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How to define an area where transmission of arthropod-borne disease is occurring?

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In this issue of *Eurosurveillance*, the authors of the report *Epidemiological surveillance of West Nile neuroinvasive disease in Italy, 2008 to 2011* use one of various definitions of 'affected area' that are utilised in practice [1].

In connection with the planning of measures to maintain the safety of the blood supply during the outbreaks of West Nile fever in Member States of the European Union (EU), we became aware that several different terms and definitions are in use to describe the same status of the infection risk in an area, and that these terms often vary by disease. This creates difficulties in establishing criteria for geographical deferral of blood donors, points to discrepancies in terminology between professional guidelines and European legislation [2] and raises questions about the applicability of existing terminology in outbreaks of other arthropod-borne diseases (ABD).

Hence, we propose a simple but structured and common terminology for areas where an ABD is occurring. It is based on the analytical revision of terms and definitions and intended to be used mainly for the implementation of measures maintaining safety and sustainability of the supply with substances of human origin.

The key point in the proposal is that every area where the chances of transmission of an ABD to humans are higher than nil is factually a risk area. This statement does not measure the level of the risk. The actual risk level in an area depends on environmental conditions, the presence of arthropod vectors and pathogen, previous ABD transmission to humans, and the disease's seasonal recurrence in the area. Consequently, we propose the following terminology and classification of risk areas (Table):

A **risk area** is an area where individuals are exposed to the risk (which can be small or large) of being infected with a locally acquired ABD. This is a generalised use of the term 'risk area' in order to prevent the imprecision linked to this term due to its use to signify a specific level of risk in an area.

A **predisposed area** is a risk area where existing conditions might facilitate the transmission of an ABD to humans, but the respective pathogen has not been detected.

Conditions favouring transmission are receptivity and/or vulnerability of the area. The receptivity of an area is the presence and/or spread of arthropod vectors and the existence of other ecological and climatic factors

Table

Terminology and classification of the risk areas where an arthropod-borne disease is occurring

Risk area type	Criteria			
	Conditions[a]	Pathogen[b]	Transmission[c]	Recurrence[d]
Predisposed	+	-	-	-
Imperiled	+	+	-	-
Affected	+	+	+	-
Endemic	+	+	+	+

[a] Environmental conditions favouring transmission of arthropod-borne diseases to human.
[b] Presence of the pathogen in vectors and/or animals.
[c] Transmission of arthropod-borne diseases to human
[d] Seasonal recurrences of arthropod-borne disease transmissions to human.

favouring ABD transmission to humans [3]. The vulnerability of an area means the proximity to areas where this ABD infection is present or a frequent influx of infected individuals or groups and/or infective arthropods [3].

An **imperilled area** is a risk area where the pathogen has been detected in vectors, or transmission of the pathogen to animals has been detected, or the transmission of the pathogen to humans has occurred previously in a defined period, specific for each ABD.

An **affected area** is a risk area with ongoing transmission of an ABD to humans. This means that at least one case of transmission of autochthonous ABD to a human has been confirmed in the area according to the agreed, standardised and disease-specific case definition [4]. Under exceptional circumstances, a probable case can be used to determine transmission but only in specific and agreed situations when case confirmation cannot be performed within a reasonable time.

An **endemic area** is a risk area where transmission of an ABD to humans is taking place over several seasonal cycles, the number of which may be different for different ABDs.

Once declared, the risk area remains within the same or moves to a higher risk type throughout the current season of the vector's activity. The risk for ABD transmission to humans in an area should be re-evaluated for every season of a given vector's activity.

In addition to assigning a risk, an area must be accurately determined geographically, i.e. with name, location and boundaries. This should follow the biological and epidemiological findings (surveillance of human and animal cases, field investigation etc.) but be adapted to the administrative territorial divisions in order to allow epidemiological mapping and harmonisation and to avoid misunderstanding and imprecision. In an initial rapid risk assessment, broader administrative divisions should be applied cautiously to avoid unnecessary donor deferrals. The final geographical determination of an area where a vector-borne disease is present is possible after an epidemiological analysis and risk assessment have been performed. For practical reasons, simplification may be necessary regarding travel advice as well as for donors of substances of human origin returning from the area of exposure.

The proposed system is a framework for classifying an area according to the present risk and other characteristics of disease transmission to humans. The epidemiological characteristics required for the classification should be determined for every ABD individually (e.g. number of seasonal cycles for the definition of an endemic area).

Although a clear terminology is important for implementation of the appropriate public health or other precautionary measures, these should be selected only after a thorough risk assessment and risk/benefit analysis. The applied measures should be proportional to the level of risk and implemented in a timely fashion [5].

Acknowledgments

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Re-emergence of dengue in Réunion, France, January to April 2012

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Since January 2012, 20 autochthonous cases of dengue virus (DENV) infection have been identified in Réunion. The first cases were detected on the western coast, but the two co-circulating viruses (DENV-1 and DENV-3) seemed to have spread later to different cities of the island. There is a non-negligible risk of increase in viral transmission over the following weeks, so health professionals and public health authorities in Réunion are preparing to face a potential epidemic.

Since January 2012, 20 autochthonous cases of dengue fever have been identified in Réunion. Of these, 13* were probable and seven* laboratory-confirmed. Nine of them occurred in April and this suggests an increase in viral circulation while the geographical distribution of the cases suggests the spread of the virus.

