MALATTIE TRASMESSE DA VETTORI:
COSA È SUCCESSO NEL 2008 E
COSA CI ASPETTA NEL 2009

Ferrara, 18 maggio 2009

Malattia del Nilo occidentale: storia e prospettive 2009

Claudio Po
Regione Emilia - Romagna

Una morte annunciata

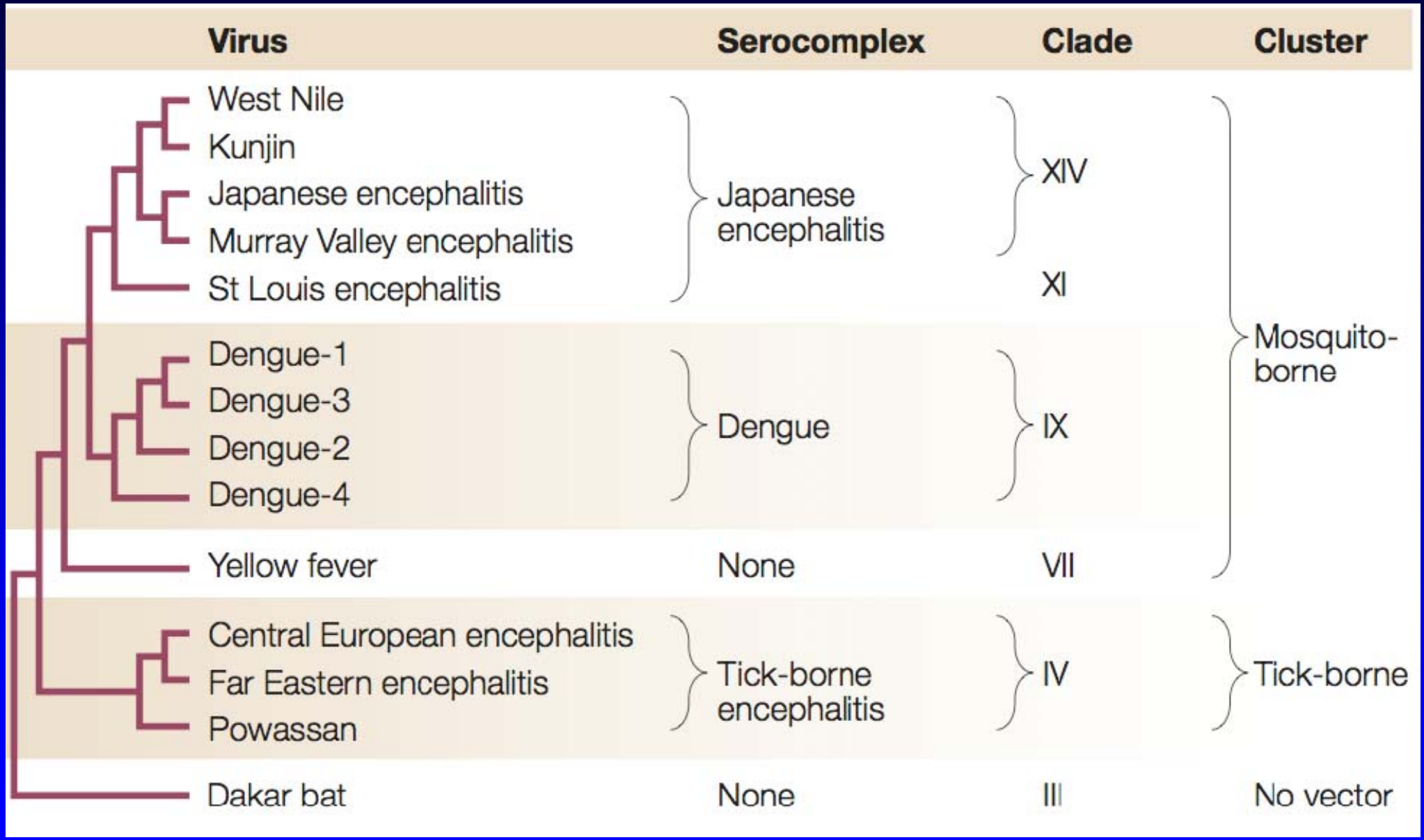
Engels, DW (1978). A note on Alexander's death. Classical Philosophy, 73:224-228

Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 9, No. 12, December 2003

Alexander the Great and West Nile Virus Encephalitis

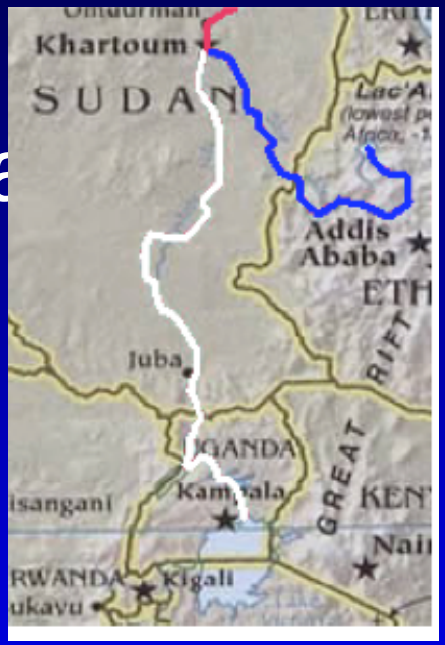
John S. Marr* and Charles H. Calisher†

Galli M, Bernini F, Zehender G (July 2004). "Alexander the Great and West Nile virus encephalitis". *Emerging Infect. Dis.* **10** (7): 1330–2; author reply 1332–3. PMID 15338540.

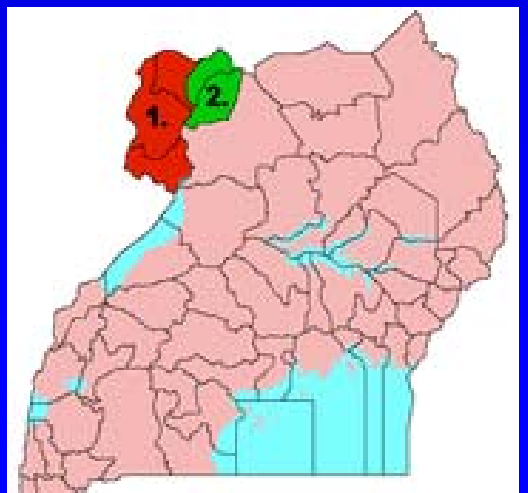

Virus
Serocomplex
Clade
Cluster
West Nile
Kunjin
Japanese encephalitis
Murray Valley encephalitis
St Louis encephalitis
Japanese encephalitis
XIV
XI
Dengue-1
Dengue-3
Dengue-2
Dengue-4
Dengue
IX
Yellow fever
None
VII
Mosquito-borne
Central European encephalitis
Far Eastern encephalitis
Powassan
Tick-borne encephalitis
IV
Tick-borne
Dakar bat
None
III
No vector

Dove si trova il Nilo occidentale

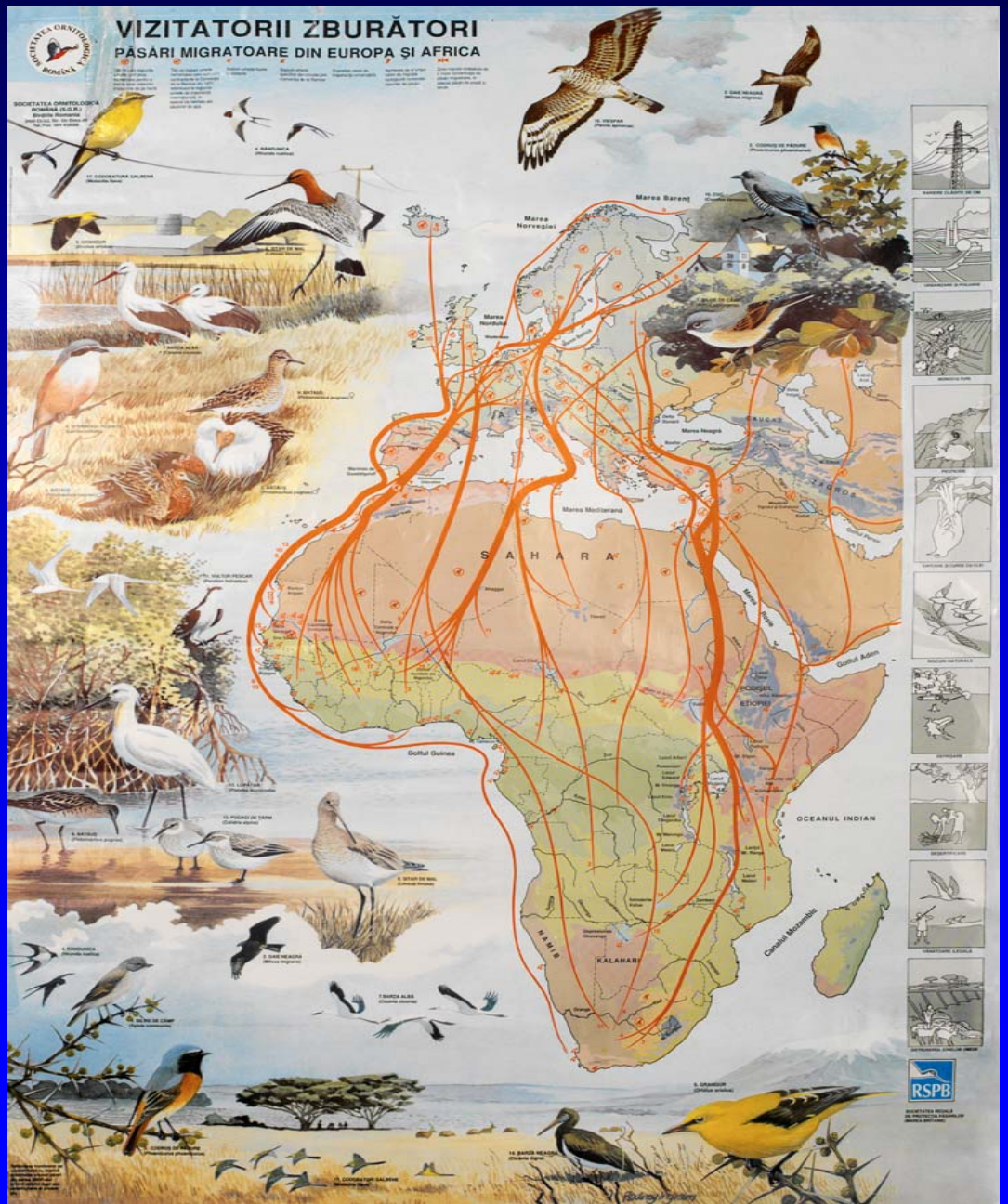
- 1937 ricerche sulla febbre gialla
- un nuovo flavivirus

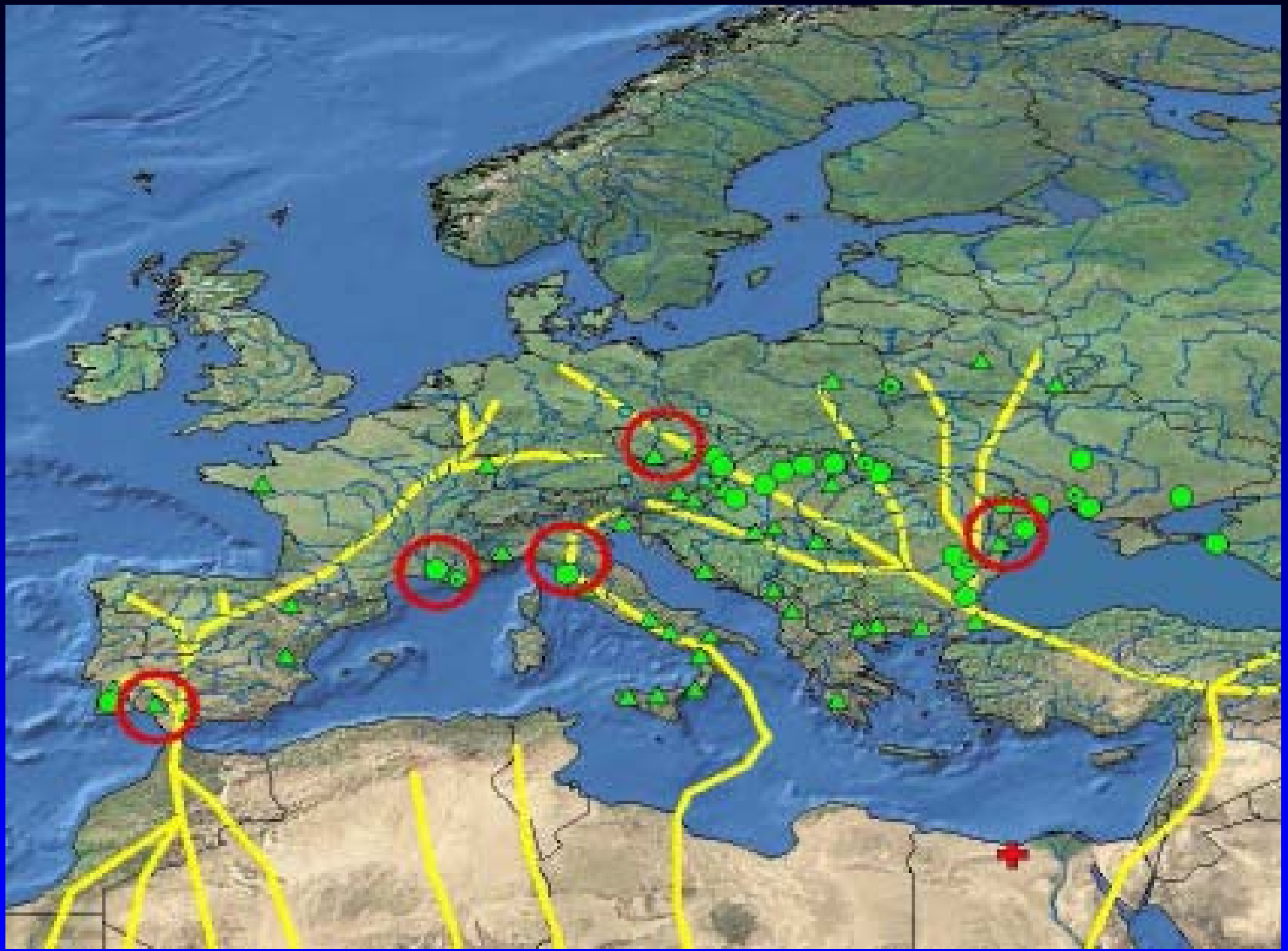


West Nile sub-region 1960s - 1970s
1. + **2.** - original West Nile district until 1950s



