaccine. In Tübingen it was grown on cloned BHK cells and the selected virus variant was called SAD B19. It yielded a minimal titre of 1×10^8 TCID/ml.

Following the application of SAD B19 the residual pathogenicity for mice and rats was low. The vaccine virus was completely innocuous for muskrats.

Following the feeding of foxes with baits containing vaccine, the 100% effective dose was 2×10^7 TCID/ml. The same virus dose proved, under laboratory and field conditions, to be very temperature stable and vaccine which was up to 8 days in the field was still completely effective in foxes.

Vaccine Production

In parallel, problems which deal with personnel and costs concerning the production and mass application of the vaccine in the field were reduced due to technical improvements in filling, packaging and storage of the vaccine. A new form of bait preparation proved to be effective for foxes. The so-called "gullet baiting system", here the vaccine container is placed into the beak cavity instead of the more laborious way of fixing it between skin and skull of slaughter house chicken heads with a bostich, reduces the personnel necessary as well as the risks for man and animal.

Conclusion on Results

Considering the Swiss trial as very successful it seems that the vaccine developed in Tuebingen could add several advantages:

1. The effectivity of the vaccine in foxes appears to be equal or even better than the Swiss vaccine.

2. Its stability and storage properties surpass the quality of the SAD vaccine from Bern.

3. The new gullet baiting system simplifies the mass application of the vaccine in the field.

(Abstracted from: Ein Feldversuch zur oralen Immunisierung von Füchsen gegen die Tollwut in der Bundesrepublik Deutschland. I. Unschädlichkeit, Wirksamkeit und Stabilität der Vakzine SAD B19, L.G. Schneider and J.H.Cox. In: Tierärztliche Umschau 38, 315-324, 1983).

3.3 Informal WHO Discussions on New Control Methods Against Wildlife Rabies at the Federal Resarch Institute for Animal Virus Diseases, Tübingen, Federal Republic of Germany (DEU) - 20/21.4.1983

The above meeting was held:

1) to inform on new procedures for the control of rabies in wildlife;

2) to participate actively during the planning and organisational stage of field trials;

3) to support future research on live virus vaccination and on the application of such vaccine to wild animals.

The present activities in the three year term field trial are coordinated and supervised by the Rabies Centre in Tübingen.

The participants of the meeting were: interested private groups, such as Dog Keeping Societies and Societies for the Protection of Animals, the industry and German Goverment officials.

The initial lectures on the subject gave background information, in the second part possible cooperation among the participating groups was discussed.

It was concluded that the oral vaccination affects the main carrier species, the fox, but is not harmful to non-target species which could take up the vaccine accidentally. The procedure of oral vaccination meets ethical as well as epidemiological and medical requirements. It is especially suitable to interrupt transmission cycles in wildlife and to prevent the spread of rabies into non-infected areas.

The goal of the present field trial is to prove the effectivity and the safety of oral vaccination under field conditions different to those in Switzerland where the first of these types of trials were carried out.

The scientific concept of the field experiment garantees that all vaccination trials are conducted under well defined conditions and safety controls. Vaccination outside the predetermined areas is not permitted.

It was common agreement of the meeting that fox vaccination should only be carried out considering the laws for the protection of animals, that the use is limited to certain areas, where the epidemiological rabies situation indicates its use, and that the time of application is limited until the area under observation is rabies-free.

3.4 Human Rabies - Michigan, U.S.A.

The first human case of rabies acquired in the United States since 1981 occured recently in Michigan. The patient, a 5-year-old female, possibly bitten by a bat in late August 1982, died on March 9, 1983, 32 days after onset of symptoms.

The child developed right-arm pain and fever after a fall. On February 7, an acute sprain of the right arm was diagnosed. By February 11, she had malaise, anorexia, sore throat, left-heel pain, and right-arm weakness. Over the next 48 hours, she became irritable, with temperatures to 39.3 C (103.9 F), progressive right-arm weakness, urinary incontinence, and difficulty swallowing saliva and water.

On February 13, she became lethargic and hypertensive. An EEG was diffusely abnormal without focal findings. The presumptive diagnosis was post-infectious encephalopathy, and treatment with high-dose steroids was initiated.

On February 23, the family remembered a possible bat bite in late August 1982. The sera collected on this day showed low titers of rabies antibody by rapid fluorescent focus inhibition test (RFFIT) and by immunoadherence hemgagglutination (IAHA). Antibody was not present in the cerebrospinal fluid (CSF). On March 4, serum and CSF showed rises of titers to 1:25 and 1:17, respectively, by RFFIT. (Without treatment, rabies antibody titers typically rise to levels of 1:10.000-1:60.000. Concurrent steroid therapy has been shown to prevent antibody formation in rabies vaccine recipients).

This is the first case of human rabies reported in Michigan since 1948.

It is pointed out that no source of exposure has been identified in rabies in approximately 40% of human cases in the United States in the past 10 years.

(Taken from Morbidity and Mortality, Weekly Report, April 1st, 1983).

3.5 Racoon Rabies in the USA on the Increase

Over the recent years there are three major outbreaks of rabies in the United States.

One major outbreak in skunks has swiftly spread through Texas and Oklahoma, north to the Dakotas and west to Montana.

The second rash has been transmitted by racoons and spread through several Southeastern states, including Florida and Georgia.