Background

South-western islands of the Indian Ocean are permanently threatened by dengue fever outbreaks because of their tropical climate, their geographical proximity to many endemic countries in Africa and Asia and their numerous tourists and commercial exchanges [1].

In Réunion, a French overseas territory located 700 km east of Madagascar with 840,000 inhabitants (2011 estimate [2]), two dengue outbreaks were documented during 1977 to 1978 and in 2004 [3,4]. In 1977 to 1978, a massive epidemic occurred in the whole island, with an estimated 30% of the population infected [3]. In 2004, 228 cases were reported in the western part of the island [4], i.e. an attack rate of 3 per 10,000 population.

Since 2004, only sporadic cases have been confirmed: two cases in 2007, three in 2008 and two in 2010 [5]. Epidemiological surveillance is undertaken by the Indian Ocean Regional Office of the French Institute for Public Health Surveillance (Cire OI - InVS) in collaboration with the vector control team (Lutte anti-vectorielle, LAV) of the French Health Agency Indian Ocean (ARS OI) [5]. It is based on an active participation of hospitals and general practitioners, as well as public and private biological laboratories, that report every dengue virus (DENV) infection. As soon as a case is notified, control measures are implemented by the LAV and an active case finding among patient's contacts is performed by the LAV together with the Cire OI. The following case definition is used: a confirmed case is defined as a patient with a positive PCR or seroconversion; a probable case is defined as a patient with positive IgM on a single sample plus epidemiological link to a confirmed case and/or dengue-like syndrome with high IgM titres; a possible case is defined as a patient with positive IgM on a single sample.

Re-emergence of dengue virus circulation

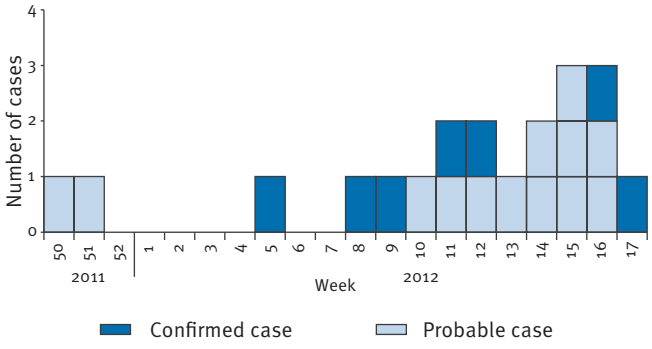
In January 2012, two possible cases without travel history were identified in two separate areas of Saint Paul, a city located on the western coast of the island, affected by the re-emergence of chikungunya virus in 2010 [6]. Despite an active search of symptomatic cases among their close contacts and in the neighbourhood, no other cases were identified. Unfortunately, second sets of blood samples for follow-up investigations could not be obtained.

On 10 February 2012, a case confirmed by RT-PCR was detected in the area of Bellemène (city of Saint Paul), the same area where the two possible cases had been identified earlier. Autochthonous transmission of the virus was therefore strongly suspected, and the two first possible cases were thus classified as probable. However, as the patient had returned from Asia three weeks before the onset of symptoms, a secondary transmission following importation of the virus by an asymptomatic co-traveller could also be possible.

Autochthonous viral circulation was confirmed in March when three confirmed and two probable cases

Figure 1

Autochthonous cases of dengue virus infection by week of symptom onset, Réunion, January–April[a] 2012 (n=20)



[a] Data for weeks 16 and 17 are incomplete because of the time lag between symptom onset and laboratory confirmation.

(dengue-like syndrome with positive IgM and epidemiological link with a confirmed case) were reported in people living in the western part of the island. In early April, two probable cases were also identified in Saint Denis, the administrative capital of the island located in the north; since then, ten more cases have been detected in different areas of the island.

Outbreak description

A total of 20 autochthonous cases of dengue fever have been identified during the past four months; of these, 13* were probable and seven* confirmed. The mean age for the 20 patients was 39 years (minimum: 2 years; maximum 86 years), and 12 of the cases were women. None had travelled in the three weeks prior to disease onset to a dengue-endemic country. Three patients required hospitalisation because alert signs were present (persistent vomiting, mucosal bleed, and clinical fluid accumulation), but did not experience a severe form of the disease.

As shown in Figure 1, nine of the cases occurred in April, suggesting an increase in viral circulation.

The geographical distribution of the 20 cases also suggests a spread of the virus, as shown in Figure 2.

Eight cases were detected in the western part of the island, in the city of Saint Paul. Epidemiological or geographical links were identified between all of them, suggesting they were all related to a single chain of transmission. However, cases were subsequently identified in other parts of the island, showing the spread of the virus. Furthermore, two different serotypes were identified (two DENV-1 and three DENV-3), confirming the presence of at least two different transmission chains. This co-circulation has its origin in the simultaneous introduction of different viruses: since the beginning of the year, seven cases were imported to Réunion from Asia (Thailand, India and Indonesia), where these two serotypes are regularly circulating [7-9]. Five of these cases had returned before onset of symptoms and have therefore been viraemic in Réunion, but the serotypes could not be identified since only serology was performed.

