



Potential of the electronic Personal Health Record system for migrants and refugees arriving in Europe.



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# Migrant health data

## FIGURE 1. WHA RESOLUTION ON MIGRANT HEALTH,

### Monitoring migrant health

- Develop health information systems, collect and disseminate data
- Assess, analyse migrants' health
- Disaggregate information by relevant categories



### HEALTH EVIDENCE NETWORK SYNTHESIS REPORT 66

What is the evidence on availability and integration of refugee and migrant health data in health information systems in the WHO European Region?

Themed issues on migration and health, X

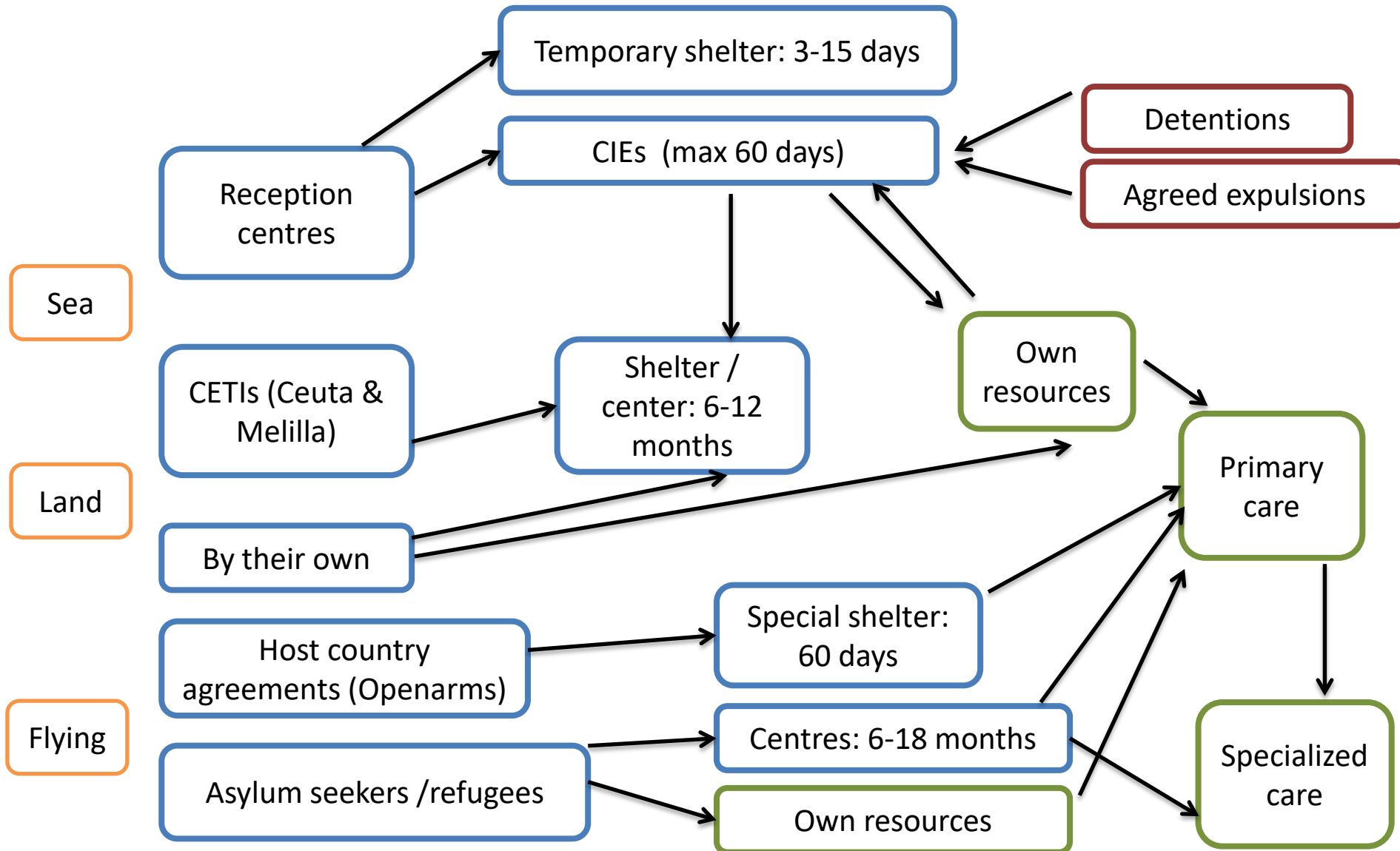
Kayvan Bozorgmehr | Louise Biddle | Sven Rohleder | Rosa Jahm



*WHO/Europe Webinar  
27th January 2021*

Technical Guidance:  
Collection and Integration of  
Data on Refugee and Migrant  
Health in the WHO European  
Region

