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# Community Health & Disease Surveillance Newsletter

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## The Second National PEM Survey

*Ms Dina Al Asfoor*

### Background

Protein energy malnutrition is among the most important priorities of the Ministry of Health. Programs that include screening and management of PEM in all primary health centres of Oman was initiated in 2002; and national PEM monitoring system was established in 2004 to follow-up the trend in the coverage and impact of the program. Other community activities that include promotion of adequate feeding habits for children, establishment of lactation counselling services in all health centres was established at the same time.

The second national survey on protein energy malnutrition among infants and young children in Oman is being carried out in all regions of Oman. This study is employing standardized procedure for data collection and analysis of anthropometry. The national data collected on 11800 children includes weight, height, head circumference, and feeding pattern and these will be used in assessing the prevalence of malnutrition, obesity, rates of exclusive and predominant feeding pattern as well as compliance of the feeding pattern with recommendations of number of meals as well as variety as an index of quality.

The study training and data collection was initiated in 11<sup>th</sup> October 2008, where 4 days training sessions are being conducted in the regions. Training of Dhofar and Wustah region teams took place in Dhofar on the 11<sup>th</sup>-14<sup>th</sup> October; North and South Batinah

teams were trained in North Sharqiyah on 18<sup>th</sup> -21<sup>st</sup> October, whereas North and South Sharqiyah teams were trained in South Sharqiyah on 25<sup>th</sup>-28<sup>th</sup> October. The training is planned in Dakhliyah on 1<sup>st</sup> -4<sup>th</sup> November for Dakhliyah, Dhahira, and Buraimi regions whereas Muscat and Musandam will train in Muscat on the 8<sup>th</sup>-11<sup>th</sup> November.

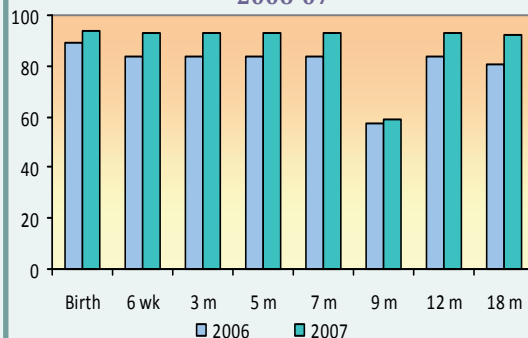
Data collection is expected to continue till March 2009, data entry, management and analysis are planned for April through June 2009 and the final report is due in December 2009. The study findings are expected to guide policy decisions related to prevention and management of protein energy malnutrition, obesity, anaemia prevention and control among infants and young children as well as appropriate infant feeding policies and training programs. These will help identifying the most important age groups and country regions in the management of those problems as well verifying the gender differences in infant feeding and child malnutrition.

### Results of PEM monitoring Data

In collaboration with the Department of Planning, the Nutrition Department established a monitoring system for PEM and infant feeding through primary health care; starting with the year 2006. This data assists in the monitoring the impact of the programs of PEM management, BFHI and Infant and Young Child Feeding Policies on annual basis in all regions.

The data indicates that the coverage rate of the PEM register on the national level ranged between 80-88% in all child visits except the 9 months visit in 2006, and it improved moderately to range between 91-93% in 2007. The visit of 9 months however still lags behind as its coverage was 57.1% in 2006 and 58.6% in 2007. A screening program for Haemoglobin at the ages of 9 months and 18 months was initiated on a trial basis in 2007 and showed a coverage rate of 6.4% and 11.2% consecutively.

**Fig-1**  
Coverage rates (%) of the PEM register 2006-07



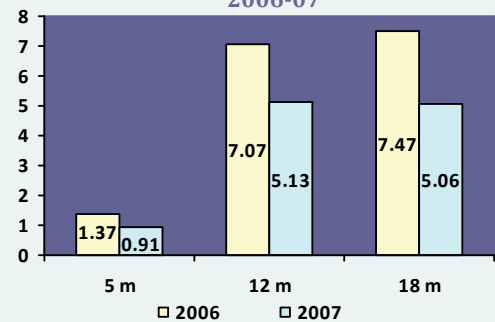
Protein Energy Malnutrition is a problem that attracted national attention by health authorities and therefore a number of programs were created to combat the problem. To understand the impact of those problems a national PEM register was established and a monitoring system to assess the direction of change in the rates. Regional data are available; however we will present here national data only.

The number of PEM cases register showed a decline at all age groups whereas at five months the rate was 1.4% in 2006 compared to 0.91% in 2007. At 12 and 18 months the rate was 7.1%, and 7.47% consecutively in 2006 and those went down to 5.13% and 5.06% in 2007 for the same age groups.

It should be noted that those reflect the incidence rates which are the percentage of new cases which is expected to be less than the prevalence which is the percentage of cases at a given point of time. However, the direction of change indicates a gradual reduction; which is cou-

pled with the improvement in the coverage indicates that the program is heading in the right direction.

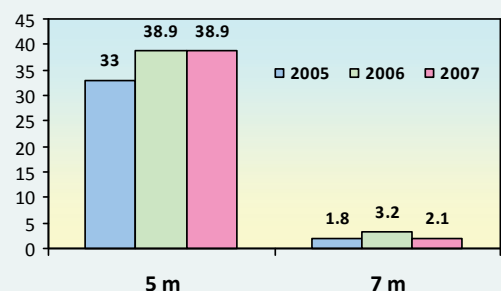
**Fig-2**  
PEM Rate in Children aged 5, 12 & 18 m 2006-07



The World Health Organization revised its recommendation of exclusive breastfeeding from 4 to 6 months. In our surveillance system the visit of 5 months is used as a marker for exclusive breastfeeding for 4 months, whereas the visit at 7 months is used as a marker for exclusive breastfeeding for 6 months.

As shown in figure 3 rates of exclusive breastfeeding for 4 months were 33% in 2005 that improved to 38.85% in 2006 and 2007. At 7 months visits the rates were 1.81% 3.22% and 2.05% in 2005, 2006 and 2007 respectively. Low rates of exclusive breastfeeding indicate that extensive efforts on the lactation counselling and community action are needed in all health regions in the area of breastfeeding; empirical observations show that there are some obstacles to exclusive breastfeeding such as maternity leaves and absence of crèches in the work place.

