The Paediatric Traveller

T Avenant, N du Plessis

SAPA Congress

2014

UNIVERSITEIT VAN PRETORIA
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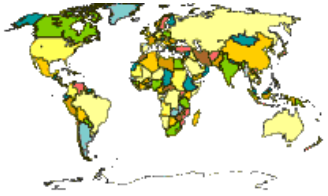
Introduction

- Approximately 4% of more than billion yearly travellers are children
- Contribute 25% of travel related hospitalizations
- Injuries account for majority of travel associated mortality
- Children accompany parents when visiting friends and relatives (VFR)

Children Returning from Travel

- Travel clinics in 6 continents
  - Jan 1997 – Nov 2007



GeoSentinel

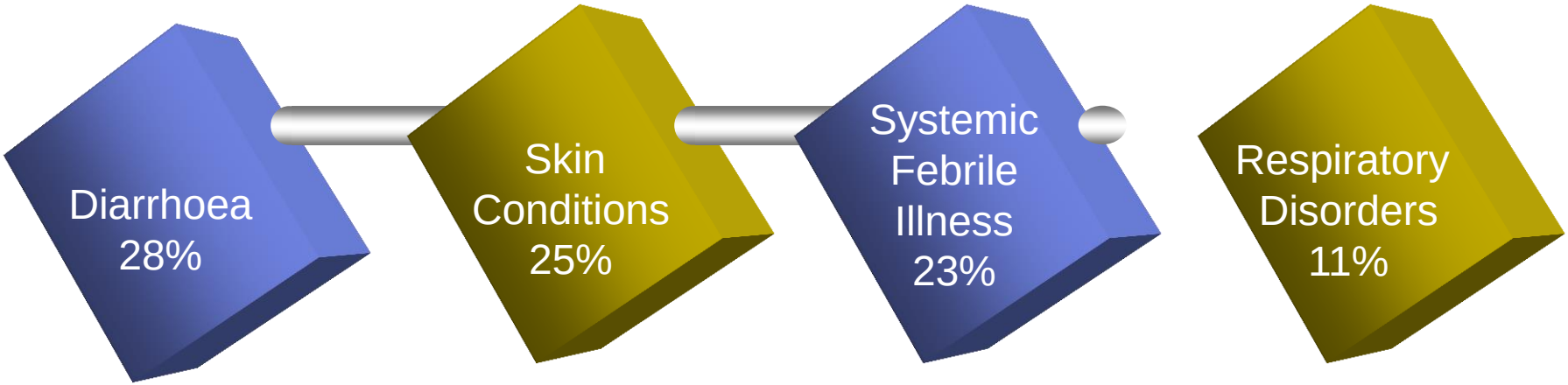
The Global Surveillance Network of the ISTM and CDC

a worldwide communications & data collection network of travel/tropical medicine clinics

- Children
  - Presented within 7 days
  - Required hospitalization
  - Lacked pre-travel health advice
  - Travelled for purpose of visiting friends and relatives

Pediatrics 2010;125;e1072

Children Returning from Travel



Middle East North Africa	Latin America	Sub-Saharan Africa Asia	Europe North America