# Complexity of Access to Health care

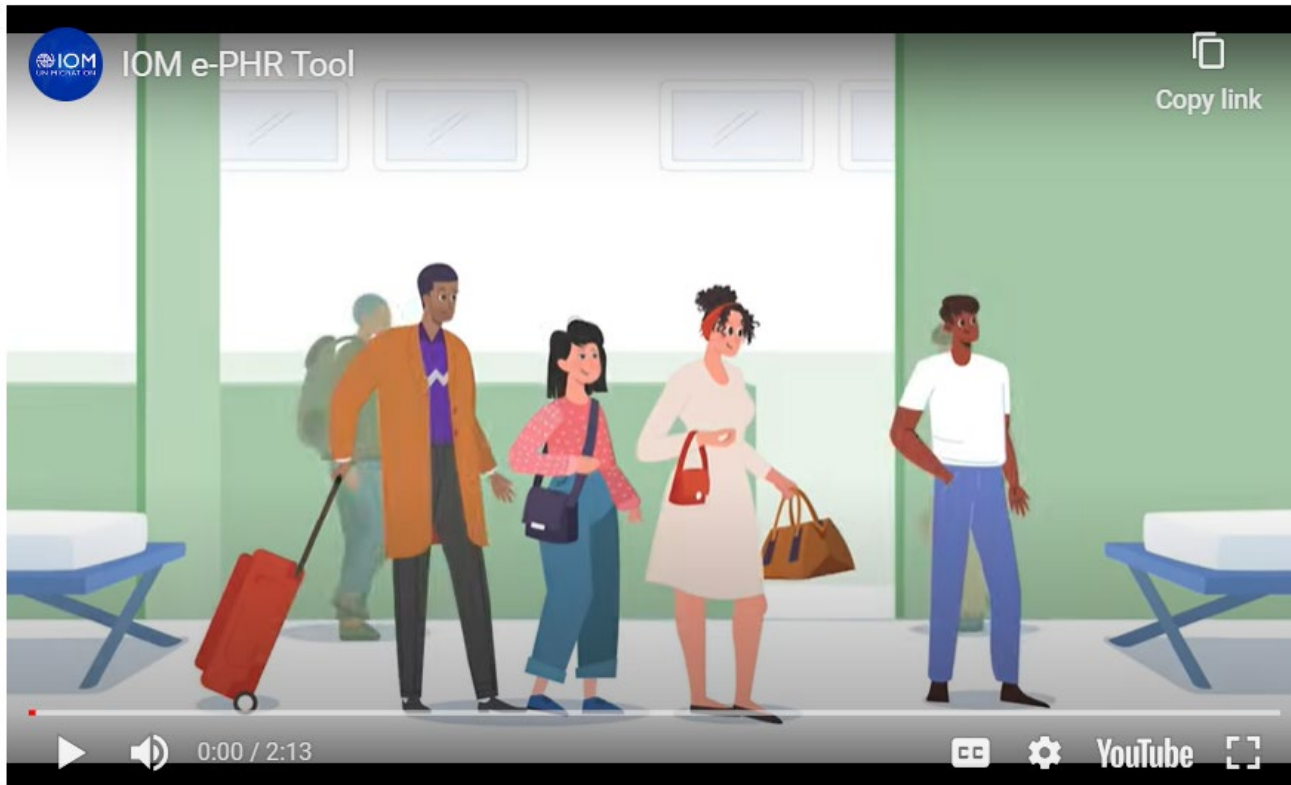


# Re→Health<sup>2</sup>

Co-funded by the Health Programme of the European Union



Electronic Personal Health Record (E-PHR)



<https://youtu.be/wFiwcKQnLuw>



# Personal health record

## السجل الصحي الشخصي

### SECTION C. MEDICAL HISTORY

17	Coughing. Specify if protracted coughing over two weeks, combined with other symptoms السعال. حدد ما إذا كان السعال قد طال مدته لما يزيد عن أسبوعين، مصحوبًا بأعراض أخرى	Y/N يوجد/لا يوجد
18	Significant weight loss (in the past 6 months) فقدان ملحوظ في الوزن (خلال الـ 6 أشهر الماضية)	Y/N يوجد/لا يوجد
19	Sexually transmitted infections الأمراض المنقولة عن طريق الاتصال الجنسي	Y/N يوجد/لا يوجد
20	Skin conditions (e.g. rash) الحالات الجلدية (مثال: الطفح الجلدي)	Y/N يوجد/لا يوجد
21	Tattoos, body piercings الحالات الجلدية (مثال: الطفح الجلدي)	Y/N يوجد/لا يوجد
22	History of blood transfusion تاريخ نقل الدم	Y/N يوجد/لا يوجد
23	History of torture, violence تاريخ التعرض للتعذيب والعنف	Y/N يوجد/لا يوجد
24	Displaced from home (specify duration) بلا منزل (حدد المدة)	
25	Current medications (specify) أدوية تتناولها حاليًا (حددها)	
26	Allergies, including to drugs الحساسية، بما في ذلك الحساسية لـ د	Y/N يوجد/لا يوجد
27	Smoking or history of smoking التدخين أو تاريخ التدخين	Y/N يوجد/لا يوجد
30	Alcohol or history of alcohol تناول الكحول حاليًا أو تاريخ تناول الكحول	Y/N يوجد/لا يوجد
32	Pregnancies (number) مرات الحمل (عدد)	Y/N يوجد/لا يوجد
33	Deliveries (number) مرات الولادة (عدد)	
34	Last menstrual period آخر دورة شهرية	
35	Current pregnancy حامل حاليًا	Y/N يوجد/لا يوجد
36	Gestational week أسبوع الحمل	

SECTION D. PATIENT'S IMMUNIZATION RECORD\*

القسم د. سجل التحصينات للمريض \*

1	Immunization record presented/available سجل التحصينات للمريض المقدم/المتاح	Y/N يوجد/لا يوجد	
2	Immunization status meets age specific requirements based on national requirement of the country of stay تُلبي حالة الحصول على التطعيمات متطلبات مُحدّدة للعُمر على أساس المطلب الوطني لبلد الإقامة	Y/N يوجد/لا يوجد	If yes, proceed with points 3-24 and indicate date or age at vaccination إذا كانت الإجابة "يوجد"، تابع مع النقاط 3-42 مع الإشارة إلى التاريخ أو العمر عند الحصول على التطعيم
3	Pediatric diphtheria and tetanus (DT) الدفترية والكزاز عند الأطفال (DT)	Y/N يوجد/لا يوجد	
4	Diphtheria, tetanus, pertussis (DTP) الدفترية والتيتانوس والسعال الديكي (DTP)	Y/N يوجد/لا يوجد	
5	Pediatric diphtheria, tetanus and acellular pertussis (DTaP) الدفترية والكزاز والسعال الديكي اللاخلوي (DTaP) عند الأطفال	Y/N يوجد/لا يوجد	
6	Older children and adults tetanus and diphtheria vaccine (Td) لقاح الكزاز والدفترية (Td) للأطفال الأكبر سناً وبالغين	Y/N يوجد/لا يوجد	
7	Older children and adults tetanus, diphtheria and acellular pertussis (Tdap) لقاح الكزاز، والدفترية والسعال الديكي اللاخلوي (Tdap) للأطفال الأكبر سناً وبالغين	Y/N يوجد/لا يوجد	
8	Oral Polio vaccine (OPV) اللقاح الفموي ضد شلل الأطفال (OPV)	Y/N يوجد/لا يوجد	
9	Inactivated Polio vaccine (IPV) لقاح شلل الأطفال غير النشط (IPV)	Y/N يوجد/لا يوجد	
10	Measles, mumps, rubella (MMR) الحصبة والنكاف والحصبة الألمانية (MMR)	Y/N يوجد/لا يوجد	

