Cross-jurisdictional AMR surveillance

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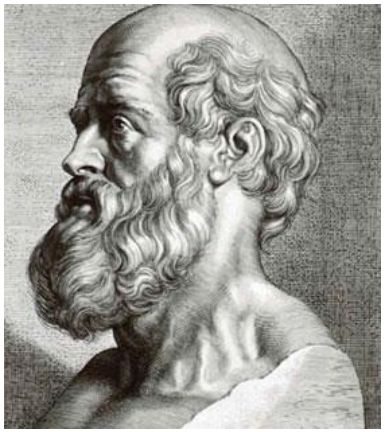
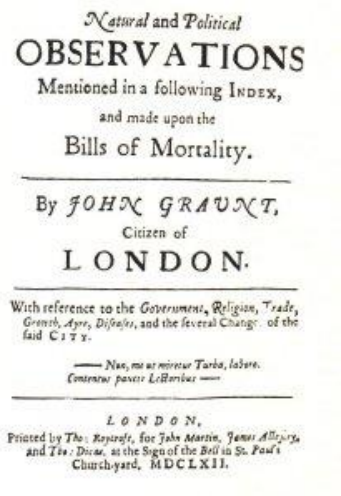
What is surveillance?

- Hippocrates
- John Graunt- a haberdasher collected mortality data
- William Farr – systematic collection and analysis





Natural and *Political*
OBSERVATIONS
Mentioned in a following INDEX,
and made upon the
Bills of Mortality.

By JOHN GRAUNT,
Citizen of
LONDON.

With reference to the *Government*, *Religion*, *Trade*, *Growth*, *Ayre*, *Diseases*, and the several Changes of the said CITY.

Nec, me ut miretur Turba, laboro.
Contentus paucis Lectoribus.

LONDON,
Printed by *Tho: Roycroft*, for *John Martin*, *James Allestry*, and *Tho: Dicas*, at the Sign of the *Bell* in St. *Paul's* Church-yard, MDCLXII.

"Diseases are more easily prevented than cured and the first step to their prevention is the discovery of their causes" Farr

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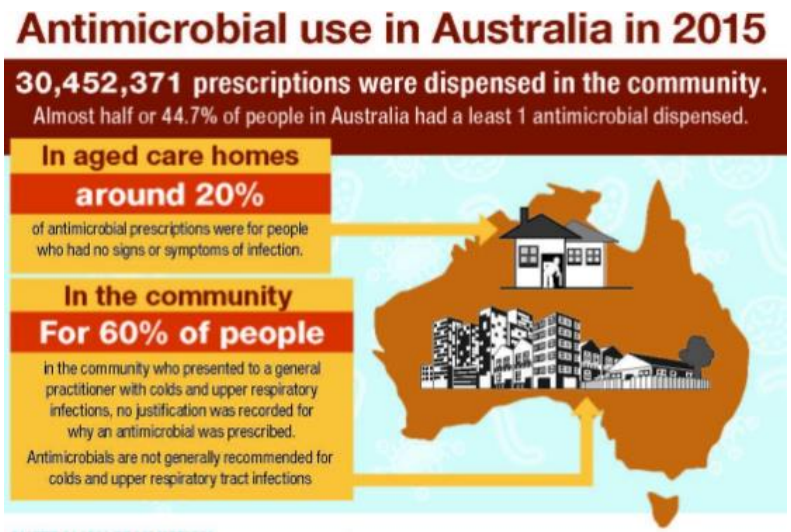
What is surveillance?

- **Is the continuous, systematic collection, analysis and interpretation of health-related data**
  - **Early warning system**
  - **Impact of interventions**
  - **Priority setting**

