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The national information system for the notification of animal diseases in Italy

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Summary

This paper describes the national system for the notification and management of outbreaks of animal diseases in Italy (*Sistema Informativo Nazionale Malattie Animali*: SIMAN). The main objective of the system is to provide a tool for the management of epidemic emergencies and to fulfil the information obligations towards international organisations, such as the European Commission and World Organisation for Animal Health (*Office International des Épizooties*: OIE). SIMAN was thus designed to collect all relevant information on outbreaks of animal diseases and to provide a useful tool for the management of activities to be implemented in emergencies. SIMAN is able to collect and report information concerning suspected or confirmed animal outbreaks in a consistent way and allows veterinary services to enter data electronically, instead of using paperwork, within the framework of the process of e-government and dematerialisation of the administrative acts. Data are immediately accessible for local and national authorities. The system provides the relevant national authorities with information relative to the planning of control measures in case epidemic emergencies. SIMAN is part of the e-government process that involves all public administrations of the European Union (EU) and refers to the use of information and communication technologies for the digital processing of documents so as to simplify the system and to make administrative procedures on the Internet much easier to follow.

Keywords

Animal, Animal health, e-government, Epidemic, Information, Italy, Management, Surveillance.

Introduction

The increase in the number of traded live animals and animal products internationally over the past 15 years has enhanced the risk of pathogen spread (33) and has exposed European livestock to infectious diseases, including diseases originating outside the European Union (EU). Italy is one of the EU countries that is most at risk, due to the substantial imports of animals and animal products and to its geographic location in the middle of the Mediterranean Basin (5). In this context, the immediate notification to the competent/relevant authority of information related to the onset of suspected outbreaks of animal diseases is essential if the implementation of control measures is to be effective (4). Furthermore, notification of disease outbreaks to the European Commission (EC) and to the World Organisation for Animal Health (*Office International des Épizooties*: OIE) is one of the basic obligations linked to membership in these international organisations (29).

In pursuance of the EC's 2007-2013 strategic plan on animal health (14, 17), the EU Animal

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Diseases Notification System (ADNS) is undergoing significant revision in order to create a single Animal Diseases Information System (ADIS) at the European level (15).

In Italy, many information systems that support the veterinary services in the field of animal disease surveillance have been created in the past (1, 8, 9, 23) but, until 2009, no single information system was in place for the collection and dissemination of information on suspected and confirmed outbreaks of animal diseases at a national level.

In 2009, the Italian Ministry of Health's Department of Veterinary Public Health, Nutrition and Food Safety (VPH Department) commissioned the *Istituto 'G. Caporale'* to develop an information system that could collect information on animal disease outbreaks, using uniform procedures and templates for data input and output, completely eliminating paperwork, within the framework of the e-government process which involves all public administrations of the EU and uses information and communication technologies for the digital processing of documents, so as to simplify and facilitate administrative procedures on the Internet.

In Italy, 2009-2011 strategic guidelines on the objectives for the central public administration of the National Centre for Information Systems in Public Administration (*Ente nazionale per la digitalizzazione della pubblica amministrazione*: DigitPA) states that technological innovation and re-engineering of administrative processes is the way to achieve the objectives of simplified administration both transparently and efficiently (13).

Materials and methods

Analysis of information obligations

The analysis took into account both the Italian information obligations towards international organisations, the current national legislation and the existing information flows within the National Health Service.

According to the veterinary police regulation DPR No. 327/92 (2), which covers the totality of veterinary rules in force in Italy, the veterinary services of the Local Health Units (*Aziende Sanitarie Locali*: ASL) must notify any outbreak of animal diseases to the Local Health Authority using a standard template (referred to as 'model 1'), which includes essential information and data that enables identification and characterisation of the outbreak.