Rotte migratorie





1943 WN Aedes Albopictus

20924. Philip, C. B., and J. E. Smadel. (*Army Med. Sch., Washington, D. C.*) Transmission of West Nile virus by infected Aedes albopictus. *Proc. Soc. Exp. Biol. and Med.* 53(1): 49-50. 1943.—Young infected hamsters were bitten by *A. albopictus*; West Nile virus was recovered from one group of engorged mosquitoes immediately after feeding by means of intracerebral inoculation of a triturated suspension of them into mice. A similar group of engorged mosquitoes, following an incubation period, transmitted the virus to young normal hamsters by biting.—*Authors.*

[illegible] P. L., and DUSSEAU,

1952 Londra

ORDINARY MEETING

of the Royal Society of Tropical Medicine and Hygiene, held at **Manson House, 26, Portland Place, London, W.1., on Thursday, 11th December, 1952, at 7.30 p.m.**

Vice-President, Dr. A. R. D. Adams, F.R.C.P., D.T.M. & H., *in the Chair*

PAPER

EPIDEMIOLOGICAL NOTES ON SOME VIRUSES ISOLATED IN UGANDA

(Yellow fever, Rift Valley fever, Bwamba fever, West Nile, Mengo, Semliki forest, Bunyamwera, Ntaya, Uganda S and Zika viruses)

BY

G. W. A. DICK, M.D., B.Sc., M.R.C.P. (Edin.), M.P.H. (Johns Hopkins).

National Institute for Medical Research, London.

During a period of 10 years (1937-1947) 10 different viruses were isolated at the Yellow Fever Research Institute (now Virus Research Institute), Entebbe, Uganda. Two of these, yellow fever and Rift Valley fever virus, had been studied in considerable detail prior to their isolations in Uganda, but the nature of the Uganda isolations has greatly helped to unravel the natural history of the former and suggested some epidemiological links which may be of importance in the development of our knowledge of the epidemiology of the latter. Of the remaining eight viruses, all were thought to be hitherto unknown agents and subsequent studies confirmed this belief except in the case of one of them, namely Mengo encephalomyelitis virus, which was shown to be related to the Columbia SK, MM and encephalomyocarditis viruses (Dick, 1949; Warren, Smadel and Russ, 1949; Olitsky and Yager, 1949).

Perhaps the most formidable thing about these recently discovered viruses are the names which they have been given, for all of them except Uganda S virus have been called after the local geographical name of the place where the isolations were made. Their names, the year of their isolation and those responsible for their discovery are as follows :

	Name of Virus	Year first Isolated	Investigators
1.	Bwamba fever	1937	Smithburn, Mahaffy & Paul (1941)
2.	Semliki Forest	1942	Smithburn & Haddow (1944)
3.	Bunyamwera	1943	Smithburn, Haddow & Mahaffy (1946)
4.	Ntaya	1943	Smithburn & Haddow (1951)
5.	Uganda S	1947	Dick & Haddow (1952)
6.	Zika	1947	Dick, Kitchen & Haddow (1952)
7.	Mengo	1946	Dick, Smithburn & Haddow (1948)
8.	West Nile	1937	Smithburn, Hughes, Burke & Paul (1940)

Map showing districts of Uganda

In their original report on West Nile virus (WNV) SMITHBURN et al. (1940) record that

two persons engaged in studying the virus developed neutralizing antibody to it without showing any clinical signs or symptoms attributable to infection with the virus. I have already mentioned the silent nature of the viraemias from which the Cairo children were suffering, from whom virus was isolated by MELNICK et al. (1952) and also that the person from whom the original strain of WNV was isolated denied being ill. Attempts have been made by SOUTHAM and MOORE (1951) to induce human infections with WNV in "volunteer" patients suffering from advanced inoperable neoplastic diseases. (These studies were made in the hope that the virus might have an onocolytic effect). None of 21 patients inoculated with WNV experienced any subjective evidence of the virus infection*. It was suggested by SOUTHAM and MOORE (1951) that one of the reasons for the failure to produce virus infection may have been due to the fact that the virus was of "little infectivity" for man since no illnesses had been reported with natural infections. It would seem more accurate to say, (from these direct inoculations of virus and from known natural infections), that West Nile virus causes few recognizable signs and symptoms, for its infectivity must be very great as evidenced by the antibody studies of SMITHBURN and JACOBS (1942), SMITHBURN (1952) and MELNICK et al. (1952). Thus SMITHBURN et al. (1942) and SMITHBURN (1952) tested a total of 1,689 sera from the Red Sea coast (13 per cent. positive), Eastern border (33.3 per cent. positive), White Nile (46.4 per cent. positive), Kordofan (20.8 per cent. positive), and Southwestern (18.6 per cent. positive) areas of the Anglo-Egyptian Sudan; from Uganda (8.1 per cent. positive), and Kenya (8.6 per cent. positive); and from Opala (6.9 per cent. positive), Buta (45.3 per cent. positive) and Bondo (1.4 per cent. positive) in the Congo; only in Tanganyika and Spanish Guinea where 36 and 16 sera respectively were tested was no antibody demonstrable. From a study of 251 sera collected in a rural area north of Cairo, MELNICK et al. (1952) concluded that more than 70 per cent. of the inhabitants of that area of 4 years and over had neutralizing and complement-fixing antibodies to WNV, and MACNAMARA (1952) showed that 24 per cent. of sera from Kontagora were positive, but only 1.2 per cent. of 161 sera from Ilaro in Southern Nigeria. All these studies not only indicate a wide geographical range but all suggest a gradual decrease in virus activity as one moves south from Cairo which might give some clue as to the probable vector. I do not know what part the only known laboratory vector (*A. albopictus*) is likely to play in the natural history.

1952 Bulgaria

PEOPLE'S REPUBLIC OF BULGARIA
MINISTRY OF PUBLIC HEALTH AND SOCIAL WELFARE

WORKS
OF THE RESEARCH INSTITUTE OF EPIDEMIOLOGY AND MICROBIOLOGY

Volume VIII

MEDICINA I FISCULTURA
SOFIA-1962

STUDIES ON THE SERA OF SOME MIGRATORY BIRDS FOR ANTIBODIES NEUTRALIZING THE WEST NILE VIRUS

M. Rusakiev, T. Hristova, P. Andonov, A. Prodromov, P. Petkov, N. Gruncharov and S. Pachev

The West Nile virus has a wide areal of distribution. It is isolated from suffering individuals in Egypt, Israel and other countries while antibodies against this virus have been detected in the sera of humans, domestic animals, monkeys and wild birds in North, East, South and West Africa, in India and in other countries (3, 4, 5, 6). Virologic and serologic studies are necessary to elucidate the distribution of the virus in the various regions of the world as well as its role in human pathology in these places.

In 1959 we established the presence of virus-neutralizing antibodies of a high titre toward the West Nile virus and the Japanese encephalitis virus in the serum of an individual who had suffered in 1952 from meningoencephalitis (1).

This gave us ground to investigate some migratory birds in this district for antibodies against the West Nile virus.

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4. Громаздов Г. Г. — Вопр. вирусол., 1955, 5, 515.
5. Левкович Е. Н. — Вопр. вирусол., 1957, 3, 151.
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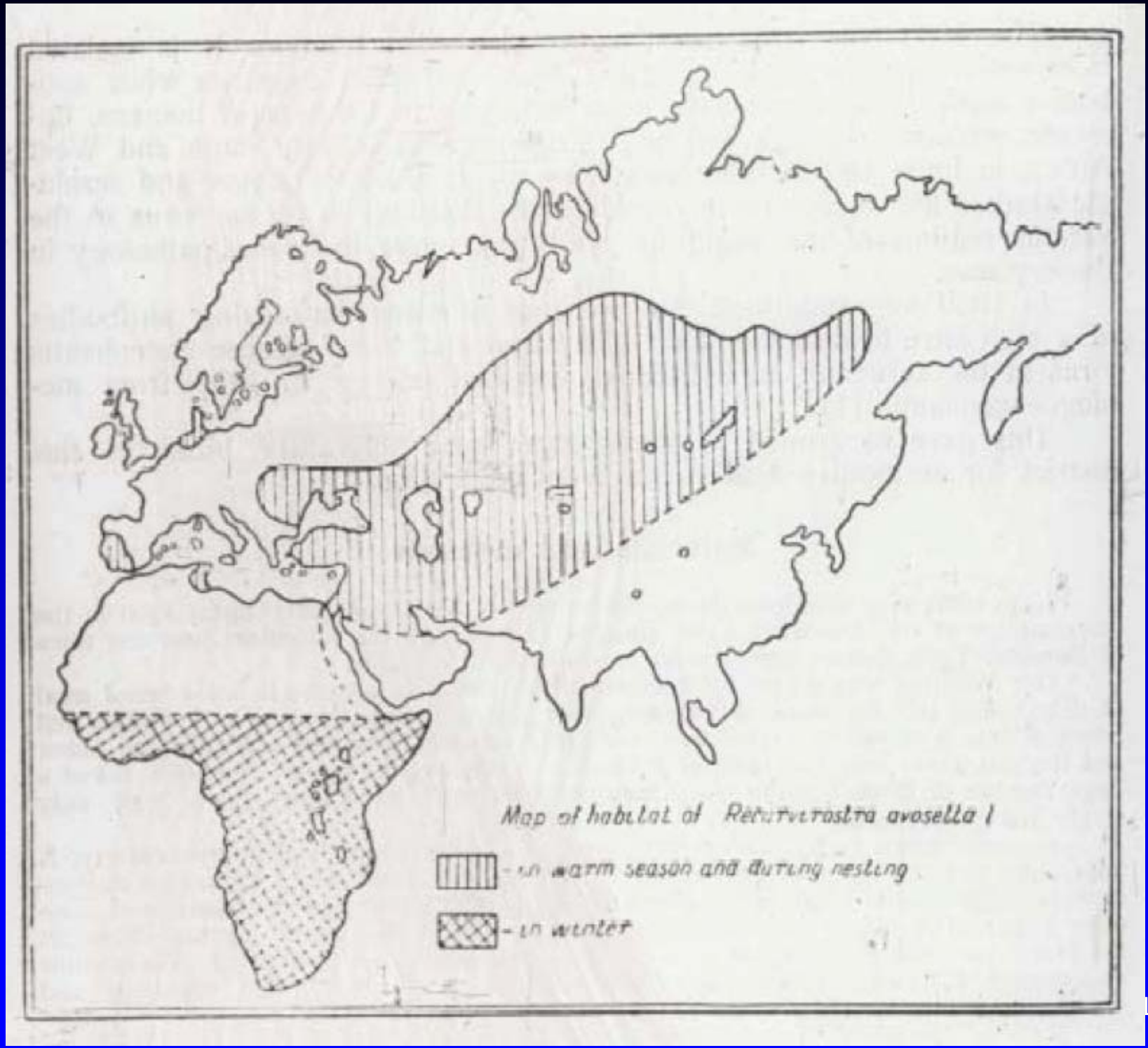
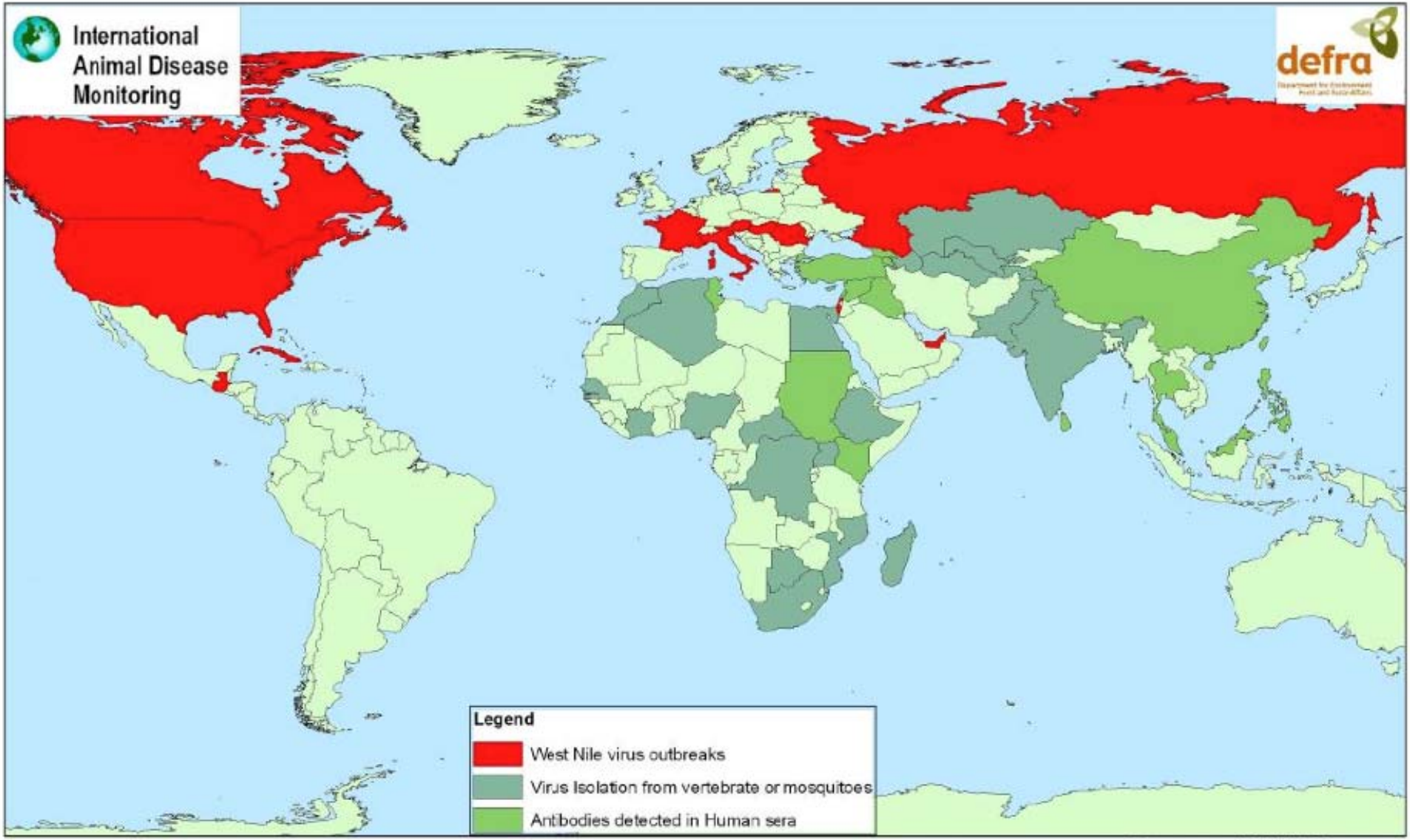
7. Патев П. — Ловец, 1933, 33, 10.
8. Патев П. — Птиците в България. БАН, 1950.
9. Дементьев Г. П., Н. А. Гладков, Е. П. Спангенберг — Птицы Советского Союза. — Сов. наука, 1951—1954.


