ED DETECTTB
early detection & treatment of tuberculosis in europe

Early Detection and Integrated Management of Tuberculosis in Europe

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D7.1
Survey of national TB control plans and strategies

WP 7 – Strengthening national TB programmes

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Key word list

TB prevention
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Definitions and acronyms

Acronyms	Definitions
ART	Anti-Retroviral Therapy
DOTS	Directly Observed Therapy – Short course
ECDC	European Centre for Disease Prevention and Control
HCW	Health Care Worker
INH	Isoniazid
IGRA	Interferon Gamma Release Assay
LTBI	Latent TB Infection
RCT	Randomised Controlled Trial
TST	Tuberculin Skin Test

1. Introduction

The aim of E-DETECT TB Work Package 7 (WP7) is to support the development of action plans in EU/EEA member states by taking best practice approaches from countries where E-DETECT TB partners have developed national and international strategies by reviewing existing action plans and strategies, holding a consensus meeting of national experts, and developing a TB strategy development guide. The aim of WP7 deliverable D7.1 is to gather information from national TB programme leaders across the EU/EEA regarding the availability, implementation and content of national TB control plans, and the prioritisation of action areas and barriers to the implementation of interventions for TB control and prevention. The information summarised in this report will be combined with the results of a systematic review of the evidence base for interventions to control and prevent TB (deliverable D7.2). A structured meeting with national TB programme leads and other experts (deliverable D7.3), supported by the results of the survey, the systematic review, and a review of barriers to TB development and implementation, will help to prioritise the summarised evidence within the context of EU/EEA countries. The outcome of this meeting will be a toolkit (deliverable D7.4) to aid national TB plan development and implementation based on evidence, expert views and the cumulative country experience.

1.1. General context

Tuberculosis (TB) incidence continues to decline across the European Union (EU) and European Economic Area (EEA), but projected trends show that an intensification of efforts is needed if WHO End TB goals are to be met by EU/EEA member states (ECDC/WHO Regional Office for Europe 2017). Because of the specific epidemiology in low incidence countries, programmes to eliminate TB in this context typically include interventions targeted at high risk groups alongside wider health system efforts to improve treatments, prevent resistance, and implement new technologies (Lonnroth *et al.* 2015). Ideally, a coordinated national TB programme is described in a national TB control plan or strategy (WHO 2015). Across the EU/EEA, support for national TB programmes is provided at supranational level through the ECDC Framework Action Plan, which takes into account social, economic and epidemiological heterogeneity between and within member states (ECDC 2008). One of the core indicators of the Framework Action Plan is the availability of a national TB control plan or strategy which has been formally adopted by the respective national government (ECDC 2010). The European Commission funded E-DETECT TB (Early Detection and Integrated Management of Tuberculosis in Europe) project combines translational research in reaching high risk groups in EU/EEA countries with the development of a practical toolkit to support national TB strategy development and implementation. This report presents the findings of a survey which gathered information from national TB programme leaders across the EU/EEA regarding the availability, implementation and content of national TB control plans, priority action areas for interventions, and barriers to TB control and prevention.

1.2.   Deliverable objectives

The specific objective of this deliverable was to conduct a survey of EU/EEA national plans and strategies for TB control and prevention. The aim of the survey is to provide national TB programme leads and experts with an up-to-date picture of current strategies, including priority action areas within national TB strategies (whether current or under development) and barriers to the implementation of national TB strategies.

2. Methodological approach

This study used an online questionnaire to collect data from national TB programme leaders or representatives across the 31 countries of the EU/EEA. The questionnaire was designed and tested at Public Health England (PHE) in collaboration with other E-DETECT TB partners. The survey included closed and open questions (**Appendix 1**) and was implemented using SelectSurvey (SelectSurvey.NETv4, ClassApps LLC, Kansas City, MO, USA).

The survey comprised 11 sections (**Table 1**): 1) availability and implementation of a national TB control plan or strategy; 2) TB programme coordination and stakeholder representation; 3) resources (including budget, workforce development, new tools, and drug supply); 4) monitoring and surveillance; 5) target populations (including high risk and vulnerable groups) and screening; 6) clinical and technical aspects (including guidelines, laboratory quality assurance, contact tracing, and vaccination); 7) multidrug-resistant (MDR) TB; 8) HIV/TB; 9) priority actions; 10) priority populations; 11) barriers to TB control and prevention. In section 9, respondents were asked to rate 18 pre-specified actions as being of low, medium or high priority. Section 10 asked for the level of unmet need for TB detection and treatment to be rated as low, medium or high in a prespecified list of vulnerable/high-risk population groups. Section 11 presented a list of 44 factors which could impede TB control and prevention, derived from the SURE checklist of barriers to implementing health policy options (The SURE Collaboration). These were grouped under four subheadings: recipients of care (6 factors); providers of care (5 factors); health system constraints (27 factors); and social and political constraints (6 factors). Respondents were asked to indicate (yes, no or unsure) whether each factor impeded TB control in their country.

Invitations to complete the survey were distributed via email to national TB programme managers on 17th May 2017. Survey data were exported from SelectSurvey to Stata (Stata Statistical Software: Release 13, StataCorp LP, College Station, TX, USA) for cleaning and descriptive analysis (tabulation of responses, presenting frequencies and percentages).

Table 1: E-DETECT TB national TB control plan survey

Section 1: availability and implementation of national TB control plan or strategy Questions about the availability of a national TB control plan or strategy, the time period covered by the plan/strategy, whether implementation had started and, if so, when. If no plan or strategy was available, respondents were asked whether a plan/strategy was being prepared and when a final version was expected to be available.
Section 2: organisation and coordination Questions about the organisational structure and coordination of the national TB control and prevention programme, and whether these are described in a national TB control/plan strategy. Further questions about stakeholder representation and frequency of meetings.
Section 3: resources Whether the national TB control and prevention programme has its own costed budget, followed by questions about impact assessment for national TB control and prevention, strategy and need for training and developing a specialist TB workforce, strategy for introducing and implementing new tools for TB control and prevention, and strategy for ensuring continuity of TB drug supply.
Section 4: monitoring and surveillance Questions about the use of electronic case registries, strategy for monitoring and evaluating TB control and prevention, and how many staff are assigned to TB surveillance at national level.
Section 5: target populations and screening Whether there are programmes for raising awareness of TB at community or primary care level and for reaching vulnerable population groups (and which groups), a strategy for TB control in prisons, and targeted screening for TB in high risk groups and migrants from high incidence countries.
Section 6: clinical and technical Questions about the availability of national guidelines, external quality assurance for laboratory diagnostic services, and professional and clinical support for clinicians, and whether there are strategies for contact tracing and BCG vaccination (and whether these are documented in the national TB control plan/strategy).
Section 7: MDR-TB and XRD-TB Whether there is a strategy to tackle drug-resistant TB and what measures are included.
Section 8: HIV/TB Whether there is an integrated approach to TB and HIV control, and whether TB patients are routinely tested for HIV and/or HIV patients are screened for TB.
Section 9: Priority actions Which of 18 pre-specified actions areas are the most important or have the greatest urgency (rated low, medium or high priority).
Section 10: Priority populations Which of 11 pre-specified population groups have the highest unmet need for TB case detection and treatment (rated low, medium or high).
Section 11: Barriers Whether any of 44 pre-specified factors impede TB control and prevention (yes, no, unsure).

