NATIONAL NUTRITION SURVEILLANCE

National nutrition surveillance report 2009

Summary: Nutrition is an important indicator of health and socio-economic status of any society; and many factors reflect nutritional status across the lifecycle. This report reviews available data on malnutrition; micronutrients deficiencies, obesity and food borne diseases in Oman from 1995 through 2007.

The data indicate that malnutrition among infants and young children is on the decline, together with vitamin A deficiency and iodine deficiency disorders whereas anemia remains a high priority for unknown reasons and obesity should be tackled in a systematic and targeted way. Incidence of food borne disease should be surveyed with more vigilance and clearer guidance.

DEPARTMENT OF NUTRITION

8/1/2009

NATIONAL NUTRITION SURVEILLANCE REPORT 2009

1 INTRODUCTION

Programs of nutrition within the ministry of health in Oman aim at achieving better nutrition for all of those living in Oman. The world health organization defines nutrition interventions in four major areas; supplementation, fortification, dietary diversification and public health measures.

This report will examine the status of nutrition among various categories of the Omanis in light of those measures and within the context of the objectives of the five year plan of action.

The current cycle of the five year plan of action ends in 2010, and this report is timely as it highlights areas of deficiency in the programs as well as nutrition status of the population. Some indicators are not obtainable yet; and therefore measures should be taken to make these available to guide the nutrition policies and plans of action.

This will be the first of annual surveillance reports that will aim to document the nutritional status of Omanis and equip decision makers with the tools to establish interventions.

2 OBJECTIVES OF THE NATIONAL NUTRITIONAL SURVEILLANCE:

1) To assess the performance the current nutrition programs in Oman.
2) To assess the nutrition status of various categories of the population, especially high risk groups and those targeted with interventions.
3) To justify the rationale for modifications in nutrition and public health interventions.

3 INDICATORS OF NUTRITION STATUS:

Indicators of nutrition status of the population are those labeled in epidemiological terms as impact indicators as their change and direction reflect impact of an intervention or more. Unlike morbidity and immunization indicators, nutritional indicators are influenced by multiple health, nutritional, education and socio-economic factors that it could be

impossible to quantitatively identify a contribution of a specific intervention. Luckily, it is not our purpose to do so here, but to monitor the change of the nutrition status of the population in the major areas in question.

This report will review trend data on malnutrition, anemia, and obesity among infants and young children, school children and women of childbearing age as well as food borne diseases, etc.

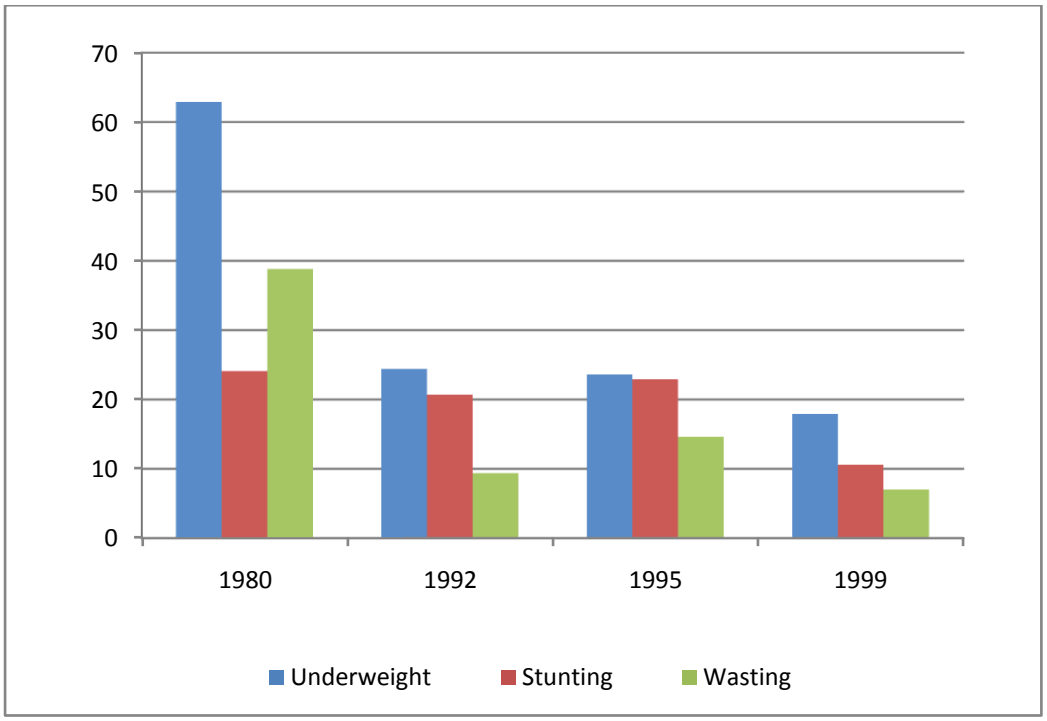
3.1 Protein energy malnutrition among infants and young children:

Protein Energy Malnutrition as manifested in underweight (low-weight-for-age), wasting (low-weight-for-height) and stunting (low height-for-age) is considered one of the important nutrition issues among infants and young children in Oman since 1992.

The trend in the PEM rates in Oman is monitored from the national surveys that took place in the years 1980, 1992, 1995 and 1999. There is a clear decline in the rates of all indicators of PEM and this can be attributed to the improvements in the quality of health care, improvements of immunization rates and reduced incidence of morbidity especially infectious diseases from the early 1990's.

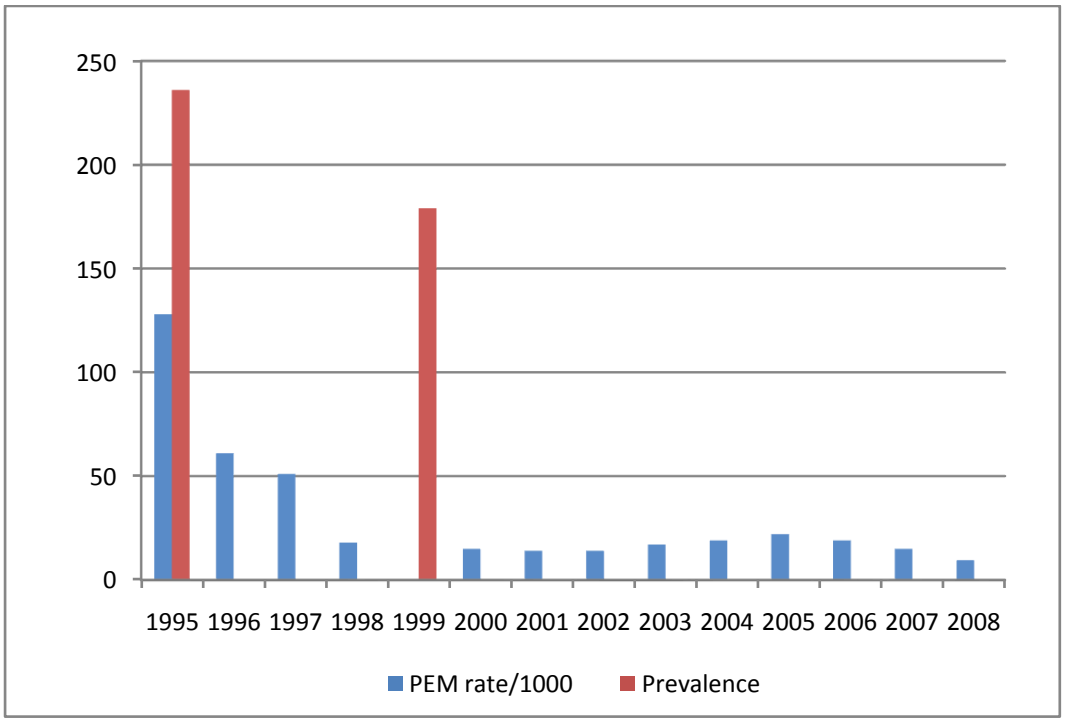
Data on PEM incidence in PHC was available from 1995, where it was estimated to be 128. In 2005 a more vigilance system of detection and management of PEM cases were introduced and after a slight increase in the incidence these started to fall again from 2006. It should be noted that reporting from PHC underestimates the prevalence of PEM as assessed in national surveys; in 1999 the prevalence of PEM was 17.9% according to the national PEM survey whereas the incidence rate reported in 2000 was 15/1000 of those in the child health register. It is not known whether the PEM register improved the detection rate; however this will be shown from the results of the national child nutrition survey 2009.

