TB ELIMINATION: DREAM OR REALITY?

29 May – 1 June 2013 – Dubrovnik, Croatia

SCHOOL COURSE

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Aims:
To describe:
  - The existing frameworks on TB elimination applicable in Europe
  - The outcomes of a European survey organised by ERS; WHO and ECDC
  - Gaps and opportunities to achieve TB elimination in Europe

Summary:
The previous presentation has introduced the concepts of TB control and elimination and listed the programmatic activities necessary to achieve TB control. Classically countries have National Programmes (NTP) within their Ministry of Health, organised to ensure that the core activities (surveillance, case finding, case holding, monitoring and evaluation, infection control, budgeting, advocacy communication and social mobilisation, development of guidelines, etc) are implemented, having the Stop TB Strategy as the guiding document.

While Europe conceptualized and committed for TB Elimination in 1990, the framework for TB elimination was published in 2002 within the Wolfheze initiative. The core additional interventions were 1) Ensuring early detection of TB patients and their treatment until cure and preventing avoidable death from TB; 2) Reducing the incidence of infection by risk group management and prevention of transmission of infection in institutional settings. 3) Reducing the prevalence of tuberculosis infection through outbreak management and provision of preventive therapy for specified groups and individuals, implemented through national programmes (called also “National schemes” adequately equipped to undertake new tasks.

The ERS Forum document identified the following core areas which are relevant to pursue Elimination: TB control commitment, TB awareness and capacity of health systems; Surveillance; Laboratory services; Prompt and quality TB care for all; M/XDR TB and TB/HIV co-infection; New tools for TB control and elimination.

In order to discuss in-depth by what extent the principles mentioned above have been implemented in Europe, a survey was organized by ERS and WHO with collaboration from ECDC.

Its preliminary results are discussed below, providing evidence that several recommended interventions are applied in a sub-optimal manner. More training, awareness and political commitment are necessary from all European countries if we want the Elimination phase is reached.
References


**Comments to the key references**

1) This is the historical consensus manuscript conceptualising TB control and the European (and other low incidence countries) commitment to pursue Elimination. The core definitions and principles approved in Wolfheze in 1990 are the basis of the ECDC and WHO EURO model of TB control we have now.

2) This perspective ERJ manuscript summarizes the contribution that the following Wolfheze Conferences has in developing the present system of TB control.

3) This well written manuscript represents the complete description of the evolution of WHO control strategies.

4) This consensus manuscript describes what Latent TB infection is under different perspectives. It helps understanding better the message included in Reference 7.

5) The recently published ERS Monograph has a chapter on TB control and elimination, summarising the concepts, the present achievement and describing for the first time the principles of the new WHO, post-2015, strategy.

6) The recently published WHO view on TB elimination, seen with the eyes of the leading WHO TB modeller.

7) This paper results from the consensus of a leading group of experts, convened by ERS in 2012 to propose new ways to improve TB control and achieve elimination. At the same time a simple and complete review of elimination tools and strategies and a think-tank for new ideas and perspectives.

8) A recent WHO contribution on the debate on new strategies, targets and indicators.

9) The ERS Monograph Chapter on TB epidemiology, with updated facts helping to understand data inspiring the development of new strategies.

10) A newly published WHO contribution on perspectives for TB and elimination. In particular useful to understand the present debate on the use of incidence, prevalence and mortality indicators for the new, post-2015, WHO Strategy.

11) The most comprehensive review of the achievements in TB control and elimination from a global perspective.

12) The ECD plan to control TB in the EU, important milestone as it has obvious implications on reporting from countries.

13) The ECDC plan to pursue elimination in the EU.

14) The WHO EURO plan, particularly focused on tacking M/XDR-TB.

15) In spite of its age (2002), this documents still represents the best conceptualization on how translate TB Elimination into practice in Europe. Very useful to be read in combination with Ref 7.

