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Community Health & Disease Surveillance Newsletter

Sultanate of Oman *Ministry of Health*

Inside this issue:

Establishing Infection Surveillance & Control

Rationale & the Concept

Health-care associated infections or nosocomial infections are emerging as one of the important public health problems in many countries of the world. Despite improvements in control methods, the prevalence of infection remains high. Infections vary in type and are mainly of surgical wounds, the respiratory and urinary tracts, and the skin. High rates of nosocomial infections lead to increased morbidity and mortality due especially to drug resistance and thus eventually lead to high cost of health care.

In addition to patients, health care staff are also at increased risk of occupational exposure to pathogens, particularly during clinical procedures and when handling sharps. Protection of staff from infection is now considered a major priority in the health care setting.

Members of the community may also become exposed during contact with improperly disposed medical waste including contaminated needles, syringes, scalpel blades, dressings and tissues. That necessitates an appropriate health waste management system and raising awareness amongst the community.

Nosocomial infections are pertinent in countries with rapid development of health care services and introduction of new technology and where infection control is still not a well recognized discipline. Traditionally infection control is associated with the hospital environment. However infections also pose a serious threat within the primary health care settings.

Development of antimicrobial resistance should be considered as an integral and essential component of infection control. The hospitals are the very places where the environment is conducive for development of resistance and a potential for its rapid spread. An emergence of a resistant pathogen is equivalent to the introduction of a new disease and is associated with high cost of its management and control. The antimicrobial resistance thus should be under constant surveillance and needs to be monitored.

Some infections are notorious for their ability to rapidly spread within the hospital environment subjecting the health care staffs to grave risk. Crimean Congo Haemorrhagic Fever (CCHF), Ebola and more recently SARS are some of the classical examples of nosocomial spread leading to deaths among doctors and nurses. These infections require specialized handling procedures, specific disinfectants and isolation and quarantine procedures.

The institutional nosocomial infection outbreaks point to a failure of the control mechanisms and hence these events demand thorough a epidemiological investigation. The outcome and recommendations of such investigations

should be utilized for fine tuning of the future prevention and control strategies.
For the purpose of monitoring surveillance data collected must be analyzed on regular basis. Similarly the information being collected must be translated into action.
The Technical Advisory Group (TAG in WHO-EMRO) in a recent meeting has also advocated the formulation of a comprehensive strategy within a programme at the country level to deal with all diverse aspects of infection control.
A fundamental activity of health care establishment is to continually improve the quality of care and provide a safe working environment for the patients as well as for the health care workers. The prevention of infection through development of a sound infection control program is one of the requirements of good quality care and is therefore relevant to all.

"The prevention of infection through development of a sound infection control program is one of the requirements of good quality care & is therefore relevant to all ".

The Goal

The prevention and control of infections acquired within health care institutions by the patients and health care workers, including the community at large so that they no longer represent a public health risk.

Current Country Situation

In Oman most of the essential components of infection control are functional within the health care system. However the policies are neither uniform nor applied universally.
The focus so far was only on control of infection within the hospitals with absence of a broader perspective.

- Infection Control Committee: A committee for infection control was functional in all the tertiary care hospitals and regional referral hospitals within the general administrative structure. A senior staff nurse was designated as the '*infection control nurse*' who was also the secretary of this committee. This committee was headed by the microbiologist/pathologist from the hospital laboratory. The epidemiological expertise available at the regional headquarters was utilized neither for data analysis nor for investigation of hospital outbreaks.
- Standard Operating Procedures: Every major hospital had developed their own set of rules, procedures, and policies for control of infection. Recently the policy guidelines (2001) developed by the Royal hospital, infection control committee were circulated for use by other hospitals. At present there was 'NO' accountable technical or administrative national focal point within the Ministry of Health. 'No' baseline data are available to assess or project the infection trends or for comparisons within the country or with other countries.
- Training in Infection Control: The Department of Nursing Affairs (DNA) conducted periodic in-service training of staff nurses in infection control. These trainings were conducted during three months posting at *Royal Hospital, Infection Control Section.* On some occasions WHO consultants were invited as resource persons.
- Injection Safety: Recently injection safety concerns were raised and a survey was conducted in year 2001 in primary health care institutions. The results have shown a weakness in the area of safe disposal of bio-hazardous waste material (sharps). The implementation of safe disposal practices demands a focal point and coordination of various departments and sectors.
- Anti-microbial resistance surveillance was being conducted but was not action oriented or was not utilized for monitoring trends.
- Epidemiological investigation of outbreaks due to drug-resistant organisms

such as MRSA, VRSA etc. were incomplete to generate actions for their control and prevention.

- There were NO uniform national policies to limit/stop the spread of infectious diseases within the health care institutions e.g. needle-stick injuries, isolation & quarantine, appropriate use of personal protective equipment (PPE) usage, rational use of disinfectants etc.

As a result a need for the review and external assessment was felt.

A team of experts from WHO EMRO visited Oman from 12th to 16th June 2004 to review the infection control activities and suggest ways and means to improve the situation. The major recommendations dealt with establishment of an *"Infection Surveillance & Control Section (ISC)"* within the Department of Communicable Disease Surveillance & Control and the *"National Infection Surveillance & Control Committee"*.

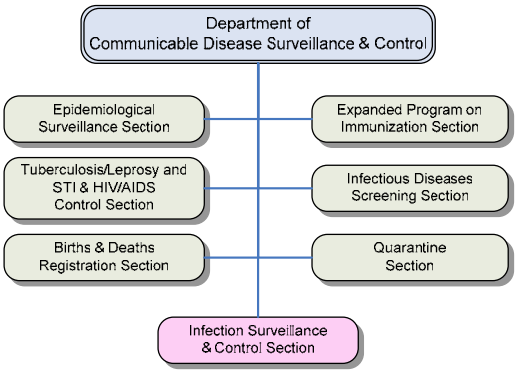
Infection Surveillance & Control section (ISC)

The section should deal with following components viz. nosocomial infection surveillance, data collection and analysis for monitoring purpose, injection safety, safety of blood and blood products, protection of the health staff against occupational exposure to health hazards, antimicrobial resistance surveillance, safe disposal of biohazardous waste, investigation and control of all health institutional outbreaks of infection, standardization of disinfection procedures with rational isolation policies, training of concerned staffs, community health education and all such activities that would help to reduce the public health risk of infection within the health care setting.