Figure 1: Trend in underweight, stunting and wasting among infants and young children at the ages of 0-5 years in Oman as reported by national surveys.



Primary Health Care data indicate a marked decline in the rates of PEM among infants and young children since it was identified as a public health problem in 1995. From 128 per 1000 in 1995, it went down to 15 /1000 in 2007 and 9.5/1000 in 2008.

Figure 2 Rate of PEM according to PHC reporting in Oman from the years 1995-2007 compared to prevalence estimates of national surveys conducted within the same time frame.

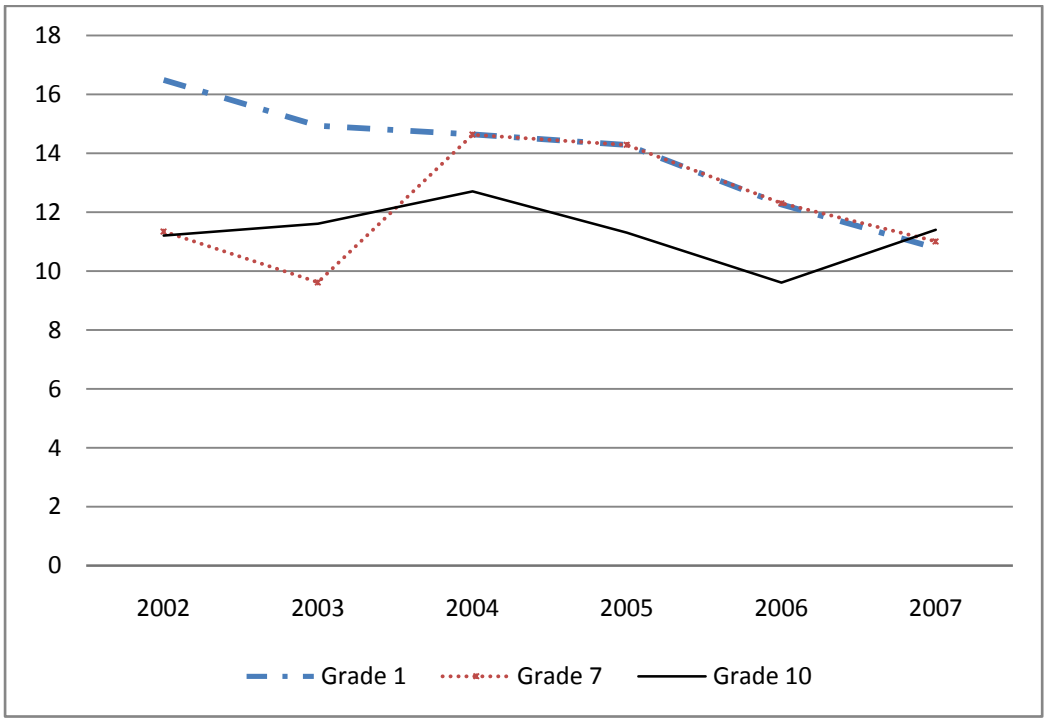


It is aimed to reduce the prevalence of underweight to below 10% on the national level and in the regions. Results of the 2009 child nutrition survey will show if this target had been achieved and geographical areas and regions where the problem still persists.

3.2 Underweight and stunting among school children:

Monitoring of malnutrition among school children was initiated in 2002 in Grades 1, 7, and 10 as part of the annual school health examination. Proportion of children in grade 1 who are underweight is showing a steady decline from 16.5% in 2002 to 10.8% in 2007 which is consistent with data from health centers for the ages 0-5 years old. This decline reflects the performance in PEM management in the preschool age. Underweight in grade 7 follows the same pattern as grade 1 starting 2004. Adolescents in grade 10 seem to have a better nutritional status as the rates of underweight is less; however in 2007 all three age groups had almost the same prevalence (11%).

Figure 3 Trend in underweight among students of grade 1, 7, and 10 according to the annual health statistics report from 2002-2007.



3.3 Underweight among adults:

Adult malnutrition as indicated by underweight reflects the socio-economic conditions in a country as well as the health and nutritional status of the population. It is one of the Millennium Development Goals to eradicate hunger as indicated by adult malnutrition. The latest data available on underweight is from the national health survey 2000; where the rates showed a 62% decline from the 25% observed by Amine et al in 1980. More recent data are needed to confirm the trend. The most effected age groups are young adults between the age of 20-34 years and those above 65 years. This calls for targeted interventions in schools and among the elderly. The most effected regions are Musendem, Dhakhilia and Muscat.

Figure 4 Trend of underweight among Omani adults according to national nutrition and health surveys.

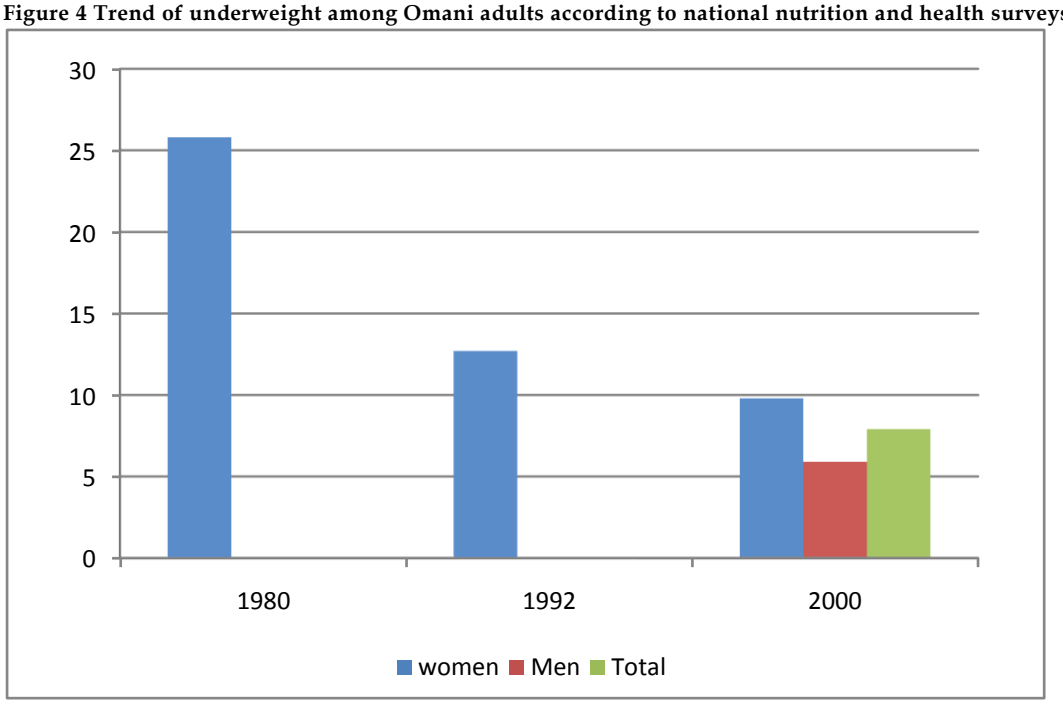
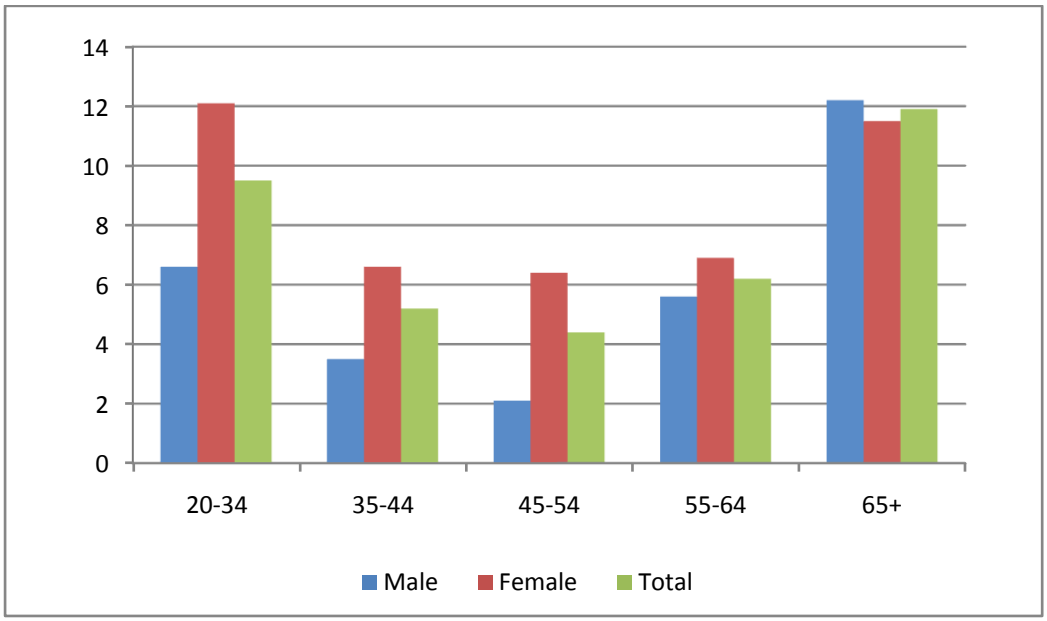