A similar outbreak, also distributed by racoons, has quickly moved through Virginia, West Virginia, Maryland, Pennsylvania and to the Washington, D.C. area. It is affecting large metropolitan areas and racoons have become the most urban rabies problem. Outbreaks, with racoons as the prime carrier, have hit Eastern metropolitan areas such as Baltimore, Philadelphia and Trenton, N.J.

Also, racoons are in some States subject of intensive trapping for pelts and one has observed that animals affected by the disease do go into traps. In June 1981 4 wild racoons were being used in a live trapping-radiotracking project at the Department of Conservation, National Zoological Park, Washington, D.C. During a 10-day trapping programme these 4 racoons behaved in an unusual manner: they were highly excitable, vocalized continuously, and constantly moved about in the trap. Unlike normal racoons, these animals often allowed themselves to be retrapped. Some animals were noted to lack coordination and to have rear-limb paralysis. Two of the 4 racoons were euthanized when in extremis, and 2 were found dead shortly after they were trapped. All four revealed rabies.

(Taken from Morbidity and Mortality, Weekly Report, November 14, 1980 and July 31, 1981 and personal communication with Dr. W.G. Winkler, Center for Diseases Control, Atlanta, Georgia 30333).

TABLE 1

EUR E U R O P E **1/83** R A B I E S C A S E S 1. 1.83 - 31. 3.83

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
AUT	AUSTRIA	1	3	-	-	1	-	5	366	13	4	16	-	399		404
BEL	BELGIUM	1	13	27	9	20	-	70	134	-	2	2	-	138		208
BUL	BULGARIA *							0						0		0
CZE	CZECHOSLOVAKIA	12	21	-	-	-	-	33	600	6	6	13	1	626		659
DEN	DENMARK *							0						0		0
DDR	GERMAN DEM. REPUBLIC	19	33	11	1	12	1	77	560	2	14	22	5	603		680
DEU	FED.REP. OF GERMANY	28	66	64	17	81	2	258	1608	33	59	114	2	1816		2074
FIN	FINLAND *							0						0		0
FRA	FRANCE	26	26	40	4	37	1	134	633	12	-	11	12	668		802
GBR	UNITED KINGDOM *							0						0		0
GRE	GREECE	1	-	-	-	-	-	1						0		1
HUN	HUNGARY	11	18	5	-	-	-	34	373	-	1	4	1	379		413
IRE	IRELAND *							0						0		0
ITA	ITALY							0	90	3	-	-	-	93		93
LUX	LUXEMBOURG	-	2	6	1	7	-	16	19	-	-	-	-	19		35
NET	NETHERLANDS							0	1	-	-	-	-	1		1
NOR	NORWAY *							0						0		0
POL	POLAND	11	13	5	-	-	-	29	91	1	-	10	7	109		138
POR	PORTUGAL *							0						0		0
RUM	RUMANIA	2	3	4	-	-	1	10	10	-	-	-	1	11		21
SPA	SPAIN *							0						0		0
SWE	SWEDEN *							0						0		0
SWI	SWITZERLAND + LIECHT	2	13	5	2	6	-	28	160	6	8	11	-	185		213
TUR	TURKEY	355	14	60	2	33	10	474	2	1	-	-	6	9		483
YUG	YUGOSLAVIA	13	9	3	-	-	-	25	346	-	-	-	10	356		381
TOTAL		482	234	230	36	197	15	1194	4993	77	94	203	45	5412	0	6606
PER CENT		7.3	3.5	3.5	0.5	3.0	0.2	18.1	75.6	1.2	1.4	3.1	0.7	81.9	0.0	100.0

* NO CASES.

TABLE 2

EUR EUROPE **1/83**

RABIES CASES
'OTHER ANIMAL SPECIES'

1. 1.83 - 31. 3.83

LOCATION CODE	NAME	OTHER DOMESTIC ANIMALS				OTHER WILD ANIMALS											TOTAL
		DONKEY	MULE	PIG	OTHER	WOLF	RACOON	WILD CAT	WILD BOAR	MOUFLON	SQUIRREL	BLACK RAT	HOUSE MOUSE	MUSKRAT	HARE	OTHER	
CZE	CZECHOSLOVAKIA	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1
DDR	GERMAN DEM. REPUBLIC	-	-	1	-	-	-	-	3	1	-	-	-	-	1	-	6
DEU	FED.REP. OF GERMANY	1	-	1	-	-	-	-	2	-	-	-	-	-	-	-	4
FRA	FRANCE	-	-	1	-	-	-	-	-	-	-	-	-	-	-	12	13
HUN	HUNGARY	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
POL	POLAND	-	-	-	-	-	2	-	-	-	2	1	-	2	-	-	7
RUM	RUMANIA	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	2
TUR	TURKEY	8	2	-	-	1	-	-	-	-	-	-	5	-	-	-	16
YUG	YUGOSLAVIA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	10
TOTAL		9	2	3	1	1	2	1	5	1	2	1	5	3	1	23	60
PER CENT		15.0	3.3	5.0	1.7	1.7	3.3	1.7	8.3	1.7	3.3	1.7	8.3	5.0	1.7	38.3	100.0