CARAlert THE NATIONAL ALERT SYSTEM FOR CRITICAL ANTIMICROBIAL RESISTANCES



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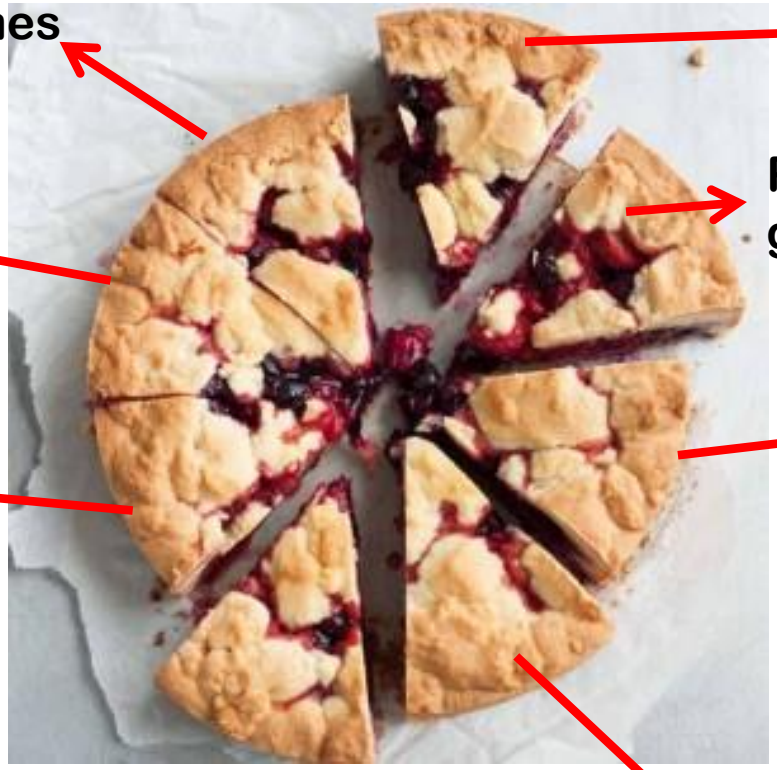
More than just collecting cases

Improved health outcomes

Fewer antibiotics



Patient safety

Practice improvements/ guideline development

Fewer infections

Evidence-based decision making

Cost saving (?)

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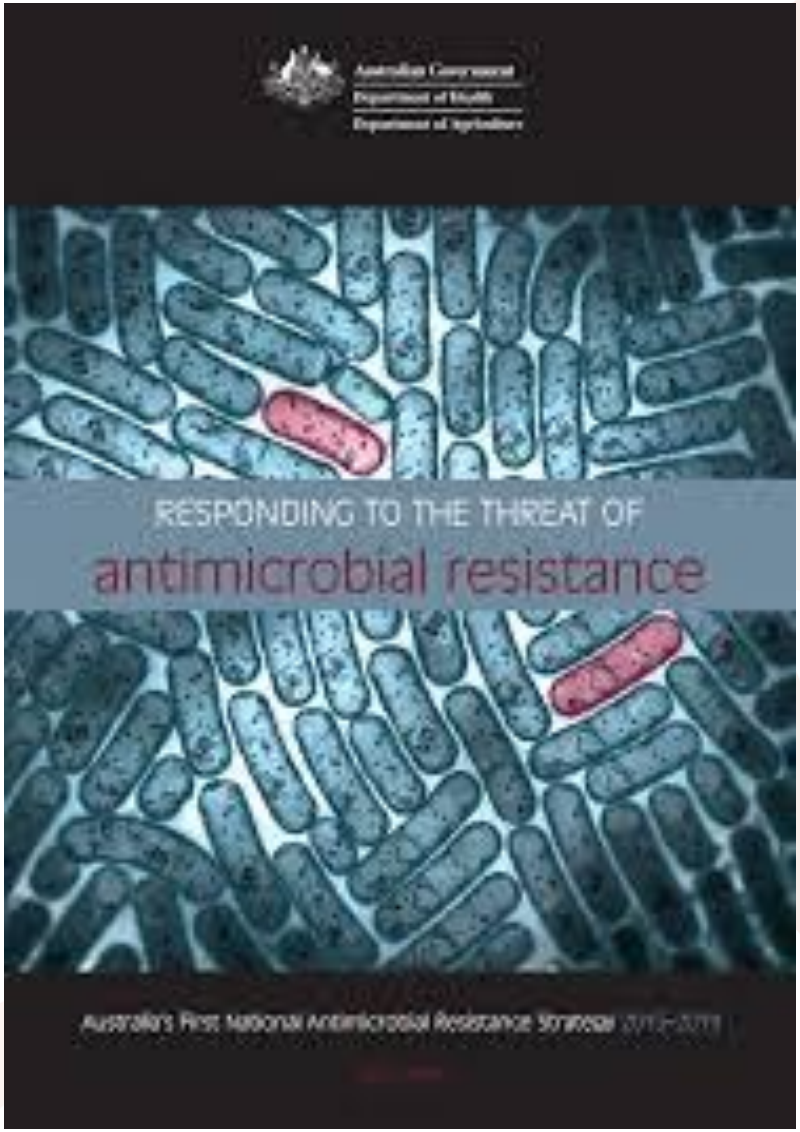
Australia's response to AMR



