



Travel Medicine: VACCINE SYMPOSIUM

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'Travel Health Information for Professionals'



Update Travel Vaccinations Nurses Dunedin - 2013



‘The World is a book, and those who
do not travel read only a page’.

St Augustine

Philosopher and Theologian





This presentation ...



Overviews common vaccine preventable diseases (VPD) and their vaccines

Establishes the language of vaccines and their essence in preventing disease for travellers

Reinforces common principles in disease prevention for travellers

Seeks to present a global approach on disease surveillance with respect to the VPD



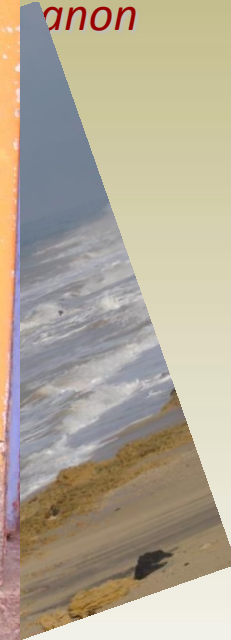


'If



en in all

anon





I met a traveller
from an antique land
PB Shelley

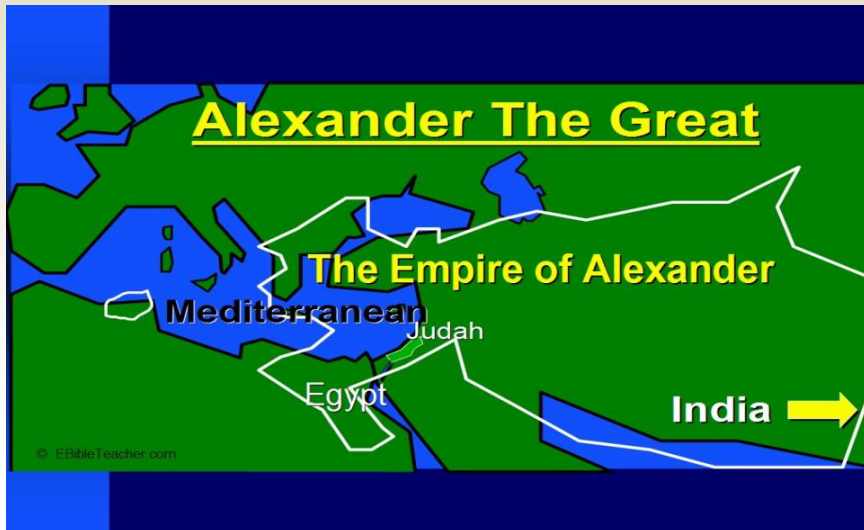


Travel medicine as an interdisciplinary concept is not new

• **Seneca (4-65 AD)** criticized sex tourism in Canopus, sunken city north in Aboukir Bay ... 6 Km N of Alexandria (Egypt), it had the infamous prestige of antiquity's Las Vegas. Having realized that rich men and young women had come from far for paid sex ... Seneca commented in a letter to Lucilius *"the wise and upright man, ... or he who is on the way toward wisdom ... will not select Canopus, nor Baiae either; for both places have begun to be resorts of vice. At Canopus luxury pampers itself to the utmost degree ..."*



Death of Seneca, by Gerrit von Honthorst



Alexander the Great

- responsible for spread of Greek culture
- died in Babylon in 323 BC, aged 33
- based on description of final illness in royal diaries, the conqueror of large parts of world of those days most likely died from malaria or typhoid fever *classical travellers' infections!*



Travel medicine as an interdisciplinary concept is not new

- Shakespeare asked question relating to epidemiology for travellers:

**Alas, what danger will it be to us,
Maids as we are, to travel forth so far**
(*As You Like It* I, iii, pp. 104–105)

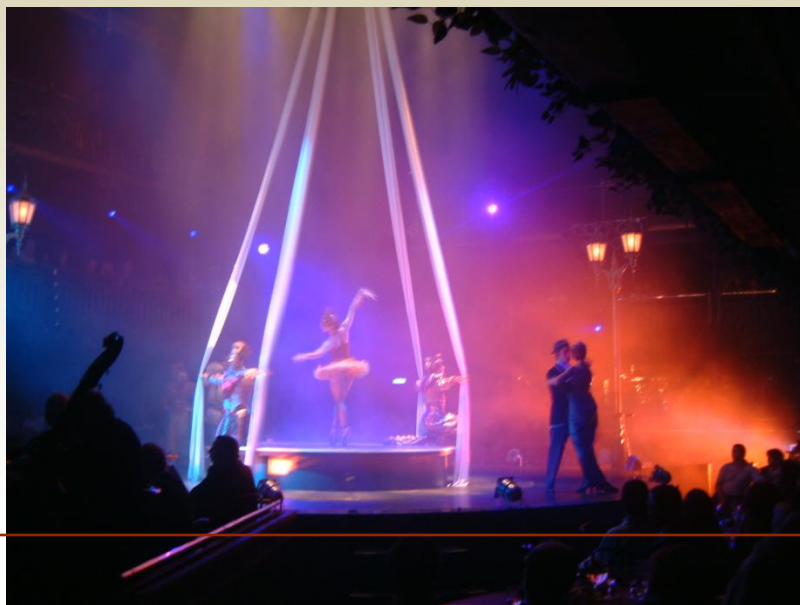
- elsewhere he concluded on the need for prevention:

**O God! — O nurse, how shall this be
prevented?**
(*Romeo and Juliet*, III, v, p. 206)

- and he also gave very specific advice:

**Leave thy drink and thy whore
And keep in-a-door**
(*King Lear*, I, iv, p. 118)



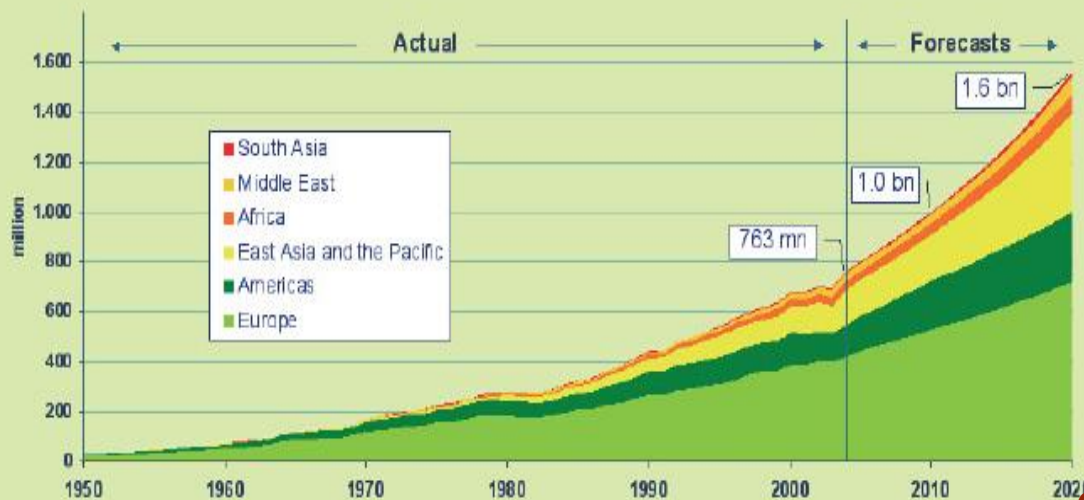


International Tourist Arrivals WTO

International tourist arrivals

- one billion in 2012
Can travel globally anywhere in < 24/24

International Tourist Arrivals. 1950-2020



Source: World Tourism Organization (WTO)

International travel affected by

- weakening economies of major tourism markets
- impact of global terrorist attacks
- EMERGING DISEASES
 - MERS. Saudi Arabia – 2012/3
 - Measles and Pertussis in Europe and US
- Natural disasters:
 - Tsunami, Floods, Earthquakes
 - Societal disasters – boats sinking

Currently travel to 'non-threatening' regions in the world is on the increase:

- Africa: Namibia, Botswana, Zambia
- India, Vietnam, Cambodia, Laos, Thailand
- Sth America: Peru, Bolivia, Ecuador
- Pacific – Samoa, Cook Islands... ↓ Fiji





Potential of DIS-ease

- **2 Million plus New Zealanders Travel overseas / year**
 - 50% of those to developing countries will become unwell

- **BIG SIX INFECTIOUS DISEASES**

● Travellers' Diarrhoea	40.0%
● Respiratory tract infection	25.0%
● Animal bites (NZ study of rabies risk)	15%
● Malaria	2.0%
● Hepatitis A	0.3%
● Gonorrhoea / STDs	0.2%



Destinations for KIWIs

- **Europe** – always Europe!!
- **Cruises** – Antarctica and Alaska
Caribbean
Pacific Region
- **Luxury/ Specialist Tours**
 - Capt Choice Tours
- **Africa** - Kenya to South Africa
- **South America**
Peru, Ecuador and Bolivia
Amazonas [adventure]
- **South East Asia**
Vietnam and Thailand
Laos and Cambodia



NZ Travellers – to JUNE 2013



- Overseas Trips by New Zealand residents in the May 2012 year (2.14 million) were DOWN 1% from the June 2012 (2.154 mill)
- The biggest increases were in trips to
 - United States (up 8,200)
 - UK (down 8,200)
 - Australia (down 26,500)
 - Cook Islands (up 4,200)

*Source: Statistics New Zealand, Tourism and Migration 2012**

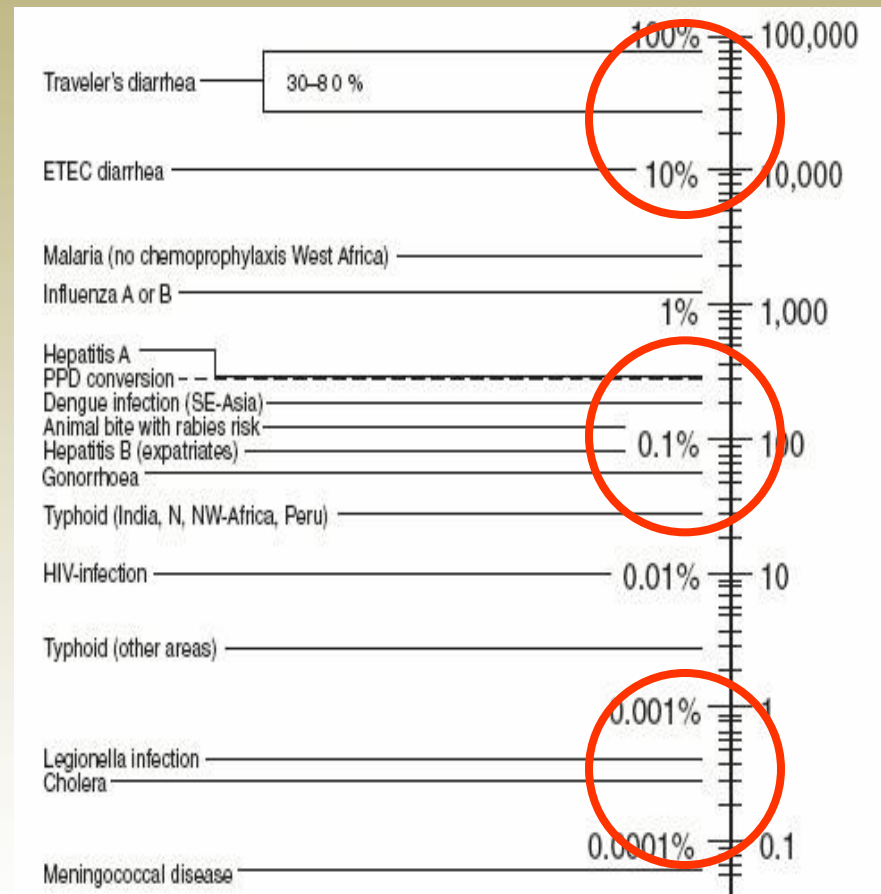




Health Problems of Travellers

- It is estimated that for every **100,000 visitors**, who visit for a month in a developing country, **about 50%** will develop some type of illness. **8,000** will visit a physician, **5,000** will be confined to bed, **300 will be hospitalised** (either during their trip or upon return), **50** will have to be transferred by air and **1 will die**

- International Society of Travel Medicine data*



Incidence rate of health problems per month during a stay in developing countries

Steffen 2009





Gone are the days when girls used
to cook like their mothers.
Now they drink like their
fathers.