3. Summary of activities and research findings

The survey was completed by programme managers or their delegated representatives in all of the 31 countries (100% response rate). Responses were received between 17th May and 19th September 2017. Responses for Liechtenstein were provided jointly by representatives from Liechtenstein and Switzerland (a non-EU/EEA country), reflecting a unified approach to TB control and prevention in the two countries. We retained N=31 as the denominator for our analyses.

3.1. Availability and implementation of national TB control plan or strategy

Just over half (17/31) of EU/EEA countries have a national TB control plan or strategy (**Table 2**). Those with a plan had begun implementation, including six in 2015/2016, and five in 2011-2013. Thirteen plans covered periods of 3-9 (median 5) years' duration, typically beginning in 2011-2016 and ending in 2017-2020, and the remainder were open-ended (4 plans). Of the 14 countries without a national TB control plan or strategy, five were either preparing a plan or intended to prepare a plan, two of which were expected to be finalised in 2017 and one in 2019.

3.2. National TB programme organisation and coordination

Three quarters (23/31) of countries reported having a clearly defined organisational structure (**Table 2**), with half defined in the national TB control plan or strategy. TB control and prevention was coordinated centrally by a national TB control board, committee or other formal body in 55% (17/31) of countries, and by other national bodies in 23% (7/31) of countries. Three of seven countries without a central TB control structure had other national or regional control structures, reporting procedures or technical coordination of TB centres (Table 1).

Stakeholder representation on the national TB control boards (or committees or other formal bodies) included: Ministry/Department of Health (16/17); national public health department (14/17); specialist clinicians (12/17); laboratory services (10/17); epidemiologists (10/17); local public health department (9/17); professional bodies (7/17); local TB control boards (6/17); specialist nurses (5/17); non-governmental organisations (4/17); patient representatives (3/17); pharmacies (2/17); civil society (2/17); and private health providers (1/17). Two of the 17 coordinating bodies met monthly, five met annually, five irregularly, and five every 3-6 months. Specific funding had been allocated to 5/17 coordinating bodies, and 5/17 received regular reports from local (regional, district, state, provincial, etc.) TB control boards, committees or other formal bodies.

Table 2: Availability and implementation of national TB control plan/strategy, and TB programme coordination in EU/EEA countries

Question	Response	%
Do you have a national TB control plan or strategy?	Yes	55% (17/31)
(If yes) Has implementation of the plan or strategy started?	Yes	100% (17/17)
(If no) Is a national TB control plan or strategy being prepared?	Yes	14% (2/14)
(If no) Do you intend to prepare a national TB control plan or strategy?	Yes	25% (3/9)
Does your national TB control and prevention programme have a clearly defined organisational structure?	Yes, as defined in national TB control plan/strategy	39% (12/31)
	Yes, but not defined in national TB control plan/strategy	36% (11/31)
	No	26% (8/31)
Is TB control and prevention coordinated centrally by a national TB control board or committee or other formal body?	Yes, as described in national TB control plan/strategy	32% (10/31)
	Yes, but not described in national TB control plan/strategy	23% (7/31)
	No, but other national bodies coordinate specific TB control and prevention tasks	23% (7/31)
	No	23% (7/31)
Has specific funding been allocated to the national TB control board?	Yes	29% (5/17)
Is TB control and prevention coordinated locally by local TB control boards or committees or other formal bodies?	Yes	47% (8/17)

3.3.   Resources

Only one fifth of countries (6/31) had a costed budget for a national TB programme (**Table 3**), with 17 of the remaining 26 countries having budgets for parts of a TB programme and/or providing for TB-related activities within their national, federal or municipal healthcare systems. Half of countries (16/31) reported conducting an impact assessment or cost-effectiveness analyses, and the same proportion had a strategy for training and developing a specialist TB workforce (coordinated at a national level in 14/16 countries) and a strategy for introducing and implementing new tools for TB control and prevention. Two thirds of countries (19/30) had a strategy for ensuring continuity of TB drug supply.

The parts of the TB workforce with the greatest need for training and development were: community health workers, 59% (16/27); specialist nurses, 52% (14/27); specialist doctors, 37% (10/27); microbiologists 33%, (9/27); epidemiologists, 33%, (9/27); surveillance scientists, 19% (5/27). Five countries mentioned other professionals in need of workforce training and development, including general practitioners (3 countries), radiologists and pulmonologists (1 country); and staff from immigration and prison services (1 country). Five respondents commented that low TB incidence in their country led to low knowledge and experience of TB because healthcare professionals encountered few cases - a further two stated that there is a need for knowledge updates among healthcare workers and GPs.

Areas in which new tools were being developed included: rapid diagnostic tests, 86% (12/14); treatment observation, 71% (10/14); infection control, 57% (8/14); drug susceptibility testing, 57% (8/14); surveillance, 50% (7/14); microbiology, 50% (7/14); contact tracing, 36%, (5/14); and outbreak investigation, 29% (4/14).

3.4.   Monitoring and surveillance

Three quarters (23/31) of countries had a strategy for monitoring and evaluation of TB control and prevention, half of which (11/23) were documented in the national TB control plan/strategy. All countries (31/31) had a national TB case registry. The median number of full-time equivalent staff assigned to TB surveillance in national offices was two (where any part-time member of staff was counted as 0.5), with a range from 0.5 (one part-time person) to 8.5.

Table 3: Resources for TB control and prevention in EU/EEA countries

Question	Response	%
Does the national TB control and prevention programme have its own costed budget?	Yes	19% (6/31)
	No, but some parts of the programme have their own budgets	23% (7/31)
	No	58% (18/31)
Has an impact assessment for national TB control and prevention been done?	Yes, as documented in national TB control plan/strategy	16% (5/31)
	Yes, but not documented in national TB control plan/strategy	13% (4/31)
	No, but impact assessment for some parts of the programme have been done	23% (7/31)
	No	48% (15/31)
Do you have a strategy for training and developing a specialist TB workforce?	Yes, as documented in national TB control plan/strategy	16% (5/31)
	Yes, but not documented in national TB control plan/strategy	36% (11/31)
	No	48% (15/31)
Do you have a strategy for introducing and implementing new tools for TB control and prevention?	Yes, as documented in national TB control plan/strategy	13% (4/31)
	Yes, but not documented in national TB control plan/strategy	39% (12/31)
	No	48% (15/31)
Do you have a strategy for ensuring continuity of TB drug supply?	Yes, as documented in national TB control plan/strategy	26% (8/31)
	Yes, but not documented in national TB control plan/strategy	39% (12/31)
	No	36% (11/31)

3.5. Target populations and screening

Twenty one countries had programmes for raising awareness of TB at community or primary care level, of which four were documented in the national TB control plan/strategy. The community or primary care groups targeted by these programmes included: primary care doctors/GPs, 95% (20/21); primary care health workers, 76% (16/21); social workers, 67% (14/21); and general public, 57% (12/21). Other target settings (each reported once) included: services for people living with HIV; prisons; schools; and non-governmental organisations that work with vulnerable groups. A strategy for TB control in prisons was in place in 77% (24/31) countries, of which nine were documented in the national TB control plan/strategy.