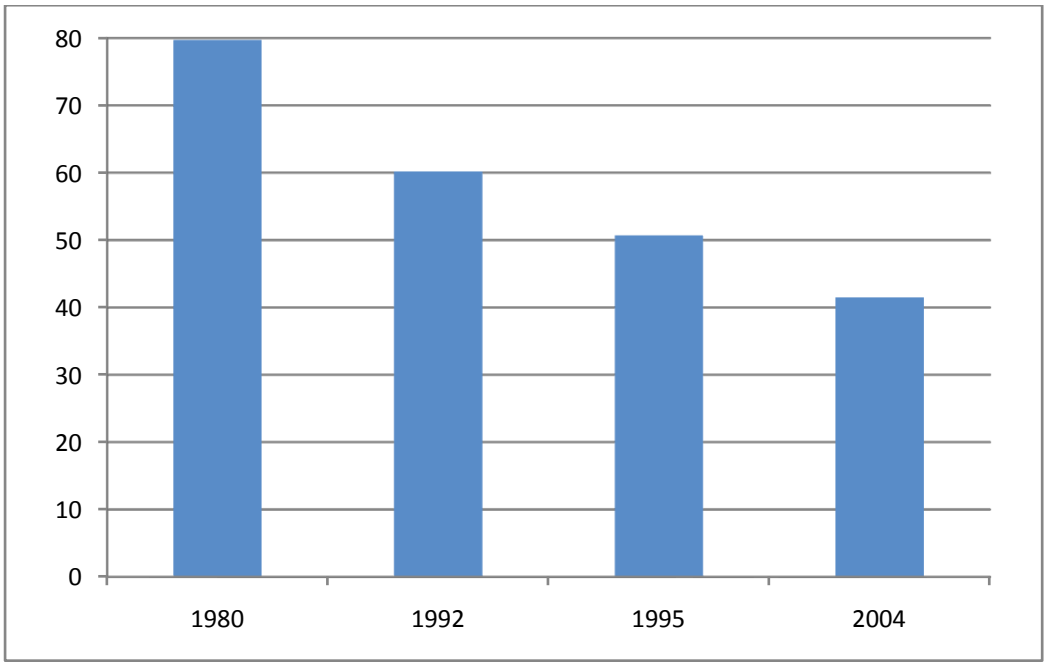
Figure 5: Age distribution of underweight among Omani males and females.



3.4 Anemia and Iron Deficiency among infants and young children:

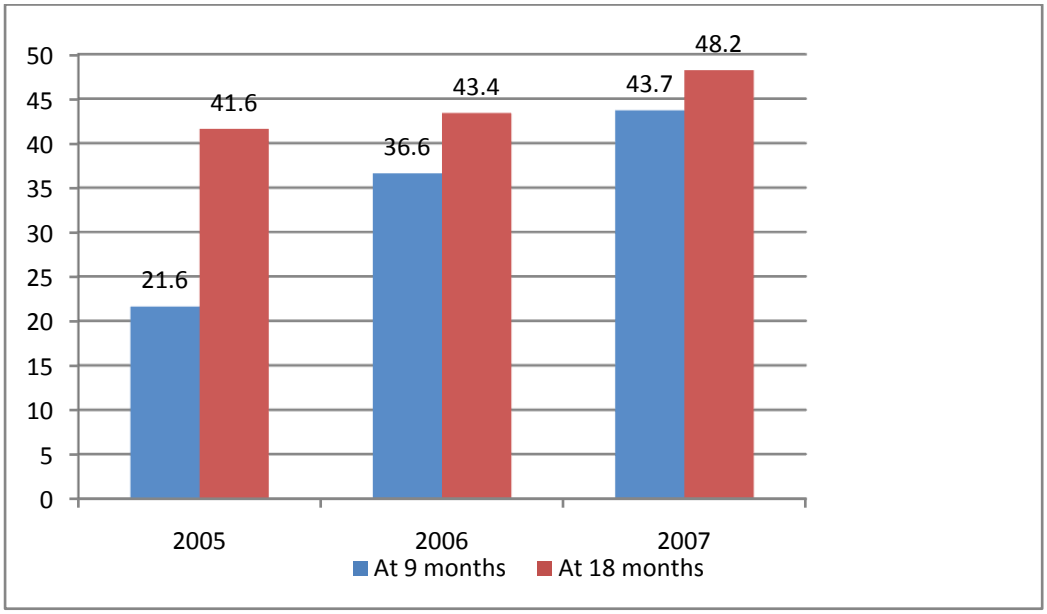
Anemia was highlighted as an important public health problem in among infants and young children in Oman through the national food fortification study (2004) where it was found that 41.5% of this age group had Hemoglobin levels below the cut-off level. A review of older literature found that anemia in this age group had significantly declined from 80% in 1980, to 60% in 1992, 50% in 1995 to reach a level of 41% in 2004. This rate however is still alarming because of the severe irreversible adverse effects of anemia on infants and young children.

Figure 6 Prevalence estimates of Anemia among infants and young children at the age of 0-5 years old according to national surveys in Oman.



As a result of these findings a national surveillance and management system was established voluntarily in several regions of the country; and screening at 9 months was established as a standard. Results of the years 2005-2007 indicate an increasing trend probably because of the improved coverage of screening. In addition the proportion of anemic children is higher at the age of 18 months than 9 months. Intervention is needed before the age of 9 months to prevent anemia at this age group.

