Emerging Infections seen by the clinician

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Patients with haemorrhagic fevers can not be diagnosed without a detailed geographical history and laboratory backup

Severe bacterial sepsis with

disseminated intravascular coagulation, DIC

Ebola virus disease EVD

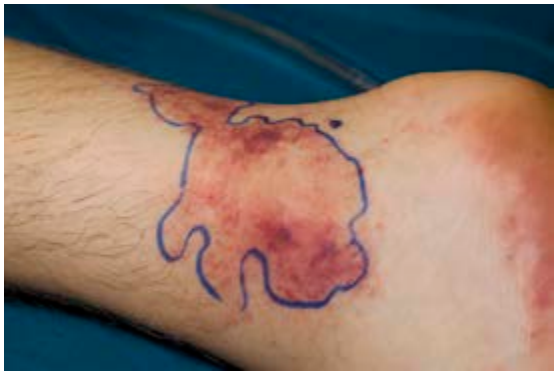
Crimean Congo Haemorrhagic Fever, CCHF

Dengue fever

Scrub typhus, spotted fevers

Leptospirosis

Malaria



39.9C, shivers, rash, leucocytosis thrombocytepenia

BBC NEWS

Mammals harbour 'at least 320,000 new viruses'

By Rebecca Morelle
Science reporter, BBC World Service

There could be at least 320,000 viruses awaiting discovery that are circulating in animals, a study suggests.

Researchers say that identifying these viral diseases, especially those that can spread to humans, could help to prevent future pandemics.

The team estimates that this could cost more than £4bn ($6bn), but says this is a fraction of the cost of dealing with a major pandemic.

The research is published in the journal mBio.

Prof Ian Lipkin, director of the Center for Infection and Immunity at Columbia University's Mailman School of Public Health in the US, said: "What we're really talking about is defining the full range of diversity of viruses within mammals, and our intent is that as we get more information we will be able to understand the principles that underlie determinants of risks."

The flying fox is one of many mammals that carry viruses that spread to humans

Related Stories

- Deadly virus found in tomb bat
- Camels could be deadly virus source
- Risky viruses found in bushmeat

MBio. 2013 Sep 3;4(5):e00598-13. doi: 10.1128/mBio.00598-13.

Syndromatic diagnosis without a microorganism is common

A GeoSentinel study found that 28% (6,957) of returning travelers registered by GeoSentinel had fever and that 26% of febrile travelers were hospitalized.

Wilson ME and the GeoSentinel Surveillance Network. Fever in returned travelers: results from the GeoSentinel Surveillance Network. Clin Infect Dis. 2007;44:1560-8.

In a more recent study, 28.5% of returning travelers from West Africa did not receive a final diagnosis during the Ebola outbreak.

Boggild AK et al. and the GeoSentinel Surveillance Network. Differential diagnosis of illness in travelers arriving from Sierra Leone, Liberia, or Guinea: a cross-sectional study from the GeoSentinel Surveillance Network. Ann Intern Med. 2015;162:757-64.

Addressing the Analytic Challenges of Cross-Sectional Pediatric Pneumonia Etiology Data

Laura L. Hammitt,[1,2] Daniel R. Feikin,[1,3] J. Anthony G. Scott,[2,4] Scott L. Zeger,[5] David R. Murdoch,[6,7] Katherine L. O'Brien,[1] and Maria Deloria Knoll[1]

Method:	A	B	C	D	E	F		G		H	
Specimens & assays	Blood culture only	Blood culture only	NP PCR only	NP PCR only	NP PCR only	Blood culture	NP PCR	Blood culture	NP PCR	Blood culture	NP PCR
Design/ analytical approach	Case-only; raw results	Case-only; adjust for measurement error	Case-only; raw results	Case-control; OR>1 & p<.05	Case-control; AF, OR>1 & p<.05	Case-only; raw results	Case-only; raw results	Case-only; raw results	Case-control OR>1 & p<.05	Case-only; raw results	Case-control AF, OR>1 & p<.05
Sensitivity of assay	100%	10%	100%	100% if OR>1; N/A if OR≤1	100% if OR>1; N/A if OR≤1	100%	100%	100%	100% if OR>1; N/A if OR≤1	100%	100% if OR>1; N/A if OR≤1
Specificity of assay	100%	100%	100%	100% if OR>1; 0% if OR≤1	(1-AF)% if OR>1; 0% if OR≤1	100%	100%	100%	100% if OR>1; 0% if OR≤1	100%	(1-AF)% if OR>1; 0% if OR≤1
Etiology pie											

Clin Infect Dis. 2017 Jun 15;64(suppl_3):S197-S204.

