Disease reporting systems in Great Britain

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Summary: The emergency, systematic and routine reporting systems used in Great Britain are described. These are important components of national disease surveillance but have their limitations in assessing the overall disease situation in the country.

Each of the systems is defined, and specific examples are given. The increasing use of computers makes it important to standardise techniques and reporting both within the country and on an international basis.

KEYWORDS: Computers - Disease surveillance - Reporting systems - United Kingdom.

In July 1865 the British Government recognised that no satisfactory machinery existed, by means of which it could be informed of outbreaks of rinderpest in a given area. At that time there was no department to which information could be sent nor was there any person specifically authorised to monitor diseases. A veterinary department of the Privy Council was set up in October 1865, and by March 1866 it had submitted a report on the origin, propagation, nature and treatment of cattle plague based on information received during the period June 1865 to March 1866 (1).

As a result of these developments, the Contagious Diseases of Animals Act was adopted in 1869, giving powers to control rinderpest, contagious bovine pleuropneumonia, foot and mouth disease (FMD), sheep pox, sheep scab and glanders. Classical swine fever became notifiable in 1878, rabies and anthrax in 1886. By 1984 the notification of 24 diseases was a statutory requirement in Great Britain (GB).

During the past two decades the economic evaluation of animal health programmes has played an increasingly important part in the justification and development of control and eradication procedures. These assessments are extremely complex as attempts to quantify the economic effects of disease can be made only when satisfactory epidemiological investigations have been completed to evaluate the physical impact of the disease on the animal population.

In 1975 various organisations involved in research and control of diseases in Great Britain indicated that there was insufficient information on the current disease situation in the country. A review of all activities in disease surveillance and monitoring was considered necessary. A Ministry of Agriculture Working Party was therefore appointed to provide a detailed report. This was produced in 1976 and has since become the basis for the development of animal disease surveillance in Great Britain.

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The term 'surveillance' has many acceptations but can be considered to include the collation and interpretation of data collected from monitoring programmes and other available sources with a view to the detection of changes in the health status of the animal population (2). An integral part of any surveillance activity is disease reporting, which is of particular value both as an early warning system for new diseases and as an indication of changes in the level of disease within the country. General surveys, special investigations, on-farm monitoring and other activities are important components of overall surveillance activity, but for the purposes of this paper they are not considered to be part of the national disease reporting system.

Most countries have an established system for the internal reporting of specified diseases to the regulatory authorities. In some cases, only a small number of diseases are reported whilst in others up to forty diseases may be notifiable. National disease reporting systems also enable countries to fulfil their obligations to the international community. Member countries of the Office International des Epizooties (OIE) are required to report details of new outbreaks of List A diseases within twenty-four hours and details of List B diseases annually. Fast and efficient disease reporting is an essential part of international cooperation both to ensure that exotic diseases do not spread into new areas and to permit the continuation of international trade in animals and animal products. For all of these reasons, a satisfactory internal reporting system is essential. The aim of this paper is to describe three different types of system which have been developed in GB for emergency, systematic and routine reporting of disease.

EMERGENCY REPORTING

In Great Britain there is a statutory requirement that the existence or suspected existence of certain diseases should be notified immediately. This report is passed directly to the State Veterinary Service for an immediate investigation, without charge, to determine whether the disease is present. Notifiable diseases include those which are exotic to GB either because they have never been recorded in the country, e.g. African horse sickness, or because they have been eradicated, e.g. foot and mouth disease. Notification is also a statutory requirement for diseases which are the object of Government control and eradication programmes requiring an extensive monitoring system to obtain data on prevalence in the country. Such diseases currently include sheep scab and warble fly, for which there are eradication programmes underway, and would also be extended to those for which an eradication programme may be implemented at a future date.

Aujeszky's disease was declared notifiable in 1979 mainly to enable the collection of data on the extent and number of outbreaks of the disease. Eradication commenced in March 1983 only after sufficient information had been gathered to enable both an epidemiological and economic assessment to be made of the benefits of an eradication programme. Many diseases of this kind are restricted to the OIE List B and would be the subject of annual reporting to that organisation.