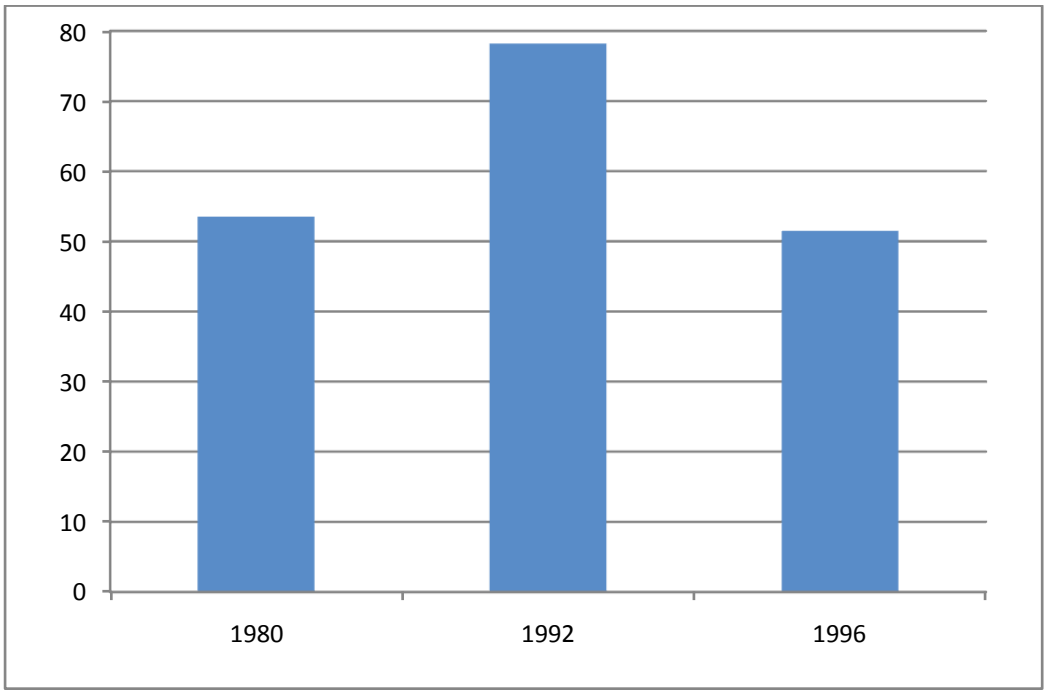
Figure 7 Proportion of anemic children from the primary health care reporting in the years 2005-2007.



3.5 Anemia among school children

Studies on Anemia among school children show inconsistent trend and the latest study in 1996 showed a high prevalence of almost 50%. Reporting data from schools indicated levels of 6%, 6.3% and 14% in the years 2005-2007. This need to be verified and the reporting mechanism of school data to be validated.

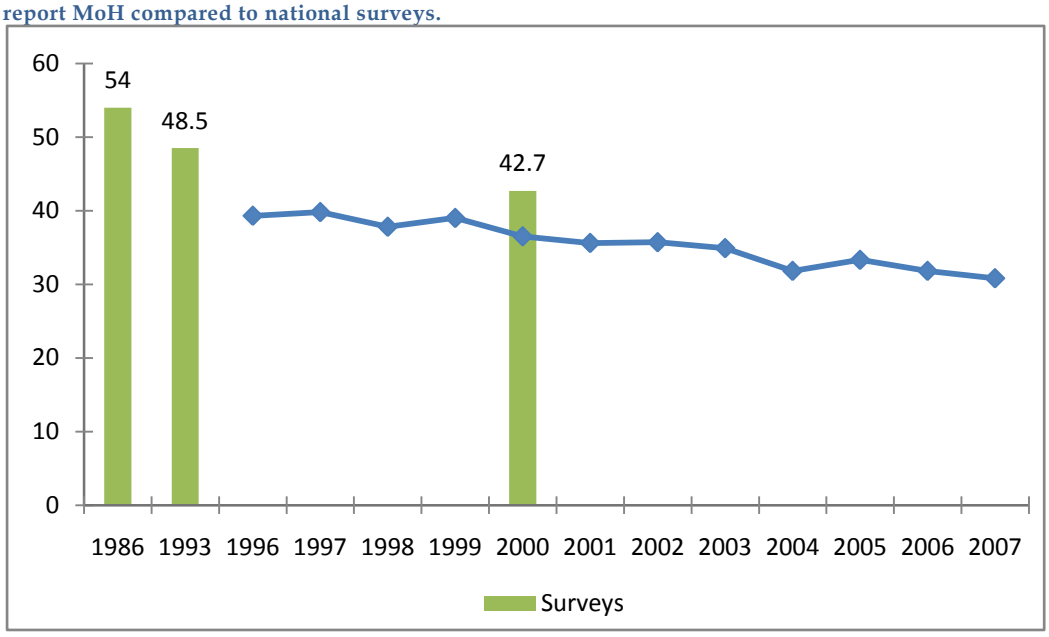
Figure 8 Prevalence of anemia among school children according to national nutrition surveys in Oman



Anemia of pregnancy as measured by Hemoglobin levels are assessed through national surveys where the latest survey in 2000 showed an

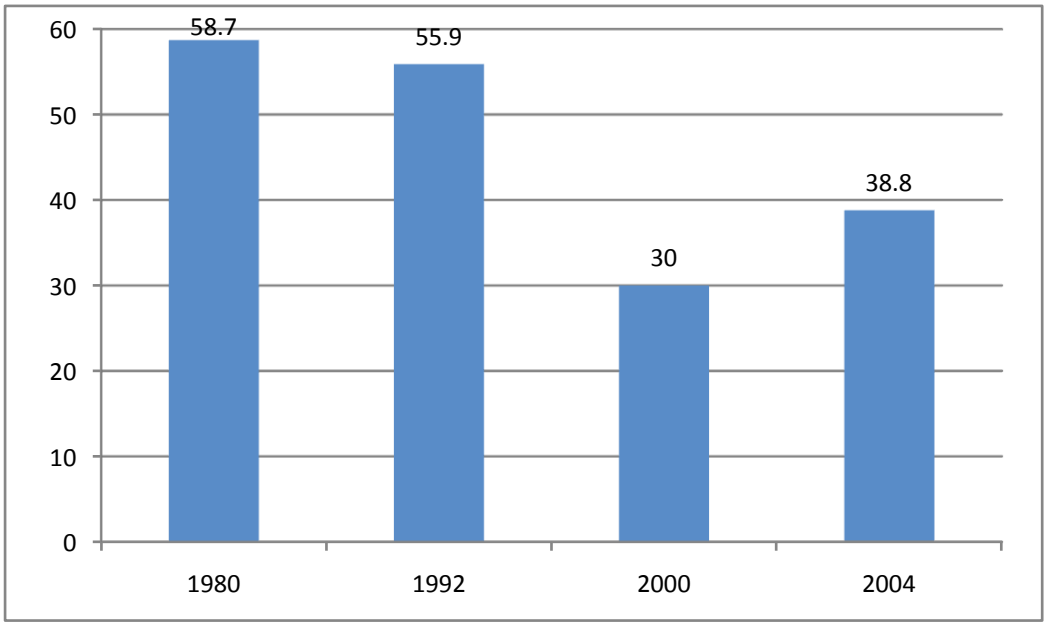
estimate of 42%. Routine reporting of the pregnancy anemia at first booking started in 1996; and as shown in figure 8 the rates are showing a slow and steady decline; probably a reflection of improvement of general health status of the population. Pregnancy anemia persists as a major public health problem in Oman.

Figure 9 Prevalence of anemia among pregnant women at first booking according to the annual health report MoH compared to national surveys.



Anemia among non-pregnant women is equally of major public health concern. The rates according to national surveys went down from 55% in 1992 to 30% in 2000 and climbed again in 2004 to reach 38.8%.

Figure 10 Trend of anemia among non-pregnant women of child bearing age according to national surveys in Oman.