Map of habitat of Recurvirostra avosetta l
- in warm season and during nesting
- in winter


International Animal Disease Monitoring
defra
Legend
West Nile virus outbreaks
Virus Isolation from vertebrate or mosquitoes
Antibodies detected in Human sera
Date prepared 08/12/2008
West Nile virus isolation and antibody detection and outbreaks reported from horses, wild birds and humans in 2008
Map prepared by IAH
Actual Scale 1:110,000,000
0 800 1,600 3,200 4,800 6,400
Kilometers

1963 Francia

- Camargue,
- Cannes - Mentone
- Corsica

Chez l'homme. Le foyer de Camargue s'étend à l'ouest jusqu'à Montpellier et Agde, vers le nord au-delà de Beaucaire, mais ne dépasse guère, à l'est, la rive gauche du Grand Rhône, dans la Crau. A Istres, en particulier, le risque d'infection est mineur : sur 280 recrues de la base militaire d'Istres, aucune n'a été contaminée du printemps à l'automne 1965. Vers l'est, un foyer important existe sur la Côte d'Azur (de Cannes à Menton). Enfin, la population de Corse présente aussi des anticorps.

Chez les animaux. Les chevaux de Camargue possèdent souvent des anticorps, rarement les ovins, jamais les bovins. Par ailleurs, les milliers de prélèvements effectués chez des porcs et des sangliers, des rongeurs (souris, mulots, rats gris et noirs, campagnols, lapins, lièvres), des oiseaux domestiques et sauvages, autochtones et migrateurs, et des animaux à sang froid (couleuvres, grenouilles, tortues) ont fourni des résultats disparates, qui n'autorisent pas encore à préciser le réservoir du virus West Nile dans cette région.

SÉANCE DU 10 JUIN 1975 495

L'arbovirose West Nile, zoonose du midi méditerranéen de la France

par M. Louis JOUBERT

INTRODUCTION

Depuis 1963, des enquêtes épidémiologiques régulières ont été menées en France méditerranéenne, et plus particulièrement en Camargue, en collaboration avec des virologues de l'Institut Pasteur de Paris, des médecins du Service de Santé des Troupes de Marine et des entomologistes de l'ORSTOM, dans le but de rechercher la présence éventuelle et l'incidence sur la santé humaine et animale d'arbovirus et de préciser leur mode de transmission.

La région camarguaise paraissait offrir les meilleures conditions requises pour une telle enquête, en raison de l'abondance et de la grande variété d'arthropodes piqueurs qu'elle héberge, en particulier de moustiques, vecteurs éventuels de virus; de la forte densité de la faune sédentaire et migratrice, réservoirs ou importateurs possibles de virus; de la conservation d'un milieu biologique particulier assurée par la protection d'une importante réserve, et, enfin, de l'existence d'un climat méditerranéen chaud et sec et d'une hydrographie originale.

A ces raisons d'ordre biogéographique s'en ajoutaient d'autres, d'ordre épidémiologique : chez l'homme, certaines affections fébriles régionalement épidémiques et saisonnières, décrites sous les noms de « fièvre d'été », « fièvre de trois jours », « grippe d'été » ou « fièvre à moustiques », étaient assez évocatrices des arboviroses humaines en général; chez le cheval, en Camargue et dans la région de Beaucaire, on connaissait depuis longtemps un syndrome encéphalomyélitique, baptisé « lourdige », survenant notamment en été, qui pouvait laisser soupçonner une origine virale.

Deux séries de recherches ont été entreprises, d'une part sur le terrain, avec isolement des virus et études séro-épidémiologiques, d'autre part au laboratoire, avec la reproduction expérimentale d'une méningo-encéphalomyélite animale par un arbovirus West Nile, souche isolée sur le terrain. Elles concernent essentiellement le virus West Nile, accessoirement le virus Tahyna.

ÉTUDES SUR LE TERRAIN

Virus West Nile

THE AMERICAN JOURNAL OF TROPICAL MEDICINE AND HYGIENE

4407 3

Vol. 16, No. 2
Printed in U.S.A.

SURVEY FOR ANTIBODIES AGAINST ARTHROPOD-BORNE VIRUSES IN MAN AND ANIMALS IN ITALY

I. SEROLOGIC STATUS OF HUMAN BEINGS AND ANIMALS IN A CENTRAL ITALIAN REGION (FONDI)*

P. VERANI,† M. BALDUCCI,† M. C. LOPES,† A. ALEMANNO,‡ AND G. SACCÀ§

INTRODUCTION

The limited amount of data on the activity of arboviruses in Italy[1, 2] suggested the usefulness of

1,000 to 2,000 mm, and is quite uniformly distributed during the year; autumn and winter are relatively more rainy than spring and summer.

Italia
1967

FIGURE 1. Map of the region of Fondi, showing the area from which the blood samples were collected.

TABLE 2

Summary of HI antibodies in 205 human sera from the Fondi region to 10 arthropod-borne viral antigens

Group	Viruses	Town (115 sera)		Countryside (90 sera)		Totals	
		Sera positive		Sera positive		Sera positive	
		(No.)	(%)	(No.)	(%)	(No.)	(%)
	Any virus	36	31.3	24	26.7	60	29.2
Group A	Sindbis	0	—	0	—	0	—
	WEE	0	—	0	—	0	—
Group B	TBE	1	0.8	3	3.3	4	1.9
	WN	7	6.1	10	11.1	17	8.3
	YF	4	3.5	3	3.3	7	3.4
	De 1	0	—	2	2.2	2	0.97
	De 2	1	0.8	1	1.1	2	0.97
Bunyamwera group	Bunyamwera	4	3.5	2	2.2	6	2.9
Ungrouped	Sicilian Phlebotomus fever	29	25.3	13	14.4	42	20.5
	Neapolitan Phlebotomus fever	10	8.7	10	11.1	20	9.7

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4407 3

SURVEY FOR ANTIBODIES AGAINST ARTHROPOD-BORNE VIRUSES IN MAN AND ANIMALS IN ITALY

II. SEROLOGIC STATUS OF HUMAN BEINGS IN A NORTHERN ITALIAN REGION (GORIZIA PROVINCE)*

M. BALDUCCI,† P. VERANI,† M. C. LOPES,† AND B. GREGORIG‡

INTRODUCTION

As reported in the companion paper,[1] which shows the results of a serologic survey among resi-

(*Vipera ammodytes, Vipera berus, Lacerta muralis*, etc.)

Arthropods possibly involved with arbovirus

Italia 1967

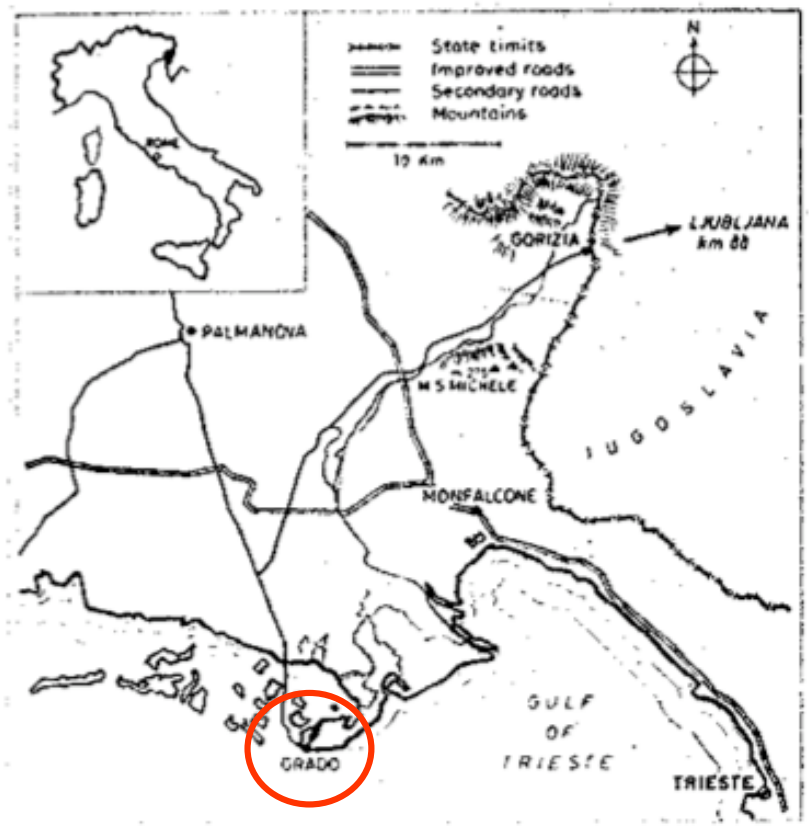

FIGURE 1. Map of the northeastern region of Italy, where the town of Gorizia is located.

TABLE 1

Summary of HI antibodies in 166 human sera from Gorizia province to 10 arthropod-borne viral antigens

Group	Viruses	Sera positive (No.)	(%)
	Any virus	58	35.0
Group A	Sindbis	1	0.6
	WEE	0	—
Group B	TBE	6	3.6
	WN	18	10.8
	YF	9	5.4
	De 1	6	3.6
	De 2	6	3.6
Bunyamwera group	Bunyamwera	0	—
Ungrouped	Sicilian Phlebotomus fever	27	16.2
	Neapolitan Phlebotomus fever	27	16.2

1963 - 1967 Russia
Astrakan Azerbaijan Turkmenistan

ISOLATION OF NEW STRAINS OF WEST NILE VIRUS IN ASTRAKHAN REGION

V. N. BASHKIRTSEV, M. P. CHUMAKOV, V. V. BEREZIN, A. M. BUTENKO, T. I. ZAVADOVA, D. N. STOLBOV

(Institute of Poliomyelitis and Virus Encephalitis of the USSR Academy of Medical Sciences, Moscow)

Circulation of West Nile (WN) virus in Astrakhan region was established in 1963. Later strains of WN virus were isolated from *H. plumbeum* ticks, mosquitoes of different species, the brain of a crow and from the blood of febrile patients.