The population groups most commonly identified as being at higher risk of having latent or active TB were: asylum seekers 89% (23/26), prisoners 85% (22/26), refugees 77%, (20/26), and documented migrants 69% (18/26) (**Table 4**). Targeted screening for active TB was conducted among asylum seekers in 77% (24/31) of countries, refugees in 71% (22/31) and current prisoners in 74% (23/31). Point-of-entry and post-entry screening for active TB in documented migrants was conducted by 32% (10/31) and 42% (13/31) countries, respectively. Two countries conducted screening for active TB in social care institutions and for people entering shared community accommodation. Two countries did not conduct targeted screening. The groups most commonly targeted for latent TB infection (LTBI) screening were asylum seekers (33% (10/30)), refugees (27% (8/30)) and current prisoners (27% (8/30)). Point-of-entry and post-entry screening for LTBI in documented migrants was conducted by 20% (6/30) and 17% (5/30) of countries, respectively.

3.6. Clinical and technical

National TB control and prevention guidelines were available in 81% (25/31) of countries, and laboratory diagnostic services were subject to external quality assurance in all countries. Forms of professional and clinical support available to clinicians included: clinical guidelines, 90% (28/31); specialist training, 74% (23/31); infection control guidelines, 74% (23/31); clinical networks, 55% (17/31); research meetings, 45% (14/31); and local multidisciplinary teams, 42% (13/31). Expert group meetings for clinicians managing difficult and MDR/XDR-TB cases were mentioned by 4/31 respondents. The majority of countries (84% (26/31)) had a strategy to implement and ensure comprehensive contact tracing, of which half (13/26) were documented in a national TB control plan/strategy. Recommended approaches to contact tracing included: household, 96% (25/26); workplace, 92% (24/26); healthcare facility, 92% (24/26); and community, 81% (21/26). Two thirds of countries (20/30) had a strategy to provide and promote BCG vaccination, of which half (9/20) were documented in the national TB control plan/strategy. The proportions of BCG vaccination strategies that included universal infant, high-risk infant and high-risk adult BCG vaccination were 42% (8/19), 58% (11/19) and 21% (4/19), respectively. Of the 10 countries that did not have a BCG vaccination strategy, two vaccinated infants born to immigrant parents from high TB incidence countries and three would vaccinate selectively in high risk situations.

Table 4: Target populations for TB control and prevention and TB screening in EU/EEA countries

Population group	Programmes for reaching vulnerable groups	Targeted screening for active TB[†]	Latent TB infection (LTBI) screening[‡]
	n=26	n=31	n=30
Documented migrants (at point of entry, i.e. on arrival)	18 (69%)	10 (32%)	6 (20%)
Documented migrants (post-entry)		13 (42%)	5 (17%)
Undocumented migrants	15 (58%)	8 (26%)	4 (13%)
Refugees	20 (77%)	22 (71%)	8 (27%)
Asylum seekers	23 (89%)	24 (77%)	10 (33%)
Homeless people	20 (77%)	15 (48%)	4 (13%)
People with alcohol problems	12 (46%)	4 (13%)	2 (7%)
People with drug problems	15 (58%)	9 (29%)	6 (20%)
People with mental health problems	5 (19%)	2 (7%)	1 (3%)
Current prisoners	22 (85%)	23 (74.2%)	8 (27%)
Former prisoners	5 (19%)	1 (3%)	1 (3%)
Minority ethnic groups	7 (27%)	3 (10%)	3 (10%)

[†] Two countries (7%) had no targeted screening for active TB

[‡] The majority of countries (87% (26/30)) screened for LTBI in contacts of cases; 37% (11/30) of respondents mentioned screening for LTBI prior to commencing immunosuppressive therapies. One country did not provide a response, and this was treated as 'missing' rather than 'no screening'

3.7.   MDR and XDR-TB

The majority of countries (80% (24/30)) had a strategy to tackle drug-resistant TB, of which 58% (14/24) were documented in the national TB control plan/strategy. Measures to tackle drug-resistant TB included: directly observed treatment, 88% (21/24); centres of expertise in MDR-TB treatment, 79% (19/24); patient-centred MDR-TB case management, 79% (19/24); infection control in health facilities, 75% (18/24); multidisciplinary MDR-TB case management, 67% (16/24); and video observed treatment, 17% (4/24). All of the countries with a drug-resistant TB strategy routinely conducted first-line drug susceptibility testing.

3.8.   HIV/TB

An integrated approach to TB and HIV control was reported by 61% (19/31) of countries, of which 58% (7/19) were documented in the national TB control plan/strategy. TB patients were routinely tested for HIV in 77% (24/31) of countries, and people living with HIV were screened for TB in 74% (23/31) of countries; 61% (19/31) of countries did both. The majority of countries (81% (25/31)) monitored TB/HIV coinfection at national level.

3.9.   Priority actions

Respondents were asked "In relation to TB control in your country, which existing or new actions do you think are most important or have the greatest urgency?" Of the 18 pre-specified action areas, the five most frequently rated as high priority were: reaching vulnerable population groups, 80% (24/30); targeted screening for active TB in high risk population groups, 63% (19/30); implementing electronic TB case registries, 60% (18/30); contact tracing and outbreak investigation, 60% (18/30); and MDR-TB, 60% (18/30) (**Table 5**). The two most frequently rated as low priority were BCG vaccination (57% (17/30)) and establishing or managing local TB control boards (43% (13/30)).

3.10.   Priority populations

The vulnerable/high risk population group most frequently rated as having a high unmet need for TB detection was undocumented migrants (47% (14/30)) (**Table 6**). All other vulnerable/high risk groups had a level of unmet need more frequently rated as low or medium. Unmet need for TB treatment was rated as low by 57-67% of countries for all vulnerable/high risk population groups, with the exceptions of homeless people (low 39% (12/31), medium 36% (11/31), high 26% (8/31)) and undocumented migrants (low 33% (10/30), medium 23% (7/30), high 43% (13/30)) (**Table 6**). One respondent commented that non-compliant patients had a high unmet need for TB treatment because patients could not be compelled to complete treatment, and another remarked that prisoners who commence treatment in prison have a high risk of non-compliance when released.