- It was recommended to establish the section administratively under the Department of Communicable Disease Surveillance & Control.
- There should be four well trained staff - medical epidemiologist, microbiologist, infection control nurse and a health inspector.

The section should be headed by a medical epidemiologist.

Fig. 1
Location of the Proposed ISC Section



Terms of Reference of the Section

- Develop a national plan for prevention and control of the nosocomial infections.
- Establishment of the national system of surveillance for health care institution related infections.
- Supervise and monitor implementation of ISC activities in all health care facilities.
- Monitor surveillance of the antimicrobial resistance and develop policies for its reduction (including biosafety in laboratories).
- Ensure availability of critical supplies and equipment necessary for ISC.
- Implement injection safety.
- Monitor needle-stick injury and develop national guidelines for its management.
- Develop specific programmes and policies for the protection of health care staff against hospital acquired infec-

(Continued on page 9)

"One of the major recommendations dealt with establishment of an "Infection Surveillance & Control Section" within the Department of Communicable Disease Surveillance & Control".

Rotavirus Gastroenteritis in Under 5 Children

(Protocol for surveillance for estimating the burden of the disease)

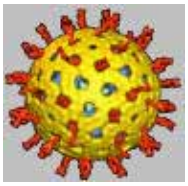
Background & Rationale

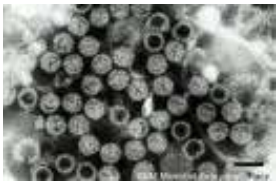
Rotaviruses are the most common cause of severe gastroenteritis and dehydration in young children in both industrialized and developing countries. A WHO sponsored review of rotavirus studies found that 20-70% of all hospitalizations and 20% of deaths from diarrhoea were attributable to rotavirus. Recent studies have estimated that 500,000 to 600,000 children die each year because of rotavirus gastroenteritis. In response to this disease burden, several vaccines against rotavirus have been or are being developed.

"The anticipated availability of an effective vaccine highlights the need for new baseline data on the rotavirus disease burden in developing countries".

Fig. 1: Rotavirus

Schematic *Under EM*





In many countries, however, the disease burden and epidemiology or rotavirus are unknown because of a lack of adequate data or because no studies have been conducted recently. The anticipated availability of an effective vaccine highlights the need for new baseline data on the rotavirus disease burden in developing countries, where rotavirus-associated morbidity and mortality are presumed to be high.

This protocol presents in details a method for hospital-based sentinel surveillance of rotavirus gastroenteritis in children less than 5 years of age in Oman. The data collected would allow the Ministry of Health to estimate the local epidemiological and virological features of the rotavirus infections in young children and thus provide baseline information to determine the need of rotavirus vaccination in future.

Rotavirus epidemiology

Rotavirus infections cause acute gastroenteritis, characterized by acute onset of watery diarrhoea, fever and vomiting. Diarrhoea usually lasts for 3-8 days and is self limited. In infants its duration may be longer than in older children. Rotavirus infections are more often severe than other common causes of diarrhoea and are most likely to be associated with dehydration consequently leading to hospitalization. The high proportion of asymptomatic infections in neonates and young infants is not clearly understood. Maternal antibody and physiological immaturity of the gut may probably play a role. Immunity from repeated exposure probably accounts for the high infection-to-illness ratio among older children and adults. Thus the highest rates of rotavirus disease occur between 3 months and 2 years of age. The incidence of symptomatic disease decreases rapidly after 24 months of age in most settings.

Almost all children are infected with rotavirus in early childhood. In prospective community cohort studies conducted in developing countries the incidence of rotavirus diarrhoea among young children has varied form 0.07 to 0.8 episodes per child per year and almost all children experienced at least one episode of rotavirus diarrhoea by the age of 24 months. In some developing countries neonates acquire nosocomial asymptomatic rotavirus infections. These children may develop immunity and such high rates of neonatal infections may as a result affect the outcome of vaccine efficacy.

The incidence of rotavirus diarrhoea is similar in developed and developing countries. Hence attempting to control these infections by sanitary measures (safe water

& food) will not alter the incidence.

Humans are the main reservoir of rotavirus. The exact modes of transmission is not known but are presumed to involve droplet or direct contact by faeco-oral route.

Rationale for Hospital-based Surveillance

The rationale for focusing on hospitalisations for the purpose of estimating the burden is as follows:

- Hospitalisations allow for surveillance of severe rotavirus disease that would be targeted for prevention by vaccines. Hospital data will therefore be important in evaluating the need for vaccine as well as rapid assessment of the success or failure of vaccination.
- Hospitalisations are easy to detect. Thus case-finding is easier.
- Hospitalizations represent a significant cost. Thus the burden of rotavirus diarrhoea on health resources and subsequently the cost-effectiveness of vaccine could be assessed.
- Hospitals have a laboratory capability, making it easy to collect stool specimens from children.

Diarrhoeal Diseases Surveillance in Oman

The Control of Diarrhoeal Disease (CDD) programme was launched in Oman in 1985. There has been a dramatic decline in diarrhoea related mortality. To achieve this goal the programme has focussed on three main strategies viz. Standardization of management, universal availability and accessibility of ORS and the health education activities. The incidence rate of diarrhoeal episodes reduced from 745/1,000 under-five children in 1991 to 298/1,000 under-five children in 2003. The mortality rate directly due to diarrhoea and diarrhoea related mortality has been maintained at near 'zero' since the year 1996. Nationally in 2003, 0.2% children had diarrhoea with severe dehydration while 11.7% had mild to moderate dehydration.

