

References

1. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: estimates for the year 2000 and projections for 2030. *Diabetes Care* 2004; 27: 1047-1053.
2. Al-Nozha MM, Al-Maatouq MA, Al-Mazrou YY, Al-Harhi SS, Arafah MR, Khalil MZ, et al. Diabetes mellitus in Saudi Arabia. *Saudi Med J* 2004; 25: 1603-1610.
3. Torgerson JS, Hauptman J, Boldrin MN, Sjostrom L. Xenical in the prevention of diabetes in obese subjects (XENDOS) study: a randomized study of orlistat as an adjunct to lifestyle changes for the prevention of type 2 diabetes in obese patients. *Diabetes Care* 2004; 27: 155-161.
4. Van Gaal LF, Rissanen AM, Scheen AJ, Ziegler O, Rossner S. RIO-Europe Study Group. Effects of the cannabinoid-1 receptor blocker rimonabant on weight reduction and cardiovascular risk factors in overweight patients: 1-year experience from the RIO-Europe study. *Lancet* 2005; 365 :1389-1397.
5. Despres JP, Golay A, Sjostrom L. Rimonabant in Obesity-Lipids Study Group Effects of rimonabant on metabolic risk factors in overweight patients with dyslipidemia. *N Engl J Med* 2005; 353: 2121-2134.

Five-year surveillance of chickenpox in Qassim, Central Saudi Arabia

Saulat Jahan, MPH, FCPS,
Abdullah M. Al-Saigul, MBBS, ABF Med,
Shamandy A. Hamed, MBBS, DPH&E.

Chickenpox or Varicella results from primary infection with varicella zoster virus. The resulting illness is usually mild, but serious complications and deaths can occur. Amongst children, generally it is a mild illness but rare complications such as pneumonia, encephalitis and acute cerebellar ataxia may occur. Chickenpox is an important public health problem because it is very common, highly contagious and carries a high secondary attack rate. It leads to untoward health and economic consequences. A live-attenuated varicella vaccine is available, has proven to be safe and effective, and introduced in some countries around the world. In the Kingdom of Saudi Arabia, chickenpox is a notifiable disease. According to the Ministry of Health Communicable Diseases Report 2003, the reported cases demonstrate a rise during the years 2000 to 2003.¹ In Saudi Arabia, the vaccine for varicella is not included in the routine childhood immunization program. At this point in time, when there is a debate regarding introduction of universal varicella vaccination in Saudi Arabia,² insight into the epidemiology of chickenpox is essential to assess the need of introduction of universal varicella vaccination. Subsequently, the knowledge

of chickenpox epidemiology will also be helpful to formulate an appropriate strategy for implementation and evaluation of the vaccination program. This study describes the magnitude of the problem as well as epidemiological factors of chickenpox in Qassim region for 5 years period; from 1999 to 2003.

It is a descriptive analysis of surveillance data of chickenpox, collected by the Preventive Medicine Department, Primary Health Care Administration, Qassim region. Qassim, located in the northern part of the center of Kingdom of Saudi Arabia, covers an area of 78,500 Km². According to the Third National Census of Population and Housing, its population was 1.016 million during the year 2004.³ Non-Saudis comprised 19.6% of the population, majority of them, being adults constituting the expatriate work force. The list of Notifiable Diseases in Qassim region follows the list of Ministry of Health and includes chickenpox as a notifiable condition. The surveillance data for notifiable diseases has been computerized in Qassim since January 1999. Reporting of notifiable diseases to the Preventive Medicine Department is "passive", that is the department relies on health care providers in health care facilities to report disease occurrence. All health care facilities; primary, secondary and tertiary, whether public or private, are obliged to submit weekly report of notifiable disease cases to the primary health care administration. The data included age, gender and nationality of the cases. Other variables were reporting week, name of reporting health care facility and district. Analyses were conducted using the Statistical Package for Social Sciences version 10. The distribution of cases was examined by age, gender and nationality. Between 1999 and 2003, 20,788 cases of chickenpox were reported and provided the basis for the analysis. Overall, the incidence rates increased from 207 per 100,000 population in 1999 to 759 per 100,000 during

