






## Early Detection and Integrated Management of Tuberculosis in Europe

Layman Version of the Final Report







*This project E-DETECT TB has received funding from the European Union's Health Programme (2014-2020) under grant agreement N°709624.*

The E-DETECT Tuberculosis (TB) consortium is a European Commission co-funded group, which brings together world-leading TB experts from:



-  National public health agencies (Sweden, United Kingdom, the Netherlands, Italy and Romania)
-  Industry (Delft diagnostics)
-  Major academic centres (UCL, Karolinska, SMI, OSR and UNIBS).

The overall objective of the consortium is to contribute to a decline, and the eventual elimination of TB, in the European Union (EU).

We used a range of approaches, reflecting the different ways that TB affects the EU's population:






-  In Romania and Bulgaria, a specialty-trained team visited vulnerable populations (homeless individuals, Roma, those with a history of drug use, and prisoners), to screen them for TB, ensure early diagnosis, and arrange follow-up care. The team's custom-built truck was fitted with digital x-ray technology. The initiative has since been expanded by the Romanian government, to help address the country's relatively high TB rates (25% of all EU cases).
-  We've been evaluating detection of TB and follow-up care of migrants, having moved from higher-burden countries, entering and travelling around Europe. We worked with agencies such as the Italian Red Cross to screen thousands of newly-arrived migrants as they arrive in Sicily, as well as working with settled migrants and asylum seekers in northern Italy.
-  We've created a multi-country database to inform effective strategies for early diagnosis of active and latent TB among migrants in low-incidence EU countries.
-  We have produced a TB Strategy Toolkit, a free to download document with a menu of options, which different states can adapt to inform their own national action plans. The Toolkit has been informed using survey results and best practice from across the EU.

To further support the wider TB and public health community who may wish to adopt or learn from our strategies, we've also:

-  Evaluated our methods in Italy and Romania, and found that they are cost-effective.
-  Produced a variety of resources including video tutorials, webinars and information sheets.

Despite facing unexpected challenges, from diagnostic equipment shortages to the COVID-19 pandemic, we are proud to say that we have achieved all of our objectives and more, establishing or strengthening relationships in the process, and we believe our work will have real impact.

The following pages attempt to provide a little more detail about our project but to find out more, please visit our website at [www.e-detecttb.eu](http://www.e-detecttb.eu). There you can find a wide range of resources and stories about our work since 2016. Highlights on our website, which has been accessed by visitors from over 135 countries, include the following:

-  Downloads of our TB Strategy Toolkit and accompanying introductory sheets in 24 languages
-  Feature articles, such as an explanation and video tutorial of our screening app system
-  News stories including our presentation at the Romanian Parliament
-  Accounts from Romanian outreach workers who visited London on a training exchange
-  Resources including factsheets and links to publications, webinars and videos

Thank you for reading about E-DETECT TB, which, we hope you will agree, will help the global effort to eliminate tuberculosis, and reduce the suffering of millions of people around the world.

**Professor Ibrahim Abubakar, Coordinator, E-DETECT TB Consortium**

## Acronyms and Glossary

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Delft Imaging	Delft Imaging Systems B.V.
ECDC	European Centre for Disease Prevention and Control
FoHM	Folkhälsomyndigheten (The Public Health Agency of Sweden)
INMI	Istituto Nazionale Malattie Infettive Lazzaro Spallanzani (National Institute of Infectious Diseases, Italy)
HSPC	Tsentar Za Zdravni Strategii I Programi (Health Strategies and Programmes Centre, Bulgaria)
KI	Karolinska Institutet
KNCV	KNCV Tuberculosefonds (Tuberculosis Foundation)
NTPR	Institutul de Pneumoftiziologie „Marius Nasta” (National Institute of Pneumology Marius Nasta, Romania)
OSR	Ospedale San Raffaele (San Raffaele Hospital, Milan)
PHE	Public Health England
TB	Tuberculosis
UCL	University College London
UNIBS	Università degli Studi di Brescia (University of Brescia)

## Work Packages 1-3: Coordination, Dissemination and Evaluation

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Three work packages focused on management, communication and analysis of the project itself, in order to support our investigative activities (work packages 4-7, described later in this report).

