Disclosure Statement:

There are no conflicts of interest pertaining to this presentation materials and/or content.

Criteria for successful completion: Attendance for the session and completion of evaluation form.
OBJECTIVE:
Enhance the ability to determine health concerns based on pre and post travel locations. (i.e. prevention and diagnosis)

a) Global health events – what we can learn
b) Public Health significance
c) *Clinical significance
Why are we discussing global epidemiology when, in this setting, we are likely most concerned with point of care?
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**Epidemiology**: the study of the distribution and determinants of health-related states or events (including disease), and the application of this study to the control of diseases and other health problems.

- World Health Organization
Why are we discussing global epidemiology when, in this setting, we are likely most concerned with point of care?

Global health events – what we can learn

1) Rabies in the United Kingdom
2) Japanese Encephalitis in Angola (Africa 2015-2016)
3) Zika virus outbreak (S. America 2015-2016)
4) Sin Nombre outbreak (United States 1993)
5) Ebola outbreak (West Africa 2013-2016)
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Global Health Epidemiology

Why are we discussing global epidemiology when, in this setting, we are likely most concerned with point of care?

Global health events – what we can learn
1) Rabies in the United Kingdom
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“Rabies is found throughout the world, particularly in Asia, Africa, and Central and South America. It’s not found in the UK except in a small number of wild bats”.

- United Kingdom National Health Service
1) Rabies in the United Kingdom

Epidemiology: Since 1946, 25 cases have been reported in the United Kingdom, all imported. Five cases occurred between 2000 and 2017. (2 Nov 18)

- two in 2001 from the Philippines and Nigeria
- one in 2005 followed a dog-bite in Goa
- one in 2008 resulted from a dog bite in South Africa
- one in 2012 developed after a dog bite in India
1) Rabies in the United Kingdom

“The United Kingdom is rabies free”.

- General belief
1) Rabies in the United Kingdom

“The UK has been rabies-free since the beginning of the 20th century, with the exception of a rabies-like virus in a species of wild bat called Daubenton's bats”.

- United Kingdom National Health Service
1) Rabies in the United Kingdom

“The UK has been rabies-free since the beginning of the 20th century, with the exception of a rabies-like virus in a species of wild bat called Daubenton's bats”.

- United Kingdom National Health Service

“In 2002 a man who was a licensed bat handler died in Scotland from infection with EBLV-2, a rabies-like virus present in bats in the UK.”

- Public Health England
1) Taxonomy Lyssavirus
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1) Taxonomy Lyssavirus
“Dogs are the main transmitter of rabies virus to humans worldwide. Less commonly rabies can be caused by other Lyssaviruses including European Bat Lyssaviruses (EBLV).” -NHS
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1) Rabies in the United Kingdom

- *Understanding of nomenclature is critical*
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*Why are we discussing global epidemiology when, in this setting, we are most concerned with point of care?*

1) Rabies in the United Kingdom
2) Japanese Encephalitis in Angola (Africa 2016)
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2) Japanese Encephalitis in Angola (Africa 2015-2016)

- Late December 2015 > index case of Yellow Fever (Luanda, Angola)
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- Late December 2015 > index case of Yellow Fever (Luanda, Angola)

- July, 2016 > 3625 cases across Angola
  (1798 cases in DRC, 2 cases Kenya, 11 cases China)
2) Japanese Encephalitis in Angola (Africa 2015-2016)

- Late December 2015 > index case of Yellow Fever (Luanda, Angola)

- July, 2016 > 3625 cases across Angola
  (1798 cases in DRC, 2 cases Kenya, 11 cases China)

- *March 2016 > local Angolan from Luanda was admitted to the hospital (fever, headache, and jaundice)
  > RT-PCR yielded positive for a YF variant, along with a JE genome
  > Patient had no travel history outside of Angola
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2) **Flavivirus Genetic Similarity**

![Flavivirus Genetic Similarity Diagram](image)
2) Japanese Encephalitis in Angola (Africa 2015-2016)

- *If you do not search for it, you will not find it*
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3) Zika virus outbreak (S. America 2015-2016)

1947: Scientists conducting routine surveillance for yellow fever in the Zika forest of Uganda isolate the Zika virus in samples taken from a captive, sentinel rhesus monkey.

1948: The virus is recovered from the mosquito Aedes africanus, caught on a tree platform in the Zika forest.

1952: The first human cases are detected in Uganda and the United Republic of Tanzania in a study demonstrating the presence of neutralizing antibodies to Zika virus in sera.
3) Zika virus outbreak (S. America 2015-2016)

1969–1983: The known geographical distribution of Zika expands to equatorial Asia, including India, Indonesia, Malaysia and Pakistan, where the virus is detected in mosquitoes. As in Africa, sporadic human cases occur but no outbreaks are detected and the disease in humans continues to be regarded as rare, with mild symptoms.

