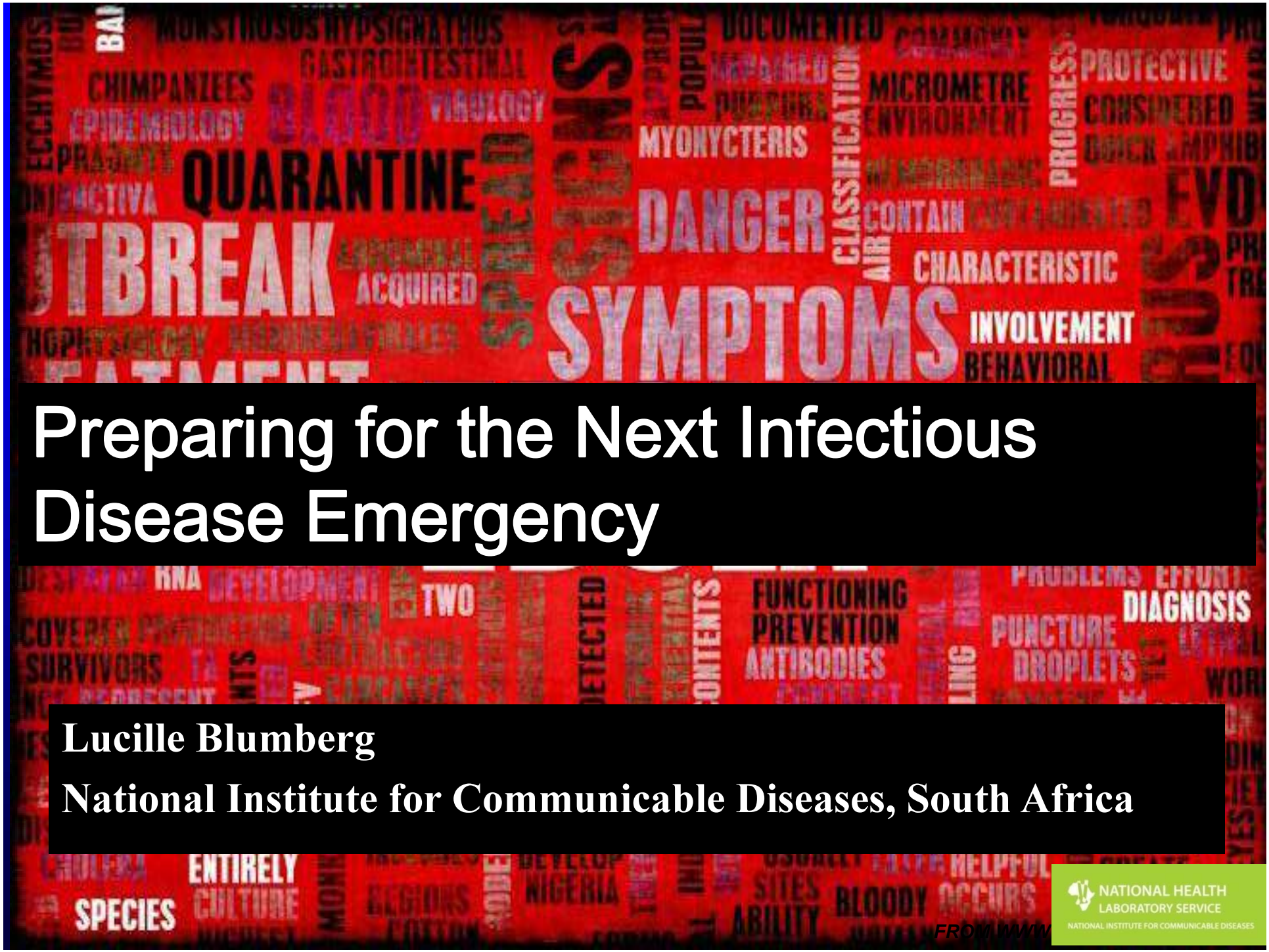


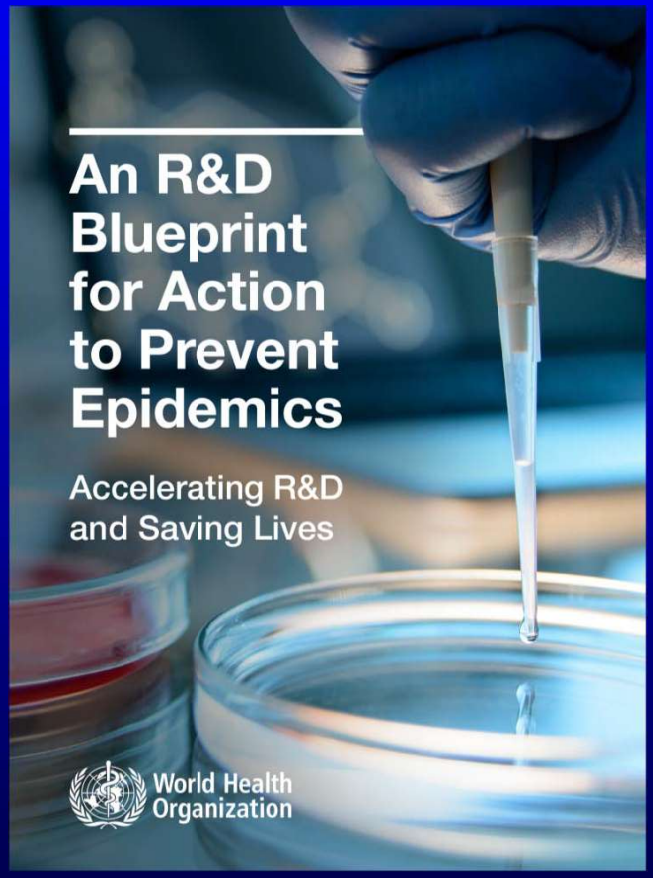
Preparing for the Next Infectious Disease Emergency

Lucille Blumberg

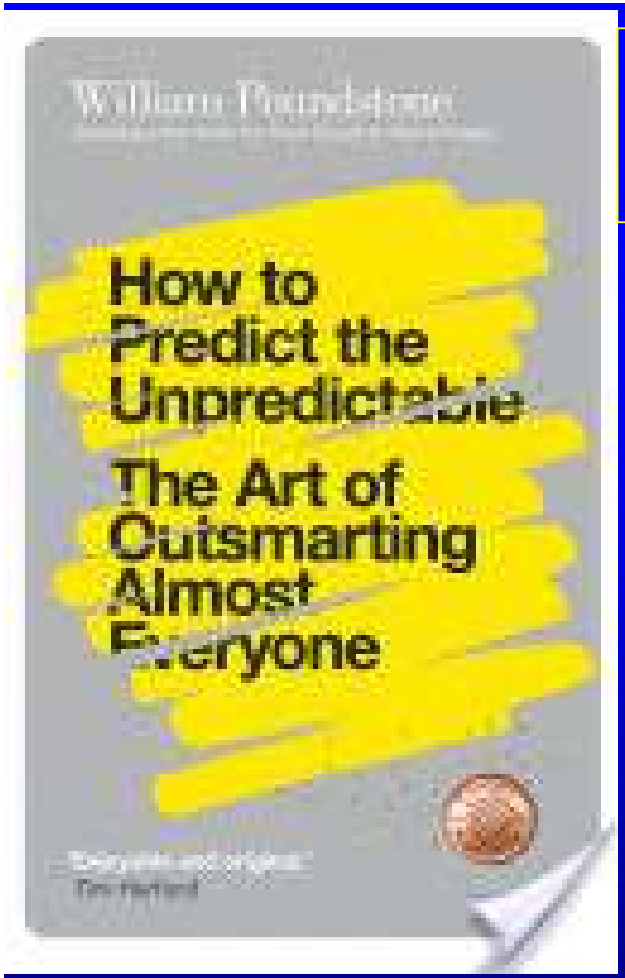
National Institute for Communicable Diseases, South Africa

NATIONAL HEALTH LABORATORY SERVICE
NATIONAL INSTITUTE FOR COMMUNICABLE DISEASES

A prioritised list of severe emerging diseases with the potential to generate a public health emergency