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Travel Health Clinic Advice

- Must focus on **important** information
- Looks at the **global** traveller
- Reviews the **childhood** immunisations
- Infectious diseases account for up to **40-70%** of travel advice
- Considers **relative risks** of diseases
- Protects ag. community diseases
- Considers **disease and dis-ease**



- **Find out from all patients**
current vaccination status

** 70% of 70 yr olds NOT protect. ag TETANUS*

** Resp infections common thus consider flu!*



The Pre-Travel Assessment

Itinerary to determine health risks

- Country of birth (esp. for VFR)
- Country raised in
- Detailed itinerary of overseas trip
- Season of intended travel
- Air-travel direction
- Places and duration of travel
- Types of accommodation /eating facilities
- Rural or urban
- Climate, temperature, altitude of the trip

VACCINATION HISTORY:

- PH personal vaccines
- Disease patterns and paediatric vaccine coverage of country to be visited



Advised Childhood Vaccines – an update, NZ

- NZ has a National Immunisation Sched that currently includes vaccines against 12 diseases - free to babies, children, adolescents and adults
- Approx 95% children fully immunised by 2 yrs:



Vaccinations – Tsunami – Nias Island, Indonesia

- **Vaccine schedule:**
 - 6 wks, 3 and 5 months:** Diphtheria, Tetanus, acellular Pertussis, Polio, *Haemophilus influenzae* type b, Hepatitis B,
 - 6 wks, 3 and 5 and 15 months:** 7-valent pneumococcal conjugate vaccine
 - 15 months:** *Haemophilus influenzae* type b
 - 15 months:** Measles, Mumps, Rubella
 - 4 years:** Measles, Mumps, Rubella, Diphtheria, Tetanus, acellular Pertussis
 - 11 years:** Diphtheria, Tetanus, acellular Pertussis
 - 12 years (girls):** HPV
 - 45 and 65 years** adult tetanus and diphtheria
 - All adults 65 years** and over and high risk
 - other groups:** seasonal Influenza



Disease Prevention ... 'Hot to trot' Vaccines

Decision on vaccinations

- The “Eclectic Eight” shots for travel to devel. countries > 1/12
 - Hepatitis A
 - Hepatitis B
 - Measles, Mumps, Rubella
 - Spreads via airborne respiratory infections
 - Typhoid
 - Tetanus
 - *Spreads via soil contaminated with animal excreta*
 - *Survives well in the tropics*
 - Diphtheria
 - Spreads via airborne respiratory infections
 - Diphtheria: in devel. countries and areas of the Soviet Union, Haiti 2010
 - Polio
 - *Faecal oral spread (poor hygiene and sanitation)*
 - Rabies





Immunisation Strategy for Intending travellers

Discuss an immunisation programme:

- 
- Consider how much time is available before the travellers departure
 - Start Immunisation Programme as early as possible (that day if willing!)
 - If necessary, consider the possibilities for an accelerated immunisation schedule
 - Schedule future appointments to complete series if required





Schedule Headaches!

- Multiple vaccinations can be given on one day without compromising immunity

Ref: CDC Yellow Book

- 
- They must be administered in separate syringes and different sites with 2 cm separating them.

Ref: IMAC and Immunisation Handbook 2006 - 2011

- Remember live vaccines such as Yellow Fever, MMR and Varicella must be given concurrently or administered a month apart





Legalities

- 
- Travel vaccinations are prescription drugs and are not covered by the independent non-medical vaccinator certificate
 - Should hold a current standard vaccinator certificate
 - Informed consent
 - Record batch, site, dose and expiry





Just remember!

Immunisation for travel is just the same...

Protocols for ...

- Cold Chain
- Emergency Equipment
- Injection Techniques
- Anaphylaxis treatment
- Faints/Adverse reactions and side effects



Travel Vaccinations

1. LIVE VACCINES

(Attenuated Vaccines, given same day or a month apart)

- **YELLOW FEVER**
- **MMR**
- **BCG**
- **VARICELLA**

- **ORAL TYPHOID**
- **OPV**

- **JEV**
- **SMALLPOX**





Travel Vaccinations

2. INACTIVATED VACCINES

- These are made from killed bacteria or viruses
e.g. Wholecell Pertussis, rabies, JEV

3. SUBUNIT VACCINES

These use fragments such as proteins, toxoids or sugars (polysaccharides) derived from the disease-causing organism.

Most vaccines currently are subunit.

e.g. Inactivated Bacterial Toxins

DIPHTHERIA and TETANUS

The use of toxoids began in 1923 at Pasteur Institute, when Demontre and Ramon found that diphtheria toxin treated with formalin and heat was transformed into a nontoxic but immunogenic moiety that could be used to immunize against diphtheria.

Initially called anatoxines by Ramon, these compounds are now known as toxoids.





Travel Vaccinations

Routine:

All Childhood vaccines *with particular emphasis (and a chance to update) on*

Polio Measles Rubella Diphtheria Pertussis

Don't forget these diseases.... outbreaks of them are still around!!

Measles:

2013: UK

**2012: NZ, Aust., USA, England, France, Belgium, Germany, Turkey, Brazil
Romania, the Russian Federation, Sweden, Norway and Switzerland**

Chicken Pox:

2012: USA

Rubella:

2011: Vietnam

2009: Austria

Diphtheria:

2012: Thailand

2010: Haiti

Mumps:

2013: Spain

2012: England, Scotland, Canada, Egypt

Pertussis:

2012: USA, UK, NZ, Australia

Polio:

2011: Wild Polio – Pakistan, China

2009: Nigeria, Sudan, Angola, India, Pakistan, Afghanistan

www.gideononline.com

www.who.int





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piece of paper, put it in an
envelope, fold it up and
shove it up your ass.



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POLIO

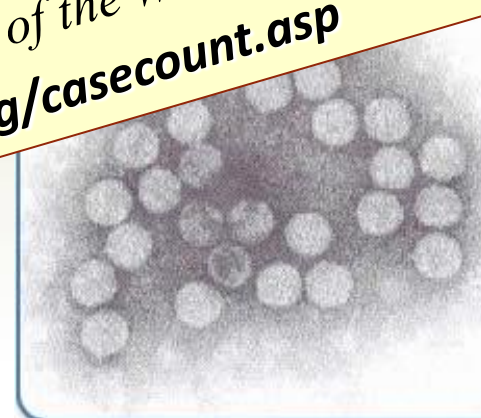
- **DON'T FORGET THIS DISEASE FOR TRAVELLERS**

- *Egyptian bas-relief from the 18th Dynasty (ca. 1500 BC) showing the crippling sequelae of a presumed polio case*



The total number of cases globally for 2012 = 223
from four countries (Nigeria, Niger, Pakistan, Afghanistan and Chad).
This compares to 303 cases from 13 countries for same period in 2011

Global Polio Eradication Initiative (GPEI) on behalf of the World Health Organization.
<http://www.polioeradication.org/casecount.asp>





POLIO

- **Poliomyelitis and its symptoms:**
 - highly infectious viral disease
 - invades nervous system
 - cause total paralysis in hrs
 - virus enters body through the mouth
 - multiplies in the intestine
 - initial symptoms: fever, fatigue, headache, vomiting, stiffness in the neck and pain in the limbs
 - 1 in 200 infections - irreversible paralysis (usually - legs)
 - In those paralysed, 5-10% die when resp. muscles affected
- **Persons at risk of polio: children < 5 years of age.**



Wild Poliovirus - 2013

01 January - 30 July



Administering polio vaccines in the Congo

Worldwide, only 5 countries are known to have people with active polio. In 3 of them, Pakistan, Afghanistan and Nigeria, the disease is considered endemic, while in the other 2, Somalia and Kenya, only a few isolated cases have been identified since the start of 2013.

Polio cases in the world in 2013

WPV3 is less commonly associated with importation events than WPV1 (which is more likely to cause paralytic disease and have a wide geographic spread)

- Wild polio virus type 1
- Endemic countries
- Importation countries

Excludes vaccine derived polioviruses and viruses detected from environmental surveillance.