**Introduction to the topic:**

On a TB control level, the cure of infectious TB patients in the community has for decades represented the pillar of tuberculosis programmes aiming at reducing transmission of Mycobacterium tuberculosis in the community. This approach, implemented through the WHO DOTS and “Stop TB Strategy” proved to be cost-effective. Through proper diagnosis and rapid treatment of infectious cases it was able to save millions of lives while breaking the chain of transmission, representing now the minimum package of interventions to tackle tuberculosis. However, as existing strategies have not accelerated the progress towards elimination as much as previously expected the WHO STAG-TB (Strategic and Technical Advisory Group for Tuberculosis) in June 2012 has initiated discussions on the future post-2015 strategy centered around the concept of Elimination.
Focus is more and more direct towards diagnosing and treating LTBI rather than awaiting the
symptomatic and active form of the disease to occur and implementing curative interventions
thereafter. Although LTBI treatment is recommended by almost all the existing national guidelines,
clinicians perceive the strategy is not used as it should (e.g. with a programmatic and population-based
approach), but in a jeopardized manner.

The existing frameworks on TB elimination applicable in Europe:
While Europe conceptualized and committed for TB Elimination in 1990, the framework for TB
elimination was published in 2002 within the Wolfheze initiative. The core additional interventions
proposed by the document were the following: 1) Ensuring early detection of TB patients and their
treatment until cure and preventing avoidable death from TB; 2) Reducing the incidence of infection
by risk group management and prevention of transmission of infection in institutional settings. 3) Reducing
the prevalence of tuberculosis infection through outbreak management and provision of
preventive therapy for specified groups and individuals.
The following programmatic pre-requisites were identified as essential to approach the Elimination
phase successfully: Government and private-sector commitment towards elimination; national
schemes for the control and elimination of tuberculosis; national TB policy; national TB network;
Legal framework; human resources development and health education; research; international and
European collaboration; case detection through case-finding among symptomatic individuals
presenting to health services and active case-finding in special groups; standard approach to treatment
of disease and infection; accessibility to TB diagnostic and treatment services; surveillance and
treatment outcome monitoring for TB diseases and TB infection.
The ERS Forum document identified the following core areas: TB control commitment, TB awareness
and capacity of health systems; Surveillance; Laboratory services; Prompt and quality TB care for all;
M/XDR TB and TB/HIV co-infection; New tools for TB control and elimination, as summarised in the
Table below (from Reference 7):

<table>
<thead>
<tr>
<th>TB elimination area</th>
<th>Core activities</th>
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</table>
| **1. TB control commitment, TB awareness and capacity of health systems** | -Maintaining and enhancing government commitment to engage with the non-state, private sector and sustain TB control and elimination  
                         -Planning and retaining the adequate human resources necessary to ensure quality TB control and elimination activities at all levels                              |
| **2. Surveillance**                          | -Establishing targets, implementing quality surveillance and monitoring (including transition patterns with molecular epidemiology) and adequate modelling to evaluate impact |
| **3. Laboratory services**                  | -Improving laboratory services for quality microbiology diagnosis and implementation of ongoing transmission and molecular epidemiology studies                                                                  |
| **4. Prompt and quality TB care for all**    | -Identifying and addressing social and economical TB determinants (e.g. housing, nutrition, smoking, etc.) with particular attention to high risk groups and vulnerable populations to reduce incidence  
                         -Improving efficiency of services and ensuring financing of services through social protection mechanisms and universal health coverage/free care                                     |
To improve service delivery, ensuring early diagnosis, efficient treatment, and through-care of all types of TB.

### 5. M/XDR TB and TB/HIV co-infection
- Preventing the emergence of further drug resistance and effective treatment of existing M/XDR-TB cases
- Preventing the further spread of HIV infection, effective testing and anti-retroviral treatment through high-quality implementation of TB/HIV collaborating activities.

### 6. New tools for TB control and elimination
- Ensuring preventive treatment of latent TB infection and airborne infection control
- Promoting innovative research on new diagnostics, drugs and vaccines
- Targeting adoption of the new tools to accelerate achievement of TB elimination with special attention to children, people infected with HIV and other immunosuppressed individuals (e.g., TNF-alpha).

### 7. Partnership and collaboration with countries
- Developing joint planning and monitoring and evaluation, and pan-European collaboration to sustain TB elimination.