**Fig-3**  
Exclusive Breastfeeding Rates in Infants aged 4 & 6 m: 2005-07

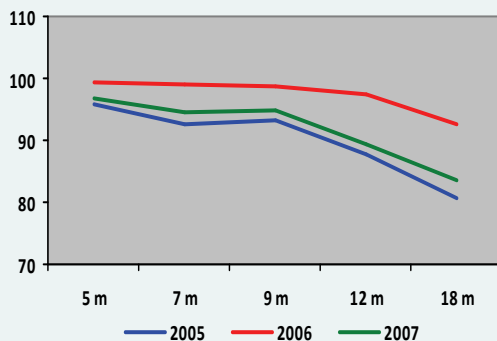


“Protein Energy Malnutrition is a problem that attracted national attention by health authorities and therefore a number of programs were created to combat the problem.”

Breastfeeding rates as shown in Figure 4 are high, as in 2005 they were almost 96% at the age of 5 months and declined gradually to 81% at 18 months. The year 2006 showed some important improvements and the rates went up to 99% at 5 months, and it was lowest at 93% at the age of 18 months. This decline however reversed in 2006 as the rate at 5 months was 96% and at 18 months it was 83%.

This unstable trend indicates annual variations that may be influenced by commercial pressure by infant formula companies, and the efforts that are carried out by the health staff to create awareness about the importance of breastfeeding. The general prevalence of breastfeeding is high; however the trend and the rates of bottle feeding, as well as rates of exclusive breastfeeding are points of concern.

**Fig-4**  
**Breastfeeding Rates (%) among Infants**  
**aged 5, 7, 9, 12 & 18 months: 2005-07**



Infant formula is discouraged by international organizations as well as the Ministry of Health for several reasons that include nutritional as well as health concerns. Infant formula use has been shown to be associated with increased diarrhoeal diseases, decreased immunity and both under and over nutrition in various communities.

The rate of introduction of infant formula remain high even in younger infants at the age of 5 months where 19% of the mothers reported to give formula to infants in 2005 compared to 19.38% and 22.15% in 2006 and 2007 consecutively. This shows that not only is formula introduced at a very young age, but this trend is also on the rise.

The data show an increasing trend at all age

groups reaching a maximum at the age of 18 months in 2007 at 30.7%. Extensive efforts need to be put in place to overcome pressure of formula companies and reduce the use of bottles. In addition more research is required to understand the underlying attitudes regarding infant formula and breastfeeding.

### **National Food-based Dietary Guidelines**

The national food based dietary guidelines initiative was launched in 2004; and they are aimed to consist of a visual presentation that includes various food groups and quantities and a number of messages that will help the consumer implement the guidelines. This initiative was started by the Department of Nutrition as a WHO consultant made a general assessment and plan for the guidelines. Following that the Department started a process that involved assessment of the nutrition problems, identifying the morbidity pattern in Oman that might be associated with nutrition, and nutrients of concern. Following that, calculations of energy and nutrients requirements of various population groups was carried out using recommended procedures that are recommended by WHO and FAO and employing data from national surveys on stature and population distribution. Food groups were then identified through listing of all food items consumed in the Omani diet and classifying them based on certain criteria. Food pattern analysis and modelling was carried out on the income and expenditure survey data of 2003. Modelling of food pattern included adjusting quantities of food group items to satisfy the energy and nutrients requirements. The product of the food pattern modelling is the food groups number of servings and quantities in grams that will satisfy the nutritional requirements of each population group in Oman. The modifications needed to shift the current food pattern to the modelled one were used as the basis of the FBDG's messages.

A qualitative study was carried out to identify the most suitable visual presentation for the Omani context, and fine tune the messages in order for them to be most

“Infant formula use has been shown to be associated with increased diarrhoeal diseases, decreased immunity and both under and over nutrition in various communities.”

“In July 2008, a Royal decree was issued to enact the national food law that was the product of long time advocacy efforts by the Department of Nutrition.”

comprehensible and that can be implemented by people. A communication plan for the dietary guidelines was developed that spans over many years to come and include several population categories and media of dissemination such as the schools, universities, health staff, as well as the public through community support groups and other means.

The shift in the dietary practices aimed from implementing the Omani food based dietary guidelines is expected to have an important impact in the prevention and control of obesity and chronic diseases in Oman.

### **The Royal Decree on the National Food Law**

In July 2008, a Royal decree was issued to enact the national food law that was the product of long time advocacy efforts by the Department of Nutrition. The National Food Law of Oman provides the legal grounds for implementing activities and systems towards providing safe food for all. The provisions of the law prohibit dealing with any food item that is not compliant with food safety standards; and leaves the responsibility of the safety of the food into the hands of the importer.

This law is a very important cornerstone of establishing an efficient food safety system; however there is plenty of room for improvement in other aspects such as food borne disease surveillance, food inspection, tracking of food imports and distribution, etc. These responsibility and areas of specializations of various food safety activities are scattered among many Ministries, therefore an extensive advocacy effort is needed to pull together those action.

Food borne disease surveillance is an area that had been vaguely recognized as the current system is only designed to identify outbreaks but not individual cases of food borne illnesses. The primary health care system in Oman is based on a catchment area concept, therefore patients reporting a food illness may report to several health centres; as such the number of outbreaks and incidents are grossly underestimated. A preliminary investigation of the pattern of

food borne diseases reporting showed that only 2% of the food borne illnesses finds their way into the disease surveillance system. A successful surveillance system should be able to identify the source of outbreak, the implicated food and the reason of contamination. This would help in identifying imports of contaminated foods, malpractice in food establishments and mishandling of transport and storage systems and consequently guide corrective actions and ultimately lays the grounds for proper implementation of the Royal Decree.

Food inspection systems and appropriate tracking of foods is extremely important in ensuring food safety and quality. The law determines that the food dealers should ensure food safety through appropriate documentations as well as following recommended and standardized storage, transport and distribution procedures. Wholesalers should provide adequate documents for tracking of food supply through out the food chain. A mechanism for food tracking is essential for timely response of international, and if any; local food contamination alerts.

### **Evaluation of MoH requirements of Nutrition Staff**

In view of the increased demand on the nutrition and dietetics services in the Ministry of Health, and the limited number of staff available, the Department of nutrition carried out a study of the requirements of nutrition staff based on the number of beds in each hospital and specialities required. The study was based on a rule of thumb that a dietician is required for each 100 beds taking into account the occupancy rates of hospitals.

Several categories of staff are providing dietetics service in Oman. The minimum requirement for a dietician to be licensed is a B.Sc. in dietetics program that follows a standardized program that is approved by an international dietetics body such as American Dietetic Association, British Dietetics Association or a similarly recognized body. These typically include course work followed by a 9 months of a structured internship.

There are total of 124 staff members working in the field of dietetics in Ministry of Health. Out of these only 60 are university graduates, whereas 64 are Diploma holders. Among the university graduates there are 18 of food science degree holders and 3 others (health sciences, public health nutrition etc.). Among the diploma holders there are 30 food science diploma holders.

