Surveillance systems in

The Netherlands and Kenya

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Nico Kalisvaart

surveillance and data management

kalisvaartn@kncvtbc.nl
Summary

- Introduction
- Surveillance system The Netherlands
- Surveillance system Kenya
- Similarities and differences
- Challenges
Introduction

“ To review country experiences/lessons learnt in implementing electronic recording and reporting systems “

- The Netherlands
  - Aggregated 1900 (CBS)
  - Paper/case based since 1980 (MoH)
  - Renewal paper based (case/patient) 1993 (KNCV)
  - Internet based (case/patient) since 2004 (MoH/KNCV)

- Kenya
  - Paper/aggregated till 2011 (NTP)
  - PDAs roll out ongoing and transfer to case based 2011 (NTP)
  - Internet/case based from 2011/12 onwards (MoH/NTP)
  - One ‘package’ PDAs-DHIS-DMU)
The Netherlands

- Aggregated 1900-1980 (CBS)
- Paper/case based since 1980 (MoH)
- Renewal paper/case based 1993 (MoH/KNCV)
  - Renewal of the contents by the (field/MoH/KNCV)
  - Integrated parts (1 to MoH – 2 Diagnosis – 3 Treatment results)
  - Capacity building and TB data management DMU
- Internet/case based ‘Osiris’ since 2004 TB integrated with diseases (MoH/KNCV)
  - Based on a needs assessment MoH/KNCV
  - Development internet tool Osiris based on TB experiences MoH/KNCV
NETHERLANDS TUBERCULOSIS REGISTER (NTR)

Data flow:
Case based
internet based

Cases 80 %
Clinician
/private
Lab

Cases 20 %
TB
Facility

Internet
Osiris

Nat Ref Lab

MoH

Data management unit
KNCV

TB-Online

Reports WHO, ECDC,
M&E, research
The Netherlands
## The Netherlands

### Actuele meldingen

| Osirisnummer | Melding | Status | Versie | Infectiesoort | Inschrijvingsdatum | Diagnose | Statusnummer | Patient
|--------------|---------|--------|--------|---------------|-------------------|----------|--------------|--------
| 905099       | 97404270 | ODA Concept | 1      | ODA-ongeval | 11-04-11 15:49 | GGD Regio Nijmegen, Hoenderloo, M. H. G. M. | 10-09-11 | 11.027 | V
| 804501       | 88-0010070 | 116 Gemali d1, d2 en 4 | 3      | Tuberculose MTR LTB | 11-04-11 15:32 | HNO Medisch Centrum Benoorden, M. | 11-01-13 | 13.570 | H
| 807299       | 8100415 | 117 Gezien MTRV d1, d2 | 4      | Tuberculose MTR LTB | 11-06-11 15:32 | HNO Medisch Centrum Benoorden, M. | 11-07-11 | 13.570 | H
| 490347       | 8811003808 | 117 Gezien MTRV d1, d2 | 5      | Tuberculose MTR LTB | 11-06-11 14:00 | HNO Medisch Centrum Benoorden, M. | 11-07-11 | 13.570 | H
| 906691       | 8102100970 | 117 Gezien MTRV d1, d2 | 7      | Tuberculose MTR LTB | 11-06-11 13:59 | HNO Medisch Centrum Benoorden, M. | 11-07-11 | 13.570 | H
| 897619       | 8100034 | 117 Gemeente MTRV d1, d2 en 4 | 9      | Tuberculose MTR LTB | 11-06-11 13:00 | HNO Medisch Centrum Benoorden, M. | 11-07-11 | 13.570 | H
| 890201       | 2401-28110072070 | 117 Gemeente MTRV d1, d2 en 4 | 10     | Tuberculose MTR LTB | 11-06-11 13:00 | HNO Medisch Centrum Benoorden, M. | 11-07-11 | 13.570 | H
| 912783       | 8202100970 | 117 Gemeente MTRV d1, d2 en 4 | 11     | Tuberculose MTR LTB | 11-06-11 13:00 | HNO Medisch Centrum Benoorden, M. | 11-07-11 | 13.570 | H
| 903739       | 8100415 | 117 Gemeente MTRV d1, d2 en 4 | 12     | Tuberculose MTR LTB | 11-06-11 13:00 | HNO Medisch Centrum Benoorden, M. | 11-07-11 | 13.570 | H
| 915789       | 8710401 | 117 Gemeente MTRV d1, d2 en 4 | 13     | Tuberculose MTR LTB | 11-06-11 13:00 | HNO Medisch Centrum Benoorden, M. | 11-07-11 | 13.570 | H

*Signaal 1 vast 1724. (2413 meldingen)*

### Electie op status

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<td>ODA Concept 65</td>
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<td>ODA Dafford</td>
<td>4965</td>
</tr>
<tr>
<td>S. Concept</td>
<td>38</td>
</tr>
<tr>
<td>VP: 18 geïntegreerd</td>
<td>188</td>
</tr>
</tbody>
</table>
The Netherlands

Nieuwe melding

Voer het meldingsnummer in en kies een infectieziekte.