11	Rubella الحصبة الألمانية	Y/N يوجد/لا يوجد	
12	Measles الحصبة	Y/N يوجد/لا يوجد	
13	Measles-Rubella الحصبة-الحصبة الألمانية	Y/N يوجد/لا يوجد	
14	Mumps النكاف	Y/N يوجد/لا يوجد	
15	Mumps-Rubella النكاف-الحصبة الألمانية	Y/N يوجد/لا يوجد	
16	Haemophilus influenzae type B (Hib) المستدمية النزلية من النوع ب (Hib)	Y/N يوجد/لا يوجد	
17	Hepatitis A التهاب الكبد أ	Y/N يوجد/لا يوجد	
18	Hepatitis B التهاب الكبد ب	Y/N يوجد/لا يوجد	
19	Meningococcal المُكَوَّرَاتِ السُّحَائِيَّة	Y/N يوجد/لا يوجد	
20	Human papillomavirus (HPV) فيروس الورم الحليمي البشري (HPV)	Y/N يوجد/لا يوجد	
21	Varicella (chicken pox) الْحُمَاق (جدري الماء)	Y/N يوجد/لا يوجد	
22	Herpes zoster (shingles) الحلأ النطاقي (القوباء المنطقية)	Y/N يوجد/لا يوجد	
23	Pneumococcal المُكَوَّرَاتِ الرِّئَوِيَّة	Y/N يوجد/لا يوجد	
24	Influenza الإنفلونزا	Y/N يوجد/لا يوجد	

\* Vaccination record codes: Completed series (C); Not age appropriate (A); Insufficient time interval (T); Contraindicated (F); Not routinely available (R); Not appropriate season for vaccination (S)

\* رموز سجل التطعيم: السلسل المكتملة (C)؛ العُمر غير مناسب (A)؛ مد زمنية فاصلة غير كافية (T)؛ مَمْنُوعُ الإِسْتِعْمَالِ (F)؛ غير متوفر بشكل دوري (R)؛ الموسم غير مناسب للتطعيم (S)

**SECTION H. DIAGNOSTICS** to be considered if needed at destination, except if emergency and person is referred to hospital.

**القسم ح.** التشخيصات الواجب دراستها عند الحاجة في المكان المقصود، باستثناء حالة الطوارئ أو إحالة الشخص إلى مستشفى.

1	Imaging: chest X-ray التصوير: الأشعة السينية على الصدر
2	Imaging: other X-ray التصوير: إجراء الأشعة السينية لأماكن أخرى
3	Imaging: other imaging examination (e.g. ultrasound, etc.) التصوير: فحوصات أخرى بالتصوير (مثال: الموجات فوق الصوتية، وغيرها)
4	Electrocardiogram (if not performed at hotspot) تخطيط كهربائية القلب (إن لم يُجر على نقطة ساخنة)
5	Laboratory: full blood count المعمل: صورة الدم الكاملة
6	Laboratory: creatinine المعمل: الكرياتينين
7	Laboratory: hep B surface antigen (HBsAg) المعمل: المستضد السطحي لالتهاب الكبد ب
8	Laboratory: hep C serology المعمل: أمصال التهاب الكبد ج
9	Laboratory: HIV المعمل: فيروس العوز المناعي البشري "الإيدز"
10	Laboratory: syphilis المعمل: الزهري
11	Laboratory: liver function tests المعمل: اختبارات وظائف الكبد
13	Laboratory: tuberculosis (sputum smear) المعمل: الدرنة (مسحة البلغم)
14	Instrument: mini-mental state dementia screening form الأداة: نموذج فحص الحد الأدنى من الحالة العقلية والخرف
15	Instrument: assessment of activities of daily living الأداة: تقييم أنشطة الحياة اليومية
16	Instrument: chart of early childhood development الأداة: مخطط النماء في مرحلة الطفولة المبكرة
17	Other referrals إحالات أخرى

**SECTION J. TREATMENT RECOMMENDATION**

1	Treatment required? هل العلاج ضروري؟
2	Treatment required For ICD A50-A64? هل العلاج ضروري من أجل التصنيف الدولي للأمراض A64-A50؟
3	Treatment required for malaria? هل العلاج ضروري من أجل الملاريا؟
4	Treatment required for gastrointestinal parasites? (e.g. presumptive treatment) هل العلاج ضروري من أجل الطفيليات المعوية؟ (مثال: علاج ظني)
5	Treatment required for acute condition? هل العلاج ضروري من أجل حالة حادة؟
6	Treatment required for chronic condition? هل العلاج ضروري من أجل حالة مزمنة؟
7	Hospitalisation required (immediate) مطلوب الحجز بالمستشفى (فوراً)
8	Hospitalisation required (within several days) مطلوب الحجز بالمستشفى (خلال عدة أيام)
9	Hospitalisation required (within several months) مطلوب الحجز بالمستشفى (خلال عد أشهر)
10	Immunisation required? هل من الضروري الحصول على تحصين؟
11	Adjusted/appropriate accommodation required? هل من الضروري الحصول على سكن معدل/مناسب؟

## ❖ First phase (2016-2017)

- October 2016: Italy and Croatia
- January 2017: Slovenia and Greece.

## ❖ Second phase (2017-2019)

- Bulgaria, Cyprus, Romania, Serbia

## ❖ Project ePHR upgrade

- Pilot tested in Spain (Canary island)
- Update of the interface
- Mental, maternal health, vaccination section,

## Implementation

- Reception centres
- Hospital
- Asylum centres
- Child-care
- Refugee camps
- Polyclinic
- Refugee shelter



Health and illness in migrants and refugees arriving in Europe: analysis of the electronic personal health record system

Dominik Zenner, MD, PhD, Ana Requena Méndez, MD, PhD, Steffen Schillinger, MSc, Elena Val, MSc, Kolitha Wickramage, MD, PhD  
 Author Notes

Journal of Travel Medicine, taac035, <https://doi.org/10.1093/jtm/taac035>

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- Cross-sectional study (2016-2019) of migrants attended in all reception centres for migrants,
- 8 European countries where ePHR implemented.
- Migrants considered newly-arrived - they arrived usually few months prior, and certainly in the last 5 years.

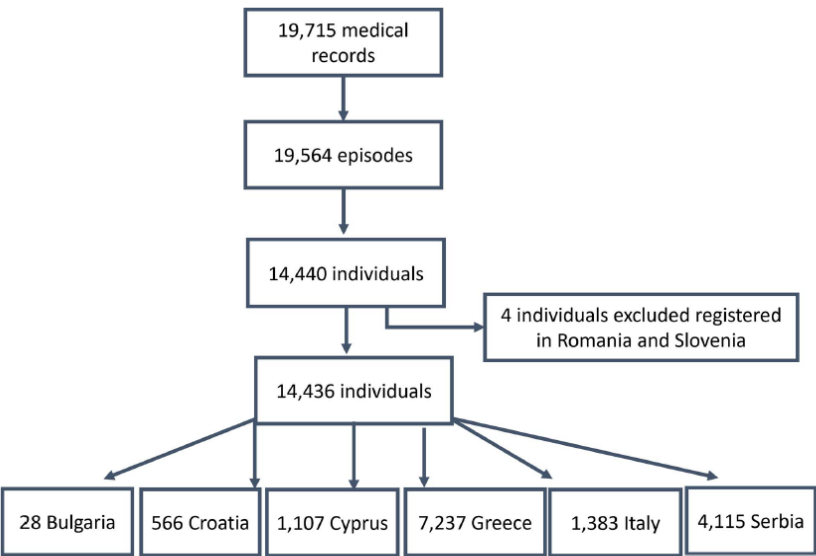


Figure 1. Flow diagram of the medical records registered at the ePHR centres.