3.6 Iodine deficiency disorders; Congenital Hypothyroidism:

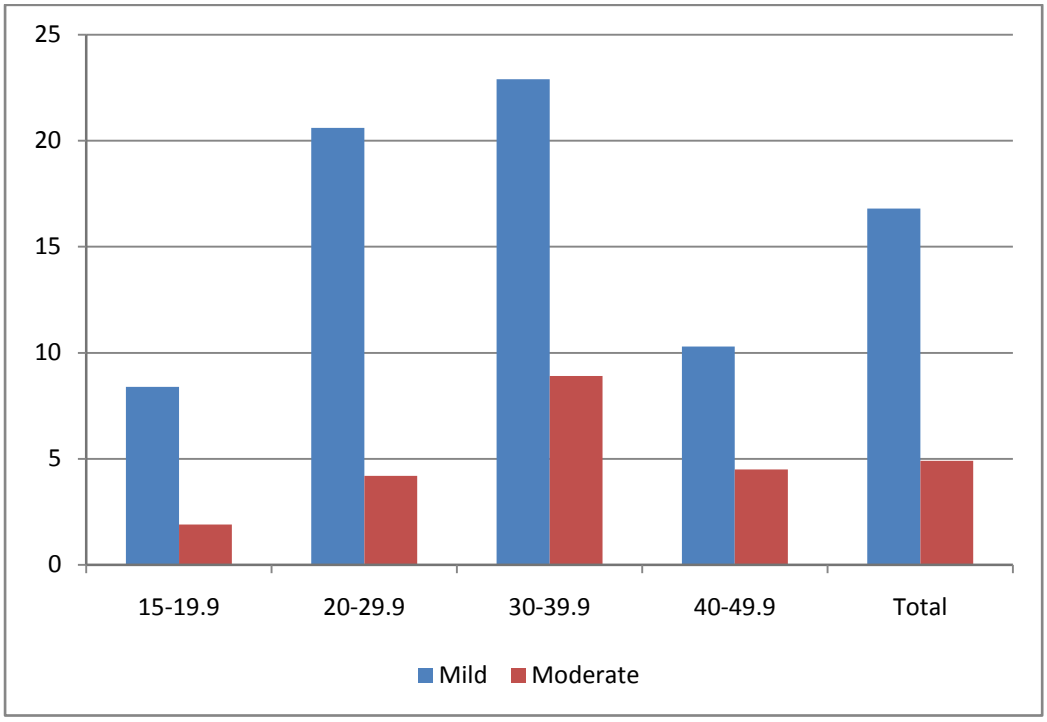
Congenital Hypothyroidism as indicated by the Thyroid Stimulant Hormone (TSH) is an important indicator of iodine status in the population. The Ministry of Health initiated screening for TSH in 2005 and the results indicate that less than 2% of the infants screened are at risk of hypothyroidism. The total case count was found to be 16 in 2005 (of 42065 live births), 16 in 2007 (44116 live births), and 24 in 2007 (41009 live births).

3.7 Subclinical Iodine Deficiency among school children and pregnant women:

The World Health Organizations recommended population goals for the control of Iodine Deficiency Disorders are to achieve a UI level of 100µg/L among at least 50 per cent of the population; and that no more than 20 per cent would have less than 50µg/L. The food fortification survey in 2004 showed that the prevalence of UI <100 µg/L (mild severity) was 16.8% and the prevalence of UI <50 µg/L (moderate severity) was 4.9%. There were no significant differences between UI levels on marital status, the head of household's education or per-capita monthly income.

These results indicate that there is the IDD had been controlled in Oman; however monitoring the salt iodization coverage is essential to ensure continuity of this success.

Figure 11 Prevalence of mild and moderate iodine deficiency among women of child bearing age according to the food fortification survey 2004.



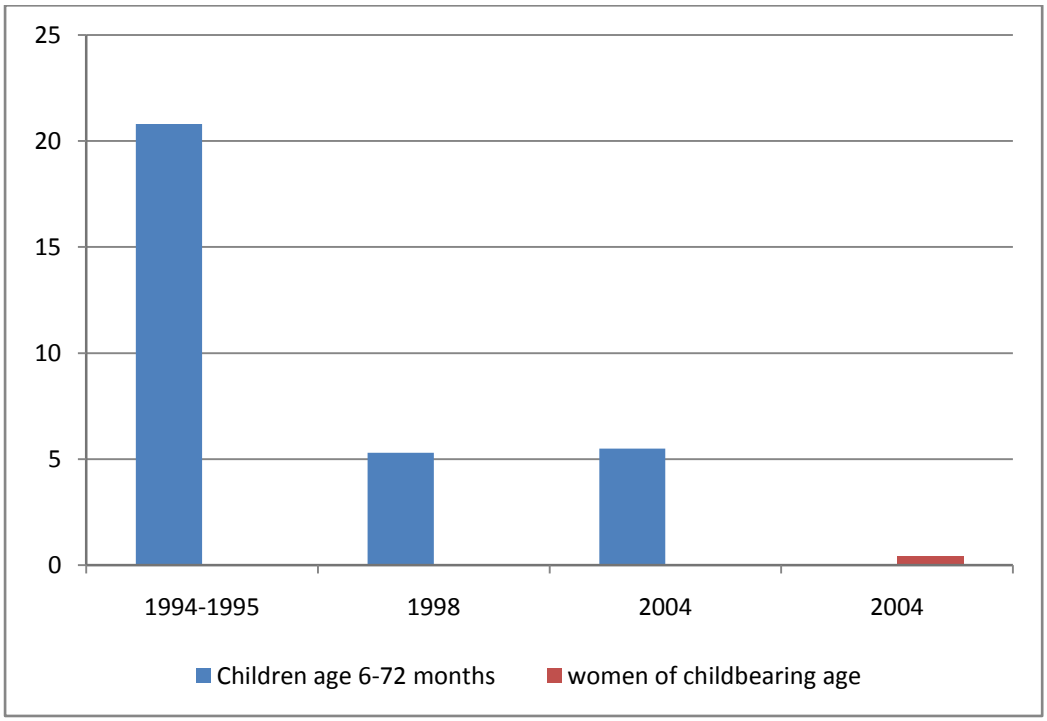
3.8 Vitamin A deficiency among preschool children and women of childbearing age:

In 1981, WHO found that 1.5% of Omani children had bitot's spot, and in 1995-1996 a study on school children showed that 11.1% of them had low vitamin A status according to the Modefied Relative Dose Response Asssay. In 1998 38.8% of lactating women had vitamin A status according to breastmilk retinol levels.

The trend in Vitamin A status according to serum retinol however can be elucidated from the studies on infants where the first study was conducted in 1994 and showed a prevalence of 20.8%; this rate went down to 5.3% in 1998 after the national supplementation program and this achievement was maintained in 2004 as the prevalence was 5.5% among infants and less than 0.4% among women of childbearing age.

The national supplementation program is continued; and an oil fortification program is being proposed and legislation is expected to be issued in 2009.

Figure 12 Trend in sub-clinical vitamin A deficiency (serum retinol levels <0.7 µmol/l among infants and prevalence among women in child bearing age in 2004.

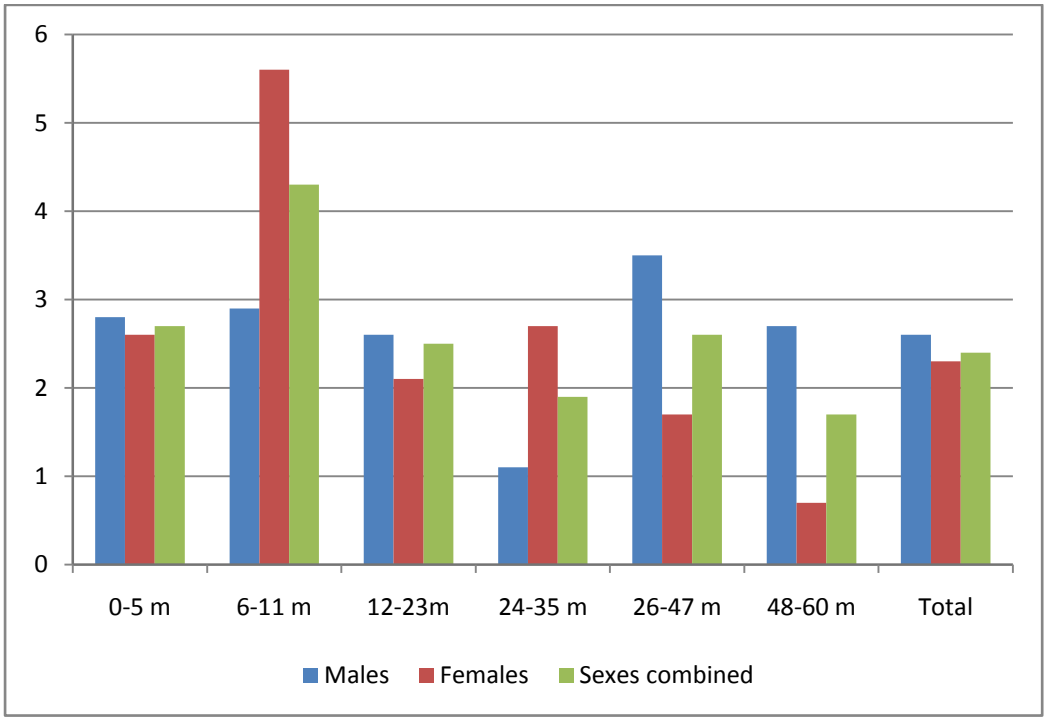


4 NUTRITIONAL RISK FACTORS OF CHRONIC DISEASES:

4.1 Obesity among infants and young children:

The only set of data available on obesity is from the national PEM study. This data set was analyzed according to the WHO growth reference 2005 and the results indicate a low prevalence of 1.9% overweight (above +2SD of BMI for age Z-score) and 0.5% morbid obesity (above +3SD of BMI for age Z-score). The chart below shows that there is no clear age trend for obesity in this age group; probably because of the low incidence.