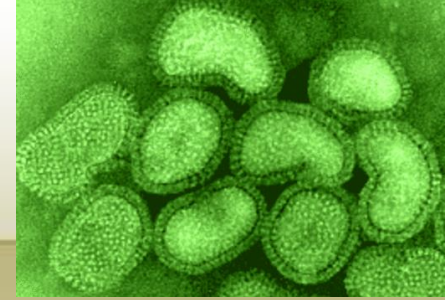
Data in HQ as of 30 July 2013

<http://www.polioeradication.org/Dataandmonitoring.aspx>





Influenza



- Influenza is considered the **most frequent vaccine-preventable infection** with potential morbidity in travellers to tropical or subtropical countries
- The transmission of influenza during transportation has been reported in **airplanes and, more often, in cruise ships**
- Outbreaks of influenza have been reported on **cruise ships in both the southern and northern hemispheres**. Influenza A and B viruses were the most common.
- **Cruise ships, tour groups and buses** used by different tour groups facilitate influenza transmission and the spread of other viruses, as does the fact that passengers are usually from different countries and both hemispheres. Crew may occas. serve as a reservoir
- On cruise ships, **passengers are often elderly** and have additional risk factors for the respiratory complications of influenza that can lead to potential morbidity

Advise travellers to have this vaccine if they are going on a cruise to any location





Advised Travel-related Vaccines

Recommended (for most travellers):

Hepatitis A
Hepatitis B
Influenza
Pneumococcus
Typhoid
Travellers Diarrhoea ETEC

Required (under certain circumstances):

Yellow Fever
Polio
Cholera
Meningitis
Q-fever

Remote or specialised:

Rabies
Japanese encephalitis
Tuberculosis
Tick borne encephalitis
Anthrax
Plague
Smallpox





HEPATITIS A

- **ORAL-FAECAL VIRAL INFECTION**
- **Incubation:** 15-50 days
- **Incidence:** 1:50 - 1:300
- **ENDEMIC REGIONS:** Africa, India, Asia ...
- **Australia and New Zealand:** *low incid.*
- **SALADS, WATER/ICE, SEAFOOD**
- **Disease not serious in children ages < 12 years, but they may excrete virus for up to 6 months after infection**
- **1.4 million** cases reported globally each year though the **true incidence is 3-10** times higher
- **Small no. of cases (<5%) spread through sex activity or contaminated blood product**
- **Virus can survive for at least a week** in ambient conditions and in **water for as long as 10 months**
- **Lancet Sept, 2003: Those fully vaccinated (with both doses of vaccine) against hepatitis A DON'T need boosting (NB Serology after one dose NOT confirmatory)**
 - **Duration of action 30-40+ years!**



'Cutting ice for drinks at Ankor Wat'



HEPATITIS B

- **Largely ignored** when advising travellers before departure
- Virus spread via **blood and other bodily fluids** inc. sweat
- **Monthly incidence:** (JTM 2005;12:26-35)
25/100,000 for symptomatic infections
up to 420/100,000 for sympt and asymt infections
- **100 x more contagious** than HIV
viable outside human for 1/12
- **Risk activities:**
 - Tattoo
 - Piercing
 - Razors
 - Sexual contact
 - Sports with **physical contact**
 - **High risk pursuits** (climbing, cycling)

**0-15% travellers expose themselves to body fluids
(volunt or involunt) whilst travelling abroad** Steffen 2008





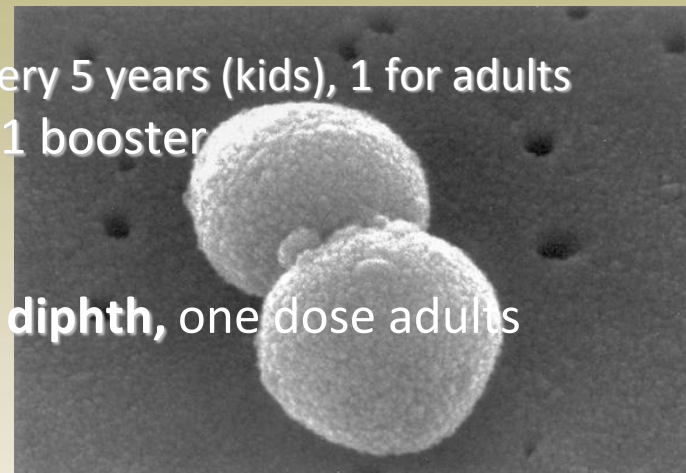
Sometimes when people
are talking to me I
daydream about what
they would do if I
suddenly punched
them right in the
face.

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PNEUMOCOCCUS

- **Major clinical syndromes** of invasive Pneumococcal disease:
 - pneumonia, meningitis, O. media, bacteraemia
- **Vaccine:**
 - Pneumo 23 - Polysacc**, boosters every 5 years (kids), 1 for adults
 - Pneumovax 23 – polysaccharide**, 1 booster
 - 0.5 ml deep SC or IM with
 - Prevanar 9, 13 – conjugated with diphth**, one dose adults



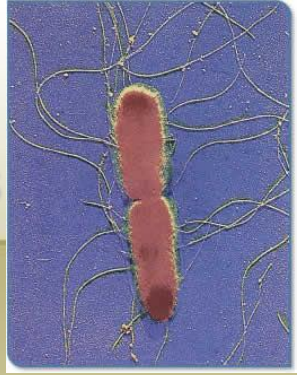
Indications:

- routine vaccination for persons **50 years of age or older**
- persons aged ≥ 2 years with **chronic cardiovascular disease**, **pulm disease**, **diabetes**
- persons aged ≥ 2 years with **[alcoholism]**, **chronic liver disease**
- persons aged ≥ 2 years with **functional or anatomic asplenia** (including sickle cell disease and splenectomy)
- **Immunocompromised** individuals





ENTERIC FEVER - Typhoid and Paratyphoid Fevers

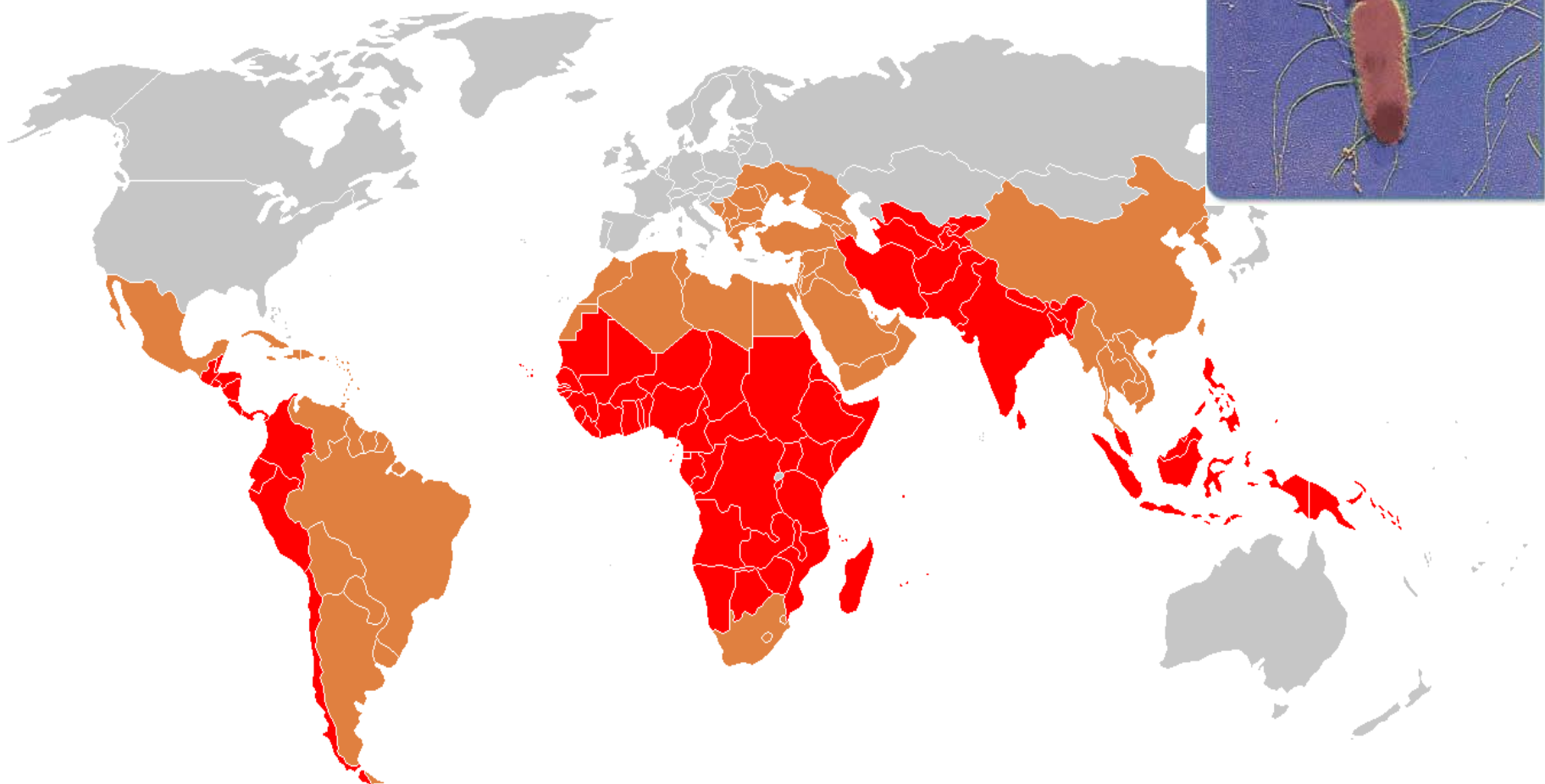
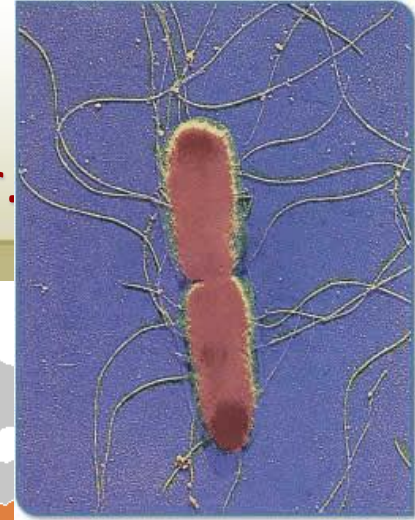


- 22 mill cases / yr – 5-600,000 deaths
- 7 mill from Asia, 4 mill from Africa, 0.5 mill Sth America
South Asia incid approx 1600/100,000
Travellers incid 3-30/100,000 – approx 1 in 3,000
- Incubation period 3-60 days and disease is widespread, esp. the tropics
- Enteric fever is classically caused by *Salmonella enterica (serovar) typhi* (typhoid); but similar syndrome caused by:
Salmonella enterica (serovar) paratyphi A (high in Indian Subcont, SE Asia)
[and *paratyphi B* and other *Salmonella* spp]
- Transmission = oral-faecal



Geographic distribution of enteric fever.

Values = no. cases per 100,000 population per yr.

