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Federal Department of Home Affairs
Federal Office of Public Health
Public Health Directorate

Tuberculosis screening in Switzerland past – present – future

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History of TB screening in Switzerland (1948-1991)

- 1948: Start of TB screening by radioscopy of immigrant workers (1960s: miniature x-ray)
- **1974-1991: 14 Federal «Border Health Posts» for radiographic TB screening**
 - **Seasonal immigrant workers**

App. 200,000/y in 1980s, «1 radiographically active case per 2300»
 - **Refugees and asylum seekers (age ≥ 14 years)**

«Border Health Posts» and cantonal radiography centers

1984-87: ~75% coverage, prevalence 290/100,000
(*Raeber PA, Ther Umschau 10, 1990*)



«Why screen for TB?» (1990)

«Would easy access to the health care system not be sufficient?»

Plans to abandon screening (FOPH) politically not acceptable:

- Screening (radiography) of immigrant labor maintained
- Screening of asylum seekers, centralized in 5 reception centers (radiography and tuberculin skin test)



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 - Seasonal immigrant workers
 - Refugees and asylum seekers
- 1992-2005: - TB screening of immigrant labor (radiography)
 - TB screening of asylum seekers (radiography if ≥ 14 yrs)
 - Screening of asylum seekers for latent TB infection (LTBI) (tuberculin skin test)
- 2006-2017: TB screening of asylum seekers with interview-based scoring



Yield of radiographic screening of immigrant labor force (1992-2005)

Target group: All immigrants getting a work permit for the first time, except if from EU, EFTA, USA, Canada, Australia, New Zealand

1995-1999 (complete data of 13 «Border Health Posts»):

12,442 radiographs

136 abnormal findings

6 TB cases

Number needed to screen (NNS) to detect one case: 2074

Early 2000s: **NNS ~7000** (*Bulletin FOPH Jan 3, 2006*)



Yield of radiographic screening of asylum seekers (1992-2005)

	2004-2005 (5 centers)	2004 (4 centers)
Asylum seekers (n)	21,727	8,995
Cases* (n)	31	27
Number needed to screen to detect one pulmonary culture-confirmed case	701	333
	Schneeberger-Geisler S, IJTLD 2010	Mathez C, Swiss Med Wkly 2007

*Both studies: culture-positive pulmonary TB cases

Referred to by: *Kunst H, IJTLD 2017*



Main effect of immigrant screening for TB

- Reduces delay to treatment (e.g. 2-3 months)
- Thereby prevents some transmission, mostly within the respective immigrant group

Verver S, Int J Tuberc Lung Dis 2001; 5: 419

- Screened cohort will have fewer cases over 10 years (~10%)

de Vlas SJ. Project ECDC.572, Part C. Rotterdam, Erasmus Medical Centre 2008



Screening for LTBI in asylum seekers (1994-2003 data)

Tuberculin skin tests (TST)

Total number of asylum seekers	223,319	
TST done and result available	191,870	86%
TST positive*	30,839	16%