There is one person currently qualified as dietician whose work was predominantly working in the breastfeeding area and currently on leave. There are other available staff members not working in patient management as they are assigned to the Department of Non-communicable diseases.

This situation implies that a training program at two levels needs to be developed, one that includes all the Diploma holders (target 64 staff members) and aims at bringing the level of those up to be consistent with a standard dietetics program. Simultaneously an assessment of the knowledge gap in the nutrition graduates followed by an extensive course based on the assessment and this should target 38 nutrition staff members. Restructuring of the services in the hospitals should take place to assign the food safety graduates to the quality sections in the hospitals.

### Human Resources Requirements in Hospitals

The Table-1 shows number of dieticians needed according to region. Muscat is the region in need for most numbers because of the Royal and Khaula hospitals the two main tertiary hospitals in the country and also because of the wide variety of specialists needed. These calculations were based on in-patient beds, occupancy rate and the number of working hours daily needed for each patient according to the severity of the cases, for surgery only major surgeries were included. It is recommended to create focal points for each specialty; as this highly qualified person acts as a trainer and resource person for other dietician in the same category of work. The most suitable location of those are the Tertiary hospitals (Royal & Khaula Hospital)

The dietetics requirements for hospitals were calculated based on the number of

**Table-1**  
**Estimated Requirement of Dieticians in the Provinces of Oman**

Region/Governorate	Dieticians
Muscat	29
Dhofar	15
North Batinah	11
South Batinah	8
Dakhliyah	12
North Sharqiyah	8
South Sharqiyah	10
Dhahira	7
Buraimi	3
Musandam	3
Al Wustah	2
<b>Total</b>	<b>107</b>

beds factored by the occupancy rate. Gastro; oncology; cardio, nephrology, paediatrics, ICU, SCBU, CCU and Renal were assigned a 0.5 working hours per day, and General; haematology, neurology, surgery. Obstetrics and Gynaecology were assigned minutes of the work day per patient, whereas all other patients were estimated to require 5-10 minutes per day.

These manpower estimates are based on the assumption that nurses implement the screening of patients during admission to hospital and refer them to the dietician according to severity and needs.

### Human Resources Requirements for Primary Health Care

The requirements of the health centres are estimated based on a minimum of one dietician per health centre. Projections based on the patient load and future expansion of health centres is needed provided adequate space and tools are available for the work of dieticians. Taking into consideration the current circumstances the total estimated number of dieticians needed for the health centres are 140. In addition each Wilayat (61) needs a nutritionist responsible for managing the nutrition awareness and other activities. Thus a total of 201 dieticians are needed for the Primary Health Care activities in the country.

“These manpower estimates are based on the assumption that nurses implement the screening of patients during admission to hospital and refer them to the dietician according to severity and needs.”



## Burden of Foodborne Diseases in Oman

### Background

In the primary health care services, Oman had put food borne disease surveillance as one of its primary target diseases. The syndromic surveillance of food borne diseases in Oman is categorized by reporting outbreaks as opposed to cases. The laboratories in PHC centres are not equipped to detect various parasites and pathogens that are responsible for the illnesses.

In Oman, in the food borne outbreaks and not cases are reported in the communicable disease surveillance under food poisoning. Shigellosis and amoebiasis had been monitored since 1985. Shigellosis had been dropping down, and this could be explained by the improvement in water resources, whereas Amoeba is increasing gradually. The age groups most affected are the children at the ages of 1-14 years.

A survey was conducted to assess the sensitivity of the surveillance and the patient and physicians perceptions. As also the laboratory practices and capacities related to the detection and management of food borne illness in the PHC services in Oman were assessed.

### Objectives

- To estimate the burden of foodborne

disease and qualitatively assesses the sensitivity of the burden of the current food borne disease surveillance system.

- To evaluate laboratory and clinical practices related to food borne disease surveillance in Oman
- Determine the percentage diarrhoea cases that seek medical care
- Determine the prevalence of cases that are investigated for a food borne illnesses
- Assess the potential impact on absenteeism and its economic const.
- To develop recommendations of the modification of the food borne disease surveillance system in Oman

### Conceptual framework

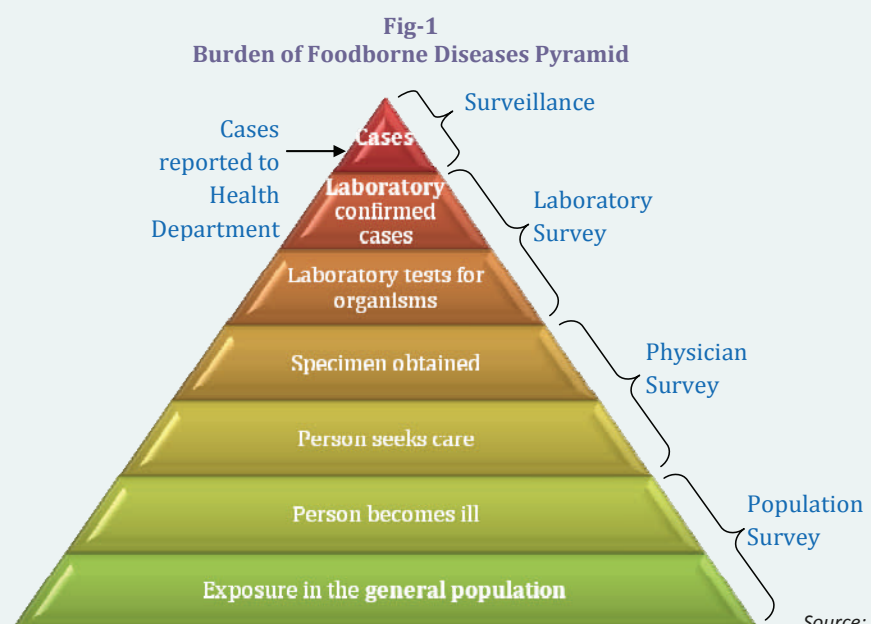
In this study, we examined the chain of events that leads to capturing an incident of foodborne diseases according to the pyramid shown below.

### Survey design

This survey was composed of:

- Population survey:** Estimate the number of persons in the population experiencing symptoms consistent with the infections identified; and the proportion of persons

“A survey was conducted to assess the sensitivity of the surveillance and the perceptions of the patient and the physicians.”



who sought medical care

- **Laboratory survey:** will collect the number of stool and blood samples received at the laboratory, and number confirmed for each of the pathogens identified, as well as the number reported.