According to the Ministerial Decree of 5 October 1984 (28), any case, even suspected, of one of the diseases listed in the Ordinance attachment I must be notified to the VPH Department providing the following information:

- date of notification
- time of notification
- name of disease (and virus type, if applicable)
- date of confirmation
- location of holding
- number of animals in the holding suspected to be involved, by species
- number of animals slaughtered, by species
- number of carcasses destroyed, by species.

Directive 82/894/EEC and subsequent amendments (15, 18) stipulate the criteria for notification of outbreaks of animal diseases to the EC. Data and information to be notified in accordance with Directive 82/894/EEC are listed in Table I. ADNS collects data on animal outbreaks in the EU with the aim of ensuring the rapid exchange of information on animal diseases occurrence among the veterinary authorities of member states and the EC. The system supports the EC and member states in the adoption of prompt measures to counter the spread of disease.

The *Terrestrial Animal Health Code* (*Code*) states that veterinary services must have at their disposal efficient animal disease notification and surveillance systems (3). The veterinary authority of each member state despatches data on outbreaks of animal diseases to the OIE in compliance with article 1.2.3 of the *Code* (35). When the disease that has occurred meets the criteria listed in Table II, each outbreak must be notified within 24 h of confirmation. Immediate notification includes transmission to the OIE of detailed information on the

Table I
Criteria for notification to the European Commission of outbreaks of animal diseases
(Attachment I to Directive 82/894/ EEC)

Data to be notified for all diseases		Additional data for classical swine fever (hog cholera)	
Country of origin	Region and geographic location of the holding	Number of animals clinically infected on premises	Distance from nearest pig holding
Name of disease and type of virus, where appropriate	Other regions affected by restrictions	Number of animals that have died on premises	Number and type of pigs on the infected premises
Serial number of outbreak	Date of estimation of first infection	Number of stock slaughtered	Number and type of pigs clinically infected on the infected premises
Type of outbreak	Origin of disease	Number of carcasses destroyed	Method of diagnosis
Reference number of outbreak linked to this outbreak	Control measures taken	Estimated date of completion of killing (if applicable)	Confirmation of primary cases in feral pigs
Date of suspicion	Number of susceptible animals on premises	Estimated date of completion of destruction (if applicable)	–
Date of confirmation	–	–	–

outbreak, the list of control measures applied, relevant epidemiological aspects of the disease and the procedures and diagnostic tests applied for diagnosis (36). In addition, the veterinary authority of each member state must dispatch to the OIE six-monthly and annual reports that provide aggregated summary data on outbreaks that have occurred. The notification to the OIE is made with the World Animal Health Information System (WAHIS), a Web application developed and managed by the OIE (7).

To date, ADNS and WAHIS are not fully harmonised, although they share the same objectives and type of information, so that member states are actually obliged to double reporting. Decision 2008/739/EC recognised the need for greater harmonisation between

Table II
Criteria for the notification of animal disease outbreaks to the World Organisation for Animal Health

Events to be notified within 24 hours	Events to be notified in weekly reports	Events to be notified in biannual reports	Events to be notified in annual reports
First appearance in the country or area or region thereof of one of the diseases listed in *Code* article 1.2.3	Additional information on evolution of an event, the notification of which is to be considered urgent	Absence or presence and evolution of diseases listed in *Code* article 1.2.3 and epidemiological information relevant to other member states	Other relevant information
Reappearance of a disease after declaration of its disappearance	–	–	–
Sudden and unexpected increase in the spread, incidence, morbidity or mortality in the country or an area or region thereof of a disease and/or infection	–	–	–
Presence of an emerging disease with significant morbidity or mortality or zoonotic capability	–	–	–
Signs of a change in the epidemiology of the disease (range of hosts, pathogenicity, strain of aetiological agent)	–	–	–

ADNS and WAHIS, enabling the collection of standardised epidemiological information and datasets, following common protocols for the data exchange (16). By 2012, the EC will develop a single animal diseases information system (ADIS) that is able to provide basic information on animal health in Europe.