Table 5: Priority actions for TB control and prevention in EU/EEA countries

Action area†	Priority rating		
	Low	Medium	High
Training and developing a specialist TB workforce	5 (17%)	10 (33%)	15 (50%)
Introducing and implementing new tools for TB control	3 (10%)	13 (43%)	14 (47%)
External quality assurance for laboratory services	7 (23%)	11 (37%)	12 (40%)
Implementing electronic TB case registries	7 (23%)	5 (17%)	18 (60%)
Staffing and expertise for national TB surveillance	7 (23%)	11 (37%)	12 (40%)
Establishing or managing local TB control boards	13 (43%)	12 (40%)	5 (17%)
Publishing and disseminating clinical guidelines‡	6 (21%)	12 (41%)	11 (38%)
Raising awareness of TB at community or primary care level	3 (10%)	14 (47%)	13 (43%)
Reaching vulnerable population groups	0 (0%)	6 (20%)	24 (80%)
TB control in prisons	6 (20%)	10 (33%)	14 (47%)
Latent TB infection screening in high risk population groups	2 (7%)	13 (43%)	15 (50%)
Targeted screening for active TB in high risk population groups	1 (3%)	10 (33%)	19 (63%)
Ensuring continuity of TB drug supply	7 (23%)	9 (30%)	14 (47%)
Screening for active TB in migrants from high-incidence countries	2 (7%)	11 (37%)	17 (57%)
Contact tracing and outbreak investigation	0 (0%)	12 (40%)	18 (60%)
BCG vaccination	17 (57%)	9 (30%)	4 (13%)
MDR-TB	2 (7%)	10 (33%)	18 (60%)
HIV/TB‡	4 (14%)	11 (38%)	14 (48%)

† These were presented in two groups of nine, under the question "Please rate the priority of each of the 9 action areas listed below." Several countries indicated other high priority action areas, including mobile outreach, increasing TB expertise and experience in health care professionals, and broader social support for vulnerable groups.

‡ This item had missing data for one country, hence denominator is 29 countries.

Table 6: Priority populations for TB control and prevention in EU/EEA countries

Population group	Unmet need for TB detection			Unmet need for TB treatment		
	Low	Medium	High	Low	Medium	High
Documented migrants	14 (47%)	10 (33%)	6 (20%)	17 (57%)	9 (30%)	4 (13%)
Undocumented migrants	7 (23%)	9 (30%)	14 (47%)	10 (33%)	7 (23%)	13 (43%)
Refugees	15 (50%)	10 (33%)	5 (17%)	17 (57%)	9 (30%)	4 (13%)
Asylum seekers	15 (50%)	9 (30%)	6 (20%)	14 (47%)	10 (33%)	6 (20%)
Homeless people	9 (29%)	16 (52%)	6 (19%)	12 (39%)	11 (36%)	8 (26%)
People with alcohol problems	10 (32%)	17 (55%)	4 (13%)	16 (52%)	9 (29%)	6 (19%)
People with drug problems	12 (39%)	16 (52%)	3 (10%)	19 (61%)	7 (23%)	5 (16%)
People with mental health problems	13 (43%)	14 (47%)	3 (10%)	18 (58%)	9 (29%)	4 (13%)
Current prisoners	18 (60%)	9 (30%)	3 (10%)	20 (67%)	6 (20%)	4 (13%)
Former prisoners	15 (48%)	12 (39%)	4 (13%)	22 (71%)	6 (19%)	3 (10%)
Minority ethnic groups	14 (50%)	9 (32%)	5 (18%)	17 (61%)	8 (29%)	3 (11%)

3.11. Barriers to TB control and prevention

Responses to the question "Please indicate whether any of the following factors impede TB control in your country?" are summarized in **Table 7** and **Table 8**. Of the six 'recipients of care' factors, three were identified by a majority of countries as impeding TB control: people in vulnerable/high risk groups lacking knowledge about TB (74% (23/31)); low motivation to adhere to treatment in vulnerable/high risk groups (70% (21/30)); low motivation to seek treatment in vulnerable/high risk groups (58% (18/31)) (**Table 7**). Only one out of five 'provider of care' factors was identified by a majority of countries: the need for specialist training of nurses in TB patient care (57% (17/30)) (**Table 7**). The six social and political constraints were identified by only 19-36% of countries as being impediments to TB control (**Table 7**). Of the 27 'health system constraints', four were selected by >40% of respondents: insufficient numbers of specialist TB nurses (45% (14/31)); funding of national TB control and prevention programme (43% (13/30)); funding constraints in the wider healthcare system (43% (13/30)); communication between the health care and social care systems (42% (13/31)).

The overall proportions of affirmative responses indicating factors which were barriers to TB control under each of the four subheadings were: recipients of care (47%, 86/182 possible responses); providers of care (41%, 62/153); social and political constraints (26%, 48/184); and health system constraints (26%, 217/827).

Among the 17 countries which had a national TB control plan or strategy, the median number of factors identified as a barrier was 11 (IQR 9 – 17), compared with 9.5 (IQR 3 – 16) affirmative responses among the 14 countries which did not have a national TB control plan or strategy. Negative responses were 31 (22 – 33) and 25 (9 – 32) for countries with and without a control plan of strategy, respectively. The median number of barriers for which the response was 'unsure' was 2 (IQR 0 – 5) for countries with a TB control plan or strategy, compared with 5 (IQR 2 – 14) among countries without a plan or strategy.

Table 7: Barriers to TB control and prevention in EU/EEA countries

| | Factors which impede TB control | | |
	No	Yes	Unsure
Recipients of care			
Vulnerable population groups have limited access to health facilities	17 (63%)	8 (27%)	3 (10%)
People in vulnerable/high risk groups lack knowledge about TB	3 (10%)	23 (74%)	5 (16%)
Acceptability of TB screening to vulnerable/high risk groups	16 (52%)	8 (26%)	7 (23%)
Low motivation to seek treatment in vulnerable/high risk groups	7 (23%)	18 (58%)	6 (19%)
Low motivation to adhere to treatment in vulnerable/high risk groups	6 (20%)	21 (70%)	3 (10%)
Health care system is not fully trusted by vulnerable/high risk groups	16 (52%)	8 (26%)	7 (23%)
Overall	36%	47%	17%
Providers of care			
Varying degree of knowledge about TB clinical guidelines	15 (48%)	14 (45%)	2 (7%)
Varying degree of adherence to TB clinical guidelines	18 (58%)	11 (36%)	2 (7%)
Need for specialist training of doctors in TB diagnosis and management	15 (50%)	13 (43%)	2 (7%)
Need for specialist training of nurses in TB patient care	10 (33%)	17 (57%)	3 (10%)
Negative beliefs regarding vulnerable/high risk population groups	19 (63%)	7 (23%)	4 (13%)
Overall	51%	41%	9%
Social and political constraints			
Lack of recognition of TB control as a public health priority at top level of government/health ministry	17 (55%)	11 (36%)	3 (10%)
High TB risk lacks credibility among community/opinion leaders in vulnerable groups	13 (43%)	7 (23%)	10 (33%)
Political focus on tertiary (hospital) care, i.e. treatment rather than control & prevention	17 (55%)	8 (26%)	6 (19%)
Clinical emphasis on tertiary (hospital) care, i.e. treatment rather than control & prevention	19 (61%)	6 (19%)	6 (19%)
Negative societal attitudes to high risk population groups	12 (40%)	9 (30%)	9 (30%)
Insufficient evidence to demonstrate cost effectiveness of TB control programme	18 (58%)	7 (23%)	6 (19%)
Overall	52%	26%	22%