The CDD programme has been now integrated into the IMCI initiative with a standardized management and referral protocols. Surveillance and management are currently based on IMCI guidelines. Watery diarrhoea in under 5 children has been included in Group C that includes all diseases and syndromes under sentinel surveillance (revised SOP manual 2005). Information on the incidence of rotavirus gastroenteritis in Oman is unknown.

Access to Health Care: The health infrastructure of Oman is well developed. With 57 hospitals providing primary, secondary elements of health care and a network of 173 health centres, extended health centres and poly clinics the population is well served. Most of these services provided are governmental and are free. Private sector comprises a very small fraction of the total health service setup. The communication and road network ensures that over 95% of the population has a quick access to health care. Every health care institution serves population in a defined catchment area. The mothers' approach to the health services reflects a high utilization rates. Hence the hospital morbidity closely reflects the health profile of the community.

"Hospitalizations represent a significant cost. Thus the burden of rotavirus diarrhoea on health resources & subsequently the cost-effectiveness of vaccine could be assessed".

Case Definition

Suspect case: Acute watery diarrhoea in children under 5 years of age with dehydration exhibiting two of the following signs (based on IMCI guidelines):

- Lethargic or unconscious
- Sunken eyes
- Not able to drink or drinking poorly
- Skin pinch goes back very slowly

Confirmed case: A suspect case in whom presence of 'rotavirus' is demonstrated by

means of enzyme immunoassay &/or culture.

Sample collection (stool)

- 5 ml of stool should be collected from the suspect case as soon as feasible on admission.
- The sample should be collected within 48 hours of admission to avoid the detection of nosocomial infection.
- Rectal swabs or swabs placed in bacterial culture media should NEVER be used.
- All stool specimens should be stored at 2^0 to 8^0C (preferably frozen at -20°C for longer storage) until transported to the Central Public Health Laboratory.
- During transport cold chain should be maintained by the use of icepacks.
- The primary responsibility of handling, labelling, recording, storage, transport and dispatching of the stool sample to the CPHL is the sole responsibility of the head of the laboratory at the sentinel site.

"The regional epidemiologist in the Directorate has been assigned as a focal point for reporting on rotavirus surveillance".

Laboratory Investigations

- All stools collected should be tested for rotavirus antigen by means of a commercial enzyme immunoassay kit.
- Once antigen detection is completed the sample would be tested for serotype & genotype analysis.

Surveillance Team Members & their Responsibilities

Paediatric Ward: The head of paediatrics department is responsible for establishing the rotavirus surveillance in the hospital. He/she should ensure that all concerned staffs are adequately trained and are meticulously following the case definition while reporting. He/she should also ensure that the adequate stool samples are collected and transported according to the surveillance requirements.

Laboratory: The head of the hospital laboratory in the sentinel hospital is responsible for the handling of specimen, storage and the dispatching procedures. The sample should be clearly marked as *"Stool for Rotavirus Surveillance"* and also with a unique identifying number. A copy of the reporting form should be enclosed with the sample. All investigations on the sample will be performed by the designated Central Public Health Laboratory, Darsait. He/she would receive results from the CPHL within 5 working days after the dispatch of sample.

Data Management: The regional epidemiologist in the Directorate has been assigned as a focal point for reporting on rotavirus surveillance. He would also liaise with the paediatrics department and laboratory and should also be involved in the staff training. He would summarize surveillance data on monthly basis and reconcile data with the computerized medical records department of the regional hospital. He should ensure that a unique identifier should be assigned to every case reported. The monthly surveillance report format provided by DCDSC should only be used for reporting. The chief medical records officer should extend full cooperation whenever and wherever required.

Reporting

All suspect cases of rotavirus gastroenteritis should be notified on the standard case notification form (PR-14) for surveillance from the sentinel sites. Copies should be dispatched as under:

- The original should be dispatched to the focal point in the region from the sentinel site
- A copy should accompany the stool sample
- A copy should be kept at the paediatric

ward

The focal point should forward the compiled and corrected monthly report to the national surveillance unit .

Feedback

The reporting paediatrician would receive investigations results from CPHL through the hospital laboratory. The regional focal point visits the hospital and informally discusses the compiled report with the paediatrician and the head of laboratory every month anytime during the first week of the month to assess the completeness and timeliness of all the surveillance components. The national level feedback would be offered every quarter through the "*Community Health & Disease Surveillance Newsletter*" including the results and performance indicators.

Surveillance Sites

At the outset all regional referral hospitals in the country along with one major hospital would be included as the sentinel sites for rotavirus surveillance in the region. As surveillance activities at these sites are regularized the scope of surveillance would be further extended to involve other hospital sites (table-1).

Duration of Surveillance

The rotavirus surveillance would continue at the sentinel sites for a period of two years and during this period the rotavirus baseline prevalence in Omani children would be estimated along with the responsible genotype. The decision of introducing rotavirus vaccine would be based on the outcome. In case vaccine is introduced in EPI then surveillance would continue to asses its impact.

"The rotavirus surveillance would continue at the sentinel sites for a period of two years & during this period the rotavirus baseline prevalence in Omani children would be estimated along with the responsible genotype".

Table 1

Hospital based Rotavirus Surveillance in Oman, 2005

Sentinel Hospital Sites & Focal Point for Surveillance

Region	Sentinel Sites	Focal point
Muscat	Royal hospital SQ University hospital	Dr. Hassan Al Tuhami
Dhofar	SQ hospital, Salalah Taqah hospital	Dr. Gagan Sonal
North Batinah	Sohar hospital Saham hospital	Dr. Emad Eldin
South Batinah	Rustaq hospital Musana hospital	Dr. Padmamohan
Dakhliyah	Nizwa hospital Samail hospital	Dr. Sunil Bhat
North Sharqiyah	Ibra hospital Sinaw hospital	Dr. Samir Shah
South Sharqiyah	Sur hospital BBB Ali hospital	Dr. Anilkumar
Dhahira	Ibri hospital Buraimi hospital	Dr. Prakash KP
Musandam	Khasab hospital	Dr. Mohd. Ghobashi
Al Wustah	Haima hospital	Dr. Nabil Guindy

Monitoring Vaccine Wastage at Country Level

Introduction

The World Health Organization reports over 50% vaccine wastage around the world. Despite the availability of many tools for reducing such wastage, high wastage rates are still occurring. Because of the increasing EPI vaccine costs, tightening vaccine security and introduction of new vaccines through the Global Alliance for Vaccines and Immunizations (GAVI), countries should be looking closely than before at vaccine coverage.