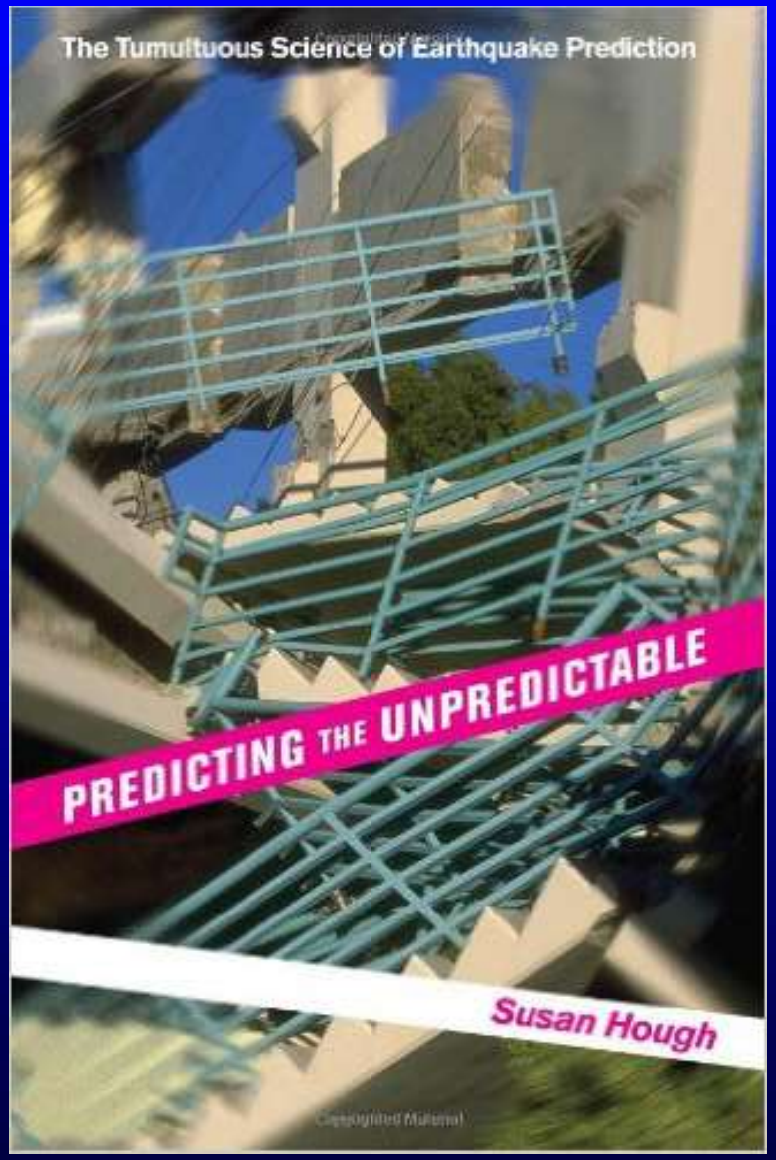


- Key gaps in development of vaccines, therapeutics, diagnostic tests
- Transitioning from research /preparedness to action



You can only predict things after they have happened.

E. Ionesco. Le Rhinocéros (1959) act 3



Front. Hum. Neurosci 2014 Predicting the unpredictable: critical analysis and practical implications of predictive anticipatory activity

The future ain't what it used to be
Yogi Berra

Many prioritisation exercises have been performed before

- New or known diseases
- Natural, deliberate, accidental outbreaks
- Special demands of WHO
- Excluded diseases managed through different platforms/programmes eg influenza, malaria, TB/HIV

Formulate criteria, weight for importance, assess diseases against criteria

- Agent -based factors
- Host- based factors
- Clinical disease factors
- Public health capacity/impact factors
- Epidemiological factors
- Broader context factors

Adapted from ECDC :
Best practices in ranking emerging infectious diseases threats , 2015

Prioritization of key Pathogens

World Health Organization

Health topics | Data | Media centre | Publications | Countries | Programmes | Governance | About WHO | Search

Essential medicines and health products

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WHO publishes list of top emerging diseases likely to cause major epidemics

Share Print

WHO HQ SHOC Room
WHO /Christopher Black

A panel of scientists and public health experts convened by WHO met in Geneva this week to prioritise the top five to ten emerging pathogens likely to cause severe outbreaks in the near future, and for which few or no medical countermeasures exist. These diseases will provide the basis for work on the WHO Blueprint for R&D preparedness to help control potential future outbreaks.

The initial list of disease priorities needing urgent R&D attention comprises: Crimean Congo haemorrhagic fever, Ebola virus disease and Marburg, Lassa fever, MERS and SARS coronavirus diseases, Nipah and Rift Valley fever. The list will be reviewed annually or when new diseases emerge.