Table 8: Barriers to TB control and prevention in EU/EEA countries (continued)

Health system constraints	Factors which impede TB control		
	No	**Yes**	**Unsure**
Funding of national TB control and prevention programme	16 (53%)	13 (43%)	1 (3%)
Funding of laboratory services	19 (61%)	8 (26%)	4 (13%)
Funding of medical facilities in prisons	22 (71%)	6 (19%)	3 (10%)
Funding of facilities and health care for vulnerable population groups	16 (52%)	12 (39%)	3 (10%)
Funding constraints in the wider healthcare system	14 (47%)	13 (43%)	3 (10%)
Insufficient numbers of specialist TB doctors	16 (52%)	10 (32%)	5 (16%)
Insufficient numbers of specialist TB nurses	13 (42%)	14 (45%)	4 (13%)
Insufficient numbers of microbiologists or laboratory staff	20 (65%)	9 (29%)	2 (7%)
Insufficient numbers of surveillance scientists	17 (57%)	11 (37%)	2 (7%)
Need for further training of existing microbiologists/lab staff	17 (55%)	11 (36%)	3 (10%)
Need for further training of existing surveillance scientists	16 (53%)	10 (33%)	4 (13%)
Communication between public health and clinical providers	20 (65%)	9 (29%)	2 (7%)
Communication between levels of the health care system	18 (60%)	11 (37%)	1 (3%)
Communication between the health care and social care systems	13 (42%)	13 (42%)	5 (16%)
Communication between providers and recipients of health care	15 (50%)	11 (37%)	4 (13%)
Allocation of authority within national TB control programme	18 (60%)	8 (27%)	4 (13%)
Clear accountability for meeting TB control programme targets	16 (55%)	7 (24%)	6 (21%)
Inadequate management or leadership within health care system	22 (71%)	2 (7%)	7 (23%)
Inadequate systems to obtain timely and accurate surveillance data	24 (77%)	5 (16%)	2 (7%)
Inadequate systems for TB programme monitoring and evaluation	21 (68%)	7 (23%)	3 (10%)
Inadequate processes for referring and transferring TB patients	25 (81%)	4 (13%)	2 (7%)
Inadequate systems for procuring and distributing TB drugs	27 (87%)	1 (3%)	3 (10%)
Inadequate systems for procuring and distributing laboratory supplies	28 (90%)	1 (3%)	2 (7%)
Bureaucracy in wider health care system	16 (53%)	8 (26%)	6 (20%)
Slow turnaround of diagnostic testing	24 (77%)	3 (10%)	4 (13%)
Inadequate quality control within laboratories	25 (81%)	3 (10%)	3 (10%)
Inadequate infection control within health care facilities	21 (68%)	7 (23%)	3 (10%)
Overall	63%	26%	11%

4. Conclusions and future steps

This survey has provided an up-to-date picture of the status and content of national TB control plans and strategies, including prioritisation of action areas and barriers to TB control and prevention in the EU/EEA. Seventeen of the 31 EU/EEA member states have a TB control plan or strategy, all of which are already being implemented. A further five countries intend to prepare and implement a TB control plan or strategy. Most EU/EEA countries reported having a clearly defined organisational structure and central coordination for TB control and prevention. One fifth of EU/EEA countries reported having a costed budget for a national TB programme. Few of the 17 national TB control boards (or equivalent formal bodies) had patient or civil society representation.

Undocumented migrants were the group most commonly reported as having a high unmet need for TB detection and treatment. The priority actions most commonly cited as being of high priority were reaching vulnerable population groups, targeted screening for active TB in high risk population groups, implementing electronic TB case registries, contact tracing and outbreak investigation, and MDR-TB. Most EU/EEA countries have an integrated approach to HIV/TB and a strategy for tackling drug resistant TB.

Factors related to recipients of care (such as lack of knowledge about TB among people in vulnerable and high risk groups and low motivation to seek and adhere to treatment) and factors related to providers of care (such as the need for specialist training of doctors and nurses and varying degree of knowledge about TB clinical guidelines) were more frequently flagged as barriers to TB control and prevention than were social and political constraints. However, one third of respondents indicated that lack of recognition of TB control as a public health priority at top level of government/health ministry impeded TB control in their country. The most commonly cited barriers within the healthcare system were insufficient numbers of specialist TB nurses, funding of the national TB control and prevention programme, funding constraints in the wider healthcare system, and communication between the health care and social care systems.

The results of this survey will be triangulated with the results of a systematic review of reviews of evidence for interventions to control and prevent TB in low-medium TB incidence countries, and with a systematic review of barriers to the implementation of TB control interventions in EU/EEA countries. The combined information will be presented to national TB programme leaders ahead of a structured meeting, which has as its ultimate outcome the formulation of a 'toolkit' to assist EU/EEA member states in developing and/or implementing action plans for TB control and prevention.

5. Bibliographical references

ECDC (2008). Framework Action Plan to Fight Tuberculosis in the European Union. Stockholm, ECDC.

ECDC (2010). Progessing towards TB elimination: A follow-up to the Framework Action Plan to Fight Tuberculosis in the European Union. Stockholm, ECDC.

ECDC/WHO Regional Office for Europe (2017). Tuberculosis surveillance and monitoring in Europe 2017. Stockholm, ECDC.

Lonnroth, K., et al. (2015). "Towards tuberculosis elimination: an action framework for low-incidence countries." Eur Respir J **45**(4): 928-952.

The SURE Collaboration SURE Guides for Preparing and Using Evidence-Based Policy Briefs: 5. Identifying and addressing barriers to implementing policy options. Version 2.1 [updated November 2011]. Available from http://www.who.int/evidence/sure/ [Accessed 29/09/2017].

WHO (2015). Toolkit to develop a National Strategic Plan for TB prevention, care and control. Geneva, WHO.

