

## 1.1. Successful treatment of pulmonary tuberculosis (QE-11)

### 1.1.1. Documentation sheet

<b>Description</b>	Percentage of people with laboratory-confirmed Tuberculosis (TB) successfully treated among TB cases notified during past year
<b>Calculation</b>	<p><b>Numerator:</b> number of people successfully treated from laboratory confirmed pulmonary tuberculosis within the Belgian tuberculosis cohort of the previous year.</p> <p><b>Denominator:</b> number of people with laboratory confirmed pulmonary tuberculosis notified the previous year, included in the Belgian tuberculosis cohort and for which information about their follow-up or treatment outcome at 12 months was available</p> <p>Results are provided as a percentage.</p>
<b>Rationale</b>	<p>Since the 1970s, Belgium has had compulsory reporting and registration of tuberculosis cases. Since 1995, our country has participated in the European surveillance network. This system allows the comparison of the epidemiology of European countries and helps to define coordinated prevention measures.</p> <p>According to the recommendation of the World Health Organisation (WHO)<sup>1</sup>, Belgium has implemented a system to collect data on the therapeutic results in a standardised manner since 2002.<sup>2</sup></p> <p>In the treatment of tuberculosis, compliance is essential to cure. However, keeping the patient's adherence to the TB treatment is challenging. Indeed, it is a long treatment of minimum 6 months, and, in addition, the treatment consists on a polytherapy with many potential side effects.<sup>3</sup></p> <p>The calculation of the indicator on successful treatment of pulmonary tuberculosis cases allows to assess the effectiveness and the compliance of the patients to their treatment. This indicator reflects notably the capacity of the health system to ensure the adherence to a long and difficult treatment, especially as it affects, as described in the tuberculosis section of the health status report, a public that is often in a precarious situation.<sup>2</sup></p>
<b>Data source</b>	<p>The Belgian tuberculosis register: data from 2011 to 2021 are used.</p> <p>All results are published in reports available on the websites of the 'Fonds des affections respiratoires asbl' (FARES)<sup>4</sup> and the 'Vlaamse vereniging voor respiratoire gezondheidszorg en tuberculosebestrijding' (VRGT).<sup>5</sup></p> <p>The Belgian tuberculosis register is created by merging the database from Flanders (Agentschap Zorg en Gezondheid) with the TUBER case management database from Brussels and Wallonia (thus data does not come directly from the regional declaration platforms for Brussels and Wallonia). In all three regions, TB registration is mandatory. Belgian tuberculosis register attempts thus to accurately represent the situation in Belgium.</p> <p>The data is processed in compliance with the General Data Protection Regulation. Encoded pseudo-anonymously by regional teams, they are then centralised once a year to be validated and processed by the data manager.<sup>2</sup> Treatment outcomes data are collected by FARES, VRGT and Agentschap Zorg en Gezondheid from the patient's physician in charge of the clinical follow-up.</p> <p>In 2020 (last cohort for which there is available data concerning treatment outcomes), 830 new notifications of TB cases were included in the register, from which 357 were eligible to be included in the cohort of lung tuberculosis treatment follow-up (see inclusion criteria in technical definition just below).</p>

<b>Technical definitions</b>	<p>The study population is part of the Belgian cohort of the tuberculosis register. It includes only people with bacteriological confirmation of pulmonary tuberculosis at the diagnostic phase (n=453 for the 2020 cohort) for whom FARES/VRGT/Agentschap Zorg en Gezondheid's teams got follow-up information on treatment outcomes at one year (n=357 for the 2020 cohort).</p> <p>Although the Belgian register includes TB incident cases whatever the localisation (with 69.3% being pulmonary TB), the results of the follow-up study published in the Belgian report only includes the pulmonary cases. However, the European report includes all TB cases (for Belgium also).</p> <p>The term 'successfully treated' covers two different treatment outcomes grouped together: patients with bacteriological evidence of negativity and patients who have completed their treatment but with no bacteriological result.</p> <p>The successful treatment rate is an indicator that evaluates the management of the TB cases in a public health perspective. The TB successful treatment rate is a usual indicator through countries and regions.</p>
<b>International comparability</b>	<p>Data comes from the database of the European Centre for Disease Prevention and Control (ECDC) and the database of the European Region of the WHO. The analysis of those databases is reported in the same document: "Tuberculosis surveillance and monitoring in Europe". The last report was published in 2023 and analyses the data of 2021 which means the treatment outcomes of the cohorts of 2020.<sup>6</sup></p> <p>Since 2008, the ECDC and the WHO Regional Office for Europe have coordinated the collection and analysis of TB surveillance data in Europe. The standards and definitions have been agreed by experts. Reporting completeness varied among countries due to differences in legislation, surveillance systems and TB case identification. Everyone should be cautious when making comparisons across countries as the rate of data reporting by countries vary a lot. So only data from a limited number of EU-countries (n=13 among EU-27) can be taken into account as they report treatment follow-up data for at least 80% of their notification cohort. However a global mean for 29 European countries is available based on the analysis of all the reported treatment follow-up cases whatever the country's origin of the data (71.7%).<sup>6</sup></p> <p>A difference appears between the data reported in Belgium and at the European level. Indeed, in Belgium, the success of the management only concerns confirmed pulmonary tuberculosis cases, whereas the data reported in the European report does not specify the body's location of tuberculosis. However, in the EU data, Belgian data concern all cases. This difference does not hamper the comparability.</p>
<b>Limitations</b>	<p>All confirmed pulmonary TB cases (new and previously treated cases) are evaluated together in Belgium because the information collected about previous TB treatment is not reliable and does not allow to distinguish relapses, failure and return after defaulted (clinical history usually not available)</p> <p>There is no treatment follow-up data available for 84 patients of the cohort 2020.</p> <p>Many European countries reports only few data on treatment follow-up.</p> <p>Belgian (FARES/VRGT) and European (ECDC) calculation methodologies are different, leading to different results.</p>
<b>Dimension</b>	Quality of care : effectiveness
<b>Reviewers</b>	Vinciane Sizaire (FARES), Wouter Arrazola de Oñate (VRGT)