In order to discuss in-depth by what extent the principles mentioned above have been implemented in Europe, a survey was organized by ERS and WHO with collaboration from ECDC. Its preliminary results are discussed below, providing evidence that several recommended interventions are applied in a sub-optimal manner. More training, awareness, and political commitment are necessary from all European countries if we want the Elimination phase is reached.

**The outcomes of a European survey organized by ERS; WHO and ECDC:**

A comprehensive questionnaire has been designed by ERS and WHO experts, and ECDC provided inputs.

It was submitted to National Programme representatives via WHO EURO channels.

As of March 24, 2013, 22 countries answered including Albania, Belgium, Croatia, Czech Republic, Estonia, France, Hungary, Ireland, Italy, Malta, Norway, Portugal, R. of Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, The Netherlands, UK.

Out of the 22 countries interviewed, 13 reported to have a National TB Programme or equivalent (NTP), 15 a National plan for TB control and Elimination (with exception of Romania, Switzerland and The Netherlands which have a plan for TB control only); 18 have specific guidelines for implementation of TB control and Elimination (UK partly covering Elimination); 11 only have a specific budget for TB.

14 countries declared to have reference TB centres, ranging from 1-2 (Czech R, Estonia, Italy, Macedonia, Netherlands, Slovakia, Switzerland with coverage range 0.5-30 Million population) to 3-7 (Ireland, Malta, Romania with population coverage range of 4.6-50 Million) and up to 28 (whole Dispensariesnetwork, coverage: 30-150,000 pop.) in Albania. Peculiar the situation in France, where 150 reference Units cover a population of 400,000 people, corresponding to the lower administrative division. Seven countries reported not to have reference TB centres (Belgium, Croatia, Norway, Serbia, Spain, Sweden and UK).

Surprisingly, 10 countries only (Albania, Croatia, Estonia, Hungary, Malta, R. of Macedonia, Romania, Serbia, Slovenia, UK) have clear targets for control and/or Elimination.
All countries have individual electronic TB surveillance data collection at national level, with different combinations of paper forms, electronic database and electronic internet-based database (Belgium, Czech Republic, Estonia, France, Italy, R. of Macedonia, Serbia, Slovenia); Electronic internet database only (Hungary, Ireland, Portugal, Romania, Sweden, The Netherlands); paper forms and electronic database (Albania, Norway, Slovakia, Spain, Switzerland); paper forms and electronic internet database (UK); electronic database only (Malta); paper forms only (Croatia).

Out of 22 countries, 14 have dedicated TB surveillance staff. All of them perform systematic data quality checks.

While only Albania, Hungary, Macedonia, Malta, Romania, Serbia and Slovakia have monitoring and evaluation plans, 13 countries declared to perform supervision from any level to any level. Only Hungary, Slovakia, Slovenia perform modelling evaluation systematically, while Norway conducted it in 1996 for the last time.

All countries except Malta have Reference Laboratories, and all but France, Malta, Slovenia and Switzerland collaborate with Suparnational Reference Laboratories (SRLs).

GeneXpert is available in all countries except Albania, Malta, R. of Macedonia, Romania, Serbia, Spain and Sweden. All countries perform External Quality Assurance (EQA) except Malta.

Free access to diagnostic and treatment services for all TB cases (diagnosis and treatment) is the standard in all countries except Czech Republic, Ireland, The Netherlands and Switzerland where, in principle, it covers ensured individuals.

In all countries except France (1 not answered) TB management is similar in the prison and in the civilian sector.

Not all first- and second-line drugs are available in 15 of the responding countries.

Incentives and enablers are provided to TB patients by Estonia, France, Malta, Macedonia, Netherlands, Serbia Switzerland and UK (1 not answered). Except Estonia, the same countries plus Hungary, Ireland, Norway and Spain use treatment supporters (1 not answered) to ensure DOT.

All countries except Croatia have strategies to deal with risk groups.

Interestingly, no or very limited collaboration between TB and HIV programmes was reported by Belgium, Czech R, Italy, Netherlands, Norway, Spain, Switzerland and UK (2 countries did not provide answers).

