

# Pathogen X – Preparing a Routine Laboratory for the Unexpected

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# Emerging Infections – Routine Laboratory Context

## Public Health Wales Microbiology Division



- Public Health Wales is the National Public Health Agency for the population of Wales
- Provide direct microbiology services for 5/7 health boards through a network of 8 laboratories (3 labs outside the network)
- Virology advice and reference services from the Wales Specialist Virology Centre (Cardiff)
- All Wales microbiology standard operating procedures and laboratory information system

# Emerging Infections – Routine Laboratory Context

## Defining an Emerging Infection

- Previously undetected or unknown infectious agents
  - HIV, human metapneumovirus, SARS, NL63, HKU1, MERS-CoV, nCoV-2019
- Known agents that have spread to new geographic locations or new populations
  - Influenza, Hantavirus, Dengue, West Nile virus, Malaria vivax , Ebolavirus, Chikungunya, Zikavirus, Hepatitis E
- Previously known agents whose role in specific diseases has previously gone unrecognized.
  - Zikavirus, Emerging non-polio enteroviruses (A71, D68)
- Re-emergence of agents whose incidence of disease had significantly declined in the past, but whose incidence of disease has reappeared.
  - TB , poliovirus, measles, yellow-fever

# Emerging Infections – Routine Laboratory Context

## Response to An Emerging Infection – Multi-agency, multi-national



# Emerging Infections – Routine Laboratory Context

## Challenges – Early Phase (new infection)

- Little to no epidemiology
  - Why? Where? Who is it affecting?
    - Limited guidance regarding clinical algorithms
- Early reports of clinical symptoms often over estimate severity
- Poor laboratory diagnostics
  - Laboratory containment level?
  - Is routine testing 'safe'
- External response often disproportionate to risk
  - Political, Media, public concern
- All make managing patients difficult



# Emerging Infections – Routine Laboratory Context

## Establishing a Team – Pathogen X

- Response in the past by a few very highly skilled individuals
  - Many moved to different jobs
- Requirement identified post 2014 (Ebola) for a robust response team in Wales
  - Responded to 6 returning workers
- Business case written in 2018 and approved for establishment of team in Cardiff with roll-out to regions

### What Is Disease X—And Is It Going To Kill You?

The World Health Organization just added it to a list of diseases that could cause a worldwide epidemic.

BY KORIN MILLER MAR 12, 2018



# Emerging Infections – Routine Laboratory Context

## The Pathogen X Team

- Small group of individuals who volunteer to
  - Attend specific training in handling high consequence pathogens (RIPL - 5 day course)
  - Become proficient in the handling and transport of samples potentially or confirmed to contain category A pathogens
  - Become proficient in the donning and doffing of appropriate PPE for the situation
  - Participate in a response rota including as part of a 'buddy system' for VHF response
  - Follow agreed standard operating procedures to ensure sample and colleague safety
  - facilitate the management of the patient in a timely fashion
  - Maintain the proficiency through twice annual assessments





# Emerging Infections – Routine Laboratory Context

## The Routine Laboratory Staff - Assessing Competency for Recruitment

- All lab staff are trained in good laboratory practice
- Many have containment level three competency
- A few have experience in working with high consequent pathogens
- Responding to an emerging infection is highly infrequent – However, some will have experience
- Assessment for participate through one to one discussion and line management agreement