2007: Zika spreads from Africa and Asia to cause the first large outbreak in humans on the Pacific island of Yap, in the Federated States of Micronesia. Prior to this event, no outbreaks and only 14 cases of human Zika virus disease had been documented worldwide.

2013–2014: The virus causes outbreaks in four other groups of Pacific islands: French Polynesia, Easter Island, the Cook Islands, and New Caledonia.26,27 The outbreak in French Polynesia, generating thousands of suspected infections, is intensively investigated. The results of retrospective investigations are reported to WHO on 24 November 2015 and 27 January 2016.
3) Zika virus outbreak (S. America 2015-2016)

2 March 2015: Brazil notifies WHO of reports of an illness characterized by skin rash in northeastern states. From February 2015 to 29 April 2015, nearly 7000 cases of illness with skin rash are reported in these states. All cases are mild, with no reported deaths. Zika was not suspected at this stage, and no tests for Zika were carried out.

1 February 2016: WHO declares that the recent association of Zika infection with clusters of microcephaly and other neurological disorders constitutes a Public Health Emergency of International Concern.
But what about in Africa?

- Cabo Verde (2015-2016) > 7580 suspected cases

- Guinea Bissau (2016) > 6 microcephaly cases (possible Zika exposure), with other sporadic suspect cases reported in adults

- Angola (2017-present) > 41 cases of Zika and 56 cases of microcephaly

- Analysis of “387 frozen blood samples taken from febrile patients in Senegal and Nigeria between 1992 and 2016, 6.2% were positive for IgM antibodies to Zika.”
3) Zika virus outbreak (S. America 2015-2016)

- With many Flavivirus infections, up to 80% can be asymptomatic

- But that still leaves 20% of a population to be concerned with
Zika virus outbreak (S. America 2015-2016)

- Do not let lack of reporting sway your clinical investigation
Why are we discussing global epidemiology when, in this setting, we are most concerned with point of care?

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- May 1993, New Mexico (index case)
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- November 1993, etiologic agent isolated
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- May 1993, New Mexico (index case)
- Within 1 week, fiancée became infected
- November 1993, etiologic agent isolated
- Total of 24 cases with an epidemiologic link
4) Sin Nombre outbreak (United States / Four Corners 1993)

- New Hanta discovered?
4) Sin Nombre outbreak (United States / Four Corners 1993)

- New Hanta discovered?
- Subsequent research determined the earliest case in the United States was in 1959.
4) Sin Nombre outbreak (United States / Four Corners 1993)

- No data ≠ No disease
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5) Ebola outbreak (West Africa 2013-2016)

- 28,652 total cases
- 11,325 deaths
- 10 countries
5) Ebola outbreak (West Africa 2013-2016)

- Liberia
  - 10,678 cases
  - 4,810 deaths

- Mathematical modeling of malaria in Liberia estimates that the disruption of treatment due to EVD will result in:
  - 520,000 untreated malaria cases
  - 57,200 new malaria cases (would not have occurred otherwise)
  - 62% increase in malaria-attributable mortality
5) Ebola outbreak (West Africa 2013-2016)

- *When you hear hoof beats, think horses and not zebras...*
5) Ebola outbreak (West Africa 2013-2016)

- When you hear hoof beats, think horses and not zebras...

-- But don’t forget the other horses...
5) Ebola outbreak (West Africa 2013-2016)

- *When you hear hoof beats, think horses and not zebras...*
  
  -- *But don’t forget the other horses...*
  
  --- *And don’t forget the zebras too.*
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Why are we discussing global epidemiology when, in this setting, we are likely most concerned with point of care?

Global health events – what we can learn

- Understanding of nomenclature is critical (beware of colloquialisms)
- If you do not search for it, you will not find it
- Do not let lack of reporting sway your clinical investigation
- No data ≠ No disease
- When you hear hoof beats, don’t forget the other horses
Public Health significance:

- No patient is an island (i.e. the disease came from someone/something)
  *imagine the number of people 1 patient interacts with during a day, and the number of people those individuals interacted with, and so on...
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- Travel history, and contact with those who have a travel history is critical
  *never assume every patient’s disease is autochthonous
  **travel history does not have to be to an exotic location
Travel Medicine:  
Global Health Epidemiology  

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- Every outbreak begins with a single patient
Travel Medicine: Global Health Epidemiology

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  **travel does not have to be to an exotic location

- Every outbreak begins with a single patient

- How many epidemics are thwarted every day by astute health care professionals?
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Clinical significance:
- Disease prevention and control is based on three interrelated concepts:
  1) **Surveillance** - ongoing systematic collection, collation, analysis of data
     *can be passive or active
  2) **Bioexclusion** – reducing the consequence of disease challenge by limiting challenge
     *e.g. vaccination
  3) **Biocontainment** - the isolation of an etiologic agent (loosely defined)
     *e.g. antibiotic therapy
Clinical significance:

- Disease prevention and control is based on three interrelated concepts:
  1) **Surveillance** – what is out there?
  2) **Bioexclusion** – how do I prevent it?
  3) **Biocontainment** – how do I treat it?
Clinical significance:
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Clinical significance:
- Disease prevention and control is based on three interrelated concepts:
  1) Surveillance – what is out there? Pre or Post travel
     - What
     - Who
     - Where
     - When
     - Why / How
     - So what?

