

## POSSIBILITIES AND LIMITS OF EPIDEMIOLOGICAL SURVEILLANCE BY USE OF THE NEW NATIONAL ANIMAL DISEASE REPORTING SYSTEM TSN IN GERMANY

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*Depuis l'introduction en 1993 du projet européen ANIMO (ANimal MOvement) pour les documents relatifs aux mouvements internes de bétail, chaque Service vétérinaire local a été équipé d'ordinateurs, de modems et de logiciels de communication. Le 1er janvier 1995 a débuté en Allemagne une nouvelle ère de suivi national officiel des 37 maladies animales dont la déclaration est actuellement obligatoire. Grâce à la base technique du projet ANIMO, une nouvelle solution informatique pour l'enregistrement et l'évaluation des cas de maladies animales nommée TSN (Informations Epizootiques) a été mise en place. Les informations concernant chaque cas de maladie à déclaration obligatoire sont enregistrées et transmises à une banque centrale de données Informix. Les données peuvent être rappelées selon différentes agrégations. Aujourd'hui, tous les Services vétérinaires allemands travaillent avec ce système d'information.*

*Le système TSN englobe 3 systèmes sectoriels : (1) un pour les services locaux, (2) un pour les services centraux, dont les Services vétérinaires nationaux et le ministère fédéral de l'Agriculture et (3) un pour l'accès en ligne à la banque centrale de données. Le système est une "solution hors ligne". La collecte et le transfert des données sont effectués séparément. Afin d'assurer un compte rendu électronique immédiat dans le cas de certaines maladies (par exemple la peste porcine, la fièvre aphteuse, la maladie de Newcastle, l'encéphalopathie spongiforme bovine, la nécrose hématoïétique infectieuse), en particulier au niveau de la Communauté européenne, le programme signale à l'utilisateur qu'il doit transférer ses données après entrée dans la banque centrale de données pour permettre l'accès à cette information aux Services vétérinaires centraux.*

*Au niveau des services locaux, des informations descriptives sur les maladies animales, déclinées spécifiquement pour chaque maladie, sont demandées par le programme. Les données sont distinguées de la manière suivante : données obligatoires (saisie obligatoire), données facultative (saisie possible), et absence de données (saisie impossible).*

*Les possibilités et les limites de la surveillance épidémiologique grâce à l'utilisation du système TSN sont décrites ici.*

### INTRODUCTION

Since 1 January 1995 in Germany the new software solution for registration and evaluation of animal disease cases named TSN (**TierSeuchenNachrichten**) is operating. One crucial requirement was the introduction of the EU project ANIMO (ANimal MOvement) in 1993. With the aid of the ANIMO project every district veterinary office is equipped with a PC, a modem and with communication software. By means of this technical basis TSN was installed in all veterinary offices in Germany (438 in districts, 51 in federal states, 13 in federal veterinary laboratories, 3 in border inspection posts (Brandenburg), 1 in the Federal Ministry of Agriculture).

The TSN system comprises 3 different subsystems: software (1) for the district offices, (2) for the superior offices, e.g. state veterinary offices and Federal Ministry of Agriculture and (3) for the online access to the central data bank. The system is an "offline solution". Collection and transfer of data is realised separately.

In order to ensure the immediate electronic reporting in case of certain diseases (e.g. swine fever, FMD, ND, BSE, IHN), particularly to the EC, the program alerts the user to transfer the data after entry to the central data bank. This ensures access to the information by the superior offices.

In Germany currently 37 animal diseases are notifiable. In the district offices information on notifiable diseases, particular for a selected disease, are asked by the program. Data are distinguished as follows: compulsory data (entries obligatory), optional data (entries possible) and no data (entries not permitted). The entries are governed by master files, which reflect the national legislation on animal diseases.

These informations are in accordance with the actual legislation, with regard to the selected animal disease, and can be updated if necessary. New program versions or master files can be down-loaded from the central computer. The central data bank offers a daily updated overview on the national situation of animal diseases, and is ready for epidemiological analyses. All veterinary offices have access. The following menu is offered: (1) case documentation, (2) evaluation, (3) information and (4) central address list about all veterinary offices in Germany (daily update through offices themselves).

For each case of a notifiable disease up to 23 input fields can be used (see table).

### WHICH GENERAL POSSIBILITIES DOES THE NEW ANIMAL DISEASE REPORTING SYSTEM OFFER NOW?

1. Small number of errors through a maximum of plausibility control during the data input.
2. Small expenditure of work for data input and maintenance.