AUT AUSTRIA — RABIES CASES — 1. 1.83 - 31. 3.83

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
108	OBERPULLENDORF							0	10	-	-	-	-	10		10
203	HERMAGOR							0	7	1	-	-	-	8		8
204	KLAGENFURT-LAND							0	32	1	-	-	-	33		33
205	SANKT VEIT AN DER GL							0	6	-	-	-	-	6		6
206	SPITTAL AN DER DRAU	1	-	-	-	-	-	1	41	2	-	5	-	48		49
207	VILLACH-LAND							0	8	-	-	-	-	8		8
305	AMSTETTEN							0	-	-	1	-	-	1		1
309	GMUEND							0	2	-	-	-	-	2		2
314	LILIENFELD							0	5	1	-	-	-	6		6
315	MELK							0	3	-	-	-	-	3		3
318	NEUNKIRCHEN							0	48	2	2	1	-	53		53
319	SANKT POELTEN-LAND							0	-	1	-	-	-	1		1
320	SCHEIBBS	-	-	-	-	1	-	1	4	1	-	-	-	5		6
322	WAIDHOFEN AN DER THA							0	11	1	-	-	-	12		12
323	WIENER NEUSTADT-LAND							0	2	-	-	-	-	2		2
413	ROHRBACH							0	1	-	-	-	-	1		1
602	BRUCK AN DER MUR							0	1	-	-	-	-	1		1
606	GRAZ-LAND							0	9	1	-	1	-	11		11
607	HARTBERG							0	11	-	-	1	-	12		12
608	JUDENBURG							0	4	-	-	-	-	4		4
609	KNITTELFELD							0	16	-	-	2	-	18		18
611	LEOBEN							0	16	-	-	1	-	17		17
613	MUERZZUSCHLAG							0	4	-	-	-	-	4		4
614	MURAU							0	63	1	-	3	-	67		67
616	VOITSBERG	-	2	-	-	-	-	2	5	-	-	2	-	7		9
617	WEIZ							0	10	-	-	-	-	10		10
704	KITZBUEHEL							0	8	-	-	-	-	8		8
705	KUFSTEIN	-	1	-	-	-	-	1	15	-	1	-	-	16		17
707	LIENZ							0	4	-	-	-	-	4		4
708	REUTTE							0	17	-	-	-	-	17		17
709	SCHWAZ							0	3	-	-	-	-	3		3
802	BREGENZ							0	-	1	-	-	-	1		1
TOTAL		1	3	0	0	1	0	5	366	13	4	16	0	399	0	404
PER CENT		0.2	0.7	0.0	0.0	0.2	0.0	1.2	90.6	3.2	1.0	4.0	0.0	98.8	0.0	100.0

RABIES CASES 1. 1.83 - 31. 3.83

LOCATION CODE NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
	DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
BEL BELGIUM															
LG LIEGE	-	1	9	2	4	-	16	32	-	1	1	-	34		50
LI LIMBURG	-	-	1	-	-	-	1						0		1
LX LUXEMBOURG	1	12	17	7	14	-	51	76	-	1	1	-	78		129
NA NAMUR	-	-	-	-	2	-	2	26	-	-	-	-	26		28
TOTAL	1	13	27	9	20	0	70	134	0	2	2	0	138	0	208
PER CENT	0.5	6.2	13.0	4.3	9.6	0.0	33.7	64.4	0.0	1.0	1.0	0.0	66.3	0.0	100.0
LUX LUXEMBOURG															
02 CAPELLEN	-	-	-	-	1	-	1	3	-	-	-	-	3		4
03 ESCH							0	3	-	-	-	-	3		3
04 LUXEMBOURG-CAMPAGNE	-	1	-	-	-	-	1	1	-	-	-	-	1		2
05 MERSCH	-	-	-	-	1	-	1	2	-	-	-	-	2		3
06 CLERVAUX	-	-	-	-	1	-	1	2	-	-	-	-	2		3
07 DIEKIRCH	-	-	2	-	1	-	3	1	-	-	-	-	1		4
08 REDANGE	-	-	2	1	3	-	6	5	-	-	-	-	5		11
09 WILTZ	-	1	2	-	-	-	3						0		3
13 REMICH							0	2	-	-	-	-	2		2
TOTAL	0	2	6	1	7	0	16	19	0	0	0	0	19	0	35
PER CENT	0.0	5.7	17.1	2.9	20.0	0.0	45.7	54.3	0.0	0.0	0.0	0.0	54.3	0.0	100.0
NET NETHERLANDS															
80 GRONINGEN							0	1	-	-	-	-	1		1

CZE C Z E C H O S L O V A K I A — R A B I E S C A S E S — 1. 1.83 - 31. 3.83

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
00	DISTRICT OF PRAGUE							0	1	-	-	-	-	1		1
01	CENTRAL BOHEMIA	1	5	-	-	-	-	6	132	2	2	2	-	138		144
02	SOUTH BOHEMIA							0	53	-	-	-	-	53		53
03	WEST BOHEMIA	3	5	-	-	-	-	8	167	-	2	3	1	173		181
04	NORTH BOHEMIA	1	1	-	-	-	-	2	51	-	1	-	-	52		54
05	EAST BOHEMIA	-	1	-	-	-	-	1	71	1	-	4	-	76		77
06	SOUTH MORAVIA							0	65	3	-	3	-	71		71
07	NORTH MORAVIA	2	2	-	-	-	-	4	14	-	-	1	-	15		19
0	CSR	7	14	-	-	-	-	21	554	6	5	13	1	579		600
10	DISTRICT OF BRATISLAV							0						0		0
11	WEST SLOVAKIA	1	1	-	-	-	-	2	4	-	-	-	-	4		6
12	CENTRAL SLOVAKIA	3	3	-	-	-	-	6	33	-	1	-	-	34		40
13	EAST SLOVAKIA	1	3	-	-	-	-	4	9	-	-	-	-	9		13
1	SSR	5	7	-	-	-	-	12	46	-	1	-	-	47		59
TOTAL		12	21	0	0	0	0	33	600	6	6	13	1	626	0	659
PER CENT		1.8	3.2	0.0	0.0	0.0	0.0	5.0	91.0	0.9	0.9	2.0	0.2	95.0	0.0	100.0

