

Epidemiology of Hepatitis A Virus Infection in South Africa

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PRETORIA, South Africa

Global Hepatitis A Meeting

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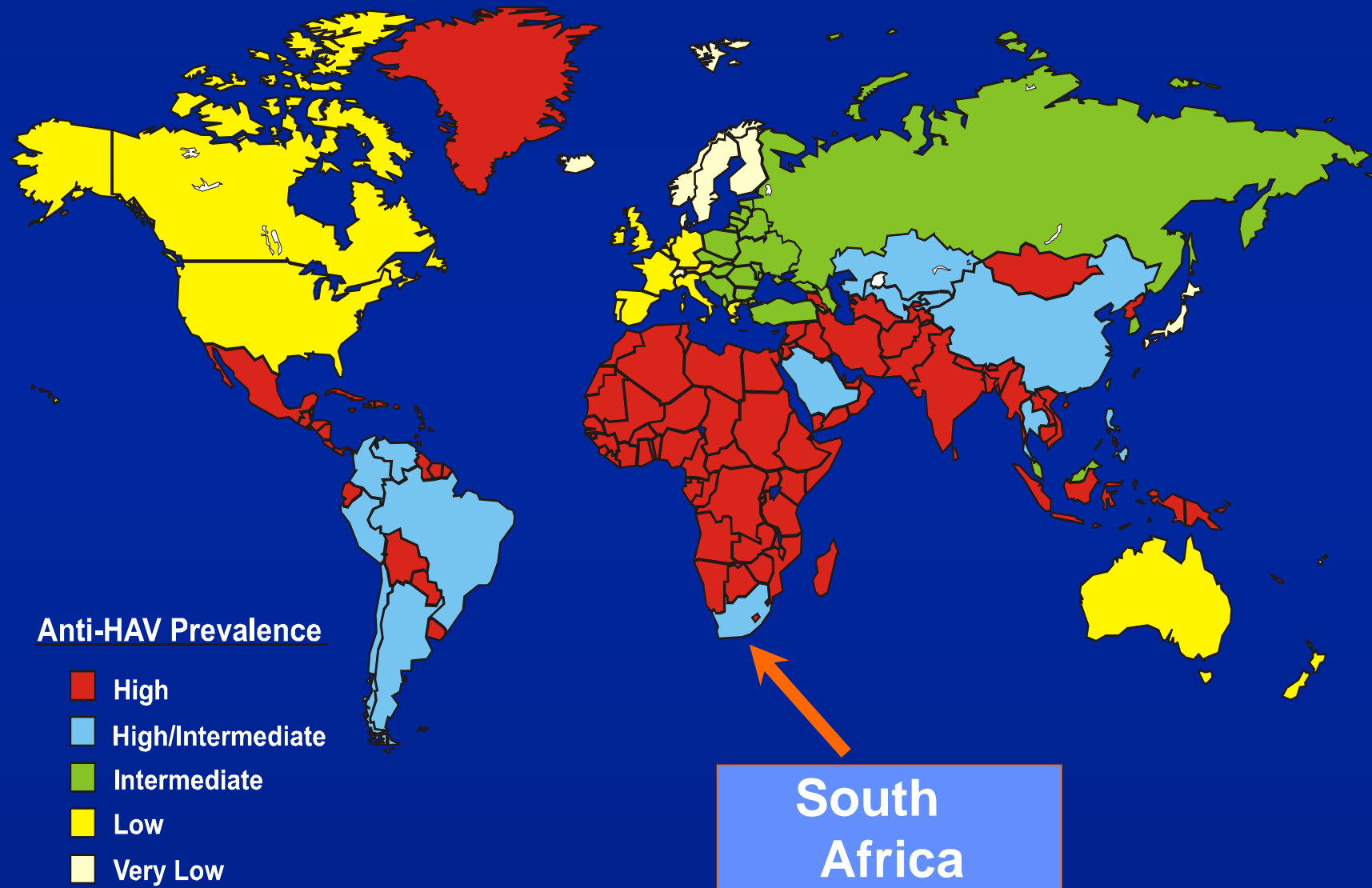
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PRESENTATION

- Burden of hepatitis A disease in South Africa
- Differences by socio-economic status, race and age
- Hepatitis A in special groups
- Outbreaks
- Prevention and Control
- Role of hepatitis A vaccine