To obtain the burden of disease, the following multipliers were used:

**Percent specimens received** = # specimens received (from laboratory survey) /# persons seek care (from population survey).

**Percent seek care** = # persons seeking care (from population survey)/# persons ill (calculated from population survey).

**Materials and Methods**

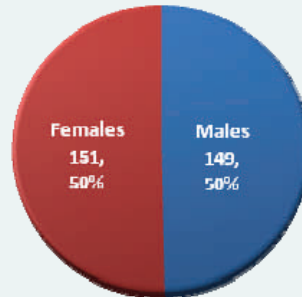
The survey was conducted through a questionnaire administered to mothers of children under five years. Such 100 school children and 100 adults over the age of 18 were included. Mothers and adults data were collected in health centres, whereas school children questionnaire was administered in a primary school. All data were collected from Muscat Region. For the laboratory survey, data for January to July 2006 were collected from the laboratory of the same health centres. This survey was conducted through an administered questionnaire and a laboratory retrospective questionnaire.

Data management and analysis: The data was entered in EPI6 software. Data cleaning and management was followed up by analysis on SPSS 12.0 software.

**Results**

There were 76 (27.5%) children below the age of 5 years that were included in the study; and for those the mothers were interviewed. The number of school aged chil-

**Fig-2**  
**Gender distribution: Survey 2005**



dren was 111 comprising 40.2% of the sample and 89 adults males and females who contributed 32.2% of the sample. The number of males was almost equal to the number of females at 49.7% compared to 50.3% respectively.

Analysis of education and occupation was carried out for adults only as these were more relevant. The percentage of the sample of no. or primary education was 8.0% and 10.0% respectively; whereas the percentage of elementary graduates was 26.0% and of secondary or more was 56.0%. The majority of the adult women interviewed were either housewife (35%), whereas most of the men were professionals (225). The remaining students (19.0%), and secretaries and associates (9.0%) and elementary jobs (10.0%)

**Percentage with symptoms indicative of food poisoning**

Overall, 26.4% (73) of the respondents experienced diarrhoea in the month prior to the interview; with statistically significant difference among age groups. Pre-school and school children were more likely to experience diarrhoea at 28.9% and 33.3% respectively. Only 15.7% of the adult respondents had diarrhoea at the same time frame.

All cases of diarrhoea had at least one accompanying symptoms; out of these 67.1% had abdominal pain; 37.0% had fever; 11.0% had headache and nausea; 15.1% had body pain; 6.8% had cold; 8.2% had fatigue; and 23.3% had vomiting.

Abdominal and body pains were significantly associated with age groups where 94.6% of school children with diarrhoea

“Overall, 26.4% (73) of the respondents experienced diarrhoea in the month prior to the interview; with statistically significant difference among age groups.”

**Table-1**  
**Age distribution : Survey 2005**

Age groups	# (%)
0-5 yrs	76 (27.5)
6-17 yrs	111 (40.2)
18+ yrs	89 (32.3)
<b>Total</b>	<b>276 (100)</b>

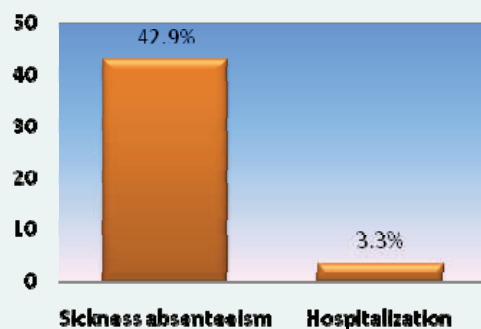
reported abdominal pain compared to 22.7% of pre-school children and 64.3% of adults. Fever was reported mostly among pre-school children where 63.6% of the respondents had fever; compared to 27.0% among school children and 21.4% among adult. A more thorough examination accompanied by confirmatory testing by the laboratories is required to understand the pattern of food borne disease among various age groups.

Percentage seeking medical advice; absenteeism and hospitalization because of diarrhoea and related symptoms;

Almost 43.0% of the respondents said they missed at least one day of work or school because of suffering from diarrhoea and other symptoms. An additional 23.3% of

Fig-3

Sickness absenteeism at work/school and hospitalization due to diarrhoeal illness



them a parent or a caretaker missed a working day as well; but only 3.3% of them were hospitalized. This warrants a closer look at the economic implications of diarrhoeal diseases.

Of the 80 respondents who had diarrhoea; 23 (28.8%) of confirmed that it may have been related to food poisoning but only 6 received information from the physician.

**Survey of Laboratory testing in health centres**

To understand some of the practices related to management of food poisoning, a survey of the laboratories in 6 health centres covering the catchment area of the interviewed subjects was conducted. Data over the months of January through June were collected on the number of samples

referred to each laboratory; the number confirmed and the numbers reported to the treating physicians and to the surveillance network.

A total of 1123 samples were examined in the laboratories and amongst those 21 pathogens were detected. Total 906 results were reported to the physicians. Only 4 out of 21 positive results were reported to the surveillance network.

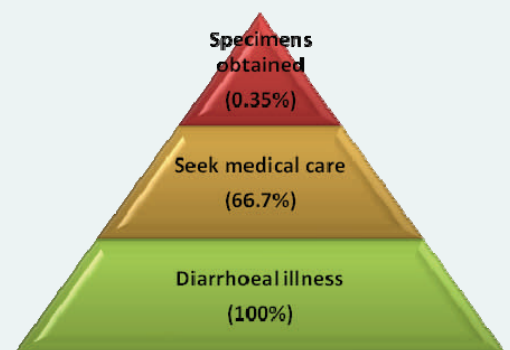
**Modelling of the burden of illness pyramid**

Based on the WHO model highlighted in the Report of the preparatory meeting “sentinel surveillance of foodborne illness (study of the burden of foodborne disease)”; Amman, Jordan October 2002; and the CDC’s burden of illness pyramid; it was attempted to quantify the chain of events that occur starting from a diarrheal episode to seeking medical care and laboratory confirmation.

The pyramid below shows that only 0.35% of the subjects who suffer diarrhoea end up being tested; confirmed and hence probably managed appropriately. This raises several issues about the health care seeking behaviour of the population and also the practices of the health staff in relation to the detection and management of the foodborne illnesses.

Fig-4

Burden of diarrhoeal illness pyramid based on pilot survey: 2005



**Conclusions and recommendations**

This study was conducted to understand some aspects related to foodborne diseases reporting and management in Oman.

“The pyramid below shows that only 0.35% of the subjects who suffer diarrhoea end up being tested; confirmed and hence probably managed appropriately.”