	CROATIA N=566	CYPRUS (%) n=1,107	GREECE n=7,241	ITALY n=1,383	SERBIA n=4,111	TOTAL 14,436
<b>Sex (male)</b>	384 (67.8)	730 (65.9)	5,192 (71.7)	1,189 (86)	3,717 (90.4)	11,224 (77.7)
<b>Age group</b>						
0-18	173 (30.6)	457 (41.3)	968 (13.4)	725 (52.4)	1,823 (44.3)	4,149 (28.7)
19-39	324 (57.2)	573 (51.8)	4,324 (59.7)	634 (45.8)	2,090 (50.8)	7,962 (55.2)
>40	69 (12.2)	77 (7.0)	1,949 (26.9)	24 (1.7)	198 (4.8)	2,325 (16.1)
<b>Region of origin<sup>1</sup></b>						
Africa	18 (3.2)	154 (13.9)	1047 (14.5)	1285 (92.9)	134 (3.3)	2638 (18.3)
America	3 (0.5)	0	1 (0.1)	1 (0.1)	3 (0.1)	11 (0.1)
Asia	536 (94.7)	950 (85.8)	6138 (85.2)	96 (6.9)	3946 (96)	11706 (81.3)
Europe	8 (1.4)	2 (0.2)	18 (0.3)	1 (0.1)	22 (0.5)	51 (0.4)
Oceania	1 (0.2)	1 (0.1)	0	0	6 (0.2)	7 (0.05)
<b>Living with no family</b>	346 (61.1)	555 (50.1)	5,839 (80.6)	1,366 (98.8)	3,463 (84.2)	11,597 (80.3)
<b>Follow-up (days)<sup>2</sup> Median (IQR)</b>	334 (268-455)	1 (1-1)	40 (13-109)	53 (21-105)	36 (11-100)	38 (12-106)
<b>Number of visits</b>	1 (1-1)	1 (1-1)	1 (1-1)	1 (1-1)	1 (1-2)	1 (1-1)
<b>Smoking</b>	162 (29.5)	14 (15.1)	451 (28.7)	172 (13.2)	44 (4.7)	845 (18.9)
<b>Alcohol consumption</b>	30 (5.4)	6 (7.4)	81 (5.4)	30 (2.5)	10 (1.1)	157 (3.7)

1. There are 34 observations registered in Greece with an unknown nationality; 2. Median of follow-up days in patients with more than one visit.

Episodes of ID: 2531/19564 (12.9%):

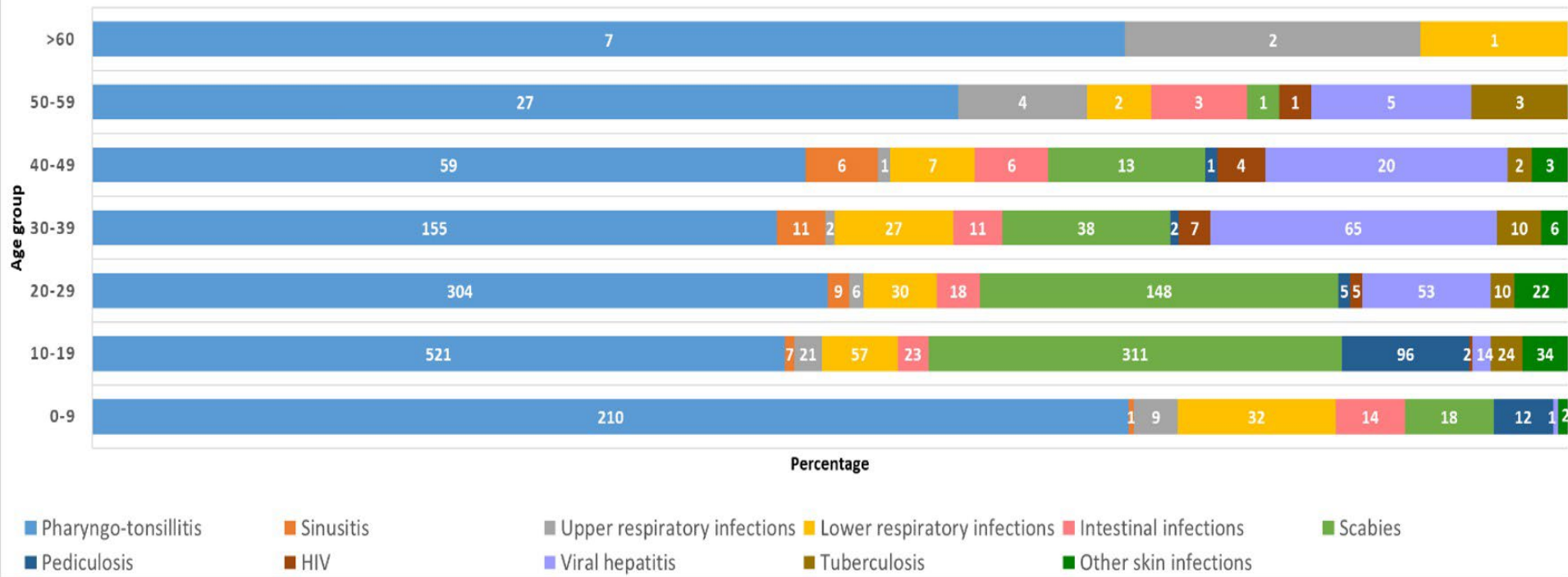
1283(50.7%) pharyngo-tonsillitis,

529(20.9%) scabies,

158(6.2%) viral hepatitis (being 110 hepatitis C infections )

156 (6.1%) lower respiratory infections.