DDR GERMAN DEMOCRATIC REPUBLIC — R A B I E S C A S E S — 1. 1.83 - 31. 3.83

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
01	HAUPTSTADT BERLIN							0	3	-	-	-	-	3		3
02	COTTBUS	-	1	-	-	-	-	1	18	-	-	1	-	19		20
03	DRESDEN	-	1	1	-	-	-	2	10	-	1	1	-	12		14
04	ERFURT	1	2	1	-	2	-	6	78	-	4	-	-	82		88
05	FRANKFURT/ODER	-	1	-	-	-	-	1	33	2	1	2	-	38		39
06	GERA	2	1	-	-	1	-	4	69	-	-	4	2	75		79
07	HALLE	3	2	1	1	-	-	7	47	-	2	3	2	54		61
08	KARL-MARX-STADT	1	8	-	-	5	-	14	47	-	2	-	-	49		63
09	LEIPZIG							0	10	-	1	-	-	11		11
10	MAGDEBURG	1	2	1	-	-	-	4	69	-	1	1	-	71		75
11	NEUBRANDENBURG	2	1	-	-	-	-	3	28	-	-	1	-	29		32
12	POTSDAM	3	10	6	-	2	-	21	48	-	-	4	1	53		74
13	ROSTOCK	2	2	-	-	2	-	6	35	-	-	2	-	37		43
14	SCHWERIN	2	1	1	-	-	1	5	38	-	2	2	-	42		47
15	SUHL	2	1	-	-	-	-	3	27	-	-	1	-	28		31
TOTAL		19	33	11	1	12	1	77	560	2	14	22	5	603	0	680
PER CENT		2.8	4.9	1.6	0.1	1.8	0.1	11.3	82.4	0.3	2.1	3.2	0.7	88.7	0.0	100.0

DEU FEDERAL REPUBLIC OF GERMANY — RABIES CASES — 1. 1.83 - 31. 3.83

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
010	SCHLESWIG-HOLSTEIN	2	-	-	1	-	-	3	19	1	3	-	-	23		26
020	HAMBURG							0	1	-	-	-	-	1		1
031	BRAUNSCHWEIG	1	2	1	-	-	-	4	17	1	-	1	-	19		23
032	HANNOVER	1	1	2	-	2	-	6	21	-	2	3	-	26		32
033	LUENEBURG	-	1	1	5	-	-	7	81	-	-	2	-	83		90
034	WESER-EMS	-	-	2	-	-	-	2	21	-	-	-	-	21		23
040	BREMEN							0						0		0
051	DUESSELDORF							0	1	-	-	-	-	1		1
053	KOELN	2	4	21	2	12	1	42	65	1	1	-	-	67		109
055	MUENSTER							0						0		0
057	DETMOLD	1	12	1	2	-	-	16	21	3	1	7	-	32		48
059	ARNSBERG	-	-	-	-	7	-	7	13	1	-	1	1	16		23
061	DARMSTADT	6	6	9	-	13	-	34	214	3	5	18	-	240		274
062	KASSEL	5	14	15	2	29	-	65	225	3	16	32	-	276		341
071	KOBLENZ	1	4	4	3	3	-	15	102	6	5	14	-	127		142
072	TRIER	-	2	5	-	3	1	11	16	-	2	-	-	18		29
073	RHEINHESSEN-PFALZ	-	6	-	-	3	-	9	23	-	1	1	-	25		34
081	STUTTGART	-	2	-	-	-	-	2	125	7	2	8	-	142		144
082	KARLSRUHE	1	1	-	-	-	-	2	55	2	5	2	-	64		66
083	FREIBURG	-	3	-	-	1	-	4	128	1	1	8	-	138		142
084	TUEBINGEN	1	2	1	1	1	-	6	109	1	2	9	1	122		128
091	OBERBAYERN	2	-	2	-	6	-	10	120	1	4	2	-	127		137
092	NIEDERBAYERN							0	5	-	-	-	-	5		5
093	OBERPFALZ	2	1	-	-	-	-	3	59	-	-	-	-	59		62
094	OBERFRANKEN	1	2	-	-	-	-	3	27	-	2	1	-	30		33
095	MITTELFRANKEN							0	8	-	-	-	-	8		8
096	UNTERFRANKEN	1	-	-	-	-	-	1	26	1	-	-	-	27		28
097	SCHWABEN	-	-	-	-	1	-	1	82	1	3	4	-	90		91
100	SAARLAND	1	2	-	1	-	-	4	24	-	4	1	-	29		33
110	BERLIN (WEST)	-	1	-	-	-	-	1						0		1
TOTAL		28	66	64	17	81	2	258	1608	33	59	114	2	1816	0	2074
PER CENT		1.4	3.2	3.1	0.8	3.9	0.1	12.4	77.5	1.6	2.8	5.5	0.1	87.6	0.0	100.0