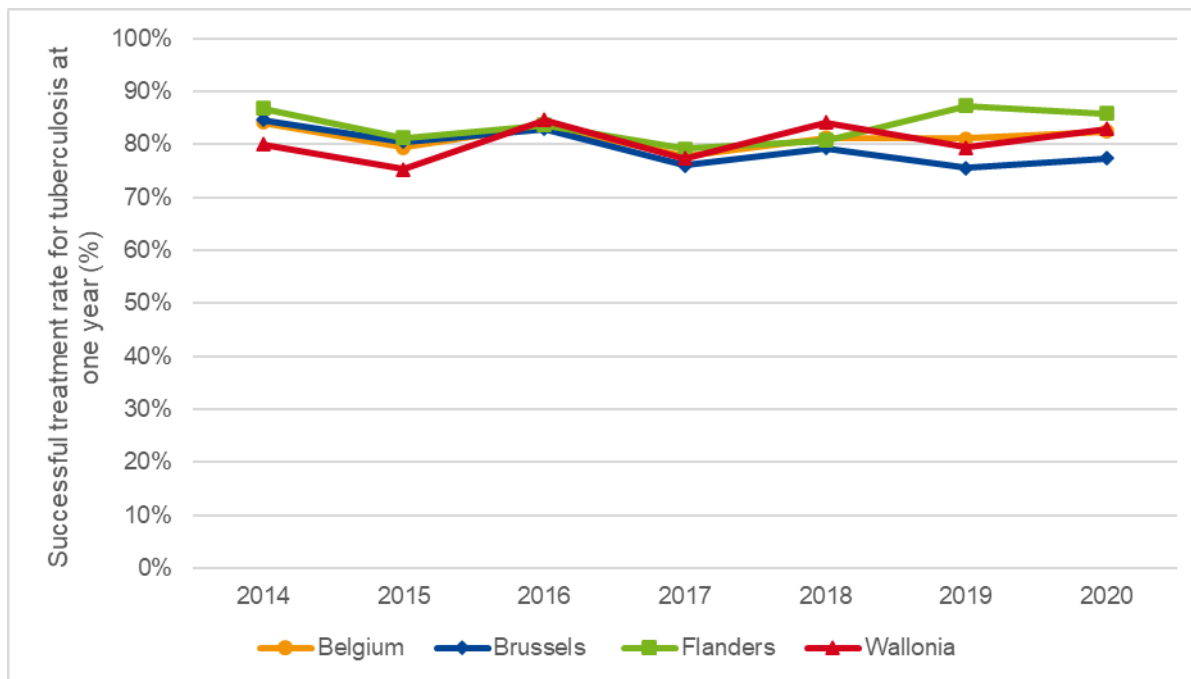
### 1.1.2. Results

#### Belgium

In Belgium in 2021, 82.4% of the people with proven pulmonary tuberculosis (TB) were successfully treated (n=294). This proportion of favourable treatment outcomes corresponds to an increase of 1.3 points of percentage from 2019 (81.1%) but to a decrease of 1.8 points of percentage from 2014 (84.2%) (see Figure 1). The target set by WHO is 85% of success rate.<sup>2</sup>

The term 'successfully treated' covers two different treatment outcomes grouped together: patients with bacteriological evidence of negativity: they are a minority (n=35), and patients who have completed their treatment but without bacteriological evidence of negativity: they are the majority (n=259). This means that the group of "successfully treated" mainly includes people without bacteriological results. Indeed, the bacteriological evidence of TB negativity in the lung is obtained only in 9.8% of the patients in the Belgian follow-up cohorts (see Table 32).

Figure 1 - Successful treatment rate in bacteriologically proven pulmonary tuberculosis at one year, per region (2014-2020)



Source: FARES and VRGT

**Table 1 – Treatment outcomes (indicator-related and other issues) at one year in bacteriologically proven pulmonary tuberculosis, per region – cohort of 2020, followed in 2021**

Treatment outcomes	Belgium	Brussels	Flanders	Wallonia
<b>Treatment fully completed</b>	82.4% (n=294)	77.4% (n=89)	85.9% (n=122)	83.0% (n=83)
Successful treatment without bacteriological evidence of negativity	65.6% (n=345)	65.2% (n=75)	83.8% (n=119)	65.0% (n=65)
Successful treatment with bacteriological evidence of negativity	9.8% (n=35)	12.2% (n=14)	2.1% (n=3)	18.0% (n=18)
<b>Treatment failure</b>	0.3% (n=1)	0% (n=0)	0.7% (n=1)	0% (n=0)
<b>Death</b>	9.5% (n=34)	8.7% (n=10)	9.9% (n=14)	10.0% (n=10)
<b>Discontinuation of treatment</b>	7.0% (n=25)	12.2% (n=14)	3.5% (n=5)	6.0% (n=6)

Source: FARES and VRGT

### Regional comparison

Between regions, very small differences exist in 2021 and those differences vary over time (see Figure 1). In 2021, Flanders (85.9%) performs a bit better than Wallonia (83.0%) and Brussels (77.4%) (see Table 1). Since 2016, the success rate in Brussels is slightly lower than in the other regions. One explanation could be that big cities host often more people at risk of unsuccessful treatment outcome (homeless people, asylum seekers...)<sup>2</sup>

Other items included in ‘unsuccessful treatment outcomes’ are death, treatment failure and treatment discontinuation, also known as loss to follow-up. Failure means that patient take the treatment correctly but does not respond. This outcome almost never happens in Belgium because treatment is always adjusted to the resistance profile. Death is usually the result of a very late diagnosis and/or co-morbidities. Loss to follow-up leads to unsuccessful treatment outcome of precarious population. Loss of follow-up is also the most valuable indicator for programmatic evaluation (which is the purpose of the TB register).

### International comparison

According to the ECDC/WHO Europe report<sup>6</sup>, the treatment success rate among 125 957 new and relapse TB cases having started treatment with first-line drugs in 2020 was 73.4% in EU WHO Region (54 countries). The treatment success rate shows results comparable with the previous year (76.5% in 2018). Only 13 countries and areas achieved an 85% treatment success rate in this treatment cohort. Another 11 were close to the target, with success rates of 80–85%. Nine had treatment success rates below 60%. However the annex 4 of the ECDC report<sup>6</sup> shows that most of the countries do not report complete data. In several countries, a very high proportion of cases are not evaluated (see Table 2). Figure 2 shows the success rate of tuberculosis treatment of 13 EU-countries which report treatment outcome data for at least 80% of their cohort.

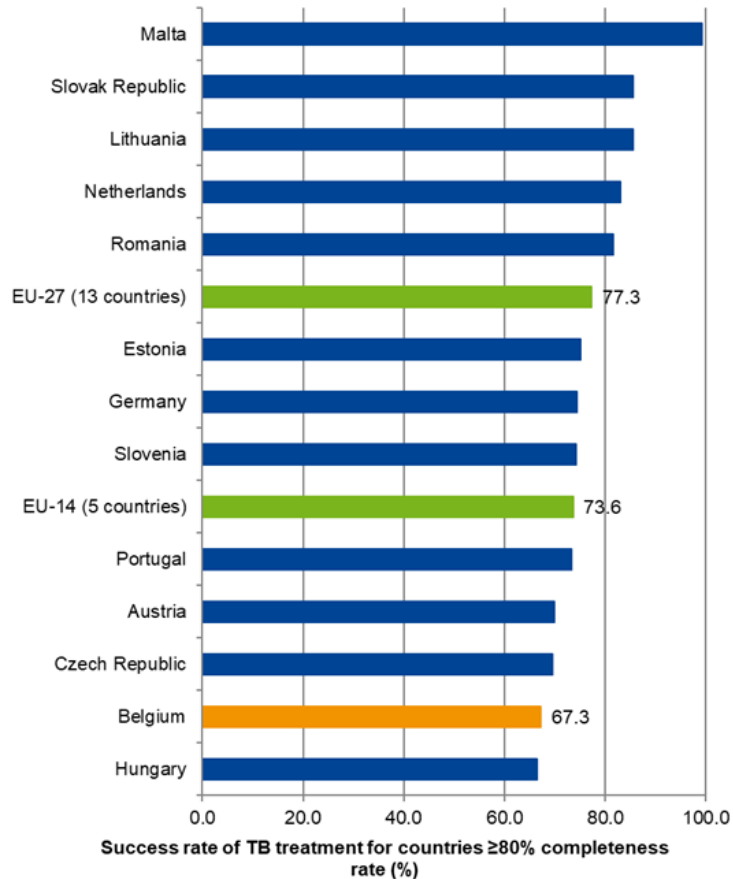
Compared to the rate available for EU-13 countries, Belgium shows a poor success rate in TB treatment (67.3%), ranked at the forelast place, just before Hungary (66.5%) (see Figure 2). Belgium is far from the countries close to the target set by WHO.

**Table 2 – Successful treatment rate of incident TB cases (new cases and relapse of TB), for EU-27 countries –reported in 2021**

Country	Successful treatment rate at one year (%)	Completeness rate (%) <sup>a</sup>
Austria	70.0	91.0
Belgium	67.3	80.8
Bulgaria	Not available	0.0
Croatia	50.5	77.3
Cyprus	44.1	66.7
Czech Republic	69.5	100.0
Denmark	34.5	38.9
Estonia	75.2	100.0
Finland	25.4	27.6
France	Not available	44.6
Germany	74.4	87.4
Greece	Not available	0.0
Hungary	66.5	97.3
Ireland	6.3	11.4
Italy	Not available	0.0
Latvia	Not available	Not available
Lithuania	85.5	100.0
Luxembourg	37.5	41.2
Malta	99.3	100.0
Netherlands	83.0	94.9
Poland	Not available	0.0
Portugal	73.4	100.0
Romania	81.6	100.0
Slovak Republic	85.5	95.6
Slovenia	74.3	100.0
Spain	53.3	64.3
Sweden	72.3	77.5
<b>EU-27 (=13 countries)</b>	<b>Mean of the 13 countries for which completeness rate is ≥ 80%</b>	<b>At least 80%</b>
	76.8	

Data source: ECDC and WHO-Europe. <sup>a</sup>: data for the 2019 cohort

**Figure 2 – Success of tuberculosis treatment in EU-27 (13) countries with  $\geq 80\%$  of completeness rate - cohorts of 2020, data reported in 2021 (%)**



Data source: ECDC and WHO-Europe

### Impact of COVID-19 pandemic

Although the incidence has stagnated around 9 per 100 000 population in recent years, there is a significant drop between 2019 and 2020. The reason for this can most likely be attributed to the COVID-19 crisis. (<https://tuberculose.vrgt.be/sites/default/files/Tuberculose%20in%20Belgi%C3%AB%20infografiek%20register%202020.pdf>)

Among non-Belgians, after a significant fall in standardised incidence between 2019 (26.5/100 000 pop.) and 2020 (21/100 000 pop.), standardised incidence rises again to 29/100 000 pop. in 2021, thus exceeding that observed in 2019. The figures for the last two years should be interpreted with caution, in the context of the Covid-19 pandemic. ([https://www.fares.be/tuberculose/publications/rapports-epidemiologiques/fares-registretbc2021\\_2hd.pdf](https://www.fares.be/tuberculose/publications/rapports-epidemiologiques/fares-registretbc2021_2hd.pdf))

## Key points

- **The successful treatment rate of tuberculosis is an indicator for which WHO European Region have set the target of 85%.**
- **The successful treatment rate of tuberculosis is an indicator composed by two subcomponents which are summed before being reported to the analysed population: people having completed their treatment with a bacteriological proof of negativity, and people who completed their treatment but without bacteriological proof of negativity.**
- **The last report of the Belgian TB register (2021) shows that 82.4% of the people with proven pulmonary tuberculosis in 2020 were successfully treated at one year. This proportion of favourable treatment outcomes corresponds to an increase of 1.3 points of percentage from 2017 (81.1%) but to a decrease of 1.8 points of percentage from 2014 (84.2%). Actually, this rate is quite stable since several years and through the different regions.**
- **Compared to 13 European countries for which outcome data are reported for at least 80% of the people included in each cohort, Belgium shows a poor successful treatment rate of (any site) tuberculosis (67.3%) in penultimate place according to the last available data (cohorts 2020).**
- **The systematic reporting of TB and follow-up of treatment outcomes, operative in Belgium since 2002, represents an important advantage to Belgian Authorities to reach the target set by WHO European Region.**
- **According to the FARES and VRGT, the systematic use of polytherapy, over a long period and the adherence to treatment till completion, are of the utmost importance to improve the successful treatment rate of TB in Belgium. It is necessary for the health care system to be able to support patients to complete this long and difficult treatment. FARES and VRGT have implemented many projects to support this objective over the last few years.**

## References

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