There were not outbreaks reported during the study period



Contributions of infectious diseases to the total number of infections by age-group

## Discussion

- Snap shot of health and disease among vulnerable migrant groups, reported through a routine Health Information system ePHR
- HIV or infectious hepatitis frequencies might be explained by prevalence rates in countries of origin and adverse circumstances during the migration route and/or in the camps
- High proportion of viral hepatitis (hepatitis C), mostly reported in Asian individuals
  - Further HCV prevalence studies in Asian migrants

## Limitations

<b>Hepatitis</b>	<ul style="list-style-type: none"><li>• If the ICD chapter related to Viral Hepatitis was marked a YES</li><li>• If the following key words were included in the free text variables related to remarks (remarks, remarks_exam, remarks_lab, remarks_other, othercondition): hepatitis c, hcv + , hbv +, history of hepatitis,</li><li>• Hepatitis B and C cases subsequently classified as B or C.</li></ul>	<ul style="list-style-type: none"><li>• Imputation of the missing as a 0 (NO)</li><li>• All missing values</li></ul>	0 (0%)
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# Screening programmes targeting migrants in primary care

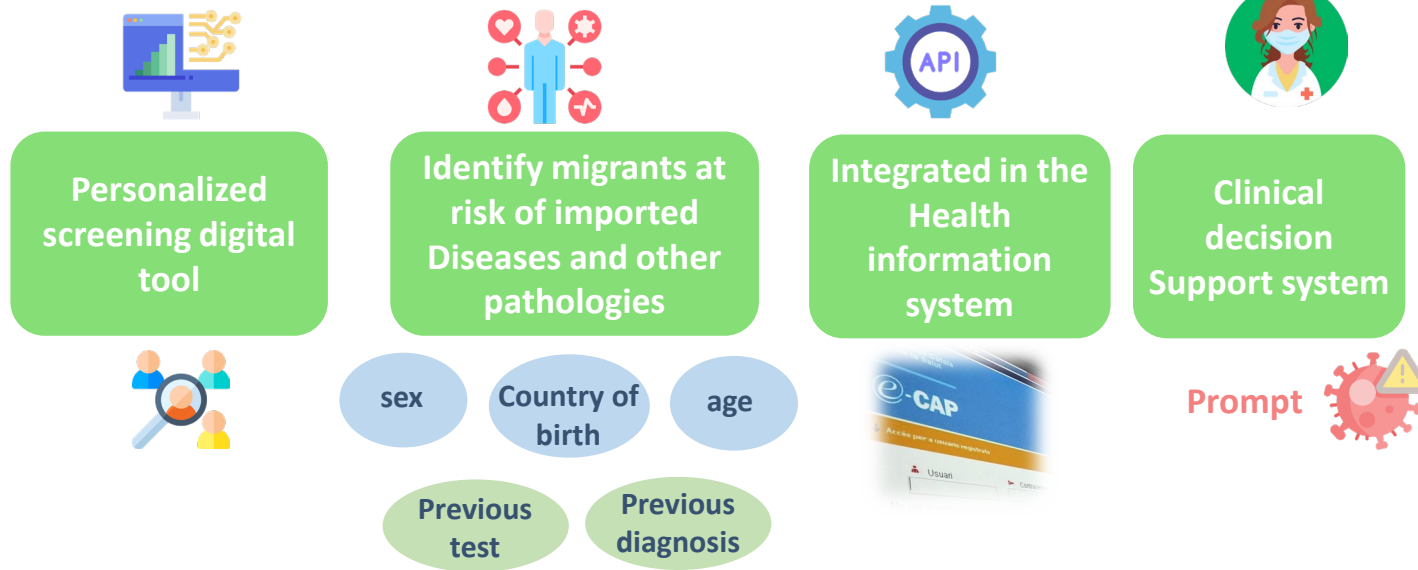
## Advantages

- ❖ Formal screening of new-arriving migrants in special clinics/hospital may miss migrant groups
- ❖ Primary care is ideally placed for the provision of healthcare for migrants
- ❖ Primary care screening can be routinely delivered.

## Implementation challenges

- ❖ Lack of knowledge of health professionals
  - Particularly parasitic infections
- ❖ Heterogeneity of migrant groups
- ❖ Lack of individualized approach
- ❖ Guidelines require the active commitment in the decision-making process

# The IS-MiHealth tool



➤ 9 conditions

➤ Introduction of **mental health** and **female genital mutilation** as migrant health needs

➤ Recommendations adapted to the context of **Primary care** in Catalonia



Ethel Sequeira-Aymar<sup>a,\*</sup>, Ximena diLollo<sup>c,d</sup>, Yolanda Osorio-Lopez<sup>e</sup>, Alessandra Queiroga Gonçalves<sup>f,8</sup>, Carme Subirà<sup>b,d</sup> y Ana Requena-Méndez<sup>b,d</sup>

**HIV >1% - UNAIDS**

**HBV and HCV >2% -ECDC data**

**Active TB - >40 cases /100,000 pop**

**WHO**

**Chagas disease (PAHO)**

**Strongyloidiasis** – endemic countries (ECDC guidelines)

**Schistosomiasis** – endemic countries (ECDC guidelines)

País origen	VIH	VHB	VHC	STR	SCH	Chagas	TB	SM	MGF
Guayana francesa						X			
Guam				X			X		
Guatemala		X		X		X			
Guinea	X	X	X	X	X		X		X
Guinea Bissau	X	X	X	X	X		X		X
Guinea Ecuatorial	X	X	X	X	X		X		
Guyana	X			X			X		
Haití	X	X		X			X	X	
Honduras				X		X			
Hong Kong		X					X		
India		X		X			X	X	
Indonesia		X		X	X		X		
Irán, República Islámica de		X						X	
Irak	X		X		X			X	
Israel			X	X				X	
Italia			X						
Jamaica	X	X		X			X		
Japón				X					
Jordania		X	X						
Kazajistán		X	X	X			X		



# Screening Immigrant Patients Using a Computer Tool Adapted to Clinical Histories in Primary Care (CRIB-MI)

# Methods

- Pilot cluster randomized controlled trial
- 4 regions in Catalonia: Selection of 8 (Primary care centres) PCC
- Selection of 2 PCCs in each región