FRA FRANCE — RABIES CASES — 1. 1.83 - 31. 3.83

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
01	AIN							0	14	-	-	-	-	14		14
02	AISNE	-	1	-	-	-	-	1	45	-	-	1	1	47		48
08	ARDENNES	2	3	13	3	3	-	24	17	-	-	-	-	17		41
10	AUBE	1	-	1	-	1	-	3	38	-	-	-	1	39		42
21	COTE D'OR	3	4	6	-	6	1	20	36	-	-	-	1	37		57
25	DOUBS	-	4	-	-	1	-	5	78	1	-	-	2	81		86
38	ISERE							0	-	2	-	-	-	2		2
39	JURA	3	2	-	-	1	-	6	113	1	-	3	2	119		125
51	MARNE	-	1	-	-	-	-	1	5	-	-	-	-	5		6
52	MARNE (HAUTE)	-	2	4	-	5	-	11	37	-	-	-	-	37		48
54	MEURTHE-ET-MOSELLE	1	-	-	-	3	-	4	18	1	-	-	3	22		26
55	MEUSE	1	-	3	-	1	-	5	10	-	-	-	-	10		15
57	MOSELLE	-	1	10	-	1	-	12	11	-	-	-	-	11		23
58	NIEVRE							0	4	-	-	-	-	4		4
60	OISE	-	1	-	-	-	-	1						0		1
67	RHIN (BAS)	4	-	1	-	-	-	5	25	1	-	1	-	27		32
68	RHIN (HAUT)	-	1	-	-	-	-	1	5	-	-	2	-	7		8
70	SAONE (HAUTE)	1	1	-	-	-	-	2	24	-	-	1	-	25		27
71	SAONE-ET-LOIRE	-	-	-	-	1	-	1	10	-	-	-	-	10		11
73	SAVOIE	5	1	1	1	1	-	9	43	2	-	1	-	46		55
74	SAVOIE (HAUTE)	3	1	-	-	-	-	4	48	2	-	2	-	52		56
75	PARIS	-	1	-	-	-	-	1						0		1
77	SEINE-ET-MARNE							0	1	-	-	-	-	1		1
88	VOSGES	2	2	1	-	10	-	15	28	2	-	-	2	32		47
89	YONNE	-	-	-	-	3	-	3	23	-	-	-	-	23		26
TOTAL		26	26	40	4	37	1	134	633	12	0	11	12	668	0	802
PER CENT		3.2	3.2	5.0	0.5	4.6	0.1	16.7	78.9	1.5	0.0	1.4	1.5	83.3	0.0	100.0

R A B I E S C A S E S

1. 1.83 - 31. 3.83

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
GRE	G R E E C E															
10	EVROS	1	-	-	-	-	-	1						0		1
ITA	I T A L Y															
22	COMO							0	6	-	-	-	-	6		6
23	SONDRIO							0	52	-	-	-	-	52		52
24	BERGAMO							0	2	-	-	-	-	2		2
25	BRESCIA							0	1	-	-	-	-	1		1
32	BELLUNO							0	2	-	-	-	-	2		2
33	UDINE							0	14	2	-	-	-	16		16
34	TRIESTE E GORIZIA							0	2	1	-	-	-	3		3
39	BOLZANO							0	11	-	-	-	-	11		11
TOTAL		0	0	0	0	0	0	0	90	3	0	0	0	93	0	93
PER CENT		0.0	0.0	0.0	0.0	0.0	0.0	0.0	96.8	3.2	0.0	0.0	0.0	100.0	0.0	100.0

HUN HUNGARY — RABIES CASES — 1. 1.83 - 31. 3.83

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
01	BUDAPEST							0	6	-	-	-	-	6		6
02	BARANYA	2	2	-	-	-	-	4	14	-	-	-	-	14		18
03	BACS-KISKUN	-	1	-	-	-	-	1	13	-	-	-	-	13		14
04	BEKES	-	1	-	-	-	-	1	17	-	-	-	-	17		18
05	BORSOD-ABAU-ZEMPLEN	-	1	-	-	-	-	1	41	-	-	-	-	41		42
06	CSONGRAD	-	2	-	-	-	-	2	13	-	-	-	-	13		15
07	FEJER	-	-	1	-	-	-	1	37	-	1	-	-	38		39
08	GYOER-SOPRON							0	13	-	-	1	-	14		14
09	HAJDU-BIHAR	-	1	-	-	-	-	1	7	-	-	-	-	7		8
10	HEVES	1	-	-	-	-	-	1	29	-	-	-	1	30		31
11	KOMAROM	-	2	-	-	-	-	2	56	-	-	-	-	56		58
12	NOGRAD	2	1	1	-	-	-	4	10	-	-	-	-	10		14
13	PEST	2	2	2	-	-	-	6	39	-	-	-	-	39		45
14	SOMOGY	2	2	1	-	-	-	5	12	-	-	3	-	15		20
15	SZABOLCS-SZATMAR	1	2	-	-	-	-	3	14	-	-	-	-	14		17
16	SZOLNOK	1	1	-	-	-	-	2	4	-	-	-	-	4		6
17	TOLNA							0	7	-	-	-	-	7		7
18	VAS							0	15	-	-	-	-	15		15
19	VESZPREM							0	9	-	-	-	-	9		9
20	ZALA							0	17	-	-	-	-	17		17
TOTAL		11	18	5	0	0	0	34	373	0	1	4	1	379	0	413
PER CENT		2.7	4.4	1.2	0.0	0.0	0.0	8.2	90.3	0.0	0.2	1.0	0.2	91.8	0.0	100.0