Coordination (work package 1) was led by UCL. Activities included organisation of internal meetings, regular reporting to our funders at the EU, management of adherence to regulations, and arrangement of two project extensions required to complete and enhance our investigations.

Dissemination (work package 2) was led by UNIBS, with UCL assisting. The dissemination team managed external communications such as our website and social media, produced videos and webinars and wrote multi-language factsheets and newsletters. Consortium members have collaborated on academic papers and attended conferences to represent the project, and training has been provided in person, via exchanges and using video tutorials. Throughout the project, we have worked alongside and consulted the TB community to inform and convey our research.

Evaluation (work package 3) was led by UCL. In addition to the monitoring of structure, process, and outputs of each work package, two models were created. The models study the cost-effectiveness of 1) screening refugees for active TB at their arrival in hotspot shelters in Sicily and Calabria and 2) the mobile screening radiography unit in the homeless population in Bucharest and the impact of the strategy in the long term. The team calculated the cost per case detected and found both strategies to be cost-effective when compared to the countries' GDP.

## Work Package 4: Outreach for Early Diagnosis

**Partners:** KNCV, NTPR, Delft Imaging, UCL, HSPC

**Countries active:** Romania, Bulgaria, Netherlands, UK

**Results and achievements:** despite obstacles faced early in the project, the team has achieved huge success. The **custom-built mobile digital x-ray screening unit (MXU)**, fitted with state of the art equipment, has been enthusiastically adopted in Romania.

- ✎ The team worked with vulnerable groups (homeless individuals, Roma, prisoners, and those with a history of drug use in the community).
- ✎ They screened more than 5,000 people, with the MXU allowing the specialist team to visit multiple sites.
- ✎ They found that automated x-ray reading equipment (CAD4TB) can select clients with presumptive TB, limiting additional reading to less than 20% of chest x-rays, avoiding unnecessary TB examinations while maintaining high sensitivity.
- ✎ Prevalence rates found in different targeted groups (prisoners, homeless persons and problem drug users) provided insight into who should be prioritised for this method of screening.



**Legacy:** E-DETECT TB representatives **attended a session at the Romanian parliament** to mark the impact of this project in 2019. The experience gained in this work package paved the way for a **nationwide TB screening project in Romania**, called POCU 4.9, deploying three additional digital MXUs alongside the E-DETECT TB vehicle, using a national electronic database, planned for 2019-2023.

**Further reading/publications/videos:**

<https://e-detecttb.eu/outreach-for-early-diagnosis/>



Clockwise from top left: World TB Day in Bucharest, March 2019; visiting Rahova prison, October 2018; training exchange visit in London, August 2017; Romanian Parliament, October 2019.

## Work Package 5: Migrant TB Detection, Prevention and Treatment

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Partners: OSR, UNIBS, INMI

Countries active: Italy

**Results and achievements:** the team was able to carry out a range of activities including **screening of newly-arrived migrants in Sicily and retrospective analysis of asylum seekers in Lombardy**. They **developed a new mHealth tool (app)**, and worked closely with local health authorities and NGOs such as the Italian Red Cross.

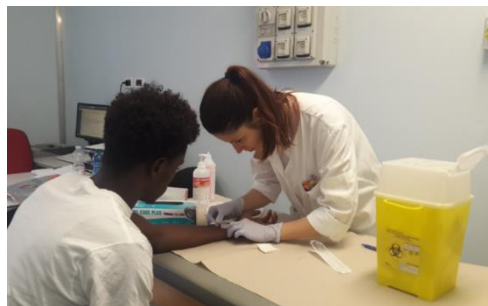
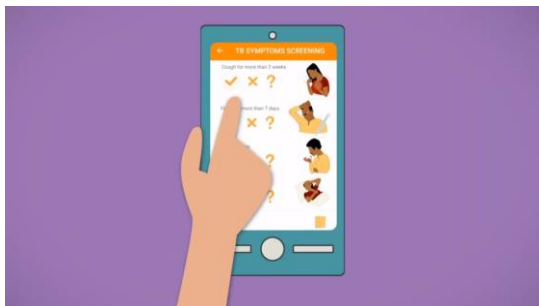
- ✎ 3,787 temporary settled migrants were screened for TB shortly after they arrived in Sicily, diagnosing 15 people with active TB.
- ✎ The screening and follow-up process combined our mHealth system with rapid diagnostics and fast-track care referrals.
- ✎ Our retrospective analysis identified further cases among asylum seekers in Brescia and established that rates are high.
- ✎ The team is now expanding their research with a survey of Italian regions, in order to study their varying TB policies.