6. Appendix 1: E-DETECT TB Survey Design

Part 1

This survey is part of the E-DETECT TB project (709624) which has received funding from the European Union's Health Programme (2014-2020).
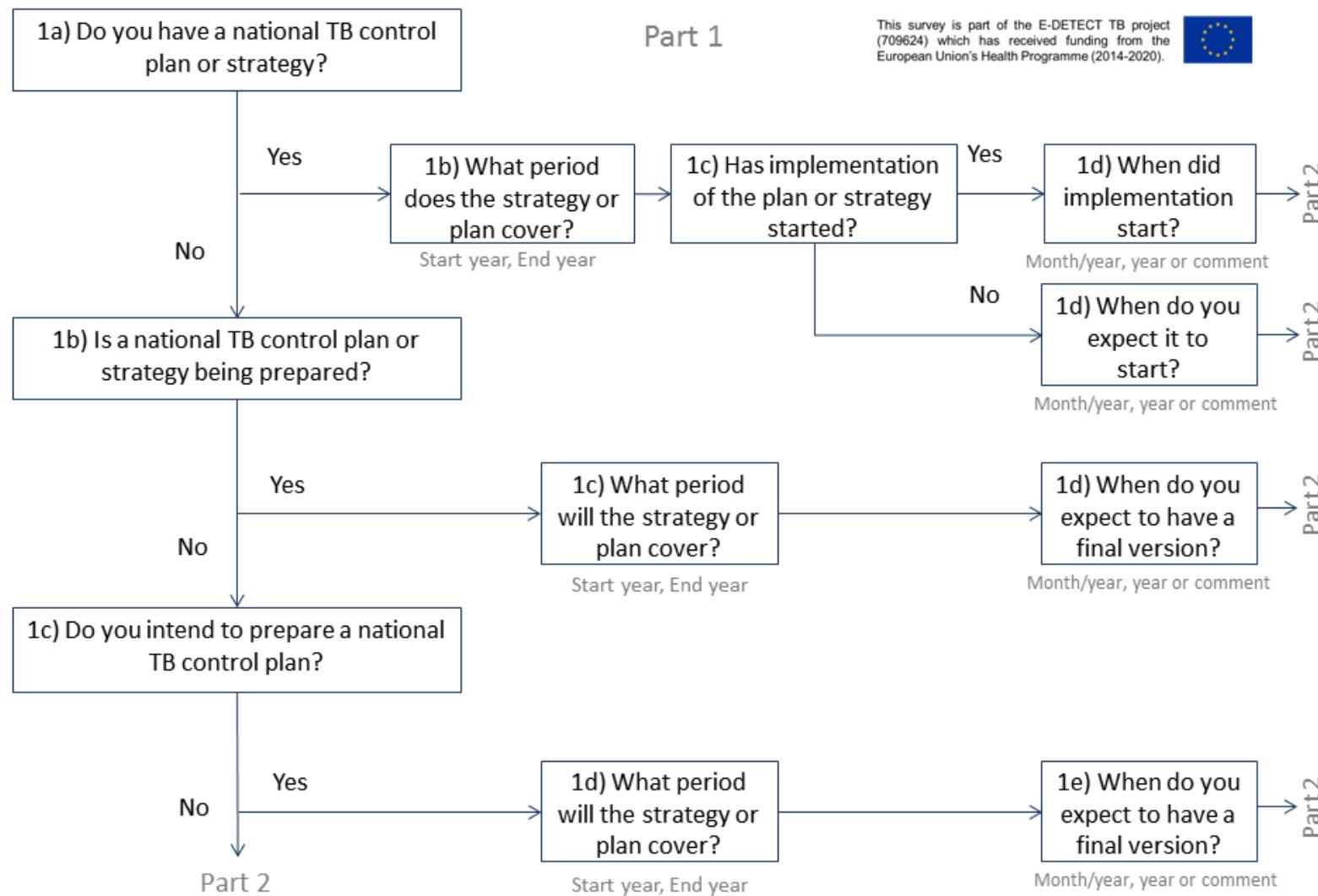
2: COORDINATION

2a) Does your national TB control and prevention programme have a clearly defined organisational structure?

○ Yes, as defined in national TB control plan/strategy

○ Yes, but not defined in national TB control plan/strategy

○ No

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2b) Is TB control and prevention coordinated centrally by a national TB control board or committee or other formal body?

○ Yes, as described in national TB control plan/strategy

○ Yes, but not described in national TB control plan/strategy

○ No, but other national bodies coordinate specific TB control and prevention tasks

○ No

Please describe briefly how TB control and prevention is coordinated in your

country

2c) Which stakeholders are represented on the national TB control board? This question refers to the control board or committee or other formal body indicated in question 2a).

☐ Ministry or Department of Health

☐ National public health department

☐ Local public health departments

☐ Local TB control boards

☐ Specialist clinicians

☐ Laboratory services

☐ Epidemiologists

☐ Specialist TB nurses

☐ Private health providers

☐ Pharmacies

☐ Professional bodies

☐ TB patient representatives

☐ Non-governmental organisations

☐ Civil society

☐ Other (please list all other participants) [   ]

17. **2d) How often does the national TB control board meet?** 0=irregularly, 1=monthly, 3=every 3 months, 6=every 6 months, 12=annually, 24=every two years, etc.

Every [   ] months

2e) Has specific funding been allocated to the national TB control board? This question refers to funding allocated specifically to cover the costs of central coordination of TB control by the control board or committee or other formal body indicated in question 2a).

○ Yes ○ No

2f) Is TB control and prevention coordinated locally by local TB control boards or committees or other formal bodies? 'Local' includes control at the level of region, district, state, province, etc.

○ Yes ○ No

20. **2g) How often do local TB control boards report to the national TB control board?** 0=irregularly, 1=monthly, 3=every 3 months, 6=every 6 months, 12=annually, 24=every two years, etc.

Every [   ] months

3: RESOURCES

3a) Does the national TB control and prevention programme have its own costed budget? i.e. a budget allocated specifically to TB control and prevention measures, not including routine clinical treatment of TB cases

○ Yes

○ No, but some parts of the programme have their own budgets

○ No

Please describe briefly how TB control and prevention is funded in your country

3b) Has an impact assessment for national TB control and prevention been done? e.g. a cost benefit analysis or other assessment of the likely impact of TB control based on epidemiological and financial information

○ Yes, as documented in national TB control plan/strategy

○ Yes, but not documented in national TB control plan/strategy

○ No, but impact assessment for some parts of the programme have been done

○ No

Please describe briefly what impact assessments have been done

3c) Do you have a strategy for training and developing a specialist TB workforce?

○ Yes, as documented in national TB control plan/strategy

○ Yes, but not documented in national TB control plan/strategy

○ No

At what level is training and development of the specialist TB control workforce coordinated?