## Global Strategy for Infant & Young Child Feeding

### Background

The World Health Assembly and UNICEF endorsed the Global Strategy on Infant and Young Child Feeding in 2002.

IYCF is a comprehensive strategy on infant and young-child feeding built on previous achievements and includes guidelines on ensuring appropriate feeding of infants and young children. It aims to promote the optimal feeding for infants and young children less than two years of age through a written national strategy, common training modules and the integration of a special monitoring and evaluation system. Set in the best available science and evidence, it focuses on active responsive complementary feeding as well as breast feeding and involves all aspects related to child nutrition: feeding, health and care practices. The strategy is based on a participatory approach bringing all parties on board, and developing a multisectorial intervention to address and manage the specific nutritional problems.

The global strategy was adopted in Oman in 2002. The IYCF policy was issued and distributed nationwide in November 2003.

The areas covered by the national strategy are as follows:

- Breastfeeding
- Complementary Feeding
- Code of marketing of breast-milk substitutes
- Safe preparation of complementary foods
- Prevention of micronutrients deficiencies
- Prevention of chronic nutritional disorders
- Multi-sectoral coordination and community participation

### Baby-Friendly Hospital Initiative (BFHI)

The BFHI is a global initiative of the World Health Organisation and UNICEF that aims to give every baby the best start in life by creating a health care environment that supports breastfeeding as the norm.

The Initiative was launched in 1991 and by the end of 2004 more than 19,000 health facilities worldwide had been officially designated Baby-friendly.

The Initiative includes a global assessment and accreditation scheme that recognises the achievements of health facilities whose practices support breastfeeding and encourages health facilities with less than optimal practices to improve.

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However further studies are required to understand the pattern related to the number of cases caused by each pathogen and the food implicated. It was apparent that a significant proportion of the subjects had a recent exposure to diarrhoea and/or illness related to food; and this had an impact on absenteeism and consequently on the economics and the society.

This study emphasizes the importance to review the reporting system related to food borne diseases; and develop a comprehensive program that entails training of physicians and laboratory technicians; develop the chain of procedures associated with food borne disease management.

The specific recommendations are:

- Review and re-structure the foodborne disease surveillance and reporting.
- Conduct qualitative research to understand the factors associated with health care seeking behaviours among population and management practices among the health care staff.
- Develop a manual of operations including standardized guidelines for foodborne disease management as well as a training manual for physicians, laboratory technicians and nurses.
- Promote laboratory confirmation approach to the cases reported as due to food poisoning.



“IYCF is a comprehensive strategy on infant and young-child feeding built on previous achievements and includes guidelines on ensuring appropriate feeding of infants and young children.”

“Currently the monitoring system appears inadequate to effectively control activities of the infant-formula companies possibly due to limited communication at various levels of the system.”

### BFHI in Oman

- The breastfeeding policy was endorsed in 1992 based on the WHO's 10 steps of BFHI and was disseminated to all health facilities highlighting baby-friendly-hospitals initiative and the establishment of support groups.
- The national breastfeeding policy was revised in 2002 to implement the WHA resolution for promoting exclusive breastfeeding up to six months instead of 4-6 months and continue breastfeeding up to two years with adequate introduction of complementary foods.
- The implementation of the policy in Ministry of Health hospitals was extremely functional because of the non-existence of private hospitals and the high rates of hospital deliveries (estimated to be 95%) and the religious backup to breastfeeding. Because of the policy, high rates of early initiation of breastfeeding and ever-breastfed infants were observed. The community support groups established all over the country were instrumental in promoting breastfeeding.

All hospitals in Oman were certified for being baby-friendly until 1998. Thereafter evidence of appropriate assessment was unavailable. However all hospitals still fol-

low practices (Baby-friendly) such as rooming in, early initiation of breastfeeding etc.

### Training and Capacity Building

Training was carried out for BFHI managers in the hospital, BFHI assessors and master trainers since the initiation of the program. These activities have slowed down in the last few years. However a training package on lactation counselling in PHC was introduced by the Nutrition Department.

Other courses on breastfeeding are:

- WHO Breastfeeding Counselling: A training course (English & Arabic)
- WHO Complementary Feeding Counselling: a training course (English & Arabic).
- WHO 2005/6 BFHI materials: Revised, Updated and Expanded for Integrated Care (English)
- WHO Breastfeeding Promotion and Support in a Baby-Friendly Hospital: A 20-hour course for maternity staff (English)

### Monitoring the Code

Currently the monitoring system appears inadequate to effectively control activities of the infant-formula companies possibly due to limited communication at various levels of the system.

**Table-1**  
**Summary of Infant and Young Child Feeding Practices: 2005-07**

Indicators	Result		
	2005	2006	2007
1. <b>Initiation of breastfeeding</b> <i>% of Babies breastfed within one hour of birth</i>	87.1 % GOOD	87.1% GOOD	89.32% GOOD
2. <b>Exclusive breastfeeding</b> <i>% of babies 0–6 months of age exclusively breastfed in the last 24 hours</i>	30.8 % FAIR	42.0% FAIR	38.84% FAIR
3. <b>Duration of breastfeeding</b> <i>Median duration in months of breastfeeding of children under three years of age</i>	15.7 m POOR	17.4 m POOR	--
4. <b>Bottle-feeding</b> <i>% of breastfed babies 0–12 months of age fed from bottles in the last 24 hours</i>	40.5 % POOR	40.5 % POOR	57.17% POOR
5. <b>Complementary feeding</b> <i>% of breastfed babies 6–10 or 7–10 months of age who received complementary foods in the last 24 hours</i>	88.9 % GOOD	91.5 % GOOD	93.24% GOOD

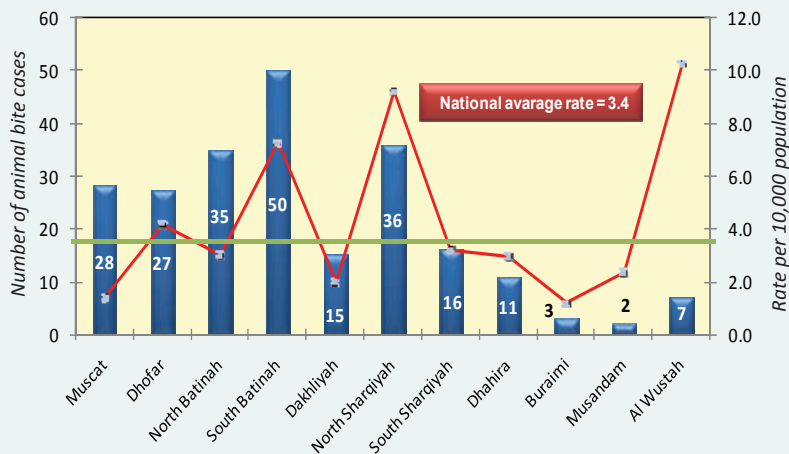
Source: Ministry of Health, Annual Health Report 2005, 2006 & 2007