Vaccine wastage can be expected in all programmes. The questions arise as to whether any of the wastage is preventable and, if so, how to prevent it.

Vaccine wastage is an important factor in calculating vaccine needs. If incorrectly calculated the country may either face serious vaccine shortages or unable to consume received quantities, leading to increased wastage through expiry. It is therefore crucial that the immunization points and the vaccine stores monitor the wastage on a continuous basis. Such monitoring can help reduce vaccine wastage at country level.

"It is therefore crucial that the immunization points & the vaccine stores monitor the wastage on a continuous basis".

Vaccine Wastage!

Wastage is defined as loss due to use, decay, erosion, leakage or through wastefulness. It is better to consider 'usage' which is established and accepted practice and is easy to perceive. Thus...

Vaccine usage rate= # of doses administered / # of doses issued * 100.

Vaccine wastage rate therefore=100 — vaccine usage rate (in a given period).

The number of doses issued includes doses used for immunization and all doses discarded or lost for any reason (including expiry, VVM indication, cold chain failure, freezing, missing inventory or routine discard of open vials at the end of a session.

Types of Wastage

Vaccine wastage is classified as occurring *"in unopened vials"* and *"in opened vials"*. This classification is more useful than stating wastage at service level or store level (refer to table 1 & 2). The calculation of vaccine wastage annually at national level is a futile exercise since it is too late for corrective measures to be taken. In addition it may not provide information on the types of wastage. Vaccine wastage must be monitored and calculated at all levels on a routine and regular basis.

Table 1: **Vaccine Wastage in Unopened Vials**

- Expiry
- VVM indication
- Heat exposure
- Freezing
- Breakage
- Missing inventory
- Theft
- Discarding unused vials returned from an outreach session

Table 2: **Vaccine Wastage in Opened Vials**

In addition to the types of wastage mentioned in the Table 1:

- Discarding remaining doses at the end of session
- Poor reconstitution practices
- Not being able to draw the correct number of doses from the vial
- Submergence of opened vials in water
- Suspected contamination
- Child's reaction requiring more than one dose.

Wastage Factor

In vaccine forecasting the vaccine wastage factor is used rather than the rate, that indicates how much additional vaccine should be ordered.

Wastage factor = 100 / vaccine usage rate

Acceptable Wastage!

There is no universally acceptable wastage level. The levels may differ between areas and programmes. In locations where a great majority of the population can only be reached through outreach services, higher wastage rates are expected. It is also important to know the type of vaccine wastage. A high wastage rate attributable to opening a multi-dose vial for a small session in order to avoid missed opportunity is acceptable than wastage attributable to freezing or expiry.

The relationship between vaccine wastage rate and immunization coverage is the key to decide whether the wastage is high. Both should be analyzed over a period of time to reveal the trend. However immunization coverage should never be compromised in favour of reducing wastage.

According to the WHO/UNICEF criteria on *Effective Vaccine Store Management* no more than 1% wastage is acceptable at the store.

Vaccine Wastage in Oman

A system of vaccine wastage surveillance and monitoring at national level will be introduced in Oman in the first quarter of 2005. The WHO protocol on surveillance of wastage at the sentinel sites would be adapted.

The sentinel sites would be chosen by cluster sampling technique (probability proportional to population size). A cluster of ten health care facilities would be selected from eight regions (total 80) randomly.

The sentinel surveillance of vaccine wastage would eventually enable the *Expanded programme on Immunization* of Oman to be more efficient in terms of resource utilization without compromising quality.

Source: Monitoring vaccine wastage at country level document: WHO/V&B/03.18

"A high wastage rate attributable to opening a multi-dose vial for a small session in order to avoid missed opportunity is acceptable than wastage attributable to freezing or expiry".

(Continued from page 3)

tions (e.g. immunization for HepB, IPV, and Rubella).

- Monitor and ensure safe disposal of bio-hazardous waste and liaison with the concerned department.
- Epidemiological investigation of all hospital infection outbreaks.
- Develop and implement ongoing training activities on ISC.
- Collection, collation and analysis of data on incidence and prevalence for monitoring trends and development of feedback mechanism.
- Developing specific policies on infection control with reference to drug resistant organisms (MDR TB, MRSA, VRSA), viral hepatitis, viral haemorrhagic fevers (RVF, CCHF, Ebola), HIV/AIDS, SARS & other emerging infections.
- Developing specific policies, SOPs, algorithms appropriate to fulfil the above goals.

National Infection Surveillance & Control committee (NISC)

The committee would be established under the Director General of Health Affairs consisting of the heads of relevant departments.

Terms of Reference for the Committee

- Review & endorse the biannual report
- Review and approve national guidelines and modified versions including standard operating procedures.
- Approve annual plans for NISCC with resource provision.
- Ensure collaboration and participation

with all local active programs, regional infection Surveillance & control programs, international organizations, and other stakeholders dealing with ISC.

Infection Control in Regions & Governorates

Establishment of an 'Infection Surveillance & Control Section' at the regional level within the Health Directorate under the Department of Health Affairs. This section should be staffed with the regional epidemiologist (section head) and a trained infection control nurse. The section might be supported by an additional staff member depending on the local needs. This regional section will receive technical policy guidance from the infection control section at the MoH-HQ.

"Establish a Regional Infection Surveillance & Control Committee headed by the Director/DG of Health Services in all the 10 health regions of Oman".