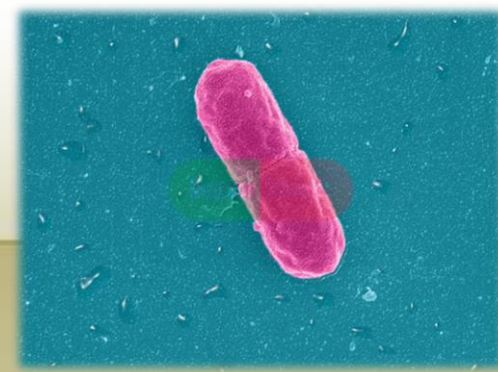


Red – High risk: >100/100,000/yr
Brown – Mod risk: 10-100/100,000/yr
Grey – Low risk: <10/100,000/yr





Salmonella paratyphi



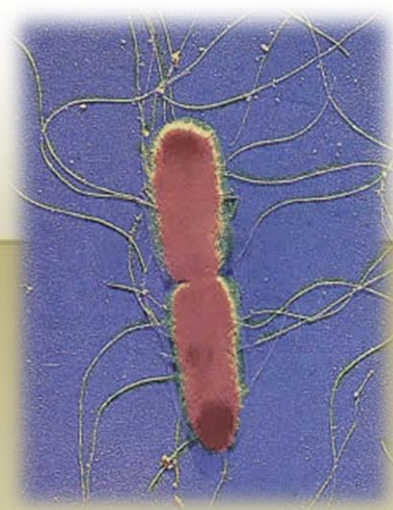
- Although initially quite sensitive to antimicrobials, strains have become **more resistant to quinolones**; in contrast, *S. typhi* has manifested resistance for some time
- In a recent report regarding differential **risk factors for typhoid and paratyphoid in Indonesia**, the infections seemed to have distinct routes of transmission
- **Typhoid was associated with factors within a household** (*recent case in the house, no soap for hand-washing, sharing of food from the same plate, no toilet in the house*), whereas **paratyphoid was associated with sources outside the household** *such as food from street vendors and flooding*



ENTERIC FEVER - Typhoid Fever

Rose spots reported in 5-30% cases but easily missed in dark-skinned patients.

Rose spots, described as blanching 2-4 mm diam. papules classically found on upper abdomen and lower chest, have been reported to occur in 30-50% patients



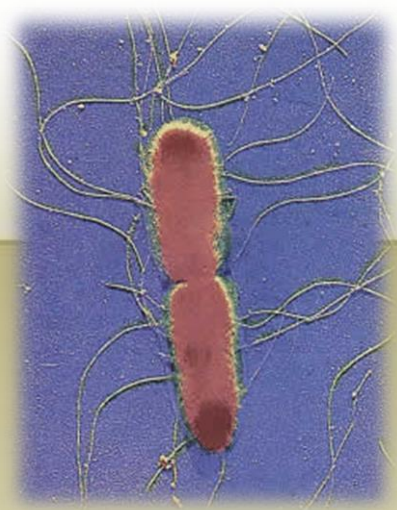
Practical Punchpoint

NB Typhoid Fever = 1° cause of fever in *returning traveller*





ENTERIC FEVER - Typhoid Fevers



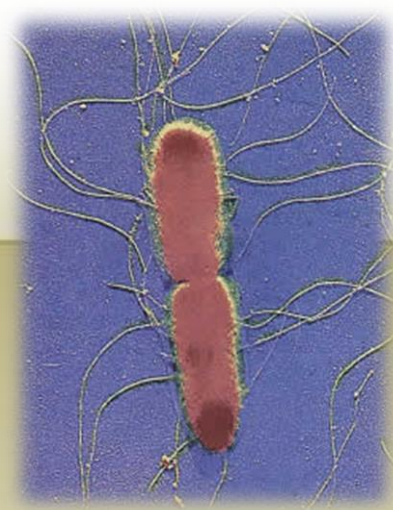
- **Vivotif Oral** – (*oral live attenuated typhoid vaccine*)
 - 3 capsules in a blister pack.
 - vaccine elicits prompt serum IgG anti-Vi responses in 85 to 95% of adults and children >2 years of age
 - used in clinical trials in endemic regions (Nepal, South Africa, China), indicating moderate protection against typhoid fever
- **Typherix** – (*purified Vi capsular polysaccharide vaccine*)
 - Each 0.5 mL pre-filled syringe contains 25 µg Vi polysaccharide of S. Typhi
- **Typhim Vi** – (*purified Vi capsular polysaccharide vaccine*)
 - Each 0.5 mL pre-filled syringe contains 25 µg Vi polysaccharide of S. Typhi
- **Adv reaction rare** – abd pain, naus (oral) and Headache, fever (IM)





ENTERIC FEVER - Typhoid Fevers

THE MESSAGE FOR TRAVELLERS



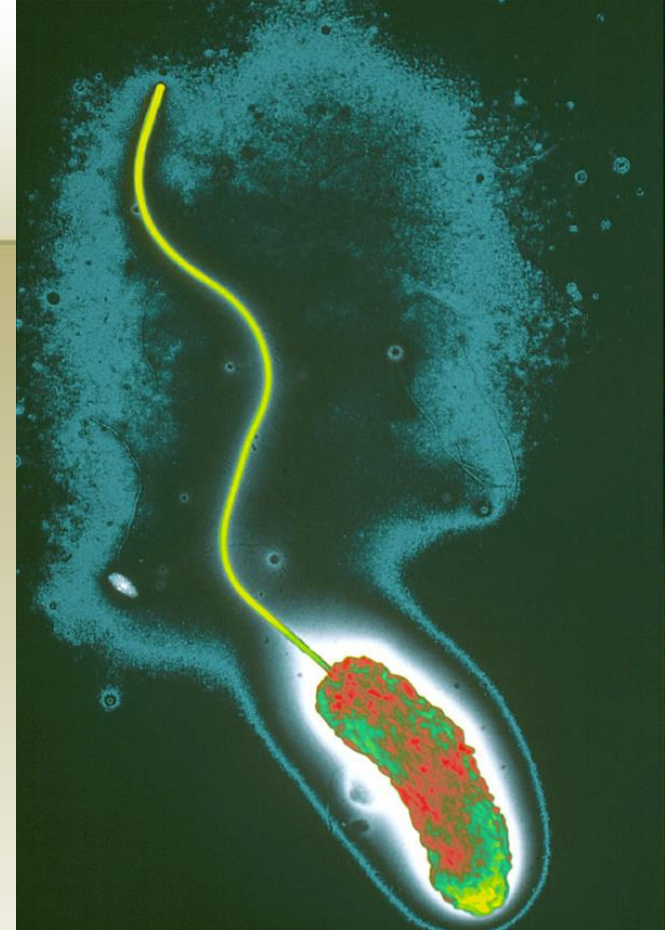
- **Do not eat raw seafood** from contam. waters
- **Treat drinking water** by boiling or chlorinating at home
- **Store treated water safely** in narrow-mouth containers with lids to prevent re-contamination after treatment
- No swimming and harvesting of seafood **when ocean & lagoon sites test positive** for human faecal coliforms
- Practice **proper hand washing**, hygiene and sanitation
- **Proper food preparation**
- **Wash raw vegetables thoroughly**



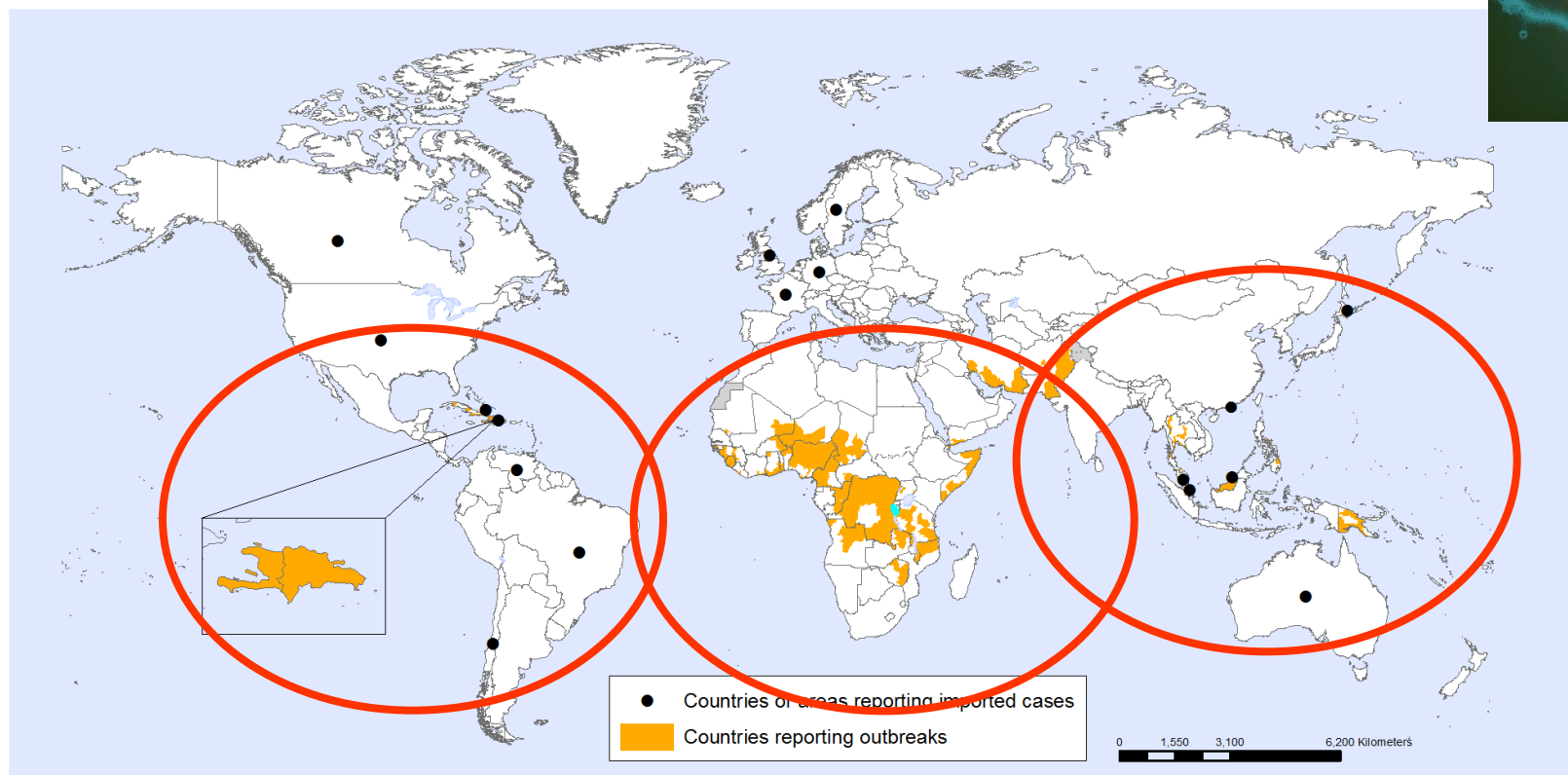


CHOLERA

- *V. cholerae*
 - produces a **toxin similar to ETEC**
 - Toxins reflect major effects of both diseases
- **Incidence:**
 - **3-5. Million / year [WHO]**
20,000 deaths in Africa, 100,000 in Asia
 - **Incid. in Travellers:** 1:60,000 - 1:200,000
- **Cholera has an acute onset**
 - **Death** - early as 4-8/24 after onset
 - **Signs of shock are terminal events**
 - In a day, adult passes **several litres** watery stools of typical fishy smell, rice-water color
 - **Dehydration** moderate to severe
 - Some patients =unconscious or semiconscious because of **hypovolemia**
 - **Signs of shock include:** low BP, poor/imperceptible pulse,
poor skin elasticity, poor urine output