Elements for prioritization

- Spill over potential
- Human transmissibility (inc population immunity, behavioural factors)
- Severity or case fatality rate
- Evolutionary potential (evolvability)
- **Available countermeasures**
- Difficulty of detection or control
- Public health context of the affected area
- Potential scope of outbreak (risk of international spread)
- Potential societal impacts

Prioritized Diseases

Urgent

- **Filovirus diseases (i.e. EVD & Marburg)**
- **Lassa Fever**
- **Rift Valley Fever**
- **Highly pathogenic emerging Coronaviruses (relevant to humans, MERS Co-V & SARS)**
- **Crimean-Congo haemorrhagic fever**
- **Nipah**

Serious

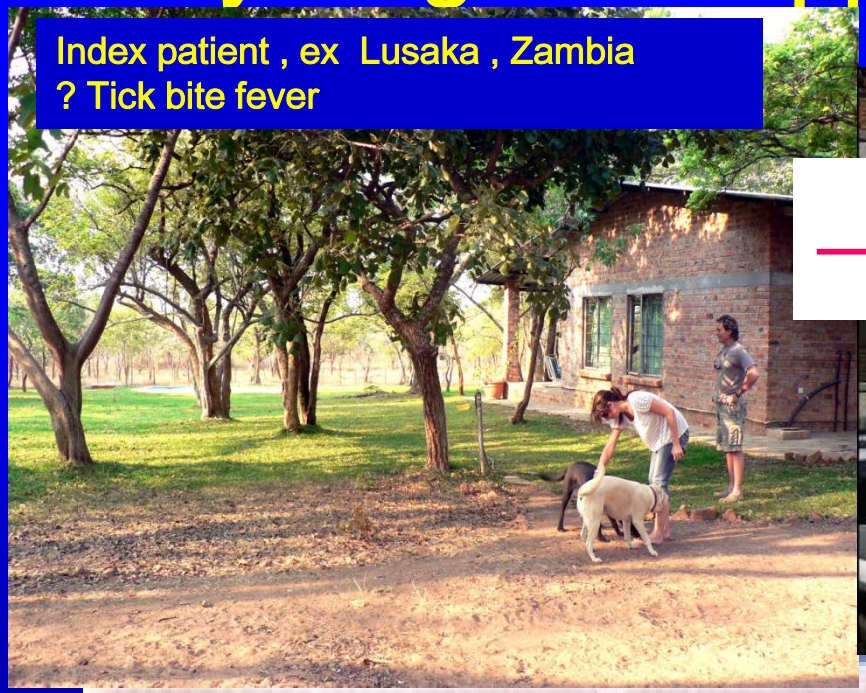
- Chikungunya
- Zika
- Severe Fever with Thrombocytopenia Syndrome

Also considered……

- Dengue Fever (already established initiatives)
- Plague (medical countermeasures and Public Health control measures exist)
- Avian influenza causing severe human disease
- Carbapenem-resistant Enterobacteriaceae
- Monkeypox

- Specific versus ‘ broad’ approach
- Consequences of not prioritising
- Optimising interventions
- New diseases/pathogens…limited data

Anything can happen anywhere ..



Health department clueless about killer virus, but tells the public:

'Don't panic'

Tests negative for Lassa, Marburg, Ebola, Crimean Congo fever..

Tick Bite Fever , Q fever, Leptospirosis……

VIRAL HAEMORRHAGIC FEVER SYNDROME ??????