CNS infections

58% (1504/2583) of CNS infections in one study failed to find an etiology

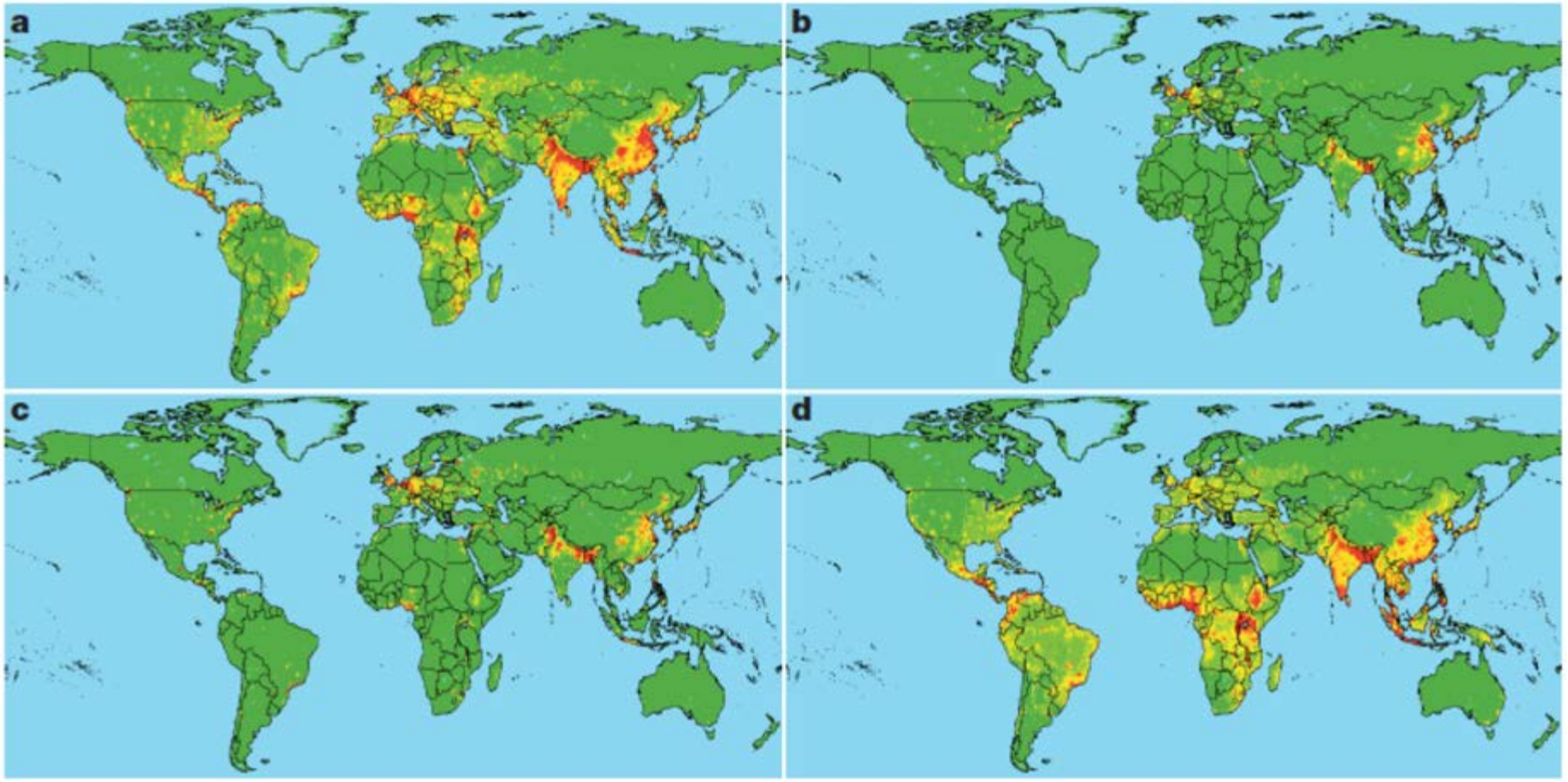
Eur J Clin Microbiol Infect Dis (2017) 36:1595–1611
DOI 10.1007/s10096-017-2973-0

ORIGINAL ARTICLE

The burden and epidemiology of community-acquired central nervous system infections: a multinational study

Erdem al.

The 2009 influenza pandemic and MERS were not predicted



a, zoonotic pathogens from wildlife, **b**, zoonotic pathogens from non-wildlife, **c**, drug-resistant pathogens and **d**, vector-borne pathogens. The

Jones KE et al. Global trends in emerging infectious diseases. Nature. 2008;451:990-3.