Out of 22 countries, 10 have a hospital-centred MDR-TB management system. Other 10 countries have a combined system, being hospital-based for the initial phase of treatment and/or till the patient is contagious (sputum smear positive) with a hospital admission length of 6/9 months or more, then outpatient-based when the patients are no longer infectious. Specifically, in Portugal the hospitalization lasts until sputum smear conversion has been achieved, while in Sweden 2 negative culture are necessary 2 countries did not answer.

In terms of LTBI management, all countries except Albania, Croatia, Romania, Serbia and Slovenia reported to perform screening for LTBI, all of them performing contact tracing (1 did not answer) and declaring to treat LTBI, with the notable exception of Norway (which has no official data at the national level), Czech Republic (that treats only children) and France (which did not answer).

Unfortunately only 5 countries are able to provide figures on LTBI treatment outcomes (completion rates), Macedonia, Netherlands, Portugal, Slovakia and Switzerland with reported completion rates of, respectively, 69%, 88%, 82.5%, 75% and 45%, respectively.

Out of 22 countries have an infection control plan, while 5 countries have either drafts or national guidelines or recommendations or control measures included in the National Surveillance Guidelines only (Belgium, Italy, Serbia, Spain and Switzerland). 2 countries reported to have no plans (R. of Macedonia and Portugal); 1 country did not answer.

Two country only (Hungary and the Netherlands) declared to have a TB operational research plan.
Few countries (Belgium, Estonia, Serbia, Spain and The Netherlands) declared to have international relationship in terms of TB control, either providing or receiving technical support.

13 out of 22 countries reported to have a consultancy body to support MDR-TB management (Consilium), although in several countries it is on a voluntary basis (Belgium, Spain, Switzerland and UK), does not cover the entire country (Portugal, Romania, Spain) or is related to specific Global Fund/Green Light Committee approved projects.

Gaps and opportunities to achieve TB elimination in Europe

From this preliminary analysis, while almost all countries are well covered for the majority of the components, some areas are still managed in a sub-optimal manner. These include lack of systematic treatment of LTBI, and absence of a system allowing to evaluate completion rates. This prevents also to undertake effective modeling, an important component of the elimination strategy.

Organization of the different European programmes is jeopardized in terms of diagnostic and treatment reference centres, and catchment population.

Conclusions

The ERS Forum perspective paper on TB Elimination concludes saying that, to achieve elimination, 3 core components are necessary: 1) improve diagnosis of LTBI; 2) improve regimens to treat LTBI; and 3) ensure public health commitment to make 1) and 2) possible.

New biomarkers able to identify those at higher risk of developing TB will facilitate precise targeting of those persons who should undergo LTBI treatment to achieve sterile eradication of *M. tuberculosis* from the latently infected host.

As new drugs are presently facing the treatment arena, including newly developed compounds (e.g. bedaquiline, PA-824, delamanid) and existing drugs with new indications (e.g. linezolid, meropenem and co-trimoxazole) adequate public health attention aimed at protecting these new drugs from irrational use needs to be secured.

Sustainable research on how to include these new molecules into new, effective and shorter LTBI regimens (also able to sterilize MDR-TB strains) facilitating adherence need to be intensified involving producers, regulatory authorities and national programmes under the WHO’s coordination.

Last but not least sound policies need to be implemented at the national level in Europe to ensure that individuals with LTBI at high risk for development of TB are diagnosed and treated, and that the whole package of core interventions necessary to reach elimination (discussed above) are duly activated.

Questionnaire - to be read before and after the session, for self-evaluation:

1. What are the principles proposed by the 2002 framework on Elimination?
2. And what are the core interventions recommended by the ERS Forum document?
3. How are they presently applied in Europe? And in your own Country?
TB ELIMINATION: THEORY AND PRACTICE IN EUROPE

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Faculty disclosure

No conflict of interest!!!!
Aim of this presentation is to describe:

- The existing frameworks on TB elimination applicable in Europe
- The outcomes of a European survey organised by ERS, WHO and ECDC
- The gaps and opportunities to achieve TB elimination in Europe