Figure 13 Prevalence of obesity among infants and young children in Oman according to the national study on PEM 1999.



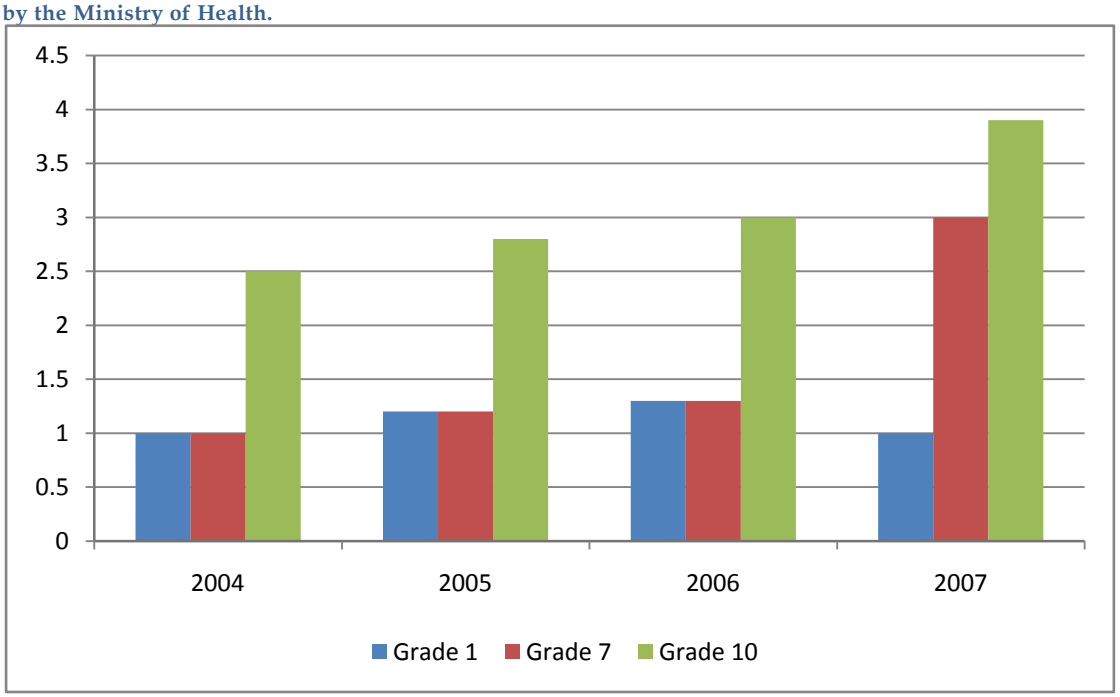
4.2 Obesity among school children:

Data on obesity among school children are collected as part of the annual health examination for grades 1, 7, and 10 since 2004. Although the rates are low; a subtle rising trend is observed for older age groups as these increased by 30% in the years 2006-2007.

Intervention to prevent obesity is timely for children and adolescents in schools as the rising trend observed in most developing and developed

countries in the world could be reversed through appropriate monitoring and intervention.

Figure 14 Trend in Obesity among school children in Oman according to the annual health statistics report by the Ministry of Health.



4.3 Obesity among adult males and females in child bearing age:

Obesity rates among adult males and females sum up to about 48% in 2000 without a significant increase from 1992.

Figure 15 Rates of Obesity in Oman in 1992 and 2000 according to national surveys and following WHO criteria of definition of grades of obesity.

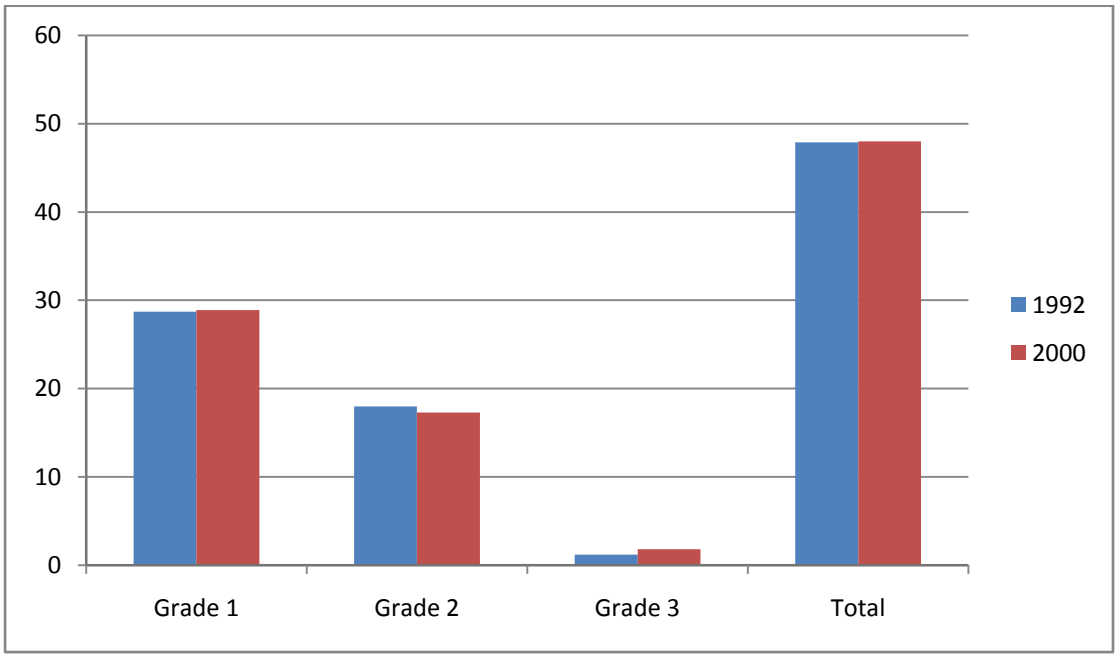
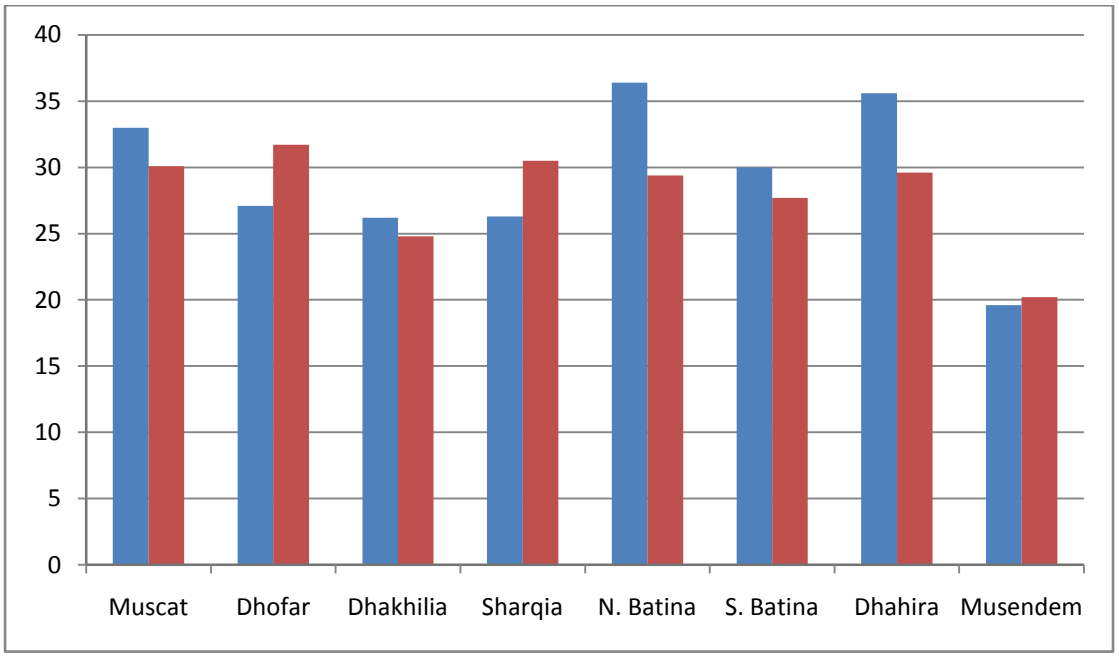
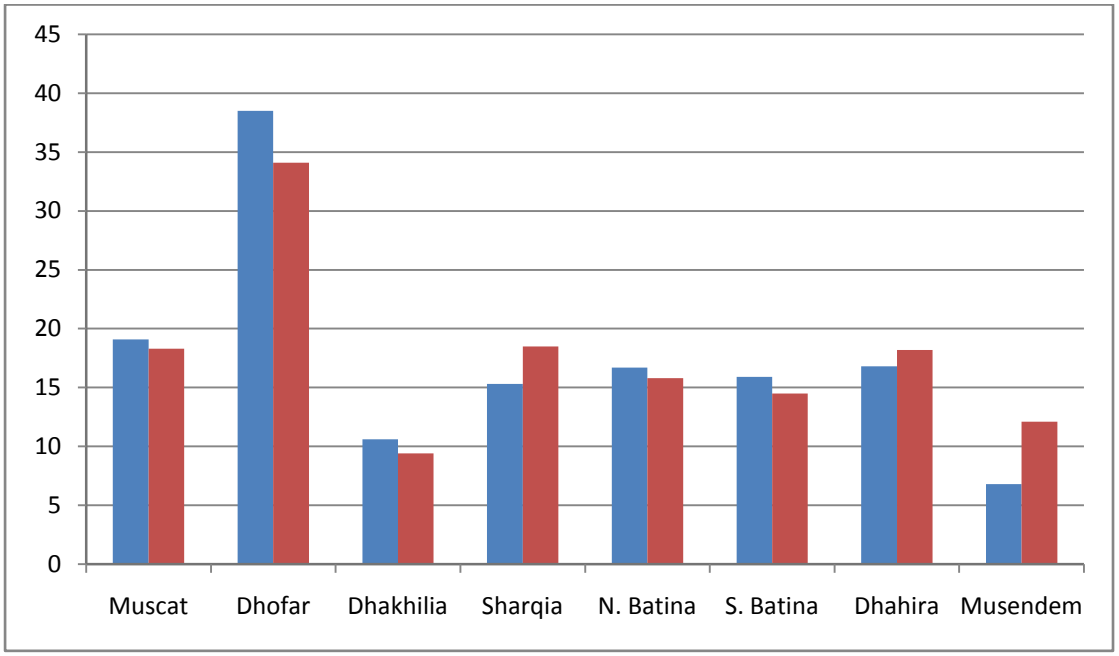