In the summer of 1968, in the lower part of the Volga delta (Astrakhan region) virological examinations were carried out with blood specimens of wild birds of different species (99), hares (15) and other animals (7), as well as with 13 groups of ticks collected from birds and hares, and about 6000 mosquitoes of 4 species. Four virus strains were isolated: from the blood of *Plegadis falcinellus*, a hare, from *H. plumbeum* ticks collected from *Corvus frugilegus*, and from *Mansonia richiardii* mosquitoes. All the isolates were antigenically similar and identical with West Nile virus.

SEROLOGIC DETECTION OF FOCI OF WEST NILE FEVER IN THE TURKMEN SSR

N. N. NEPESOVA

(Ashkhabad Institute of Epidemiology and Hygiene)

In 6 villages of Turkmenia 2004 human blood sera and 679 blood sera from farm animals were examined. Circulation of West Nile virus was demonstrated by the results of HI, NT, NIT and kinetic HI tests. This infection is prevalent in the Murgab river valley (Iolotan. 38.5%, Takhta-Bazar — 32.8%, Bairam-Ali — 29.2% of positive results by the HI test).

ISOLATION OF WEST NILE VIRUS FROM TURDUS MERULA AND SITTA EUROPEA IN AZERBAIJAN

S. Ya. GAIDAMOVICH, L. P. NIKIFOROV, V. I. CHERVONSKY, G. A. KLISENKO, V. L. GROMASHEVSKY, V. R. OBUKHOVA

(D. I. Ivanovsky Institute of Virology of the USSR Academy of Medical Sciences, Moscow)

In 1967, two strains of virus were isolated from organs of *Turdus merula.* and *Sitta europea.* caught in Azerbaijan (Lenkoran lowland and Talysh foothills). Identification was performed according to the classical scheme: filtration, determination of sensitivity to sodium desoxycholate and ether, lack of inhibition of multiplication by 5-from-2-desoxyuridine, and by serological methods. The isolates were found to be identical with West Nile virus. Trustworthiness of isolation was confirmed by reisolation from the original materials in suckling white mice and in tissue cultures of BHK-21, Vero cells and by the plaque method in chick embryo fibroblasts.

1968 URSS WN e JE

COMBINATION OF FOCI OF JAPANESE ENCEPHALITIS (JE) AND WEST NILE (WN) VIRUSES ECOLOGICALLY ASSOCIATED WITH BIRDS IN PRIMORSKY REGION

V. V. POGODINA, N. G. BOCHKOVA, L. S. LEVINA, L. G. TATARINOVA

(Institute of Poliomyelitis and Virus Encephalitis of the USSR Academy of Medical Sciences, Moscow)

Primorie is the only territory in the USSR where simultaneous circulation of JE and WN viruses occurs. In 1968 sera of human beings and domestic animals were examined in districts near the lakes Khanka and Khasan. Three zones of influence of these viruses were established: (1) with predominant occurrence of antibody for JE virus (Khasan, Khankay districts); (2) with domination of antibody for WN virus (Spassk district); (3) mixed zone (Khorol, Oktyabrsk districts). The ecological cycle of both WN and JE viruses involves swine (up to 25%) showing antihemagglutinins in titers of 1 : 20 to 1 : 640. Antibody for WN virus is found more frequently in swine under 1 year of age, for JE virus in swine over 1 year. The population of a number of districts had antibody for 3 arboviruses simultaneously. By the rate and titers, antibody for WN virus prevails followed by antibody for tick-borne and Japanese encephalitis.

Bull. Org. mond. Santé
Bull. Wld Hlth Org. 1970, **42**, 297-303

Enquête sérologique en Tunisie sur les arbovirus

B. NABLI,[1] C. CHIPPAUX-HYPPOLITE,[2] A. CHIPPAUX [3] & J. TAMALET [4]

Les conditions écologiques réunies en Tunisie — présence de nombreux arthropodes, passages d'oiseaux migrateurs — et la fréquence de syndromes méningo-encéphalitiques d'étiologie indéterminée ont incité les auteurs à entreprendre un premier sondage immunologique sur la présence des arbovirus.

Au cours d'une enquête menée en divers points du pays, 1406 sérums, dont 1370 prélevés chez des enfants de moins de 15 ans, ont été titrés vis-à-vis d'une série d'antigènes : 5 % d'entre eux présentaient des anticorps pour un ou plusieurs des antigènes étudiés. Ces résultats montrent l'activité dans la population tunisienne de divers arbovirus, et en particulier du virus West Nile.

Tunisia
1970

SUMMARY

SEROLOGICAL STUDY OF ARBOVIRUSES IN TUNISIA

A serological investigation was conducted in Tunisia to obtain preliminary information on the arboviruses that might be present among the population. Altogether 1406 serum samples were drawn, 1094 of them from persons living on the island of Djerba; all but 36 of the total sera were from children of school age. The haemagglutination-inhibition test was used for most sera, but serum neutralization tests were also performed on 25 sera and complement-fixation tests on 170. Seven antigens representative of the more important arboviruses isolated in the Mediterranean area were used—namely, Sindbis, chikungunya, West Nile, Japanese encephalitis, Central European tick-borne encephalitis, Sicilian sandfly fever and Tahyna.

It was shown that arbovirus infections are present among the Tunisian population, some 5% of the total sera tested containing antibodies to one or more of the antigens. The highest proportions of antibody were to West Nile (4.7%) and Sicilian sandfly fever (2.5%); rather few sera were positive for Central European tick-borne encephalitis and Japanese encephalitis (0.5% each) or to Sindbis (0.2%), and none to chikungunya or Tahyna.

The authors point out that, since birds are known to be important in the West Nile and Sindbis virus cycles and may play a role in the transcontinental transmission of other arboviruses and since Tunisia is on the spring and autumn bird-migration route between Europe and Africa and also serves as an important wintering territory, a variety of arboviruses already known from other countries elsewhere in the Mediterranean area may well be endemic in Tunisia.

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1974

49(1)
20-26

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A SEROLOGICAL SURVEY ON GROUP A AND B ARBOVIRUS ANTIBODIES IN LIBYA

MEDHAT A. DARWISH AND ABDEL HALIM IBRAHIM
Ain Shams University, Faculty of Medicine, Cairo, Egypt

TABLE 1. Hemagglutination-inhibiting antibodies against Arboviruses in 148 human Sera at Sebha, Libya.

Arbovirus Tested		Positive Sera	
Name of Virus	Antigenic group	Number	Percentage
Sindbis	Group A	62	41.8%
O'nyong-nyong	»	0	0
W E E*	»	0	0
West Nile	Group B	110	74.3%
Dengue type 1	»	0	0

* WEE = Western equine encephalitis.

TABLE 2. Human Sera form Sebha, Libya positive by HI test for Sindbis and West Nile Viruses.

Age in years	Number of tested Sera	Sindbis Virus		West Nile Virus	
		Number	%	Number	%
6 - 15	34	4	11.7 %	18	52.9 %
16 - 70	114	58	50.8 %	92	80.7 %
Total	148	62	41.8 %	110	74.3 %

Il Nilo ?

- Delta del Nilo: 1168 persone, 61% sieropositivi
- Sud Sudan: 350 persone, 40% sieropositivi
- Alta sieroprevalenza in molte specie di volatili
- Alta sieroprevalenza in molte speci di mammiferi
- Corvi e passeri domestici abbondanti

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ANTIBODIES TO ARBOVIRUSES IN NORTHWESTERN SPAIN*

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Abstract. A survey for antibodies to arboviruses was done in the human population of the north of Spain (provinces of La Coruña, Orense, Pontevedra, Leon, Asturias). Sera were obtained from 701 persons living in the area. The hemagglutination-inhibition (HI) test showed that 16.5% of the population studied had antibodies to group B arboviruses. All sera were negative for group A and Phlebotomus fever group viruses, as well as for Tahyna and Calovo. No evidence of antibody to tick-borne encephalitis viruses was found. Neutralization tests done with several group B viruses on 56 selected sera with HI antibodies confirmed an earlier infection with West Nile and probably one other group B virus not included in the test battery. A high rate of antibody was found in young persons, indicating that epidemic activity occurred between 1961 and 1970 in the area studied.

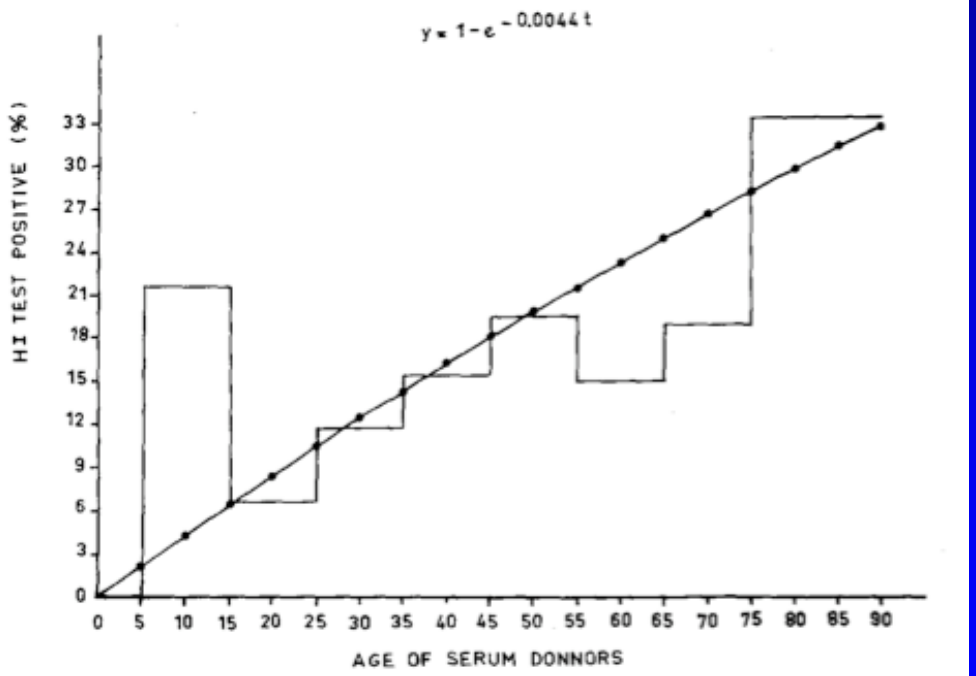


FIGURE 2. Hemagglutination-inhibition (HI) antibody prevalence by age. The data were fitted to Muench's simple catalytic curve. (The equation is written above the curve.)

TABLE 4

Results of some serum specimens studied by the neutralization (N) test and hemagglutination inhibition (HI) test*

Serum no.	Town	Province	Age	Sex	Results† WN HI	WN N	BAN HI	BAN N	NTA HI	NTA N
351	Vigo	Pontevedra	60	M	Neg.	–	1:40	–	1:40	2.0
365	Vigo	Pontevedra	22	M	Neg.	Neg.	Neg.	–	1:80	2.0
574	Marín	Pontevedra	46	M	1:80	2.0	1:80	2.0	1:40	2.0
573	Vito	Pontevedra	38	F	1:20	3.3	1:40	2.0	1:80	1.7
567	Corcubion	Coruña	41	M	Neg.	3.7	Neg.	–	Neg.	–
572	Ferrol	Coruña	43	M	Neg.	3.6	Neg.	–	Neg.	–
569	Ferrol	Coruña	13	M	1:20	2.4	Neg.	–	1:80	1.80
566	Ferrol	Coruña	9	M	1:40	2.0	1:80	2.0	1:40	–
571	Ortigueira	Coruña	56	F	1:40	1.3	1:40	2.0	1:160	2.0
634	Leon	Leon	48	M	1:20	4.0	1:20	2.0	Neg.	Neg.
555	Villaviciosa	Asturias	57	?	Neg.	2.0	1:80	2.0	1:320	2.0

* N-test expressed as neutralization index.
† WN, West Nile; BAN, Banzi; NTA, Ntaya.

Fifty-six sera that were positive in the HI test were tested for N antibodies against West Nile, Banzi, and Ntaya viruses. The N-test was first carried out qualitatively. Of 53 sera tested for West Nile virus, 5 were positive and 1 equivocal; of 43 sera tested for Banzi virus, 3 were positive and 2 equivocal; and of 46 sera tested for Ntaya virus, 4 were positive and 5 equivocal. The N-test

TABLE 5

*Results of hemagglutination-inhibition tests to group B arboviruses distributed by age group and analyzed by Muench's simple catalytic curve**

Year of birth	Age group	Number of sera Studied	Number of sera Positive	% positive	Center of class	Fitted curve %	Fitted curve Age
1971–1975	0–4	10	0	0.00	2.5	1.09	2.5
						2.18	5
1961–1970	5–14	37	8	21.62	10	4.30	10
						6.39	15
1951–1960	15–24	105	7	6.67	20	8.42	20
						10.42	25
1941–1950	25–34	110	13	11.82	30	12.37	30
						14.27	35
1931–1940	35–44	136	21	15.44	40	16.14	40
						17.96	45
1921–1930	45–54	123	24	19.51	50	19.75	50
						21.49	55
1911–1920	55–64	94	14	14.89	60	23.20	60
						24.87	65
1900–1910	65–74	52	10	19.23	70	26.51	70
						28.11	75
1885–1900	75–90+	12	4	33.33	83	29.67	80
						30.59	83
						31.20	85
						32.70	90

* Other unidentified sera were also studied by serological tests, but the results were not included in this table.