GLOBAL DISTRIBUTION OF HAV INFECTION



HEPATITIS A EPIDEMIC IS MOST PROBABLY IN THE "TRANSITION PHASE" IN SOUTH AFRICA

- **>90% of black South Africans are exposed by age of 10 yrs**
- **Some population groups have lower prevalence**
 - ★ **Whites**
 - ★ **Asians**
 - ★ **Better living std's**

Table 1. *HAV seroprevalence rates among African children and young adults*

Country [ref.]	% with anti-HAV
Cameroon [20]	94% of ages 4–6; 100% by age 12
DR Congo (Zaire) [24]	96% of ages 5–7; 100% of age 10+
Djibouti [8]	99% of young adults
Ethiopia [22]	>90% by age 6; 100% of age 15+
The Gambia [16]	55% of children; >95% of age 30+
Kenya [23]	>90% by age 2
Liberia [14, 26]	>80% by age 4; >90% by age 5
Madagascar [12]	>95% of age 5+
Namibia [9, 19]	100% of age 7+
Senegal [4]	100% of age 4+
Sierra Leone [7]	97% of age 6+
Somalia [5]	>90% of age 1+
South Africa (black) [1, 10, 15]	>90% by age 10; 100% of adults
Tanzania [11]	99% of adults age 20+
Zimbabwe [6]	>95% of age 10+

GLOBAL PATTERNS OF HEPATITIS A VIRUS TRANSMISSION

Endemicity	Disease Rate	Peak Age of Infection	Transmission Patterns
High	Low to high	Early childhood < 5 years	Person to person; outbreaks uncommon
High/ Intermediate	High	Late childhood/ young adults 5-15 years	Person to person; food and waterborne outbreaks
Low	Low	Young adults and at-risk groups >15 yrs	Person to person and waterborne Outbreaks, day care centers
Very low	Very low	Adults and at-risk groups >20 yrs	Travelers, drug users, etc; Outbreaks uncommon

Major Risk Factors for Transmission in South Africa

- Low socio-economic standards
- Overcrowding
- Poor hygiene
- Poor sanitation
- Poor access to clean water

HAV in South African water surfaces (river and dam) used for domestic and recreational purposes

Table 1. Hepatitis A virus (HAV) and human astroviruses (HAstVs) detected in the Klip River and Vaal Dam water by a reverse transcriptase–polymerase chain reaction–oligonucleotide probe assay with and without prior cell culture amplification

Sample source and virus	No. of weekly water samples	Total no. of positive samples	Direct detection	Detection after cell culture amplification
River				
HAV	51	18 (35.3%)	5 (9.8%)	14 (27.5%)
HAstV	51	11 (21.6%)	3 (5.9%)	10 (19.6%)
Dam				
HAV	51	19 (37.3%)	3 (5.9%)	17 (33.3%)
HAstV	51	3 (5.9%)	2 (3.9%)	1 (1.9%)

Hepatitis A virus in South African water surfaces (river and dam) used for domestic and recreational purposes