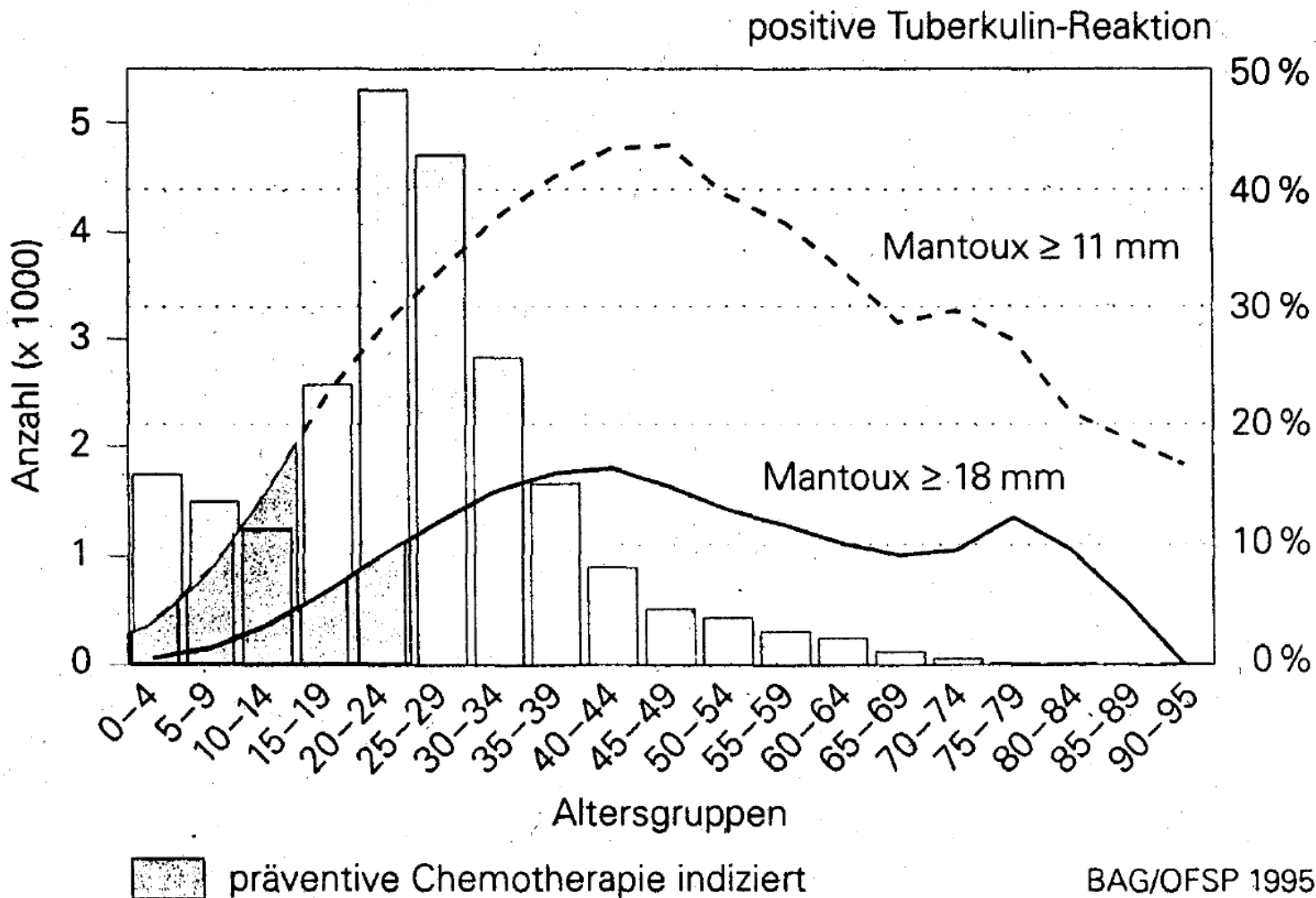
* 10 mm for age <15 years
15 mm for age >=15 years

No data on number of treatments started for LTBI

*P.S. Indication for treatment was more restrictive (5% in 1992-1993):
<15 years >=11 mm; 15-25 years >=18mm (Bull FOPH 24.4.1995)*



Screening for LTBI in asylum seekers (1992-1993 data, courtesy Hans Rieder)





LTBI screening – WHO guidelines 2015

“Systematic testing and treatment of LTBI should be considered for prisoners, healthcare workers, **immigrants from high TB burden countries**, homeless persons and illicit drug users.”

“**Conditional recommendation, low to very low quality of evidence**”

*Guidelines on the management of latent tuberculosis infection
WHO/HTM/TB/2015.01*



LTBI screening – WHO guidelines 2015

Conditional recommendation, low to very low quality of evidence

“[WHO] Panel concluded that **“the desirable effects of adherence to the recommendation probably outweigh the undesirable effects, but the Panel was not confident** about these trade-offs.