Figure 16 Trend in overweight among adults in various regions of Oman from 1992 to 2000 according to national nutrition surveys.



The association between severity of obesity and morbidity/ mortality is well known. Graphs 16 and 17 indicated that Grade 1 obesity (overweight) has increased in Dhofar (increase of 17%), Sharqia (16%) and Musendem (3%); whereas Grade II obesity increased in Sharqia (21%); and Dhahira (8%). These data indicate that obesity should be tackled through targeted programs and national data could be misleading because of the variation in the severity of the problem and its distribution. Sharqia seem to be the most vulnerable region. There are not data available to compare South and North Sharqia.

Figure 17: Trend in Grade II obesity among adults in Oman according to national surveys in 1992 and 2000.



4.4 Food borne diseases

Data of food borne diseases show that there is no obvious trend since the late 1900's, and the most affected age-groups are 1-15 as shown in the graphs below. The reported number of salmonella cases are declining; probably due to lack of follow up of the system to those cases. A more comprehensive system to follow up food borne diseases is required as illustrated by recommendations of several WHO consultations.

Figure 18 Trend in the incidence rate of Diarrhea cases per 1000 child below the age of 5 years in Oman.

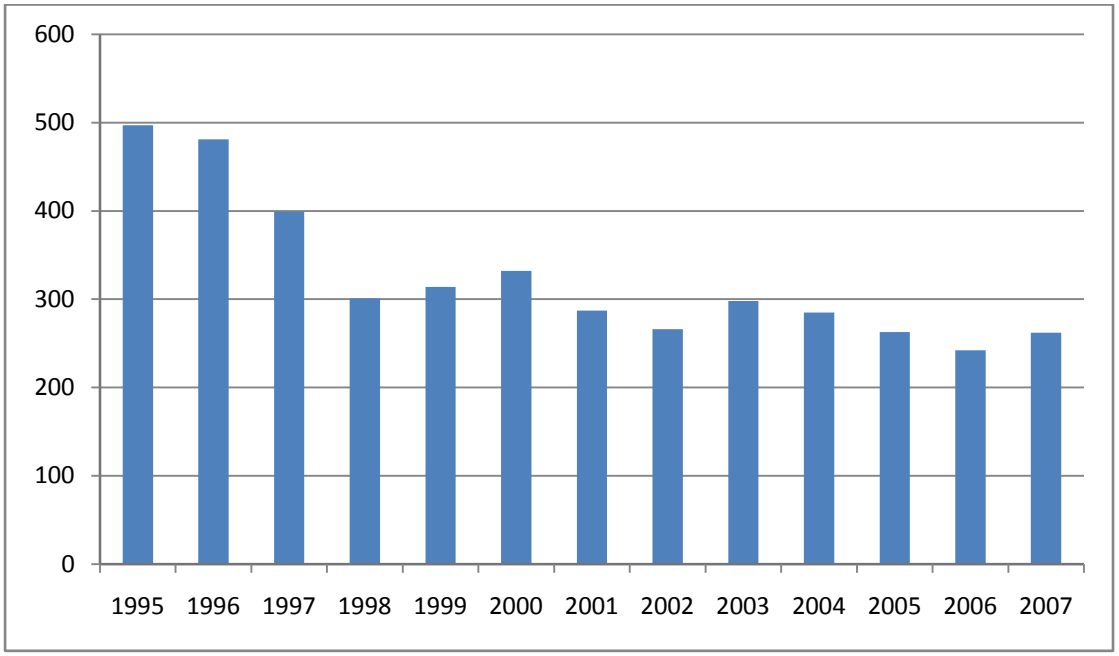


Figure 19 Incidence of food poisoning cases as reported by Primary health care facilities in the years 1995-2008.

