

What is Surveillance? What is Screening? How are They Related?

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No known conflicts of interest.



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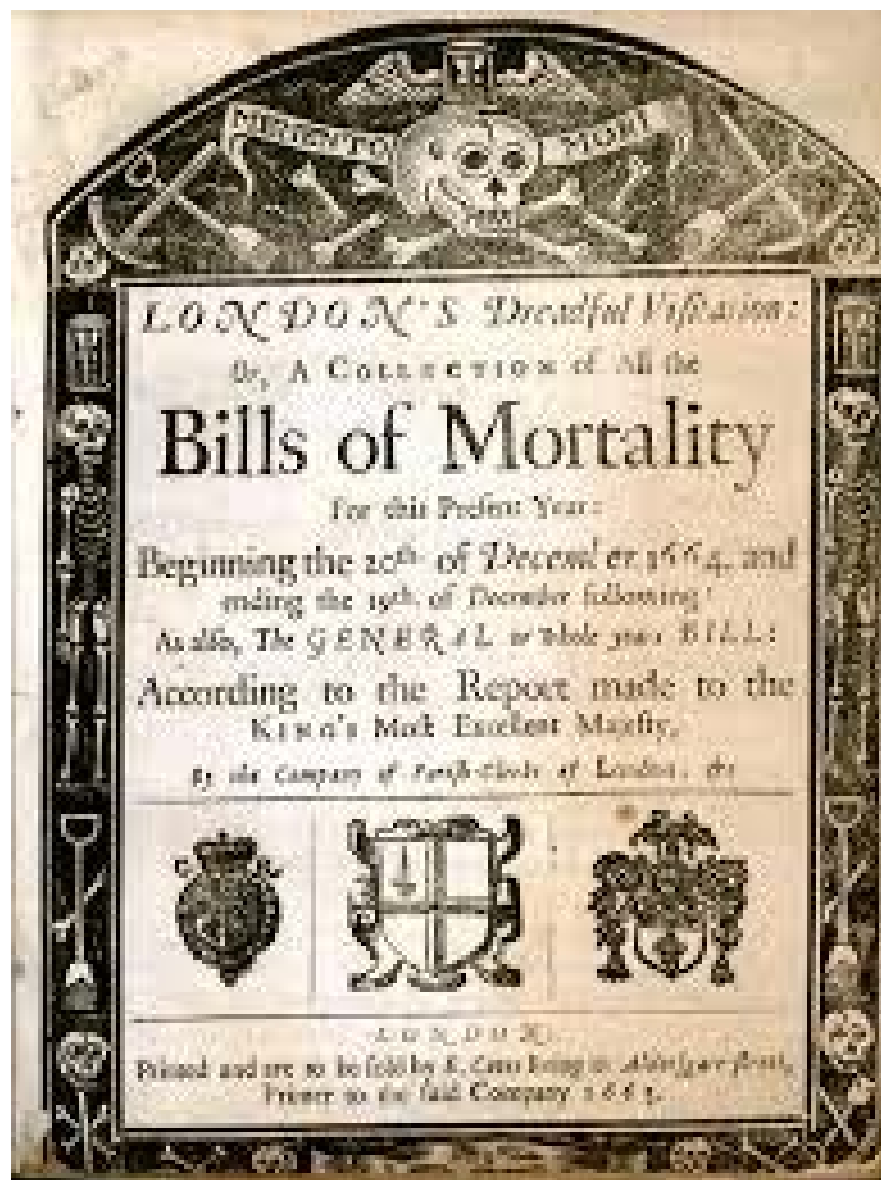
Surveillance: Etymology

- French origin:
 - *sur-* "over"
 - *veiller* "to watch"
- From Latin:
 - *Vigil-* "watchful"



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LONDON'S Dreadful Visitation:

Or, A COLLECTION of All the

Bills of Mortality

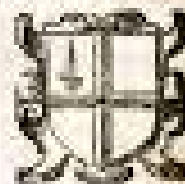
For this Present Year:

*Beginning the 20th of December 1664, and
ending the 19th of December following:*

As also, The GENERAL or whole year BILLS:

