The Danish microbiology database

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OVERVIEW

- The visions
- The basic principles of MiBa
- Datamodel and coding
- Perspectives for use of SNOMED CT in MiBa
THE PRIMARY VISIONS FOR MIBA

- Nationwide sharing of patient reports on microbiological test results.

- A new national surveillance system for infectious diseases and microorganisms:
  - automatic, flexible and real time.

- A database for research and quality assessment projects.
MIBA IS A COLLABORATION BETWEEN

- All Danish Microbiology Departments
- Suppliers of Laboratory information systems
  - Autonik AB
  - MADS
- Statens Serum Institut
  - Microbiology and Infection Control
  - Virology Surveillance and Research
  - Department of Infectious Disease Epidemiology
  - National Sundheds IT (NSI)
- MedCom
- The Ministry of Health
BASIC PRINCIPLES OF MIBA

SDN = The Danish health care network

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Copy of test report

Test report

Department of clinical microbiology

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DEPARTMENTS OF CLINICAL MICROBIOLOGY IN DENMARK

Different
- IT-systems
- data structure
- coding

Regions formed in 2007

Statens Serum Institut
(The National Public Health Institute)

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ACCES TO MICROBIOLOGICAL TEST REPORTS

Before MiBa

- No sharing of test reports between hospitals or GPs

After MiBa

- Nationwide access to all test reports
LOOK UPS (OF INDIVIDUAL PATIENTS) IN MIBA PER MONTH

Clinicians

Microbiologists
NATION WIDE ACCES TO

ALL TEST REPORTS

In MiBa:

14 millions records

accumulated from Jan 2010 - Oct 2014

The Danish population: 5.5 million
NATIONAL SURVEILLANCE
NATIONAL SURVEILLANCE AS IS – (BEFORE MIBA)

Based on manual workflows
Automatic real time data transfer and analysis

Lab confirmed influenza

Antal personer med pøvist influenza

Uge 40 42 44 46 48 50 52 2 4 6 8 10 12 14 16 18

2012 2013

Influenza A
Influenza B
% influenza A
% influenza B
WHAT IS SPECIAL ABOUT MIBA DATA??

- Complete data at a national level
- Real time data
- Both positive and negative test results
- All data are personalised (contain the unique CPR number)
- Can be linked to other public registries
- No extra burdens of reporting for the laboratories or health care workers
HOW DIFFICULT CAN THIS BE............

Your plan

Reality
DATA TRANSFER
STANDARD XML TRANSFER PROTOCOL  
(MEDCOM XRPT05)

Exterior Plan (Hitachi Proposal)
The Danish health care network

Departments of Clinical Microbiology

XRTP05

Report original version

Central dynamic mapping

Report mapped version

Access to test report

Surveillance
MAIN VARIABLES IN MIBA TEST REPORTS

Administrative data

- Patient identification / CPR-number
- Sample IDs
- Various dates
- Requestor (hospital department or GP) (code)*
- Laboratory that performed the test (code)*
- The kind of test ordered (code)*
- Material examined (code)*
- Anatomical location of (code)*
- Clinical information (text)

Results / findings

- Microorganism (findings) (local code)
- Antimicrobial resistance pattern (local code)
- Test performed (analyses) (local code)
- Result / interpretation of test (local code)
- Final evaluation or comment (text)

* National codes
DATA MODEL

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XRTP05

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# MAIN VARIABLES IN MIBA TEST REPORTS

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* National codes

## Results / findings
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  - Test performed *(analyses) *(local code)*
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  - Final evaluation or comment *(text)*

Microorganism *(findings) *(local code)*
CENTRAL DYNAMIC MAPNING

Skejby-Lab
V. cholerae
Code: 23

Odense -Lab
Vibrio kolera
Code: 42

SSI- Lab
VIBRIO CHOLERA
Code: VICHOL

MiBa
Vibrio chol
Code: 0024

Should we use SNOMED CT for the shared code?
Same term for MiBa and SNOMED CT (preferred term)

- **Skejby-Lab**
  - V. cholerae
  - Code: 23

- **Odense -Lab**
  - Vibrio kolerae
  - Code: 42

- **SSI- Lab**
  - VIBRIO CHOLERAE
  - Code: VICHOL

- **MiBa**
  - Vibrio cholerae
  - Code: 70024

- **SNOMED CT**
  - Vibrio cholerae
  - ID: 75953000
  - Preferred term DK
MAPPING IN PROGRESS

Skejby-Lab
V. cholerae
Code: 23

Odense -Lab
Vibrio kolera
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VIBRIO CHOLERA
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MiBa
Vibrio cholerae
Code: 70024

1:1

SNOMED CT
Vibrio cholerae
ID:75953000

7700 local terms accumulated in MiBa
6650 terms evaluated and mapped to a shared term

1160 shared terms or concepts created in the MiBa classification

790 terms mapped to SNOMED CT® Microorganism.

Some terms do not belong to this klassification
SNOMED CT® MICROORGANISM

1:1 mapping
- semi automatically and manually using a browser

- 792 MiBa mapped 1:1 to SNOMED CT
- Definitions of “Genus” >> “X species”
- 35 new SNOMED CT concepts

Unresolved issues:
- Microbial properties
  (subtypes, genes, toxins)
Genus Enterobacter (organism)
- Enterobacter species – synonym to Genus

Genus Salmonella
- Salmonella species – child of Genus

Ongoing discussion in the IHTSDO community what x-species mean.
X species have been modelled in two different ways:
- As a synonym to Genus X
- As a child of Genus X
CONCLUSIONS AND PERSPECTIVES

- The clinically important preferred terms of the microorganism sub-hierarchy in SNOMED CT have been evaluated by Danish experts in microbial taxonomy.

- The microorganism sub-hierarchy was found valid and up-to-date
  - suitable for implementation in MiBa as a national terminology

- A few concept’s were missing (now created in the Danish extension)

- The concept of X species needed clarification

- Technical aspects of a SNOMED CT implementation will now be considered

- Other MiBa classifications will be considered for SNOMED CT mapping
I MiBa samles og vises mikrobiologiske prøvesvar fra hele landet.

MiBa er et vigtigt redskab i den nationale overvågning af smitsomme sygdomme og mikroorganismer.