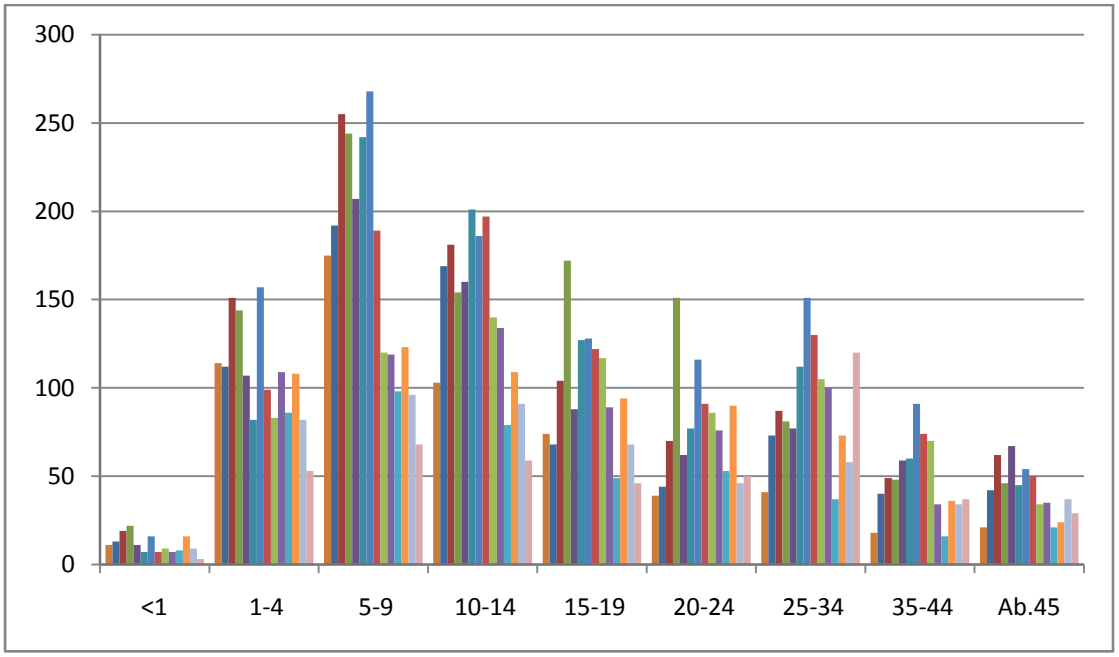
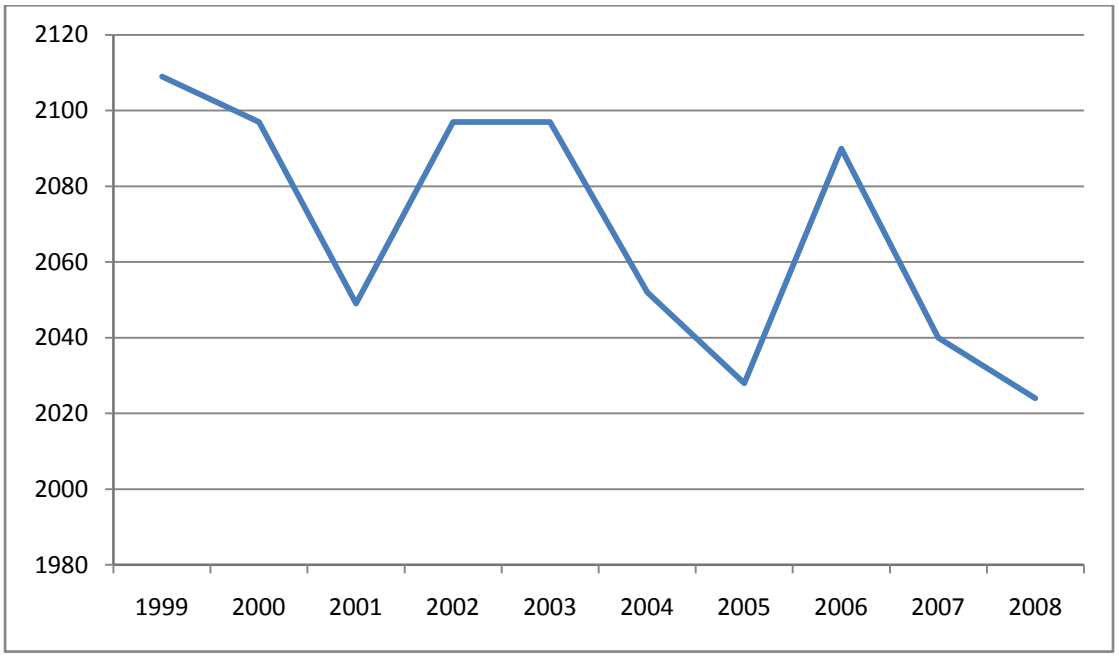


Figure 20 Number of salmonella poisoning cases as reported by primary health care institutions in the Ministry of Health from the years 1999-2008.



REFERENCES:

1. Ministry of Health. National Study on the Prevalence of Vitamin A deficiency (VAD) among children 6 months to 7 years. Ministry of Health 1995, WHO, UNICEF., Muscat.
2. Suleiman AJM, Alriyami A, Farid SM. Oman Family Health Survey 1995: Principal Report. Muscat- Ministry of Health 2000.
3. Protein Energy Malnutrition among pre-school Children in Oman, Results of a national survey. D. Alasfoor, M. K. Al Sayed., A. A.M Al Qasmi et al. Eastern Mediterranean Health Journal (Vol 13; 5: 2007: 146-154).
4. Determinants of persistent underweight among 6-35 mo old children after huge economic and health services improvements in Oman; Deena Alasfoor; Pierre Traissac; Agnes Gartner and Francis Delpeuch (Journal of Health population and nutrition; 2007 September 25(3) 359-369.
5. Pellet P. A food and Nutrition Policy of Oman. Assignment report 1996.,WHO Muscat.
6. Rosalind S. Gibson. Principles of Nutritional Assessment. Oxford University Press 1990., New York.
7. Directorate General of Planning (2003). Annual Health Statistics Report. Ministry of Health, Oman.
8. Amine, E et al. (1980) Nutrition Status Survey in Oman and Bahrain. Report of the United Nations Children's Fund (UNICEF). UNICEF, Muscat, Oman.
9. A, O, Mussaigher., (1992) Study of health and nutritional status of Omani families. Report of the United Nations Children's Fund (UNICEF) UNICEF, Muscat, Oman.
10. Suleiman, A.J.M., Al-Riyami, A and Farid S.M., (2000) Oman Family Health Survey 1995: Principal Report. Muscat: Ministry of Health.
11. Al-Asfoor, D., (1999) National PEM Survey. Unpublished report of the Ministry of Health, Oman. Ministry of Health, Muscat, Oman.
12. De Onis, M., Frongillo, E. A., and Blőssner, M., (2000) Is malnutrition declining? An analysis of changes in levels of child malnutrition since 1980. Bulletin of the World Health Organization 2000; 78(10):1222-1233.
13. Davidson R. Hemoglobin values in preschool children and pregnant women in Oman. *Medical newsletter*, 1986, 2:38.
14. Maternal and Child Health and Family Health, World Health Organization. Evaluation of Nutritional Anemia Control

Programme in the Sultanate of Oman. Report of the Safe motherhood Programme. 1993. WHO/HQ.

15. Deena Alasfoor. Nutritional Anemia and Vitamin A deficiency in Oman, A multivariate analysis. 1996. Cornell University. Ithaca, NY.
16. Ministry of Health, Oman. Center for Disease Control, USA. UNICEF, Muscat. Eastern Mediterranean Regional Office of the World Health Organization. The study of food fortification in Oman. Flour, Salt and Oil. Executive Summary April 2006 (non-published report).
17. Dr. K. A. Abbas and S.K. Reddy, Assignment Report; Appraisal of vitamin A deficiency. 1981. WHO/Oman.
18. Ministry of Health. World Health Organization. United Nations Children's Fund, National Study on the Prevalence of Vitamin A Deficiency (VAD) among Children 6 months to 7 Years. Oman, 1994-1995;
19. Ministry of Health, UNICEF-Oman. National Vitamin A Impact Study. 1999.
20. Ministry of Health, Oman. UNICEF. 1998. A National Breastmilk Vitamin A Study. Sultanate of Oman.
21. Ministry of Health, Sultan Qaboos University, WHO, UNICEF. National Study on the Prevalence of Iodine Deficiency Disorders. 1993-1994. MOH-Oman.
22. Ministry of Health, UNICEF. Monitoring Universal Salt Iodization in Oman, A Collaborative Project of MOH/UNICEF 1998. MOH/UNICEF-Oman.
23. Ministry of Health, UNICEF. Monitoring Oman's Progress in Achieving Universal Salt Iodization. 2000. MOH/UNICEF-Oman.
24. Ministry of Health, National Diabetes Survey, 1992 (Non-Published data).

Ministry of Health, Unicef, UNFPA. Oman. 2000. National Health Survey, 2000. Volume I: Study of lifestyle risk factors. MoH-Oman.