Intervention

Control

Training session of  
migrant health  
Prompts with  
recommendation

Routine care  
+ training  
session

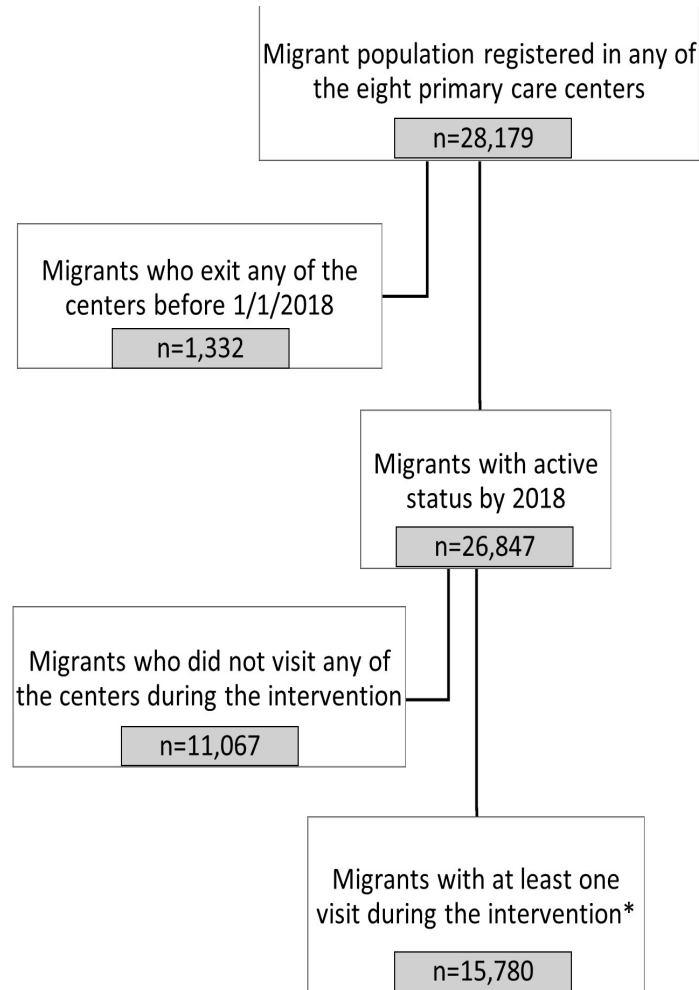
- Data extraction from EPR from 2012-2018:
- Number of diagnosis of selected diseases (ICD-10) and of serological tests requested
- PO: Monthly diagnostic yield of all aggregated conditions
- Difference in difference approach

Data  
extraction



# Results

## Screening tests performed for ID included in the screening program among those who attended the PCC during the intervention.



	Control	Intervention	OR(95% CI)	p-value <sup>2</sup>
Total population	7,609	8,171		
Number of <i>T. cruzi</i> disease screening tests	24 (0.3)	102 (1.3)	4.14 (2.63-6.52)	<0.001
Screening number among those with screening criteria	20/1663 (1.2)	95/1454 (6.5)	5.26 (3.20-8.65)	<0.001
Number of <i>Strongyloides</i> screening tests	32/5695 <sup>1</sup> (0.6)	375/6435 <sup>1</sup> (5.8)	10.92 <sup>1</sup> (7.58-15.74)	<0.001
Screening number among those with screening criteria	28/4635 <sup>1</sup> (0.6)	373/5878 <sup>1</sup> (6.4)	11.15 <sup>1</sup> (7.58-16.40)	<0.001
Number of <i>Schistosoma</i> screening tests	2/5695 <sup>1</sup> (0.04)	100/6435 <sup>1</sup> (1.6)	39.34 <sup>1</sup> (9.64-160.50)	<0.001
Screening number among those with screening criteria	1/685 <sup>1</sup> (0.2)	82/1084 <sup>1</sup> (7.6)	59.64 <sup>1</sup> (9.25-431.26)	<0.001
<b>Total screening number of any parasitic infection</b>	49/5695 <sup>1</sup> (0.9)	407/6435 <sup>1</sup> (6.3)	<b>7.78<sup>1</sup> (5.77-10.49)</b>	<b>&lt;0.001</b>
<b>Screening number among those with screening criteria</b>	44/4644 <sup>1</sup> (1.0)	405/5886 <sup>1</sup> (6.9)	<b>7.73<sup>1</sup> (5.65-10.57)</b>	<b>&lt;0.001</b>
Number of HIV screening tests	403 (5.3)	726 (8.9)	1.40 (1.22-1.60)	<0.001
Screening number among those with screening criteria	84/948 (8.9)	201/1373 (14.6)	1.56 (1.18-2.06)	0.002
Number of HBV screening tests	639 (8.4)	827 (10.1)	1.16 (1.04-1.30)	0.009
Screening number among those with screening criteria	256/2784 (9.2)	406/3445 (11.8)	1.27 (1.07-1.51)	0.005
Number of HCV screening tests	628 (8.3)	790 (9.7)	1.13 (1.01-1.26)	0.038
Screening number among those with screening criteria	236/2644 (8.9)	413/3299 (12.5)	1.39 (1.17-1.65)	<0.001
Number of active TB screening tests	221 (2.9)	376 (4.6)	1.56 (1.31-1.85)	<0.001
Screening number among those with screening criteria	41/1215 (3.4)	59/1168 (5.1)	1.60 (1.06-2.42)	0.027
<b>Number of screening tests for any condition</b>	984/7609 (12.9)	1411/8171 (17.3)	<b>1.34 (1.22-1.46)</b>	<b>&lt;0.001</b>
<b>Screening number among those with screening criteria</b>	885/6851 (12.9)	1359/7747 (17.5)	<b>1.36 (1.24-1.50)</b>	<b>&lt;0.001</b>

1. The Tortosa region is excluded. 2. Multilevel mixed-effect logistic regression

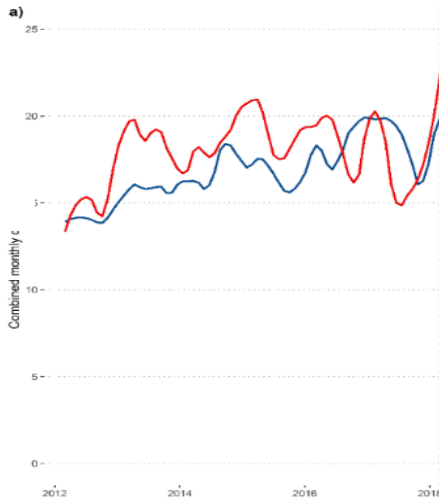
Original Article

## Improving the detection of infectious diseases in at-risk migrants with an innovative integrated multi-infection screening digital decision support tool (IS-MiHealth) in primary care: a pilot cluster-randomized-controlled trial

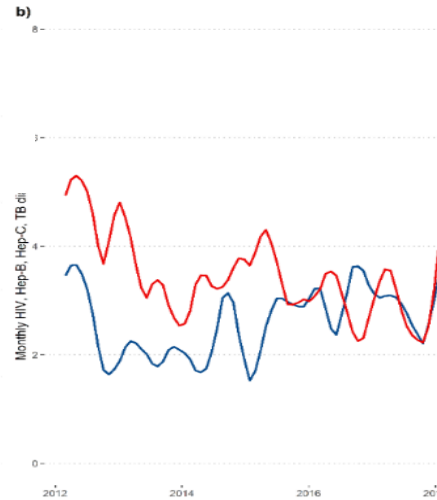
Ethel Sequeira-Aymar, MD<sup>1,2,3</sup>, Angeline Cruz, MD<sup>3</sup>, Miquel Serra-Burriel, PhD<sup>4</sup>, Ximena di Lollo, MD<sup>2</sup>, Alessandra Queiroga Gonçalves, PhD<sup>5,6</sup>, Laura Camps-Vilà, Ana Requena-Mendez, PhD<sup>3,17,\*</sup>, and on behalf of the CRIBMI (IS-MiHealth) Working Group

Monthly diagnostic rates of the intervention and control PCC, before and after implementation.