Reasons for not being confident included:

- **absence of high-quality evidence (data to support the recommendation are scant);**
- presence of **imprecise estimates of benefits or harms** (new evidence may result in changing the balance of risk to benefit);
- uncertainty or variation regarding how different individuals value the outcomes (only applicable to a specific group, population or setting);
- **small benefits and benefits that may not be worth the costs** (including the costs of implementing the recommendation)”



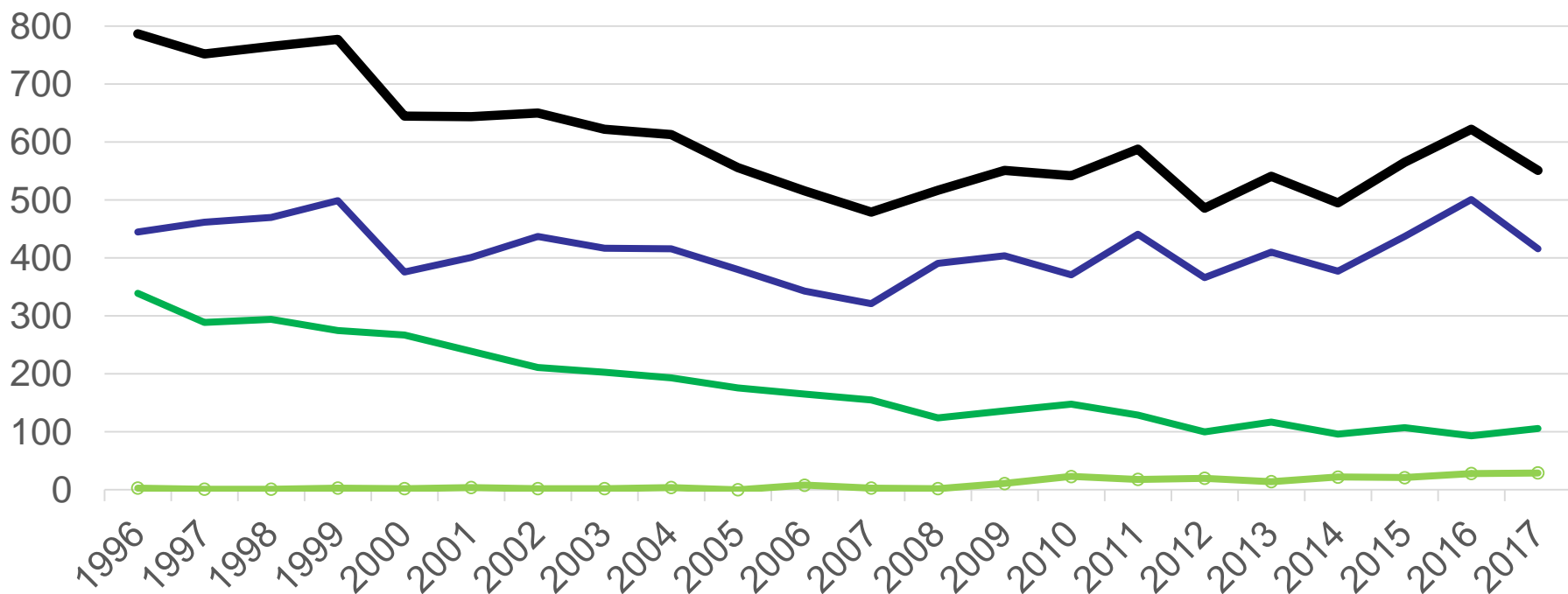
Screen immigrants for LTBI?

- TB elimination drive: invented primarily for funding purposes
USA in 1980s
WHO in 2014 «End TB strategy»: *«If we don't come up with new bold ideas, funding will go down» (Personal communication Raviglione M, WHO, Münchenwiler Symposium 2014)*
- WHO: «The target [of elimination by 2050] will not be reached with the technology and procedures we have today»
Dye C, Annu. Rev. Public Health 2013
- No elimination possible in low-prevalence countries with immigration from high-prevalence countries