Control measures

Since January 2012, more than 3,500 premises have been investigated by LAV in the proximity of the cases. Measures taken included: removal of natural and artificial breeding sites for *Aedes albopictus*, spatial insecticide treatments, and active search for symptomatic cases. In addition, all health professionals and general practitioners in the areas concerned have been contacted by phone and provided with information updated on a weekly basis. The general population has been regularly informed on the situation by health authorities through the media in order to strengthen preventive measures to protect against mosquitoes.

Conclusion

Dengue is currently re-emerging in Réunion after a seven-year inter-epidemic period, with 20 cases reported in four months compared with a total of seven cases reported between 2005 and 2011. The epidemiological situation seems stable at the moment, probably due to timely control measures implemented for every case and improved epidemiological surveillance. However, *Ae. albopictus* has shown to be a good vector for dengue in Réunion [10]: its density is high enough to allow transmission during the whole year and the current meteorological conditions (high temperatures and precipitation levels) are particularly favourable to its reproduction. Moreover, because of the potentially high proportion of asymptomatic forms (50% to 94% according to the studies [11]), the virus could continue to spread unnoticed. It has been recently suggested that the number of asymptomatic infections could increase with the incidence of infection in the preceding year [12]. This would be in favour of a moderate proportion in Réunion which has been free from active dengue circulation during the past seven years. However, asymptomatic cases are inevitably present on the island, and might reach levels of viraemia sufficient to infect competent mosquitoes [13].

The risk of an increased viral transmission in the following weeks is therefore non-negligible, and health professionals as well as public health authorities are currently preparing themselves to face a potential epidemic. The identification of two serotypes among autochthonous cases, combined with a high vector density and probably a low immunity of the population, suggest the presence of a higher risk, which will most probably decrease with the arrival of the austral winter. Indeed, past outbreaks of arboviruses in Réunion showed that viral circulation ended or significantly decreased in July [4-6, 14]. However, during the chikungunya outbreak in 2005-2006, low viral circulation persisted during the austral winter and led to the greatest epidemic ever described with 266,000 persons infected (i.e. an attack rate of 34%) [14]. Drawing

on experiences from this outbreak, epidemiological surveillance has now been reinforced in order to early detect any new case and to obtain systematic laboratory confirmations, with an active involvement of hospital and general practitioners as well as public and private laboratories.

* Authors' correction:

The numbers of probable and confirmed cases were corrected on 22 May 2012, at the request of the authors: 13 cases were probable and seven were laboratory-confirmed.

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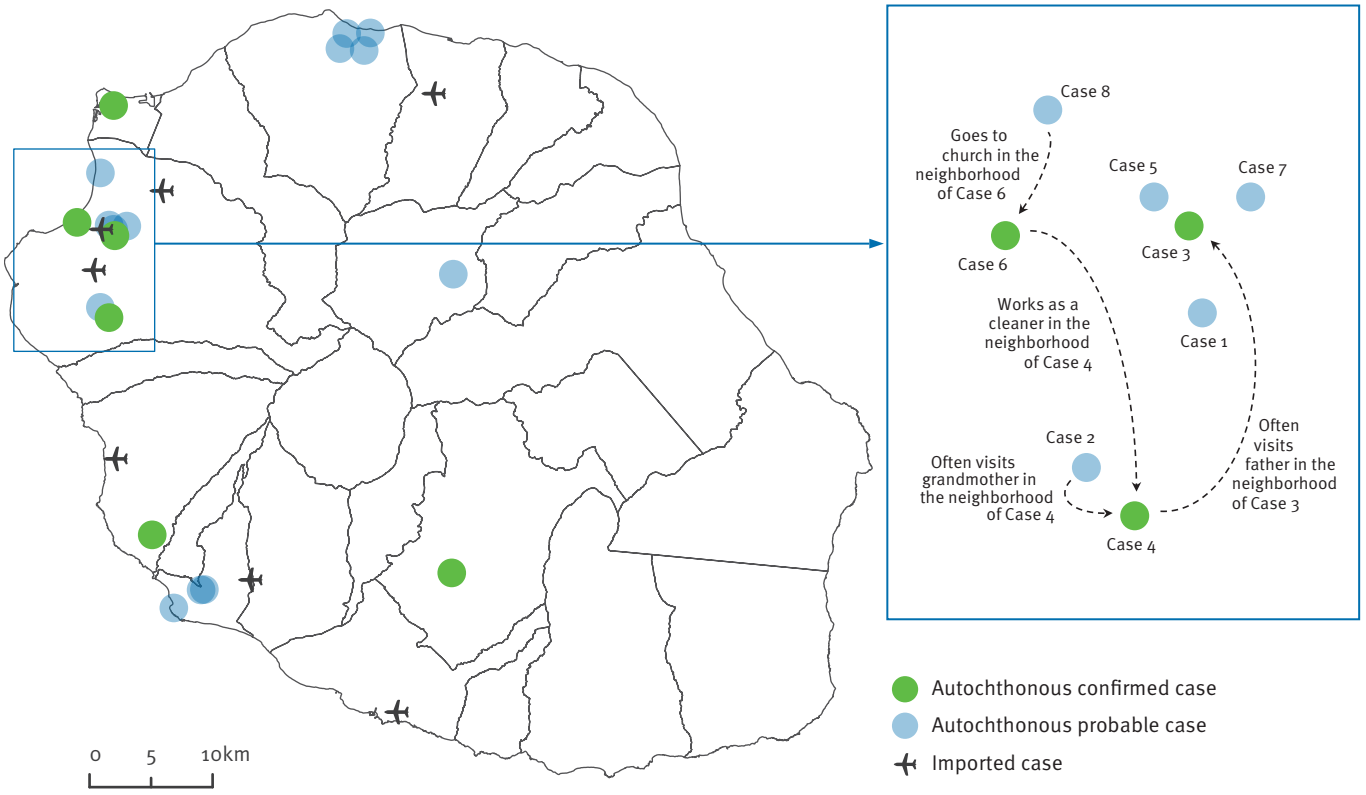
Figure 2