POL POLAND — RABIES CASES — 1. 1.83 - 31. 3.83

LOCATION CODE NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
	DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
03 BIALA PODLASKA	-	-	1	-	-	-	1	2	-	-	-	-	2		3
09 BYDGOSZCZ							0	2	-	-	-	-	2		2
11 CHELM	-	2	-	-	-	-	2						0		2
15 CZESTOCHOWA	1	-	-	-	-	-	1	1	-	-	1	-	2		3
17 ELBLAG	-	1	-	-	-	-	1	4	-	-	-	1	5		6
19 GDANSK	-	1	-	-	-	-	1						0		1
21 GORZOW							0	1	-	-	-	-	1		1
23 JELENIA GORA							0	13	-	-	-	-	13		13
27 KATOWICE							0	2	-	-	2	-	4		4
33 KOSZALIN	3	-	-	-	-	-	3	6	-	-	3	2	11		14
35 KRAKOW	2	1	-	-	-	-	3	3	-	-	-	-	3		6
39 LEGNICA							0	4	-	-	-	-	4		4
41 LESZNO							0	4	-	-	-	-	4		4
51 OLSZTYN							0	3	-	-	-	1	4		4
53 OPOLE							0	6	-	-	-	-	6		6
57 PILA							0	2	-	-	-	-	2		2
63 POZNAN	-	1	-	-	-	-	1	4	-	-	-	-	4		5
65 PRZEMYSL	-	1	-	-	-	-	1						0		1
71 SIEDLCE							0	3	-	-	-	-	3		3
77 SLUPSK	1	1	-	-	-	-	2	1	-	-	1	-	2		4
79 SUWALKI	1	1	1	-	-	-	3	-	-	-	-	1	1		4
81 SZCZECIN	3	2	1	-	-	-	6	7	1	-	3	2	13		19
85 TARNOW							0	1	-	-	-	-	1		1
87 TORUN							0	1	-	-	-	-	1		1
89 WALBRZYCH	-	1	-	-	-	-	1	14	-	-	-	-	14		15
93 WROCLAW	-	-	1	-	-	-	1	3	-	-	-	-	3		4
95 ZAMOSC	-	1	-	-	-	-	1	1	-	-	-	-	1		2
97 ZIELONA GORA	-	-	1	-	-	-	1	3	-	-	-	-	3		4
TOTAL	11	13	5	0	0	0	29	91	1	0	10	7	109	0	138
PER CENT	8.0	9.4	3.6	0.0	0.0	0.0	21.0	65.9	0.7	0.0	7.2	5.1	79.0	0.0	100.0

RABIES CASES

1. 1.83 - 31. 3.83

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
RUM	RUMANIA															
01	ALBA	-	2	-	-	-	-	2						0		2
02	ARAD	2	1	1	-	-	-	4	1	-	-	-	-	1		5
04	BACAU							0	1	-	-	-	-	1		1
12	CALARASI	-	-	2	-	-	1	3						0		3
22	HUNEDOARA							0	2	-	-	-	-	2		2
23	IALOMITA							0	1	-	-	-	-	1		1
32	SALAJ							0	5	-	-	-	1	6		6
41	BUCURESTI	-	-	1	-	-	-	1						0		1
TOTAL		2	3	4	0	0	1	10	10	0	0	0	1	11	0	21
PER CENT		9.5	14.3	19.0	0.0	0.0	4.8	47.6	47.6	0.0	0.0	0.0	4.8	52.4	0.0	100.0
YUG	YUGOSLAVIA															
I	SR BOSNA I HERCEGOVI	6	-	2	-	-	-	8	31	-	-	-	3	34		42
III	SR HRVATSKA	2	3	1	-	-	-	6	139	-	-	-	1	140		146
V	SR SLOVENIJA	2	1	-	-	-	-	3	114	-	-	-	5	119		122
VI	SR SRBIJA	1	-	-	-	-	-	1	5	-	-	-	-	5		6
VI1	SAP VOJVODINA	1	5	-	-	-	-	6	57	-	-	-	1	58		64
VI2	SAP KOSOVO	1	-	-	-	-	-	1						0		1
TOTAL		13	9	3	0	0	0	25	346	0	0	0	10	356	0	381
PER CENT		3.4	2.4	0.8	0.0	0.0	0.0	6.6	90.8	0.0	0.0	0.0	2.6	93.4	0.0	100.0