Vaccine preventable diseases will emerge in war: Syria

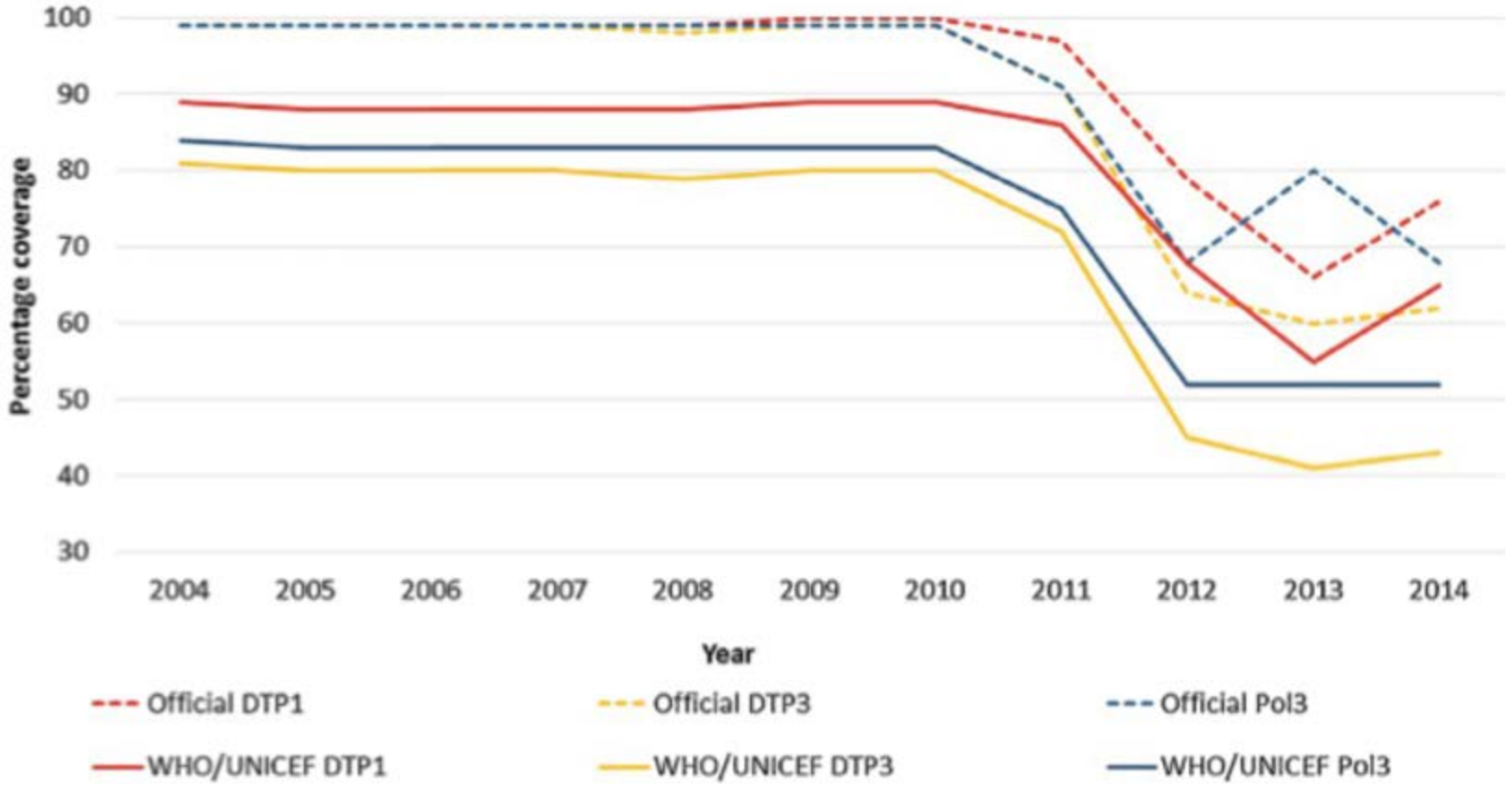


Figure 3. Trends in vaccination coverage for polio (in DTP1, DTP3, and Pol3 administration) for Syria, 2004–14. .

International Journal of Infectious Diseases 47 (2016) 15–22

44 CASES OF MEASLES REGISTERED TILL APRIL END: MINISTRY OF HEALTH

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Muscat Daily staff writer
May 08, 2017

MUSCAT - The Ministry of Health on Monday said that there has been an outbreak of measles in the country and announced the start of a National Measles Immunisation Campaign from May 14.

Oman immunized 1.6 million people from February to May 2017 at a cost of 5 mil.