Geographical distribution and epidemiological links[a] between autochthonous cases of dengue virus infection, Réunion, January–April 2012 (n=20[b])



[a] Epidemiological links are detailed for eight cases.

[b] In addition to the 20 autochthonous cases, seven imported cases were identified on the island in the same period.

Epidemiological surveillance of West Nile neuroinvasive diseases in Italy, 2008 to 2011

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We describe the geographical and temporal distribution of West Nile neuroinvasive diseases (WNND) cases in Italy from 2008 to 2011. The increasing number of confirmed human cases from eight in 2008 to 18 in 2009 and the occurrence of the virus in a larger geographical area in 2009 (moving from east to west) prompted the Ministry of Health to publish, in spring 2010, a national programme for WNND human surveillance, comprising veterinary and vector surveillance. Subsequently, in 2011, a new national plan on integrated human surveillance of imported and autochthonous vector-borne diseases (chikungunya, dengue and West Nile disease) was issued. Between 2008 and 2011, 43 cases of WNND were reported from five regions in Italy with a case fatality rate of 16%. The incidence of WNND during the entire study period was 0.55 per 100,000 population (range: 0.06–0.23 per 100,000). During 2011, two new regions (Friuli-Venezia Giulia and Sardinia) reported confirmed cases in humans. Integrated human, entomological and animal surveillance for West Nile virus is a public health priority in Italy and will be maintained during 2012.

Introduction

West Nile Virus (WNV) infection was first identified in Italy in 1998, when the disease was detected in horses in Tuscany, with no rise in human neurological cases detected at the time [1]. After the WNV epidemic in horses in Tuscany in 2001, the Ministry of Health decided to implement a national veterinary surveillance programme. The aim of the veterinary surveillance programme was to detect the introduction of WNV and it was in place in 15 Italian wetland areas, chosen due to the presence of a significant number of water fowl, including migratory bird species that can represent a possible risk of virus introduction [2]. The plan foresees Italian regions to adopt the operative procedure for entomological, sentinel bird and horse surveillance in coordination with the West Nile Disease (WND) National Reference Laboratory of the Public Veterinarian Health Department (Istituto Zooprofilattico Sperimentale) in Teramo, and the National Reference Laboratory for Vector Surveillance of the National Institute of Health (Istituto Superiore di Sanità, ISS) [3].

In summer 2005, WNV activity was detected again in the north-eastern part of Italy in sentinel chicken [4] whereas in summer 2008, WNV was confirmed in horses with neurological symptoms in the regions Veneto and Emilia-Romagna. This evidence prompted the immediate implementation of a WNV surveillance plan for human surveillance of West Nile neuroinvasive disease (WNND) in the two affected regions in June 2008 [5-8]. During the remaining six months until November 2008, following the implementation of the plan, a total of eight human cases of WNND were reported in the two regions during 2008 [6,7,9]. In 2009, the number of human WNND cases increased to a total of 18 in that year and included new wet areas surrounding the Po river (nine cases in Emilia-Romagna, seven in Veneto and two in Lombardy) [5-7].

After the number of human cases had increased from eight in 2008 to 18 in 2009 and the geographical distribution WNND had widened in 2009 with the virus expanding from east to west, the Ministry of Health (MoH) published, during spring 2010, a national plan for WNND human surveillance in Italy that integrated veterinary and vector surveillance [10]. Subsequently, in 2011, a new national plan on integrated human surveillance of imported and autochthonous vector-borne disease (chikungunya, dengue and West Nile disease)

was issued [11]. In this report we describe the geographical and temporal distribution of WNND cases in Italy, from 2008 to 2011.

Methods

The national surveillance system

The national plan for human surveillance defined 'affected areas' as provinces (secondary administrative units) were laboratory-confirmed WNV infections in horses and/or humans had been notified in previous years or during the surveillance period (defined as between 15 June and 15 November, the period with the highest vector activity). Identification of an affected area immediately triggers the definition of the 'surveillance area' that represents the regional territory of the affected area were the competent vector is present.

During the surveillance period, activities to be carried out by local and regional health authorities are different for affected and surveillance areas. Affected areas identified within the national veterinary programme are published every week on the IZS website [12].