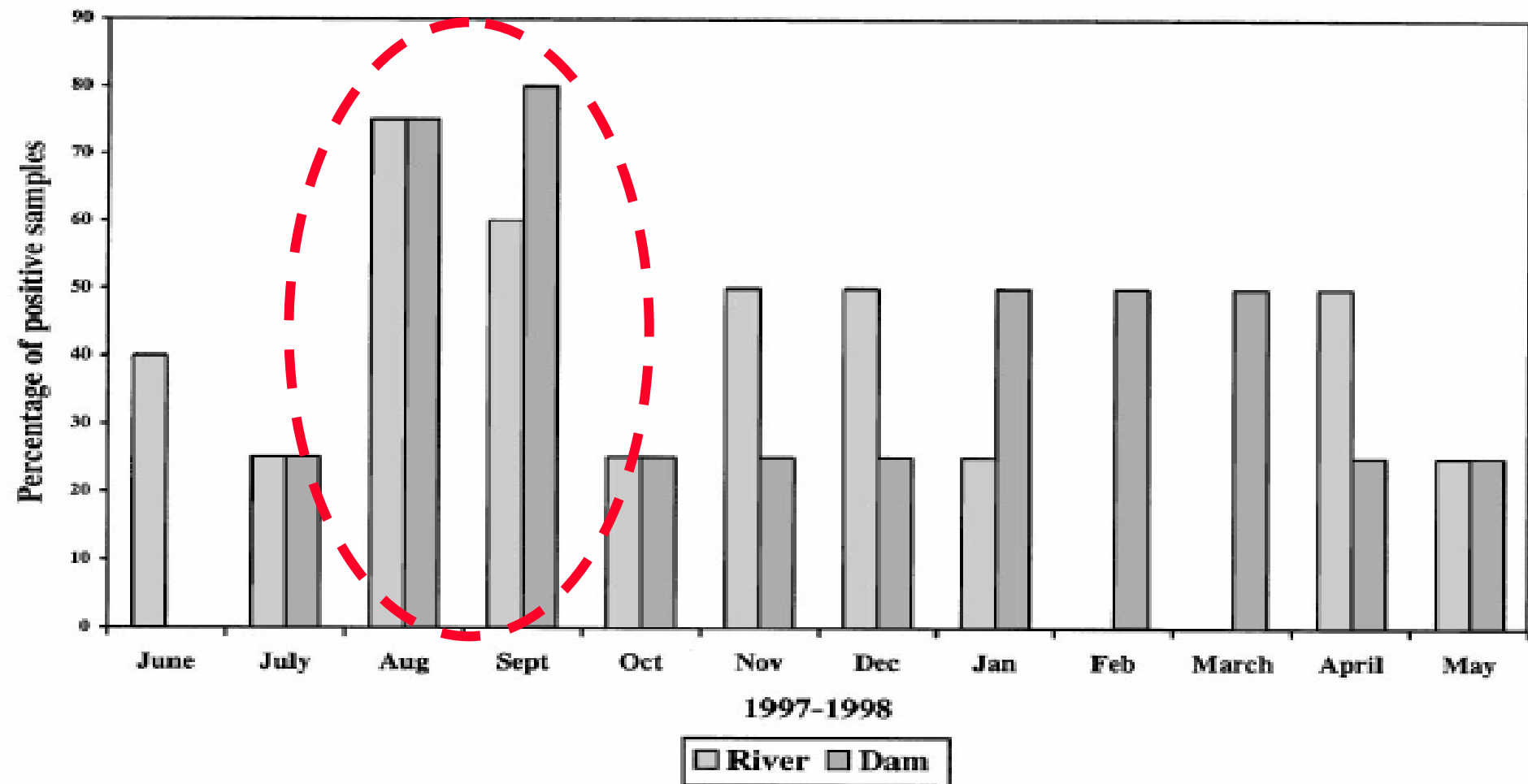


Fig. 1. Seasonal variation in the occurrence of hepatitis A virus (HAV) in the Klip River and Vaal Dam water samples.

Precise burden of hepatitis A disease unknown

- **Notifiable disease in South Africa**
 - Notification extremely poor

- **WHO Case Definition of acute viral hepatitis**

A clinical case of acute viral hepatitis is an acute illness that includes the discrete onset of symptoms and jaundice or elevated serum aminotransferase levels (≥ 2.5 times the upper limit of normal).

- Problem: multiple causes of hepatitis

Acute Viral Hepatitis in children <14 yrs at Red Cross War Memorial Children's Hospital Medical Outpatient Department, Cape Town

Group	HAV IgM positivity
Coloureds (mixed)	89% (n = 148)
Blacks	82.4% (n = 64)

Mortality rate for all AVH was 0.3% (1/326)

No case of acute hep B was detected

Westwood,

Correlation of HAV sero-prevalence

With:

- **Socio-economic status**
 - Differences between lower and upper class
 - Lower class associated with higher prevalence
- **Age**
 - Over 90% become anti-HAV positive between 5 and 10 yrs of age in the lower class
 - Sero-prevalence increase with age in the upper class
- **Race**
 - Exposure to natural infection is higher in Blacks, followed by coloureds (mixed race), Asians and Whites

Seroprevalence of HAV in rural black South Africans from KwaZulu Natal Province

Age (yrs)	Number tested	Positives
6-10	6	5 (83%)
11-20	13	11 (85%)
21-30	5	5 (100%)
31-40	6	5 (83%)
41-50	3	3 (100%)
51-60	4	3 (75%)
TOTAL	37	32 (87%)