Outline

**INTerventions over time: Old weapons might be useful again to manage XDR**

- First sanatorium, Germany, 1857
- First Dispensary, Scotland, 1897
- Koch, Mtb, 1882
- Drugs, 1945-1962
- MMR, 1950-1980
- Fox: Ambulatory treatment, 1968
- Styblo model, 1978
- DOTS, 1991
- sanatoria
- Outbreak Management
- Risk Group Management
- screening
- BCG vaccination
- drug therapy
- Socio-economic improvement
- Pneumotorax, Italy, 1907

**European framework for tuberculosis control and elimination in countries with a low incidence**


- Monitoring and surveillance of tuberculosis in countries with a low incidence
- Tuberculosis control services and delivery of care
- Targeted approach to tuberculosis control
- Tuberculosis treatment and management of multidrug-resistant tuberculosis
- Understanding the tuberculosis epidemic
- Access to tuberculosis control services
- Equity in access to tuberculosis care
- Communication and patient education
- Research and development
NTP CENTRAL LEVEL (CENTRAL UNIT)

- Technical policies and guidelines
- Coordination of the TB programme activities, and with other MOH programmes and health care providers
- Training, monitoring and supervision
- Collaboration with other MOH departments, other Ministries & partners
- Evaluation
- Operational research
- Programme plan and budget
**NTP: REGIONAL LEVEL**

- Collaboration with District Medical Officers
- Coordination of the need for supplies (drugs, lab. reagents, other supplies)
- Supervision of TB Case Registers and TB Lab. Registers
- Ensure training courses are conducted
- Review and evaluate district quarterly reports
- Collaborate with other health care providers

**NTP: DISTRICT LEVEL**

- Coordinate DOTS activities in the district
- Register cases, prepare quarterly reports and analyze the data
- Supervision of health facilities and laboratories
- Ensure continuous supply of drugs and other supplies
- Coordinate training of identified staff (cadres)
- Plan and budget activities in the district

**Core additional interventions to pursue elimination**

1) Ensuring early detection of TB patients and their treatment until cure and preventing avoidable death from TB;
2) Reducing the incidence of infection by risk group management and prevention of transmission of infection in institutional settings.
3) Reducing the prevalence of tuberculosis infection through outbreak management and provision of preventive therapy for specified groups and individuals.
Elimination programmatic pre-requirements (1)

- Government and private-sector commitment towards elimination
- National schemes for TB control and elimination
- National TB policy
- National TB network
- Legal framework
- Human resources development and health education
- Research
- International and European collaboration

Elimination programmatic pre-requirements (2)

- Case detection through case-finding among symptomatic individuals presenting to health services and
- Active case-finding in special groups
- Standard approach to treatment of disease and infection
- Accessibility to TB diagnostic and treatment services
- Surveillance and treatment outcome monitoring for TB diseases and TB infection
**ACKNOWLEDGMENTS**

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>RESPONDENTS</th>
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<tr>
<td>ALBANIA</td>
<td>Hasan Hafizi</td>
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<td>AUSTRIA</td>
<td>Flick Holger</td>
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<td>Maryse Wanlin, Wouter Arrazola de Onate, Guido Groenen</td>
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<td>UK</td>
<td>Laura Anderson, Ian Laurenson</td>
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1. TB control commitment, TB awareness and capacity of health systems

- Maintaining and enhancing government commitment to engage with the non-state, private sector and sustain TB control and elimination
- Planning and retaining the adequate human resources necessary to ensure quality TB control and elimination activities at all levels

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**SECTION I: TB CONTROL COMMITMENT, TB AWARENESS AND CAPACITY OF HEALTH SYSTEMS**

<table>
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<tr>
<th>NTP</th>
<th>National TB control &amp; Elimin Plan</th>
<th>Guided TB control &amp; Elimin Plan</th>
<th>TB specific HR Res (mB)</th>
<th>TB Hr Develop plan</th>
<th>TB Ref Contr</th>
<th>TB budget</th>
<th>Private sector relevant in TB control</th>
<th>NGOs/ civil society involved in TB control</th>
<th>Profes scientific societies involved in TB control</th>
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<td>13 y</td>
<td>y</td>
<td>17 y</td>
<td>18 y</td>
<td>10 y</td>
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2. Surveillance