The primary source of reports of notifiable disease is the owner of the animals or his veterinary surgeon. A standard system has been developed whereby the report is made by telephone either to the police or to the veterinary authorities. An immediate
investigation is undertaken by a Government veterinary officer. Restrictions are imposed on the farm until the disease is confirmed or investigations have been completed with negative results. For many diseases, samples are collected and dispatched to approved laboratories. Following confirmation, routine control procedures for the disease are implemented. At all stages the field veterinary staff is in constant communication with the headquarters of the State Veterinary Service. To back up the telephone reports, written accounts are sent in at regular intervals so that the details of the outbreak, the epidemiology and implications for national control policy can be constantly reviewed.

To minimise spread and to facilitate eradication, there must be recognition and prompt control of notifiable diseases. In order to accomplish this objective it is essential that the farming community, practising veterinary surgeons and members of the public should know which diseases are notifiable and what type of clinical picture is to be expected. One of the most important features of a notifiable disease system is that it relies on the goodwill and ability of the population concerned to identify and report suspicions of the disease to the authorities. Although it may be a legal requirement that the existence or suspected existence of a notifiable disease be reported to the police, continued publicity is essential to maintain a high level of awareness in the community.

During outbreaks of Newcastle disease in 1984, the number of reports investigated rose to 145 in a two-month period. This shows that publicity over the identification of a disease in the country encourages the community to inspect stock and animals more closely. Out of the 145 cases investigated during the period, however, only 17 were positive for Newcastle disease. Similarly, in 1980 there were 96 reported cases of suspected FMD. The number rose to 229 in 1981, the year when an outbreak occurred on the Isle of Wight, but dropped back to 53 reported cases of suspected FMD in 1982. This emphasises how reporting of suspect disease returns to previous levels when disease is non-existent.

Continued education of the community is one of the most important components of a successful notifiable disease reporting system. Publicity may be organised on a regular basis, e.g. in the case of the campaign to prevent the introduction of rabies into GB, or as a specific campaign when there appears to be an increased risk of disease being introduced. Prior to the outbreak of FMD on the Isle of Wight in 1981, veterinary surgeons and the farming community were alerted to the risks of windborne spread from the Continent. For this reason, the only outbreak to occur in Great Britain since 1968 was reported quickly and successfully eliminated. Technical and professional discussions are also essential in bringing to the attention of the private veterinary surgeon the potential risks associated with disease trends in various parts of the world.

A further requirement is to provide a consultative service for the private veterinary practitioner who may request advice especially when he is unable to reach a definitive diagnosis and when the clinical picture bears some resemblance to that seen in a specified disease. In GB a consultation service is readily available and so the private practitioner is not inhibited in expressing his concern or suspicions.

The Zoonoses Order of 1975 makes it a statutory requirement to report the isolation of organisms of the Salmonella or Brucella genus from food animals or animal products. This case is unlike that of notifiable diseases where the report must
be based on the presence or suspected presence of clinical disease. The authorities conduct a detailed investigation following the receipt of a report in the case of a *Brucella* isolation, but the potential animal or public health risks are assessed before further investigation into a *Salmonella* isolation.

Computerised forms are completed for the initial identification of the organism and, where applicable, subsequent investigations are recorded in the same way. The initial report includes the identity of the organism, the species of animal involved, its location and the date of isolation. The information is forwarded to the Epidemiology Unit at the Central Veterinary Laboratory where it is added to the Zoonoses data bank. This step is of particular value in that it provides immediate information for control purposes and gives a long-term record of trends, especially in the case of *Salmonella* infections.

**SYSTEMATIC REPORTING**

Unlike many of the notifiable disease reports which are received, systematic reporting takes place according to a plan which is neither casual nor unintentional. A continual assessment of disease status is essential for the overall policy and administrative decisions needed in running national programmes such as the brucellosis and tuberculosis eradication schemes. It is important to obtain national statistics to be able to assess the development of a control programme and to make annual estimates of the on-going costs. It is equally important to receive negative returns to ensure that an eradication programme is proceeding satisfactorily and that disease is not reappearing in areas of the country where the programme has been completed.