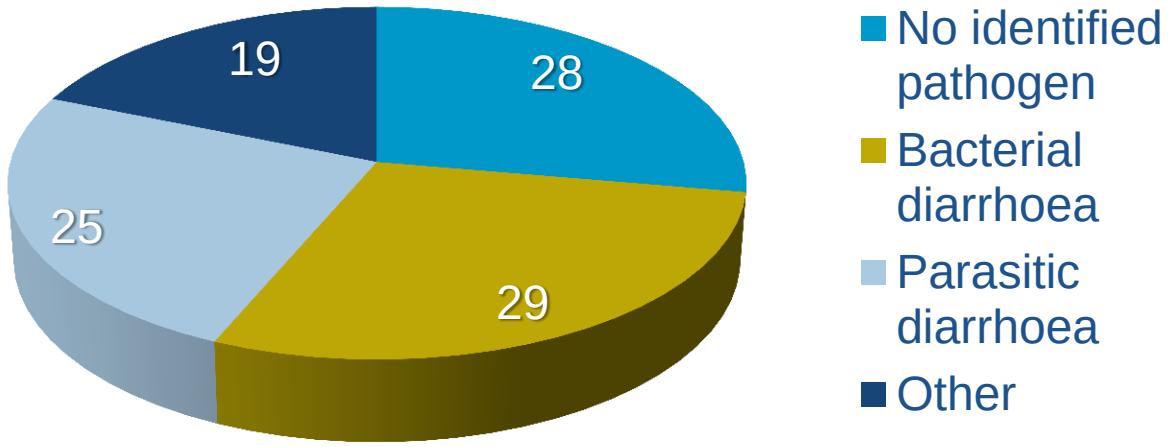
Pediatrics 2010;125;e1072

Travel Associated Diagnoses

1. Diarrhoeal Syndrome

Diarrhoeal Syndrome

- Acute in 80%



- Chronic in 20%
  - >2 weeks

Pediatrics 2010;125;e1072

Travel Associated Diagnoses

1. Diarrhoeal Syndrome

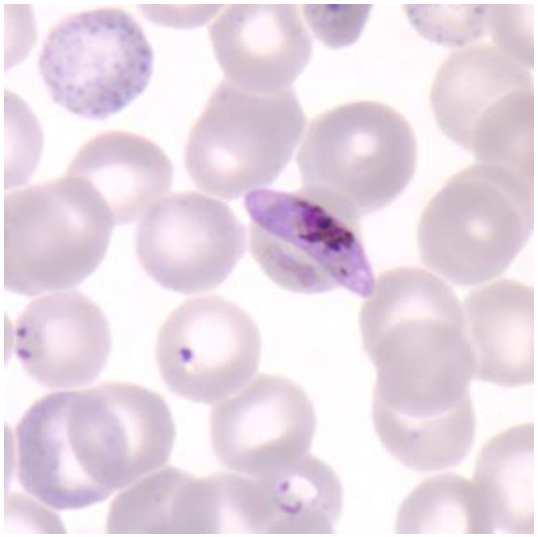
2. Dermatological Disorders

Dermatological Disorders

- Animal bites
  - Dog
  - Cat
  - Monkey
- Cutaneous larva migrans
  - Caribbean region
- Insect bites
  - E.g. tumbu fly

Travel Associated Diagnoses

1. Diarrhoeal Syndrome
2. Dermatological Disorders
3. Systemic Febrile Illness



Systemic Febrile Illness

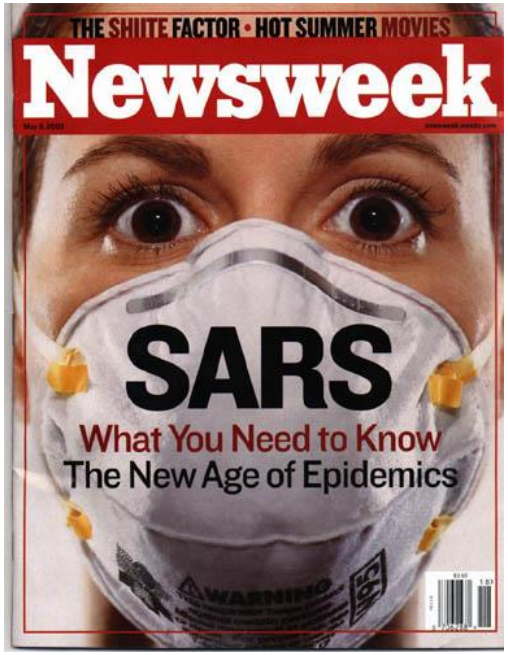
- Malaria (35%)
- Viral syndromes
- Unspecified febrile illness
- Dengue and enteric fever (6% each)