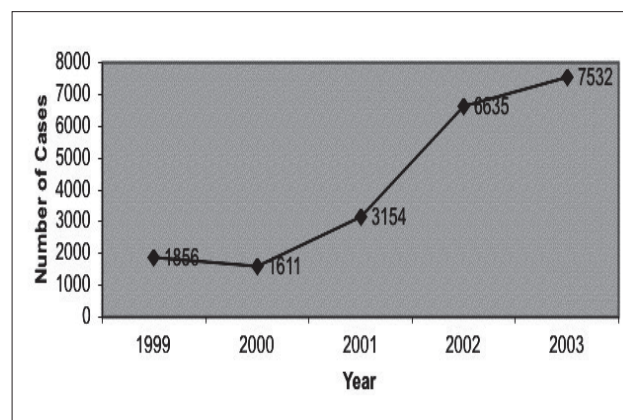


Figure 1 - Reported cases of chickenpox in Qassim, Kingdom of Saudi Arabia (1999-2003).

Five year surveillance of chickenpox in Qassim, Central Saudi Arabia

Table 1 - Distribution of cases of chickenpox by gender and age-group in Qassim, Kingdom of Saudi Arabia (1999-2003).

Age-group	Gender (%)		Total
	Males	Females	
<1 year	158 (1.4)	158 (1.7)	316 (1.5)
1-4 years	1433 (12.7)	1206 (12.7)	2639 (12.7)
5-9 years	4193 (37.0)	3461 (36.6)	7654 (36.8)
10-14 years	3069 (27.2)	2644 (27.9)	5713 (27.5)
15-19 years	1338 (11.8)	976 (10.3)	2314 (11.1)
20-24 years	423 (3.7)	384 (4.1)	807 (3.9)
25-44 years	587 (5.2)	541 (5.7)	1128 (5.4)
45-64 years	94 (0.8)	63 (0.7)	157 (0.8)
65+ years	25 (0.2)	27 (0.3)	52 (0.3)
Unknown	4 (0.0)	4 (0.0)	8 (0.0)
Total	11324 (100)	9464 (100)	20788 (100)

2003. The incidence rates in Saudis increased from 245 per 100,000 in 1999 to 918 per 100,000 in the year 2003. In case of non-Saudis the incidence rates for 1999 and 2003 were 51 per 100,000 and 107 per 100,000. A sharp rise in the absolute number of cases can be noticed since the year 2000 (**Figure 1**). The number of cases increased from 1611 in 2000 to 7532 in the year 2003-more than 4-fold increase.

Table 1 displays the numbers of incident cases of chickenpox by gender and age group for the period 1999-2003. Chickenpox was reported in 11324 (54.5%) males and 9464 (45.5%) females. The highest proportion (36.8%) of notifications for chickenpox cases occurred in the 5-9 age group. Approximately 78.5% of the reported cases were below age 15. Children <5 years constituted 2955 (14.2%) cases and 52 (0.3%) cases were >65 years. Saudis constituted 20,034 (96.4%) of the notified cases, while 752 (3.6%) were non-Saudis. In 2 reports, nationality was not recorded. The weekly distribution of chickenpox in the region showed a seasonality pattern with higher incidence between 9th and 26th weeks of the year, corresponding to the months of March-June. More than one-third (43.7%) of the cases was reported during these months. There was then a decline from June through September. A rise in number of cases was noticed again starting from the 38th week namely mid-September and was continuous until the end of the year. The highest number [10,004 (48.1%)] of cases were reported from Primary Health Care Centers, followed by 5,752 (27.7%) cases from other government institutions, then from hospitals 3,296 (15.9%) cases were reported and least [466 (2.2%)] by private institutions. The reporting health care facility of 1270 (6.1%) cases was

not recorded. Our study shows an increasing incidence of chickenpox in the Qassim region during the study period. This finding is in accordance with the results reported in other published literature.^{1,2} The lower incidence rates amongst non Saudis can be explained by the fact that chicken pox is mainly a childhood disease and majority of non Saudi population comprises of adult working age group. Although the incidence of disease was reported to be similar in both gender in most of the medical literature,^{4,5} the number of cases is significantly ($p < 0.0001$) higher in males in our study. Several studies carried out in the prevaccination era in developed countries have reported that varicella was most frequently seen between ages 4 and 10 years. In our study also, the highest proportion (36.8%) of cases are reported in the age group 5-9 years. In France and USA, during prevaccination era, approximately 90% of chickenpox cases occurred in children <15 years of age. In contrast, in our study the percentage of chickenpox cases <15 years was 78%, which is consistent with other reports from Saudi Arabia, demonstrating 16-25% of chickenpox occurring in adults, and 15-20% of adults being seronegative.⁶ Various studies from developed countries have mentioned that the age distribution of chickenpox appears to be changing, with more cases being reported in children aged 0-4 years.^{7,8} Some researchers have attributed this change to increased social mixing in pre-schoolers, allowing greater opportunity for virus transmission.⁸ Others have attributed it to the possibility of an overall decline in transmission or increasing rates of mild or sub clinical infection in under 5-age group.⁴ However, the proportion of cases in 0-4 age group in our study remains almost stable during the study period. This might be explained by