- Establishing targets
- Implementing quality surveillance and monitoring (including transition patterns with molecular epidemiology) and
- Adequate modelling to evaluate impact

### SECTION II: SURVEILLANCE

<table>
<thead>
<tr>
<th>Specific targets for TB Control &amp; Elimination</th>
<th>National System for TB surveillance data collection</th>
<th>Person/tem dedicated only to TB surveill</th>
<th>Quality checks on data reported</th>
<th>M &amp; E plan</th>
<th>Support superv from any level to any level</th>
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### 3. Laboratory services

- Improving laboratory services for quality microbiology diagnosis and
- Implementation of ongoing transmission and molecular epidemiology studies
SECTION III: LABORATORY SERVICES

<table>
<thead>
<tr>
<th>Ref</th>
<th>Lab for TB</th>
<th>Nat Reg</th>
<th>Periph MicrCentre</th>
<th>Periph Micr + C Centre</th>
<th>Periph Micr + C + DST Centre</th>
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<td>4 no</td>
<td>18.2%</td>
<td>1 no</td>
</tr>
<tr>
<td>2 no</td>
<td>9.1%</td>
<td>2012 Reg</td>
<td></td>
<td>1 NA</td>
<td>4.5%</td>
<td>2 no</td>
<td>2012 Reg</td>
<td></td>
<td>1 NA</td>
<td>4.5%</td>
</tr>
</tbody>
</table>

4. Prompt and quality TB Care for all

- Identifying and addressing social and economical TB determinants (e.g. housing, nutrition, smoking, etc.) with particular attention to high risk groups and vulnerable populations to reduce incidence
- Improving efficiency of services and ensuring financing of services through social protection mechanisms and universal health coverage/free care
- Improving service deliveries ensuring early diagnosis, efficient treatment and through-care of all types of TB

SECTION IV: PROMPT AND QUALITY TB CARE FOR ALL

<table>
<thead>
<tr>
<th>Ref</th>
<th>Lab for TB</th>
<th>Free for all</th>
<th>All TB in all LD/SLD available in the country</th>
<th>Drug stock out, last 2 years</th>
<th>Treatment available for all patients</th>
<th>DOT treatment for patients</th>
<th>Specific strategies and policies for TB prevention &amp; care in high risk groups</th>
<th>Periodic re-evaluation of epidemiological situation of TB in high risk groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 yes</td>
<td>81.82%</td>
<td>12 yes</td>
<td>64.19%</td>
<td>8 yes</td>
<td>36.37%</td>
<td>6 yes</td>
<td>36.36%</td>
<td>11 yes</td>
</tr>
<tr>
<td>4 no</td>
<td>9.18%</td>
<td>1 no</td>
<td>4.54%</td>
<td>7 no</td>
<td>31.81%</td>
<td>12 no</td>
<td>54.34%</td>
<td>10 no</td>
</tr>
<tr>
<td>1 NA</td>
<td>4.54%</td>
<td>2 NA</td>
<td>9.09%</td>
<td>1 NA</td>
<td>4.54%</td>
<td>1 NA</td>
<td>4.54%</td>
<td>2 NA</td>
</tr>
</tbody>
</table>
5. M/XDR-TB and TB/HIV co-infection

- Preventing emerging of further drug resistance and effective treatment of existing M/XDR-TB cases
- Preventing further spread of HIV infection, effective testing and anti-retroviral treatment through quality implementation of TB/HIV collaborating activities

### SECTION V: M/XDR TB AND TB/HIV CO-INFECTION

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>13 Hospital-based 59,10%</td>
<td>15 yes 68,19%</td>
<td>12 yes 54,55%</td>
<td>8 yes 36,37%</td>
</tr>
<tr>
<td>2 Outpatient-based 9,09%</td>
<td>6 no 22,27%</td>
<td>7 no 31,82%</td>
<td>3 no 13,63%</td>
</tr>
<tr>
<td>5 mixed IN/OUT 22,72%</td>
<td>1 NA 4,54%</td>
<td>2 NA 9,09%</td>
<td>11 NA 50%</td>
</tr>
<tr>
<td>2 NA 9,09%</td>
<td>1 yes, partly 4,54%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. New tools for TB Control and Elimination

