Overview of possible applications of linking databases at national and EU level

Carlo Gagliotti

Agenzia Sanitaria e Sociale Regionale Emilia-Romagna, Italy

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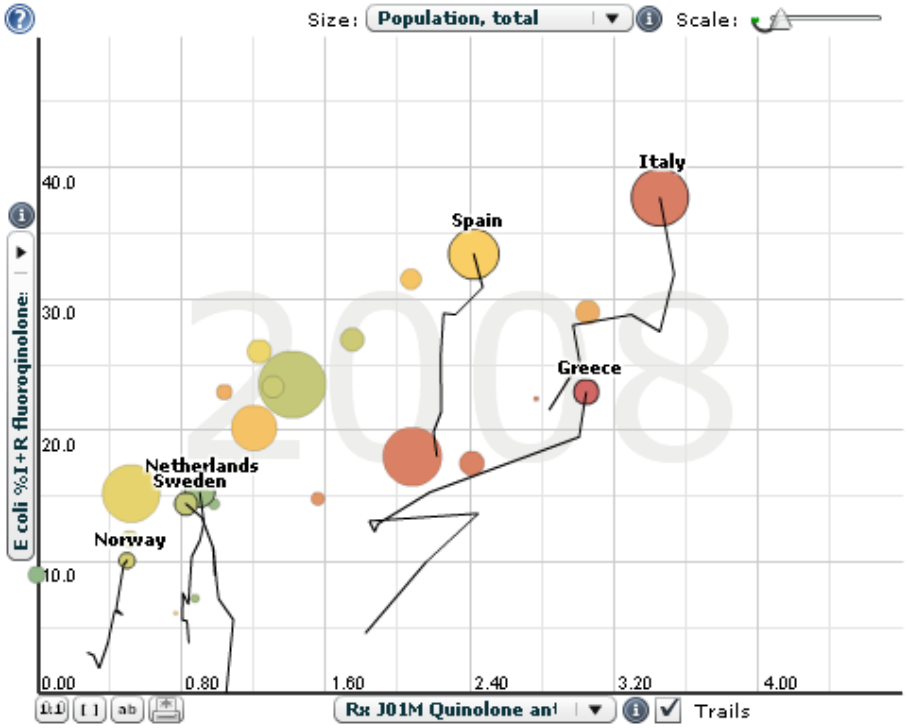
Already existing example of linkage

(*EARS-Net and ESAC-Net data)*

Antibiotic use and resistance in Europe 1998-2008

The use of quinolones vs. resistance in *E. coli*: correlation between countries



Bubble graph:

x-axis - Prescription of quinolones (DDD/thousand inhabitants and day)

y-axis - Fraction of isolates with I or R against quinolones

Time graph for six marked countries

Modified from Mikael Hoffmann – The NEPI foundation

Linking databases

This presentation aims at giving inputs on:

- Requirements for linkage
- Examples of application

……starting point for further discussion and proposals from the workshop

Variables for linkage of datasets

Definition

Consistent definitions of variables between datasets

Level of requirement

Mandatory (required with error)

Coding

Coded values according with a definite list; codes should be consistent over time within and between datasets

Example 1: Hospital ID

ARHAI DATABASES
HAI SSI standard/light protocol *(HAISSI-HAISSILIGHT)*
HAI ICU standard/light protocol *(HAIICU-HAIICULIGHT)*
HAI PPS standard/light protocol *(HAIPPS-HAIPPSLIGHT)*
AMR denominator data *(AMRDENOM)*
AMR resistance data *(AMRTEST)*

Objectives of the linkage

- *Describing multiple dimensions of HAI and AMR epidemiology at hospital level*
- *Exploring correlation between structure and process indicators and various clinical outcomes*
- *Improving risk adjustment*

Hospital ID

Describing multiple dimensions of HAI and AMR epidemiology at individual hospital level

- Availability of a broad range of performance indicators
- Identification of hospitals or areas at higher needs of support

Useful at National level

Hospital ID

Exploring correlation between structure and process indicators and various clinical outcomes

- Generate hypotheses and new insights in HAI control

Improving risk adjustment

- Proper comparison at hospital, regional, national level

Useful at National and EU level

Hospital ID

Examples of structure and process indicators and clinical outcomes from different TESSy datasets

- N. beds
- Proportion of ICU beds
- Proportion of single room beds
- Number of IC nurses/doctors per n. of beds
- Median in hospital length of stay
- Hospital type
- Region where hospital is located
- Blood culture rate
- Rate of use of alcohol hand hygiene products
- Rate of infection *(general, by infection or specific for department/pathogen/resistance profile)*
- Proportion of antimicrobial resistance *(by bug/drug combination)*

Hospital ID

Current status of this variable in TESSy

ARHAI DATABASES			
HAI SSI standard/light protocol *(HAISSI-HAISSILIGHT)*			
HAI ICU standard/light protocol *(HAIICU-HAIICULIGHT)*			
HAI PPS standard/light protocol *(HAIPPS-HAIPPSLIGHT)*			
AMR denominator *(AMRDENOM)*			
AMR resistance *(AMRTEST)*			

[Reporting Country + Code of 3 characters + letter assigned to the Hospital] e.g. NL001A

Hospital ID

Linkage by *Hospital ID* possible if:

- **Member states use a stable list of codes** (consistent over time within and between datasets)
- **ECDC improves the consistency of this variable in TESSy** (definition/requirement/codes)

…but the first question is:

Do you think this is a priority area?

Example 2: Patient counter

- A numeric, anonymous code to specify patient
- Assigned by labs in AMR databases, by hospitals in HAI databases *(therefore unique within lab or hospital depending on the surveillance system)*
- Not to be confused with RecordID *(unique anonymous identifier for each record)*

Linking databases by patient would allow a wide range of additional analysis with adjustments for confounding at individual level

Therefore, this linkage has a big theoretical potential of use but it is difficult to achieve….

Patient counter

To be used for linkage between databases it should be unique in different databases and stable over time (at least for one year)

- Is this linkage actually feasible?
- Is it allowed?

…but first of all:

What's your point of view?

Possible steps

- **Define purposes and priorities**
- **Check for feasibility**
- **Decide who should do what by when*(?)***

Time for discussion and proposals!