Establish a Regional Infection Surveillance & Control Committee headed by the Director/Director General of Health Services in all the ten health Regions/Governorates of Oman.

This regional committee will supervise and oversee all ISC activities at the provincial level. The head of nursing department in the Directorate and the head of department dealing with hospital and health centre affairs should be included in the committee. The regional referral hospitals should be represented in the committee to share their technical expertise

Terms of Reference of the Regional ISC

- Implement policies and protocols for infection surveillance and control in the Region/Governorate.
- Approve annual regional plan for ISC.
- Ensure establishment of surveillance system
- Data collection, collation, analysis & feedback.
- Investigation of hospital outbreak of nosocomial infections.
- Ensure collaboration and participation all the stake holders (inter-sectoral collaboration may be required especially for the disposal of infectious waste).

Infection Control Teams at Institutional Level

Wilayat (district) & local hospital and health centres will have infection control teams at the institutional level comprising one or more staffs.

Two structures should be developed at the Wilayat/Local hospital level:

- ISC committee (include members according to desired levels of standards)
- ISC team includes one doctor and one nurse for hospitals with < 200 beds.
- At the primary health care level, only one infection control nurse should be assigned do deal with all activities.

Members of ISC committee from the major health institutions will participate in the meetings of the regional ISC as and when invited.

Coordination of Committees at the Regional Level

The microbiologist and the medical epidemiologist in the region will form a technical partnership in the regions which will serve following benefits:

- The technical expertise of the regional hospital infection control committee will be available for the other hospitals and health centres in the region.
- The technical expertise of the medical epidemiologist will be available for investigation of nosocomial infection outbreaks as well as for data management.

Frequently Asked Questions (FAQ): Rift Valley Fever

Q1: What is Rift Valley Fever (RVF)?

Ans.: RVF is a zoonosis of viral origin i.e. a disease essentially of animals but occasionally transmissible to man.

Q2: When RVF was first described?

Ans.: RVF was first recognized in 1930 in the Rift Valley of Kenya when the virus was isolated from a sheep.

Q3: Is RVF the disease confined to Africa?

Ans.: No. For the first time the disease was reported outside the African continent in the Arabian peninsula in 2000 which raises the threat of its expansion into Asia & Europe.

Q4: How RVF is transmitted?

Ans.: RVF is transmitted by the bite of infected mosquitoes. A wide variety of species are involved. It also spreads by contact with infected animals, or with the blood or tissue fluids (slaughtering) or even through inhalation (aerosol). There is NO person-to-person transmission.

Q5: How RVF remains endemic in an area?

Ans.: The *Aedes* mosquitoes may acquire the infection from feeding on infected viraemic animals and are capable of transovarial transmission. The eggs of these mosquitoes may survive in nature for several years in dry conditions. In rainy seasons the eggs will hatch & the next generation of mosquitoes will continue to infect animals & humans.

Q6: How to recognize an impending outbreak of RVF?

Ans.: The epizootic of RVF is recognized by a wave of unexplained abortions amongst livestock in a defined geographical area.

Q7: What is the incubation period & the clinical presentation?

Ans.: The incubation varies from 2 to 6 days. The presentation is usually influenza like illness, with sudden onset of fever, headache, myalgia, & backache. Some develop neck stiffness & photophobia (meningeal signs). The disease resolves after 4 to 7 days with appearance of IgM & IgG antibodies.

Q8: How the severe disease presents?

Ans.: 0.5 to 1% cases may develop eye disease while less than 1% develop meningoencephalitis & haemorrhagic fever syndrome.

Q9: How to diagnose RVF?

Ans.: By serology. Serological test (ELISA) is available in CPHL.

Q10: Is there a vaccine available for humans?

Ans.: NO.

Q11: Is RVF reported or endemic in Oman?

Ans.: NO. RVF has not been reported so far in Oman. However the risk of importation exists especially in Dhofar Governorate. Constant vigilance is therefore essential.

Source: WHO Fact Sheet N°207 . For further reading logon to http://www.who.int/csr/

"New systems that monitor variations in climatic conditions are being applied to give an advance warning of outbreaks by signaling events (through satellite imaging). Such warnings will allow the authorities to avert an impending outbreak"

Communicable Diseases Quarterly Report

Third Quarter (July to September 2004)