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Australia's response to AMR

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ISBN: 987-1-921983-47-4

June 2013

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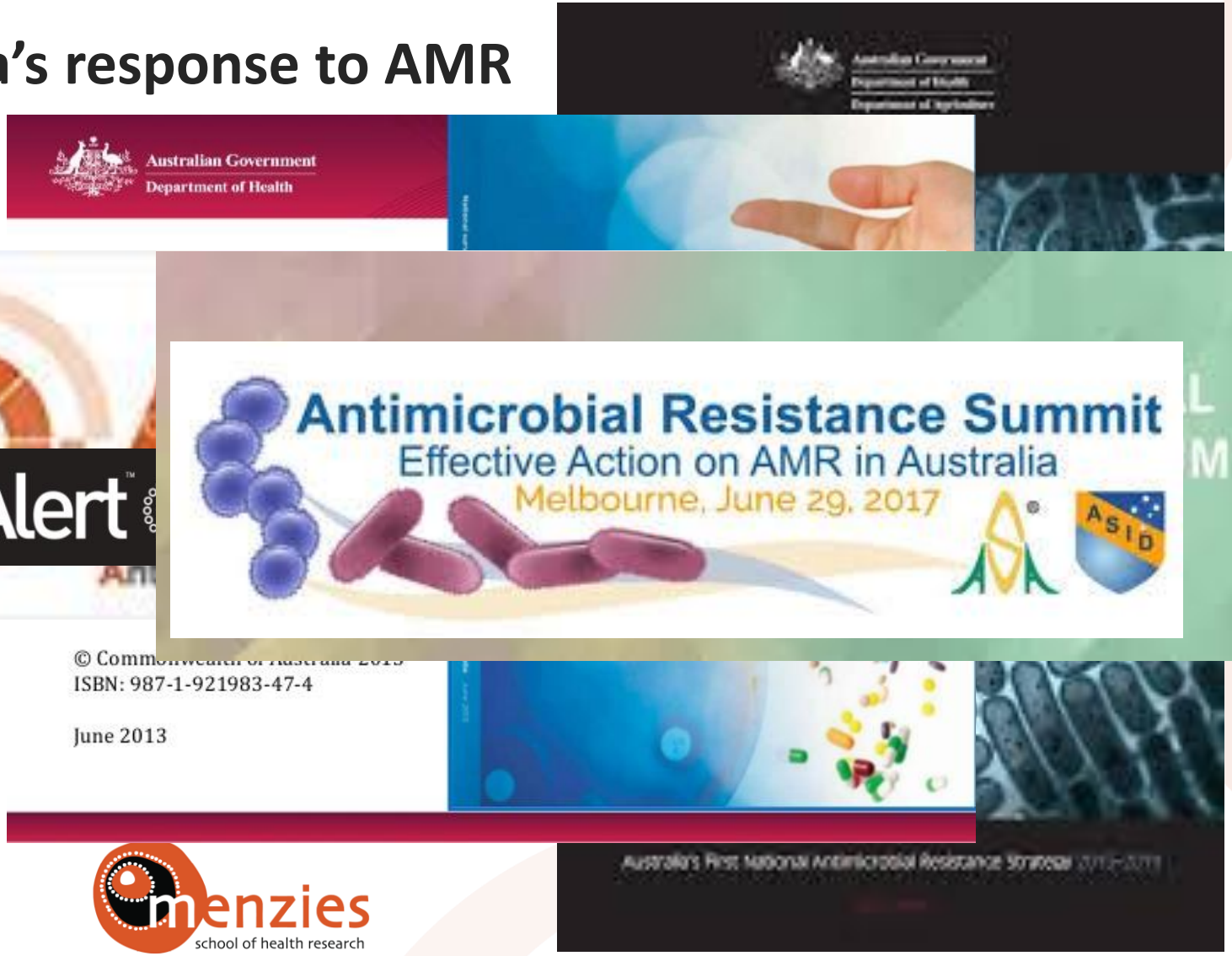
Australia's response to AMR



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Patient-centered

Population-centered

Pathogen-centered

Across time

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Population-centered

1. To assess the regions capacity for a surveillance and response system – gap analysis
2. To quantify the occurrence of key organisms (retrospective 10-year temporal analysis):
   - *> S aureus*
   - *> E. coli*
   - *> K. pneumoniae*
   - *> P. aeruginosa*
   - *>S. pyrogenes*
   - *> H. influenza*
   - *> N. gonorrhoea/ meningoccocal*
   - *> A. baumannii*
   - *> S. pneumoniae*
3. Determine the requirements for a prospective laboratory-based surveillance system