OR = 15 mil USD

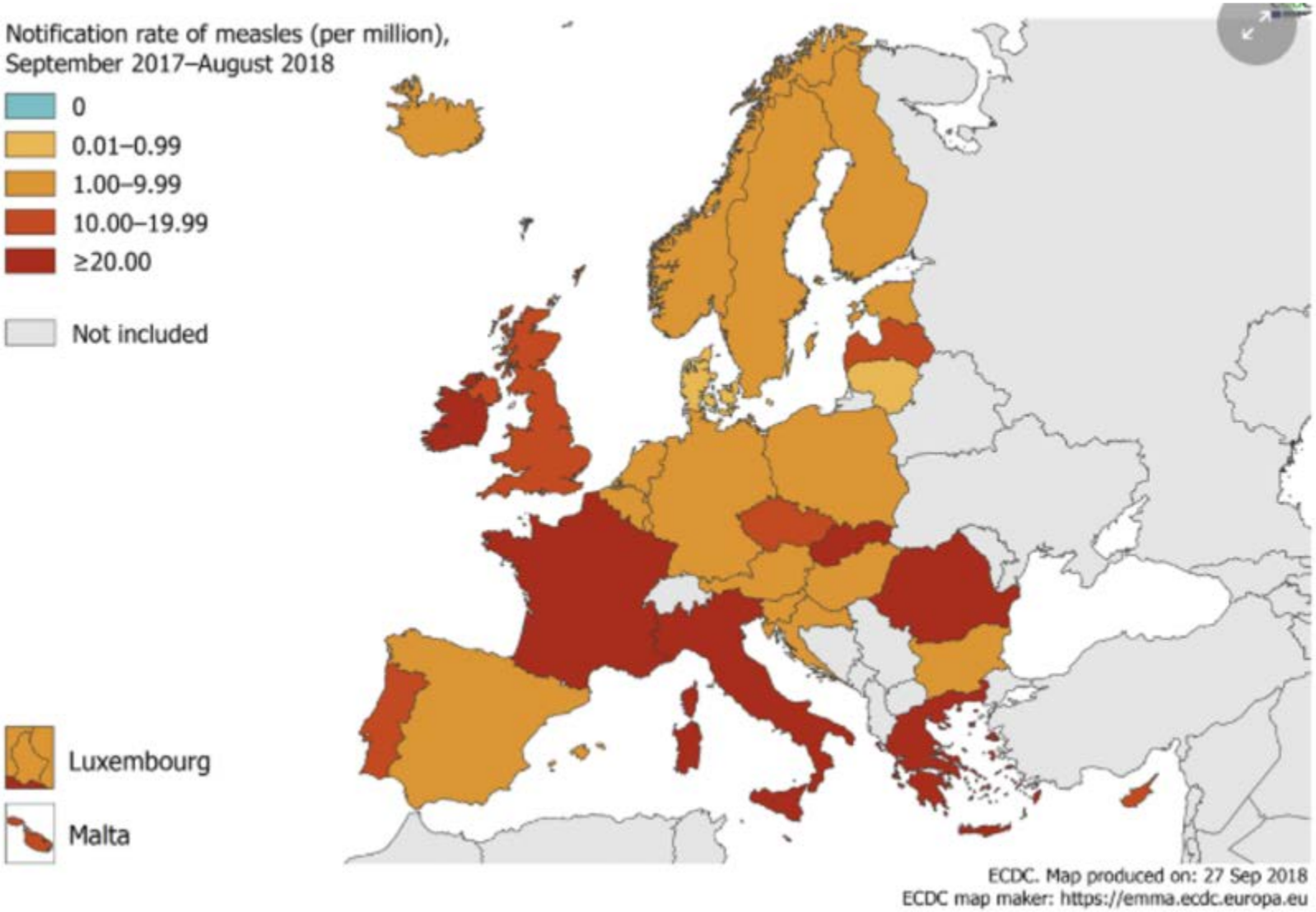
Last case in April

Probably introduced from Yemen.

Not reported in ProMED

http://www.muscatdaily.com/Archive/Oman/44-cases-of-measles-registered-till-April-end-Ministry-of-Health-50m4

ECDC report 40,000 cases of measles in Europe so far in 2018



Case 1

37 year old Indian male. Admitted 16/9-17 with fever and coagulopathy.

Returned from vacation in southern India 2 days before admission.

Fever first day after returning to Oman. Noticed hemoptysis and dark urine.

At admission low GCS and low BP.

So what does this tells us ?

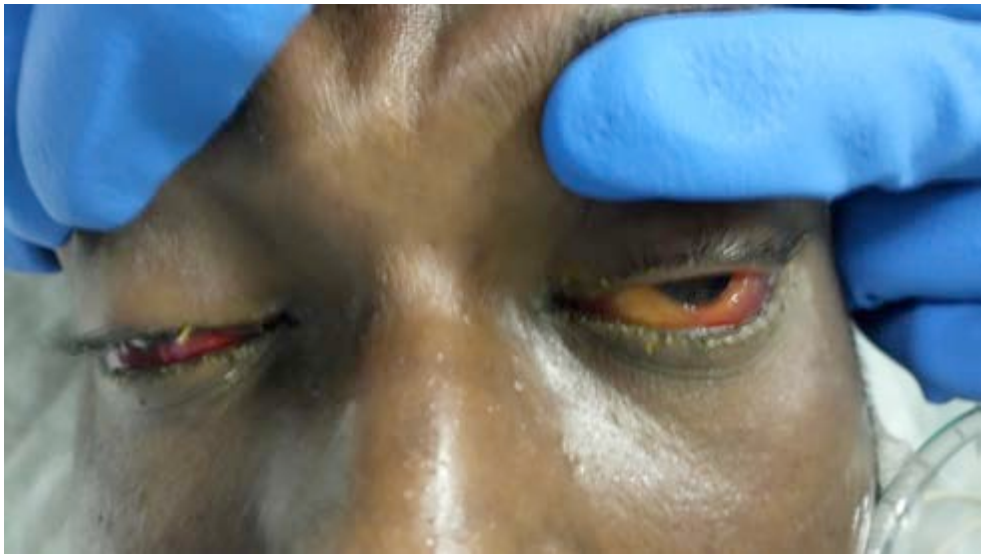
Short incubation period

Haemorrhagic symptoms –

a haemorrhagic fever ?

Geographic history –

Southern India Sept. 2017



Hb 15.9 (11.5 – 15.5)

Plts 30 (140 – 450)

WBC 4.9 (Normal)

Bil 228, ALT 2700 (<50), LDH >655,

CK 3470 (normalized 21/9),

Crea 209 with GFR 33.

HIV test not done (low sample volume, not repeated).

Haptoglobin low (<80) throughout.

WBC increase during stay and 19.7 with 16.6 neutro's the 24th Sept. .

INR 4.1. CRP 26 at adm. 79 the 24/9 never higher.

Last coag. prof. 23/9: PT 20.9 (9.8-11.9s);

APTT 64 (26.4 – 38.9s); TT (14.3-17.8s); INR 1.96.

24/9-17. On maximum inotropic support, BP decreasing.

24/9-17. Cardiac arrest. Last pH 6.9. Lac 14

Investigations

CCHF,
Dengue,
Malaria,
Leptospira PCRs
Blood culture

} **Negative**

What was in ProMED from India around September 2017

Japanese encephalitis & other - India (21): (MH)	(26 Sep.)
Kyasanur Forest disease - India (15): (GA, MH) monkey, susp	(16 Sep.)
Japanese encephalitis & other - India (14)	(16 Aug.)
Typhoid fever - India: (AP)	(8 Aug.)
Leptospirosis - India: (MH) fatal	(28 Jul.)
Crimean-Congo hem. fever - India: (GJ)	(28 Jul.)
Influenza (14): China (Hong Kong) India (MH)	(19 Jul.)
Kyasanur Forest disease - India (13): (MH) update	(15 Jul.)
Anthrax - India (10): (AD) caprine, more human cases	(29 Jun.)
Malaria - India: New Delhi	(29 Jun.)
Scrub typhus - India: increasing recognition	(15 Jun.)
Diphtheria - India (02): (KL) fatality, commentaries	(28 Apr.)

Pick your choice !

Case 2 Admission 4 Aug 2018 23.45

28 years old Omani, no travel history. Policeman, on leave for the past 2 weeks with family. Family healthy.

Fever for 2 days.