ICD Code	Diseases	2004 Third Quarter				2003		2004	
		Jul	Aug	Sep	Total	Q3 Jul-Sep	Q4 Oct-Dec	Q1 Jan-Mar	Q2 Apr-jun
GROUP 'A' DISEASES									
A00	Cholera	-	-	-	**0**	2+1(i)	-	-	-
A20	Plague	*Never Reported*							
A36	Diphtheria	*Last Case in 1992*							
A39	Meningococcal infection	2	-	-	**2**	2	3	2	2
A80	Poliomyelitis	*Last Case in 1993*							
	Acute Flaccid Paralysis	2	2	3	**7**	2	4	8	9
B05	Measles	3	1	1	**5**	-	-	-	16
B06	Rubella & [CRS]	2 [0]	1 [0]	-	**3 [0]**	-	1	-	9
A95	Yellow fever	*Never Reported*							
A82	Rabies	-	-	-	**0**	1	-	-	-
A75.0	Louse-borne typhus	*Never Reported*							
A68	Relapsing fever	*Last Case in 1997*							
A33	Tetanus Neonatorum (NNT)	*Last Case in 1995*							
A99	Viral Hemorrhagic fever	-	-	-	**0**	-	-	-	-
GROUP 'B' DISEASES									
A03.0	Typhoid fever	7	4	4	**15**	13	11	4	8
A01.4	Paratyphoid fever	-	3	3	**6**	2	1	1	2
A02	Food poisoning	113	107	14	**234**	307	115	156	178
A22	Anthrax	*Never Reported*							
A23	Brucellosis	9	10	9	**28**	57	34	32	30
A37	Pertussis	3	5	5	**13**	43	25	29	22
A35	Tetanus (Excluding NNT)	-	-	-	**0**	1	2	-	2
A90	Dengue (Including DHF)	1	1 (i)	-	**1+1 (i)**	1 (i)	1 (i)	1	2 (i)
	Viral Hepatitis - Total	**70**	**48**	**29**	**147**	**269**	**180**	**228**	**185**
B15	Viral Hepatitis 'A'	30	3	17	**43**	91	88	136	83
B16	Viral Hepatitis 'B'	5	4	2	**11**	14	13	8	9
B17.1	Viral Hepatitis 'C'	2	1	-	**3**	8	9	2	3
B17.0	Viral Hepatitis 'D' among 'B'	-	-	-	**0**	-	-	-	-
B17.2	Viral Hepatitis 'E'	2	1	-	**3**	3	3	9	3
B19/B17.8	Viral Hepatitis (Unspecified)	31	39	17	**87**	153	67	73	87
B55	Visceral Leishmaniasis	-	-	-	**0**	-	-	-	-
B55.1	Cutaneous Leishmaniasis	-	-	-	**0**	3	-	1	-
B65	Schistosomiasis	-	2	-	**2**	41	-	-	13
B74	Filariasis	-	-	-	**0**	1 (i)	-	-	-
B72	Dracunculiasis	*Certified by WHO as Eradicated from Oman*							
G00.0	Haemophilus influenzae type b, Meningitis	-	-	-	**0**	3	3	-	0
G00.1-9	Bacterial meningitis other than Nm & Hib	2	2	1	**5**	8	11	11	9
A87	Viral meningitis	1	-	1	**2**	8	6	2	3
G03	Meningitis - Unspecified	1	1	1	**3**	13	7	15	11
A30	Leprosy	-	-	-	**0**	2	1	1	1
A15	Pulmonary Tuberculosis Sputum Positive	9	16	9	**34**	24	24	30	27
A16	Pulmonary Tuberculosis Sputum Negative	6	3	2	**11**	7	3	9	9
A17-19	Extra-Pulmonary Tuberculosis	10	2	6	**18**	18	21	23	16
B50-54	Malaria (All sources)	85	82	82	**249**	286	273	80	175
B20-24	HIV & [AIDS]	3 [2]	6 [5]	4 [1]	**13 [8]**	6 [5]	18 [8]	9 [10]	12 [7]
A50-53	Syphilis	12	11	9	**32**	32	17	22	53
A54	Gonococcal Infections	15	19	17	**51**	62	55	79	54
GROUP 'C' DISEASES									
A03	Shigellosis	66	87	89	**242**	171	181	198	179
A06	Amoebiasis	343	383	361	**1,087**	1,153	1,184	1,131	1269
A09	Acute Gastro-Enteritis & Diarrhoea	6,840	9,131	10,035	**26,006**	22,732	30,131	31,263	22,350
B01	Chicken Pox	2,751	1,903	1,637	**6,291**	4,313	7,539	16,204	18,608
B26	Mumps	46	74	54	**174**	288	358	235	253
A71	Trachoma	47	87	83	**217**	100	82	99	154
J10-J11	Influenza	69	29	39	**137**	460	533	451	182

Communicable Diseases Quarterly Report by Regions

Third Quarter (July to September 2004)

ICD Code	Diseases	Total	Muscat	Dhofar	Dakhli-yah	North Sharqi-yah	South Sharqi-yah	North Batinah	South Batinah	Dhahira	Musan-dam	Al-Wustah
GROUP 'A' DISEASES												
A00	Cholera	**0**	-	-	-	-	-	-	-	-	-	-
A20	Plague	*Never Reported*										
A36	Diphtheria	*Last Case in 1992*										
A39	Meningococcal infection	**2**	-	-	-	-	-	-	1	1	-	-
A80	Poliomyelitis	*Last Case in 1993*										
	Acute Flaccid Paralysis	**7**	2	-	-	2	-	1	1	-	1	
B05	Measles	**5**	2	-	-	1	-	-	1	-	1	-
B06	Rubella & [CRS]	**3 [0]**	-	-	-	-	1	-	2	-	-	-
A95	Yellow fever	*Never Reported*										
A82	Rabies	**0**	-	-	-	-	-	-	-	-	-	-
A75.0	Louse borne typhus	*Never Reported*										
A68	Relapsing fever	*Last Case in 1997*										
A33	Tetanus Neonatorum (NNT)	*Last Case in 1995*										
A99	Viral Haemorrhagic fever	**0**	-	-	-	-	-	-	-	-	-	-
GROUP 'B' DISEASES												
A03.0	Typhoid fever	**15**	7	3	-	-	1	3	-	-	1	-
A01.4	Paratyphoid fever	**6**	4	1	-	-	1	-	-	-	-	-
A02	Food poisoning	**234**	31	4	23	21	8	32	22	93	-	-
A22	Anthrax	*Never Reported*										
A23	Brucellosis	**28**	-	25	-	-	2	1	-	-	-	-
A37	Pertussis	**13**	8	4	1	-	-	-	-	-	-	-
A35	Tetanus (Non-NNT)	**0**	-	-	-	-	-	-	-	-	-	-
A90	Dengue (including DHF)	**1+1 (i)**	-	-	-	-	-	1 (i)	1	-	-	-
	Viral Hepatitis - Total	**147**	**22**	**8**	**9**	**1**	**46**	**28**	**11**	**12**	**1**	**9**
B15	Viral Hepatitis 'A'	**43**	2	-	-	-	26	4	8	1	-	2
B16	Viral Hepatitis 'B'	**11**	6	1	2	-	-	1	1	-	-	-
B17.1	Viral Hepatitis 'C'	**3**	2	-	1	-	-	-	-	-	-	-
B17.0	Viral Hepatitis 'D' among 'B positive'	**0**	-	-	-	-	-	-	-	-	-	-
B17.2	Viral Hepatitis 'E'	**3**	-	-	2	-	-	-	1	-	-	-
B19/17.8	Viral Hepatitis Unspecified	**87**	12	7	4	1	20	23	1	11	1	7
B55	Visceral Leishmaniasis	**0**	-	-	-	-	-	-	-	-	-	-
B55.1	Cutaneous Leishmaniasis	**0**	-	-	-	-	-	-	-	-	-	-
B65	Schistosomiasis	**2**	-	2	-	-	-	-	-	-	-	-
B74	Lymphatic Filariasis	**0**	-	-	-	-	-	-	-	-	-	-
B72	Dracunculiasis	*Certified by WHO as Eradicated from Oman*										
G00.0	Haemophilus influenzae type b, meningitis	**0**	-	-	-	-	-	-	-	-	-	-
G00.1-9	Bacterial meningitis except Nm & Hib	**5**	2	1	-	1	-	1	-	-	-	
A87	Viral meningitis	**2**	-	-	1	-	-	-	-	1	-	-
G03	Meningitis - Unspecified	**3**	-	-	-	-	1	2	-	-	-	-
A30	Leprosy	**0**	-	-	-	-	-	-	-	-	-	-
A15	Pulmonary Tuberculosis Sputum Positive	**34**	14	3	-	2	3	7	1	3	-	1
A16	Pulmonary Tuberculosis Sputum Negative	**11**	3	2	1	-	1	3	1	-	-	-
A17-19	Extra-Pulmonary Tuberculosis	**18**	5	3	1	-	2	4	2	-	-	1
B50-B54	Malaria (All sources)	**249**	87	9	21	9	36	37	13	27	8	2
B20-24	HIV [AIDS]	**13 [8]**	7 [3]	0 [1]	-	-	-	4 [3]	-	2 [1]	-	-
A50-A53	Syphilis	**32**	13	-	2	-	3	11	-	3	-	-
A54	Gonococcal Infections	**51**	4	16	1	-	18	2	7	-	-	3
GROUP 'C' DISEASES												
A03	Shigellosis	**242**	25	11	68	62	35	1	9	29	1	1
A06	Amoebiasis	**1,087**	40	1	175	168	304	40	37	145	24	153
A09	Acute Gastro-Enteritis & Diarrhoea	**26,006**	3,500	4,787	3,421	2,119	3,507	3,362	2,686	1,659	435	530
B01	Chicken Pox	**6,291**	937	398	782	409	1,173	1042	777	663	86	24
B26	Mumps	**174**	42	14	34	9	8	21	19	27	-	-
A71	Trachoma	**217**	80	-	14	-	-	1	57	65	-	-
J10-J11	Influenza	**137**	54	-	6	-	-	4	-	71	2	-