LE VIRUS WEST NILE : IMPLICATIONS EN TRANSFUSION SANGUINE : ÉTUDE DE SÉROPRÉVALENCE DE L'ARC MEDITÉRRANÉEN

GALLIAN P., DE MICCO P.

ÉTABLISSEMENT FRANÇAIS DU SANG ALPES-MÉDITERRANÉE, 149 BD BAILLE, 13005 MARSEILLE. FRANCE. UNITÉ DES VIRUS EMERGENTS (EA 3292, IFR 48, IRD UR 034). FACULTÉ DE MÉDECINE. 27 BOULEVARD JEAN MOULIN. 13005 MARSEILLE. FRANCE

pierre.gallian@efs.sante.fr

Depuis 1999, le virus West Nile est responsable d'une épidémie aux USA. Des cas de contamination par transfusion sanguine ont été démontrés en 2002. Le diagnostic en 2003 de cas humains dans le Var a conduit l'Établissement Français du Sang a mettre en œuvre des mesures d'évaluation du risque.

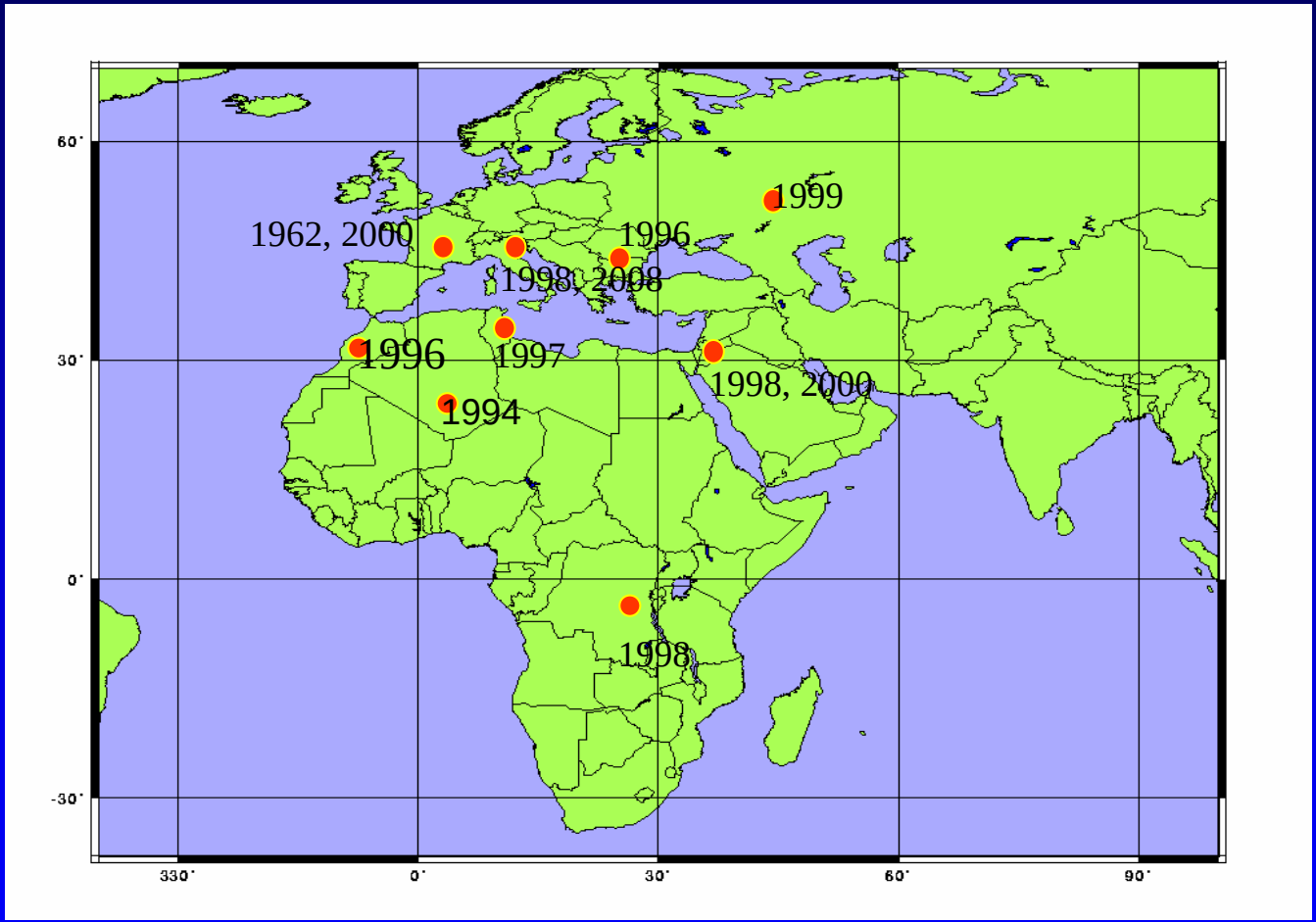
Objectif : Évaluation du risque transfusionnel par la connaissance de la prévalence des marqueurs du virus WN dans les populations de donneurs de sang des régions exposées.

Matériels et méthodes : Le détermination des marqueurs sérologiques du virus WN (IgG et IgM antiWNV) a été réalisée par des tests ELISA sur des échantillons de plasma congelé. La spécificités des échantillons réactifs a été confirmée par un test de séroneutralisation par réduction de plage de lyse (PRNT). Deux populations de donneurs de sang ont été étudiées : 1) des donneurs résidants dans les départements de l'arc méditerranéen et 2) une population de référence.

Résultats : Les résultats provisoires montent que la prévalence sérologiques des individus ayant eu un contact avec un flavivirus (IgG antiWNV positive répétable) est < 1,5 % chez les donneurs vivant dans les départements de l'arc méditerranéen, alors que cette prévalence est inférieure à 1 % dans la région Bourgogne franche Conté. Seront présentés les résultats définitifs après confirmation des sérologies positives. Une étude de la répartition géographique des cas sera présentée.

Conclusion : Les résultats de ces travaux permettront à terme de mieux connaître en France, l'épidémiologie de cette zoonose, de mettre en évidence des zones géographiques exposées et de mettre en œuvre de mesures préventives pour sécuriser les produits d'origine humaine.

Recenti epidemie di WN



H. Zeller

E’ una malattia emergente in Europa?

Bucarest

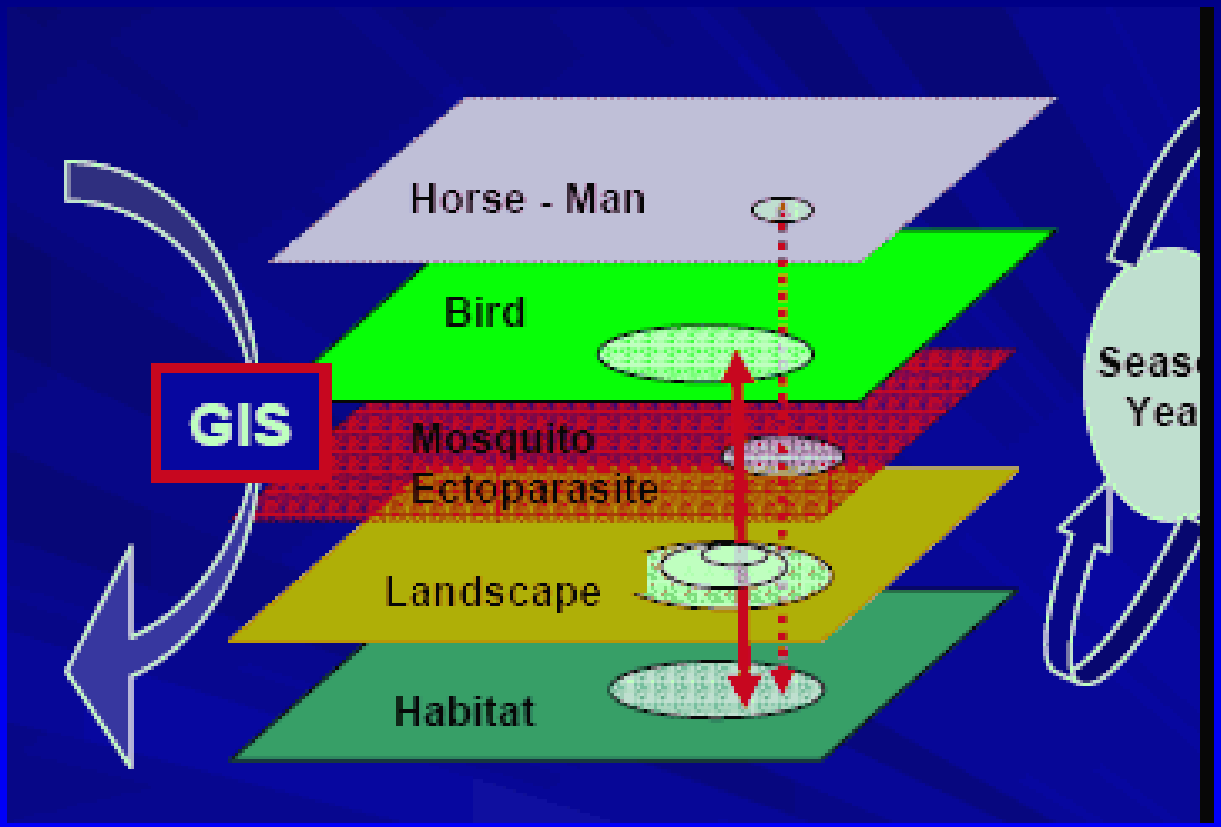
Bucarest

Delta del
Rodano Danubbio Nilo Volga

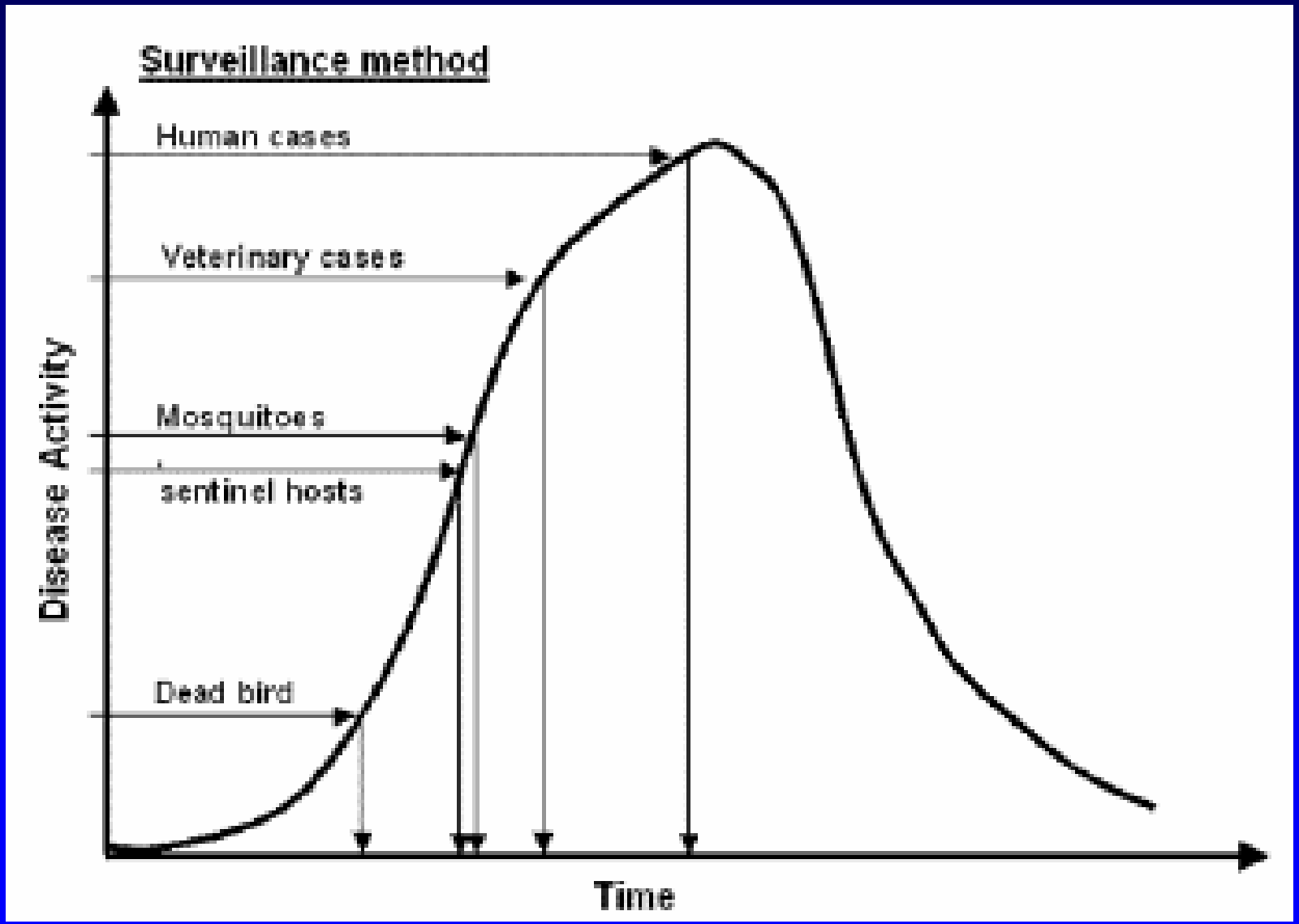
???