<u>At admission</u>

tp. 39.3C

WBC normal (6.0),

HB 15.3 g/dL (11.5-15.5),

CRP 204,

ALAT 1800, bilirubin 26 umol/L (0-20),

Alp 66 (40-150),

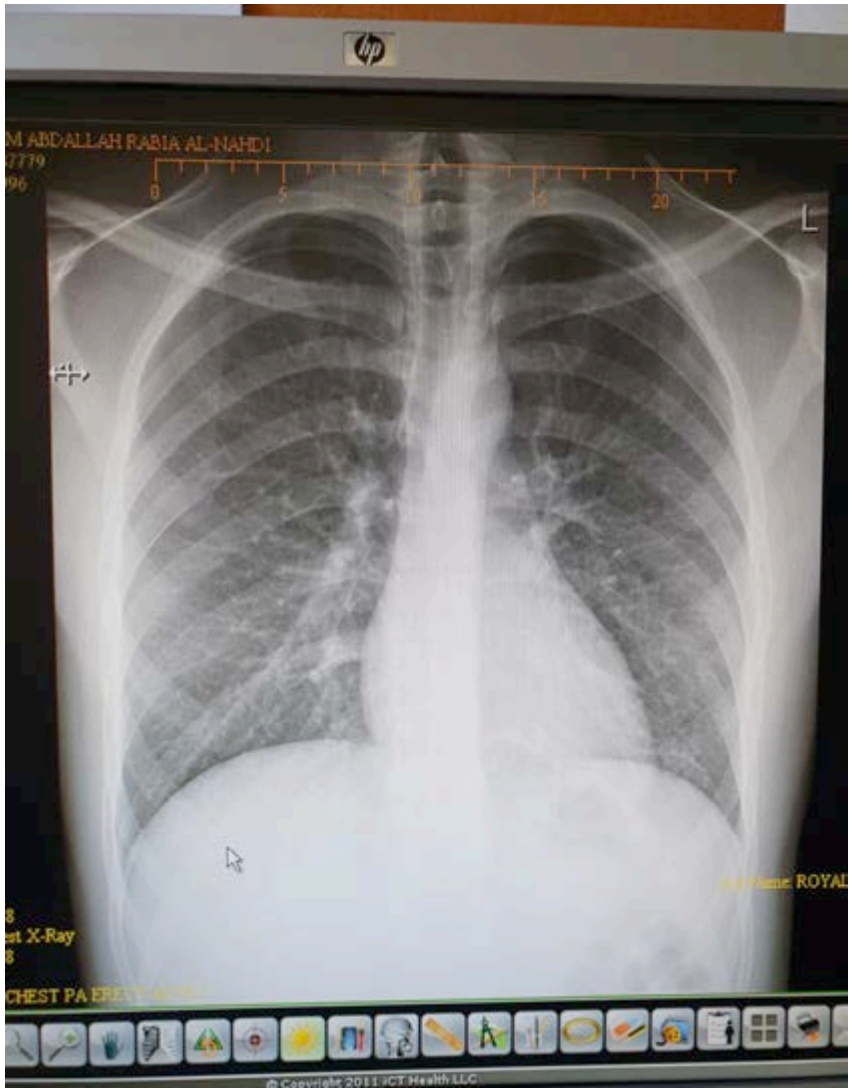
Creatinine 77

<u>Next day - 5/8</u>

ALAT 1027, Bil 20,

Albumin 19,

Creatinine >90.



Investigations

Blood cultures neg., serology for

HAV, HBV, HCV, HEV: neg.

PCR for CCHF, MERS, Dengue,

Leptospira, Coxiella: Neg.

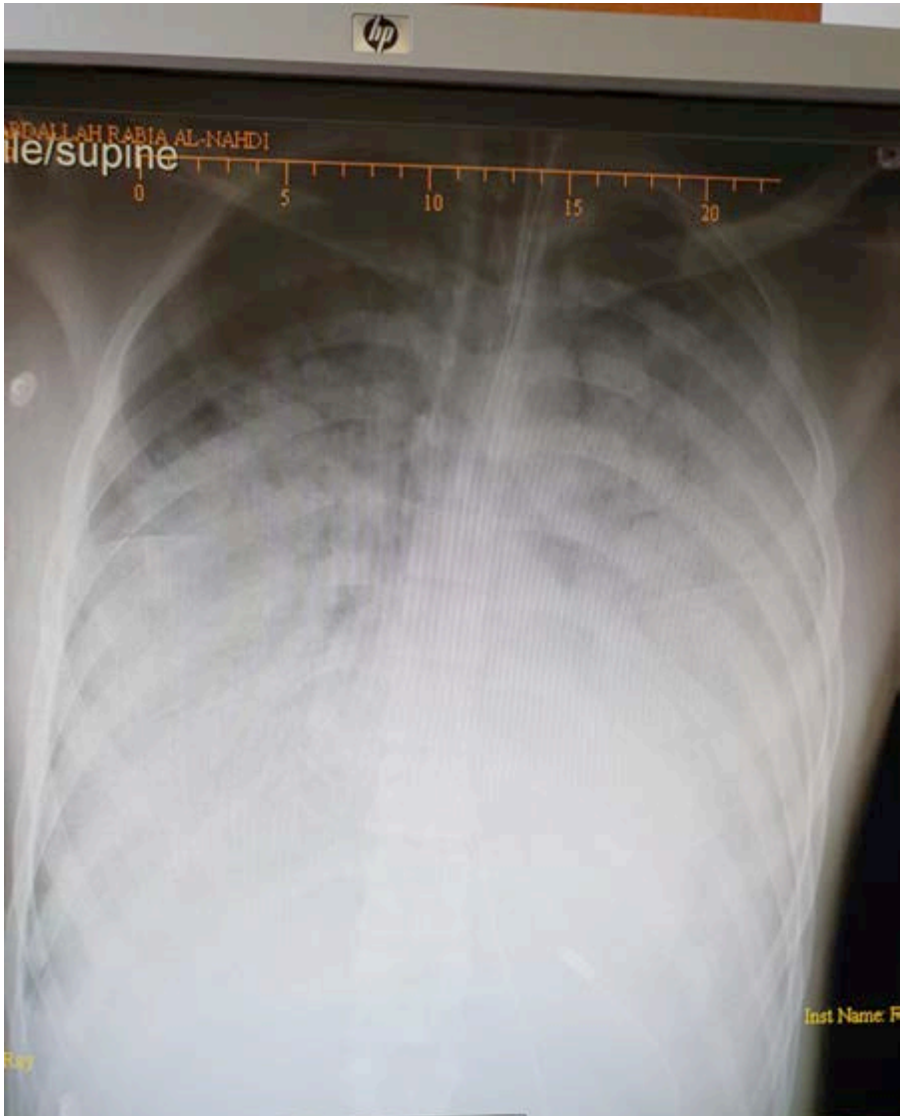
HIV screening: neg.

