Quality of UK TB Surveillance and Electronic Reporting Systems

Ibrahim Abubakar, PhD, FFPH
Head, Tuberculosis Section
Health Protection Agency
Outline

• The System
• The Quality Checks
• The Added Value
• The Problems
• The Future
1. System

• The national web based enhanced tuberculosis surveillance system
  – Rationale: To replace distributed Access based local, regional and national databases, improve timeliness, quality and reporting.
  – National expert group and consultation concluded that web based technologies will provide the best solution
  – Characteristics of the system
    • Case based (minimizes duplicate entry – moving to patient based)
    • Includes: treatment outcome, drug susceptibility and strain typing data
    • National coverage
    • Used primarily by clinical and admin staff in hospitals, regional coordinators and national team
1. System: Development

In house team of developers using a variety of software development tools applied a modified waterfall approach:

– User specification
– Technical specification concurrent with initial development
– Coding
– Testing
– User acceptance testing
– National pilot with further changes as a result of lessons learnt
1. System

https://10.190.223.145/ets.site/

Password min 8 chars, at least 1 upper, 1 lower + # or special char
1. System

Home page & Alerts

Cathy Southwood's home page

Alerts

Treatment outcome

- 7 treatment outcome reports due. [View]
- 43 six month treatment outcome reports possible. [View]
- 0 twenty four month treatment outcome reports due.

Case transfers

- 0 inbound transfers pending.
- 0 outbound transfers pending.
- 0 rejected outbound transfers pending.

Laboratory isolates

- 0 unmatched laboratory isolates available for matching.
1. System

Entering a case: summary & submit
1. System: Reports

Number of TB cases by Age Small Groups and Sex for the period 2006 - 2008 for the region London

<table>
<thead>
<tr>
<th>Age Group</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>Total</th>
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<td>Male</td>
<td>21</td>
<td>28</td>
<td>21</td>
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<tr>
<td>05 - 09 years</td>
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<td>26</td>
<td>20</td>
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<td>51</td>
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<td>15 - 19 years</td>
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</table>
1. System: Strain Typing

- Sample
- Microscopy
- Culture
- Drug Susceptibility
- VNTR typing
- False positives
- Phylogenetics
- Outbreak Investigation
- Enhanced Contact Investigation to stop transmission

Advancing science

Public Health Measures
2. Quality

Part of a centre wide quality assurance mechanisms towards ISO9001 certification = full quality system meeting key principles:

• Commitment of senior management
• Audits and evaluation
• Records allow tracing of problems
• Customer driven with feedback and complaints
• Development process documented with tests for quality and user satisfaction
• Quality improvement process
• System for dealing with poor performance
2. Quality

• Before Data Entry
  – Limiting error by training
  – Providing resources
  – Limiting error by pre-specifying possible entries

• During Data Entry
  – Validity checks (dates and logic)
  – Limiting error by specifying mandatory fields
  – Limiting error by including checks (NHS number)
  – Post code derived geographical fields (local authority etc)
  – Matching / cross checking

• After Data Entry - validation
  – TOM
  – Capture recapture
  – Audits
2. Quality

• Before Data Entry
  – Data dictionary
  – Training
  – Webcasts
  – Proving resources
2. Quality

During: Limiting error by pre-specifying possible entries
2. Quality

During: Limiting error by pre-specifying possible entries
2. Quality

During: Limiting error by validity checks - dates
2. Quality

During: Limiting error by validity checks - dates
2. Quality

During: Limiting error by validity checks - dates
2. Quality

During: Treatment outcome reminders
2. Quality

During: denotification
2. Quality: Assessing completeness

• “Inventory Method”: Record linkage
  – Comparison of laboratory and clinical reports
  – TB-HIV matching
  – Bespoke audits: British Paediatric Surv Unit
  – HIV
  – Mortality
  – Hospitalisation
  – Biologics Register

• Capture Recapture
  – Overall data
  – Mortality
2. Quality: Validation

• Audits and surveillance evaluation: completing the loop by going back to clinics

• User Feedback System
## 2. Quality: Mandatory Fields

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<th>Region/Country</th>
<th>Postcode</th>
<th>Name</th>
<th>Sex</th>
<th>Ethnic group</th>
<th>Date of notification</th>
<th>Date of birth</th>
<th>Born/not born in UK</th>
<th>Previous treatment</th>
<th>Start of treatment</th>
<th>Previous TB diagnosis</th>
<th>Treatment outcome reported</th>
<th>Sputum smear status*</th>
<th>Site of disease</th>
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</table>
2. Quality: Timeliness

• Assessing timeliness: annual audit of reporting dates against national standards

• Improving timeliness
  – High priority identified nationally
  – Use of web-based system – however....... 
  – Cleaning, validation, record linkage, audits take a lot of time
3. The Added Value

• Keeping stakeholders assured
• More confidence in policy
• Makes compliance with ISO9001 easier
4. The Problems/caveats

- Development process tedious: bugs and dealing with user feedback
- Routine electronic checks often require human follow up of inconsistencies
- Systems are only as good as what you have pre-specified
- It is time and resource intensive to do properly
- Dealing with perception
5. The Future: Contact Tracing

Finding a record

Searching for a record

Or enter a record
Enter demographic data

NHS number

Contact data
Symptoms, BCG, Travel and TB history
**Clinical risk factors**

**Social risk factors**

### Clinical Risk Factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Yes</th>
<th>No</th>
<th>Not Known</th>
<th>Within last month</th>
<th>Between 1 month and 5 years</th>
<th>Over 5 years</th>
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</thead>
<tbody>
<tr>
<td>Has the patient ever been in prison?</td>
<td>Yes</td>
<td>No</td>
<td>Not known</td>
<td>Currently in the last 5 years</td>
<td>Over 5 years</td>
<td></td>
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<tr>
<td>Alcohol misuse?</td>
<td>Yes</td>
<td>No</td>
<td>Not known</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Mental Health Concerns?</td>
<td>Yes</td>
<td>No</td>
<td>Not known</td>
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<tr>
<td>History of Smoking</td>
<td>Passive</td>
<td>Active</td>
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### Social Risk Factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Yes</th>
<th>No</th>
<th>Not Known</th>
<th>In the last 5 years</th>
<th>Over 5 years</th>
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</thead>
<tbody>
<tr>
<td>Does the patient have a history of problem drug use?</td>
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<td>Not known</td>
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<tr>
<td>Has the patient ever been homeless?</td>
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<td>No</td>
<td>Not known</td>
<td>Currently in the last 5 years</td>
<td>Over 5 years</td>
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### Environmental Risk Factors

<table>
<thead>
<tr>
<th>Factor</th>
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<th>No</th>
<th>Not Known</th>
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<tbody>
<tr>
<td>Weight and Height Details</td>
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</table>

### Weight and Height Details

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Weight and Height</td>
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</table>
Investigation
Outcomes and quality checks
5. The Future

• Operating within a more resource constrained set up with raised expectations
• Need to meet the needs of other stakeholders – research
• Adding further functionality and reporting functions