Travel Associated Diagnoses

1. Diarrhoeal Syndrome
2. Dermatological Disorders
3. Systemic Febrile Illness
4. Respiratory Syndromes

Respiratory Syndromes

- Upper respiratory tract disorders
- Hyperactive airway disease
- Acute otitis media



Travel Associated Diagnoses

1. Diarrhoeal Syndrome
2. Dermatological Disorders
3. Systemic Febrile Illness
4. Respiratory Syndromes
5. Other

Other

- Non-diarrhoeal gastro-intestinal disorders
  - *Schistosoma mansoni, Strongyloides stercoralis*, hepatitis A
- Dental problems
- Tissue parasites
  - Schistosoma, loiasis, non-hepatic echinococcosis
- Genitourinary disorders
- Injuries
- Non-specific symptoms

Approach to Ill Child after Travel

- Severity of illness
  - Life threatening or requiring involvement of public health authorities
    - Malaria
    - Severe respiratory syndrome
    - Haemorrhagic fever
- History
  - Itinerary and duration of travel
    - Specific diseases excluded/ more likely depending on region of travel
    - Risk of travel related illness increases with length of trip

Approach to Ill Child after Travel

- History
  - Timing in relation to illness
    - Most will look for help within a month of return
    - Detailed history may be necessary
    - Diseases that may manifest later
      - Schistosomiasis
      - Leishmaniasis
      - Chagas disease
  - Underlying medical illness
    - More susceptible or different presentation
    - Immunosuppression

Approach to Ill Child after Travel

- History
  - Vaccines received and prophylaxis used
    - Less than half of travellers seek advice pre-travel
    - Vaccinations and malaria prophylaxis
      - May develop malaria despite prophylaxis
    - Vaccine preventable diseases found in GeoSentinel study
      - Enteric fever (typhoid and paratyphoid)
      - Viral hepatitis
      - Influenza

Approach to Ill Child after Travel

- History
  - Individual exposures
    - Disease contacts
    - Accommodation
    - Insect precautions
    - Source of water
    - Ingestion raw meat or unpasteurised dairy
    - Insect bites
    - Freshwater exposure
    - Body fluid exposure
    - Medical care received
      - Transfusions, drugs

Approach to Ill Child after Travel

- History
  - Travellers who visit friends and relatives (VFR) higher risk
    - Stay longer
    - More remote destinations
    - Contact local water sources
    - Don’t stay in luxury air conditioned hotels
    - Do not seek pre-travel advice

Approach to Ill Child after Travel

- Physical examination
  - Jaundice
  - Hepatosplenomegaly
  - Cough , coryza and conjunctivitis
  - Rashes (macular and maculopapular)
  - Purpura and petechiae
  - Regional lymphadenopathy
  - Insect bites

Approach to Ill Child after Travel

- Differential diagnosis
  - Associated with travel
  - Not associated with travel
- Diagnostic evaluation
  - FBC and differential count
  - RDT, Thick and thin smears
  - PCR/serology e.g. measles
  - LFT
  - Blood cultures
  - CXR
  - Urine MCS
  - Stool MCS

Pre-travel Consultation

Travel Restrictions

- Avoid in neonates < 2weeks
- Discourage where tropical diseases
- Not to malaria areas < 5 years
- Children with underlying diseases
  - CF, DM
  - Immunosuppressed

Air Travel

- Avoid
  - Avoid < 2weeks
  - Acute middle ear infections
  - Two weeks after myringotomy
  - Spontaneous pneumothoraces
- Pain on descent (15%)
  - Breast- or bottle feed
  - Suck on sweet or chew gum
- Careful with hot drinks