Cosa hanno in comune tutte queste zone

Modellizzando abitat e malattia



CDC 2003


Surveillance method
Human cases
Veterinary cases
Mosquitoes
sentinel hosts
Dead bird
Disease Activity
Time

Pensierino finale

La malaria è … centinaia di diverse malattie e un puzzle epidemiologico. Come gli scacchi, sono giocati con pochi pezzi, ma sono capaci di una varietà infinita di situazioni.

Hackett, LW. (1933). Malaria in Europe, an Ecological Study

…ma la malaria ha solamente un ospite… e pochi vettori…

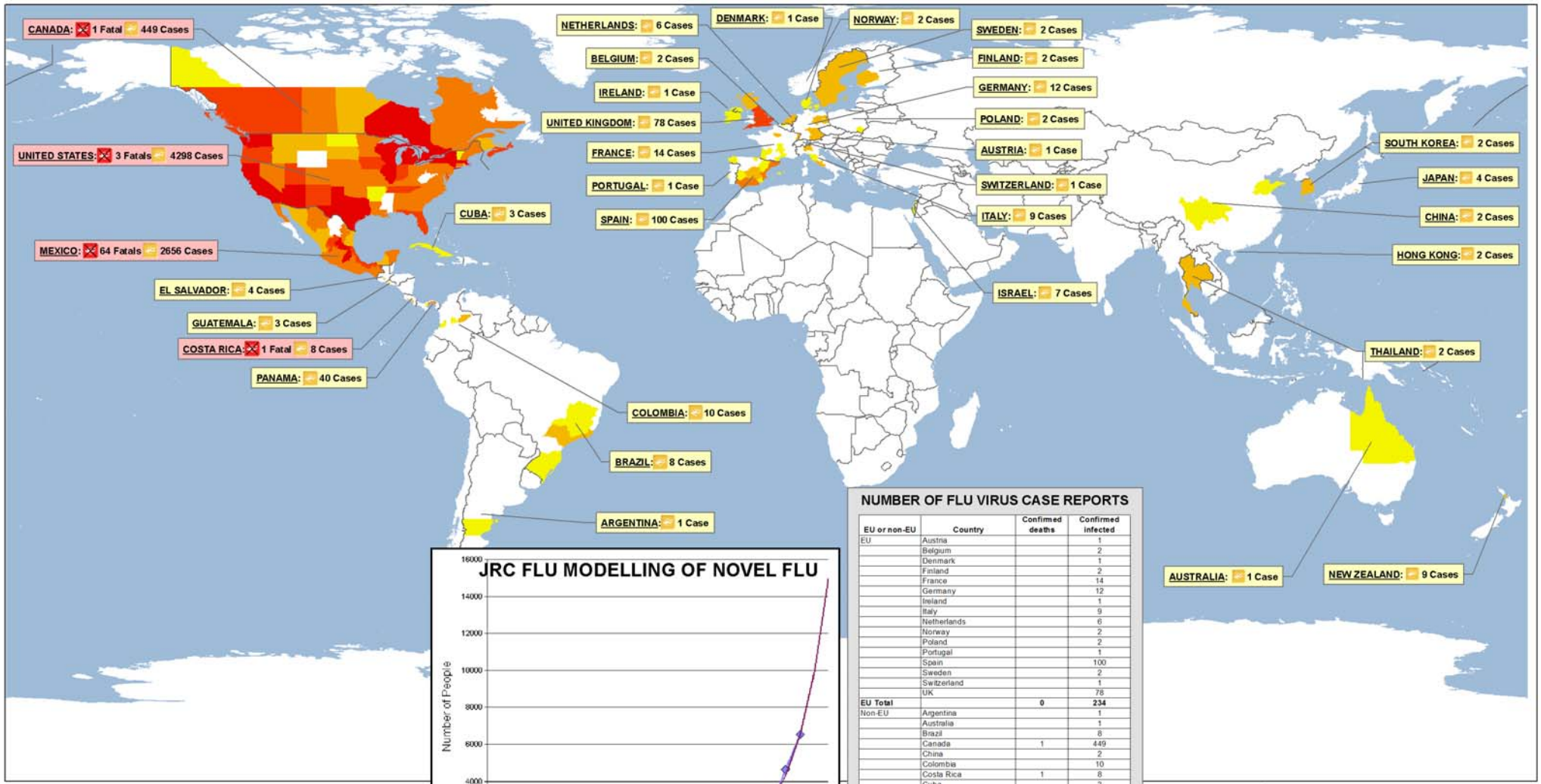
in conclusione

- Epidemiologia appare sempre più complessa
- Trasmissione in Europa è una “punta dell’iceberg africano”
- Associazione con il clima in Europa è elusiva
- Future importazioni di arbovirosi esotiche, come il virus della St. Louis Encephalitis può essere più pericoloso

NOVEL FLU - Situation Map

15 May 2009

JRC
EUROPEAN COMMISSION



JRC FLU MODELLING OF NOVEL FLU

JRC FLU MODELLING OF NOVEL FLU

The model describes the dynamics of an influenza outbreak without any intervention. It is a simple SIR-type model and typical for influenza epidemics. The figure shows the cumulative number of case as the epidemic progresses and the corresponding fit of the model. Based on data made available until 14/5/2009 the R0 is calculated by fitting the model and is estimated to be about 1.6. This estimate should be treated with caution and will change as more data become available.
Interventions such as administration of drugs and social distancing have been applied and those measures together with other factors such as seasonality are expected to have an effect and become visible in the next days.

NUMBER OF FLU VIRUS CASE REPORTS

EU or non-EU	Country	Confirmed deaths	Confirmed infected
EU	Austria		1
	Belgium		2
	Denmark		1
	Finland		2
	France		14
	Germany		12
	Ireland		1
	Italy		9
	Netherlands		6
	Norway		2
	Poland		2
	Portugal		1
	Spain		100
	Sweden		2
	Switzerland		1
	UK		78
EU Total		**0**	**234**
Non-EU	Argentina		1
	Australia		1
	Brazil		8
	Canada	1	449
	China		2
	Colombia		10
	Costa Rica	1	8
	Cuba		3
	El Salvador		4
	Guatemala		3
	Hong Kong		2
	Israel		7
	Japan		4
	Mexico	64	2656
	New-Zealand		9
	Panama		40
	South Korea		3
	Thailand		2
	USA	3	4298
Non-EU Total		**69**	**7510**
Grand Total		**69**	**7744**

Data from WHO, ECDC, CDC, PAHO, HPA, InVS, Mexican Health Ministry as of 15/05/2009

Legend
Number of cases for administrative level 1

- 1
- 2 - 10
- 11 - 50
- 51 - 100
- 101 +

Map information

This map shows the confirmed cases and deaths of the Novel Flu.The pop-ups show the cumulative cases. The charts show the trendlines of the cases.

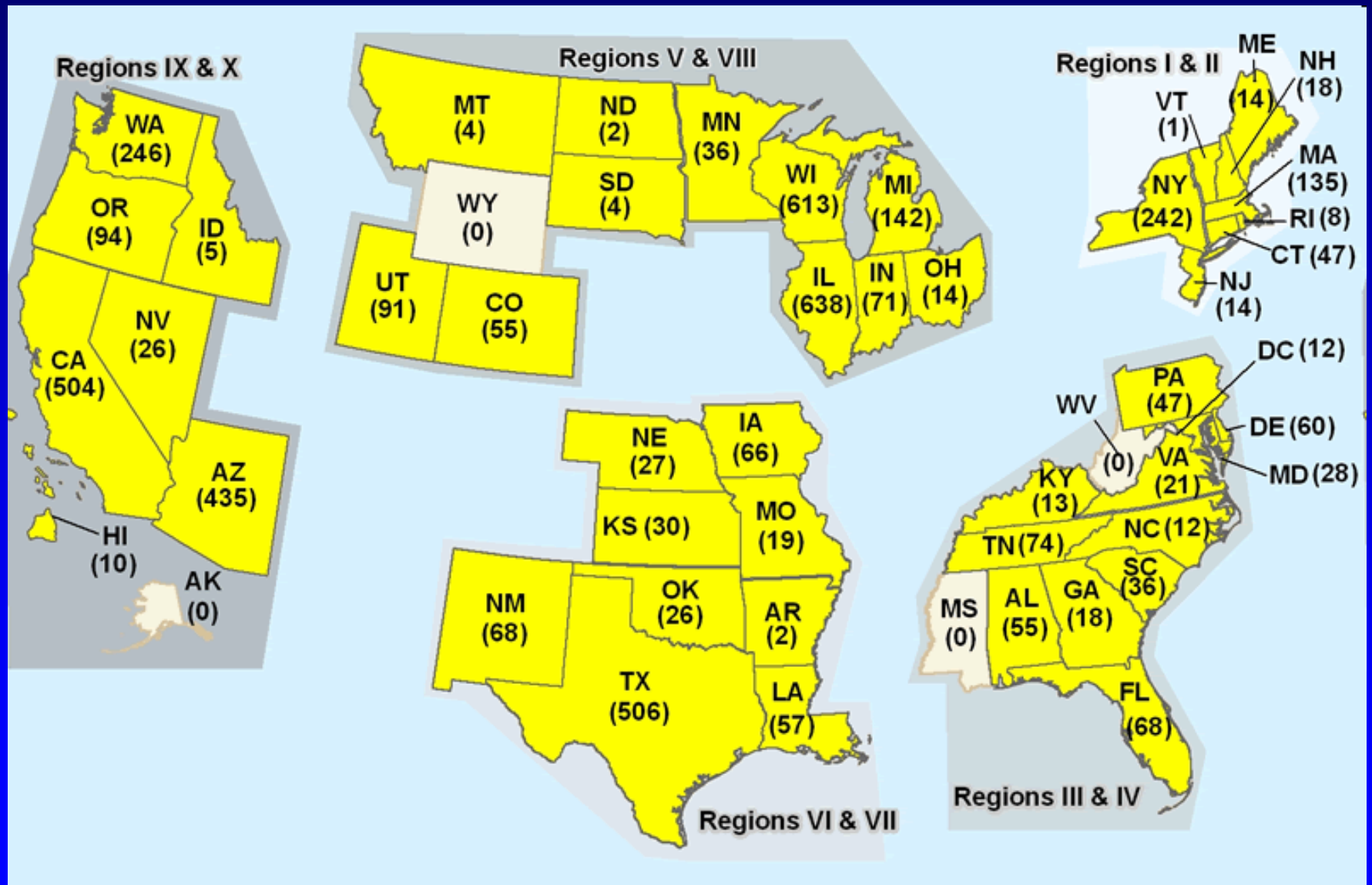
Spatial Reference: GCS- WGS 1984
Scale: 1 : 100 000 000
Time Reference: 14/5/2009
Background Data: JRC Streetmap WMS