EBV: EBNA-pos, CMV: not done.

Autoimmune markers all neg.

(ANA, ANCA, SM, Mitochr.).

Died 6 Aug 04.53 with pulmonary mono-organ failure with hypoxia and acidosis. Last pH 6.8 with lactate 15.5.



5th August 2018 – evening

Case 3. 28 year old Nepali arrived in Oman 4 days ago (10th Sept. 2017) and the day after arrival developed fever, rigors and headache.

4 weeks in southern Nepal where he take care of cows and goats.

On admission Tp 37.6C, BP 110/65, HR 77, Resp. rate 24.

Lab.:

Hb	**17 g/dl**	**(11.5 – 15.5)**
Hct	**53%**	**(35-45)**
Thromb.	**91**	**(140-400)**
WBC	**3.8**	**(2.2 – 10)**
Lymph.	**0.5**	**(1.2 – 4)**
Crea	**92**	**(45 – 100)**
GFR	**>90**	

What do we have here ?

Short incubation

Nepal

Fever

Thrombocytopenia

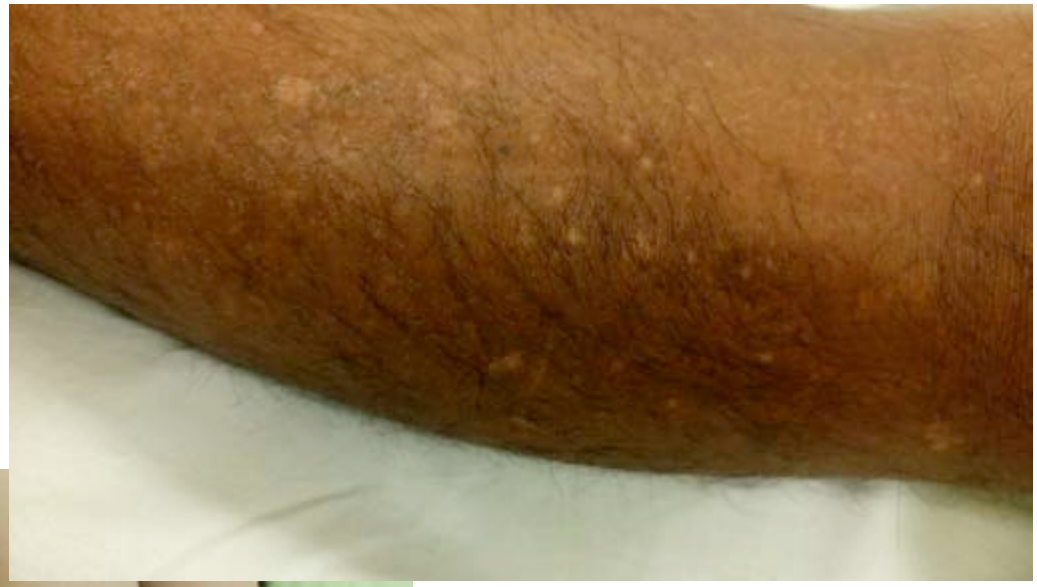
Haemoconcentration

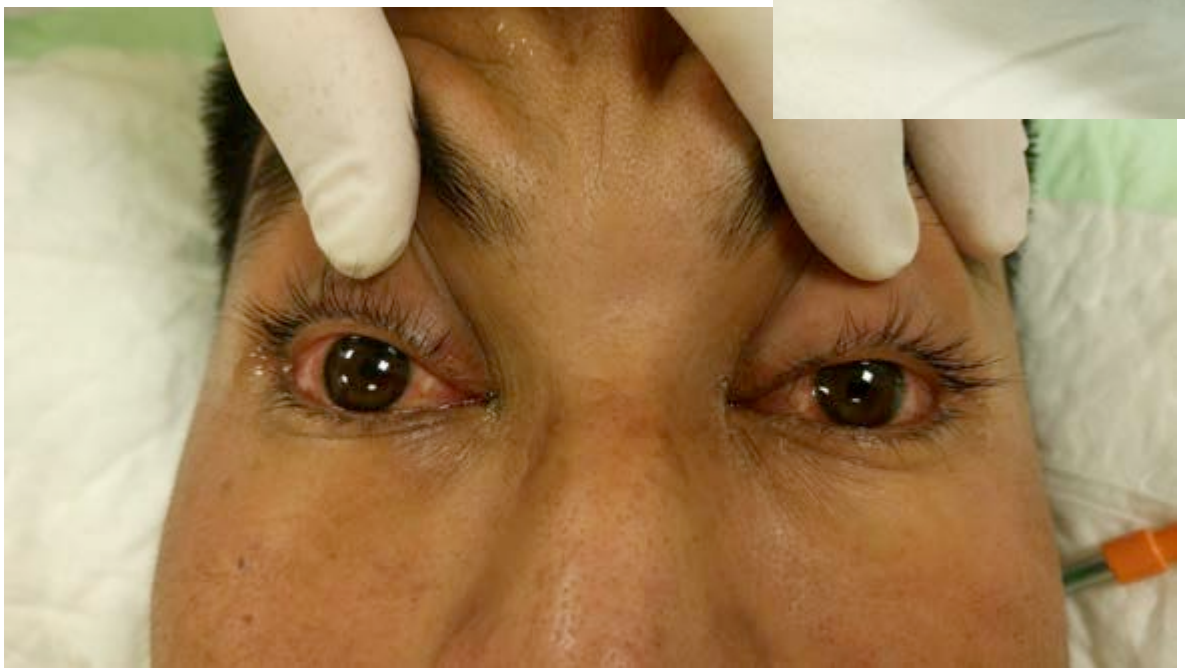
Lymphopenia

Day 6

The throbocytes continue to decrease to 39. Conjunctival injection and a diffuse maculopapular rash.

Low haptoglobin





Malaria neg.

Dengue PCR neg.

Blood cultures neg.

Day 7

Increasingly confused

BP decrease to 90/60 and transferred to ICU

Decreasing pO_2

A chest X-ray showed acute respiratory distress syndrome (ARDS) and cardiomegaly

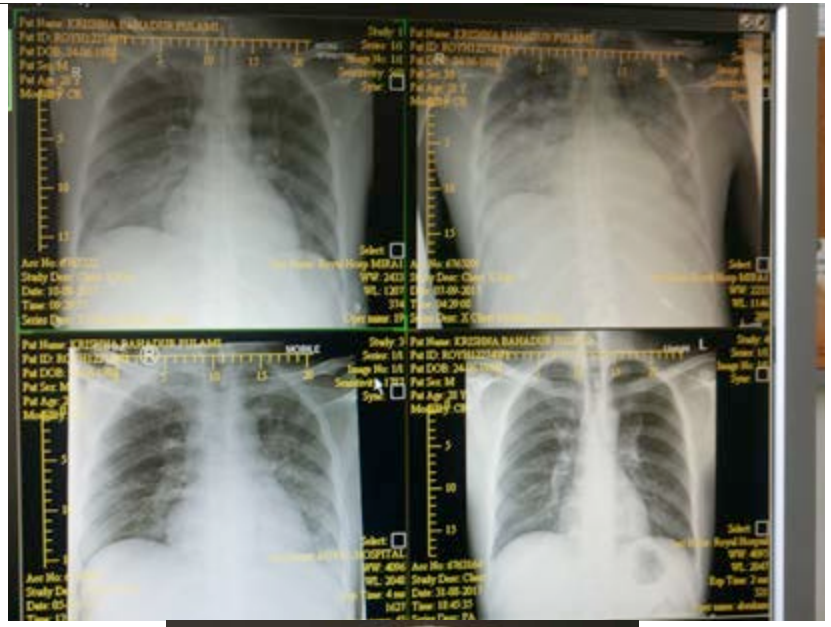
Did not tolerate NIV and sedated and intubated in ventilator

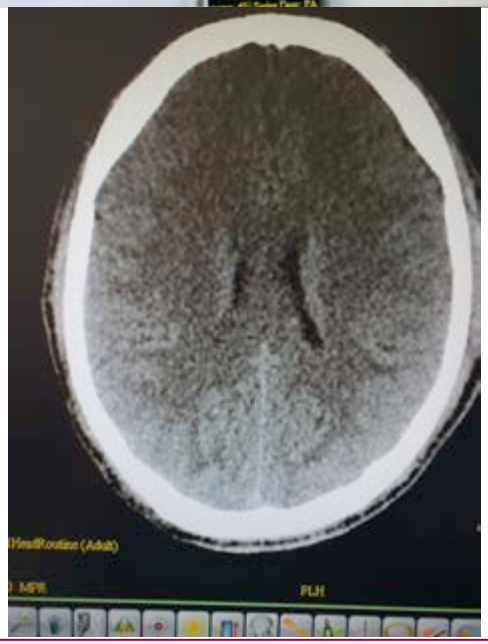
CT brain show diffuse oedema (Day 8)