When an affected area is defined by the veterinary programme, local health authorities have to activate an active surveillance system for WNND in workers employed on the farms where equine cases of WNND have been identified and in individuals living or working in the surrounding area (province). Moreover, measures for vector control have to be implemented immediately. At the same time, passive surveillance has to be set up in the surveillance area, requesting physicians to report all possible, probable and confirmed WNND cases using a modified European case definition [13]:

Only probable and confirmed cases have to be reported to the national level (MoH and ISS). A possible case is defined as any person meeting the clinical criteria of (fever ≥38,5° C, and at least one of the following: viral encephalitis, viral meningitis, polyradiculoneuritis (a condition similar to Guillain–Barré syndrome), and acute flaccid paralysis. A case is considered probable if the patient meets the clinical criteria, and their serum sample shows either a WNV-specific antibody response (IgG or IgM) with seroconversion from negative to positive or a four-fold increase in the seroconversion titre on two subsequent samples. A confirmed case is defined as any person meeting the clinical criteria and at least one of the following four laboratory criteria: (i) isolation of WNV from blood or cerebrospinal fluid (CSF), (ii) presence of IgM antibodies in the CSF detected by ELISA, (iii) detection of WNV RNA by RT-PCR in blood or CSF, or (iv) a specific antibody response (IgG or IgM) against WNV detected by neutralisation assay.

All possible cases have to be notified by the regional authorities to the MoH and to the ISS (National Centre for Epidemiology, Surveillance and Health Promotion) using a specific Internet-based software that is password-protected. The system permits the local or regional health authorities to introduce possible cases directly on the website and to update the entry when more information from diagnostic tests becomes available. The regional reference laboratory (or the hospital laboratory) has to confirm the case through isolation of WNV from blood or CSF, detection of IgM antibodies in CSF by ELISA, detection of WNV RNA by RT-PCR in blood or CSF, or by neutralisation test if a specific IgG or IgM antibody response was detected in the serum sample. In case a neutralisation test is not available at the local or regional level, patient sera should be sent to the National Reference Laboratory at ISS that will perform the neutralisation test for confirmation.

Moreover, if in the same year human cases of WNND are detected, immediate WNV nucleic acid amplification test (NAAT) screening of all blood and haematopoietic stem cells donations are introduced in affected areas (provinces), and in surveillance areas (regions) additional screening of solid organ donations, according to the blood directive [14,15]. At the national level, all blood, tissue and solid organ donors who travelled

Table 1

Distribution of cases of West Nile neuroinvasive disease by region and year, Italy, 2008–11 (n=43)

Region	Provinces of exposure	2008	2009	2010	2011	Total[a]
Emilia-Romagna	Ferrara, Bologna, Modena	3	9	0 [+1[b]]	0	12
Veneto c	Belluno, Padua, Rovigo, Treviso, Venice, Vicenza	5	7	3 [+1[b]]	8	23[c]
Lombardy	Mantua	0	2	0	0	2
Friuli-Venezia Giulia	Udine	0	0	0	2	2
Sardinia	Oristano, Olbia	0	0	0	4	4
Total[a]		8	18	3	14	43

[a] Not including imported cases.

[b] Both cases imported from Romania.

[c] These cases do not include West Nile fever cases identified within the regional surveillance system in the Veneto region that have been reported in [8].

to an affected area have to be temporarily deferred for 28 days starting with the day they left the affected area [14].

In our analysis we did not include imported WNND cases notified in the regions Veneto and Emilia-Romagna, cases detected in organ donors [16], and West Nile fever cases identified within the regional surveillance system for WNV fever in the Veneto region. Those cases have already been reported and described in [8].

Data analysis

Incidence rates were calculated using the National Bureau of Statistics estimates of the Italian population for 2010 (mid-year) [17]. Comparison of categorical variables was assessed using the chi-square test. The analysis was carried out using STATA (Version 11).

Results

From June 2008 to November 2011, 43 confirmed WNND cases were notified in Italy. The distribution of WNND cases by year and region is reported in Table 1. All cases described in the present report were confirmed cases.

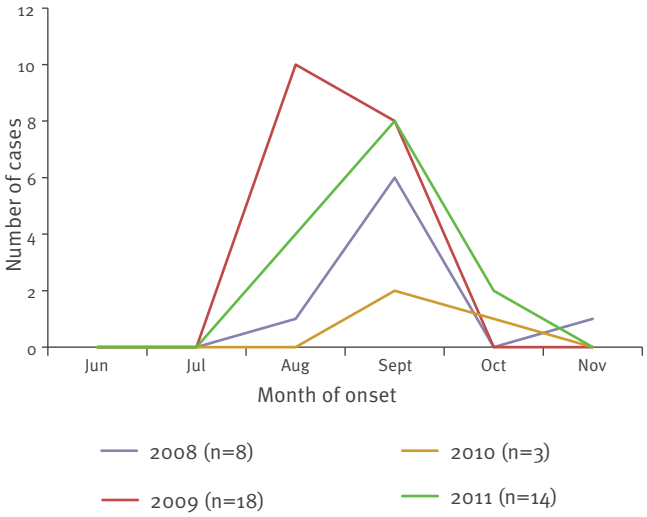
All 43 cases reported not to have travelled abroad during the incubation period. However, two additional cases that occurred in 2010, one in the Emilia-Romagna and one in the Veneto region, reported to have travelled in Romania during the incubation period (within 15 days before the disease onset). Furthermore, a probable WNND case reported in 2011 in the Toscana region had IgM and IgG antibodies against Toscana virus (confirmed by neutralisation test), indicating acute disease, as well as IgG antibodies against WNV (confirmed by neutralisation test), suggesting a previous exposure to WNV. This patient was an immigrant from India and was therefore considered as an imported case. Notably, one case in 2009 and four cases in 2011 were reported in organ recipients who received organs from two donors resident in affected areas [15]. In our study data from the three imported cases and from the two donors and organ recipients are not included.