Air Travel

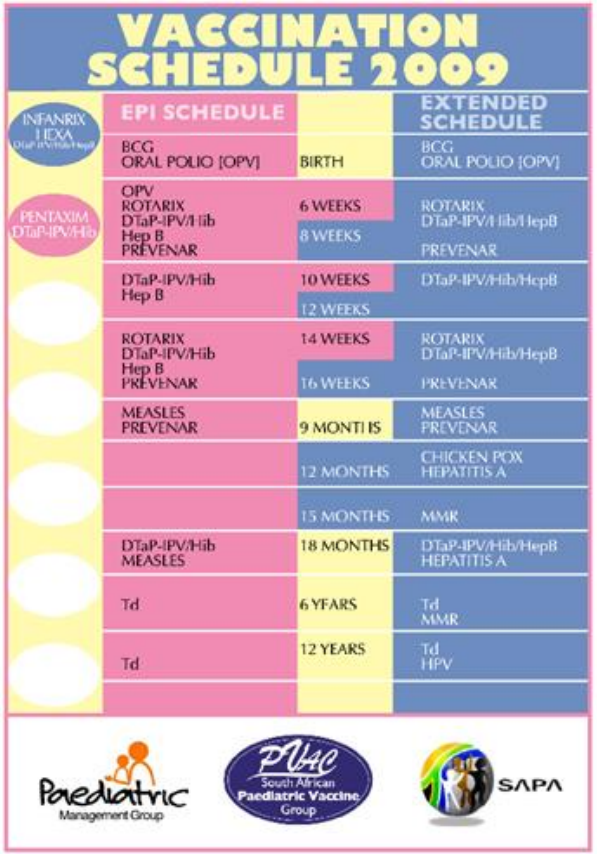
- Sedation not recommended…
  - Chloral hydrate: well studied, safe and effective*
  - Diphenhydramine (Benadryl®)
  - Paradoxical agitation (> with promethazine)
- Melatonin not in young children
  - Can affect sexual development

*Mike Starr. British Journal of Clinical Pharmacology (2012)

**William Stauffera,, Travel Medicine and Infectious Disease (2008) 6, 101–113

Routine Immunizations

- Make sure it's up-to-date
- Consider vaccines to be given during the stay – usually vaccines can be given slightly earlier…
  - Measles (6 months) / MMR (2 doses, 28 days apart)
  - DTaP-Hib-IPV i.s.o. DTaP-Hib-IPV-HBV from 6 weeks
- Accelerated schedule will benefit infant taken overseas for several months in their first year of life



Influenza

- At-risk travellers
  - Visiting friends and relatives (VFR)
  - > 30 day stay
- Preventive measures:
  - Seasonal influenza vaccine – should be available…
  - Vaccine on arrival
  - Frequent hand washing…
  - Anti-viral stand-by emergency treatment (where vaccine is contra-indicated)

Expert Review of Vaccines, July 2008

Travel - Immunisations

- Hepatitis A
- Typhoid
- Meningococcal A, C, Y, W135
- Yellow Fever
- Rabies
- Japanese Encephalitis
- Cholera

Table 1 Travel-related vaccines and minimum ages recommended for administration[a], [92,100–102]