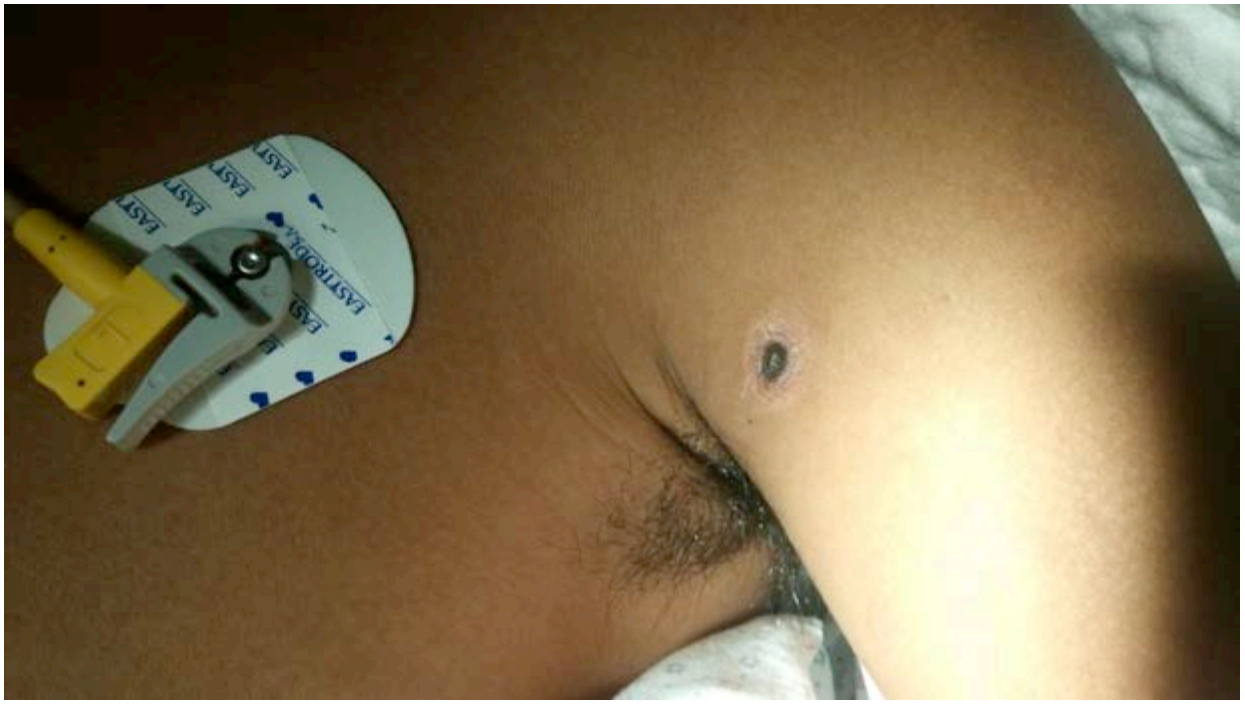
Leptospirosis IgM neg.

Dexamethasone

Day 11 extubated







?

Scrub typhus caused by *Orientia tsutsugamushi*

Weil Felix agglutination showed a titer of 1,200 (Remel Europe Ltd, UK).

Confirmatory testing at the Naval Medical Research Center, Silver Spring, MD, USA, showed more than fourfold antibody titer increase between an admission and a convalescence sample. Treated with doxycycline.

What should we have done if there had not been an eschar ?

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Conclusion

Most surveillance is based on syndromatic approach, but what is needed is real time advanced, laboratory backup.

New emerging infections: what, when, where can not be predicted

Hospitals are hotspots for identifying emerging infections

The clinician often face a lack of access to advanced diagnostics

Infectious disease will surge in situations of war

Infectious Diseases
A GeographicGuide

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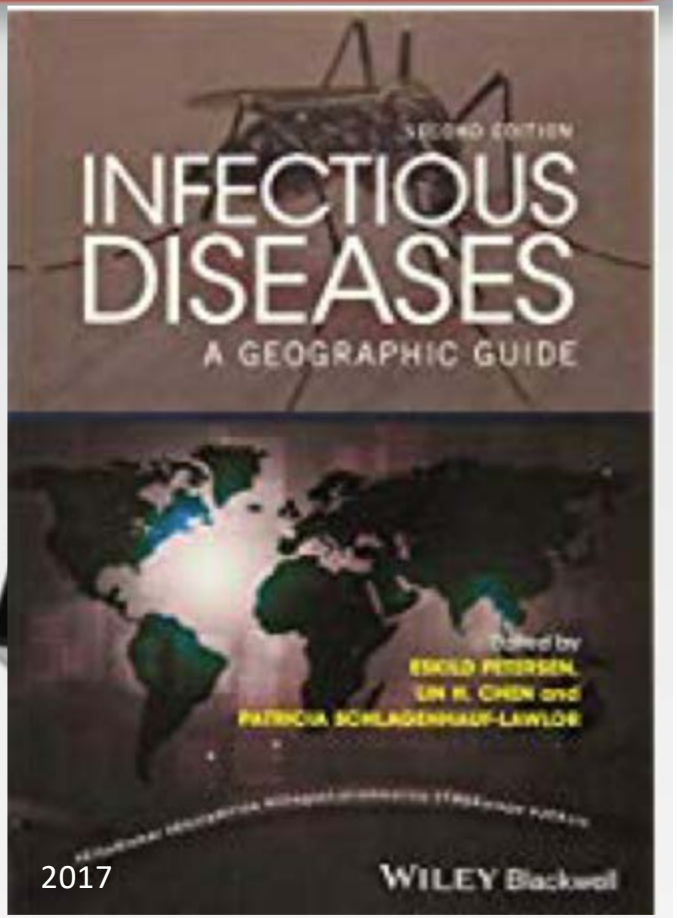

This concise and practical guide describes infections in geographical areas and provides information on disease risk, concomitant infections (such as co-prevalence of HIV and tuberculosis) and emerging bacterial, viral and parasitic infections in a given geographical area of the world.

Infectious Diseases: A Geographic Guide is divided according to United Nations world regions and addresses geographic disease profiles, presenting symptoms and incubation periods of infections. Each chapter contains a section on the coverage of the childhood vaccination programs in the countries included in that region. Chapters also include descriptions of infectious disease risk and problems with resistant bacteria in each region (e.g. antibiotic resistance in Salmonella infections in Southeast Asia).

The three sisters, Canmore, Canada

Thank you