Results

In 2009, the Istituto 'G. Caporale' developed the Italian national information system for the notification of animal diseases (*Sistema Informativo Nazionale Malattie Animali:* SIMAN). SIMAN is located on the website of veterinary information systems of the Italian Ministry of Health (https://www.vetinfo.sanita.it), together with other national information systems (Fig. 1). Users can log in with a user name and password or by using a smart personal card with a digital certificate. SIMAN is accessed by veterinary services at local and regional levels, National reference laboratories, the VPH department and veterinary laboratories *(Istituti Zooprofilattici Sperimentali*: IZS). SIMAN is able to collect data produced at local levels, using standard procedures and templates for data input and output. SIMAN can display data in tabular format or as thematic maps. Data aggregation can be customised according to the user's needs and territorial jurisdiction (6).

There are four levels of territorial jurisdiction, namely: national, regional, municipal and 'IZS', assigned automatically during the user profile registration.

A call centre service (toll-free phone 800 08 22 80) provides technical support for

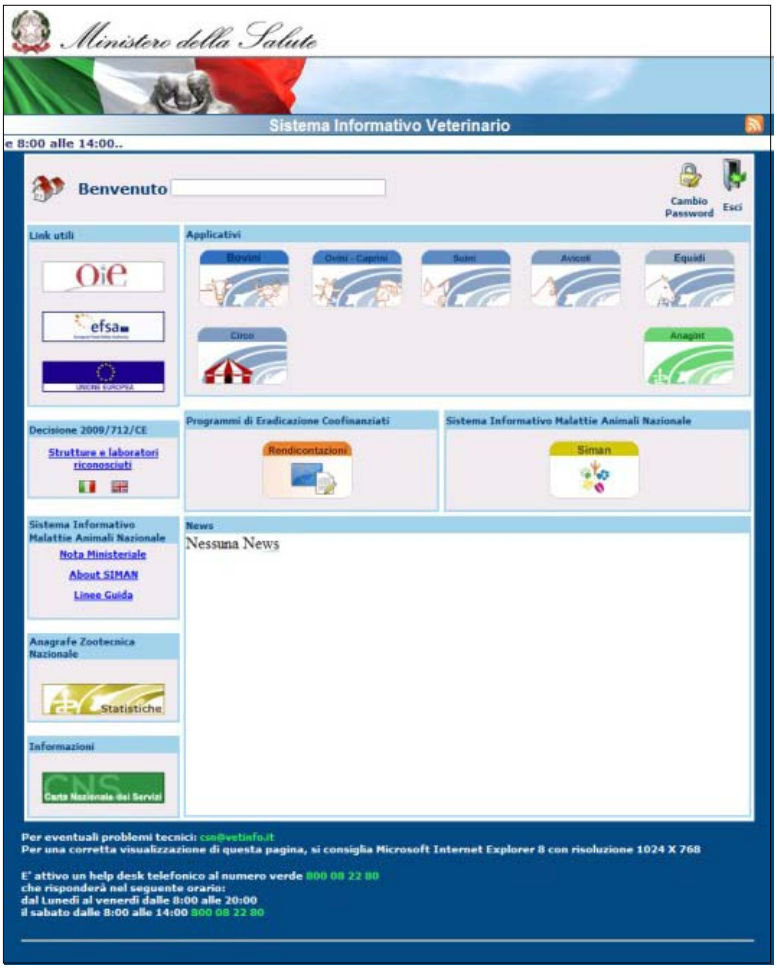

Figure 1
Access to SIMAN through the veterinary information systems portal

SIMAN *Sistema Informativo Nazionale Malattie Animali* (Italian national information system for the notification of animal diseases)

accessing and using the system. A support e-mail service (emergenze.support@vetinfo.it) can be used for both technical and veterinary questions.

Data on suspected or confirmed outbreaks are provided by the veterinary services and the data on laboratory results are reported by the IZS, using online forms or extensible mark-up language (xml) files. Moreover, SIMAN enables users to query data on holdings and farms contained in the national Italian animal identification and registration system (Banca Dati Nazionale: BDN) using Web services.