5Ws
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What resources do I have to support patient care?
- https://wwwnc.cdc.gov/travel
VACCINES, MEDICINES, ADVICE.

In the News: Get the latest updates on yellow fever and Zika virus.

YOUR PATIENTS ARE GOING PLACES.

Providers: Access CDC’s Think Travel campaign posters to help start the conversation about patient travel.

For Travelers

Where are you going?

Select One

What kind of traveler are you?

- Select One

Special travel needs

- Select One

For Clinicians

Traveler destination

Special travel needs

- Select One

Travel Health Notices

Visit the travel health notices page to see the full list of travel notices including:

- Warning Level 3, Avoid Nonessential Travel
- Alert Level 2, Practice Enhanced Precautions
- Watch Level 1, Practice Usual Precautions

Updates

- New! Yellow Fever Information
  - Interim CDC Guidance for Travel to and from Countries Affected by the New Public Vaccine Requirements
  - Yellow Fever Vaccine for Travelers
  - Announcement, Temporary Suspension of US Licensed Yellow Fever Vaccine Addressed by Availability of Stamaril Vaccine at Selected Clinics
  - Medical Commentary, Travelers’ Diarrhea: New Guidelines for Prevention and Treatment
  - Medical Commentary: New Cholera Vaccine for Adult Travelers
  - Zika Virus Travel Information
  - YouTube Video: Healthy Home, Healthy Travel
  - Yellow Fever Vaccine Boosters

PRE-TRAVEL Tool

Providers: Use this interactive clinical tool to guide you through pre-travel consultations with US patients traveling abroad.
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What resources do I have to support patient care?
Outbreak data and maps

During outbreaks, ECDC regularly produces maps, graphs and other data visualisations to support understanding of the dynamics of the event.

Yellow fever distribution and areas of risk in Brazil, as of 13 March 2018
Yellow fever distribution and areas of risk in Brazil, as of 28 February 2018
Yellow fever distribution and areas of risk in Brazil, as of 16 January 2018

Zika transmission in the Caribbean
Zika transmission worldwide
Zika transmission in South East Asia
What resources do I have to support patient care?
- https://www.fitfortravel.nhs.uk/home
News

- 29 Oct 2018 - World AIDS Day 1st December 2018
  The theme for World AIDS Day 2018, which will be marking its 30th anniversary ...more

- 22 Oct 2018 - Zika Virus in Angola
  Public health authorities quoted by media in Angola have reported more than ...more

- 17 Oct 2018 - Myanmar - International Measures to Stop the Spread of Poliovirus Update

- 17 Oct 2018 - Multi-drug Resistant Typhoid in Pakistan (Update 2)

- 16 Oct 2018 - Zika Virus Infection in India (Rajasthan)
  After Rajasthan reported its first case of Zika virus in September of this year ...more

Travel Health Advice

- General Travel Health Advice
- Disease Prevention Advice
- Malaria
- Yellow Fever

Current popular advice pages:

- Travelling for Pride?
- Mosquito Bite Avoidance
- Food and Water Precautions
- Travel Health for School Groups
What resources do I have to support patient care?
- https://www.travax.nhs.uk/
What resources do I have to support patient care?
- http://www.who.int/ith/precautions/en/
International travel and health

General precautions

All individuals planning travel should seek advice on the potential hazards in their chosen destinations and understand how best to protect their health and minimize the risk of acquiring disease. Forward planning, appropriate preventive measures and careful precautions can protect their health and minimize the risks of accident and of acquiring disease. Although the medical profession and the travel industry can provide extensive help and sound advice, it remains the travellers’ responsibility to seek information, to understand the risks involved and to take the necessary precautions to protect their health while travelling.

Travel-related risks
Medical consultation before travel
Assessment of health risks associated with travel
Medical kit and toilet items
Travellers’ pre-existing medical conditions and special needs
Insurance for travellers
Role of travel industry professionals
Responsibility of the traveller
Medical examination after travel

Read more about ITH

Read more about the scientific and technical advisory group on geographical yellow fever risk mapping (GYPF)
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What resources do I have to support patient care?
- https://www.healthmap.org/
Switzerland

2 Nov 2018 - 🌐 PRO/EDR> Measles update (66): Europe, Americas, Southeast Asia

28 Oct 2018 - 🌐 Switzerland: Listeria outbreak affects 12 since June - Outbreak News ...
What resources do I have to support patient care?
- http://outbreaks.globalincidentmap.com/
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Why are we discussing global epidemiology when, in this setting, we are likely most concerned with point of care?

An ounce of prevention is worth a pound of cure
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Questions?
Comments?
Thank You