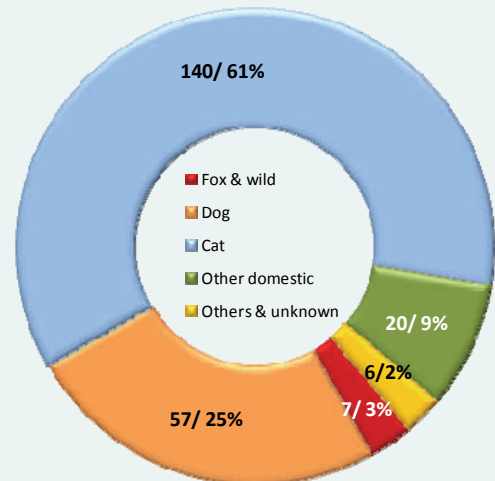
## Animal Bite Surveillance Data

Third quarter: July to September 2008

Notified animal bites by Regions (# & annualized rate/10,000 population)



Notified animal bites by type of animal (# / %)



### Brief Summary & Observations on

### Communicable Disease Surveillance Data: Third quarter - July to September 2008

#### Group A Diseases & Syndromes

- **AFP:** Two AFP cases were reported from Mudhaibi Wilayat (North Sharqiyah) and Ibri Wilayat (Dhahira). These were later classified as non-polio-compatible with final diagnosis of 'Sickle Cell Disease' and 'Guillian Barré Syndrome' respectively. The later child had residual paralysis during 60 days follow-up.
- **Fever & Rash illness:** Of the 209 cases reported, 4 were classified as clinical and one case from Rustaq Wilayat (South Batinah) was confirmed as Measles. A staff nurse from Haima Wilayat (Al Wustah) with a travel history abroad was confirmed as a Rubella case. No CRS cases were reported in Q3.
- **Meningococcal infections:** One case of meningococcal meningitis was reported from Seeb (Muscat Region).
- **Hib Meningitis:** 21 month old child (vaccinated) from Seeb Wilayat (Muscat Region) was diagnosed as a case of Hib meningitis.
- **Pulmonary Tuberculosis:** Of the reported cases, 30 were sputum positive and 8 were sputum negative.
- **Food poisoning:** One major episode of food poisoning was reported from Taqah Wilayat (Dhofar) involving 54 cases in a workers' camp of Marina Tourism Development Company. 14 minor episodes with 46 cases were reported.
- **Other diseases (unlisted):** One case of travel associated Dengue fever type-1 was reported from Royal Hospital during Q3. She was a Korean flight attendant.

#### Group B Diseases

- **Meningitis:** Eight cases of meningitis other than Nm and Hib were reported. Of these 4 were from Muscat Region.
- **Viral Hepatitis:** Total 189 cases were reported and of these 185 were unspecified due to unavailability of the diagnostic Kits at the CPHL.
- **Pertussis:** 17 clinical cases were reported and additional three were serologically confirmed.
- **Brucellosis:** 22 cases were reported, 20 of them are from the endemic Dhofar Governorate.
- **Leishmaniasis:** Two sporadic case of Cutaneous Leishmaniasis were reported from Muscat and Dhofar regions.
- **HIV [AIDS]:** 13 new HIV infections were diagnosed and 7 AIDS cases were reported among the HIV positive chronic carriers.

#### Group C Diseases

- **Varicella:** In the 3<sup>rd</sup> quarter a total of 7348 cases of chickenpox were reported from all over the country.
- **Mumps:** 120 cases of clinical mumps were reported through the passive surveillance system while from sentinel sites 55 cases were reported that were subjected to laboratory confirmation. Of these 11 were IgM positive.

## Communicable Disease Surveillance Data: *By Month*

**Third quarter: July to September 2008**

Priority Communicable Diseases	2008				2007		2008	
	Jul	Aug	Sep	Total	Q3 Jul-Sep	Q4 Oct-Dec	Q1 Jan-Mar	Q2 Apr-Jun
<b>Group A Diseases</b>								
Cholera	-	-	-	0	3	2	-	-
Plague	Never reported							
Yellow Fever	Never reported							
Meningococcal Infection	-	-	1	1	1	2	1	0
H. influenzae type b, meningitis ( <i>Hib</i> )	1	-	-	1	-	-	0	1
Rabies	-	-	-	0	-	-	0	0
Malaria ( <i>Imported Cases</i> )					245	187	103	281
Pulmonary Tuberculosis ( <i>sputum positive</i> )	9	12	9	30	37	18	15	33
<b>Group A Syndromes</b>								
Acute Flaccid Paralysis [Polio]	-	1	1	2	5	3	17	4
Fever & Rash-Illness	91	76	42	209	133	160	173	320
<i>Clinical Cases</i>	-	4	-	4	3	-	1	5
Measles ( <i>IgM positive</i> )	1	-	-	1	1	4	4	1 + 2 (i)
Rubella ( <i>IgM positive</i> )	1	-	-	1	-	-	-	3
Congenital Rubella Syndrome ( <i>CRS</i> )	-	-	-	-	-	-	-	-
Severe Acute Respiratory Syndrome ( <i>SARS</i> )	Never reported							
Acute Haemorrhagic Fever Syndrome	-	-	-	0	-	-	-	-
Food Poisoning ( <i>Infectious origin</i> )	79	28	63	170	208	116	80	159
<b>Group B Diseases</b>								
Bacterial Meningitis ( <i>other than Hib &amp; Nm</i> )	3	2	3	8	5	8	3	16
Viral Meningitis	-	-	-	0	2	2	-	-
Other Meningitis ( <i>unspecified</i> )	3	-	4	7	3	11	12	8
Acute Viral Hepatitis ( <i>Total</i> )	50	79	60	189	143	134	192	259
Acute Viral Hepatitis A	-	2	2	4	87	61	103	11
Acute Viral Hepatitis B	-	-	-	0	2	7	9	-
Acute Viral Hepatitis C	-	-	-	0	8	3	2	-
Acute Viral Hepatitis D ( <i>amongst B positive</i> )	-	-	-	0	-	-	-	-
Acute Viral Hepatitis E	-	-	-	0	-	3	-	-
Acute Viral Hepatitis ( <i>unspecified</i> )	50	77	58	185	46	60	78	248
Typhoid & Paratyphoid Fever	7	5	6	18	12	13	9	24
Clinical Pertussis [IgM positive]	10	6	1 [3]	17 [3]	34 [1]	19	18	30 [2]
Trachoma ( <i>active</i> )	9	4	6	19	20	6	14	23
Brucellosis ( <i>human</i> )	8	4	10	22	25	13	17	35
Leishmaniasis Cutaneous (CL)	-	1	1	2	1	2	1	3
Leishmaniasis Visceral (VL)	-	-	-	0	-	-	-	-
Schistosomiasis ( <i>intestinal</i> )	-	-	-	0	-	1	-	-
Pulmonary Tuberculosis ( <i>sputum negative</i> )	3	2	3	8	10	3	9	11
Extra-pulmonary Tuberculosis	4	4	14	22	33	14	28	32
Leprosy	-	-	-	0	-	-	-	1
HIV [AIDS]	4 [1]	3 [0]	6 [6]	13 [7]	10 [8]	7 [2]	23 [9]	11 [8]
<b>Group C Diseases and Syndromes</b>								
Influenza Like Illnesses ( <i>ILI</i> )	2005	2318	2718	7041	11431	14789	10950	11829
aLRTI & Pneumonia ( <i>childhood</i> )	638	959	1317	2914	2947	6021	4746	3240
Acute 'Watery' Diarrhoea ( <i>childhood</i> )	1729	1806	1722	5257	6302	8797	10783	7597
Chickenpox	3218	2604	1526	7348	10461	11956	18838	22226
Clinical Mumps [Sentinel sites-IgM positive]	44 [7]	40 [2]	36 [2]	117 [11]	124 [10]	153 [22]	148 [20]	189 [27]