Reporting is based on a systematic approach to disease investigation and is the responsibility of the field veterinary staff. In the case of bovine tuberculosis, this includes a programme of tuberculin testing of all herds, the interpretation of herd test results and the supervision of the local veterinary inspector carrying out the tuberculin tests (to ensure that all returns are completed and that correct procedures are carried out). The tuberculin testing interval for herds varies according to the status of the herd and the area in which the farm is situated. Tuberculosis reporting has been computerised, giving details of herds in which reactors have been disclosed, the lesions of tuberculosis identified at slaughterhouses, number of cattle tested with positive reactors and herds in which reactors had visible lesions with details of *Mycobacterium* typing results. Clinical tuberculosis in cattle is notifiable but has not been identified since 1976.

A similar procedure has been adopted in the brucellosis eradication programme with an annual test of all eligible animals in the majority of herds. In dairy herds this includes all female cattle over 12 months of age which have not commenced lactation. In beef herds all female cattle over 12 months of age are eligible. Both beef and dairy bulls over 12 months of age are tested. In addition, routine monthly testing of bulk milk samples collected from all dairy herds takes place using the milk ring test for brucellosis. These tests are performed at Veterinary Units of the Milk Marketing Boards which have the responsibility for reporting any positive reactions to the veterinary authorities. On receipt of a positive result the necessary action is taken to investigate the farm for the possibility of infection. This is perhaps the main systematic reporting system which is not directly controlled by Government but which is essential for the continued success of the brucellosis eradication programme.
It is a statutory requirement that any abortions in cattle must be reported to the authorities. Every case is investigated for evidence of brucellosis. The emergency reporting of clinical disease remains an essential component of the eradication schemes so that effective countermeasures can be introduced when necessary.

With both tuberculosis and brucellosis eradication, the majority of investigations and control procedures is performed at a local level but national statistics are compiled from returns made to headquarters.

Statistical returns for brucellosis have recently been revised in view of the progress of the eradication campaign. Computer input documents are now completed only when breakdown occurs. These documents are submitted to headquarters. Details stored on the computer include type of herd, method of detection of breakdown, isolation of the organism, numbers of reactors and contacts slaughtered, and origin of breakdown.

It is hoped that in the near future, terminal links with local offices will allow direct input of this information.

In addition to the compulsory control programmes for brucellosis and tuberculosis, voluntary schemes exist for maedi/visna and enzootic bovine leukosis (EBL) control. These schemes have been designed for the owner who wishes to establish and maintain his flock or herd free of the disease. Flocks or herds are registered as maedi/visna- or EBL-accredited on the basis of two or three consecutive clear blood tests. Further periodic testing after the flock or herd has been declared free of the disease is carried out on a systematic basis. In both cases, samples taken from the animals are submitted to an official laboratory for serological examination. Positive results are returned to the local veterinary staff via headquarters, thus enabling a systematic picture to be maintained of the overall disease incidence in monitored flocks or herds.

In the course of an eradication programme against a disease, particular monitoring is necessary to ensure that the disease has been eliminated and not reintroduced.

Systematic reporting is an essential part of on-going monitoring and becomes more important as the level of disease begins to decrease. A stage is reached, however, when systematic monitoring of all herds may no longer be economical, and other systems of surveillance such as slaughterhouse surveys may need to be developed. Alternatively, the interval between periodic testing can be increased but in all cases the systematic process remains. Computerised recording provides an important means of collecting and analysing the large quantities of data generated by this type of reporting system.

**ROUTINE REPORTING**

The Veterinary Investigation Services (VIS) consist of twenty-seven laboratories distributed throughout Great Britain. Their objective is to provide a diagnostic, advisory and consultative service, to provide support for statutory health schemes in England and Wales, to be involved in research and development projects and to provide educational facilities. The VIS have a dual role in national disease reporting. Each Centre produces a monthly report which describes the disease picture in the area and indicates any unusual events, the appearance of new syndromes and unusual disease trends. These reports are of importance in general disease monitoring and
may be the first indication that a new disease has appeared. A summary of reports from all Centres is published monthly in the Veterinary Record. Many conditions have been described for the first time by the VIS, including turkey rhinotracheitis, colitis and coronavirus infection in pigs, pruritis, pyrexia and haemorrhage syndrome in cattle and paramyxovirus 1 in domestic fowls. The VIS also provide a national diagnostic recording system which holds up to 150,000 records on computer file for each year since 1975. Material is sent into the laboratories for diagnosis from private veterinary practitioners in the majority of cases. Autopsy and laboratory investigations are supplemented by farm visits and long-term enquiries. The laboratories perform a valuable function as they are often the first point of reference for a number of new diseases and syndromes identified in the country.