Cholera, areas reporting outbreaks, 2011–2012

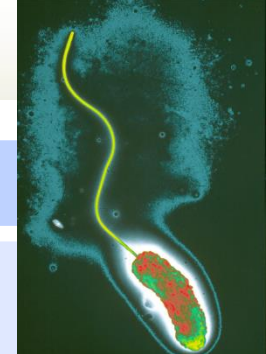


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Data Source: World Health Organization
 Map Production: Public Health Information
 and Geographic Information Systems (GIS)
 World Health Organization

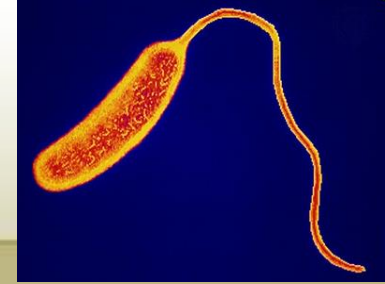


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Immunisation - Dukoral



- **Adult (AND children > 6)** – 2 doses 1 - 6 weeks apart
- **Children 2-6 years** – 3 doses 1 - 6 weeks apart

- No food and fluid for 1 hour before and after
- Protection expected at about 1 week

Booster: *provided there's continued risk of V. cholerae infection:*

1. **1 booster at 2 years for those > 6 years**
 - If interval between primary series and booster > **2 years** then primary series needs to be recommenced
2. **Children 2-6 yrs– 1 booster recommended 6 monthly,** and
 - if interval between primary immunisation and booster is > **6 months**, primary immunisation needs to be recommenced



TRAVELLERS DIARRHOEA

- **40 - 60% RISK IN DEVEL. COUNTRIES**
 - ... *esp*: Mexico, Peru, India, Egypt
- **Travellers diarrhoea** affects 40+%
- **Oral-faecal** transmission
 - 50% TD rainy season c.f. 4% = *dry*
 - 80% resolves within 2 days

Defining Travellers Diarrhoea:

- this tends to have subjective comp. ...includes
- **3 loose stools** with 8 hours OR
- **4** within 24 hours

PLUS 1 of:

- **nausea, vomiting, Faecal Urgency**
- **abd. cramps, fever**

Practical Punchpoint



ROLE OF THE DOC/ NURSE:

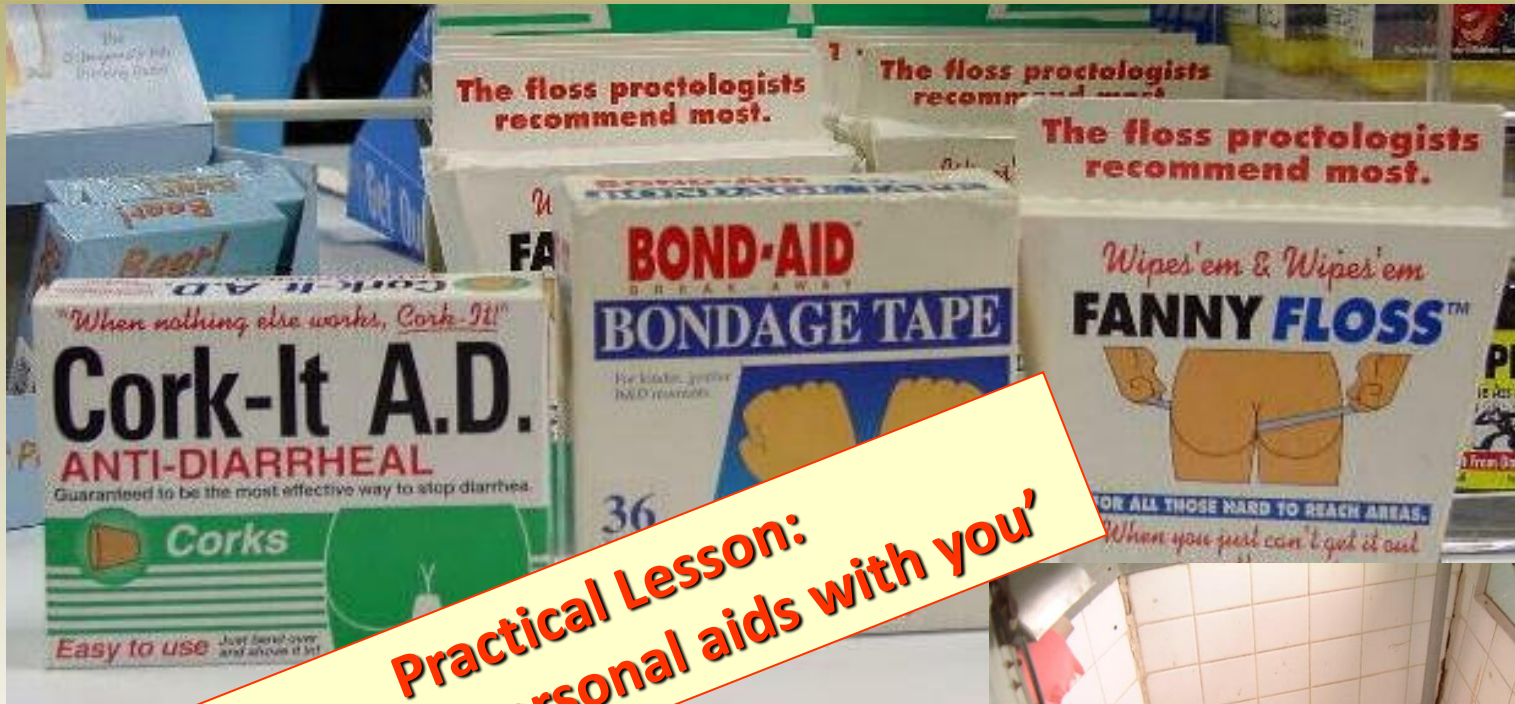
In the provision of preventative advice:

... we need to teach

- i) when to treat**
- ii) what to self treat with**
- iii) when to seek advice**



Aids for travellers!!



Practical Lesson:
'take your personal aids with you'

Reunification Express – Vietnam
... at the start of the journey!





Snap Therapy... the SIX pointer!

Practical Punchpoint

1. **Alimentary Hygiene DOES** work but is not reality
... too impractical for most travellers!
2. **WHO recommend:** 1 teasp salt+8 teasp sugar in 1 L potable H2O
Food should be started as soon as the patient can eat
3. **ORS OK** because electrolytes/ sterility of mixtures, HOWEVER
ORS had no influence on symptoms, thus soups, juices etc
4. **Wait 'til get ongoing diarrhoeal symptoms b4 Rx**
5. **With TD parameters being met ...**
Loperamide + antibiotic combo. = illness few hrs
6. **IMMUNISATION** ag. ETEC good for 3 months - 60% effective



I don't like making
plans for the day,
because then the
word "premeditated"
gets thrown around in
the courtroom.



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MENINGITIS



- **Worldwide endemicity**

... of concern: vast majority caused by meningococci of serogroups A, B, C

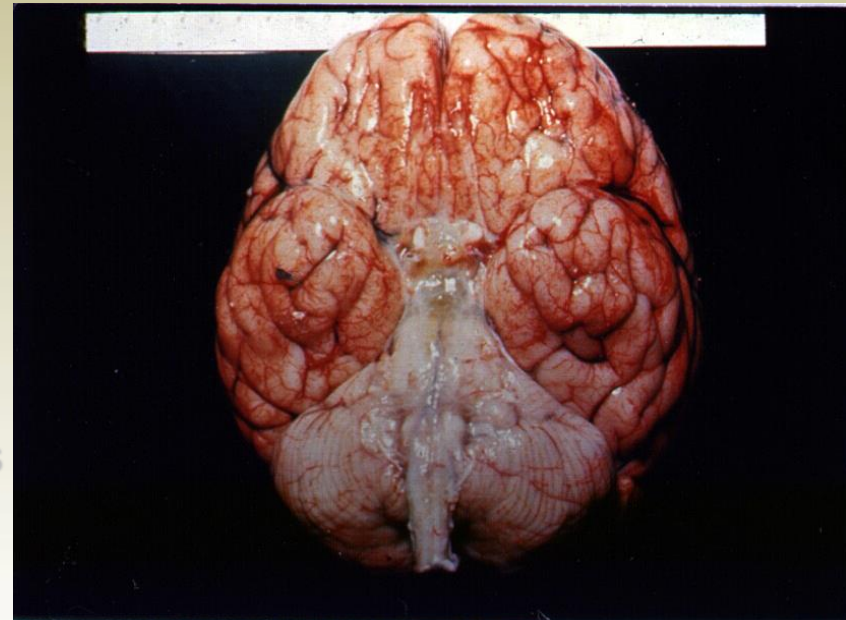
Group A... mainly Sub-Sahara, epidemics, intervals 7-14 yrs

Group B... epidemics in NZ, Europe, Brazil

Group C... Australia, NZ, Nth America, UK

Group W... recently 2000 in Saudi, W. Africa

Group Y... United States



- **Incidence: 500,000 / yr, and with 50,000 deaths**

- **Nasopharyng. carriage common in adoles. / Young adults (5-15%)**
but ... rare in adults (1%)





MENINGITIS

- Widespread endemicity...