Meldingsnummer: [ ]

Infecziekt: [ -- selecteer een infectieziekte -- ]

Organisatie: [GG & GD Utrecht ]

Locatie: [ ]

OK
The Netherlands
The Netherlands

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
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<tbody>
<tr>
<td>OSIRIS Version</td>
<td>8.1.0.9</td>
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<tr>
<td>OSIRIS</td>
<td>921531</td>
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<tr>
<td>Melder</td>
<td>82200168</td>
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<tr>
<td>Infektnaam</td>
<td>Tuberculose NTR slechte</td>
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**Status: Huidig tBS - Gevonden bij 2, 3 en 4**

**Versie: 14, 11-04-2011, Schimmel, H** tBS - Gevonden bij 2, 3 en 4

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<th>Field</th>
<th>Value</th>
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<td>Field</td>
<td>Value</td>
</tr>
<tr>
<td>Field</td>
<td>Value</td>
</tr>
</tbody>
</table>

**Beschikbare gegevens:**

- **RAV laboratoriumgegevens**
  - **Ziektevrije datum:** 22 december 1970
  - **RESISTENTIE-vakantie VNTR typering februari**
  - **DNV nr.: 201301059**
  - **Antiserum:** 30-02-2010
  - **Bacteriologisch:** gevoelig
  - **Sensitisation:** gevoelig

**Lijst patiënt:**

- **Naam:** Onbekend
- **Geboorte:** Onbekend
- **Adres:** Onbekend

**Gegevens:**

- **Man**
- **Vrouw**
- **Onbekend**

**Naar nieuwe status:**
### The Netherlands

#### Osiris Versie 8.1.0.9

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<tr>
<td>Naam</td>
<td>09-0616054</td>
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<td>Infectieziekte</td>
<td>Tuberculose NTR-LTB12</td>
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<tbody>
<tr>
<td></td>
<td>Aflezen</td>
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</tbody>
</table>

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### TBI Deel 2

- **Bovennatuur**: 7
- **Geboorte datum**: 15-05-1984
- **Geboorte bestaat**: Vrouw
- **Bovenaar t/a**: Nederland
- **Bovenaar moeder**: Nederland
- **Bovenaar vader**: Nederland
- **Legale huidige diagnose**: LTBI zonder radiologische afdrukkingen
- **Tijds van diagnose**: Interferon-gamma test (Tuberculin test)
- **COD-rijtnummer**: 7
- **Geboorte bestaat**: Man
- **Bovenaar onderzoek**: Bron- en contactonderzoek
- **Bovenaar onderzoek**: Screening na mogelijke blootstelling
- **Bovenaar onderzoek**: Immunosuppressie
- **Bovenaar onderzoek**: Overige (incl. voorafgaand aan IBG / rel. aanstelingsonderzoek etc.)

---

**Version**: 2, 11-04-2011, Borsersna, S., t16 Gemeld d/ f 2, 3 en 4
## The Netherlands

### NTR Deel 3
### Ziekte episode

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<thead>
<tr>
<th>Resulstert epidemiologisch clusteronderzoek</th>
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</thead>
<tbody>
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<tr>
<td>Registreer gedurende de behandeling? Ja/nee</td>
<td>7</td>
</tr>
<tr>
<td>Registreer gedurende de behandeling? Ja/nee</td>
<td>8</td>
</tr>
<tr>
<td>Behandeling met:</td>
<td>9</td>
</tr>
<tr>
<td>□ Standaard regime 2 HR2S/ 4 HR2S</td>
<td>10</td>
</tr>
<tr>
<td>□ Andere</td>
<td>11</td>
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</table>

<table>
<thead>
<tr>
<th>Datum begin behandeling</th>
<th>12</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Werd patiënt behandeld met een standaard regime?</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Werd de behandeling langer dan totaal 14 dagen onderbouwd?</td>
<td>14</td>
</tr>
</tbody>
</table>

| Belangrijkste bijeenkomsten die wijziging of (inleiding) staken van de medicatie tot gevolg hebben | 15 |