Sathar et al,

Seroprevalence of HAV in blood donors from KwaZulu Natal Province

Age (yrs)	Whites	Indians	Coloureds	Blacks
17-20	16/44 (36%)	23/50 (46%)	38/51 (75%)	12/13 (92%)
21-30	16/55 (21%)	33/49 (67%)	46/49 (94%)	49/53 (92%)
31-40	15/22 (68%)	19/20 (95%)	25/29 (86%)	23/25 (92%)
41-50	18/24 (75%)	14/20 (95%)	6/6 (100%)	20/22 (91%)
51-60	14/22 (64%)	19/20 (95%)	1/1 (100%)	11/14 (79%)
>60	14/20 (70%)	2/4 (50%)	1/1 (100%)	-
TOTAL	93/187 (50%)	110/163 (67%)	117/137 (85%)	115/127 (91%)

IgG anti-HAV in adult Black South Africans

Group	No tested	No Positives	Age range (yrs)
Females	173	172 (99.4%)	-
Urban	60	60 (100%)	17 - 57
Rural	60	60 (100%)	-
Institution staff	53	52 (98.1%)	22 - 72
Males	119	118 (99.2%)	-
Urban	59	58 (98.3%)	17 - 52
Rural	60	60 (100%)	20 - 72
HCWs	366	358 (97.8%)	-
Nurses & Lab	42	39 (92.9%)	20 - 62
Workers	32	29 (97.8%)	17 - 32
Medical students			

IgG anti-HAV in adult White South Africans

Martin et al,
1994

Group	No tested	Positive	Age range (yrs)
Medical Students	91	12 (13.2%)	18 - 42
First year	45	5 (11.1%)	-
Final year	46	7 (15.2%)	-
Laboratory Staff	55	15 (27.2%)	20 - 60
High risk females	127	59 (47.6%)	-
Family planning	28	13 (46.4%)	16-41
STDs	24	11 (45.8%)	14-53
ANC	45	22 (48.9%)	15-38
Institution staff	30	13 (43.3%)	19-59
High risk males	200	116 (58.0%)	-
STDs	98	61 (62.2%)	19-61
Non Liver Diseases	61	31 (50.9%)	-
Homosexuals	41	24 (58.0%)	17-69

HAV infection amongst South African HCWs

HCWs	Anti-HAV positivity
Whites	10 - 40% *
Blacks	90 - 96.2%

* Majority at risk of acquiring HAV infection

Distribution of anti-HAV in South African travellers

Race	Travellers positive for anti-HAV	
White	73/228	(32%)
Coloured	4/6	(67%)
Indian	34/50	(68%)
Black	15/17	(88%)
TOTAL	126 / 301	(42%)

IgG anti-HAV in South African canoeists

Group	No tested	Anti-HAV	NV	Schisto. spp	Age range (yrs)
Canoeists	577	213 (37.2%)	251 (43.5%)	287 (49.7%)	15 - 53
Male	549	205 (37.3%)	241 (43.9%)	281 (51.2%)	15 - 53
Female	28	8 (28.6%)	10 (35.7%)	6 (21.4%)	22 - 47
Prevalence OR (95% CI)		2.4 (1.64-3.66)	1.8 (1.29-2.63)	13.6 (7.54-25.12)	
Non-canoeists	207	40 (19.4%)	61 (29.8%)	14 (6.8%)	18 - 54
Male	137	30 (22.1%)	36 (26.5%)	10 (7.4%)	18 - 54
Female	70	10 (14.3%)	25 (36.2%)	4 (5.8%)	18 - 49