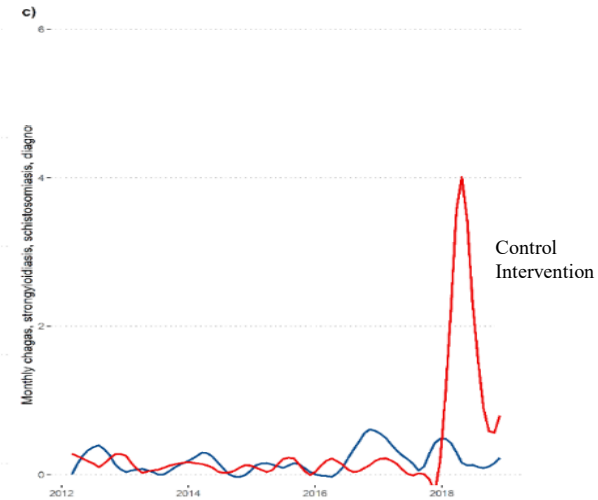
Combined monthly diagnostic rate



HIV, TB, viral hepatitis



*T. cruzi*, *S. stercoralis*, *Schistosoma* spp.



- The tool appears to modify the clinician behavior on routinely screening for infections in migrants
- Guidelines or education alone are insufficient to influence practice.
- A multi-disease approach may reduce the cost impact on health system.
- Low numbers (pilot study) prevented to have conclusive results for each infection
- No data analysis on treatments and follow-up,
- The date of arrival to the country was not collected in the e-CAP system
- Missing values of country of origin <5%

## Acceptability of the tool

Training on migrant health was well valued in general.

- It broadened their knowledge about the health problems of migrants
  - Imported diseases
- Type of training is not usually offered in PC centres
  - limitation reported was the absence of a guide to support health care provision for migrants (cultural competence aspects)

### Usefulness of IS Mi Health

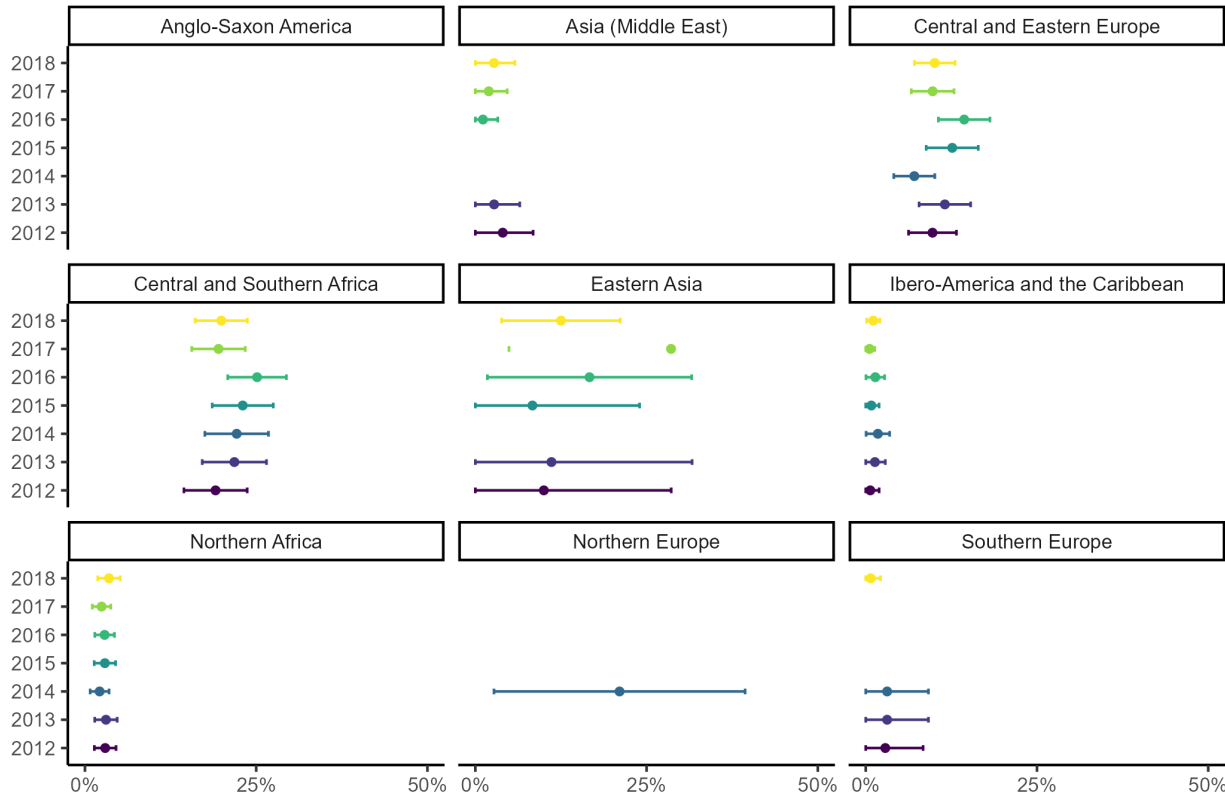
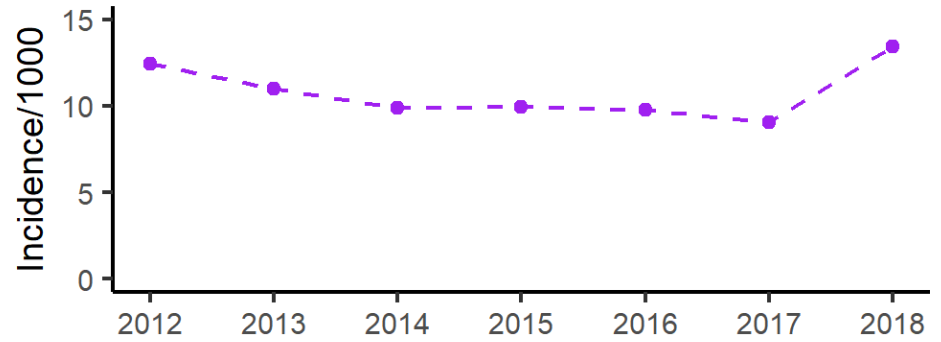
“Without the tool they would have not screened most of the patients, in particular parasitic infections”

Follow-up visits after screening  
A relatively high percentage of loss to follow up.