The Veterinary Investigation Diagnosis Analysis 2 (VIDA 2) system provides data for each submission made to the laboratory. This indicates a unique reference, laboratory, species, sample, age, diagnosis and a number of other parameters. Information from VIDA 2, which includes up to 399 diagnostic codes, is forwarded to a central computer for direct entry into the data base. The records are validated and incompatibilities are checked.

Output from the system may be of two forms, including routine print-outs in specified monthly and annual reports. The annual report lists all diagnoses made each month of the year and also compares the number of diagnoses made each year since 1975. A retrieval system exists for ad hoc investigations on the distribution of many diseases.

Although the laboratory records present a biased sample they provide a satisfactory reporting system which enables information to be made available on over 399 diseases, many of which are OIE List B diseases. This reporting system is considered as routine rather than systematic since the information is not sought but is submitted on a sporadic and voluntary basis by the farming community. Although the reporting procedures are routine, the material on which they are based may vary from month to month and has no systematic basis.

CONCLUSION

Disease reporting systems in Great Britain have been developed over many years as an integral part of a balanced surveillance system. The main requirements of a surveillance system have been catalogued on many occasions and the Ministry of Agriculture Working Party in 1976 found that the majority of functions could be put into five groups:

i) A comprehensive body of simple disease data which is readily accessible.

ii) A capability for detailed assessments of particular disease situations.

iii) An early warning system for new events (new diseases, rapid changes in prevalence, disease losses in new systems of husbandry).

iv) Facilities for tracing the course of outbreaks of infectious diseases.

v) Systems that record details of disease events on certain farms over a long period of time (on-farm recording).
It can be seen that the national reporting systems in Great Britain provide much of the information needed to fulfil the requirements of categories i and iii.

In terms of international reporting and the trade in animals and animal products, it is possible that the other categories listed above are of more importance in determining freedom from disease. It is relatively easy to use a reporting system to identify the presence of diseases, but considerably more difficult to prove that they are absent. Other surveillance techniques such as detailed surveys and specific investigations are essential. The reporting systems described in this paper are equally important but their limitations must be taken into account when assessing disease risks and problems.

The increasing use of computers will facilitate the development of more sophisticated reporting systems both within a country and between countries. The recent development of the OIE information system will ultimately result in reporting taking place between computer terminals in a number of countries and with the headquarters of the international organisations. It is essential that these technical developments be matched by similar developments in the standardisation of disease diagnosis and reporting throughout the world.

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SYSTÈMES DE DÉCLARATION DES MALADIES EN GRANDE-BRETAGNE. – J.M. Scudamore.

Résumé : L'auteur décrit les systèmes utilisés en Grande-Bretagne pour la déclaration d'urgence, systématique et de routine des maladies. Ce sont des éléments importants de la surveillance des maladies au plan national, mais ils comportent des limites en ce qui concerne l'évaluation de la situation zoosanitaire globale dans le pays.

Chaque système est défini et des exemples concrets sont présentés. L'utilisation croissante de l'informatique rend nécessaire la standardisation des techniques et des déclarations, à la fois dans le pays même et à l'échelle internationale.

MOTS-CLÉS : Informatique - Royaume-Uni - Surveillance des maladies - Systèmes de déclaration.

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Resumen: El autor describe los sistemas empleados en Gran Bretaña para la notificación urgente, sistemática y rutinaria de las enfermedades. Estos sistemas constituyen importantes elementos de vigilancia de las enfermedades en el plano nacional, pero presentan limitaciones en lo que se refiere a la evaluación de la situación zoosanitaria global en el país.

El artículo define cada sistema, dando ejemplos concretos. Por otra parte, debido al creciente empleo de la informática, resulta indispensable normalizar
las técnicas y las formas de notificación tanto a escala nacional como internacional.

PALABRAS CLAVE: Computadores - Reino Unido - Sistemas de notificación - Vigilancia de enfermedades.

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REFERENCES