When entering notification on a new outbreak, the information below (Fig. 2) is mandatory:

- name of the disease
- serotype/subtype of the aetiological agent, when applicable; if unknown, the option 'unknown' can be selected and the information can be entered afterwards
- holding involved in the outbreak, selected from the BDN; if the site of the outbreak is not a farm but the place where the infected animal was found (for example in case of wild animals), the location is identified through territorial references and geographic coordinates
- geographic coordinates of the holding or site where the outbreak occurred; the system uses Google maps to help the user to check and enter the coordinates
- date of notification of the suspected disease.

The suspected outbreak may then be confirmed or cancelled. If confirmed, the information on the holding (number livestock in the holding, number of sick animals, dead,

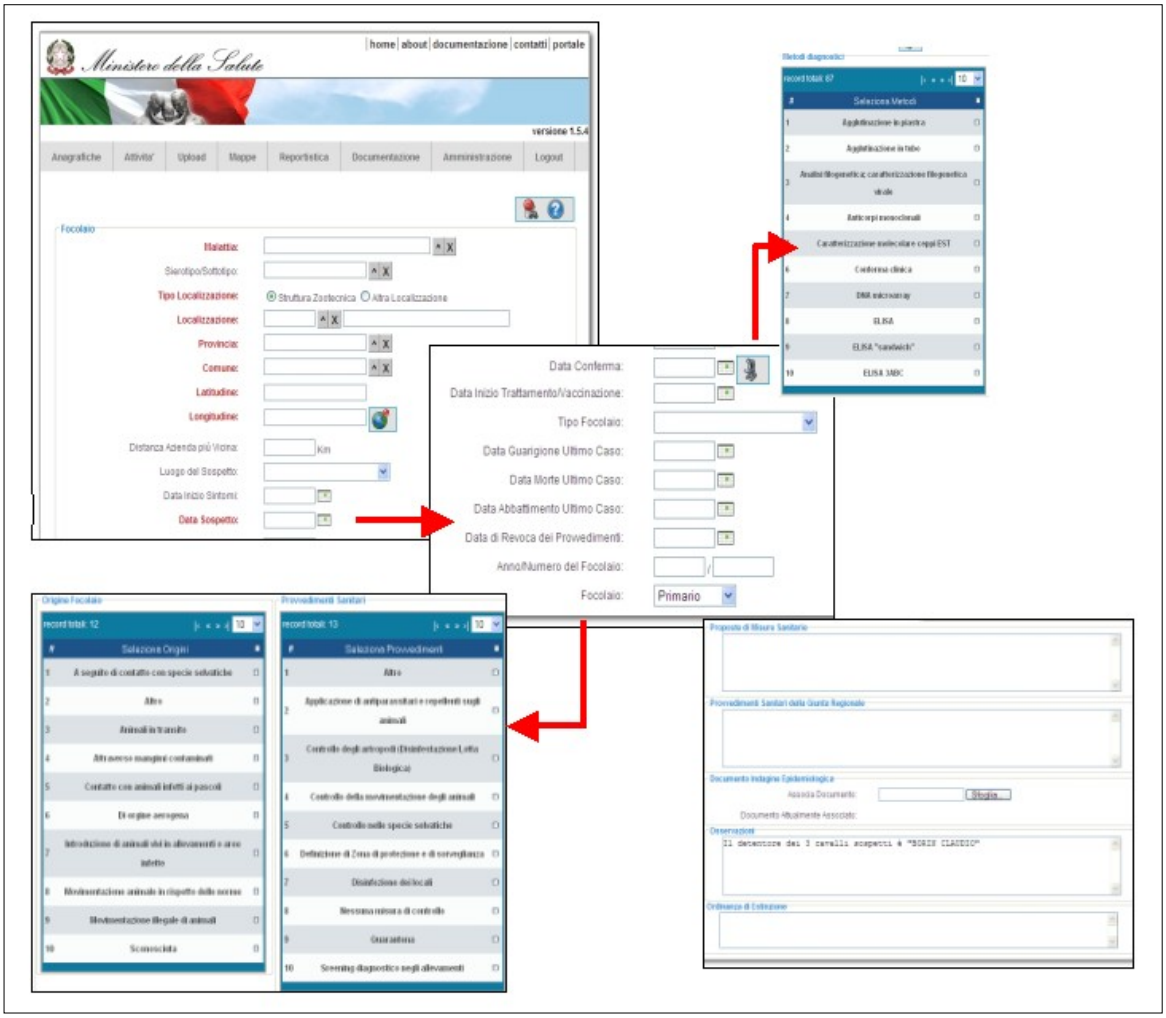

Figure 2
Online outbreak data entry form

slaughtered and destroyed livestock) and the date and method of confirmation must be provided. If an event is cancelled, the reason and date must be provided. Other information on outbreaks can be provided, such as the date of the onset of clinical signs, the date of any treatment or vaccination, the type of outbreak (i.e. clinical or laboratory evidence), the origin of the outbreak (e.g. any contact with wild species, unfenced animals, etc.) and sanitary measures implemented (e.g. control of animal movements, containment of wild species, establishment of protection and surveillance area, etc). Furthermore, a document devoted to the epidemiological investigation can be associated with each outbreak. An automatic alert system via e-mail is in place to transmit the information on suspected or confirmed outbreaks to the competent authorities in real time.

Data and information collected by SIMAN were formatted according to the requirements of both ADNS and WAHIS.

In the case of a confirmed outbreak, the system automatically assigns a progressive number and includes the outbreak in the list of those to be sent to the ADNS and/or WAHIS by thee VPH Department. SIMAN also sends information on confirmed outbreaks to the reference laboratories through Web services. The epidemic event is closed and the control measures stopped when the date of outbreak containment is reported. SIMAN also includes an online geographic information system (WebGIS), which displays thematic maps (10, 11). WebGIS has map navigation tools and spatial data querying options (Figs 3 and 4) (24, 27, 32).

Discussion and conclusions

The efficient management of outbreaks can be achieved only if the competent authority has access to updated and reliable information. The efficiency of the management of health emergencies may be improved by fast,