The median age of the 43 cases was 70 years (range: 33–88 years) during the entire study period, varying from 71.6 (range: 50–86 years) in 2008 to 72.2 (range: 49–84 years) in 2009, 46.5 (range: 29–68 years) in 2010 and 68.8 (range: 33–88 years) in 2011. The attack rate increased significantly with age (p=0.0001) and the proportion of males was significantly higher than of females (p=0.014). None of the patients were vaccinated against yellow fever, tick-borne encephalitis or Japanese encephalitis. For 30 of 43 cases follow-up information was available and 25 of 43 recovered.

The trend over time of human cases of neuroinvasive WNV infection by month of symptom onset and the geographical location of cases from 2008 to 2011 is shown in Figures 1 and 2. September was the peak

Figure 1

Cases of West Nile neuroinvasive disease by month of onset, Italy, 2008–11 (n=43)



month in all years but 2009 when the peak was in August. The majority of WNND cases were reported from the provinces Ferrara, Treviso and Rovigo (Table 2). During 2011, two new regions (Friuli-Venezia Giulia and Sardinia) reported confirmed cases in horses, and later confirmed cases of WNND in humans.

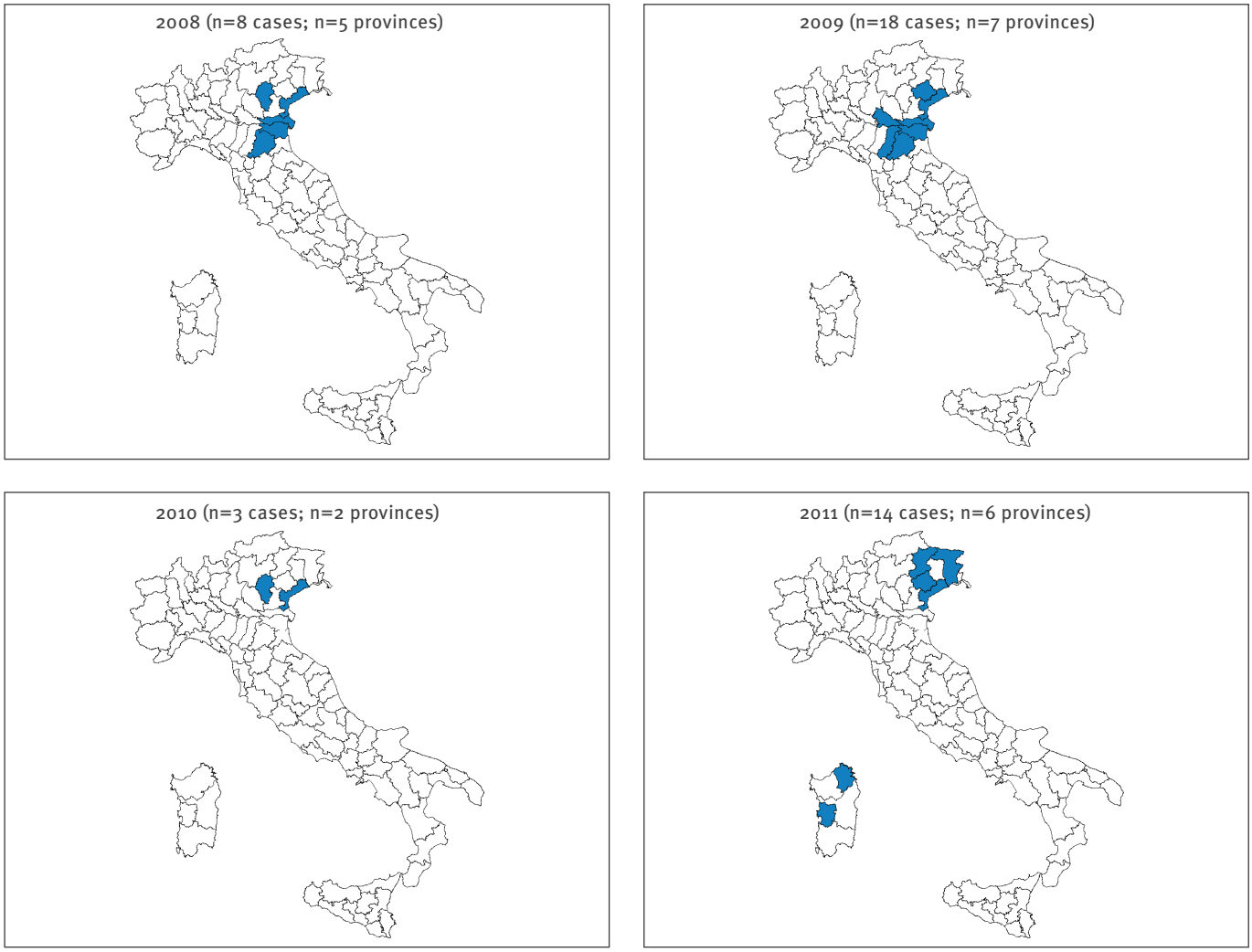
All WNND cases were hospitalised. Seven of them (three in 2009 and four in 2011) died during hospitalisation, corresponding to a case fatality rate of seven of the 43 WNND cases (16%). The median age of WNND cases who died was 76 years (range: 72–82 years) in 2009, 70 years (range: 34–87 years) in 2011 and 73 years (range: 34–87 years) overall. The reported fatalities do not consider the two donors resident in the affected areas.