☐ National

☐ Regional (state, province, region)

☐ Local (county, district, city)

☐ No coordination

Which parts of the TB workforce have the greatest need for training and development?

☐ Specialist doctors

☐ Specialist nurses

☐ Microbiologists

☐ Surveillance scientists

☐ Epidemiologists

☐ Community health workers

☐ Other (please list)

[Optional] Please comment briefly on any aspects of TB workforce development which you think might be relevant to this survey, including approaches and obstacles to training, recruitment and retention:

3d) Do you have a strategy for introducing and implementing new tools for TB control and prevention?

○ Yes, as documented in national TB control plan/strategy

○ Yes, but not documented in national TB control plan/strategy

○ No

In which areas are you developing new tools?

☐ Surveillance

☐ Rapid diagnostic tests

☐ Microbiology

☐ Drug susceptibility testing

☐ Treatment observation

☐ Contact tracing

☐ Outbreak investigation

☐ Infection control

☐ Other (please list)

[Optional] Please comment briefly on any aspects of introducing and implementing new tools for TB control and prevention which you think might be relevant to this survey:

3e) Do you have a strategy for ensuring continuity of TB drug supply?

○ Yes, as documented in national TB control plan/strategy

○ Yes, but not documented in national TB control plan/strategy

○ No

[Optional] Please comment briefly on any aspects of TB drug supply which you think might be relevant to this survey:

4: MONITORING

4a) Do you have electronic TB case registries? (select all that apply)

☐ No electronic registries

☐ National registry

☐ Regional registries

☐ Local registries

☐ Other (please specify)

4b) Do you have a strategy for monitoring and evaluation of TB control and prevention?

○ Yes, as documented in national TB control plan/strategy

○ Yes, but not documented in national TB control plan/strategy

○ No

[Optional] Please comment on any aspects of TB programme monitoring and evaluation which you think might be relevant to this survey:

4c) How many staff in your national office are assigned to TB surveillance?

	Full-time staff	Part-time staff	
Data analysts			
Epidemiologists			
Surveillance scientists			
Public health officers			
Medical staff			
Administrative staff			
TB nurses			
Other			

5: POPULATION

5a) Do you have any programmes for raising awareness of TB at community or primary care level? i.e. within local communities or among primary care providers

○ Yes, as documented in national TB control plan/strategy

○ Yes, but not documented in national TB control plan/strategy

○ No

In which community or primary care groups are you trying to raise awareness?

☐ General public

☐ Primary care doctors (GPs)

☐ Primary care health workers

☐ Social workers

☐ Other (please specify)

5b) Do you have any programmes for reaching vulnerable population groups? We define 'vulnerable population group' as a subpopulation within a country of low or medium TB incidence, who are at higher risk of having latent or active TB.

○ Yes, as documented in national TB control plan/strategy

○ Yes, but not documented in national TB control plan/strategy

○ No

Which vulnerable population groups have been identified? (select all that apply)

☐ Documented migrants

☐ Undocumented migrants

☐ Refugees

☐ Asylum seekers

☐ Homeless people

☐ People with alcohol problems

☐ People with drug problems

☐ People with mental health problems

☐ Current prisoners

☐ Former prisoners

☐ Minority ethnic groups

☐ Other (please specify)

5c) Do you have a strategy for TB control in prisons?

○ Yes, as documented in national TB control plan/strategy

○ Yes, but not documented in national TB control plan/strategy

○ No

5: POPULATION (continued)

5d) Do you conduct targeted screening for active TB in high risk groups?(select all that apply)

☐ No targeted screening

☐ Documented migrants (at point of entry, i.e. on arrival)

☐ Documented migrants (post-entry)

☐ Undocumented migrants

☐ Refugees

☐ Asylum seekers

☐ Homeless people

☐ People with alcohol problems

☐ People with drug problems

☐ People with mental health problems

☐ Current prisoners

☐ Former prisoners

☐ Minority ethnic groups

☐ Other (please specify)

5e) Do you conduct screening for active TB in migrants from high-incidence countries?(from countries in any of the following regions)

☐ No pre-entry screening

☐ Central Asia

☐ South Asia (including Afghanistan, Pakistan, Bangladesh and India)

☐ Southeast Asia

☐ South or Central America

☐ Middle East

☐ North Africa

☐ Sub-Saharan Africa

☐ Europe

☐ Other (please specify)

5f) Do you conduct latent TB infection (LTBI) screening in high risk groups?(select all that apply)

☐ Contacts of cases

☐ Documented migrants (at point of entry, i.e. on arrival)

☐ Documented migrants (post-entry)

☐ Undocumented migrants

☐ Refugees

☐ Asylum seekers

☐ Homeless people

☐ People with alcohol problems

☐ People with drug problems

☐ People with mental health problems

☐ Current prisoners

☐ Former prisoners

☐ Minority ethnic groups

☐ Other (please specify)

6: CLINICAL

6a) Are national TB control and prevention guidelines available?

○ Yes   ○ No

6b) Are laboratory diagnostic services subject to external quality assurance (EQA)?

☐ No EQA

☐ ERLN-TB

☐ WHO Collaborating Centre

☐ WHO SRLN

☐ INSTAND e.V.

☐ ISO 15189

☐ Other (please specify)

Percentage of reference laboratories with ERLN-TB EQA score >80%

6c) Is culture confirmation of new pulmonary TB cases recommended?

○ Yes   ○ No

6d) What professional and clinical support is available to clinicians?

☐ Clinical guidelines

☐ Clinical networks

☐ Specialist training

☐ Local multidisciplinary teams

☐ Infection control guidelines

☐ Research meetings

☐ Other (please specify)

6: CLINICAL (continued)

6e) Do you have a strategy to implement and ensure comprehensive contact tracing?

○ Yes, as documented in national TB control plan/strategy

○ Yes, but not documented in national TB control plan/strategy

○ No

Please comment:

Which approaches to contact investigation are recommended?

☐ Household contact tracing

☐ Community contact tracing

☐ Workplace contact tracing

☐ Health care facility contact tracing

☐ Other (please specify)

6f) Do you have a strategy to provide and promote BCG vaccination?

○ Yes, as documented in national TB control plan/strategy

○ Yes, but not documented in national TB control plan/strategy

○ No

Please comment:

Which groups have been identified for BCG vaccination? (select all that apply)

☐ Universal infant

☐ High-risk infant

☐ High-risk adult

☐ Other (please specify)

7: MDR-TB and XDR-TB

7a) Do you have a strategy to tackle drug-resistant TB?

○ Yes, as documented in national TB control plan/strategy

○ Yes, but not documented in national TB control plan/strategy

○ No

Please comment:

Which measures are included?