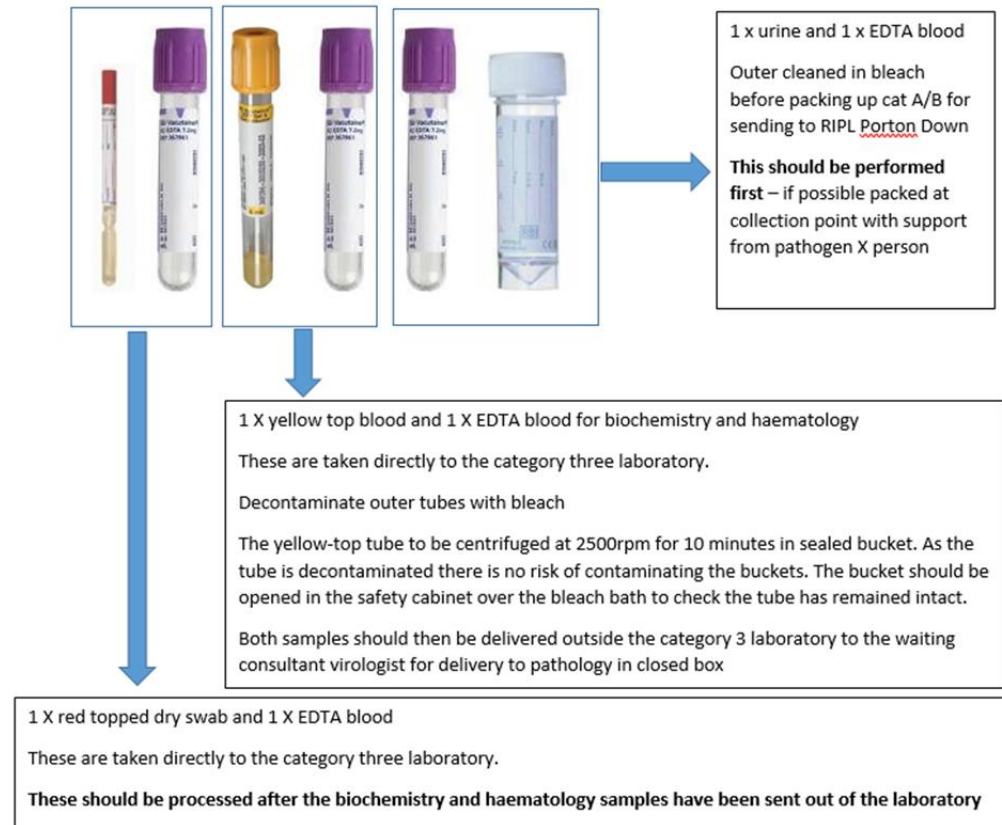


# Emerging Infections – Routine Laboratory Context

## Pathogen X Team – Years one and two

- Six people recruited
- All now fully proficient in all aspects
- SOPs finalised (including a significant review)
- Work in progress to map proficiency across network

Standard Sample Collection and Pathway for VHF samples – Pathogen X Buddy System



# Emerging Infections – Routine Laboratory Context

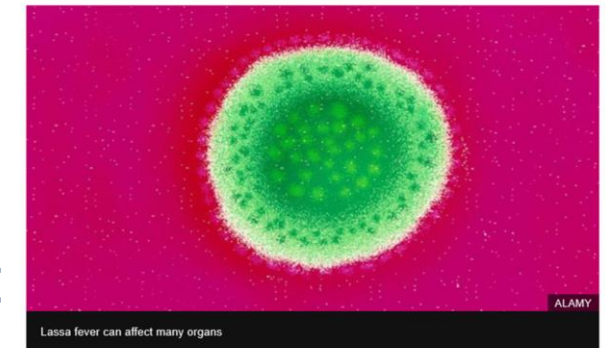
## Pathogen X – Recent Response

- Female Anaesthetist returned from SL 17<sup>th</sup> Nov 2019 following volunteering in a hospital in country
- Telephoned in work by PHE (20<sup>th</sup>) to say she had been in contact with confirmed Lassa case
- Asked to take temperature
  - recorded at 38.4°C x 3
  - Self-isolated
  - Moved to ID isolation suite
- Risk assessment by local ID consultant and virologist
  - Category 3
  - Cannulated the case without PPE

### Dutch doctor dies after contracting Lassa fever in Sierra Leone

© 24 November 2019

f t e Share



Lassa fever can affect many organs

A Dutch doctor who was evacuated from Sierra Leone after contracting Lassa fever has died in hospital.

# Emerging Infections – Routine Laboratory Context

## Pathogen X Response

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- Buddy system used
  - Transported the samples from the ID suite to the cat 3 lab
  - Cleaned and packaged samples for sending to RIPL for Lassa testing
  - Performed pre-analytical decontamination and processing for biochemistry and haematology baseline tests
  - Performed malaria rapid test
  - Performed rapid respiratory screen
  - Reported all results back to consultant virologist
- Benefits to the wider lab
  - No concerns around who is around who can do the work
    - No reliance on a single or very small pool of people
  - Processes are clear
  - 'Buy-in' from senior management
  - Everyone knows who is proficient (records kept)
  - Stress is reduced for the laboratory system

# Emerging Infections – Routine Laboratory Context

## Summary

- Responding to emerging or high consequence infection is no longer that infrequent
- The laboratory response is a key factor in supporting the management of the patient and the incident
- All laboratories will have staff with the capability and enthusiasm to respond– we need to learn to tap that strength
- By establishing a formal team within the routine laboratory framework – response to emerging infection becomes less stressful and increasingly part of the normal process

# Acknowledgements



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