Discussion

Overall from 2008 to 2011, 43 confirmed autochthonous cases of WNND were reported in Italy. In this report we focus on WNND cases that conformed with the case definition of the Italian National Surveillance system. From 2008 to 2009, the incidence of West Nile disease increased two-fold and most of the affected areas were localised in north-eastern Italy, with the disease apparently moving from east to west. In 2010, the incidence rate decreased four-fold and cases were mostly localised in north-eastern Italy. It increased again three-fold in 2011, when cases occurred in the same provinces as in previous years and also in new regions. In fact, a new geographic pattern of WNV spread was observed in 2011, with a southward expansion that affected areas in the region Sardinia. During the entire study period, most of the areas affected by WNV were localised in north-eastern Italy, with the highest incidence rate (2.43 per 100,000) observed in

Figure 2

Provinces with confirmed human cases of West Nile neuroinvasive disease, Italy, 2008–11 (n=43)



the Rovigo province in the Veneto region, a very humid and flat area limited by the rivers Po and Adige. In 2011, the highest incidence rate (1.80 per 100,000) was observed in a newly affected area, Oristano province in the Sardinia region.

We found a case fatality rate of 16% during the entire study period (2008–11) that was higher than in Israel (8.4% in 2000 and 8% in the surveillance period 2005–10), Romania (4.3% in 1996) [18-20] and the United States (9% in the surveillance period 1999–08) [21], and similar to that described Greece (17% in 2010) [22]. In Italy, as described for Greece [22], an association between age and severe disease was observed.

During the study period, veterinary and human surveillance activities were intensified across the country [2,23] in order to define a system able to detect WNV circulation as early as possible in infected animals for triggering immediate surveillance of WNND in humans. The calculation of incidence and case fatality rate of WNND cases in humans may be affected by underreporting due to inappropriate use of the case definition at the regional level or due to under-reporting of cases who attend healthcare services but whose disease status is incorrectly diagnosed. However, since the case definition of human cases includes only WNND, it is unlikely that the clinical picture should be affected by underreporting and under-ascertainment (if also the case definition for West Nile fever was included in the National Surveillance System, a high degree of underreporting of clinical cases would be likely).

Notably, as far as we are aware, only WNV lineage 1 infections have been described in Italy since 2008, but the situation changed in 2011. Recently in 2011, co-circulation of both lineage 1 and 2 (the latter very closely related to the Hungarian lineage) has been demonstrated in north-east Italy [24], suggesting a probable introduction of lineage 2 in the southern European countries possibly along the routes of migratory birds [24,25]. However, as yet no human cases infected with WNV lineage 2 have been detected in the north-eastern affected areas of Italy. As a consequence, it can be

Table 2

Characteristics of reported West Nile neuroinvasive disease, Italy, 2008–11 (n=43)

Characteristics	Number of cases (incidence rate[a]/100,000)				
Age group (years	2008	2009	2010	2011	**Total**
<30	0 (0)	0 (0)	0 (0)	0 (0)	**0 (0)**
30–49	0 (0)	1 (0.04)	2 (0.09)	3 (0.13)	**6 (0.27)**
50–59	2 (0.21)	0 (0)	0 (0)	0 (0)	**2 (0.21)**
60–69	1 (0.12)	4 (0.46)	1 (0.12)	2 (0.23)	**8 (0.93)**
≥70	5 (0.44)	13 (1.15)	0 (0)	9 (0.79)	**27 (2.38)**
Sex					
Female	3 (0.08)	5 (0.13)	1 (0.03)	5 (0.13)	**14 (0.35)**
Male	5 (0.13)	13 (0.34)	2 (0.05)	9 (0.24)	**29 (0.77)**
Province (region) of residence					
Ferrara (Emilia-Romagna)	2 (0.56)	5 (1.39)	0 (0)	0 (0)	**7 (1.95)**
Bologna (Emilia-Romagna)	1 (0.10)	2 (0.20)	0 (0)	0 (0)	**3 (0.30)**
Modena (Emilia-Romagna)	0 (0)	2 (0.29)	0 (0)	0 (0)	**2 (0.29)**
Belluno (Veneto)	0 (0)	0 (0)	0 (0)	1 (0.47)	**1 (0.47)**
Venice (Veneto)	1 (0.12)	1 (0.12)	2 (0.23)	1 (0.12)	**5 (0.58)**
Vicenza (Veneto)	3 (0.35)	0 (0)	1 (0.12)	0 (0)	**4 (0.46)**
Treviso (Veneto)	0 (0)	1 (0.11)	0 (0)	6 (0.68)	**7 (0.79)**
Rovigo (Veneto)	1 (0.40)	5 (2.02)	0 (0)	0 (0)	**6 (2.43)**
Olbia (Sardinia)	0 (0)	0 (0)	0 (0)	1 (0.64)	**1 (0.64)**
Oristano (Sardinia)	0 (0)	0 (0)	0 (0)	3 (1.80)	**3 (1.80)**
Udine (Friuli-Venezia Giulia)	0 (0)	0 (0)	0 (0)	2 (0.37)	**2 (0.37)**
Mantua (Lombardy)	0 (0)	2 (0.48)	0 (0)	0 (0)	**2 (0.48)**
Total	**8 (0.10)**	**18 (0.23)**	**3 (0.06)**	**14 (0.18)**	**43 (0.55)**