Meningitis belt of Sub-Sahara

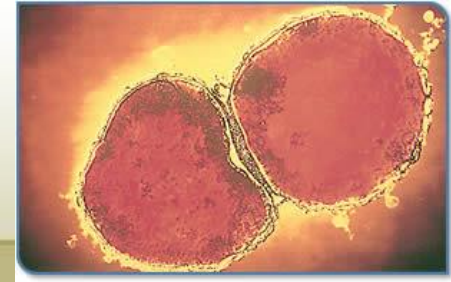
Meningococcal ACW-135Y

Polysaccharide

4 strains in vaccine in NZ, Aust

NOT for type B

Non-conjugated



Single dose vaccine - NZ / Aust brands: *Mencevax, Menomune* ... lasts 2-3 yrs

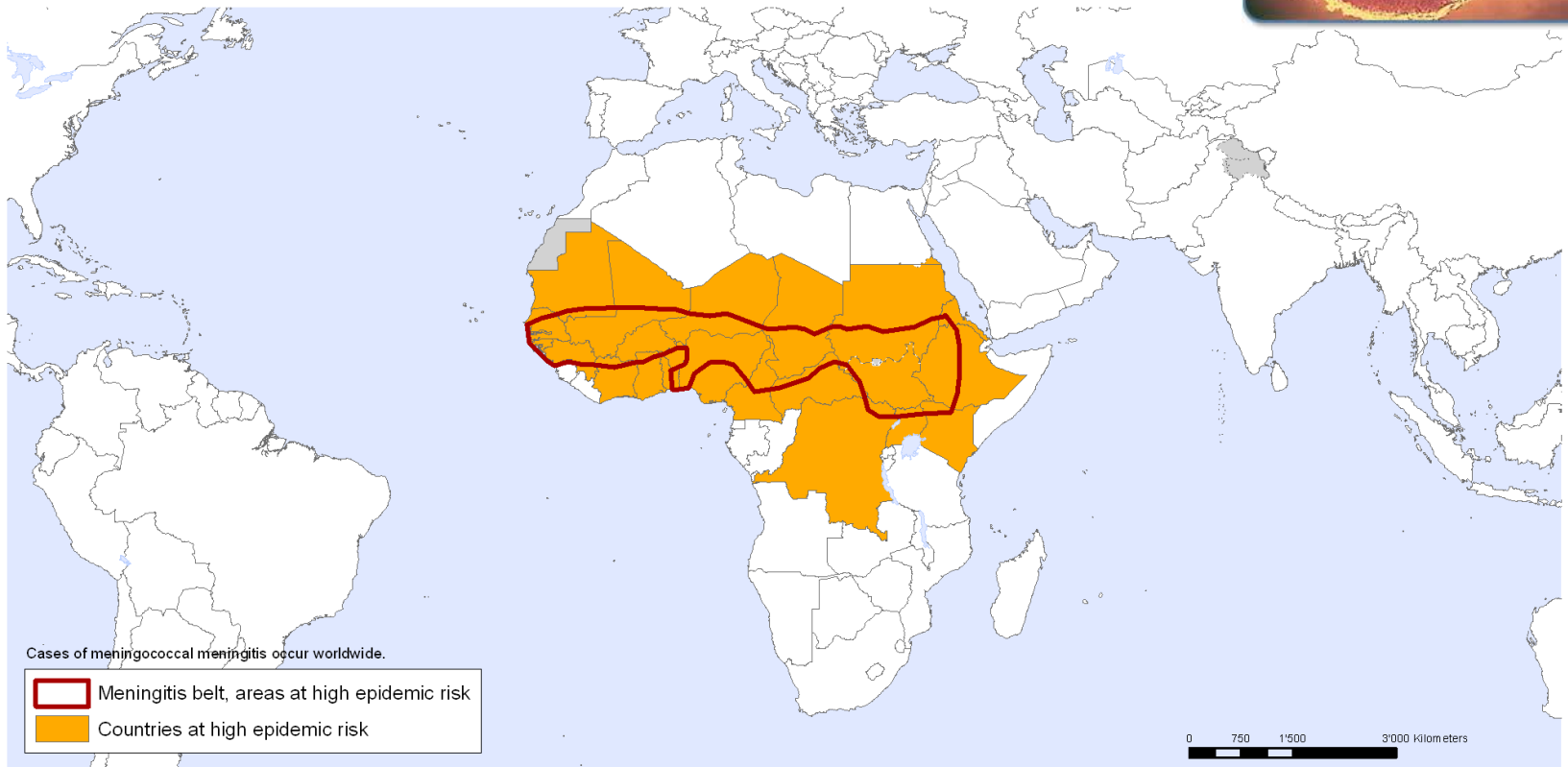
MENVEO, MENACTRA (conjugated) ... 5-10

Conjugate vaccines should be used in travellers to areas in Africa rather than polysaccharide vaccine. The vaccine efficacy is 87–98% and 85–100% for conjugate and polysaccharide vaccines, respectively





Meningococcal meningitis, countries or areas at high risk, 2011



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Compulsory for annual pilgrimage of Muslims to Haj and Umra, Saudi Arabia

No longer 'compulsory' for travel to Nepal highlands...



YELLOW FEVER



- **Viral haemorrhagic disease**
- **200,000 / year and 30,000 deaths** → liver failure AND multi-organ collapse
- **Virus similar to those of: dengue fever, JE, TBE, West Nile**
- **Virus is mosquito borne**
- **Humans accidental hosts**
 - In forest pattern, monkeys are prime host, *humans: accidental*
- **Incubation in Humans: 12-21/7**
- **Legally vaccination is required for visas & borders**
- **Can only be given by Health Dept registered clinics**
- **Travellers must carry certificate of vaccination**
- **Single dose vaccine in NZ and Australia, Stamaril, and effective for 10 years+**
 - to be given in ages over 6-9 mths - confers immunity in > 95% vaccinees
 - **safe: 150 million doses/4 years and ~ 30 deaths**

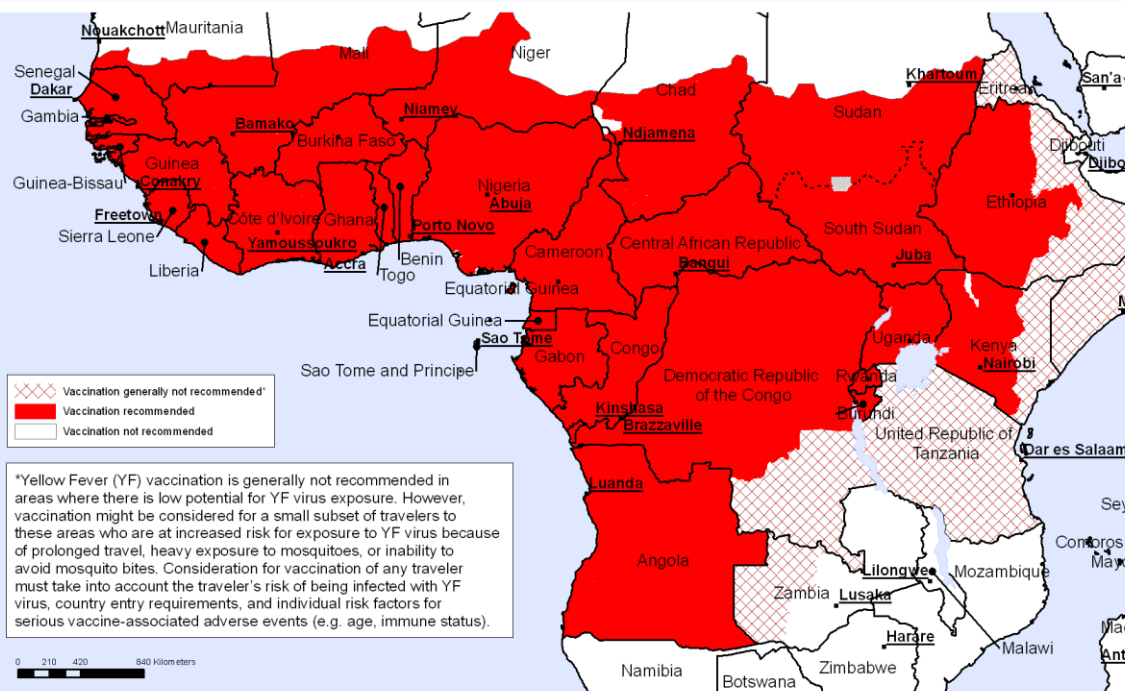
Red Howler (*Alouatta seniculus*)



YELLOW FEVER in AFRICA



Yellow Fever Vaccination Recommendations in Africa, 2011



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Yellow fever disease Activity	Illness	Death
Epidemic (infected areas)	1: 250	1: 1,300
Endemic areas	1: 2,000	1: 10,000

Africa: (highest risk July – Oct)
Risk of Yellow Fever Disease for 2 week stay:



YELLOW FEVER (endemic zones) Americas



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Yellow fever disease Activity	Illness	Death
Epidemic (infected areas)	1: 2,500	1: 13,000
Endemic areas	1: 20,000	1: 100,000

South America: ~~(highest risk Jan- Mar)~~

**Risk of Yellow Fever Disease for 2 week stay:
(10 times lower risk than Africa)**





YELLOW FEVER - *clinical*



- **Incubation** in humans 3-6 post bite
 - Patient only infectious to mosq. for first 3-4/7 after symptom onset
- **Presentation:**
 - sudden ACUTE onset: **fever, headache, myalgia, N and V, jaundice**
 - ***Faget's sign: charact. bradycardia in relation to temp***
 - **15%** of infected develop serious illness:
 1. acute phase approx 3/7
 2. remission for up to 24/24 (characteristic saddle-back)
 3. toxic phase (**50% death rate**)with jaundice and vomiting (black),also:
 - haemorrhagic signs, albuminuria and oliguria, hiccoughs, diarrhoea, tachycardia, shock, death 7-10 days
- **Differential:**
 - Malaria (may co-exist), Typhoid, rickettsial disease, 'Flu
 - Leptospirosis, viral hepatitis, Infect. mono., tick-borne relapsing
 - Dengue, Lassa, Ebola, Marburg, chikungunya, Crimea-Congo, Rift Valley
- **Diagnosis: Serology**





THE VACCINE



- Vaccine is very well tolerated, and usually doesn't restrict activities
- Common adverse events approx 20%
 - ... 2-8% with limitation of activities
- Fever, Backache, Headache, injection site 'discomfort', malaise, myalgia
- Mild local reactions (erythema, injection site pain), systemic reactions may occur in **first 3-7 days post vaccination ... may last 5-10 days**
- **1st time vaccinees have a mild viraemia** for ≥ 1 day bet 3-7th day post vax
- **Revaccination results in no viraemia** + lower incid. of adverse reactions because vaccine inoculum is neutralized by pre-formed antibody





THE VACCINE



- In Australasia – **STAMERIL for Yellow Fever (YF)**
- **17D YF live [170+] attenuated vaccine in use since 1936:** the two vaccine substrains used for production (17D-204 and 17DD)
- The vaccine is produced in embryonated eggs – approx. 95% effective
- Immunization sched: admin. 1 dose for persons ≥ 9 months

3 ADVERSE REACTION SYNDROMES:

Neurotropic (*encephalitis*) ~ YEL-AND

Viscerotropic (*resembles YF disease - fever, jaundice, multi-organ failure*)

Allergic reaction, uncommon (*risk 1 case/131,000 doses*)

From: Plotkin Vaccines 5 edition



Case study – Yellow Fever

- 35 year old, logger in remote Peruvian jungle (Pucallpa, capital Ucayali department, Amazonia)
- 8 day history retro-orbital headache and fever
- Generalized seizure, icteric, agitated
- Spontaneous bleeding oral mucosa and venepuncture sites
- DIC, hepatic encephalopathy, coma
- IgM yellow fever positive
- Died 4 days after admission

*The Gorgas Course in Clinical Tropical Medicine
Dr. David O. Freedman and Eduardo Gotozzo
Reproduced with permission*

Case from David Freedman

© 2002, Universidad Peruana Cayetano Heredia





SERIOUS ADVERSE EFFECTS - ELDERLY



- Risk of adverse reaction of **YEL-AVD (YEL-AND) due to YF Vaccine** as a one-time event with case-fatality rate of 65% is estimated at:
 - All ages risk = 0.4 (0.8) per 100,000
 - 60-69 years old = 1.0 (1.6) per 100,000
 - 70 and over = 2.3 (2.3) per 100,000
- If these risks were additive (excl. anaphylaxis which is treatable), then overall rates for this one-time vaccine risk event approx:
 - **All ages risk = 1.2 per 100,000**
 - **60-69 years old = 2.6 per 100,000**
 - **70 and over = 4.6 per 100,000**





lolsotrue:#1222

Dear paranoid people who check behind their shower curtains for murderers, if you do find one, what's your plan?

lolsotrue.com





RABIES



ENCOUNTERS WITH ANIMALS: PROBLEMS FOR TRAVELLERS!