*According to the Report made to the
King's Most Excellent Majesty,*

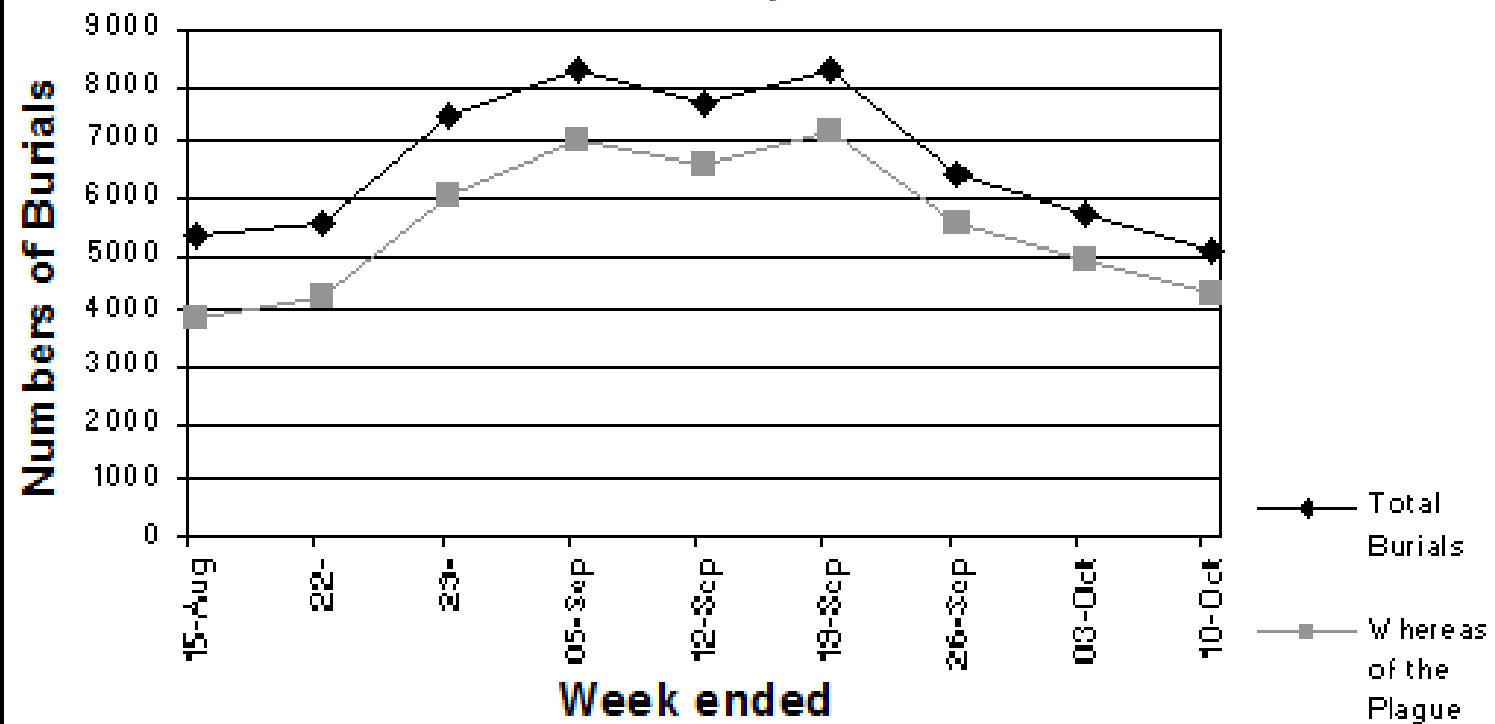
By the Company of Parish-Clarks of London. &c.



LONDON:

*Printed and are to be sold by E. Cotes living in Aldersgate Street,
Printer to the said Company 1665.*

Bills of Mortality, numbers of Burials in London, 9 weeks in 1665



Surveillance: Dictionary of Epidemiology, Porta, 2008 (1)

- Essential feature of epidemiological and public health practice
- Systematic and continuous
- Data
 - Collection
 - Analysis
 - Interpretation
- Timely and coherent dissemination ... so that action can be taken.