- Ensuring preventive treatment of LTBI and airborne infection control
- Promoting innovative research on new diagnostics, drugs and vaccines
- Targeting adoption of the new tools to accelerate achievement of TB elimination with special attention to children, people infected with HIV and other immunosuppressed individuals (e.g. TNF-alpha).
- Ensuring rational use of new drugs for TB and LTBI treatment
SECTION VI: NEW TOOLS FOR TB CONTROL AND ELIMINATION

<table>
<thead>
<tr>
<th>Partnership with countries</th>
<th>Specific action</th>
<th>TB CR done</th>
<th>Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing joint planning and monitoring and evaluation, and Pan-European collaboration to sustain TB elimination</td>
<td>yes</td>
<td>12 years</td>
<td>15 no</td>
</tr>
<tr>
<td>yes</td>
<td>10 years</td>
<td>2 years</td>
<td>5 NA</td>
</tr>
<tr>
<td>35 years</td>
<td>10 years</td>
<td>2 years</td>
<td>2 NA</td>
</tr>
<tr>
<td>72.7%</td>
<td>5 years</td>
<td>5 NA</td>
<td>2 NA</td>
</tr>
<tr>
<td>0%</td>
<td>2 years</td>
<td>5 NA</td>
<td>2 NA</td>
</tr>
<tr>
<td>4.0%</td>
<td>4.0%</td>
<td>9.0%</td>
<td>15 NA</td>
</tr>
<tr>
<td>50%</td>
<td>9.0%</td>
<td>9.0%</td>
<td>9.0%</td>
</tr>
<tr>
<td>68.18%</td>
<td>40.91%</td>
<td>40.91%</td>
<td>40.91%</td>
</tr>
<tr>
<td>40.91%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>9.09%</td>
<td>9.09%</td>
<td>9.09%</td>
<td>9.09%</td>
</tr>
</tbody>
</table>

7. Partnership and collaboration with countries

- Developing joint planning and
- Monitoring and evaluation, and
- Pan-European collaboration to sustain TB elimination

SECTION VII: PARTNERSHIP WITH COUNTRIES

<table>
<thead>
<tr>
<th>Strategic collaboration with other Countries for TB elimination</th>
<th>Availability of in-country “Consilium”</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 yes</td>
<td>12 yes</td>
</tr>
<tr>
<td>22.73%</td>
<td>50%</td>
</tr>
<tr>
<td>15 no</td>
<td>9 no</td>
</tr>
<tr>
<td>68.18%</td>
<td>40.91%</td>
</tr>
<tr>
<td>2 NA</td>
<td>2 NA</td>
</tr>
<tr>
<td>9.09%</td>
<td>9.09%</td>
</tr>
</tbody>
</table>
Conclusions (1)

• To achieve elimination, 3 core components are necessary:
  1) improve diagnosis of LTBI;
  2) improve regimens to treat LTBI;
  3) ensure public health commitment to make 1) and 2) possible
• New biomarkers able to identify those at higher risk of developing TB will facilitate precise targeting of those persons who should undergo LTBI treatment to achieve sterile eradication of *M. tuberculosis* from the latently infected host.

Conclusions (2)

• As new drugs are presently facing the treatment arena, including newly developed compounds (e.g. bedaquiline, PA-824, delamanid) and existing drugs with new indications (e.g. linezolid, meropenem and co-trimoxazole) adequate public health attention aimed at protecting these new drugs from irrational use needs to be secured.

ACKNOWLEDGEMENTS

• Thanks to the working team contributing to develop the questionnaire as well as to collect and analyse it
• GB Migliori, Lia D’Ambrosio, Rosella Centis
• Giovanni Sotgiu & Marina Tadolini
• Francesco Biasi
• Davide Manissero
• Masoud Dara & Marieke van der Werf
• The National Representatives
TB elimination: which future?

(Photograph: Two individuals carrying a large bundle of sticks, possibly for fuel or construction use.)

(Handwritten note: "An average person's opinion every breath counts.")