RABIES IS PRESENT WORLDWIDE except in:

- UK, Switzerland, Norway, Malta, Japan, Oceania, 'Australia', NZ

Rabies is 100% fatal if untreated

- **50,000+** year die from the disease ... 30,000 in India, ??? In Africa
- Transmitted via broken skin and the bite of infected animal (esp. dogs)
- **80% caused by dogs** ... in Bangkok, 5-8% dogs have rabies
- **ALL bites or licks should be considered as possible exposure**
- Once bitten, then
 - clean wound with soap
 - apply povidone-iodine
 - get to clinic to start vaccinations: *initiated within 48 hours*





RABIES

WORLDWIDE STUDY OF 54 TRAVELLERS *(JTM Jan 09)*

Geographical region where exposure occurred:

South East Asia:	45 (83.3%)
	Thailand: 19 (35.2%)
	India: 10 (18.5%)
	Vietnam: 4 (7.4%)
	Indonesia: 3 (5.6%)
Central/South America:	5 (9.3%)
	Peru: 3 (5.6%)
	Ecuador: 1(1.9%)
Africa:	3 (5.6%)
	Zimbabwe: 1(1.9%)
	Kenya: 1(1.9%)
USA:	1(1.9%)



Mexican Free tailed bat

There was an adult to child ratio 5:1

The highest exposure risk group was in those aged 16-30 years

Dogs = commonest animals
– 2/3 of incidents.

Commonest sites animal exposure to body = thigh/lower leg (48.1%), and the hand (18.5%).





RABIES

ENCOUNTERS WITH ANIMALS

Signs and Symptoms may develop up to **25 years later!!**

As Rabies *infects the central nervous system*:

- extremely **painful throat spasms** when drinking...**terror** seeing H₂O
- periods of **excitability** or **dementia**
- **muscle spasms, hypersalivation, convulsions, paralysis** (vocal cords)
- **Final stage:** coma, cardiac/respiratory fail., death (6 reported surviv.)





RABIES



Pre-exposure Vaccination (NZ and Australia):

Cell derived Vaccine is inactivated-virus vaccine

HDCV (human), PCEC (chick)

3-dose series IM or *WHO sanctioned ID*

Days 0, 7, and 21 or 28

Who Should Consider Pre-exposure Vaccination?

1. Travel to endemic countries >30 days in rural rabies area

Mainly Asia (except Taiwan and Japan), Africa, Latin America.

2. At risk occupations, avocations or activities, e.g.

hunters, forest rangers, laboratory workers, spelunkers (!) ...etc



JAPANESE ENCEPHALITIS

- Virus first descr. in Japan in 1871
- Isolated in 1934 from brain of victim
- JE virus (JEV), a mosquito-borne flavivirus, is the most common vaccine-preventable cause of encephalitis in Asia
- JE occurs throughout most of Asia and parts of the western Pacific
- Est. 35-50,000 cases/yr
 - 20%-30% of patients die, and 30%-50% of survivors have neurol/psychiatric sequelae
- **No specific treatment exists**





JAPANESE ENCEPHALITIS



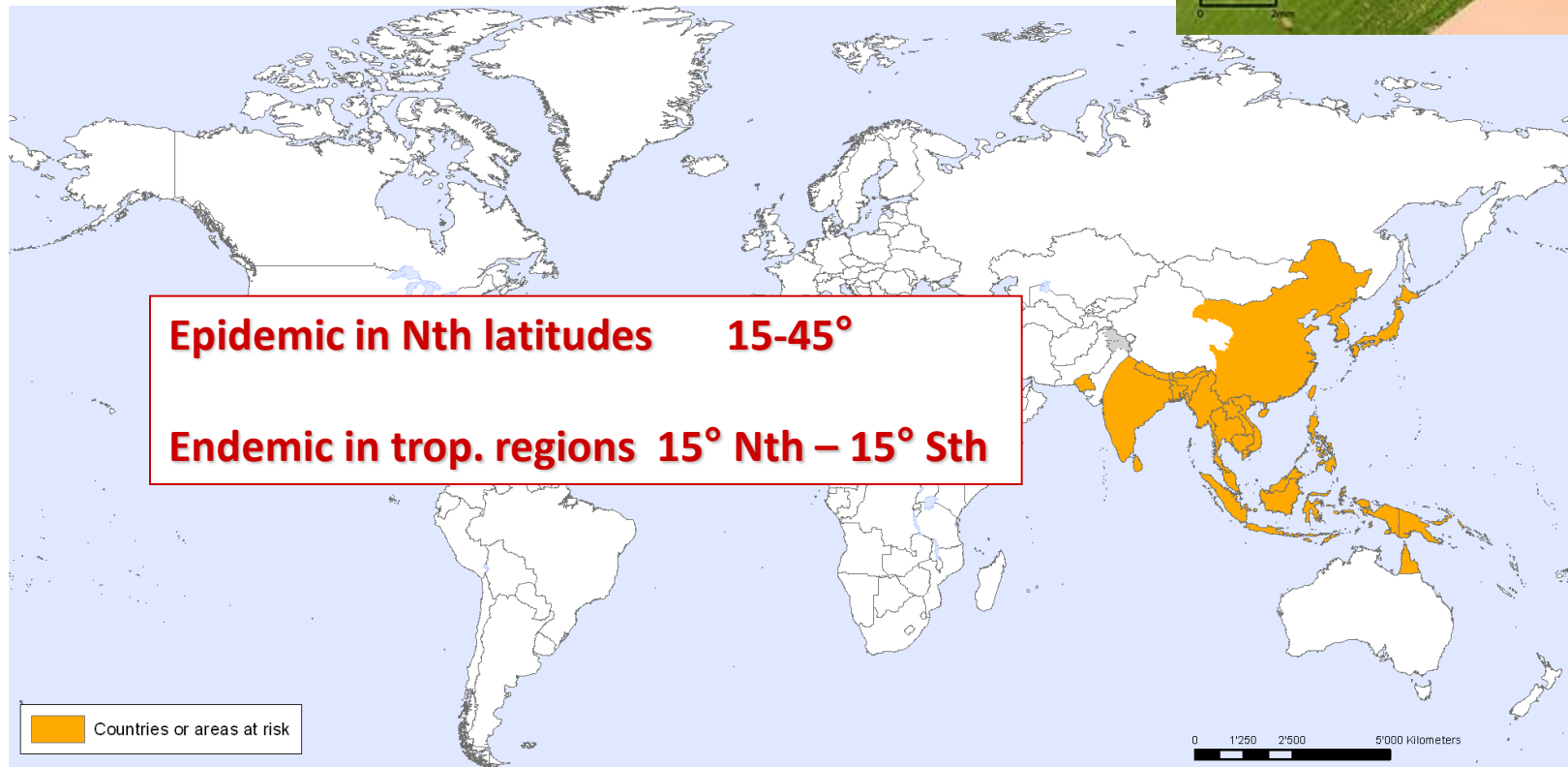
- JE transmitted to humans - bite of infected mosq, primarily *Culex* spp.
- Wading birds are main animal reservoir for the virus
- Pigs = imp. amplifying host/reservoir ➤ transmission of JEV because:
 - Live close to humans and have prolonged and high viraemia
 - Numerous offspring = continuous supply new hosts
- Wild birds are reservoir hosts
- Humans are a dead-end host in the JEV transmission cycle

NB: Cattle are not involved in the transmission cycle of JE virus; wild birds are the reservoir. Pigs are amplifying hosts





Japanese encephalitis, countries or areas at risk, 2011



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JAPANESE ENCEPHALITIS



- Risk for indiv. travellers is highly variable **BUT CAN OCCUR AT ANY AGE**
- Principle factors contributing to risk in Asia are:
 - Travel during the transmission season
 - Exposure in rural areas, especially for extended periods
 - Children <15 YRS and >50 YRS more at risk for devel. symptomatic illness after infection – *incidence 1 sympt:300 cases*
 - JEV transmission principally occurs in rural agricultural areas, often associated with rice production and flooding irrigation.
 - In endemic countries, JE is primarily a disease of children.



JE - INCIDENCE



- <40 cases of confirmed JE reported in travellers in the last 40 years
- **SHORT TERM:** Overall incid. JE reported among **people from non-endemic countries travelling to Asia is <1 case per 1 million travellers**
- **LONG TERM:** Expats and travellers staying for long periods in rural areas with active JEV transmission have similar risk as susceptible resident pop. **0.1–2 cases per 100,000 persons per wk**
- CDC estimate risk for **travellers spending time in rural destinations** during the season of risk *as bet.* **1 case /5000/week to 1 case /20,000/week**
- Travellers on **brief trips prob at incr. risk if they have extensive outdoor** or night exposure in rural areas, including persons staying in resort areas or with family
- Short-term travellers, visits are restricted to major urban areas, **minimal JE risk**



VACCINE - JESPECT



**Inactivated Vero Cell Culture-Derived JE Vaccine [JE-VC]
JESPECT IN AUSTRALASIA and IXIARO IN NTH AMERICA AND EUROPE**

Not compatible with the JE-VAX.

JESPECT is indicated for persons 17(18) years of age

**Dosage: 2 x 0.5 ml doses admin. on Day 0 and 28 days after the 1st
dose 2-dose series should be completed at least 1 wk B4
potential exposure to JEV**

3rd (booster) dose within 2nd yr

**IM or SC means, though the latter may produce a suboptimal
response**

**If co-admin. with other vaccines then injections into separate limbs
ADVISED**





lolsotrue: #2262

Farts are just the ghosts of
the things we ate.