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3. Fulfilment of all national and international commitments of disease notification in accordance with the actual legislation.
4. Completeness, high level of accuracy as well as transfer on time of disease informations.
5. Immediate availability of informations about each case and summarized informations from every veterinary office in Germany.
6. Flexibility and possibility of extension of the information system (e.g. change in notification of diseases, animal species, virus types/agents or diagnostic methods are centrally restored and can be updated online if necessary).
7. Data protection through identification of all authorized users (user password and network user identification).
8. Further development of the information system step by step and well organized. A Windows-Version is in preparation (currently MS-DOS).
9. Application of anonymous data for epidemiological research (see next paragraph).

**Table I**  
**List of the 23 possible input fields at disposal**

simple input fields	tables	text
1. Municipality	1. Diagnostic method (s) (1 column)	1. Remarks
2. Locality	2. Information on susceptible animals at first reporting; species and number of sick, died, killed or slaughtered in the herd; type of farm management system (8 columns)	
3. Confirmation date	3. Information on susceptible animals at supplementing reporting; date, species, animals added or transferred, sick, died, killed or slaughtered (7 columns)	
4. Date of extinguishing	4. Species suspected of infection and number (2 columns)	
5. Virus type / agent	5. Way of transmission (2 columns)	
6. Animal holder (only for district veterinary office)	6. Implemented measures (4 columns)	
7. Reason for investigation		
8. Diseased herd vaccinated before disease detected		
9. Date of last vaccination		
10. Date of suspicion of disease		
11. Suspected day of first infection		
12. Date of extinguishing by killing		
13. Date of extinguishing by slaughtering		
14. Distance to neighbouring farm in metre		
15. Neighbouring territory at risk		
16. Connection to other cases (case number)		

#### **SPECIAL POSSIBILITIES FOR EPIDEMIOLOGICAL SURVEILLANCE (REQUIREMENT : HIGH LEVEL OF DATA QUALITY !)**

1. From the epidemiological surveillance point of view TSN data are secondary data (see next Paragraph: limits of the system). These data are already existing and don't involve additional costs. There exists a large data volume and always an uniform data format (dBASE). Through an existing interface data can permanently be exported for evaluation by means of other software (e.g. cartography and statistical procedures).
2. Data are existing for large spaces of time and for the whole territory of the FRG and allow an observation of trends. Complete data exist for many animal diseases (e.g. Classical swine fever, Aujeszky's disease, Blackleg, Rabies, Bovine brucellosis and tuberculosis) or at least are representative (e.g. Enzootic bovine leukosis). Double notifications as a source of fault can be excluded.
3. The office which is responsible for notification of a disease case, can be immediately contacted by other offices and can be involved in further steps of preventive and control (completeness address directory is integrated in the system).

#### **TSN SYSTEM - LIMITS OF EPIDEMIOLOGICAL SURVEILLANCE**

1. Data recording primary does not happen for purpose of a certain epidemiological question. The data bank is a typical secondary statistics.
2. Data of some diseases are incomplete or not representative (e.g. Bovine genital infections).
3. Assembly of national stock of animals is widely known only for important agricultural species of animals (cattle, pig, sheep, goat and horse). Reference figures of disease territories (especially from municipalities) are missing frequently.
4. Recording of risk factors (especially: suspected day of first infection and transmission ways) are influenced to a high extent of subjectivity.
5. The system is not frequently used by experts, but data input needs expertise and should be done by veterinarians.

#### **DISCUSSION**

Lilienfeld and Stolley (1994) quoted Langmuir (1963): "The focus of epidemiological surveillance shifted from an infected individual to the status of a disease in a population, e.g., the continued watchfulness over the distribution and trends of incidence through the systematic collection, consolidation and evaluation of morbidity and mortality reports and other relevant informations and the regular dissemination of such data to all who need to know." Furthermore Lilienfeld and Stolley wrote: "A surveillance system provides for the ongoing collection of

data by a data center, the analysis of those data, the dissemination of the data and analyses, and the implementation of a response based upon the analyses." TSN complies with all these functionalities. TSN in Germany fulfils not only epidemiological surveillance measures, it is extended for disease prevention and control. The evaluation of the disease status on different territory levels is possible for all responsible officers in districts, federal states and in the national agricultural ministry :

- overview on all active disease outbreaks in Germany
- overview on all confirmed diseases
- overview on all confirmed new or updated diseases
- overview on all confirmed and already extinguished animal disease objects (e.g. farm in case of classical swine fever or single animal in case of rabies)

TSN is an active type of a surveillance system. As a rule the disadvantage of such type of system is its high expenditure. But in the case considered here the ANIMO project is used as the technical basis for TSN so that the above mentioned disadvantage is not longer existent. Some manual disease recording systems are replaced. The disadvantage of TSN is more to underestimate the presence of disease in the population for a few diseases. Via TSN a limited quantification of risk factors is possible.

The introduction of TSN improve significantly the disease reporting system in Germany. Any veterinary officer which is involved in disease prevention and control can recall immediately the present disease status of the Federal Republic of Germany.

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