Selected Communicable Diseases by Wilayat

Third Quarter (July to September 2004)

Region	Wilayat	AFP	Measles	Rubella	Pertus-sis	TB (Total)	TB Sputum Positive	Tetanus (Ex. NNT)	Malaria (All)	Viral Hepatitis (Total)	Leprosy	Meningo. Infection	Hib Men-ingitis	Leishma-niasis Visceral	Leishma-niasis Cutaneous
MUSCAT	Muscat				2	1			3	5					
	Seeb	1	1		2	10	5		34	1					
	Muttrah	1			1	4	4		13	8					
	Bowsher		1		3	1	1		30	2					
	Al Amerat					4	3		3	3					
	Quriyat					2	1		4	3					
DHOFAR	Salalah				3	5	2		7	2					
	Thumrait				1				1	5					
	Taqah														
	Mirbat														
	Sudah					1									
	Rakhyut									1					
	Dhalqut														
	Muqshan								1						
	Shaleem					2	1								
NORTH BATINAH	Sohar					2	1		16	7					
	Shinas					4	1		2	2					
	Liwa					1				3					
	Saham					3	2		10	6					
	Khabura								5	5					
	Suwaiq	1				4	3		4	5					
SOUTH BATINAH	Rustaq		1	1						10		1			
	Nakhl			1		1									
	Wadi Maawil														
	Al Awabi														
	Musanah					1			3	1					
	Barka	1				2	1		10						
DAKHLIYAH	Nizwa				1				4	6					
	Bahla					1			5	3					
	Adam								4						
	Hamra	1				1									
	Manah								1						
	Sumail								2						
	Izki								1						
	Bid Bid								4						
DHAHIRA	Ibri					2	2		11	9					
	Yanqul								2	1		1			
	Dhank								2						
	Buraimi					1	1		11	2					
	Mahda								1						
NORTH SHARQIYAH	Ibra					1	1		1						
	Mudhaibi	1	1						5	1					
	Bidiyah								3						
	Al-Qabel	1				1	1								
	Dima Al-Tayeen														
	Wadi Bani Khalid														
SOUTH SHARQIYAH	Sur			1		3	2		32	13					
	Masirah									1					
	Al Kamil & Al Wafi								1	5					
	BBB Ali					2			2	15					
	BBB Hassan					1	1		1	12					
MUSANDUM	Khasab	1							3						
	Dibba								4	1					
	Bukha		1						1						
	Madha														
AL-WUSTAH	Haima								2						
	Duqum					2	1								
	Mahoot														
	Al-Jazer									9					
NATIONAL TOTAL		**7**	**5**	**3**	**13**	**63**	**34**	**0**	**249**	**147**	**0**	**2**	**0**	**0**	**0**

Age Distribution of Communicable Diseases

Third Quarter (July to September2004)