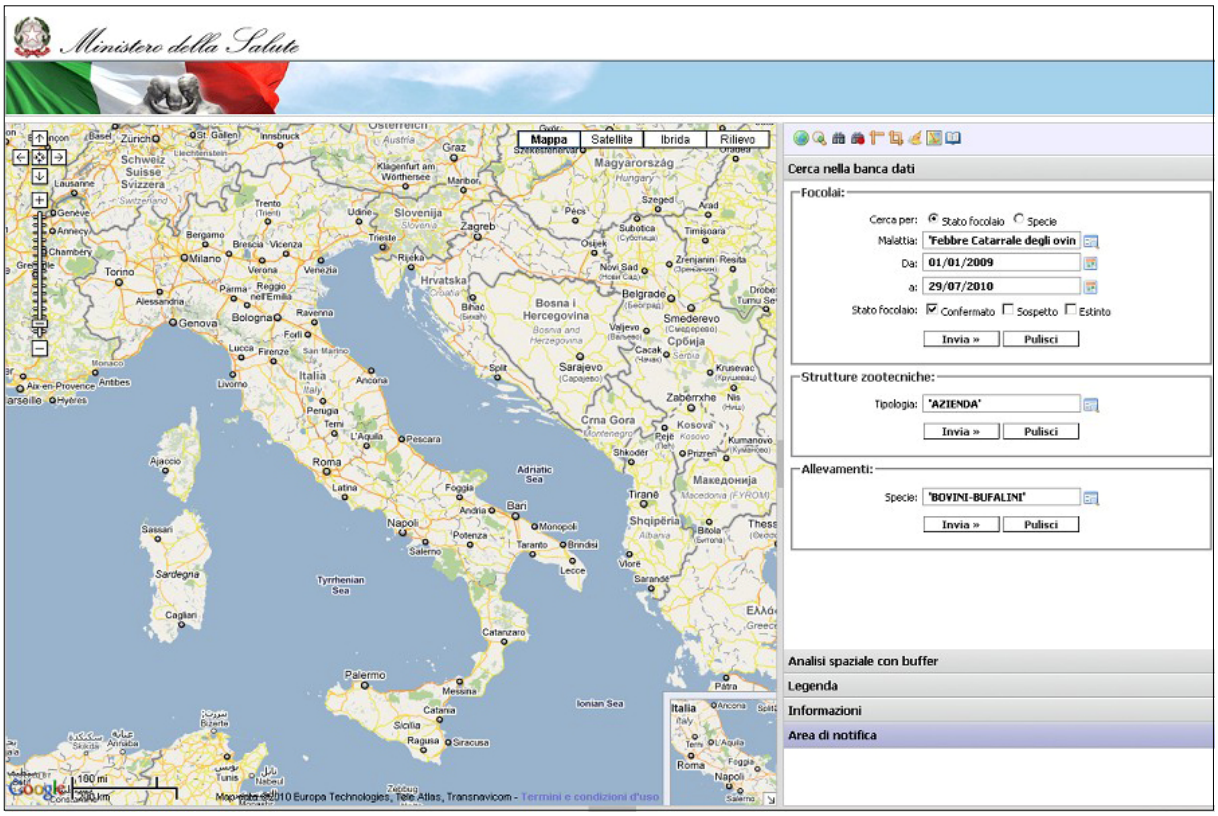

Figure 3
Home page of SIMAN's WebGIS application

SIMAN *Sistema Informativo Nazionale Malattie Animali* (Italian national information system for the notification of animal diseases)