**Legacy:** The **E-DETECT TB app** can be used in other low resource or outreach settings to perform active and latent TB screening activities. Furthermore, **the team's analysis shows that screening of migrants is effective**, with policy implications for European governments who have migrants from high burden countries.

**Further reading/publications/videos:**

<https://e-detecttb.eu/migrant-tb-detection-prevention-and-treatment/>



Above left: an image from the E-DETECT screening app tutorial video.

Above right: TST (tuberculin skin test) administration, Brescia, 2018.

## Work Package 6: Establishing a Database on Migrant TB Screening in Europe

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**Partners:** KI, FoHM, PHE, KNCV, UCL, UNIBS

**Countries active:** Sweden, Italy, Netherlands, UK

**Results and achievements:** In countries where TB is of relatively low prevalence, further decline of TB cases can only be achieved with special interventions among migrant populations, who account for the majority of new TB notifications. With this in mind, our team:

- 📌 Agreed how to be able to get data for analysis into one place whilst making sure privacy laws are adhered to.
- 📌 Created a database which is being continually updated.
- 📌 Analysed the data to determine which approaches to screening and care are best suited to different groups of migrants.



**Legacy:** The **international migrant TB screening database**, for use by public health experts, national health authorities, ECDC, and researchers, which is **filling an important data gap** for surveillance and evaluation of screening programmes.

The database could be used as a template for EU countries and globally on how to standardise and share key surveillance and evaluation data across and within countries.

**Further reading/publications/videos:**

<https://e-detecttb.eu/establishing-a-european-tb-database/>



Above: a migrant participant with E-DETECT TB's Dr Stancanelli during a TB screening interview in Lampedusa in 2017.

## Work Package 7: Strengthening National TB Programmes

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**Partners:** PHE, KNCV, KI, UCL

**Countries active:** All EU/EEA member states

**Results and achievements:** Our team has been working with the ECDC and stakeholders across Europe, from policy-makers to civil society, to provide resources and advice to inform national strategies.

- ✎ Our survey of national TB control plans and policies was completed by all 31 EU/EEA member states.
- ✎ We also carried out two large literature reviews to determine what's best for a strategy and what issues there may be with getting these into practice.
- ✎ We hosted a meeting of TB experts from across Europe, to get their opinions and input to inform and add to our research.
- ✎ We combined the survey and literature review results with expert knowledge to produce our TB Strategy Toolkit.
- ✎ The Toolkit, and one-page summaries in all 24 official EU languages, are available free of charge on our website.



**Legacy:** The **TB Strategy Toolkit** document is available freely via the E-DETECT TB website, targeting policy makers, institutions responsible for the planning and commissioning of health and social care measures, TB programmes and services, civil society organisations, non-governmental organisations, charities and services linked to social support systems.

It combines best practice from the literature with field evidence to offer a menu of choices of TB control actions, which **can be adapted to the specific member state's situation**.

**Further reading/publications/videos:**

<https://e-detecttb.eu/supporting-national-tb-programmes/>

<https://e-detecttb.eu/tb-strategy-toolkit/>



Above: the expert stakeholder meeting held in Leiden, October 2018.



## Acknowledgements

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The members of the E-DETECT TB consortium wish to thank their partner agencies, non-governmental organisations and individuals for their guidance, cooperation and assistance throughout the project.

These include, but are not limited to, the following: Consumers, Health, Agriculture and Food Executive Agency (CHAFEA), the World Health Organization (WHO), the European Centre for Disease Prevention and Control (ECDC), the Tuberculosis Europe Coalition (TBEC), UCLH Find & Treat and The European Respiratory Society.

### The E-DETECT TB Consortium:



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