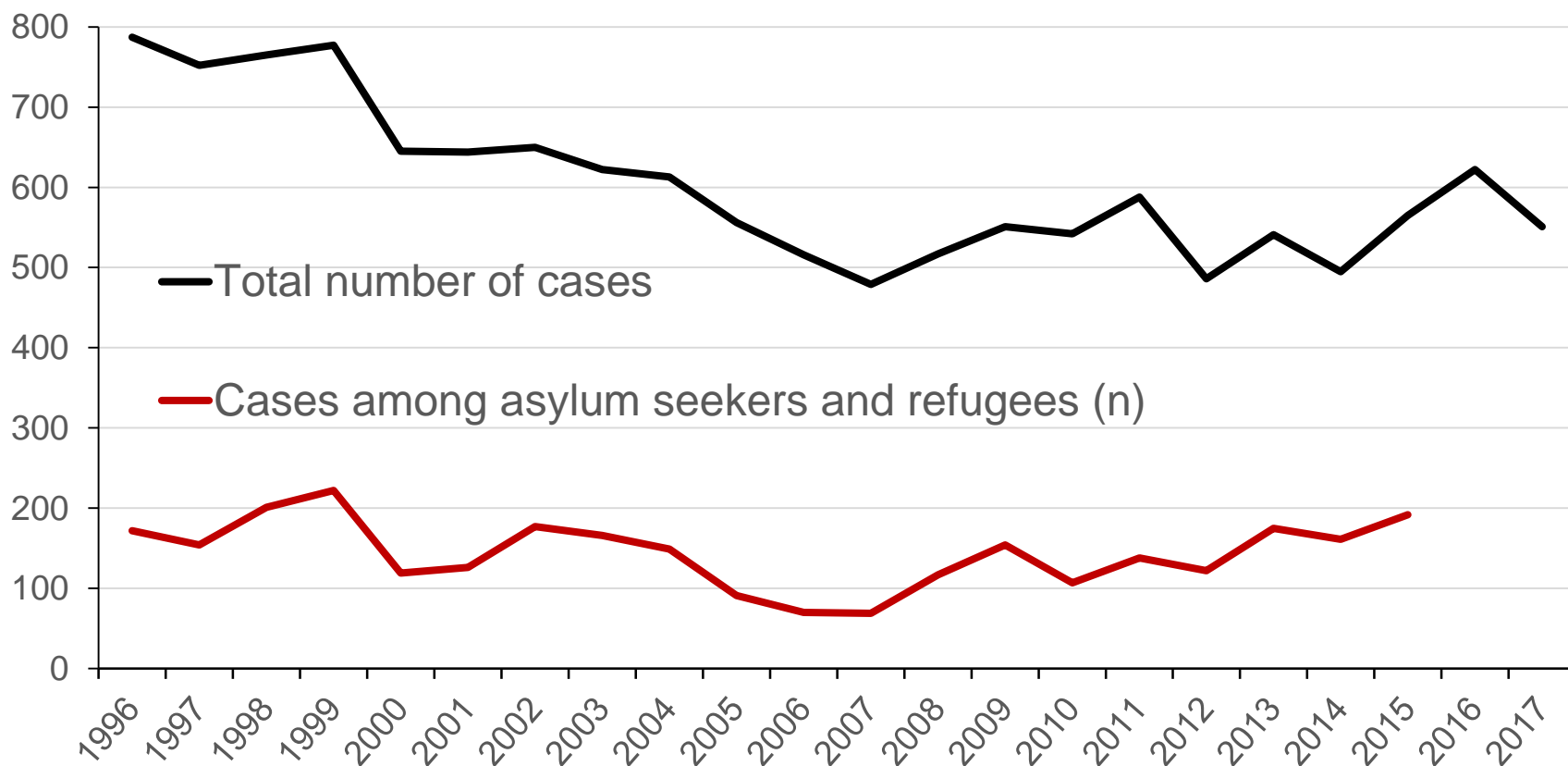
Origin of notified cases of tuberculosis Switzerland 1996-2017

— Total — Foreign — Swiss — Unknown origin





TB cases among asylum seekers / refugees vs. total n Switzerland 1996-2017





Screen immigrants for LTBI?