NV = Norwalk virus; Schisto = *Schistosoma*

Taylor et al,

PRESENTATION

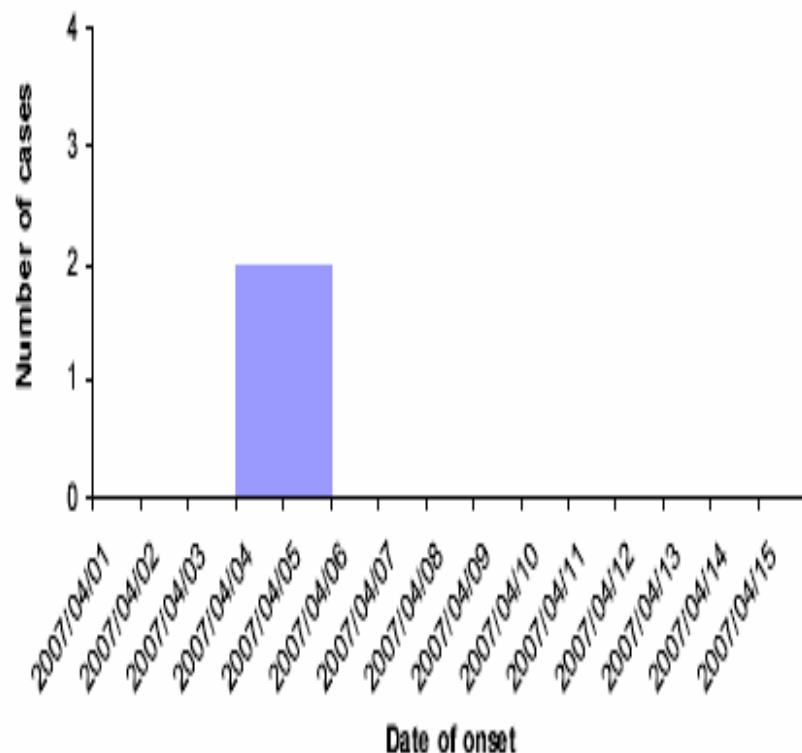
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AN INSTITUTIONAL OUTBREAK OF HEPATITIS A

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Epidemic curve of laboratory confirmed hepatitis A cases in an institution, Gauteng Province, April 2007.

- Closed Institution in Gauteng;
60 mentally challenged residents &
20 staff members

- First case was adult with jaundice,
admitted to hospital & lab confirmed
IgM anti-HAV positive

- Total 6 suspected cases identified
over 4-day period

- Total 4 IgM anti-HAV positive (3 males and 1 female) and 2 negative



Hepatitis A outbreak

An outbreak of hepatitis A has been reported from Louis Trichardt in Limpopo Province. To date there are 7 laboratory confirmed cases who presented with illness over a 12 day period from 30/9/07 to 12/10/07. Preliminary outbreak investigations indicate that all cases have a link to a local crèche: two pupils, one teacher, three parents and a sibling of a pupil. The source of the outbreak is still being investigated. Control measures thus far include: administration of pooled immunoglobulin to all pupils at the crèche as well as household contacts of the confirmed cases and health promotion with emphasis on hand washing and improvements in general hygiene. Active case finding has been instituted.

Outbreaks of hepatitis A in the childcare setting are well described. It is not yet clear whether this is a point source outbreak or propagated with secondary spread and further epidemiological investigation is underway.

Asymptomatic disease is typical in young children and it is likely that there may have been other cases within the crèche.

Source: Epidemiology Division, NICD and Public Health Programme, Limpopo

PREVENTION AND CONTROL

- Hygiene (e.g., hand washing)
- Sanitation (e.g., provision of clean water)
- Hepatitis A vaccine (pre- and post-exposure)
- Immune globulin (pre- and post-exposure)

ROLE OF HEPATITIS A VACCINE

- **Routine immunisation**
 - Universal national immunisation is not yet available
 - Individual immunisation is highly recommended
- **Post-exposure prophylaxis**
- **Occupational risk groups; e.g.**
 - HCWs, food handlers, workers in food industry, sewerage works, etc
- **High risk communities**
 - recipients of blood or blood products, children in day-care centres their families, and day-care centre staff , people living in closed or crowded conditions, military and security personnel, etc
- **High risk individuals**
 - haemophiliacs, IVDUs, individuals with underlying chronic liver conditions, immunodeficient individuals, etc
- **Susceptible travellers to endemic countries**

SUMMARY

- South Africa is a country of intermediate to high endemicity
- There are pockets of low prevalence in groups with better living conditions
- Outbreaks occur almost every year in schools, creches, closed institutions with compromised hygiene, etc
- Immunisation schemes
 - Universal national immunisation is not yet introduced
 - Individual immunisation is highly recommended
- Immunisation of at risk individuals highly recommended