<table>
<thead>
<tr>
<th>Leeffuctionstests</th>
<th>16</th>
</tr>
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<tbody>
<tr>
<td>Neurologische stoornissen</td>
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<tr>
<td>Psychische stoornissen</td>
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<tr>
<td>Visuallatentie</td>
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<td>Afspraak</td>
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<table>
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<tr>
<th>Benadering door sociale: verpleegkundige van SGO</th>
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</thead>
<tbody>
<tr>
<td>Aantal ondersteunende persoonlijke contacten</td>
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<tr>
<td>Werd de medicatie gedurende enige tijd dagelijkse onder toezicht (DOT) ingezien?</td>
<td>23</td>
</tr>
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<table>
<thead>
<tr>
<th>Door wie werd DOT verstrekt</th>
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<table>
<thead>
<tr>
<th>Uitvoering DVD toegestaan (samen met:</th>
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</table>

<table>
<thead>
<tr>
<th>Einde behandeling</th>
<th>26</th>
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</thead>
</table>

| Datum einde behandeling | 27 |

### The Netherlands

#### Osiris Versie 8.1.0.9

<table>
<thead>
<tr>
<th>zoals meldingen</th>
<th>Nieuwe melding</th>
<th>Rapporten</th>
<th>Contact</th>
<th>Help</th>
<th>Uitloggen</th>
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<table>
<thead>
<tr>
<th>Meldnr.</th>
<th>Infektieziekte</th>
<th>Status</th>
<th>Versie</th>
<th>Aanleiding</th>
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<td>921551</td>
<td>Tuberculose NTR</td>
<td>Huislij</td>
<td>11-04-2011</td>
<td>Schimmel, H.</td>
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#### Deel 4 bron-/contactonderzoek

<table>
<thead>
<tr>
<th>bron-/contactonderzoek versocht</th>
<th>ja</th>
<th>nee</th>
<th>onbekend</th>
</tr>
</thead>
</table>

### 1e ring

<table>
<thead>
<tr>
<th>In aantal personen 1e ring &gt; 0</th>
<th>ja</th>
<th>nee</th>
<th>onbekend</th>
</tr>
</thead>
</table>

| Totaal aantal opgeroepen personen | 2 |
| Totaal aantal onderzocht personen | 1 |

### Inhoudelijke kenmerken

| Aantal persoon met tuberculose (TVT) of latent tuberculose (LTBI) of latent tuberculose (LTBI) | 0 |
| Aantal persoon met uitsluiting PVG | 1 |
| Totaal aantal gevonden personen met actieve tuberculose | 0 |

### 2e ring

<table>
<thead>
<tr>
<th>In aantal personen 2e ring &gt; 0</th>
<th>ja</th>
<th>nee</th>
<th>onbekend</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Prevalentie berekenen</th>
<th>ja</th>
<th>nee</th>
<th>onbekend</th>
</tr>
</thead>
</table>
The Netherlands
### The Netherlands

#### Status:

- **133 Gezond**
- **2, 3 en 4**

**Verplichte melding, 11-04-2011, Scrimm, H., t.t.t. Gezond**

**Last seen:**

**Version:** 14, 11-04-2011, Scrimm, H., t.t.t. Gezond 2, 3 en 4
The Netherlands
The Netherlands

Additional modules:

- Registration of cases with a recent infection (included in Osiris since 1993);
- Online preformatted reports/maps (http://www.tbc-online.nl);
- IGRA test results (included in Osiris as a research project);
- Source/contact tracing information ‘part 4’ (included in Osiris since 2004);
- Cluster management based on DNA Fingerprinting/VNTR (included since 2011)
  - Provides automatic feedback (all cases within a cluster including additional information based on the social status of the patient);
Kenya

- Paper based/aggregated till 2011 (NTP)
  - Data recording based on the ‘TB patient card’ (source information) and the data recording/collection based on the ‘TB treatment register’ (according to WHO standards)

- PDAs roll out ongoing 2011 transfer to case based (NTP)
- PDAs functioning in 5 provinces (data collection case based but data transmission aggregated)
- Further country wide roll out planned in 2011 (data collection case based and data transmission case based)

- Internet/case based from 2012 onwards (MoH/NTP)
- Development plan ‘Renewal of the national TB surveillance system’ NTP/KNCV
- HMIS transforms from aggregated ftp to internet and case based DHIS (MoH)

- One ‘package’ PDAs-DHIS-DMU
Kenya

Development plan October 2009:

‘Renewal of the national TB surveillance system’

- **Goal:**
  - ‘To have an established efficient patient and internet based national TB surveillance in Kenya at all levels by the end of 2013’

- **Objectives:**
  - To develop, to implement and to maintain an efficient patient and internet based national TB surveillance system which provides quality information for evidence based decision making at all levels

- **Strategy:**
Kenya

- **Strategy to realize the 3 objectives:**
  - **to develop**
    - Defining the need (initial needs assessment)
    - Defining the methods
    - Defining the expertise needed (Technical working group, 'expert group')
    - Defining an IT plan (technical design of the system, software tools and equipment)
    - Defining an authorization plan
    - Defining linkages with other infectious diseases surveillance systems
    - Defining a data management plan
    - Setting up a financial plan
  - **to implement**
    - Consensus building/field visits
    - Acquisition of equipment
    - Capacity building
    - Phasing in the new system
    - Providing support
  - **to maintain**
    - Monitoring and evaluation of the surveillance system
    - Adjusting components of the system
    - Managing data and validate cases at different levels
    - Managing human resources
Requirements