- Elimination drive, invented for funding purposes (?)
USA in 1980s; WHO in 2014
- «The target [of elimination by 2050] will not be reached with the technology and procedures we have today» Dye C, Annu. Rev. Public Health 2013
- No elimination possible in low-prevalence countries with immigration
- Treatment of LTBI found in current contact tracings in Switzerland: Room for improvement («low-hanging fruit»)?



More LTBI screening needed?

LTBI treatments in Switzerland from contact tracings (data from Swiss Lung Association)

Year	2014	2015
Contact tracings	268	247
Tests with available results	2873	2339
Infected persons	340	245
LTBI treatments started	147 43%	133 54%
LTBI treatments carried out to the end	119 35%	103 42%



Screening – a priority?

CDC
CENTERS FOR DISEASE CONTROL
AND PREVENTION

September 8, 1995 / Vol. 44 / No. RR-11

MMWR[™]

*Recommendations
and
Reports*

MORBIDITY AND MORTALITY WEEKLY REPORT

Screening for Tuberculosis and Tuberculosis Infection in High-Risk Populations

“In general, screening should not be given preference over higher priority activities (e.g., treatment of TB patients and contact investigation).”



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 - TB screening of asylum seekers (radiography)
 - LTBI screening of asylum seekers (tuberculin skin test).
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Decision not to screen for LTBI after 2005

- Intention: Treatment would reduce future TB cases
- Screening test positive: possible remote contact to tuberculosis, lower progression rates* compared to contact tracing
- Treatment of ~20% of asymptomatic asylum seekers is not feasible – trying it is costly.
- We have tried (1992-2005) and failed!

**Shea KM, Am J Epi 2014: Reactivation rate
<1 case/1000 person-years in TST positive*



Decision to abandon routine radiography in 2006

Background

- Limited effectiveness

Dasgupta K. Eur Respir J 2005; 25: 1107

- High costs

(Swiss data: 10% of persons screened had abnormal radiographs requiring microbiological investigations.)

Reason

- Popular referendum on national debt brake (2001)
 - > Limit on deficit spending by federal government
 - > Linear budget cuts



TB screening 2006-2017

- Federal Reception Centers for asylum seekers
 - Nurse consultation with IT tool: Score based on TB prevalence in country of origin, person's history of TB, current symptoms, clinical impression (cf. generic version on www.tb-screen.ch)
- Radiography in approximately 4%



Evaluation of yield: Comparison to x-ray

Outcome: Culture-positive pulmonary TB cases starting treatment within 90 days after screening

	2004-2005 Radiography	2007-2008 Interview
Asylum seekers (n)	21,727	23,402
Cases (n)	31	29
Period prevalence (n/10,000)	14.3	12.4
Median time from screening to start of treatment (days)	6	25



Tuberculosis (TB) and latent TB (LTBI) in Federal Reception Centers (FRC) 2014-2017

	2014	2015	2016	2017	Total 2014-2017
TB diagnosed while in FRC	24	33	49	31	137
Arrival with diagnosis of TB	8	3	9	12	32
LTBI diagnosed in FRC	3	4	5	10	22
Arrival with diagnosis of LTBI	0	2	3	4	9
Total number of asylum seekers screened	20658	37855	21782	14188	94483



Period prevalence of TB in Federal Reception Centers for asylum seekers 2014-2017

	Asylum seekers (n)	TB cases diagnosed (n)	Period prevalence / 100,000	“Number needed to stay” for one diagnosis of TB
Somalia	3991	53	1327	75
Tibet	776	5	644	155
Sudan	753	3	398	251
Georgia	1874	7	374	268
Guinea	2150	6	279	358
Gambia	2623	5	191	525
Eritrea	20140	30	149	671
Morocco	2179	3	138	726
Nigeria	3470	3	86	1157
Afghanistan	12343	4	32	3086



Period prevalence of TB among Somali asylum seekers in Federal Reception Centers (2014-2017)