## Communicable Disease Surveillance Data: *By Regions*

Third quarter: July to September 2008

Priority Communicable Diseases	Total	Muscat	Dhofar	North Batinah	South Batinah	Dakhli- yah	North Sharqi- yah	South Sharqi- yah	Dhahira	Buraimi	Musan- dam	Al Wustah
<b>Group A Diseases</b>												
Cholera	0	-	-	-	-	-	-	-	-	-	-	-
Plague	Never reported											
Yellow Fever	Never reported											
Meningococcal Infection	1	1	-	-	-	-	-	-	-	-	-	-
H. influenzae type b, meningitis ( <i>Hib</i> )	1	1	-	-	-	-	-	-	-	-	-	-
Rabies	0	-	-	-	-	-	-	-	-	-	-	-
Malaria ( <i>Imported Cases</i> )												
Pulmonary Tuberculosis ( <i>sputum +ve</i> )	30	9	2	9	3	1	-	2	2	-	-	2
<b>Group A Syndromes</b>												
Acute Flaccid Paralysis [Polio]	2	-	-	-	-	-	1	-	1	-	-	-
Fever & Rash-Illness	209	17	12	43	46	44	12	19	12	-	1	3
<i>Clinical Cases</i>	4	2	-	-	1	-	-	1	-	-	-	-
Measles ( <i>IgM positive</i> )	1	-	-	-	1	-	-	-	-	-	-	-
Rubella ( <i>IgM positive</i> )	1	-	-	-	-	-	-	-	-	-	-	1
Congenital Rubella Syndrome ( <i>CRS</i> )	0	-	-	-	-	-	-	-	-	-	-	-
Severe Acute Respiratory Syndrome ( <i>SARS</i> )	Never reported											
Acute Haemorrhagic Fever Syndrome	0	-	-	-	-	-	-	-	-	-	-	-
Food Poisoning ( <i>Infectious origin</i> )	170	5	54	32	15	9	15	7	31	2	-	-
<b>Group B Diseases</b>												
Bacterial Meningitis ( <i>other than Hib &amp; Nm</i> )	8	4	1	1	1	-	-	1	-	-	-	-
Viral Meningitis	0	-	-	-	-	-	-	-	-	-	-	-
Other Meningitis ( <i>unspecified</i> )	7	-	-	6	-	-	1	-	-	-	-	-
Acute Viral Hepatitis ( <i>Total</i> )	189	9	26	15	17	1	23	88	4	4	-	2
Acute Viral Hepatitis A	4	4	-	-	-	-	-	-	-	-	-	-
Acute Viral Hepatitis B	0	-	-	-	-	-	-	-	-	-	-	-
Acute Viral Hepatitis C	0	-	-	-	-	-	-	-	-	-	-	-
Acute Viral Hepatitis D ( <i>amongst B +ve</i> )	0	-	-	-	-	-	-	-	-	-	-	-
Acute Viral Hepatitis E	0	-	-	-	-	-	-	-	-	-	-	-
Acute Viral Hepatitis ( <i>unspecified</i> )	185	5	26	15	17	1	23	88	4	4	-	2
Typhoid & Paratyphoid Fever	18	4	3	6	1	1	1	-	-	-	1	1
Clinical Pertussis [IgM positive]	17 [3]	3	3	-	6 [1]	3	1 [2]	1	-	-	-	-
Trachoma ( <i>active</i> )	19	-	-	-	2	3	14	-	-	-	-	-
Brucellosis ( <i>human</i> )	22	-	20	-	-	1	-	-	-	1	-	-
Leishmaniasis Cutaneous (CL)	2	1	1	-	-	-	-	-	-	-	-	-
Leishmaniasis Visceral (VL)	0	-	-	-	-	-	-	-	-	-	-	-
Schistosomiasis ( <i>intestinal</i> )	0	-	-	-	-	-	-	-	-	-	-	-
Pulmonary Tuberculosis ( <i>sputum negative</i> )	8	1	4	-	2	-	-	-	1	-	-	-
Extra-pulmonary Tuberculosis	22	7	8	2	3	-	-	2	-	-	-	-
Leprosy	0	-	-	-	-	-	-	-	-	-	-	-
HIV [AIDS]	13 [7]	6 [3]	0 [1]	3 [1]	0 [1]	3 [0]	-	-	0 [1]	-	1 [0]	-
<b>Group C Diseases and Syndromes</b>												
Influenza Like Illnesses ( <i>ILI</i> )	7041	1	167	-	21	-	6795	3	52	-	2	-
aLRTI & Pneumonia ( <i>childhood</i> )	2914	169	945	230	817	354	176	196	-	-	15	12
Acute 'Watery' Diarrhoea ( <i>childhood</i> )	5257	520	1397	720	124	1456	-	421	405	133	80	1
Chickenpox	7348	570	375	997	1343	1172	805	970	721	167	90	138
Clinical Mumps [IgM positive]	120 [11]	14 [1]	14	29 [2]	23 [5]	18 [1]	9	8 [1]	3 [1]	1	-	1