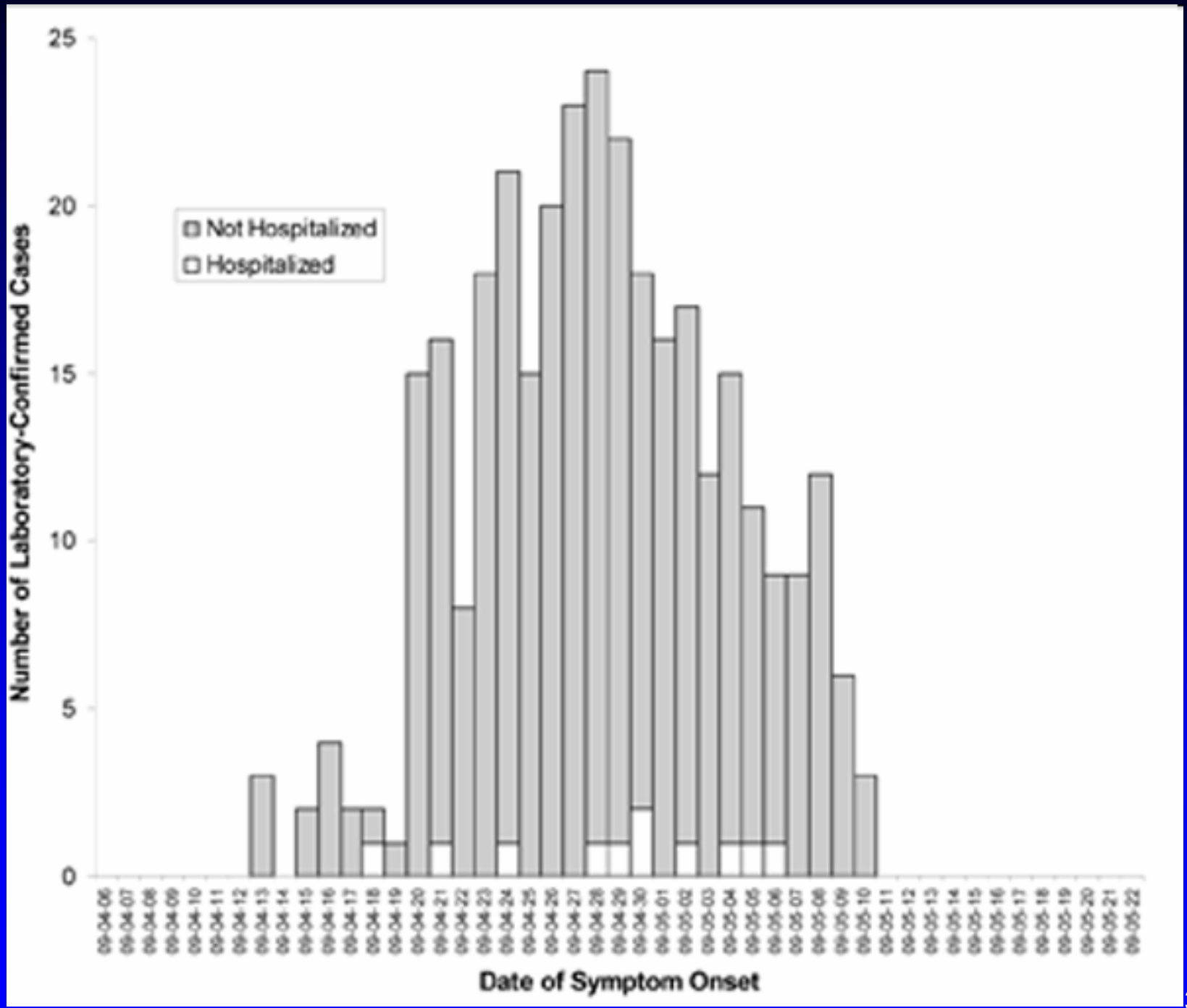
Map created 15 May 2009

CDC H1N1 Flu Update: U.S. Human Cases of H1N1 Flu Infection

Novel Influenza A (H1N1) Cases by HHS Joint Field Office Coordination Groups
May 15, 2009, 11:00 AM ET

4,714 Confirmed and Probable Cases in 47 States




Number of Laboratory-Confirmed Cases
25
20
15
10
5
0
Not Hospitalized
Hospitalized
09-04-06
09-04-07
09-04-08
09-04-09
09-04-10
09-04-11
09-04-12
09-04-13
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09-05-16
09-05-17
09-05-18
09-05-19
09-05-20
09-05-21
09-05-22
Date of Symptom Onset

GRAZIE PER L'ATTENZIONE

Am. J. Trop. Med. Hyg., 61(4), 1999, pp. 600–611

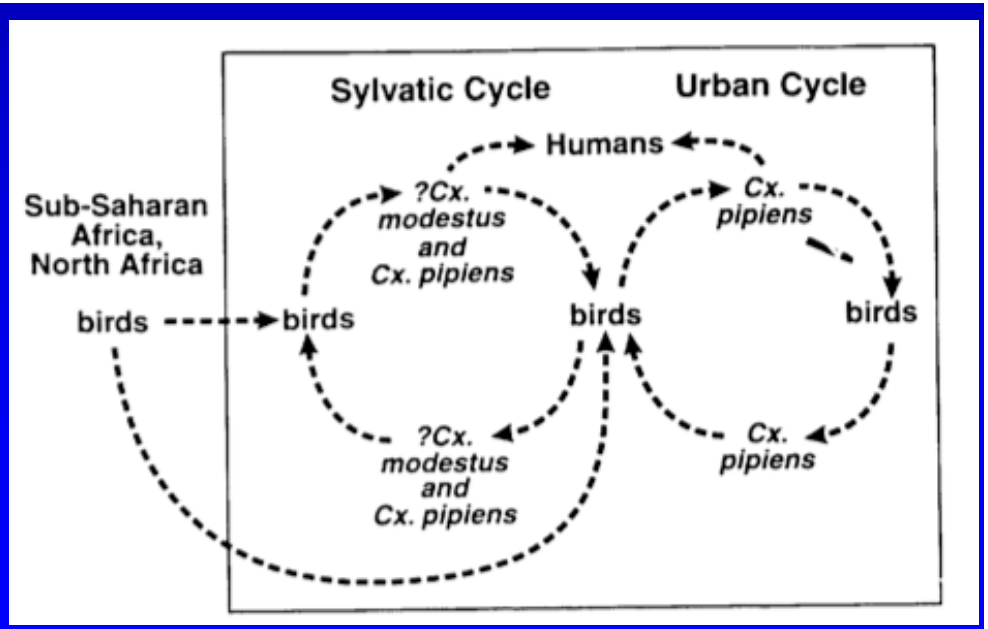
171946

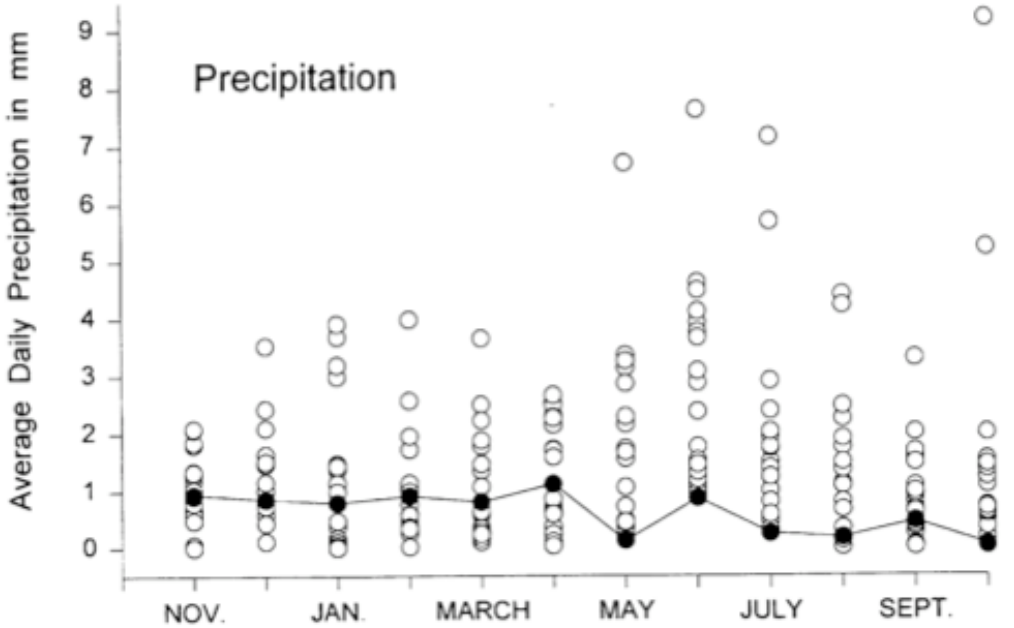
ENTOMOLOGIC AND AVIAN INVESTIGATIONS OF AN EPIDEMIC OF WEST NILE FEVER IN ROMANIA IN 1996, WITH SEROLOGIC AND MOLECULAR CHARACTERIZATION OF A VIRUS ISOLATE FROM MOSQUITOES

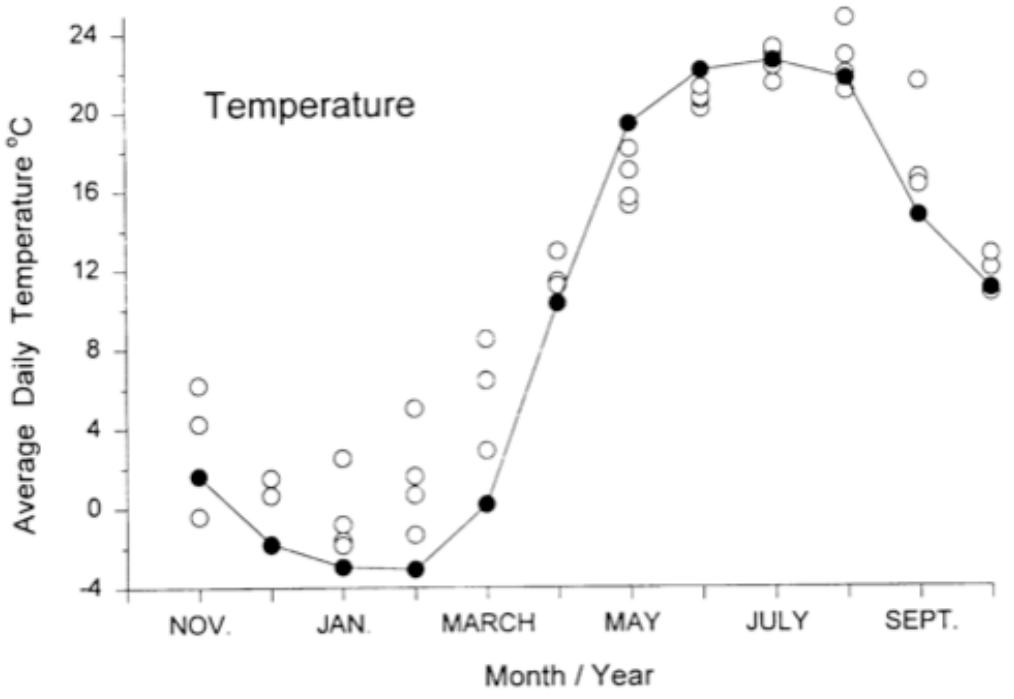
H. M. SAVAGE, C. CEIANU, G. NICOLESCU, N. KARABATSOS, R. LANCIOTTI, A. VLADIMIRESCU, L. LAIV, A. UNGUREANU, C. ROMANCA, AND T. F. TSAI

Division of Vector-Borne Infectious Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, Fort Collins, Colorado; Department of Medical Entomology, Cantacuzino Institute, Bucharest, Romania; Romanian Ornithological Center, Bucharest, Romania; Army Center of Medical Research, Bucharest, Romania; Bucharest Preventive Medicine Center, Bucharest, Romania

Abstract. Between July and October 1996, a West Nile (WN) fever epidemic occurred in the southern plain and Danube Valley of Romania and in the capital city of Bucharest, resulting in hundreds of neurologic cases and 17 fatalities. In early October 1996, entomologic and avian investigations of the epidemic were conducted in the city of Bucharest and nearby rural areas. Thirty (41%) of 73 domestic fowl sampled had neutralizing antibody to WN virus, including 5 of 13 ducks (38%), 1 of 1 goose, 19 of 52 chickens (37%), 1 of 1 peahen, and 4 of 6 turkeys (67%). Seroprevalence in domestic fowl (27%, or 7 of 26) from the urban Bucharest site was not significantly different ($P = 0.08$, by Fisher's exact test) than rates at three rural sites (50%, or 23 of 46). Serum collected from one of 12 Passeriformes, an *Erithacus rubecula*, was positive for neutralizing antibody to WN virus. A total of 5,577 mosquitoes representing seven taxa were collected. *Culex pipiens pipiens* accounted for 96% of the mosquitoes collected. A single virus isolate, RO97-50, was obtained from a pool of 30 *Cx. p. pipiens* females aspirated from the walls and ceiling of a blockhouse located near the center of Bucharest, resulting in a minimum infection rate of 0.19 per 1,000. Antisera prepared against RO97-50 failed to distinguish among RO97-50, WN virus strain Eg101, and Kunjin (KUN) virus strain MRM16. A 2,323-basepair DNA fragment of the envelope (E) glycoprotein gene from RO97-50 and a Romanian WN virus strain obtained from a human cerebrospinal fluid sample, RO96-1030, were sequenced. Phylogenetic analyses of 23 WN virus strains and one KUN virus strain using the amino acid and nucleotide sequences for a small portion of the E gene suggest the existence of two large lineages of viruses. Bootstrap analysis of the nucleotide alignment indicated strong support (95%) for a lineage composed of WN virus strains from northern Africa, including isolates from Egypt and Algeria, and west, central, and east Africa, all of the European isolates, those from France and Romania, an Israeli isolate, and an isolate of KUN virus from Australia. The nucleotide sequence of RO97-50 was identical to the sequence of a WN virus isolate obtained from *Cx. neavei* mosquitoes from Senegal and *Cx. univittatus* mosquitoes from Kenya. The phylogenetic analyses were compatible with the introduction of virus into Romania by birds migrating from sub-Saharan Africa, to northern Africa, and into southern Europe.