	2014	2015	2016	2017
Cases/ «stays»	8/637	7/1266	23/1407	15/681
«Number of stays needed»/case	80	181	61	45
MDR (n)	?	>=1	>=3	>=4



TB screening and cases diagnosed in Federal Reception Centers 2016

	Altstä	BS	BE	Chiasso	Kreuzl	Vallorbe	ZH	Total
MD consultation before registration in screening system	0	1	1	6	0	0	0	8
From screening to MD to diagnosis without delay	3	5	0	21	3	1	1	34
From screening not to MD, diagnosis later (initially missed diagnosis)	0	2	1	3	0	0	1	7
Total	3	8	2	30	3	1	2	49



Screening for TB (first 30 weeks of 2017) Are the defined procedures respected?

Asylum requests in federal reception centers: N=10,788

Score >9, radiograph needed	499 (4.6%)
Radiograph taken	447 (90%) [2016: 97%]
Radiograph not normal	46 (10%) [2016: 12%]
Microbiological specimens taken	37 (80% of abnormal x-rays) [2016: 73%]



Screening for TB disease by tuberculin skin test?

Recommendation by Pediatric Infectious Diseases Group of Switzerland (PIGS)
(*Bernhard S, Paediatrica 2016*)

Target group: Asylum seekers <5 years of age born abroad

Stated objective: To diagnose existing TB disease before symptoms appear

Stated rationale: Majority of children <5 years of age progress to disease within 6 months after infection.

FOPH does not support the recommendation:

- The cohort to be tested is 1500 children per year.
- There is one (01) case per year in this cohort (one complicated case per 10 yrs).
- It is unlikely that the case will be screened exactly at the time stated above.
- WHO recommends against using any screening test for this purpose (*WHO/HTM/TB/2013.04*).
- If the objective were to find and treat LTBI: Test >>1500 children to prevent one case (Ethical? Cost-effective? CHF >1 million per case prevented)



From 2018 onward:

**“Communicable diseases in collective centers for
asylum seekers in Switzerland: the new national
concept”**



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Eidgenössisches Departement des Innern EDI
Bundesamt für Gesundheit BAG

Eidgenössisches Justiz- und Polizeidepartement EJPD
Staatssekretariat für Migration SEM

Gesundheitsversorgung für Asylsuchende in Asylzentren des Bundes und in den Kollektiv- unterkünften der Kantone

Konzept zur Sicherstellung der Erkennung, Behandlung
und Verhütung von übertragbaren Krankheiten sowie
des Zugangs zur notwendigen Gesundheitsversorgung



2012 revision of legal framework

- Epidemics Act (RS 818.101) and its ordinance (RS 818.101.1)
- Relevant articles: Art. 19 in RS 818.101 and Art. 31 in RS 818.101.1
- Enacted 2016 (art. 31: 2018)



Responsibilities

Federal Office of Public Health (FOPH)

- Recommendations, directives and procedures
- Technical and administrative procedures
- Provision of information material
- Periodical control of the effectiveness and efficacy of the prevention measures

State Secretariat for Migration (SEM)

- Implementation of the measures as mentioned in Art 31 OEp
 - Mandatory information
 - Access to primary health care
 - Access to vaccinations / prevention material
 - Coordination with the cantons
 - Evaluation



Federal centers

- To be carried out by **nurses**
 - **Medical information upon arrival**
 - **First consultation:** not compulsory, but strongly recommended
 - **Individual medical file** for each asylum seeker
- Access to vaccinations
- Written cooperation **agreements** with physicians of the centres
 - Supervision of the nurse
- Costs covered for **interpreters** for the physicians of the centre
- Directives and procedures in the case of an outbreak of communicable diseases in the centres
- Teaching module on transcultural clinical competences «Séminaire **Compétences Cliniques Transculturelles (CCT)** »



Questionnaire (IT tool) for the first consultation

Mandated by the FOPH

- **Interview on various subjects (including questions and scoring of www.tb-screen.ch)**
- 14 languages so far; pictogrammes, spoken, written
- **No saving of electronic data**
- Answers can be printed and form **part of the medical file**



Acknowledgements

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