ICD Code	Diseases	Total	Age Groups in Years								
			< 1	1-4	5-9	10-14	15-19	20-24	25-34	35-45	45+
GROUP 'A' DISEASES											
A00	Cholera	**0**	-	-	-	-	-	-	-	-	-
A20	Plague	*Never Reported*									
A36	Diphtheria	*Last Case in 1992*									
A39	Meningococcal infection	**2**	-	1	-	1	-	-	-	-	-
A80	Poliomyelitis	*Last Case in 1993*									
	Acute Flaccid Paralysis	**7**	1	2	3	1	-	-	-	-	-
B05	Measles	**5**	1	3	-	1	-	-	-	-	-
B06	Rubella & [CRS]	**3 [0]**	-	3	-	-	-	-	-	-	-
A95	Yellow fever	*Never Reported*									
A82	Rabies	**0**	-	-	-	-	-	-	-	-	-
A75.0	Louse borne typhus	*Never Reported*									
A68	Relapsing fever	*Last Case in 1997*									
A33	Tetanus Neonatorum	*Last Case in 1995*									
A99	Viral Haemorrhagic fever	**0**	-	-	-	-	-	-	-	-	-
GROUP 'B' DISEASES											
A03.0	Typhoid fever	**15**	-	3	2	5	1	-	1	-	3
A01.4	Paratyphoid fever	**6**	-	1	1	1	-	-	1	-	2
A02	Food poisoning	**234**	4	33	45	38	29	18	41	17	9
A22	Anthrax	*Never Reported*									
A23	Brucellosis	**28**	-	6	7	5	1	1	4	3	1
A37	Pertussis	**13**	11	2	-	-	-	-	-	-	-
A35	Tetanus (Non NNT)	**0**	-	-	-	-	-	-	-	-	-
A90	Dengue	**1+1 (i)**	-	-	-	-	-	-	1+1 (i)	-	-
	Viral Hepatitis - Total	**147**	**1**	**23**	**28**	**18**	**11**	**17**	**19**	**13**	**18**
B15	Viral Hepatitis 'A' (ELISA)	**43**	-	18	16	6	-	1	-	1	1
B16	Viral Hepatitis 'B' (ELISA)	**11**	1	-	-	-	2	2	4	2	-
B17.1	Viral Hepatitis 'C' (ELISA)	**3**	-	-	-	-	-	-	1	-	2
B17.0	Viral Hepatitis 'D' (ELISA) among 'B'	**0**	-	-	-	-	-	-	-	-	-
B17.2	Viral Hepatitis 'E' (ELISA)	**3**	-	-	-	-	-	-	1	-	2
B19/B17.8	Viral Hepatitis Unspecified	**87**	-	5	12	12	9	14	13	10	12
B55	Visceral Leishmaniasis	**0**	-	-	-	-	-	-	-	-	-
B55.1	Cutaneous Leishmaniasis	**0**	-	-	-	-	-	-	-	-	-
B65	Schistosomiasis	**2**	-	-	-	-	-	-	1	-	1
B74	Lymphatic Filariasis	**0**	-	-	-	-	-	-	-	-	-
B72	Dracunculiasis	*Certified by WHO as Eradicated from Oman*									
G00.0	Haemophilus Meningitis type b	**0**	-	-	-	-	-	-	-	-	-
G00.1-9	Bacterial meningitis other than Nm & Hib	**5**	2	1	-	-	-	-	2	-	-
A87	Viral meningitis	**2**	1	1	-	-	-	-	-	-	-
G03	Meningitis - Unspecified	**3**	1	1	-	-	1	-	-	-	-
A30	Leprosy	**0**	-	-	-	-	-	-	-	-	-
A15	Tuberculosis: Sputum Positive	**34**	-	-	-	-	3	1	8	3	19
A16	Tuberculosis: Sputum Negative	**11**	-	1	-	-	-	-	2	1	7
A17-19	TB Extra-Pulmonary	**18**	-	-	-	3	-	1	5	2	7
B20-24	HIV [AIDS]	**13 [8]**	-	-	-	-	1 [0]	4 [1]	4 [2]	3 [3]	1 [2]

Note:

1. *The quarterly data are provisional & should be scrutinized & verified by the focal point of communicable diseases (Epidemiologist) in the regions. Previous quarter data would be finalized in the following quarter after receiving the feedback.*
2. *Tuberculosis, Leprosy & HIV [AIDS] data are for nationals only.*
3. *(i) = imported case.*
4. *Currently laboratory diagnostic procedures are in the process of being laid down and standardized to categorize Viral hepatitis into different types. Cases not subjected to testing therefore are classified as unspecified viral hepatitis.*

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Animal Bite Surveillance by Regions

Third Quarter (July to September 2004)

Region	Estimated Population at Risk	Type of Animal					Total Animal Bites	Annualized rate per 10,000 population	Annualized Rates in Previous Quarters			
		Fox or Wild	Dog	Cat	Other Domestic	Others & (unknown)			2003		2004	
									Q3	Q4	Q1	Q2
Muscat	632,073	-	20	10	2	-	**32**	2.0	2.1	2.2	3.6	3.8
Dhofar	215,960	29	1	23	10	-	**63**	**11.7**	1.3	2.1	4.1	**11.2**
North Batinah	408,963	-	18	20	2	-	**40**	3.9	**4.5**	**4.5**	4.0	1.3
South Batinah	244,542	1	11	44	3	-	**59**	**9.7**	**8.1**	**9.1**	**7.5**	**7.9**
Dakhliyah	267,140	1	-	15	-	-	**16**	2.4	5.0	4.1	**5.1**	2.4
Dhahira	207,015	-	3	4	1	-	**8**	1.5	0.5	2.0	1.4	1
North Sharqiyah	140,091	-	3	32	7	-	**42**	**12.0**	**9.2**	**12.1**	**12.8**	**12.8**
South Sharqiyah	173,670	2	5	5	3	-	**15**	3.5	3.2	**4.3**	3.5	1.4
Musandam	28,378	-	-	1	-	-	**1**	**1.4**	**4.5**	**4.5**	2.8	**5.7**
Al-Wustah	22,983	-	-	6	3	-	**9**	**15.7**	**5.6**	**8**	**6.9**	3.5
Total	**2,340,815**	**33**	**61**	**160**	**31**	**0**	**285**	**4.9**	**3.8**	**4.2**	**4.7**	**4.4**

Note: Rodent bites are excluded

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