- The **minimum (core) requirements** for the web based and patient based national surveillance system are:
  - To notify TB patients via the internet on a national scale (contents to be defined later) which includes a combination of features of existing systems;
  - To be linked with the existing surveillance system of the MoH and for (step wise) integrated notification of other (infectious) diseases;
  - To authorize users at different levels with different tasks;
  - To manage data and to validate cases at different levels (TB facility, district, province and national level) following the data management and validation protocols;
  - To manage commodities like anti tuberculosis drugs;
  - To be able to create reports/downloads at all levels;
  - To be able to notify patient information, diagnosis, treatment outcome;
  - To be able to trace transfer in and transfer out patients;
  - To be able to identify patients (define ID key and privacy procedures), retreatment cases and previous episodes;
  - Above all system should be user friendly, include a communication tool, a HELP feature and the system should be flexible and able to expand with new features and tools in the (near) future.
The **additional requirements** for the web/case based national surveillance system are:

- To manage commodities like anti tuberculosis drugs;
- To track major anti-TB drugs side effects;
- To have training modules available for all users at different levels;
- Linkage with Laboratory Information Management System (LIMS) and HIV surveillance/PDAs;
- Monitoring of treatment/case holding/progress/default alerts;
- To use the system in offline mode.
- Program performance management and additional modules like validation, authorization, reporting, automatic alerts, duplicate and previous episode tracing, linkages with laboratory and HIV registers, optional the use of PDAs for data collection;
- On the managerial part of the system the focus needs to be on adequate implementation, training of staff of all intermediate levels as well as establishing a data management unit including well trained staff members to manage the system and the data, to support the users and to further develop the system;
One package PDA – DHIS – DMU

Data `recording and reporting` procedure

- The data collection procedure consists of three major parts:
  - the PDA to collect data
  - the DHIS internet based system to transmit input data from PDAs and output data in predefined reports and digital data files
  - the DMU to manage the complete system of data collection, validation and maintenance of the system
PDA

The PDA is used by the district coordinator (DTLC) to collect the patient based data at TB facility level as close as possible to the primary source.

The DTLCs collect the data at TB facility by data entry the patient based data on a monthly basis.

At the same time the first validation of the TB treatment register takes place. Only complete and correct data will be entered in the PDA.

The data collected at district level will be uploaded via the internet monthly and send to the DMU of the DLTLD.
One package PDA – DHIS – DMU

DHIS

- The second tool is the internet based DHIS system of the MoH
  - Introduced 2011 aggregated
  - Further development tool case based (TB first to be included cases based)
- **Input**: PDAs will download into DHIS
- **Output**: of the system will be validated cases and management information. Only validated cases will be reported on in external reports on TB facility, district, provincial or national level
- The use of reports within DHIS is based on authorization procedures defined by the DMU/DLTLD. Reports can be on aggregated level as well as on digital patient based level. Aggregated reports are directly available in DHIS
- Manage TB data (including validation procedures) by the DMU/DLTLD
One package PDA – DHIS – DMU

DMU

- To manage the data collection a Data Management Unit (DMU) will be installed based on the Data Management Plan.
- The DMU consists of a coordinating data manager and data management officers.
- The coordinating data manager is responsible for all activities related to the national TB surveillance in Kenya including the further development, the implementation and the maintenance of the system.
- The DLTLD will define the further needs in training and equipment needed for the DMU.
- Procedures/DMP/place within the M&E unit.
<table>
<thead>
<tr>
<th>Similarities and differences</th>
<th>Netherlands</th>
<th>Kenya</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osiris</td>
<td></td>
<td>DHIS</td>
</tr>
<tr>
<td>Contents based on WHO standards</td>
<td>Yes</td>
<td>incl. requirements</td>
</tr>
<tr>
<td>Internet based/nation wide</td>
<td>Yes</td>
<td>District level onwards</td>
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<td>Case and patient based</td>
<td>Yes/Yes (DMU)</td>
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<td>Diagnosis and treatment</td>
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<td>Flexible</td>
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<td>DHIS</td>
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<td>Trace transfer in/transfer out</td>
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<td>Linkage with Laboratory register</td>
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<tr>
<td>Online user management</td>
<td>Yes</td>
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</table>
Challenges

- Highest possible quality of data
  - Source of data
  - Collection/transfer
  - Management of data
  - ...

- Quality improvement tools
  - Guidelines
  - Training (management system/management data)
  - ...