SWI SWITZERLAND AND LIECHTENSTEIN — R A B I E S C A S E S — 1. 1.83 - 31. 3.83

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS.						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
01	AARGAU							0	3	-	-	-	-	3		3
02	APPENZELL A.RH.							0	4	-	-	-	-	4		4
03	APPENZELL I.RH.	1	-	-	-	-	-	1	2	-	1	-	-	3		4
05	BASEL-LAND							0	-	-	1	-	-	1		1
06	BERN	-	1	-	-	-	-	1	4	1	-	1	-	6		7
07	FRIBOURG							0	12	-	1	-	-	13		13
08	GENEVE							0	3	-	1	-	-	4		4
09	GLARUS							0	2	-	-	-	-	2		2
10	GRAUBUENDEN	-	2	-	-	1	-	3	14	1	2	1	-	18		21
15	SCHAFFHAUSEN							0	14	-	-	5	-	19		19
16	SCHWYZ	-	-	1	-	-	-	1						0		1
17	SOLOTHURN							0	2	-	-	-	-	2		2
18	ST.GALLEN	1	3	1	1	4	-	10	33	2	-	3	-	38		48
20	THURGAU	-	5	2	1	1	-	9	12	1	-	1	-	14		23
21	URI							0	1	1	-	-	-	2		2
22	VAUD	-	-	1	-	-	-	1	20	-	-	-	-	20		21
25	ZUERICH	-	2	-	-	-	-	2	32	-	2	-	-	34		36
26	JURA							0	1	-	-	-	-	1		1
LI	LIECHTENSTEIN							0	1	-	-	-	-	1		1
TOTAL		2	13	5	2	6	0	28	160	6	8	11	0	185	0	213
PER CENT		0.9	6.1	2.3	0.9	2.8	0.0	13.1	75.1	2.8	3.8	5.2	0.0	86.9	0.0	100.0

TUR TURKEY — RABIES CASES — 1. 1.83 - 31. 3.83

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
001	ADANA	5	1	1	-	-	-	7						0		7
002	ADIYAMAN	1	-	-	-	-	-	1						0		1
003	AFYON	6	-	1	-	7	-	14						0		14
005	AMASYA	7	-	-	-	-	-	7						0		7
006	ANKARA	20	-	4	-	6	-	30						0		30
007	ANTALYA	2	-	5	-	2	-	9						0		9
009	AYDIN	26	-	1	-	1	3	31						0		31
010	BALIKESIR	9	-	2	-	5	-	16						0		16
011	BILECIK	7	-	1	-	-	1	9						0		9
014	BOLU	9	-	5	-	-	-	14						0		14
015	BURDUR	-	-	-	-	4	-	4						0		4
016	BURSA	20	3	1	-	-	-	24	1	-	-	-	1	2		26
017	CANAKKALE	13	-	1	-	2	-	16						0		16
018	CANKIRI	2	-	1	-	-	-	3						0		3
019	CORUM	7	-	-	-	-	-	7						0		7
020	DENIZLI	7	-	2	-	-	-	9						0		9
021	DIYARBAKIR	4	1	1	-	-	-	6						0		6
022	EDIRNE	1	-	-	-	-	1	2						0		2
023	ELAZIG	2	-	-	-	-	-	2						0		2
025	ERZURUM	4	-	-	-	-	-	4						0		4
026	ESKISEHIR	2	-	2	-	1	-	5						0		5
027	GAZIANTEP	6	-	1	-	-	-	7						0		7
028	GIRESUN	4	-	2	-	-	1	7						0		7
033	ICEL	7	-	-	-	-	-	7	-	1	-	-	2	3		10
034	ISTANBUL	21	1	1	-	1	-	24						0		24
035	IZMIR	22	3	6	1	-	-	32						0		32
036	KARS	2	-	-	1	-	-	3						0		3
037	KASTAMONU	9	-	1	-	-	-	10						0		10
038	KAYSERI	3	-	2	-	-	-	5	-	-	-	-	1	1		6

TUR CONTINUED

LOCATION CODE	NAME	DOMESTIC ANIMALS							WILD ANIMALS						HUMAN CASES	TOTAL
		DOG	CAT	CATTLE	HORSE	SHEEP GOAT	OTHERS	TOTAL	FOX	BADGER	OTHER MUSTEL	DEER	OTHERS	TOTAL		
039	KIRKLARELI	4	–	–	–	–	–	4						0		4
040	KIRSEHIR	3	1	–	–	–	–	4						0		4
041	KOCAELI	1	–	1	–	–	–	2						0		2
042	KONYA	10	1	1	–	–	–	12						0		12
043	KUETAHYA	2	–	–	–	–	–	2						0		2
044	MALATYA	1	–	–	–	–	–	1						0		1
045	MANISA	14	1	–	–	–	1	16						0		16
046	KAHRAMAN MARAS	2	–	–	–	–	–	2	–	–	–	–	1	1		3
047	MARDIN	1	–	–	–	–	–	1						0		1
048	MUGLA	–	–	–	–	–	1	1						0		1
049	MUS	1	–	–	–	–	–	1						0		1
050	NEVSEHIR	2	–	–	–	–	–	2						0		2
052	ORDU	14	–	3	–	1	–	18	–	–	–	–	1	1		19
054	SAKARYA	11	2	1	–	–	–	14						0		14
055	SAMSUN	18	–	2	–	–	1	21	1	–	–	–	–	1		22
057	SINOP	6	–	3	–	1	–	10						0		10
058	SIVAS	3	–	2	–	–	–	5						0		5
059	TEKIRDAG	3	–	1	–	–	–	4						0		4
060	TOKAT	4	–	–	–	–	–	4						0		4
061	TRABZON	8	–	–	–	1	–	9						0		9
062	TUNCELI	1	–	1	–	1	–	3						0		3
063	URFA	–	–	1	–	–	–	1						0		1
066	YOZGAT	9	–	2	–	–	1	12						0		12
067	ZONGULDAK	9	–	1	–	–	–	10						0		10
TOTAL		355	14	60	2	33	10	474	2	1	0	0	6	9	0	483
PER CENT		73.5	2.9	12.4	0.4	6.8	2.1	98.1	0.4	0.2	0.0	0.0	1.2	1.9	0.0	100.0