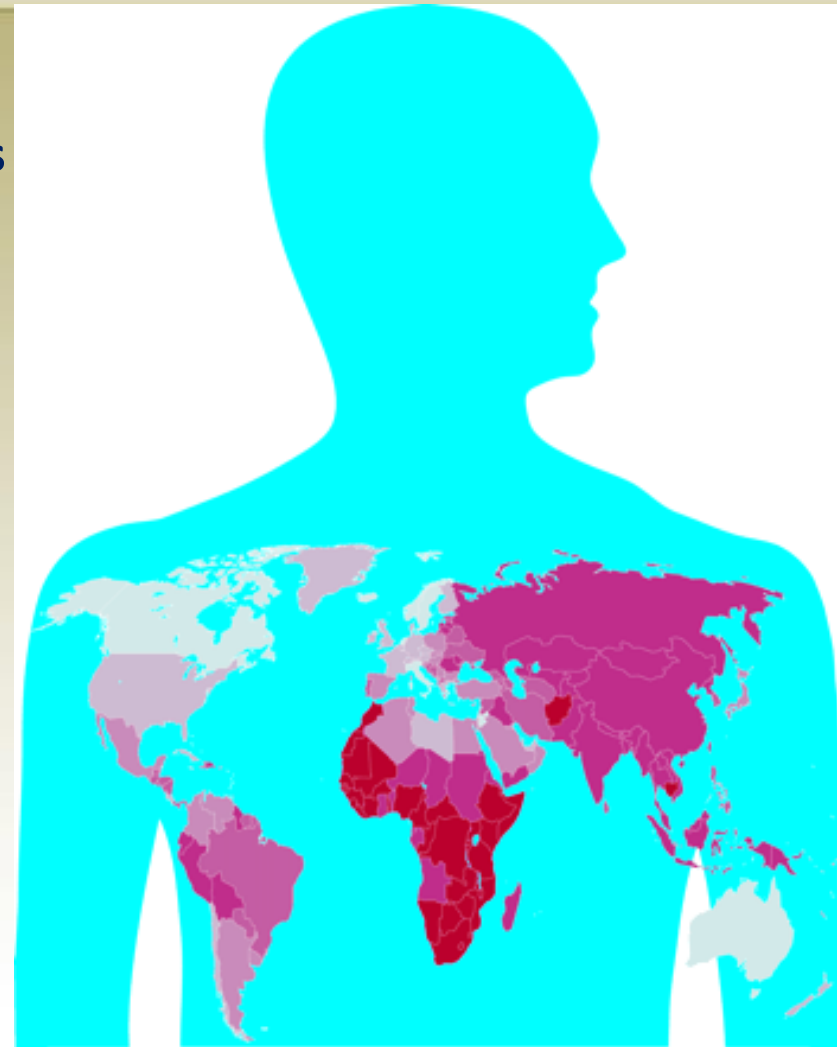
lolsotrue.com





TUBERCULOSIS

- 1 in 3 affected
- Outdoor transmission is negligible unless there is repeated exposure
- No really effective vaccine
 - 50% adults
 - 70% children
 - Extra-pulmonary
- Prevalence of transmissible TB among air travellers is estimated at 5-10 / 100,000 passengers
- Mantoux 2-step
 - 2 tests a week apart CXR ... if indic.



TICK BORNE ENCEPHALITIS



Distribution of Western and Eastern subtype of TBE virus



Literature: J. Süß (Hrsg.), 4th Potsdam Symposium on Tick-borne encephalitis (1997), data from National Health Institutes

Eastern subtype

Western subtype

both types



TICK BORNE ENCEPHALITIS





TYPES OF TBE



There are three main types of TBE:

- **Western European** – found in the forested areas of central, eastern and northern Europe, including Austria, Bosnia-Herzegovina, Croatia, Estonia, Latvia, Czech Republic, Slovakia, Germany, Hungary, Macedonia, Montenegro, Poland, Serbia, Slovenia, Switzerland, Russia and Ukraine
- **Far Eastern** – found in eastern Russia during spring and summer and in some countries in East Asia, particularly forested regions of China and Japan
- **Siberian** – found in Siberia

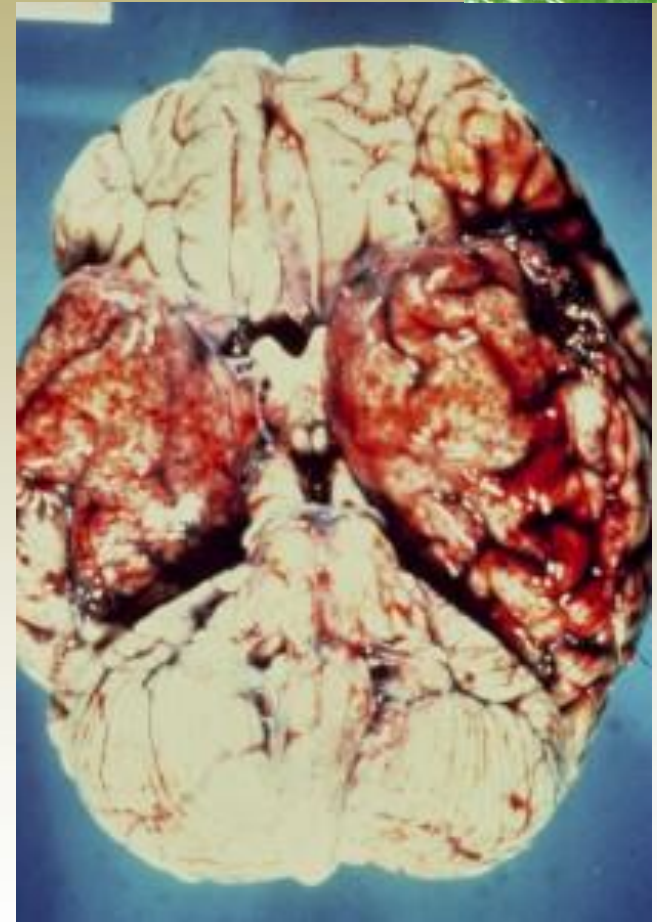


TBE- VACCINES

- Two safe, effective inactivated TBE vaccines are available in Europe, in adult and paediatric formulations:
 - FSME-IMMUN (Baxter, Austria)

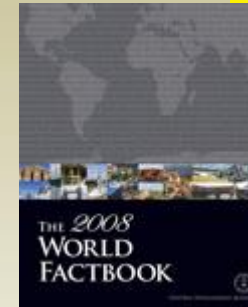
Primary series Day 0
 1-3 mth
 5-12 mth after 2nd vax

1st Booster 3 yrs after 3rd vax
Sequential boosters every 3-5 yrs
(first 2 vax given prior to tick-season, in spring)



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 - www.nathnac.org
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 - www.travel-essentials.com.au/www.travel-essentials.co.nz





SUMMARY

- Vaccine-preventable diseases (VPDs) are costly at both the individual and societal levels
- The most common VPDs recorded in travellers are enteric (typhoid or paratyphoid B) fever, acute viral hepatitis, influenza, varicella, measles, pertussis and bacterial meningitis
- Travellers suffering from VPDs are frequently hospitalized, illustrating the point that VPDs are serious and expensive
- Many travellers are not properly immunized before travel
- In addition to individual consequences, VPDs can have public-health consequences if they are introduced or re-introduced by infected travellers returning to areas with susceptible populations



Session Take home points

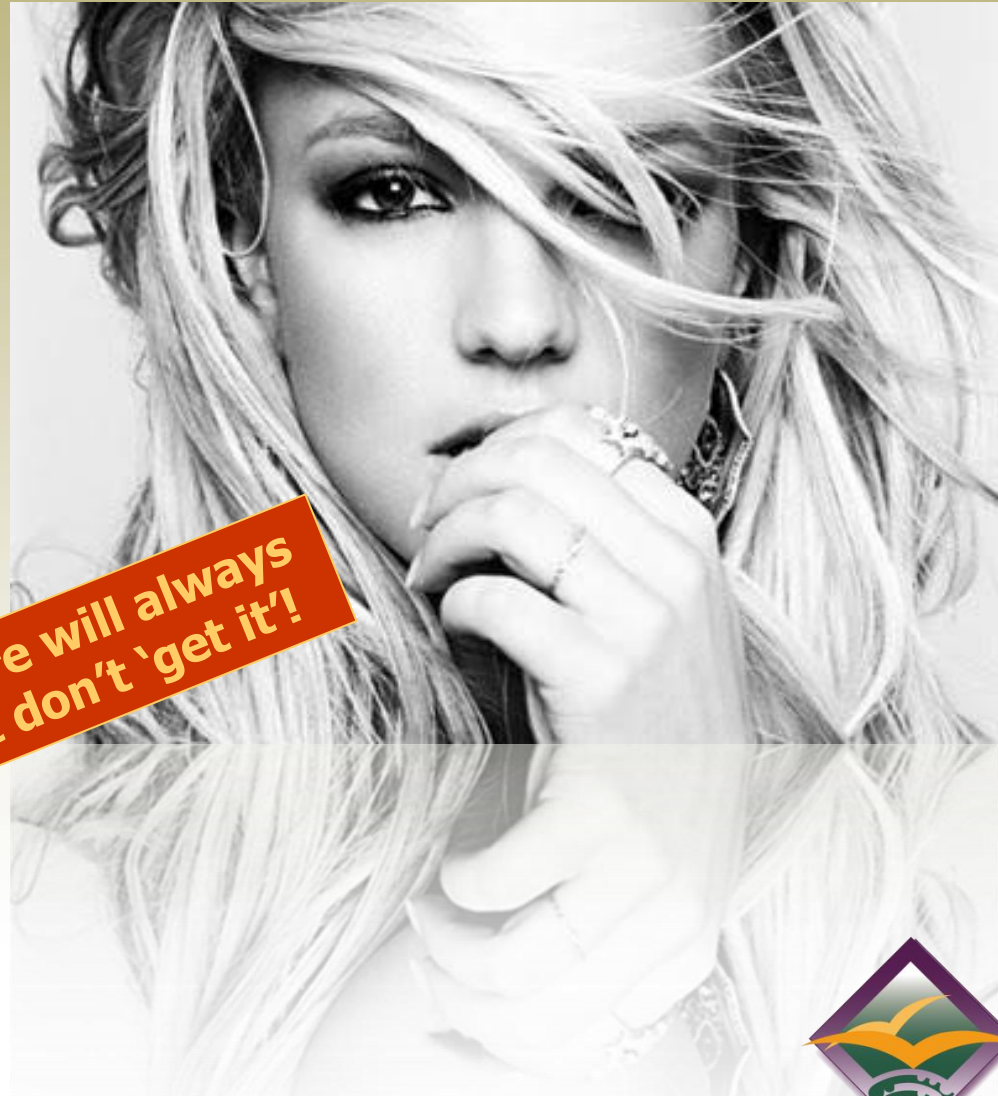
- More people are travelling to more destinations, becoming exposed to the health and safety of that destination and also having the potential to impact on the health and safety of that destination
- Travel health advisers need current info on vaccinations and anti-malarial meds, and information (including a capacity to undertake traveller risk-assessment), training, experience, documentation and ... travellers!!
- Travellers' health is a continuum and includes the pre-travel health, contingency planning while abroad and caring for the traveller upon returning home





“I’ve never really wanted to go to Japan. Simply because I don’t like eating fish; and I know that’s very popular out there in Africa.”
Britney Spears

**Whatever we do there will always
be people that just don’t ‘get it’!**





- 'It is the job of a Travel Health Professional to guide the knowledge that contributes to the wisdom acquired by our travellers'

THANK YOU!

Worldwise Travellers Health NZ
'NZ's Travel Health Specialists'

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