"VHF" Infection Control

Contact tracing and monitoring

EID 2009 *Paweska*

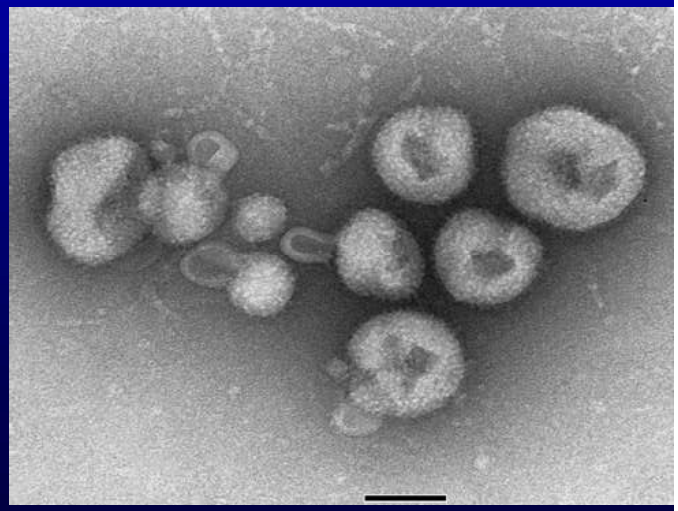
PLOS 2009 *Lipkin*

EID 2011 *Ishii*

J Gen Virology *2012 Ishii*

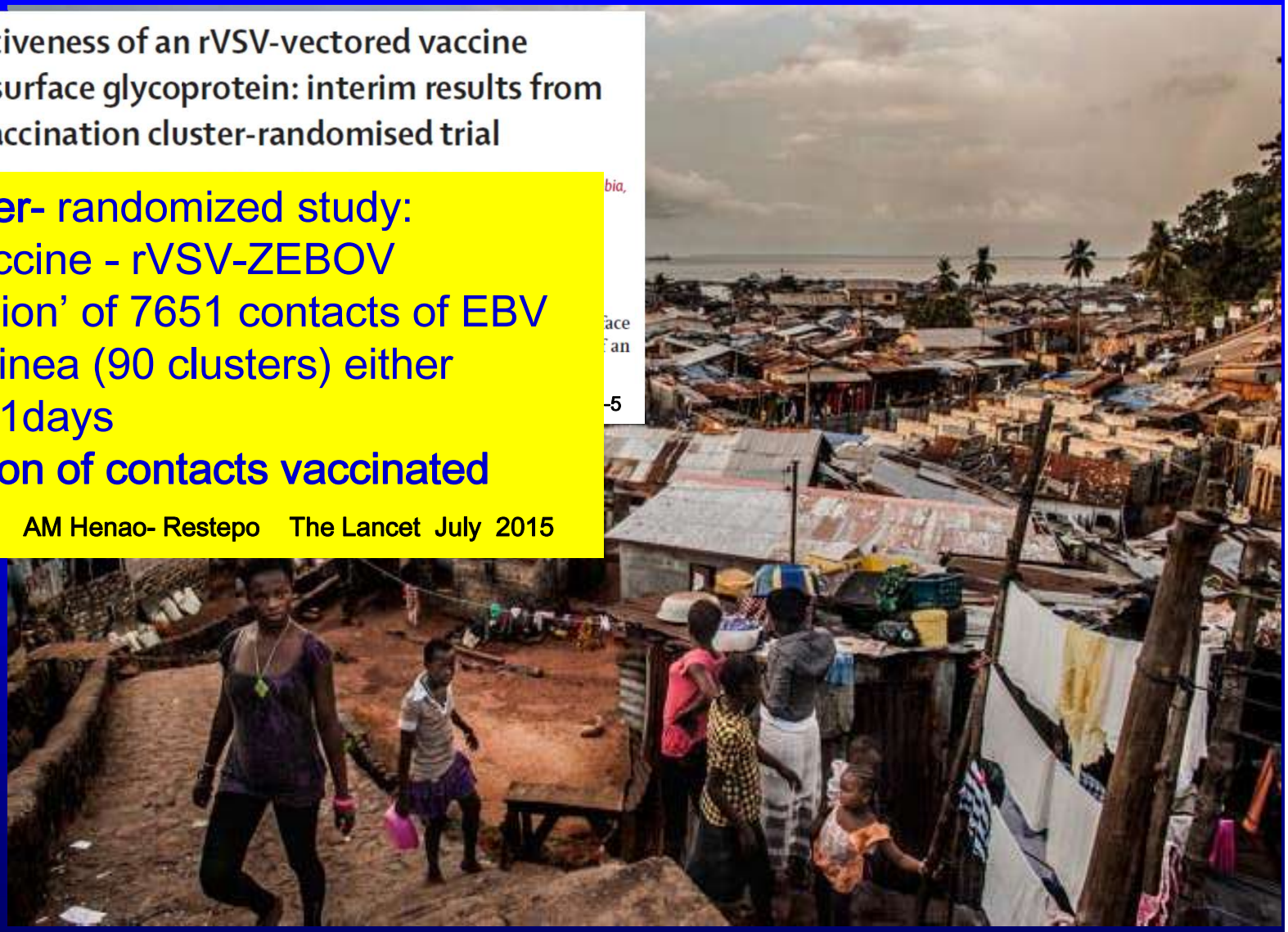
'New Arena virus'

LUJO



Efficacy and effectiveness of an rVSV-vectored vaccine expressing Ebola surface glycoprotein: interim results from the Guinea ring vaccination cluster-randomised trial

Phase 3 cluster- randomized study:
novel EBV vaccine - rVSV-ZEBOV
'Ring vaccination' of 7651 contacts of EBV patients in Guinea (90 clusters) either immediately/21days
100% protection of contacts vaccinated immediately AM Henao- Restepo The Lancet July 2015



'From villages such as Méliandou, the 2014 outbreak spread to urban areas, including Freetown's Kroo Bay. Crowding, poverty, and scant health services accelerated Ebola transmission, heightening fear and resentment.'

Source Pete Muller National Geographic Feb 2016

Next steps

- Decision instrument needed for new diseases
- Review landscape and repeat prioritization on annual basis; regular methodological review
- Emergency advice as needed for urgent prioritization
- Operational plan for initiating action during a health event

Preparing for the inevitable