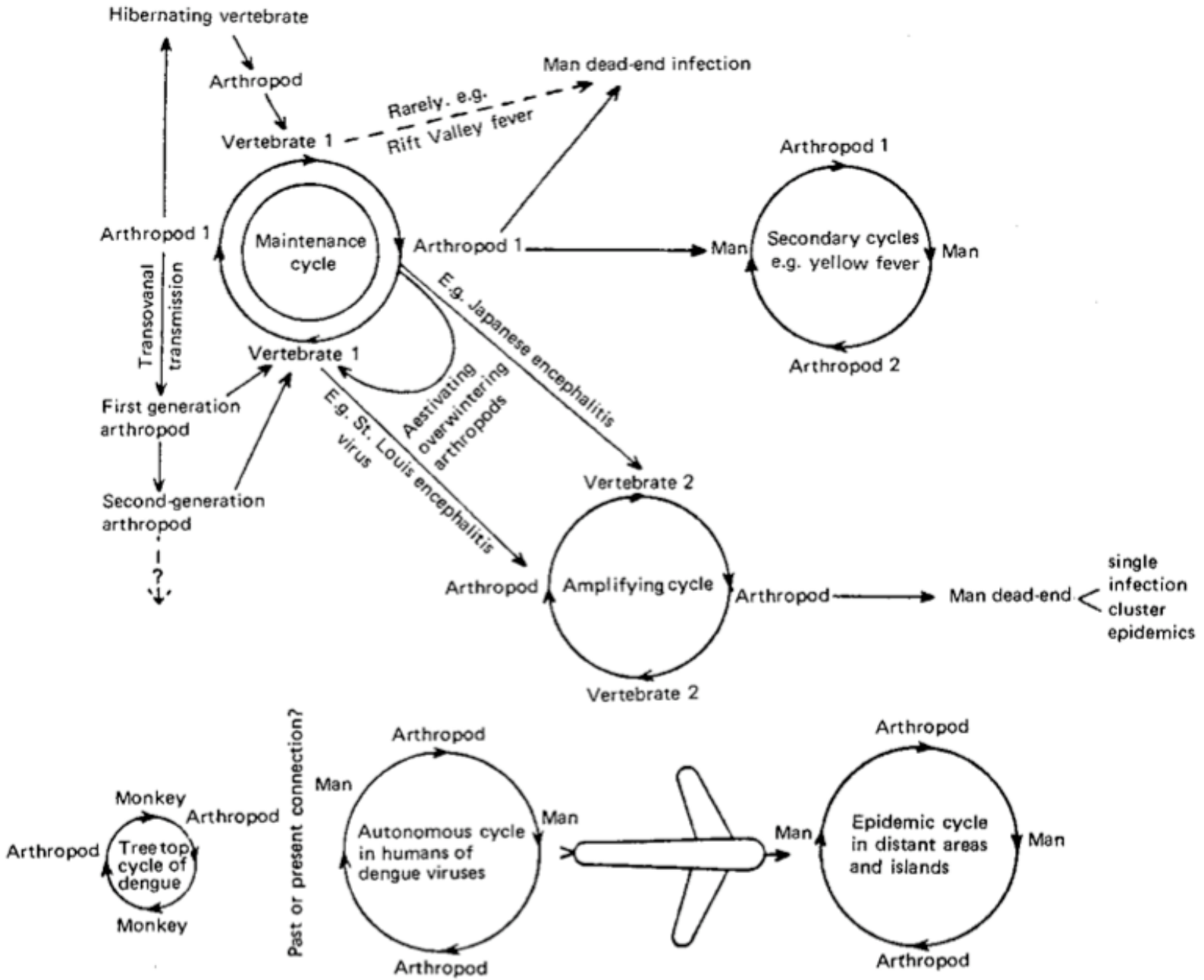


Fig. 1 The complicated epidemiology of arboviruses (From Metselar and Simpson, 1982)

114(4) 521-538

fornia. Les conditions climatiques et géographiques sont favorables au développement de très nombreuses espèces d'oiseaux et au passage de beaucoup d'oiseaux migrateurs. Ces migrations sont etudiées à la station biologique de la Tour du Valat (L. Hoffmann).

L'enquête d'origine avait été financée par l'Institut Pasteur. La décision de la poursuivre selon un programme échelonné sur plusieurs années exigeait un autre mode de financement, en particulier pour tout le travail effectué par le groupe sur le terrain. Le premier, l'I. N. S. E. R. M., dès 1964, a accordé dans ce but une subvention à l'Institut Pasteur, puis l'I. N. R. A. à l'Ecole Vétérinaire de Lyon et enfin la D. R. M. E. à l'Ecole d'Application du Pharo de Marseille.

De plus, des aides locales ont été accordées soit par des organismes publics (Ponts-et-Chaussées), soit par des particuliers (MM. Maillan et Fabre) pour héberger les laboratoires de campagne. Des facilités ont été accordées, par la direction et le personnel de la réserve naturelle pour l'hébergement des chercheurs, par les compagnies Air-Inter et Air-France pour les transports aériens.

Ce sont les résultats de cette enquête, au moins ceux de ses

ÉPIDÉMIOLOGIE DU VIRUS WEST NILE : ÉTUDE D'UN FOYER EN CAMARGUE.

II. — ESQUISSE DU MILIEU PHYSIQUE, BIOLOGIQUE ET HUMAIN(*) (**)

par L. HOFFMANN, J. MOUCHET, J. RAGEAU, Cl. HANNOUN, L. JOUBERT, J. OUDAR et D. BEYTOUT.

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Ecole Vétérinaire de Lyon, I. N. R. A.
Ecole d'Application du Pharo, Marseille, D. R. M. E.
Station Biologique de la Tour du Valat].)

SUMMARY

Epidemiology of the West Nile virus : study of a focus of the disease in Camargue

Thus, the Camargue is a region characterized by the unquestionable originality of its climate, of its flora, of its fauna and even of its people ; it differs sharply from the neighbouring regions, in particular by the great number of species of wild vertebrates more or less domesticated and, in the same time, by the great number of agressive arthropods.

In consequence, it has been unavoidable to describe in detail the numerous conditions which must be united in order to allow the maintening and the transmission of the arboviruses. The Camargue has seemed to us particularly convenient for the study of this viral group : thus, the choice made by our team is justified and the results related in the following articles of these series fully explained.

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LÉSIONS HISTOLOGIQUES DU SYSTÈME NERVEUX DANS L'INFECTION A VIRUS WEST NILE CHEZ LE CHEVAL (*)

par J. C. GUILLON, J. OUDAR, L. JOUBERT et Cl. HANNOUN (**)

(Service d'Histopathologie, Service de Microbiologie Animale et Service de la Fièvre Jaune et des Arbovirus, Institut Pasteur, Paris, et Service de Microbiologie et des Maladies Contagieuses, I. N. R. A., Ecole Vétérinaire, Lyon)

En septembre 1965, Panthier et coll. [3] observèrent en Camargue un cas d'encéphalomyélite chez un poulain de six mois, Halima II, vivant à l'état demi-sauvage. Cet animal fut abattu et autopsié immédiatement après la mort. Les examens virologiques conduisirent à l'isolement et à l'identification du virus West Nile, arbovirus du groupe B, qui avait déjà été obtenu auparavant, dans cette même région, à partir de moustiques *Culex modestus* et d'hommes malades, par Hannoun et coll. [1].

La reproduction expérimentale de la maladie fut tentée à partir de la souche de virus isolée de la moelle lombaire du poulain Halima II pour confirmer cette étiologie et pour démontrer l'origine virale des symptômes de paralysie observés chez de nombreux chevaux camarguais atteints d'un syndrome parétique postérieur dénommé en dialecte local « lourdige », évoquant la démarche « lourde », ébrieuse de l'animal.

MATÉRIEL ET MÉTHODES

Dans une première expérience (avril 1966), une ânesse de trois ans et cinq chevaux, dont deux adultes et trois poulains, furent inoculés avec des doses variables de virus simultanément par les voies sous-cutanée et intraveineuse, afin de reproduire les conditions spontanées de la contamination par l'arthropode vecteur. Deux des poulains ayant reçu 10^6 unités virulentes (poulain n° 1) et 10^4 unités

(*) Ce travail a bénéficié d'une subvention de l'I. N. S. E. R. M.
(**) Manuscrit reçu le 3 octobre 1967.

TRANSLATION FROM RUSSIAN. BEREZIN, V. V. & RESHETNIKOV, I. A. (1971)*. West Nile fever virus in wild birds. Mater 6. Simp. Izuch. Virus. Ekol. Svyazan. Ptits. (Omsk, 1971), pp. 93-94.

Several serological and virological investigations made in 1964-1969 in the Volga River lower reaches allowed us to determine that birds are the main hosts of West Nile fever (WN) in nature. Our investigations aimed at clarifying the periods and character of viremia in birds and dynamics of antibodies and their preservation period. Owing to frequent isolations of WN virus from immature Hyalomma plumbeum** ticks collected from birds, we studied experimentally the possible infection of these arthropods following feeding on birds and afterward transstadial virus transmission. We infected with WN virus 15 rock doves, 7 pheasants, 2 rooks, 2 carrion crows, and 5 grey herons. No signs of clinical infection were recorded in experimental birds. The maximum virus titer in the bird blood was $10^{2.5}$ LD_{50}/0.03. Viremia lasted 5 or 6 days, except in 2 cases in which the virus was isolated from rock-doves on day 9 and 10 following infection. The virus was isolated on day 20 and 34 from rock dove organs. First appearance of antihemagglutins was observed on day 5 and in 1 case after 48 hrs. The antibody titer reached maximum on day 12-16. Two rock doves naturally immune to WN virus were used in a test. Virological examination of blood taken from these birds at different times after infection proved to be negative but antibody titers increased 4 fold. The maximum antibody titer was 1:1280 in pheasants and herons and 1:320 in rock doves. In some rock doves, the antibody titers sharply decreased (in some cases to 0) on day 30 and afterward increased; this is apparently associated with repeated virus circulation in bird blood. After 3 months, antihemagglutinin titers in most experimental birds decreased to the minimum level and no antibodies were found in some individuals.

WN virus was isolated from nymphal H. plumbeum fed on infected rooks, carrion crows, and herons. Thus, this fact shows that these arthropods may become infected while feeding on birds.

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* Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of

Fogne ...

Svernamento

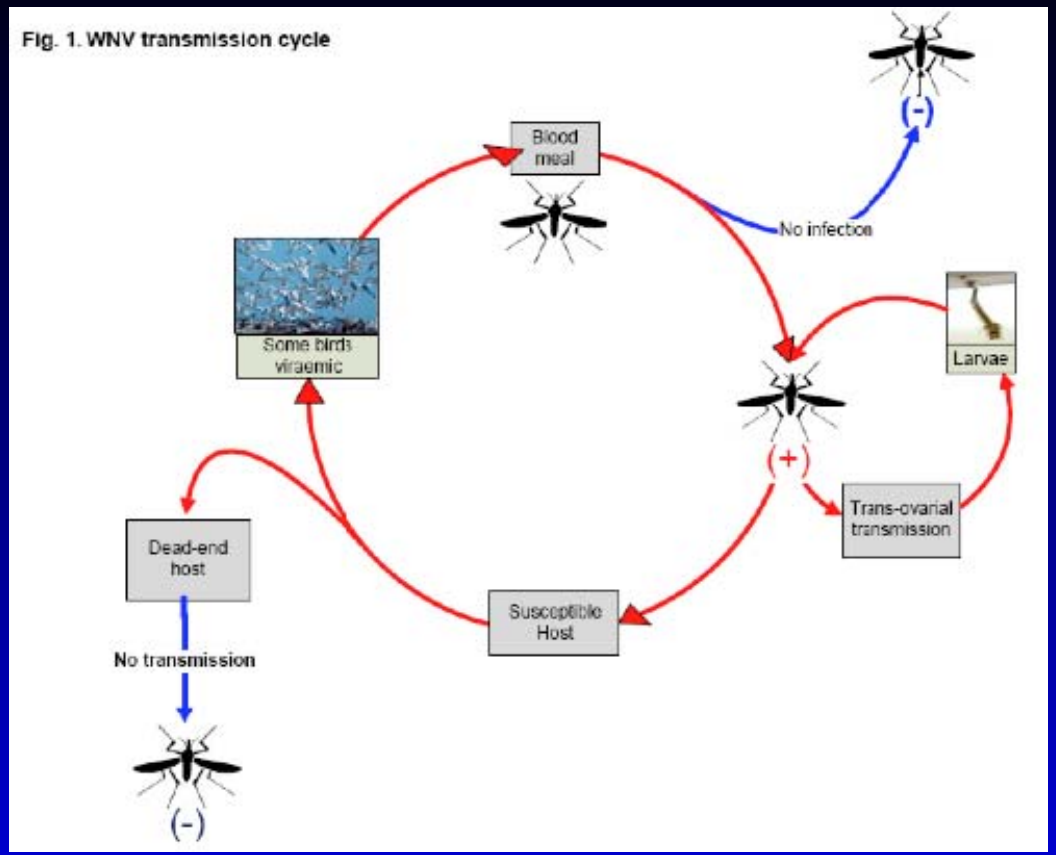

Fig.2 Transmission cycle and limiting factors in the spread of disease