Surveillance: Dictionary of Epidemiology, Porta, 2008 (2)

- Methods distinguished by
 - Practicality
 - Uniformity
 - Rapidity
 - *Not:*
 - Accuracy
 - Completeness



Surveillance: Dictionary of Epidemiology, Porta, 2008 (2)

- By observing trends in outcomes or pathways to outcomes in
 - Persons, places, time
- Further investigation or intervention



Surveillance of Antimicrobial Resistance: Needs and Next Steps

Vision

“To achieve a monitoring capacity that will capture the global situation of antimicrobial resistance, and inform decision-making.”

http://apps.who.int/iris/bitstream/10665/90975/1/WHO_HSE_PED_2013.10358_eng.pdf

Towards integrated surveillance of AMR

In humans and animals
and in disease specific programs

Immediate steps will focus on ABR

Standards for global surveillance
Collaborative platform for surveillance



Summary:

Surveillance of Antibacterial Resistance

1. Gaps are largest where health systems are weak
2. There is no agreement on surveillance standards:
 - What samples and information to collect
 - How to analyse samples
 - How to compile and share data
3. Obtained national data was usually based on proportions of resistant bacteria rather than proportions of resistant bacteria causing specific diseases or affecting defined populations
4. The report provides a benchmark for future surveillance progress



Antimicrobial Resistance in a Wider Context

A global problem requiring a global solution

Commitment from
stakeholders in all
sectors



Comprehensive
national plans



**Surveillance is key to inform
public health actions and strategies**

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World Health Organization definition

“Screening is the presumptive identification of unrecognized disease or defects by means of tests, examinations, or other procedures that can be applied rapidly.”



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World Health Organization guidelines for a screening program

[Wilson and Jungner 1968](#)

- The condition should be an important health problem.
- There should be a treatment for the condition.
- Facilities for diagnosis and treatment should be available.
- There should be a latent stage of the disease.
- There should be a test or examination for the condition.
- The test should be acceptable to the population.
- The natural history of the disease should be adequately understood.
- There should be an agreed policy on whom to treat.
- The total cost of finding a case should be economically balanced in relation to medical expenditure as a whole.
- Case-finding should be a continuous process, not just a "once and for all" project.

Potential benefits and harms of screening

	Disease or condition present	Disease or condition absent
Test positive	True positive	False positive
Test negative	False negative	True negative



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Medical screening: History

- Mental tests, 1917, U.S. Army
- “to help to eliminate from the Army at the earliest possible moment those recruits whose defective intelligence would make them a menace to the military organisation”



Who should be screened?

- Patients and/or staff?
- Universal screening?
- Targeted screening?
 - Age or sex
 - Risk factors
 - Past
 - Present
 - Future



How to screen?

- History (previous colonization or infection)
- Testing
 - For what?
 - Which samples?
 - Which tests?
 - Repeats for positives or negatives?



When to screen?

- Prior to admission?
- At admission?
- After admission?
 - Point prevalence screening



What is the screening intervention?

- Isolation?
- Decolonization?
- Other?



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The “simple” questions to ask about any screening program?

- Do the benefits of early detection (and subsequent intervention) outweigh the harms (net effectiveness) sufficiently to justify the resource utilization (costs)?
- In other words,
 - how efficient (e.g. cost-effective) is it, and
 - what are the opportunity costs for other allocations of resources (equity) ?
 - For the patient
 - For their immediate contacts
 - For the facility
 - For the community
 - For the larger communities



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Screening and Surveillance:

How are they related?

Screening

- Individual-based (but can benefit others)
- Always intervention-linked
 - Need for validity at individual level
- Can inform surveillance practice

Surveillance

- Population-based (but can benefit individuals)
- May be intervention-linked
 - Need for accuracy, not precision
- Can inform screening practice

Conclusions

- Screening can be used to for short term management of screened individuals in a specific setting – and can inform surveillance
- Surveillance can be used for short and long term management of populations in many settings – and can inform screening
- The most effective use and evaluation of screening and surveillance requires standardized definitions and systematic application



Thank you!

Questions? Comments?

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