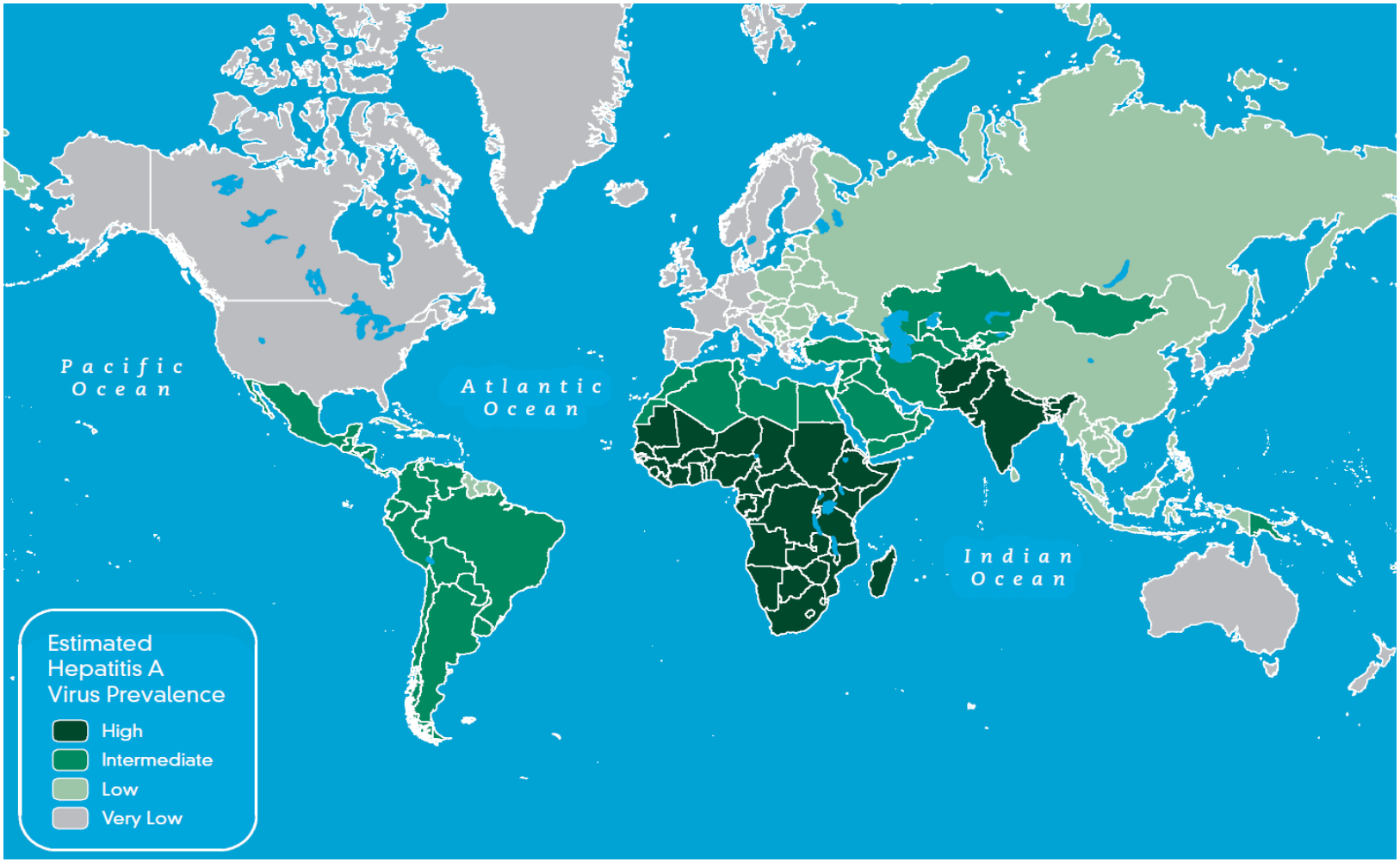
Vaccine	Minimum age recommended for administration
Bacillus Calmette-Guérin	Birth[b]
Hepatitis A	1 year
Immunoglobulin	Birth
Hepatitis B	Birth
Influenza	6 months
Japanese encephalitis virus	
Inactivated mouse-brain–derived (JE-VAX®)	1 year
Inactivated cell culture-derived (Ixiaro®)	17 years
Measles, mumps, and rubella (MMR)	1 year, monovalent measles vaccine recommended during age 6 months–1 year, but MMR is acceptable if monovalent measles vaccine is unavailable
Meningococcus (A, C, Y, W-135)	
Quadrivalent polysaccharide-protein conjugate vaccine (MCV4)	2 years
Quadrivalent polysaccharide vaccine (mpsv-4)	Licensed $\geq$2 years, but recommended over MCV4 if child is aged <2
Rabies	No minimum age, but risk assessment should be undertaken if child is under 1 year of age
Tick-borne encephalitis[c]	1 year
Typhoid	
Vi capsular	2 years
Ty21a oral typhoid	6 year
Yellow fever	9 months (see text for < 9 months)

[a] Recommended minimum ages may vary by country and vaccine manufacturer, and should be confirmed prior to administration of any vaccines.

