Reviews and reports

Infectious diseases surveillance in schoolchildren in Oman

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Introduction

Surveillance of diseases is a continuous and systematic process of collection of data, their compilation, collation and analysis for action.

Disease surveillance has two basic components:

- an information system that provides information on the occurrence of the disease under surveillance in relation to time, place and person; and
- an outbreak and epidemic investigation system that collects and analyses further information to discover why an outbreak occurred, how it can be controlled and how it can be prevented from occurring again.

Disease surveillance is basic for the proper planning of health services, including priority setting and proper allocation of human and other resources. It is also important in monitoring disease trends and in measuring the impact of control programmes.

Infectious disease surveillance in schoolchildren in Oman functions through the national communicable disease surveillance system, with the following objectives:

- Continuous and systematic collection data of communicable diseases on a *wilayat*, regional and national base for implementing prompt action for disease investigation and control where indicated.
- Collation, analysis and feedback of information to those responsible in disease control programmes.
- Data collected are used to evaluate the effectiveness and impact of control measures in operation under the different disease control programmes, so that necessary programme modification can be made according to the local situation.

Background information

The national communicable disease surveillance system in Oman has been updated since March 1991. The surveillance system is planned, monitored and managed by the Department of Communicable Disease Surveillance and Control in the Ministry of Health.

The amount of information required and the speed with which it needs to be reported are very much dependent on the incidence/prevalence of the disease and the action that needs to be taken to address it.

In this respect there are three groups of diseases:

- Group A, which includes diseases for which every case is notified and investi

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gation initiated within 24 hours in order to immediately control the spread of the disease.

- Group B, which includes diseases for which every case is notified and investigated, but with less urgency (say, within one week) because less urgent action is required to control the spread of the disease.
- Group C, which includes diseases for which investigation is not required for every case, but whose incidence is needed on a monthly basis.

These actions are regulated by the communicable diseases law and regulations, issued by a Royal Decree and Ministerial Decision that details procedures for communicable disease reporting and control. A communicable disease surveillance manual was issued in December 1994 with guidelines and instructions for all health personnel on how to notify all communicable diseases. It also spells out control action to be taken.

Organizational structure of school health services

School health services are provided through a network of school health doctors and nurses posted in the various regions of the country. The ratio is 1 doctor:5000 students and 1 nurse:2500 students. Each doctor and nurse has a number of schools in a specific catchment area and is responsible for all aspects of the health of schoolchildren, including reporting of communicable diseases whenever diagnosed on the prescribed forms.

Infectious disease morbidity in schoolchildren

The main morbidity observed in schoolchildren between the ages of six and 18 years is due to infectious diseases. The commonest diseases are those related to orofaecal transmission, mainly through water- and food-borne vehicles and poor personal hygiene, and they include viral hepatitis and enteric fever.

Parasitic infection (hookworm) is also a problem in the Dhofar region in southern Oman, because of its climate, which is conducive to the transmission of the disease (temperature and rainfall). A study was carried out in the five *wilayats* that comprise the green belt area of the Dhofar region, which has a population of 75 000. Out of this about 15% were sampled: 5253 people selected from schools, paediatric units and adult outpatients. The prevalence of hookworm infection according to age is shown in Table 1. The 6–13 years age group showed the highest prevalence of hookworm infection.

A hookworm control project is being conducted in one of the *wilayats* as part of a *wilayat* team problem-solving exercise. The

Table 1 **Prevalence of hookworm infection by age (1995)**

Age (years)	Total number examined	Infected	
		Number	%
2–5	858	132	15.4
6–9	867	218	25.1
10–13	978	280	28.6
14–17	652	149	22.9
Adults	1738	411	23.6
Total	5093	1190	23.4

Source: Communicable Disease Surveillance and Control Department, Ministry of Health, Oman

results of the intervention are being followed up in order to formulate a comprehensive prevention and control programme for hookworm infection in the Dhofar region.

Brucellosis is a public health problem in the Dhofar region. The infection is mainly transmitted through drinking unpasteurized camel and cow milk. Age breakdown shows that the predominantly affected group is schoolchildren.

Airborne respiratory infections like measles and rubella occurred in the form of large outbreaks in Oman between 1992 and 1994. There was a large outbreak of rubella affecting mainly schoolchildren in 1993 with 1253 cases reported. The age distribution of these cases (Table 2) shows that 45.3% occurred in schoolchildren aged 6–13 years. In response to this outbreak, the Ministry of Health began large-scale introduction of measles–rubella vaccine in outpatient departments and health centres. Regardless of their previous measles immunization status, children aged 15–18 years received measles–rubella vaccine through school health programmes. School vaccination teams advised girls aged 12–18 years not to accept the vaccine if there was a possibility they could be pregnant. In March 1994, measles–rubella vaccine was added to the routine immunization schedule with one dose being administered at 15 months of age. Single antigen measles vaccine continues to be administered routinely at 9 months of age. This means that Oman has adopted a two-dose measles immunization schedule.

Chicken pox and mumps are two other important causes of school morbidity reported in Oman.

Table 2 **Age distribution of rubella cases reported in Oman (1993)**

Age (years)	Rubella cases Number	%
< 1	105	8.4
1	78	6.2
2–5	316	25.2
6–13	567	45.3
14–23	117	9.3
24–48	69	5.5
> 48	1	0.1
Total	1253	100.0

Source: Communicable Disease Surveillance and Control Department, Ministry of Health, Oman

Specific intervention measures

Several specific intervention measures are being taken among the school-going population for prevention and control of infectious diseases in Oman.

For example, as part of the introduction of the measles–rubella vaccine in Oman in March and April 1994 covering the age group 15 months to 18 years, the age group of 6–18 years was immunized in schools. The coverage achieved was close to 99% in the school-going age group. This operation served several purposes:

- it acted as primary immunization to those who had not received measles vaccine before
- it acted as a booster for others
- it protected female students against rubella before they became of child-bearing age.

As part of a campaign to eliminate neonatal tetanus, every female school student receives more than five doses of tetanus toxoid during infant and school immunization. Hence female students enter child-bearing age fully protected against tetanus and their

babies will be born with enough immunity to protect them against neonatal tetanus.

In response to a large outbreak of poliomyelitis type 1 in Oman in 1988–89, which resulted in 118 cases of confirmed poliomyelitis, all schoolchildren were given extra poliovirus vaccine live oral (OPV) to reduce transmission potential in this age group.

The role of school health services in national surveillance systems

Medical examination and screening of schoolchildren is an excellent opportunity to detect any infectious disease at an early stage. Suspect cases are referred to the nearest hospital or health centre for further investigation, notification and treatment. Follow-up diagnosis of the patient can be made, if relevant.

Any outbreaks of communicable disease can be detected clinically through regular screening or through significant absence from school. Such suspect outbreaks are reported to the local body responsible for initiating investigation and control measures.

School health services advise the school staff, students and parents on the recommended action to be taken in case of occurrence of a communicable disease, including restriction of attendance at school. They also periodically test water and food supplies in the school in order to prevent outbreaks any waterborne or foodborne disease.