## Communicable Disease Surveillance Data: *By Wilayah*

### Third quarter: July to September 2008

Region / Governorate	Wilayah	AFP	Measles	Rubella	Meningococcal infection	Viral Hepatitis A	Viral Hepatitis B	Malaria	Pertussis [IgM +ve]	TB Total	TB Sputum positive
Muscat	Muscat										
	Mutrah					1				5	3
	Bawsher								2	2	2
	Seeb				1	1			1	7	2
	Al Amerat					2					
Dhofar	Qurayat									3	2
	Salalah								1	10	2
	Taqah									3	
	Mirbat										
	Thumrait										
	Sadha									1	
	Rakhyut										
	Dhalkut										
	Shaleem										
North Batinah	Muqshan								2		
	Mazyoona										
	Sohar									2	2
	Suwaiq									3	2
	Saham										
	Shinas									1	1
South Batinah	Liwa										
	Khaburah									5	4
	Rustaq		1						2	1	
	Barka								2	3	1
	Musanah								1	2	2
	Nakhl										
Dakhliyah	Wadi Maawil									2	
	Al Awabi								1 [1]		
	Nizwa								2	1	1
	Samail										
	Bahla								1		
	Izki										
	Adam										
North Sharqiyah	Al Hamra										
	Manah										
	Bidbid								0 [1]		
	Ibra										
	Mudaibi	1							1 [1]		
South Sharqiyah	Bidiyah										
	AL Qabil										
	Dima Wa Al Tayeen										
	Wadi Bani Khalid										
	Sur									2	1
Dhahira	Jalan Bani Bu Ali								1	1	1
	Jalan Bani Bu Hassan									1	
	Al Kamil Wa Al Wafi										
	Masirah										
Buraiimi	Ibri	1								1	
	Yankul									1	1
	Dhank										
Musandam	Buraimi									1	1
	Mahda										
	Sunaina										
Al Wustah	Khasab										
	Daba Al Biya										
	Bukha										
	Madha										
Total	Haima			1							
	Duqum									1	1
	Mahoot										
	Al Jazer									1	1
<b>Total</b>		<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>17 [3]</b>	<b>60</b>	<b>30</b>

## Communicable Disease Surveillance Data: Age Distribution

Third quarter: July to September 2008008

Priority Communicable Diseases	Total	Age groups in years								
		< 1	1-4	5-9	10-14	15-19	20-24	25-34	35-45	45+
<b>Group A Diseases</b>										
Cholera	0	-	-	-	-	-	-	-	-	-
Plague	Never reported									
Yellow Fever	Never reported									
Meningococcal Infection	1	-	-	-	-	-	-	-	1	-
H. influenzae type b, meningitis ( <i>Hib</i> )	1	-	1	-	-	-	-	-	-	-
Rabies	0	-	-	-	-	-	-	-	-	-
Pulmonary Tuberculosis (sputum positive)	30	-	-	-	-	5	4	4	5	12
<b>Group A Syndromes</b>										
Acute Flaccid Paralysis [Polio]	2	-	2	-	-	-	-	-	-	-
Fever & Rash-Illness	209	85	86	19	2	1	5	8	1	2
<i>Clinical Cases</i>	4	1	2	1	-	-	-	-	-	-
Measles ( <i>IgM positive</i> )	1	-	1	-	-	-	-	-	-	-
Rubella ( <i>IgM positive</i> )	1	-	-	-	-	-	-	1	-	-
Congenital Rubella Syndrome ( <i>CRS</i> )	-	-	-	-	-	-	-	-	-	-
Severe Acute Respiratory Syndrome ( <i>SARS</i> )	Never reported									
Acute Haemorrhagic Fever Syndrome	0	-	-	-	-	-	-	-	-	-
Food Poisoning ( <i>Infectious origin</i> )	170	4	20	22	19	19	24	43	13	6
<b>Group B Diseases</b>										
Bacterial Meningitis ( <i>other than Hib &amp; Nm</i> )	8	4	1	-	-	-	-	1	1	1
Viral Meningitis	0	-	-	-	-	-	-	-	-	-
Other Meningitis ( <i>unspecified</i> )	7	1	1	1	1	-	1	-	1	1
Acute Viral Hepatitis ( <i>Total</i> )	189	4	61	65	15	9	11	11	6	7
Acute Viral Hepatitis A	4	1	-	1	1	-	1	-	-	-
Acute Viral Hepatitis B	0	-	-	-	-	-	-	-	-	-
Acute Viral Hepatitis C	0	-	-	-	-	-	-	-	-	-
Acute Viral Hepatitis D ( <i>amongst B positive</i> )	0	-	-	-	-	-	-	-	-	-
Acute Viral Hepatitis E	0	-	-	-	-	-	-	-	-	-
Acute Viral Hepatitis ( <i>unspecified</i> )	185	3	61	64	14	9	10	11	6	7
Typhoid & Paratyphoid Fever	18	2	2	1	1	3	-	6	2	1
Clinical Pertussis [ <i>IgM positive</i> ]	17 [3]	13 [3]	4	-	-	-	-	-	-	-
Trachoma ( <i>active</i> )	19	-	1	2	5	4	5	1	-	1
Brucellosis ( <i>human</i> )	22	1	5	4	4	1	2	1	3	1
Leishmaniasis Cutaneous (CL)	2	-	-	1	-	-	-	1	-	-
Leishmaniasis Visceral (VL)	0	-	-	-	-	-	-	-	-	-
Schistosomiasis ( <i>intestinal</i> )	0	-	-	-	-	-	-	-	-	-
Pulmonary Tuberculosis ( <i>sputum negative</i> )	8	-	-	-	-	1	2	2	-	3
Extra-pulmonary Tuberculosis	22	-	-	-	1	2	5	5	3	6
Leprosy	0	-	-	-	-	-	-	-	-	-
HIV [AIDS]	13 [7]	-	1 [1]	-	-	1 [1]	1 [1]	6 [0]	2 [4]	2 [0]

### Note:

- High proportion of unspecified Viral Hepatitis in Q2 is due to shortage of diagnostic ELISA kits in CPHL.
- The quarterly data are 'provisional' & should be scrutinized & verified by the focal point of communicable diseases (Epidemiologist) at the provincial level. The data would be finalized, after receiving feedback.
- The Group C data should also be carefully checked & verified for accuracy. Ensure that case definitions are strictly followed.
- Tuberculosis, Leprosy & HIV [AIDS] data are for nationals only.
- All notified cases of Malaria are imported cases.
- (i) = imported case.

"The wisest mind has something yet to learn."



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*Concept, layout & Design  
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