[b] Not routinely given in U.S. or Canada, but can be considered in infants and children under 5 in these countries traveling for extended periods to areas with very high TB incidence (101).

[c] Not available in the United States.

Hepatitis A Vaccine



wwwnc.cdc.gov – Accessed 27/02/2013

Hepatitis A Vaccine

- Only one known serotype
- Travellers from developed countries are at risk
- Hepatitis A vaccine safe, effective and long lasting
- All children over the age of 1 year…
- HAV in the first 6 years of life usually results in mild or asymptomatic infection

Mike Starr. Paediatric Travel Medicine: vaccines and medications. British Journal of Clinical Pharmacology (2012)

Meningococcal Vaccine

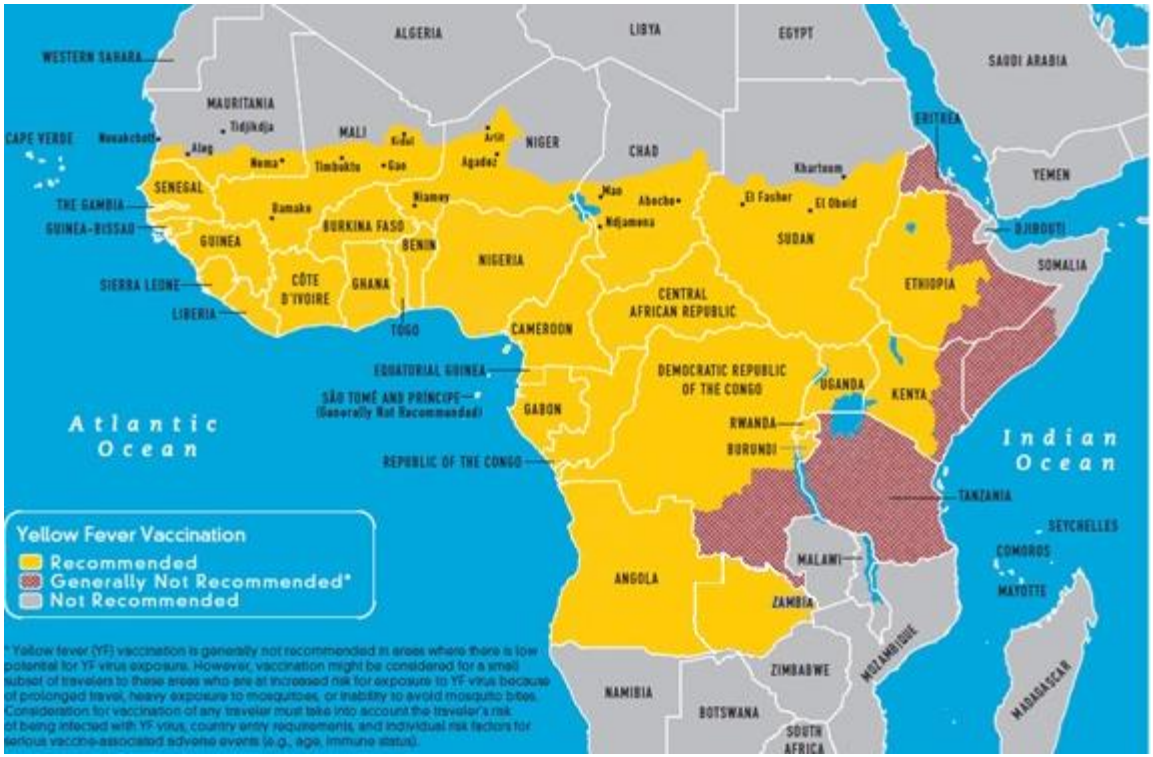
- Sub-Saharan meningitis belt
  - Serogroup A and W135
  - December to June
- Pilgrims to Mecca
  - Tetravalent vaccine required

