An NHMRC Centre of Research Excellence

Genomics, Informatics and Ethics research for more effective Public Health Action and Policy

Professor Tania Sorrell
May, 2018
CREID overview

- Multidisciplinary
- 20 Cls and Als
- 6 institutions
- 4 states/territories
- Natl/international collaborators

Cross-sectoral Expert Ad. Board
- Jenny Firman
- Paul Effler
- Jeremy McAnulty
- Nicola Stephens
- John Turnidge
- Jeannette Young

Scientific Advisory Board
Chair, Bart Currie

Improve public health outcomes by

- Incorporating state-of-the art, high throughput and digital technologies into EID risk prediction and PH response
- Developing an enabling practice and policy framework grounded in ethics research
**CREID Research Themes**

**Theme 1**
Pre/early outbreak risk prediction

**PREDICT**
Pathogen behaviour
Viruses, [R] bacteria, fungi

Pathogen discovery, evolution, risk profiles
- host-jumping
- transmissibility
- virulence
- AMR

**Theme 2**
Rapid, targeted public health responses

**EARLY WARNING**
PRECISION TRACKING
RAPID RESPONSE TOOLS

Integrated information systems (for action)
- Clinical/Syndromic
- Lab/Genomic
- Digital/epi

**Theme 3**
Ethics-based policy frameworks

**EFFECTIVE RESPONSE**
Avoid indecision, public suspicion, panic

Surveillance ethics
Acceptability
- Professional, public, political
- Communication
- Data safety/security
Viruses and viral syndromes

- Arboviruses (*Dengue, ZIKA, Chik)
- Influenza (avian, swine, human)
- Human enteroviruses (eg HEV71)
- Encephalitis

AMR - Emergent “high-risk” clones: transmission dynamics, virulence

- *Kleb. pneumoniae*: Transmissible AMR, adaptive virulence
- MRSA: Nosocomial & community pathogen; VRE
- S. Typhimurium: Persistent, increasing, food-borne illness
- Strep pneumoniae: Evolution under vaccine pressure

Research responsive to public health issues/
Evidence gaps 2017-8

- Parechovirus [ECR Britton et al]
- RSV [ECR Fernandez, Eden et al]
- [R] meningococcus [ECR Kwong et al]
- Francisella tularensis ssp. holarctica [ECR Eden et al]
PathogenOmics in public health outbreaks/pathogen discovery

• Outbreaks: food-borne e.g., Salmonella, Listeria; multidrug [R] Klebsiella, hospital-acquired MRSA, VRE; legionellosis, meningococciosis, MDR TB

• Seasonal Influenza A in WA - molecular evolution/epidemiology, synchronisation of continental (Aust) flu epidemics

• Dengue in the region - returned travellers

• EV71/flu/encephalitis/encephalopathy

• RSV in NSW

• Parechovirus

• New/Previously unrecognised: Francisella tularensis ss holoarctica in Tasmania
  S. Wangata: New Salmonella serotype (zoonotic) identified in NSW; Fitzroy River virus WA

Translation into policy/practice
Ethics of digital ‘epidemiology’ and enhanced infectious disease surveillance

**Enhanced surveillance technology**
- Social media; clinical/laboratory information systems; data linkage; pathogenOmics

**Ethical and legal risks**
- **Using it:** privacy; fear of surveillance; no explicit consent; data misuse
- **NOT using it:** failure to prevent infectious disease outbreaks & associated costs

**Importance of public acceptability**
- Community values
- Legal constraints

**Processes**
Delphi technique (engage with experts); Discrete choice expts, Citizens’ juries (public)

**In order to**
- Develop ethical standards for enhanced surveillance
- Develop public education and communication strategies
Consensus: Reasonable to monitor social media posts in the interests of public health

Controversial: Use of social media platforms to contact identified individuals.

Controversial: PathogenOmics in epidemiological research and pub. health investigations, re:

• necessity for consent before testing and data-linkage
• thresholds for action
• ethical importance of harms to individuals and commercial entities

Conclusion: Greatest risk: Erosion of public trust

Solution: (Rapidly as technology is here) Develop clear guidelines for use that address legal & ethical concerns, in consultation with relevant experts and the Australian public

(Submitted, Degeling et al)
Collaborative EID & preparedness education, training, research

**AIM:** Build and upskill national health & medical research workforce

Skills development
- Observerships (eg CDNA, PHLN)
- Exchanges, DOH attachments
- Masters programs
  - MAppEpi
  - M Health Security

**CREID:** (24 post-docs, 17 PhD students)
Skills development


Workshops

➢ Flaviviruses in Asia-Pacific (ASM, Perth ‘16)
➢ Policy makers and researcher perspectives (CREID mtg, Sydney ‘16)
➢ The ABC of ATGC for TB (Intl Congress Trop Med & Malaria, Brisbane ‘16)
➢ PathogenOmics for public health (CD Control Conf, Melbourne 06/17)
➢ Communicating Research Outcomes (Stand-alone, Sydney 05/17)
➢ With Marie Bashir Institute, DFAT: EID threats in the Indo-Pacific region - Australia’s regional leadership

Cross-pollination:
CREs/HOT NORTH CIs/AIs in common (CREID, APPRISE, PRISM, ISER (TB-CRE)

➢ CRE Symposium (ASID Annual scientific meeting‘17)
➢ Research Priorities in CD Control (Panel Aust CD Control Conf. ‘17)
➢ Adv. In Microbial Genomics for Public Health & Clinical Microbiology Workshops (Doherty Inst/MDU and MBI/CIDM PH, annual)
➢ ASID/ASA AMR summit (Melb June 2017) CREID & other CREs involved; AMR, R&D
➢ Multi-CRE ECR Academy meeting and workshop on modelling (Darwin, HOT NORTH mtg, May ’18)
Research Engagement – External partners

Cross-sectoral Expert Advisory C’ttee
Chair J Firman

AHPPC CDNA PHLN NAMAC Jurisdiction C’ttees

Daily work Interactions with DOHs

Professional Societies (P/V) President ASID, ASM ASA, ACIPC

Public Research Forums Website Twitter

Global National CREs [APPRISE, HOT NORTH TB, Dig. Health PRISM ISER]

External research collabs

Global WHO GOARN GLoPID R DFAT TAG

Institutional Enablers MBI PathWest Doherty Menzies

SAB Chair B Currie