[a] Incidence rates were calculated using the 2010 mid-year population of the affected areas (provinces) and respective groups as denominator, available from the National Bureau of Statistics (www.istat.it).

expected that both lineages will be co-circulating in these areas in the next season probably. However it is impossible to predict if this will enhance or reduce the virulence of the virus in humans, should genetic recombination occur [26]. Moreover, genomic sequencing of the virus isolate from one of the four cases confirmed in Sardinia (Olbia province) showed that the virus belonged to WNV lineage 2 (unpublished data), similar to that circulating in Greece in 2010 (Dr Loredana Nicoletti, personal communication, Jan 2012). Another lineage 2 virus was isolated from a case of West Nile fever that was described in the Marche region (Ancona province) [27]. The case was a man in his late 50s presenting with high fever and without evidence of neuroinvasive disease. For this reason he was not included in the present analysis. The genomic sequencing of that isolate showed that the virus belonged to WNV lineage 2 and had 99% identity to the complete genome of isolate goshawk-Hungary/04 and to the more recent Nea Santa-Greece-2010 isolate [28].

The confirmed cases from the Sardinia and Marche regions who were infected with WNV lineage 2, where diagnosed by detection of WNV RNA both in serum or plasma and in urine [27]. As previously reported, urine samples are more appropriate for WNV diagnosis because of longer shedding and higher viral load in the kidneys [29], which was also shown in experimental animal studies [30]. In fact, serum or plasma may give false-negative results due to the short duration of viraemia, while WNV can be shed in urine even years after the initial infection [29]. However, the use of the WNV RNA in urine is still debated [31].

In 2011, many autochthonous WNV human cases were reported in Europe and in neighbouring countries: 96 confirmed human cases in the European Union (69 in Greece, three in Hungary, 14 in Italy and 10 in Romania), and 207 in neighbouring countries (two in Albania, four in the Former Yugoslav Republic of Macedonia, 34 in Israel, 153 in the Russian Federation, three in Tunisia, three in Turkey and eight in Ukraine) [32].

In 2012, integrated human, entomological and animal surveillance will be continued in Italy in order to monitor the spread of WNV and to implement control measures for blood transfusions and organ donations, in accordance with the Blood Directive [33], to control and prevent transmission of the disease in humans. Comprehensive epidemiological, virological and entomological investigations are crucial for a better understanding of factors triggering the spread of WNV. In

Italy, public health authorities (both veterinarian and human) should improve their collaboration at national, regional and local levels.

Establishing and having in place such an integrated surveillance could also be valuable to rapidly identify the risk of introduction of new vector-borne diseases with zoonotic potential, the most obvious candidates being chikungunya [34] and dengue fever [35], not to forget Malaria [36].

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WHO seeking input from health experts into ICD-11

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Public health experts who work with the diagnosis and treatment of patients will, for the first time, have an opportunity to contribute to the development of version 11 of the International Classification of Diseases, ICD-11 [1].

On 14 May 2012, the World Health Organization (WHO) announced the launch of a beta version of a wiki-type platform which allows for stakeholders comments to be added after they have been peer reviewed. Stakeholders interested in commenting can register to access and interact with the platform.

The ICD is a standard used for defining and reporting diseases and health conditions. It is published by the WHO and aims to ensure that members of the health community refer to diseases and health conditions in a consistent way. The ICD is used by epidemiologists to study patterns of disease and also by insurers, national and international health programme managers, specialists in data collection and others involved in the mapping of global health progress and the expenditure of health resources. The final ICD-11 is foreseen to be released in 2015.

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WHO launches the World Health Statistics 2012

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The World Health Organization (WHO) today 16 May 2012 launched its publication 'World Health Statistics 2012' [1], the WHO compilation of health-related data for its 194 Member States, published on a yearly basis. This year's edition consists of three parts: (i) health-related Millennium Development Goals, (ii) highlighted topics (non-communicable diseases, health expenditures, universal coverage) and (iii) global health indicators.

Part I summarises status and trends in areas such as average annual rate of decline (AARD) in under-five mortality rates, measles immunisation therapy, AARD in HIV prevalence and as well as in tuberculosis incidence and antenatal care coverage. Part II contains e.g. detailed information on total health expenditure per capita for 180 countries as well as the coverage and quality of cause-of-death data. Part III, on global health indicators, contains detailed data arranged in tables on topics such as life expectancy and mortality, cause-specific mortality and morbidity, selected infectious diseases, health service coverage and expenditure.

The WHO states that all indicators shown have been included on the basis of global public health relevance, data availability and quality, and the reliability and comparability of the resulting estimates. These indicators provide a comprehensive summary of the current status of national health and health systems in key areas.

The World Health Statistics 2012 is compiled using publications and databases produced and maintained by WHO technical programmes and regional offices. A number of demographic and socioeconomic statistics have also been derived from external databases.

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