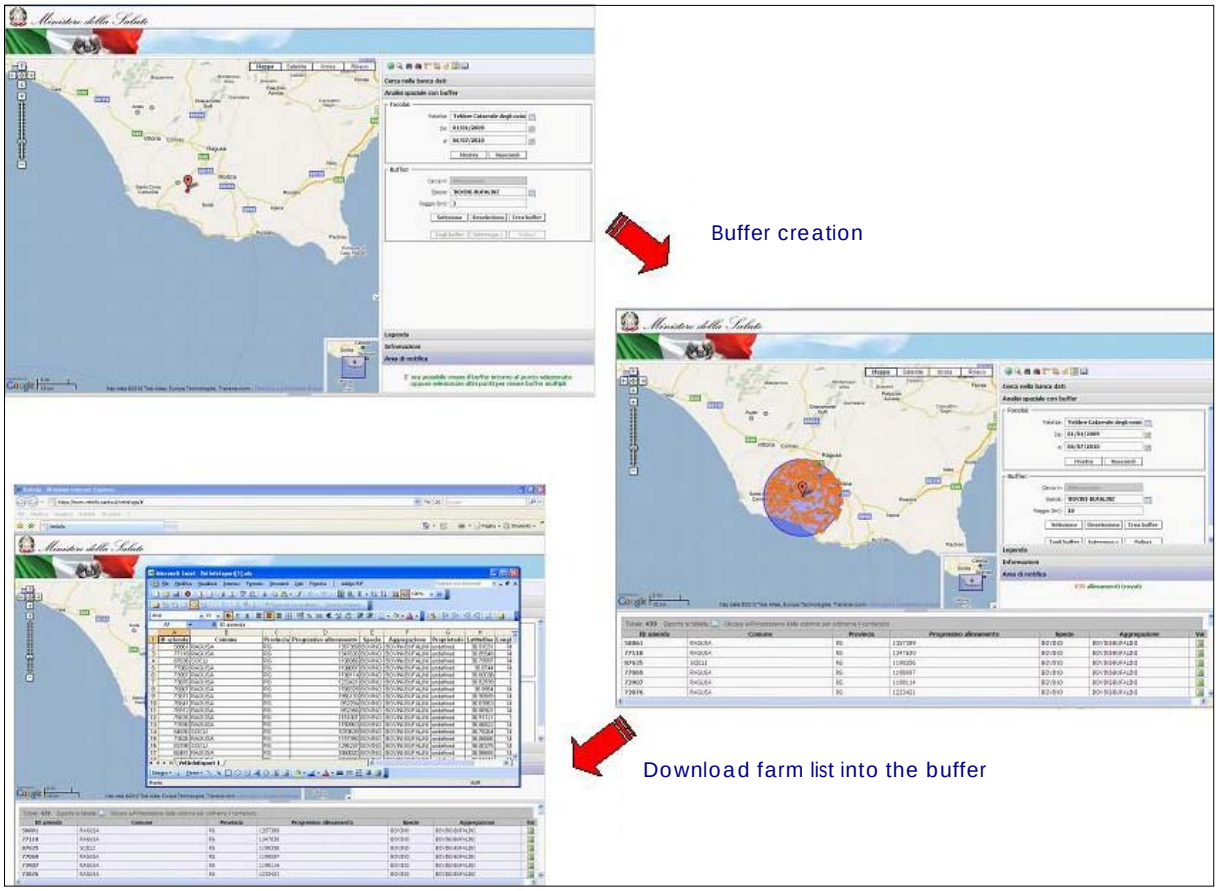

Figure 4
Creation of a buffer beginning from an outbreak and download of the list of holdings within the buffer

comprehensive and standardised information flows on disease outbreaks. The efficiency of surveillance systems and disease control or eradication programmes is increased by using specific software for data analysis and collection (29). The OIE, in collaboration with the Food and Agriculture Organization (FAO) and the World Health Organization (WHO), provides the national competent authorities with the global early warning system (GLEWS), which shares data generated by these international organisations and provides useful information for risk analyses related to the introduction and spread of animal diseases, including zoonoses (20). Within the framework of the emergency prevention system for transboundary diseases (EMPRES), the FAO has also developed the transboundary animal disease information system (TADinfo) for the management and analysis of data on animal diseases and zoonoses (21).

In this context, the national notification systems are essential not only for the management and prevention of animal diseases but also for the implementation of national eradication programmes (22). Information systems for the notification and management of data on animal diseases have been developed in many countries, including Australia (National Animal Health Information System: NAHIS) (26), United States (National Animal Health Surveillance System: NAHSS) (34), India (Animal Disease Infosystem of Tamil Nadu) (30), Nigeria (National Disease Reporting System: NDRS) (31) and Namibia (Veterinary Information System for Namibia) (25).

In the framework of epidemic surveillance networks that have been established to promote cooperation and coordination between member states with the support of the EC, SIMAN is a useful tool for the prevention and control of animal diseases (19).

SIMAN is able to collect and report information on suspected and confirmed animal outbreaks in a consistent manner; it also enables veterinary services to enter data electronically, instead of using paperwork (dematerialisation), as part of the framework of the e-government process (12).

SIMAN is the official national website for information on outbreaks. Data are accessible immediately to local and national authorities. The system provides the national authorities with all relevant information for planning control measures in case of epidemic emergencies. SIMAN helps the veterinary services to perform epidemiological analyses, which are essential for surveillance and control of a wide range of animal diseases. The system is also capable of collecting data produced at the local level, using standard procedures and templates for data input and output. The system produces the periodical and immediate outbreak notifications required to fulfil the information obligations towards the international competent authorities. SIMAN automatically provides the report on the health status of livestock and is the source of information for the preparation of the *National Veterinary Epidemiological Bulletin*. Finally, since 2009, SIMAN has been used to manage the West Nile disease emergency in Italy.

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