Will it be possible to shorten the delay between the start of an outbreak and its detection by health care systems?

An example with MERS-CoV

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Emerging and re-emerging infectious of zoonotic origin

Human health, animal health and the state of ecosystems are inextricably linked with 75% of emerging and re-emerging infectious diseases known to be of zoonotic origin*

*MERS-COV  Avian influenza  Ebola

Epidemiology of MERS-CoV

- **Pattern of the epidemic:** repeated sporadic introductions into the human population from direct or indirect contact with dromedary camels (and possibly other not-yet identified animals), resulting in limited human-to-human transmission, notably in healthcare settings.

- No cases associated with religious pilgrimages.

- There is no evidence of sustained human-to-human transmission.

- Failures in infection control and prevention in healthcare settings has resulted in large numbers of secondary cases.

(L) Reuskin et al EID 2014; (R) Ferguson & Van Kerkhove 2014
MERS-CoV

>1694 cases reported from 26 countries, >603 deaths
Peaks in activity are dominated by nosocomial outbreaks
Primary infection – an opportunity?

Probable source of infection or confirmed MERS-CoV-2015 (based on date of onset)

Figure provided by Dr Abdullah Assiri, KSA Ministry of Health
Transmission of MERS
Human Surveillance for MERS

- Significant variation in surveillance for MERS-CoV within and outside of the Middle East
  - Testing uneven between countries
  - Testing uneven over the course of the year
  - Noncompliance with surveillance recommendations from WHO
  - Notable increases in efforts to monitor for MERS during Hajj
    - To date, not a single case associated with Hajj (or Umrah)*
    - Worry is visits to health care facilities or camel contact

Animal Surveillance for MERS

- Improving, but not ideal
- MERS is reportable virus according to OIE (May 2015)
- Surveillance is reactive rather than proactive

Each human/camel case presents an opportunity

- Improvements in case investigations are urgently needed
  - All human cases of MERS-CoV need to be thoroughly investigated
  - Including
    - Immediate notification of health sector to animal sector if human case reports direct or indirect camel exposure
    - Joint animal and human investigations for all community acquired cases
    - Monitoring and testing of all contacts regardless of symptoms
    - Tracing and testing of animals
    - Reporting of follow up for both animal and human investigations

If PCR positive camel identified, animal sector should inform human sector
  - Reporting of PCR positive camels to OIE (Doha Declaration)

- Knowledge learned leads to improvements in prospective studies and can minimize missed cases seeking health care
How can we limit camel-to-human transmission?

• Active surveillance in animals and humans – surveillance must be improved

• Intensive and joint animal/human investigations for every case (needs public trust)

• Clear guidance for at risk populations to limit entering human population

• Coordinated, multi-site, inter-sectorial human/camel research is needed to better understand transmission patterns
Will it be possible to shorten the delay between the start of an outbreak and its detection by health care systems?

- Yes - absolutely
- Need better surveillance in animals and humans
- Need better case investigations through:
  - Improvements in field training
  - More cooperation between the animal and human sectors
  - More cooperation within and between countries
- Improvements in health care response – earlier suspicion and isolation
- We to limit introduction into the human population with better mitigation measures