Meningococcal Vaccine

- Polysaccharide
  - Bivalent(A,C)
  - Quadrivalent (A, C, Y and W-135)
    - > 2 years
    - 3 months to 2 years (special circumstances)
    - 7-10 days protective (3 years)
- Conjugated vaccines
  - Monovalent (serogroup C)
  - Quadrivalent
- Meningococal serogroup B (4CMenB)
  - Licenced as Bexsero, Novartis in Europe

V Manchanda, S Gupta, P Bhalla. Meningococcal disease: History, epidemiology, pathogenesis, clinical manifestations, diagnosis, antimicrobial susceptibility and prevention

Yellow Fever Vaccine

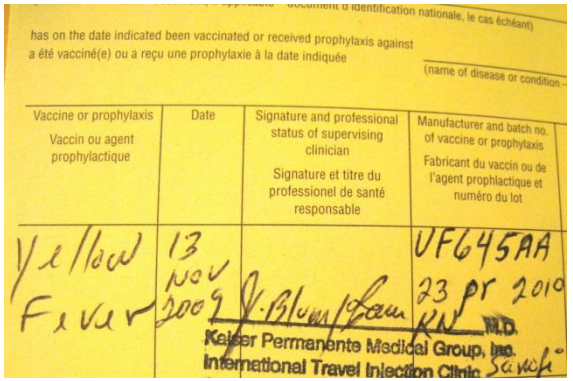


Yellow Fever Vaccine

* Yellow fever (YF) vaccination is generally not recommended in areas where there is low potential for YF virus exposure. However, vaccination might be considered for a small subset of travelers to these areas who are at increased risk for exposure to YF virus because of prolonged travel, heavy exposure to mosquitoes, or inability to avoid mosquito bites. Consideration for vaccination of any traveler must take into account the traveler's risk of being infected with YF virus, country entry requirements, and individual risk factors for serious vaccine-associated adverse events (e.g., age, immune status).

Yellow Fever Vaccine

Contra-indications	Precautions
• Allergy to components • Age < 6 months • Symptomatic HIV or CD4 <200/mm^3 (< 15% in < 6yrs) • Thymus disorder with abnormal immune-cell function • Primary immune-deficiencies • Malignancy • Transplantation • Immune-suppression	• 6-8 months • > 60 years • Asymptomatic HIV • Pregnancy • Breastfeeding


has on the date indicated been vaccinated or received prophylaxis against
a été vacciné(e) ou a reçu une prophylaxie à la date indiquée
(name of disease or condition)

Vaccine or prophylaxis Vaccin ou agent prophylactique	Date	Signature and professional status of supervising clinician Signature et titre du professionel de santé responsable	Manufacturer and batch no. of vaccine or prophylaxis Fabricant du vaccin ou de l'agent prophlactique et numéro du lot
Yellow Fever	13 NOV 2009		UF645AA 23 SEP 2010

Kaiser Permanente Medical Group, Inc.
International Travel Injection Clinic

Mike Starr. Paediatric Travel Medicine: vaccines and medications. British Journal of Clinical Pharmacology (2012)

Malaria Prophylaxis

- Young children at risk for severe malaria and death
- Not to travel if younger than 5 years
- General protective measures
  - Mosquito nets (treated) and gauze screens
  - Insecticides
  - Long light-coloured clothing
  - Repellents
    - DEET-containing insect repellents >2months
    - Citronella containing repellents (40-90 minutes)
  - Avoid marshy areas and water bodies
  - Dusk to dawn…
  - Ceiling fans and air conditioners
  - Mosquito coils/mats

Malaria Prophylaxis

•	Location	Cities	– less risk
		Camping near river	– high risk
•	Accommodation	Air conditioned hotels	– low risk
		Huts or tents	– higher risk
•	Time of the year	Transmission is less during dry cold months	
•	Time of the day	Malaria carrying mosquitoes bite at night	
•	Length of stay	The longer the stay, the higher the risk	

Malaria prevention DOH guidelines 2012.
http://www.doh.gov.za/docs/policy/2011/malaria_prevention.pdf