the fact that the majority of children are exposed to the virus in their schools as the culture of day cares and pre-school nurseries is not much prevalent in this region. In our study, distinct seasonality pattern was observed as also reported by other researchers. Varicella is reported to be more common in the spring and winter season it was also observed in this study. Biases are inherent in a passive surveillance system that relies on reporting from health care providers. Not all chickenpox cases, from the community submit reports to the health care facilities that lead to underestimation of the problem size. Similarly, chickenpox cases may not be notified to the preventive medicine department. These factors need to be identified and investigated.

Our study concludes that there is a substantial increase in reported cases of chickenpox in Qassim and routine varicella immunization will definitely decrease the incidence and severity of disease. However, decision making should depend on special studies to determine the true incidence and severity of chickenpox, its seroprevalence and cost-effectiveness of immunization.

Acknowledgment. We would like to thank all health care providers who provide surveillance reports to Primary Health Care Administration, Qassim, Kingdom of Saudi Arabia.

Received 13th September 2006. Accepted 20th December 2006.

From the Health Education and Training Department (Jahan), Primary Health Care Administration (Al-Saigul), and the Department of Preventive

Medicine, (Hamed), Primary Health Care Administration, Qassim, Kingdom of Saudi Arabia. Address correspondence and reprint requests to: Dr. Saulat Jahan, Health Education and Training Department, Primary Health Care Administration, Qassim, Kingdom of Saudi Arabia. Tel. +966 (6) 3820481. E-mail: saulatjahan@hotmail.com

References

1. Ministry of Health Communicable Diseases Report, Saudi Arabia: Ministry of Health Publication; 2003.
2. Almuneef M, Memish ZA, Balkhy HH, Alotaibi B, Helmy M. Chickenpox complications in Saudi Arabia: Is it time for routine varicella vaccination? *J Infect Dis* 2006; 10: 156-161.
3. The Saudi Arabia Information Resource. Ministry of Economy and Planning. Kingdom of Saudi Arabia. (Accessed 2006 July 16) Available from URL: <http://www.saudinf.com>
4. Lowe GL, Salmon RL, D Rh Thomas and M R Evans. Declining incidence of chickenpox in the absence of universal childhood immunisation. *Arch Dis Child* 2004; 89: 966-969.
5. Russell ML, Svenson LW, Yiannakoulis N, Schopffocher DP, Virani SN, Grimsrud K. The changing epidemiology of chickenpox in Alberta. *Vaccine* 2005; 23: 5398-403.
6. Raddadi A, Osoba AO, Abdullah S, Al-Shareef B. Sero-epidemiological study of varicella zoster virus antibodies among an adolescent and adult Saudi population. *Oman Med J* 2000; 16: 14-17.
7. Brisson M, Edmunds WJ, Gay NJ, Miller E. Deaths from chickenpox. Deaths from chickenpox in adults are decreasing. *BMJ* 2002; 324: 609.
8. Holmes SJ, Morrow AL, Pickering LK. Child-care practices: effects of social change on the epidemiology of infectious diseases and antibiotic resistance. *Epidemiol Rev* 1996; 18: 10-28.

Who are entitled for authorship?

Excerpts from the Uniform Requirement
updated November 2003,
available from website www.icmje.org

The international Committee of Medical Journal Editors has recommended the following criteria for authorship; these criteria are still appropriate for those journals that distinguish authors from other contributors.

Authorship credit should be based on 1) substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; 2) intellectual content; and 3) final approval of the version to be published. Authors should meet conditions 1, 2, and 3.

Acquisition of funding, collection of data, or general supervision of the research group, alone, does not justify authorship.

Author should be prepared to explain the order in which authors are listed.