☐ Routine first-line drug susceptibility testing

☐ Directly observed treatment

☐ Video observed treatment

☐ Multidisciplinary MDR-TB case management

☐ Patient-centred MDR-TB case management

☐ Centres of expertise in MDR-TB treatment

☐ Infection control in health facilities

☐ Other (please specify) [text box]
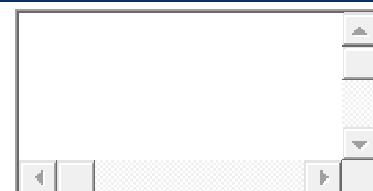
8: HIV/TB

8a) Do you have an integrated approach to TB and HIV control? i.e. TB and HIV services are integrated or work closely together

○ Yes, as documented in national TB control plan/strategy

○ Yes, but not documented in national TB control plan/strategy

○ No

Please comment: [text box]

8b) Are TB patients routinely tested for HIV and/or HIV patients screened for TB? (select all that apply)

☐ No coordinated HIV/TB testing

☐ TB patients tested for HIV

☐ HIV patients screened for TB

☐ Other (please specify) [text box]

8c) Is TB/HIV coinfection monitored at national level?

○ Yes ○ No

9: PRIORITY ACTIONS - In relation to TB control in your country, which existing or new actions do you think are most important or have the greatest urgency?

a) Please rate the priority of each of the 9 action areas listed below:

	Low	Medium	High
Training and developing a specialist TB workforce	○	○	○
Introducing and implementing new tools for TB control	○	○	○
External quality assurance for laboratory services	○	○	○
Implementing electronic TB case registries	○	○	○
Staffing and expertise for national TB surveillance	○	○	○
Establishing or managing local TB control boards	○	○	○
Publishing and disseminating clinical guidelines	○	○	○
Raising awareness of TB at community or primary care level	○	○	○
Reaching vulnerable population groups	○	○	○

b) Please rate the priority of each of the 9 action areas listed below:

	Low	Medium	High
TB control in prisons	○	○	○
Latent TB infection (LTBI) screening in high risk population groups	○	○	○
Targeted screening for active TB in high risk population groups	○	○	○
Ensuring continuity of TB drug supply	○	○	○
Screening for active TB in migrants from high-incidence countries	○	○	○
Contact tracing and outbreak investigation	○	○	○
BCG vaccination	○	○	○
MDR-TB	○	○	○
HIV/TB	○	○	○

c) Please list here any other action areas which are a high priority for TB control in your country:

10: PRIORITY POPULATIONS - In relation to TB control in your country, which population groups do you think have the highest unmet need for TB case detection and treatment?

a) Please rate the level of unmet need for TB <u>detection</u> in the following vulnerable/high risk population groups:

	Low	Medium	High
Documented migrants	○	○	○
Undocumented migrants	○	○	○
Refugees	○	○	○
Asylum seekers	○	○	○
Homeless people	○	○	○
People with alcohol problems	○	○	○
People with drug problems	○	○	○
People with mental health problems	○	○	○
Current prisoners	○	○	○
Former prisoners	○	○	○
Minority ethnic groups	○	○	○

b) Please list here any other population groups which have high unmet need for TB <u>detection</u>:

c) Please rate the level of unmet need for TB <u>treatment</u> in the following vulnerable/high risk population groups:

	Low	Medium	High
Documented migrants	○	○	○
Undocumented migrants	○	○	○
Refugees	○	○	○
Asylum seekers	○	○	○
Homeless people	○	○	○
People with alcohol problems	○	○	○
People with drug problems	○	○	○
People with mental health problems	○	○	○
Current prisoners	○	○	○
Former prisoners	○	○	○
Minority ethnic groups	○	○	○

d) Please list here any other population groups which have high unmet need for TB <u>treatment</u>:

11: BARRIERS - Please indicate whether any of the following factors impede TB control in your country?

RECIPIENTS OF CARE

	Yes	No	Unsure
Vulnerable population groups have limited access to health facilities	○	○	○
People in vulnerable/high risk groups lack knowledge about TB	○	○	○
Acceptability of TB screening to vulnerable/high risk groups	○	○	○
Low motivation to seek treatment in vulnerable/high risk groups	○	○	○
Low motivation to adhere to treatment in vulnerable/high risk groups	○	○	○
Health care system is not fully trusted by vulnerable/high risk groups	○	○	○

PROVIDERS OF CARE

	Yes	No	Unsure
Varying degree of knowledge about TB clinical guidelines	○	○	○
Varying degree of adherence to TB clinical guidelines	○	○	○
Need for specialist training of doctors in TB diagnosis and management	○	○	○
Need for specialist training of nurses in TB patient care	○	○	○
Negative beliefs regarding vulnerable/high risk population groups	○	○	○

HEALTH SYSTEM CONSTRAINTS

	Yes	No	Unsure
Funding of national TB control and prevention programme	○	○	○
Funding of laboratory services	○	○	○
Funding of medical facilities in prisons	○	○	○
Funding of facilities and health care for vulnerable population groups	○	○	○
Funding constraints in the wider healthcare system	○	○	○
Insufficient numbers of specialist TB doctors	○	○	○

Insufficient numbers of specialist TB nurses	○	○	○
Insufficient numbers of microbiologists or laboratory staff	○	○	○
Insufficient numbers of surveillance scientists	○	○	○
Need for further training of existing microbiologists/lab staff	○	○	○
Need for further training of existing surveillance scientists	○	○	○
Communication between public health agency and clinical care providers	○	○	○
Communication between levels of the health care system	○	○	○
Communication between the health care and social care systems	○	○	○
Communication between providers and recipients of health care	○	○	○
Allocation of authority within national TB control programme	○	○	○
Clear accountability for meeting TB control programme targets	○	○	○
Inadequate management or leadership within health care system	○	○	○
Inadequate systems to obtain timely and accurate surveillance information	○	○	○
Inadequate systems for TB control programme monitoring and evaluation	○	○	○
Inadequate processes for referring and transferring TB patients	○	○	○
Inadequate systems for procuring and distributing TB drugs	○	○	○
Inadequate systems for procuring and distributing laboratory supplies	○	○	○
Bureaucracy in wider health care system	○	○	○
Slow turnaround of diagnostic testing	○	○	○
Inadequate quality control within laboratories	○	○	○
Inadequate infection control within health care facilities	○	○	○

SOCIAL & POLITICAL CONSTRAINTS

	Yes	No	Unsure
Lack of recognition of TB control as a public health priority at top level of government/health ministry	○	○	○
High TB risk lacks credibility among community/opinion leaders in vulnerable groups	○	○	○
Political focus on tertiary (hospital) care, i.e. treatment rather than control & prevention	○	○	○
Clinical emphasis on tertiary (hospital) care, i.e. treatment rather than control & prevention	○	○	○
Negative societal attitudes to high risk population groups	○	○	○
Insufficient evidence to demonstrate cost effectiveness of TB control programme	○	○	○

OTHER FACTORS Please list here any other barriers to TB control in your country: