



National Institute for Public Health  
and the Environment  
*Ministry of Health, Welfare and Sport*

# Dépistage des migrants: l'expérience des Pays Bas (Screening of migrants in the Netherlands)

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Guideline Committee, RIVM-CIb



# Outline presentation

- 1 Migrant population in the Netherlands
- 2 TB epidemiology of migrants
- 3 TB screening policy and practice
- 4 Evaluation of TB screening
- 5 Way forward: TB-infection screening
- 6 Ukrainian refugees



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# Migrant population in the Netherlands



# “Migrants differ as well as their risk for TB”



**Eritrea**



**Morocco & Turkey**



**Syria**



▲ Indiase werknemers aan de slag voor Wegener ICT. © Cees Baars

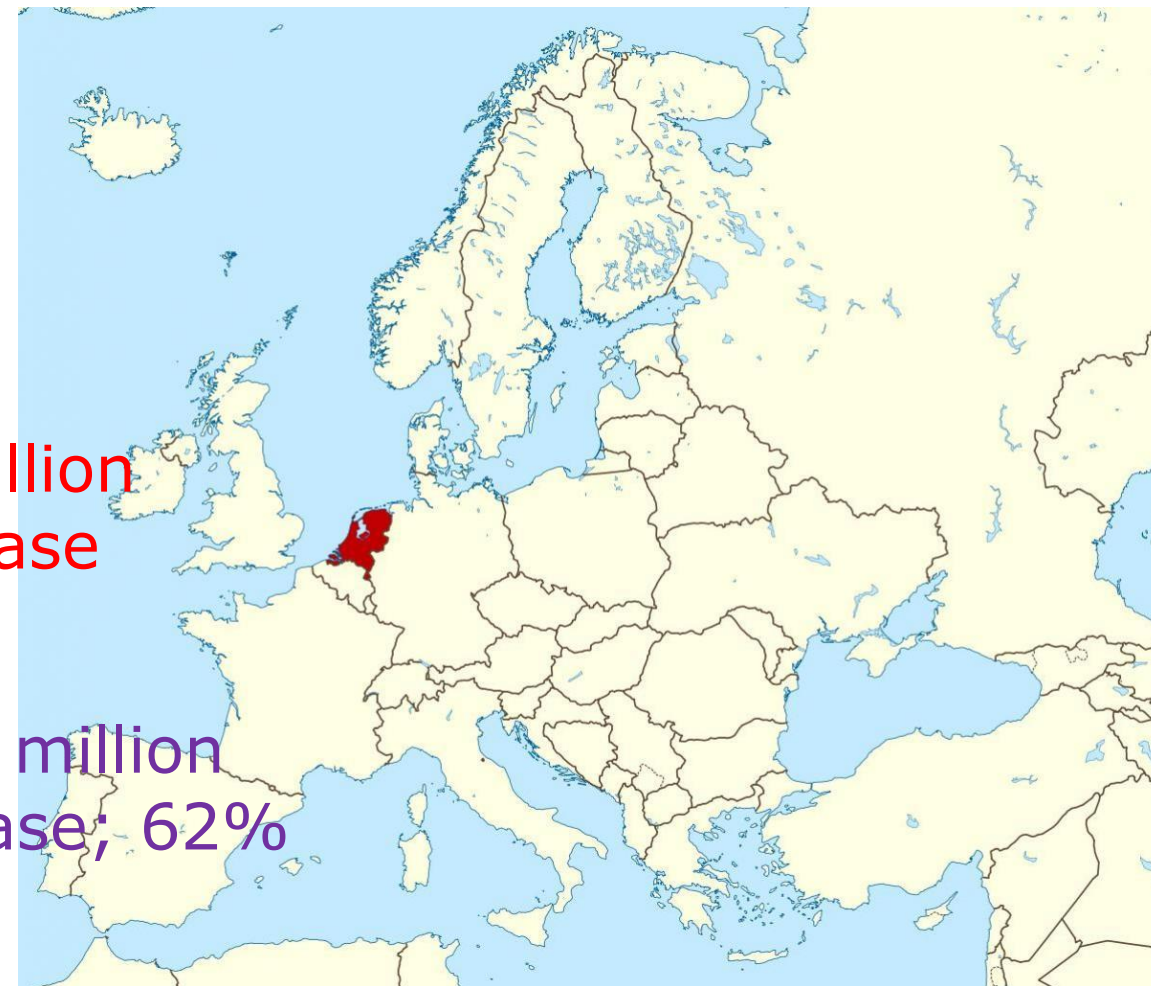
**In 5 jaar tijd ruim 35.000 migranten uit **India** naar ons land**



# Dynamics of migration

## Population of the Netherlands

- > **2000**: 15.9 million people
    - > 1.4 million migrants (9%)
  - > **2021**: 17.5 million people
    - > 2.3 million migrants (13%)
- 1.6 million increase
- 0.9 million increase; 62%





# Migrant population data of the Netherlands

## Residents 1/1/2021 (2,312,000)

Top 5 countries of birth:

1.	Turkey	199,000
2.	Suriname	177,000
3.	Morocco	173,000
4.	Poland	163,000
5.	Germany	108,000
6.	Syria	97,000
	Eritrea	19,800

## New arrivals 2020 (186,000)

Top 5 countries of birth:

1.	Poland	25,531
2.	Germany	10,230
3.	Romania	9,430
4.	Bulgaria	8,473
5.	United Kingdom	6,898
8.	India	6,147
9.	Syria	6,014
	Eritrea	1,755

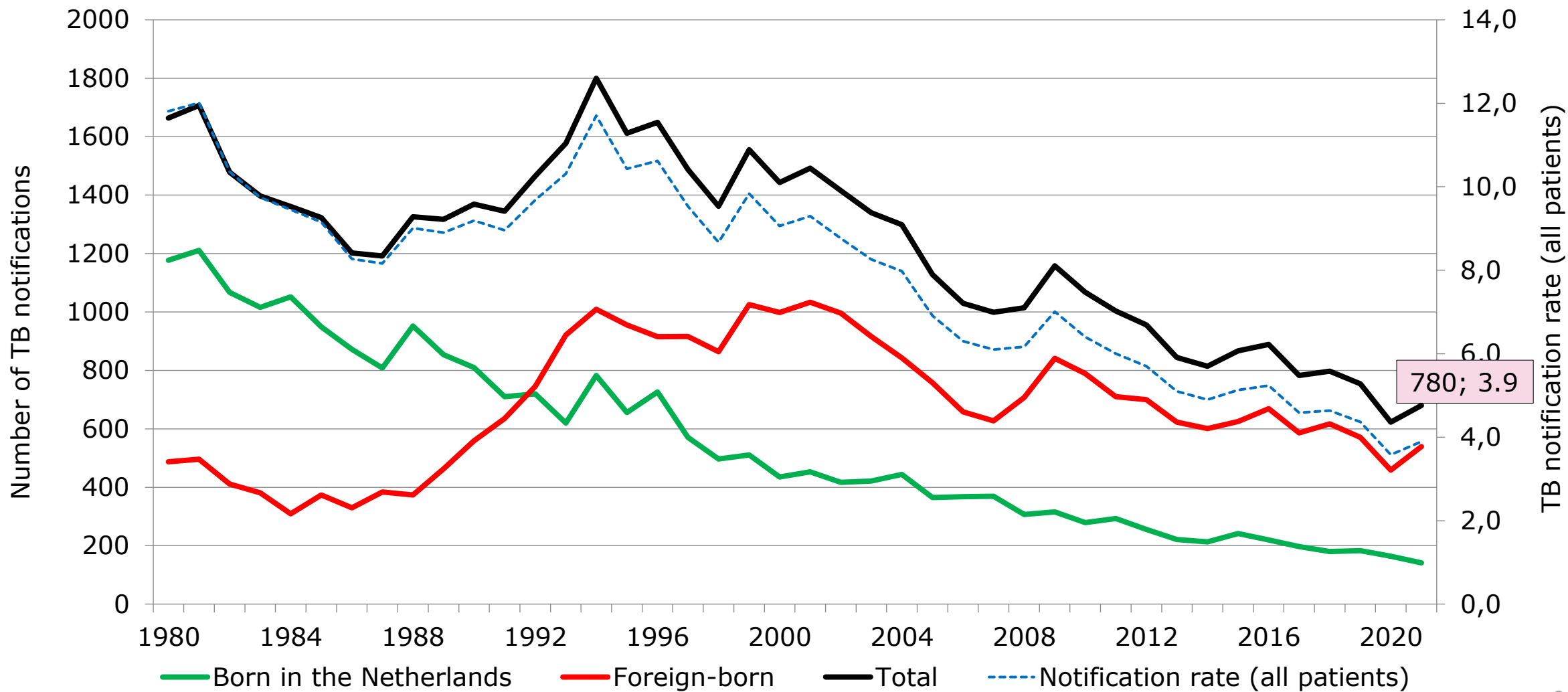


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# TB epidemiology of migrants



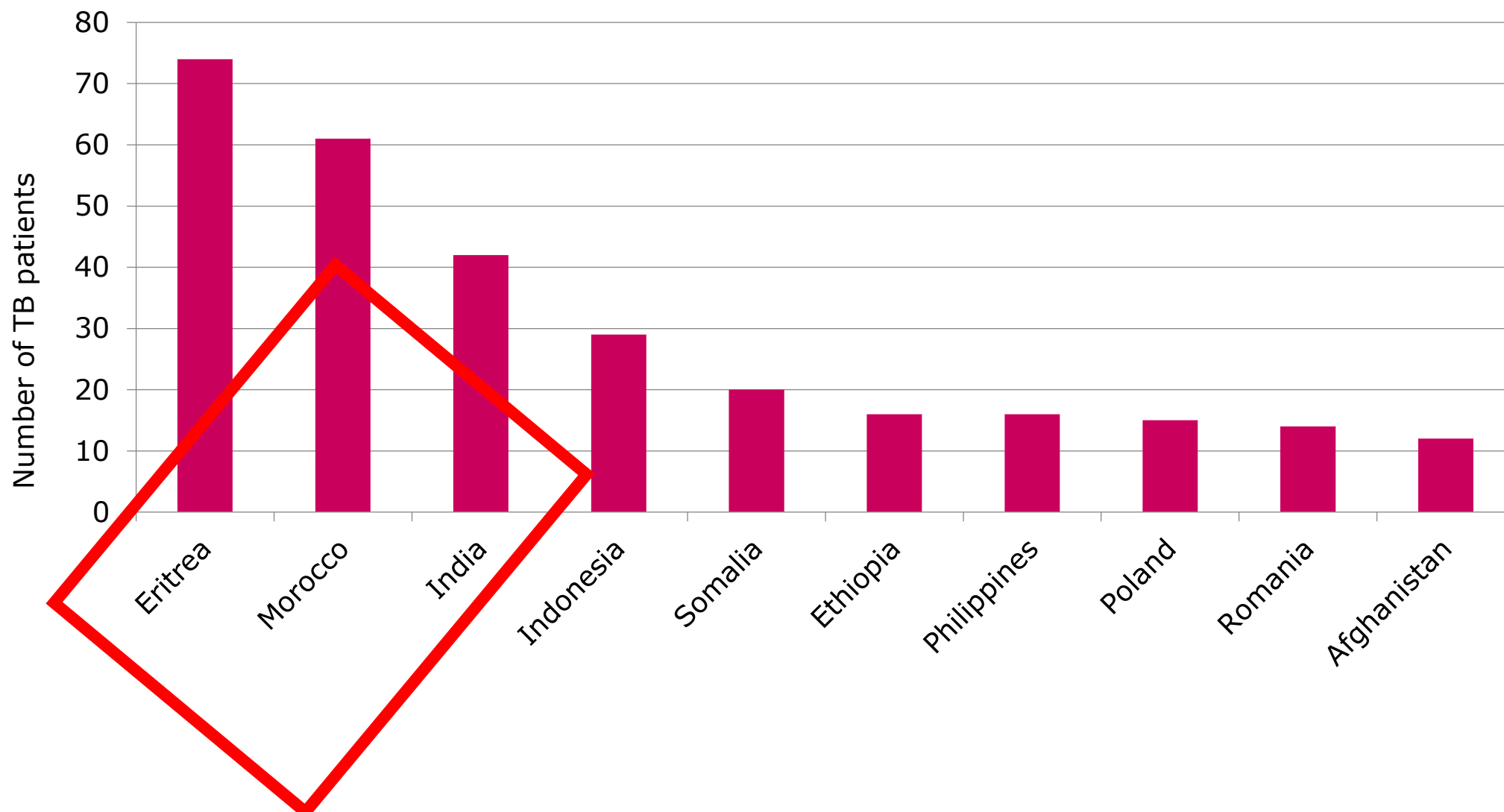
# TB notifications in the Netherlands





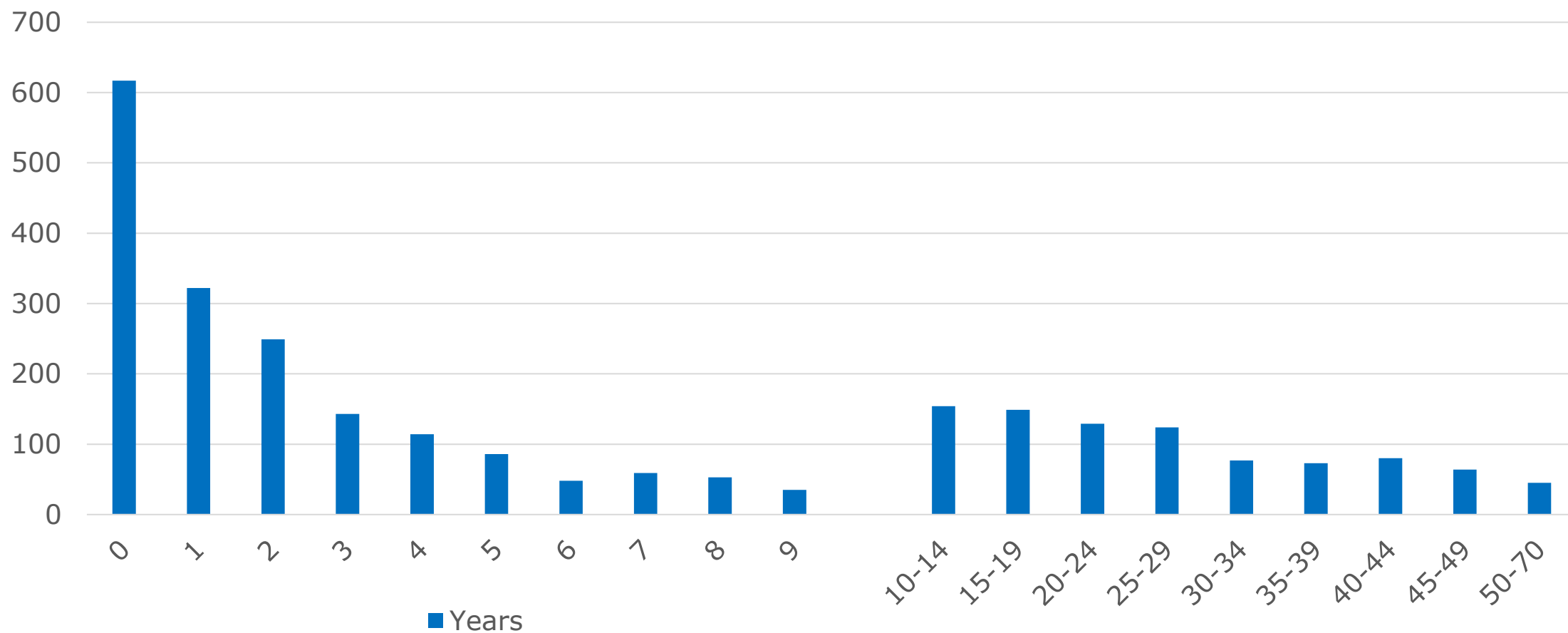


# TB patients by country of origin, 2020



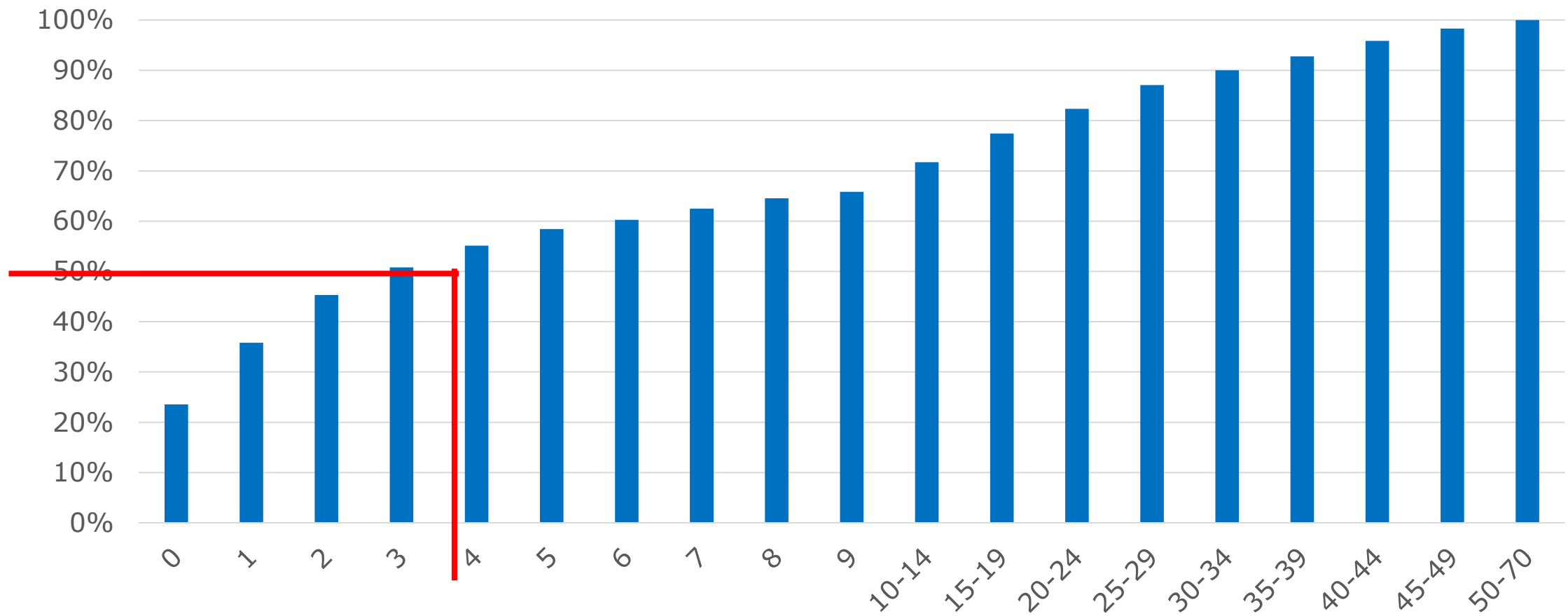


# Duration of residence in the Netherlands at the time of TB diagnosis, 2016-2020



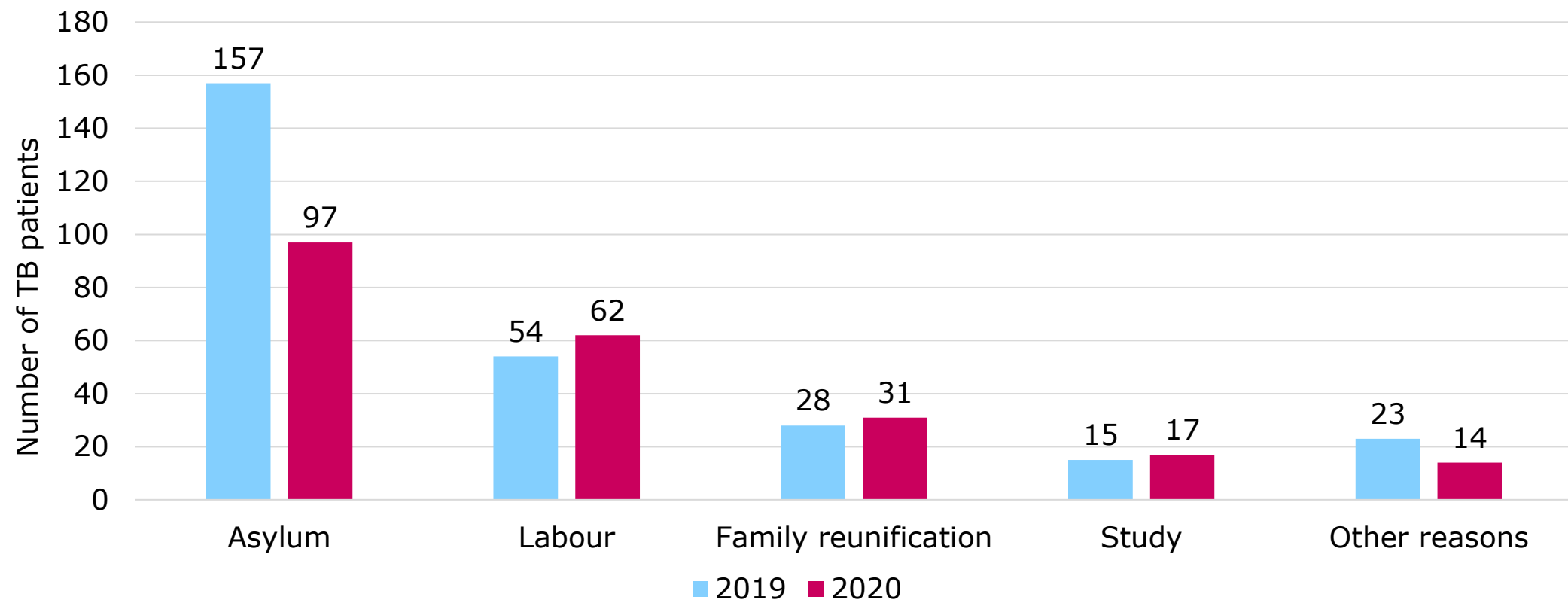


# Duration of residence in the Netherlands at the time of TB diagnosis, 2016-2020





# Number of migrant TB patients <5 years in the Netherlands according to reason of migration





# Screening migrants for TB

## Dépistage des migrants

Mandated by the Immigration Act.

- Exempted, initially, EU/EEA-countries, Switzerland, Australia, New Zealand, Canada, USA, Israel and Suriname.
- Exempted countries was changed several times.



## Two screening pathways: 1) 'regular' immigrants

- > Reason for migration: work, study, family reunification.
- > Screening is mandatory, if intended stay is >3 months and (now) from a country with TB incidence >100/100,000.
- > Screening is done by Public Health Office (GGD) within 1-2 months after arrival.
- > Initially free of charge (cost GGD), but most migrants have to pay themselves nowadays.





## Two screening pathways: 2) asylum seekers/refugees

- > Reason for migration: war, disasters, etc.
- > Initially all screened, but now if the person is from a country with TB incidence  $>50/100,000$ .
- > Screening is done by 2 GGDs within 2 days after arrival at the two reception centres.
- > Contractual arrangements between GGDs and organisation to accommodate asylum seekers.





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# Evaluation of TB Screening

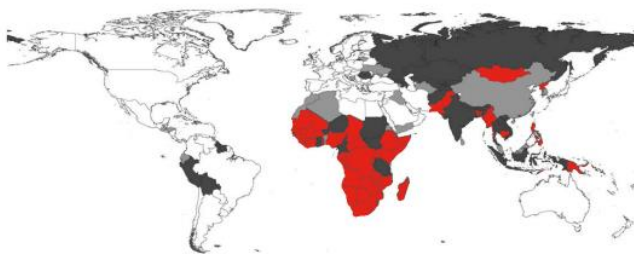




# Evaluation of TB screening

## Evaluatie tuberculosescreening immigranten

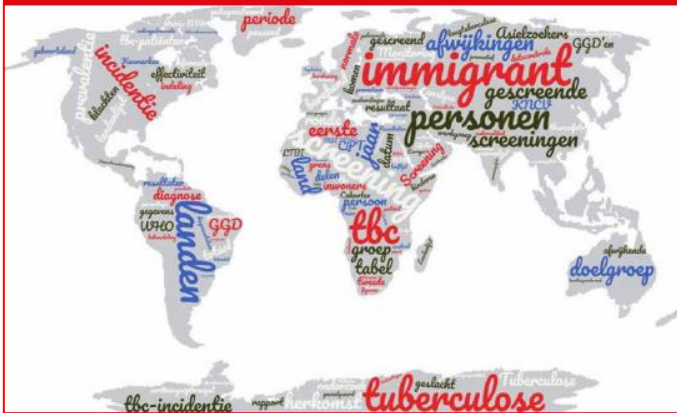
Resultaten binnenkomst- en vervolgscreening op tuberculose van immigranten in de jaren 2005 t/m 2010



Incidentie per 100.000  <50  50-100  100-200  >200

## Evaluatie tuberculosescreening immigranten

Resultaten binnenkomst- en vervolgscreening op tuberculose van immigranten in de jaren 2011-2015



## Evaluatie tuberculosescreening asielzoekers

Resultaten binnenkomst- en vervolgscreening op tuberculose van asielzoekers in de jaren 2011-2015





# Evaluation TB screening immigrants 2005-2010

## Criterion to stop screening:

- > TB prevalence < 50/100.000, or
- > Number Needed to Screen (NNS) > 2000

TABLE 1 Results of chest radiograph screening of immigrants (excluding asylum seekers) in the Netherlands, 2005–2010

	Screened n	TB detected n	TB prevalence per 100 000 (95% CI)
<b>Age years</b>			
0–14	11 020	3	27 (5–80)
15–34	85 352	86	101 (81–124)
35–64	20 406	18	88 (52–139)
≥65	611	1	164 (2–911)
<b>Sex</b>			
Male	52 866	46	87 (64–116)
Female	64 135	62	97 (73–121)
Unknown	388	0	
<b>TB incidence in country of origin per 100 000<sup>#</sup></b>			
<50	31 218	7	22 (9–46)
50–99	30 019	18	60 (36–94)
100–199	32 407	48	148 (109–196)
≥200	21 740	35	161 (112–224)
Unknown	2 005	0	
<b>Total</b>	117 389	108	92 (75–109)
<b>Top five immigration countries</b>			
China	14 949	11	73 (37–132)
Turkey	13 347	4	30 (8–77)
India	9 310	5	53 (17–125)
Morocco	7 425	6	80 (30–176)
Indonesia	5 888	19	322 (194–504)

<sup>#</sup>: according to the World Health Organization in 2008.



# Evaluation TB screening immigrants 2011-2015

**1/4/2019 screening was stopped for immigrants (excluding asylum seekers) from countries with TB incidence 50-100/100,000**

TB incidence country of origin	Number	TB found by screening	Yield per 100,000 (+ Conf. Interval)
≤50	26,101	7	<del>27 (11-55)</del>
51-100	37,787	11	29 (15-52)
101-200	36,548	41	112 (80-152)
>200	13,028	38	292 (206-400)
unknown	2,837	0	-
<b>Total</b>	<b>116,200</b>	<b>97</b>	<b>83 (67-100)</b>



# Evaluation screening asylum seekers 2011-Sept. 2015

## Low yield of screening asylum seekers from countries with a tuberculosis incidence of <50 per 100 000 population

TABLE 1 Results of screening asylum seekers in the Netherlands from countries with a tuberculosis (TB) incidence <50 per 100 000 people, 2011–September 2015

	Number screened	TB identified via screening	TB prevalence of screening per 100 000	95% CI
<b>TB incidence in the country of origin per 100 000<sup>#</sup></b>				
0–9.9	423			
10.0–19.9	34 825	8	23.0	10.7–43.6
20.0–29.9	3 496			
30.0–39.9	166			
40.0–49.9	6 529	4	61.3	19.5–147
<b>Total</b>	<b>45 439</b>	<b>12</b>	<b>26.4</b>	<b>14.3–44.9</b>
<b>Top 5 countries<sup>#</sup></b>				
Syria <sup>¶</sup>	31 470	7	22.2	9.7–44.0
Iraq <sup>+</sup>	5 327	3	56.3	14.3–153
Iran <sup>§</sup>	3 086			
Former non-European Union Yugoslav countries <sup>f,##</sup>	2 051	2	97.5	16.4–322
Albania <sup>¶¶</sup>	547			

Data are presented as n, unless otherwise stated. <sup>#</sup>: TB incidence according to the World Health Organization in 2013 [12]; <sup>¶</sup>: incidence 15 per 100 000; <sup>+</sup>: incidence 45 per 100 000; <sup>§</sup>: incidence 22 per 100 000; <sup>f</sup>: TB incidence of Bosnia and Herzegovina, Macedonia, Montenegro and Serbia were weighted according to population; <sup>##</sup>: incidence 25 per 100 000; <sup>¶¶</sup>: incidence 18 per 100 000.

**NNS for  
Syrian  
asylum  
seekers:**

$$31470 / 7 = 3,787$$



# Evaluation TB screening asylum seekers 2011-2015

<b>TB incidence country of origin</b>	<b>Number</b>	<b>TB found by screening</b>	<b>Yield per 100,000 (+ Conf. Interval)</b>
≤50	49,142	16	33 (19-53)
51-100	5,883	11	189 (94-337)
101-200	10,385	34	327 (227-457)
>200	23,966	65	271 (205-337)
unknown	10,180	0	-
<b>Total</b>	<b>99,506</b>	<b>126</b>	<b>127 (105-148)</b>



Very high rates among certain migrant groups

# **High Incidence of Active Tuberculosis in Asylum Seekers from Eritrea and Somalia in the First 5 Years after Arrival in the Netherlands**

Josy van den Boogaard, Erika Slump, Henriette J. Schimmel, Wim van der Hoek,  
Susan van den Hof, Gerard de Vries



# Methods

- > Sources:
  - National TB screening register
  - National TB Register
- > Prevalent TB: those with active TB at arrival (as registered in National TB Register)
- > Incident TB: those developing TB after negative screen (by year)



# Results

**Table 1.** Characteristics of asylum seekers from Eritrea and Somalia in whom active TB was detected, the Netherlands, 2013–2017\*

Characteristic	Total study population	Country of origin		p value†
		Eritrea	Somalia	
Population size, no.	26,057	21,182	4,875	NA
Arrivals per year				
2013	3,741 (14.4)	911 (4.3)	2,830 (58.1)	<0.001
2014	5,353 (20.5)	4,168 (19.7)	1,185 (24.3)	<0.001
2015	8,889 (34.1)	8,378 (39.6)	511 (10.5)	<0.001
2016	3,484 (13.4)	3,250 (15.3)	234 (4.8)	<0.001
2017	4,590 (17.6)	4,475 (21.1)	115 (2.4)	<0.001
Age group				
<18 y	10,750 (41.3)	7,320 (34.6)	3,430 (70.4)	<0.001
≥18 y	15,307 (58.7)	13,862 (65.4)	1,445 (29.6)	<0.001
Sex				
F	10,731 (41.2)	8,191 (38.7)	2,520 (51.7)	<0.001
M	15,326 (58.8)	12,991 (61.3)	2,355 (48.3)	<0.001
Persons with prevalent TB	78 (0.3)	61 (0.3)	17 (0.4)	0.48
Of whom had PTB	59/78 (75.6)	49/61 (80.3)	10/17 (62.5)	0.068

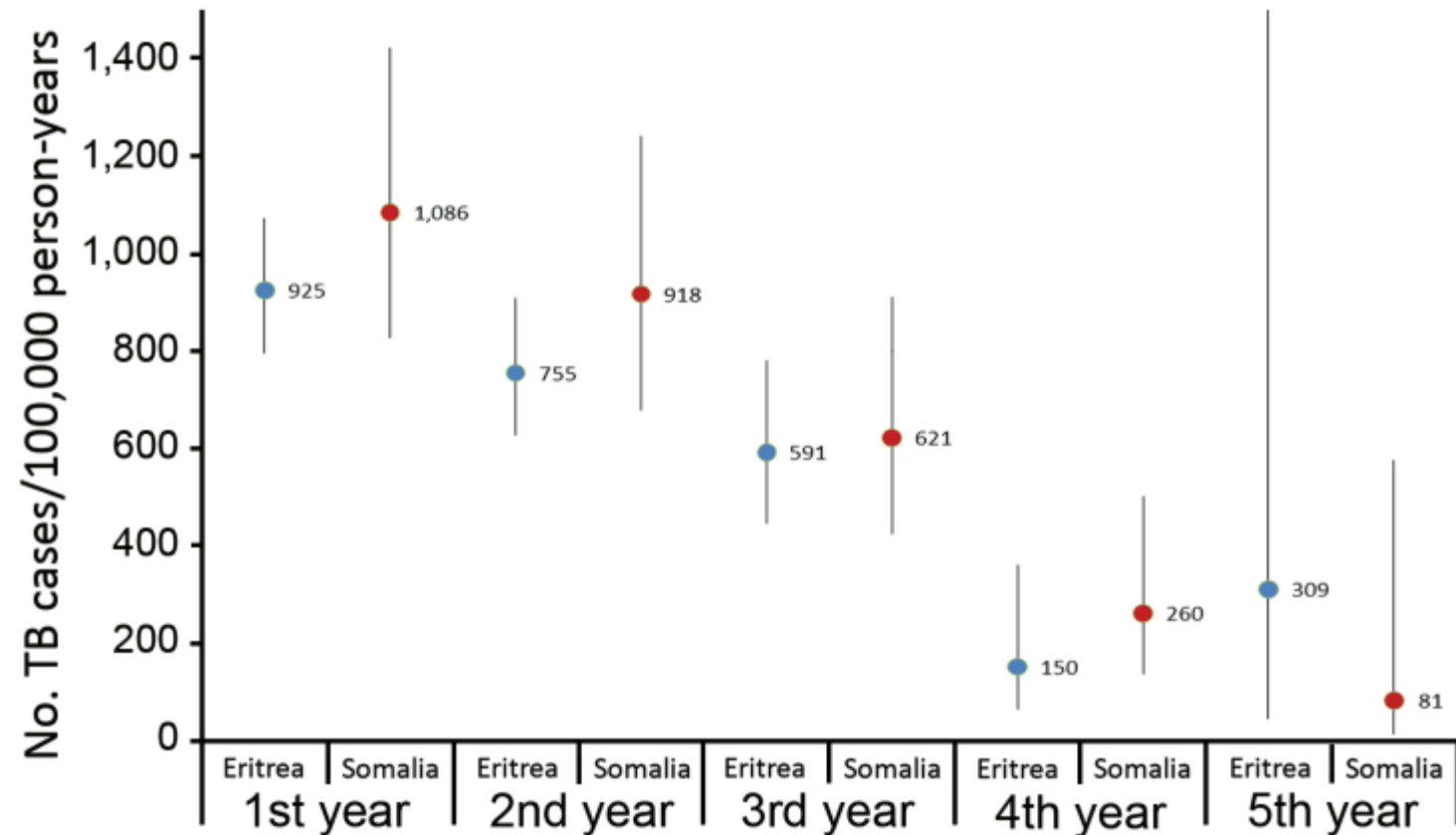




# Results

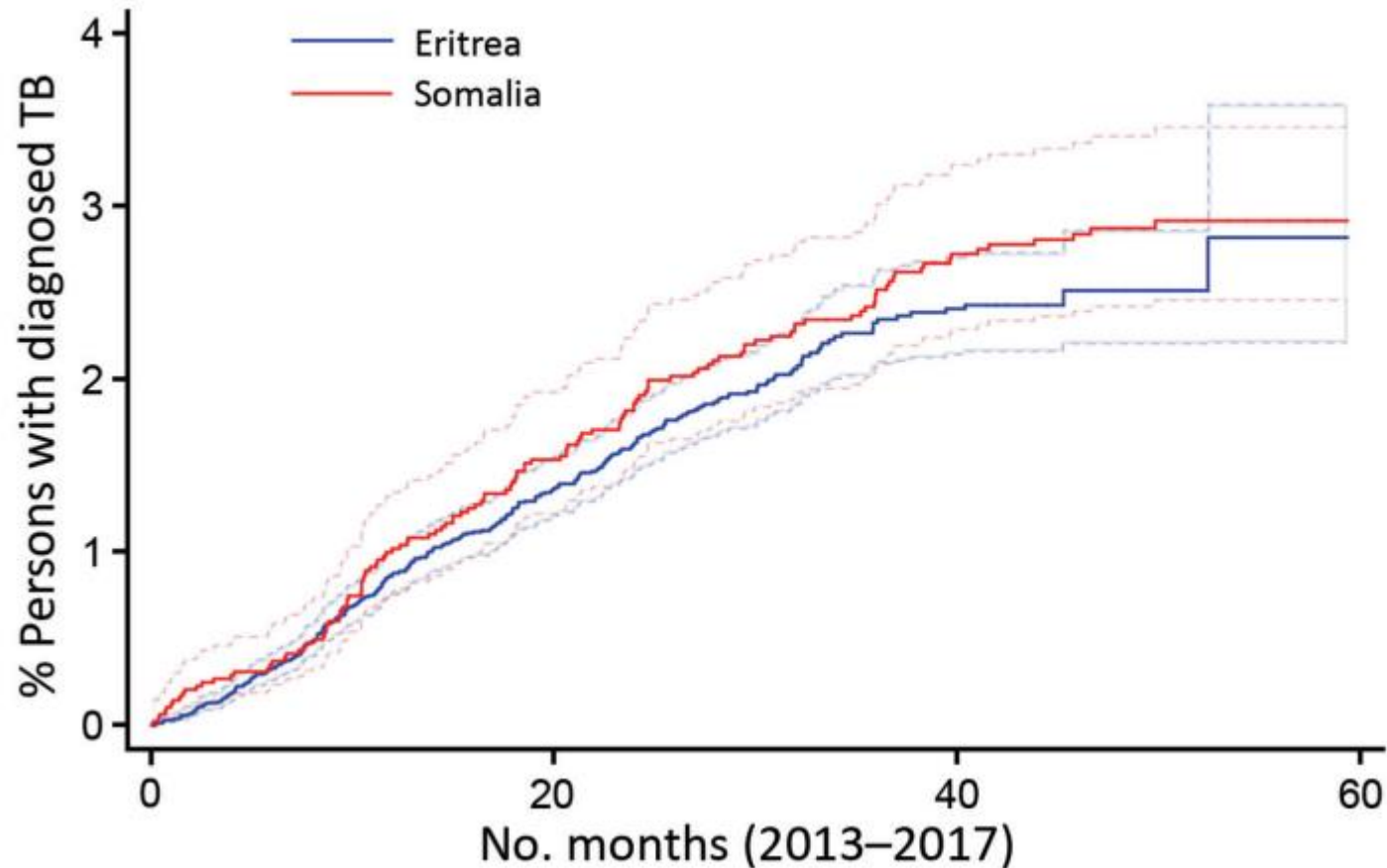
**Figure 1.** Trend of TB incidence rates (cases/100,000 person-years) of asylum seekers arriving from Eritrea and Somalia in the Netherlands, 2013–2017, by year after arrival. Error bars indicate 95% CIs; upper limit of the 95% CI for persons from Eritrea in the fifth year after arrival (2017) is 2,195. TB, tuberculosis.

- > Red: Somalia
- > Blue: Eritrea





# Results



**Figure 2.** Kaplan-Meier curve indicating risk for TB among asylum seekers arriving from Eritrea and Somalia in the Netherlands, over a 60-month follow-up period (2013–2017). TB, tuberculosis.

**~3% developed TB after arrival**  
**+ 0.3% had prevalent TB (not in graph)**



# Lessons learned

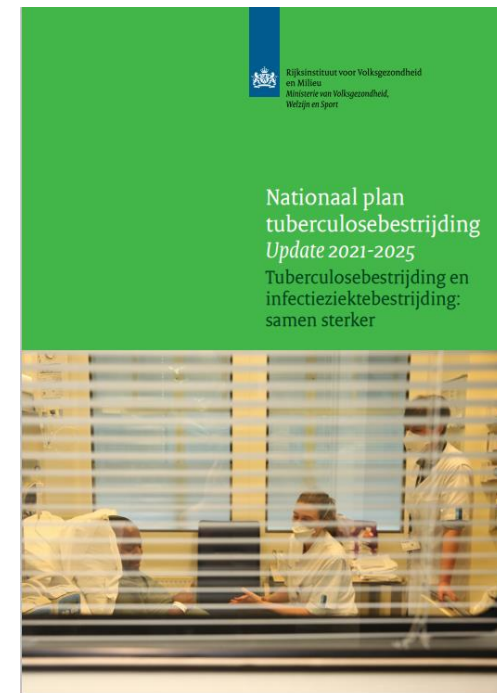
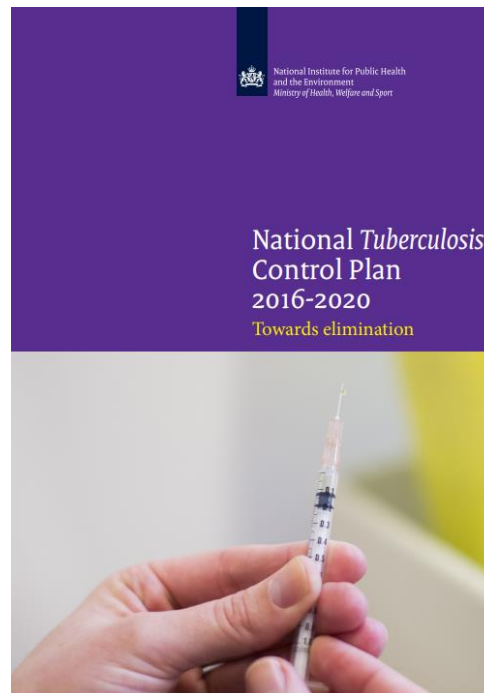
- 1 M&E system essential to evaluate
  - 2 Large differences in yield, related to country of origin and migration route
  - 3 Screening efficiency can be increased by targeting those a highest risk
  - 4 Substantial number of migrants develop TB after negative X-ray screen
- > Need to screen for TB infection



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# Way forward: Screening migrants for (latent) TB infection

**Main recommendation  
in last 2 National TB  
Control Plans**  
(2016-2020, 2021-2025)





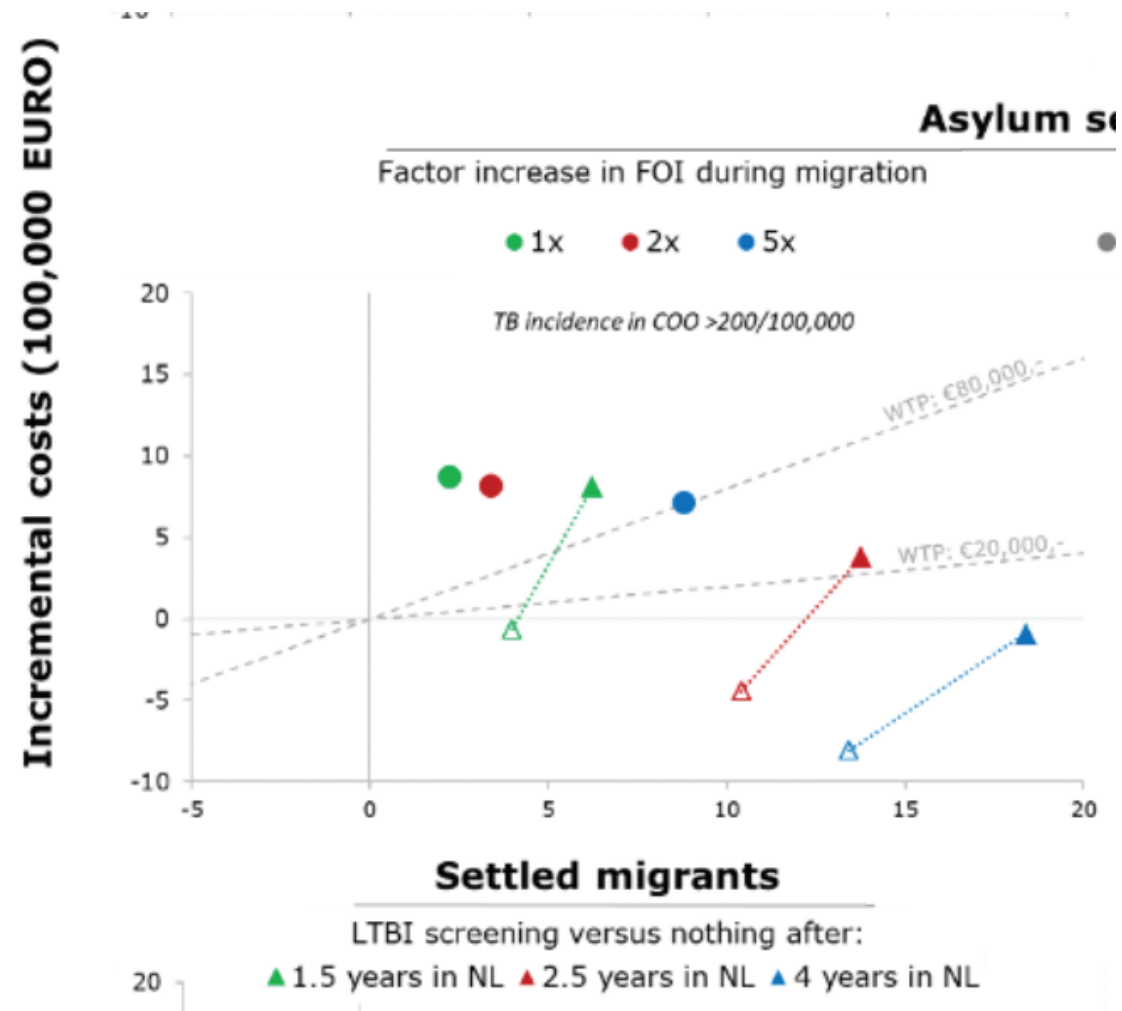
# Studies on TBI-screening migrants

	Eligible	Screened	TBI / TB disease	Started Rx	Completed Rx	Publication
Immigrants (>50/100.000)	588	566 (96%)	94 (17%) <b>+ 3 TB</b>	49 (52%)	34 (69%)	Spruijt, PloSONE, 2019
Asylum seekers ≥12 years (>200/100.000)	1055	719 (68%)	178 (25%) <b>+ 4 TB</b>	149 (84%)	129 (87%)	Spruijt, ERJ, 2019
Resident migrants <5 years (Eritrea)	779	257 (28%)	30 (12%) <b>+ 1 TB</b>	29 (97%)	28 (97%)	Spruijt, BMC PH, 2020



# Cost-effectiveness analysis

- > Asylum seekers >200/100.000 – cost saving
- > Immigrants >200/100.000 – cost effective
- > Others: not cost-effective
- > **In specific high-TB-risk migrant groups TBI-screening should be considered as an alternative to current CXR screening strategies in low-TB-incidence countries.**





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# Current screening algorithms



# Current screening algorithms migrants

TB incidence in country of origin	'Regular' immigrants		Asylum seekers	
	< 18 years	≥ 18 years	< 12 years	≥ 12 years
50-100	Not applicable		CXR*	CXR
100-200	Symptom questionnaire + TBI-test	CXR		CXR
>200		CXR + f/u CXR (or TBI-test)		CXR + f/u CXR (or TBI-test)**





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# Ukrainian refugees





# Screening NL: yes or no?

- > TB incidence Ukraine  
77/100.000
- > Few Ukrainian came to the Netherlands last years;
- > 0-2 Ukrainian TB patients annually in our register

## **Our screening policy:**

- > Ukrainian immigrants: No
- > Ukrainian asylum seekers: Yes
- > Ukrainian refugees: Yes/No?



## Screening NL: no

- > TB incidence Ukraine  
77/100.000
- > Few Ukrainian came to the Netherlands last years;
- > 0-2 Ukrainian TB patients annually in our register

### **Our screening policy:**

- > Ukrainian immigrants: No
- > Ukrainian asylum seekers: Yes
- > **Ukrainian refugees: No**



# Merci de votre attention!



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