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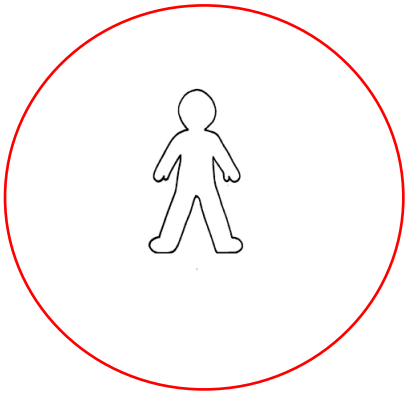
Time frame: 1-2 years



Patient-centered

1. To enhance HOT DREAM #1 with data on antibiotic utilisation and health determinants

1. Pathology data linked with hospital admissions and primary care data
   - Patient demographics
   - Hospitalisation (extra length of stay, treatment, antibiotic prescribing)
   - Geographical location of acquisition
   - Economic burden to the healthcare system (in collaboration with PhD student Will Cunningham)

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Time frame: 2-4 years

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Pathogen-centered

To enhance HOT DREAM #1&2 with genomic data

- Small proof of concept studies

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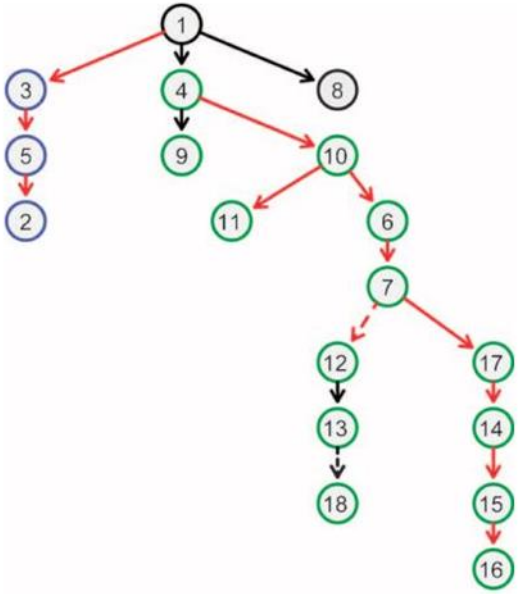
Time frame: 2-4 years

Pathogen-centered



Missing transmission events if lacking epidemiological link

Sci Transl Med. 2012 August 22; 4(148): 148ra116. doi:10.1126/scitranslmed.3004129.

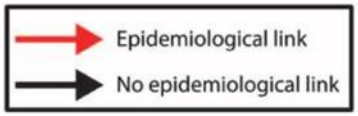
Tracking a Hospital Outbreak of Carbapenem-Resistant *Klebsiella pneumoniae* with Whole-Genome Sequencing

Evan S. Snitkin[1], Adrian M. Zelazny[2], Pamela J. Thomas[1], Frida Stock[2], NISC Comparative Sequencing Program[3], David K. Henderson[2], Tara N. Palmore[2,*], and Julia A. Segre[1,*]

[1]National Human Genome Research Institute, Bethesda, MD 20892, USA

[2]National Institutes of Health Clinical Center, Bethesda, MD 20892, USA

[3]National Institutes of Health Intramural Sequencing Center (NISC), Bethesda, MD 20892, USA



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Keep on dreaming?

- Actively collaborate (WA, QLD and National)
  - Pathology providers
  - Clinicians
  - Stewardship programs
  - Government agencies
  - YOU

Time frame: now- ongoing

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Keep on dreaming?

- Actively collaborate (WA, QLD and National)
  - Pathology providers
  - Clinicians
  - Stewardship programs
  - Government agencies
  - YOU

Time frame: now- ongoing

- A 10 –year retrospective snapshot of resistance

Time frame: 1 year

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- Actively collaborate (WA, QLD and National)
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  - Clinicians
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  - Government agencies
  - YOU

Time frame: now- ongoing

- A 10 –year retrospective snapshot of resistance

Time frame: 1 year

- A prospective surveillance system
  - Provide feedback via regular reports enhanced data quality

Time frame: 2-4 years

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Keep on dreaming?

- Actively collaborate (WA, QLD and National)
  - Pathology providers
  - Clinicians
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  - Government agencies
  - YOU

Time frame: now- ongoing

- A 10 –year retrospective snapshot of resistance

Time frame: 1 year

- A prospective surveillance system
  - Provide feedback via regular reports enhanced data quality

Time frame: 2-4 years

- Build in health determinants and genomic surveillance

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FEEDBACK
COLLABORATE
EVALUATE
DREAM BIG. WORK HARD.
NEVER STOP BELIEVING
THAT ANYTHING IS
POSSIBLE