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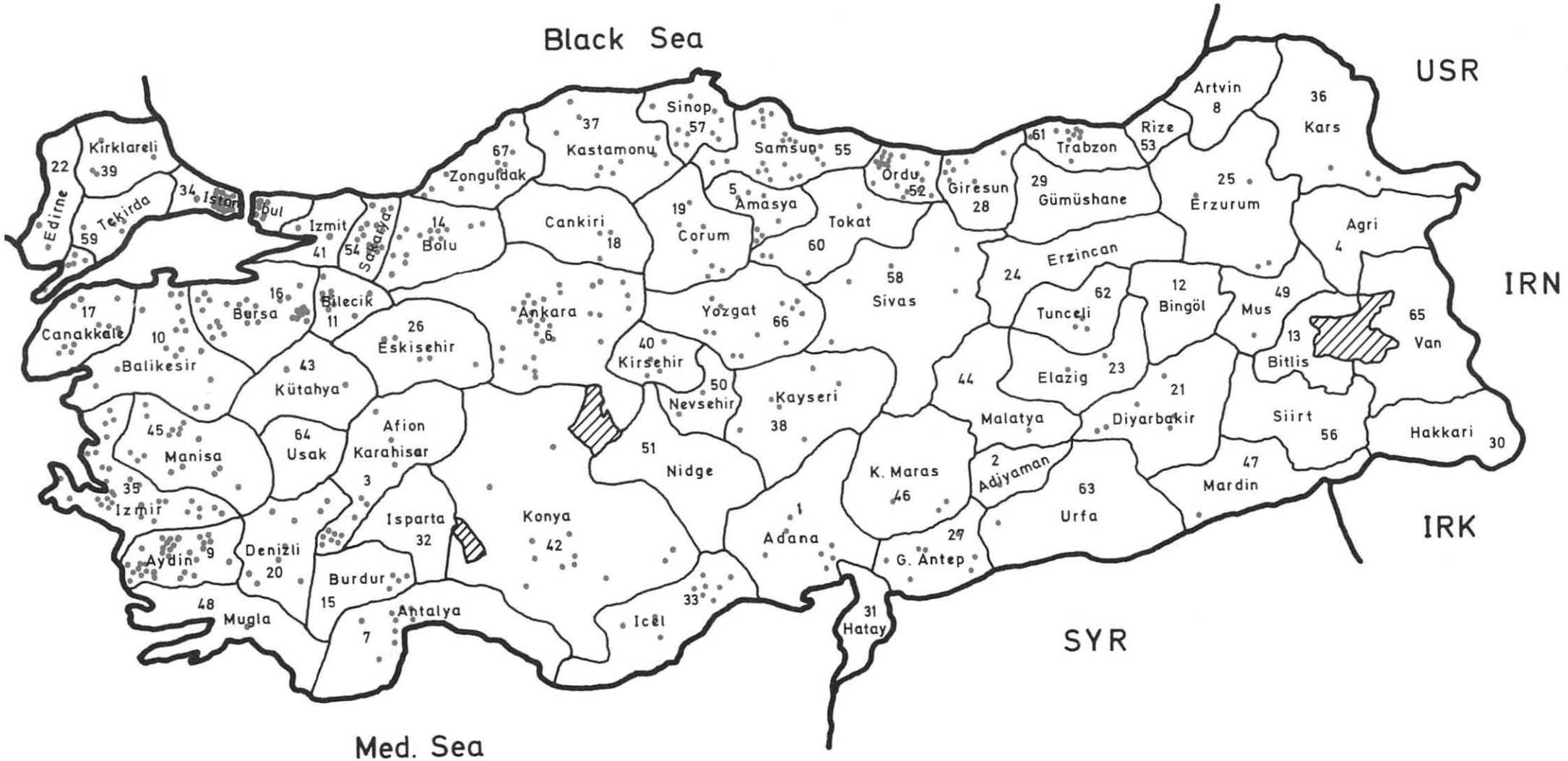
WHO Coll. Centre
uebingen / DEU

Rabies Cases Turkey
1st Quarter 1983
483 cases reported



WHO Coll. Centre
Tuebingen / DEU

Rabies Cases Europe
1st Quarter 1983

6606 cases reported

NOR
(rabies free)

FIN
(rabies free)

SWE
(rabies free)

DEN
(0)

IRE
(rabies free)

GBR
(rabies free)

NET
(1)

(2074)
DEU

DDR
(680)

POL
(138)

BEL
(208)

CZE
(659)

FRA
(802)

AUT
(404)

HUN
(413)

SWI
(213)

RUM
(21)

ITA
(93)

YUG
(381)

BUL
(rabies free)

POR
(rabies free)

SPA
(mainland rabies free)

ALB
(no data)

TUR
(483)

GRE
(1)

0 50 100 km