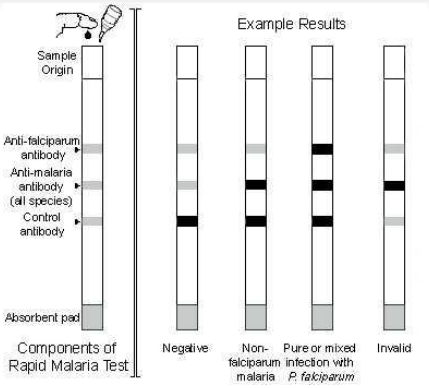
Chemoprophylaxis

- With food and adequate fluids (condensed milk)

Drug	Before travel	After travel
Mefloquine	1-2 weeks	4 weeks
Doxycycline	1-2 days	4 weeks
Atovaquone-proguanil	1-2 days	7 days

1. Mefloquine: over 3 months of age or weighing over 5kg*
2. Doxycycline if > 8 years of age and the HIV-infected traveler
3. Atovaquone-proguanil: > 11kgs in weight

Detection



- Rapid Antigen Test (RAT)
  - plasmodial histidine rich protein-2 (HRP-2) or parasite-specific lactate dehydrogenase (pLDH) (*P. falciparum)*
- Do not indicate severity of infection

Travellers' Diarrhoea

- Children more likely to acquire TD
  - Reduced killing - higher gastric pH and more rapid gastric emptying time
  - More immunologically naïve
  - Put everything in their mouths

Group	Pathogen	Frequency
Bacteria	ETEC	10 – 45%
	E. coli (Aggregative)	5 – 35%
	Campylobacter	5 – 25%
	Salmonella	0 – 15%
	Shigella	0 – 15%
Viruses	Norovirus	0 – 10%
	Rotavirus	0 – 5%
Parasites	Giardia intestinalis	0 – 5%
	Cryptosporidium	0 – 5%
None identified		10 – 50%

Travellers' Diarrhoea

- Boiled or bottled water only
- Freshly cooked food
- Fruit or vegetables - bought whole and peeled
- New vaccine: heat-labile enterotoxin from ETEC (skin)
- Hyperimmune bovine colostrum for prevention of TD showed protective efficacy 90% against ETEC

William Stauffera. Travel Medicine and Infectious Disease (2008) 6, 101–113

Travellers' Diarrhoea

- ORS
- Loperamide
  - Lethargy, ileus, and coma (different age cut-offs)
- Antiemetics (> 2yrs)
  - Metoclopramide , Prochlorperazine, Ondansetron
- Smecta® (diosmectite)
- Probiotics/Zinc - not studied in TD:
- Antibiotic treatment (standby)
  - Azithromycin (SE Asia)
  - Ciprofloxacin

Motion Sickness

- More common in children – 58%
- Non-pharmacologic suggestions
- Pharmacologic intervention (>2 yrs)
  - Diphenhydramine (Benadryl®)
    - 1 hour before travel and every 6 hours during journey
  - Promethazine (Phenergan®)
  - Cinnarizine (Stugeron®) – dosing > 5 yrs
- (Prochlorperazine/metoclopramide – ineffective)

Pre-travel Consultation

- Sun Exposure
  - Children increased risk for short and long term damage
  - Avoid 11am – 3pm
  - SPF 30
- Bites
  - Increased risk both domestic and wild animals
  - Warn when visiting rabies areas
  - Consider pre-exposure prophylaxis when high risk and access to medical care restricted

Pre-travel Consultation

- Personal safety
  - Photographs, contact details
- Altitude sickness
  - Harder to recognise, Presume if ill above 2500m
- Car seats
  - MVA's most common cause of death
  - May need to pre-book or take along
- Water safety
  - Supervision, Ear infections, Shoes in sand
- Medicine safety
- Hand washing

Pete Vincent, PedMed, Issue 1 2013

Resources

- SASTM: www.sastm.org.za
- ISTM: www.istm.org
- International Travel and Health: www.who.int/wer/en/
- CDC Yellow book: www.cdc.gov/travel/refence.htm/