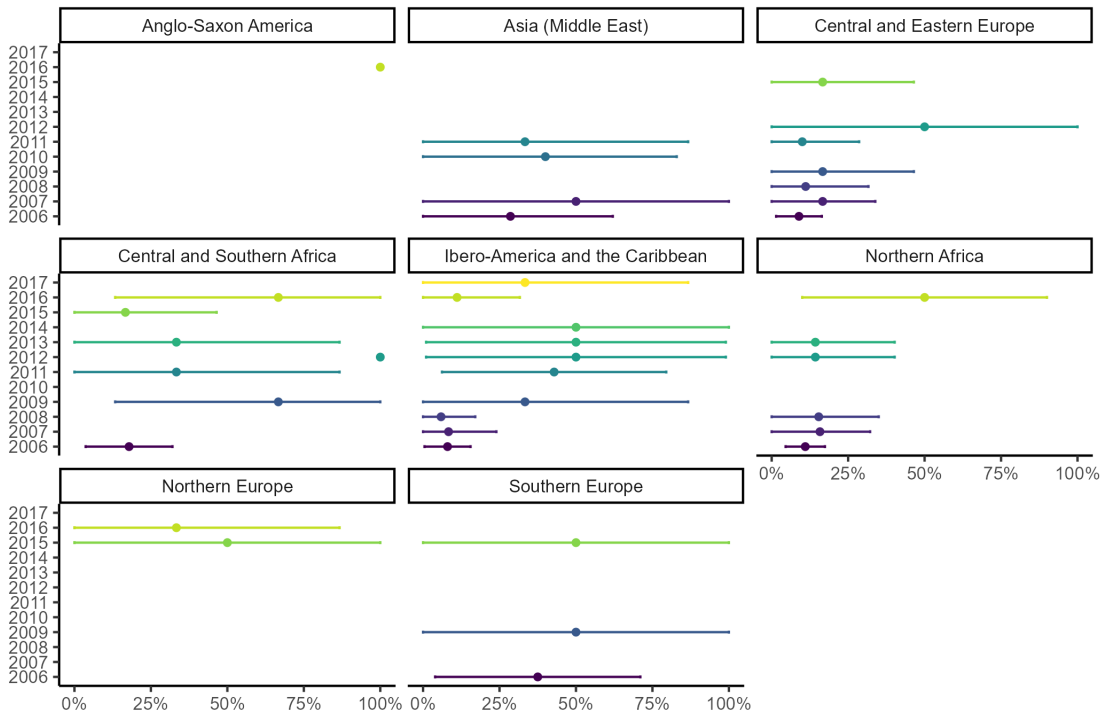
Few resources/time allocated to the reception of migrants at PC

# Results on Hepatitis B

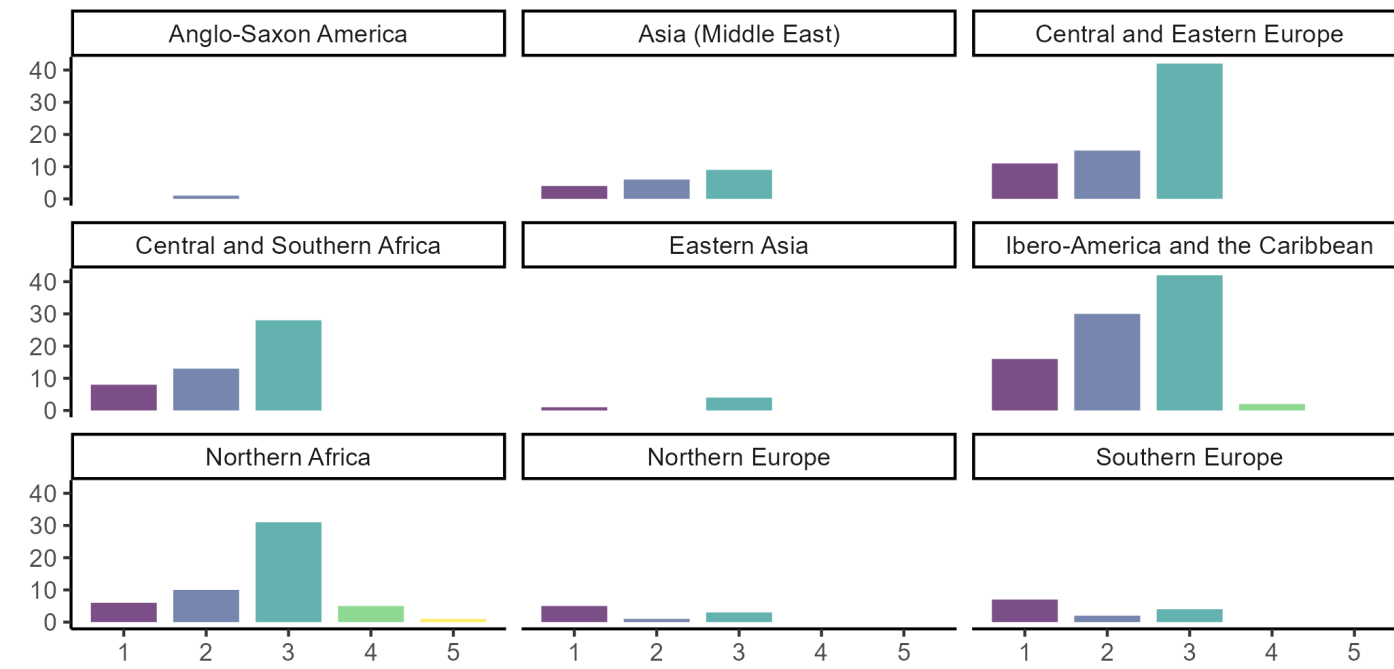
## Hepatitis B incidence/1,000 people



Proportion of active hepatitis B cases among those tested (VHC CV or HBsAg)



% vaccinated people among people who would need to be vaccinated



Distribution of number of HBV doses by area of origin

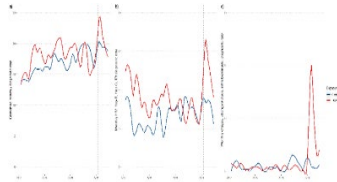
# Innovation approach

## Electronic Patient Records

Structured information  
(automatic extraction)

Clinical decision support  
system CRIBMI

- IP registered
- Contract signed



EPR –other HIS

Validating the tool  
at larger scale

Mental Health  
FGM

Unstructured free text  
(humans reading/extracting)

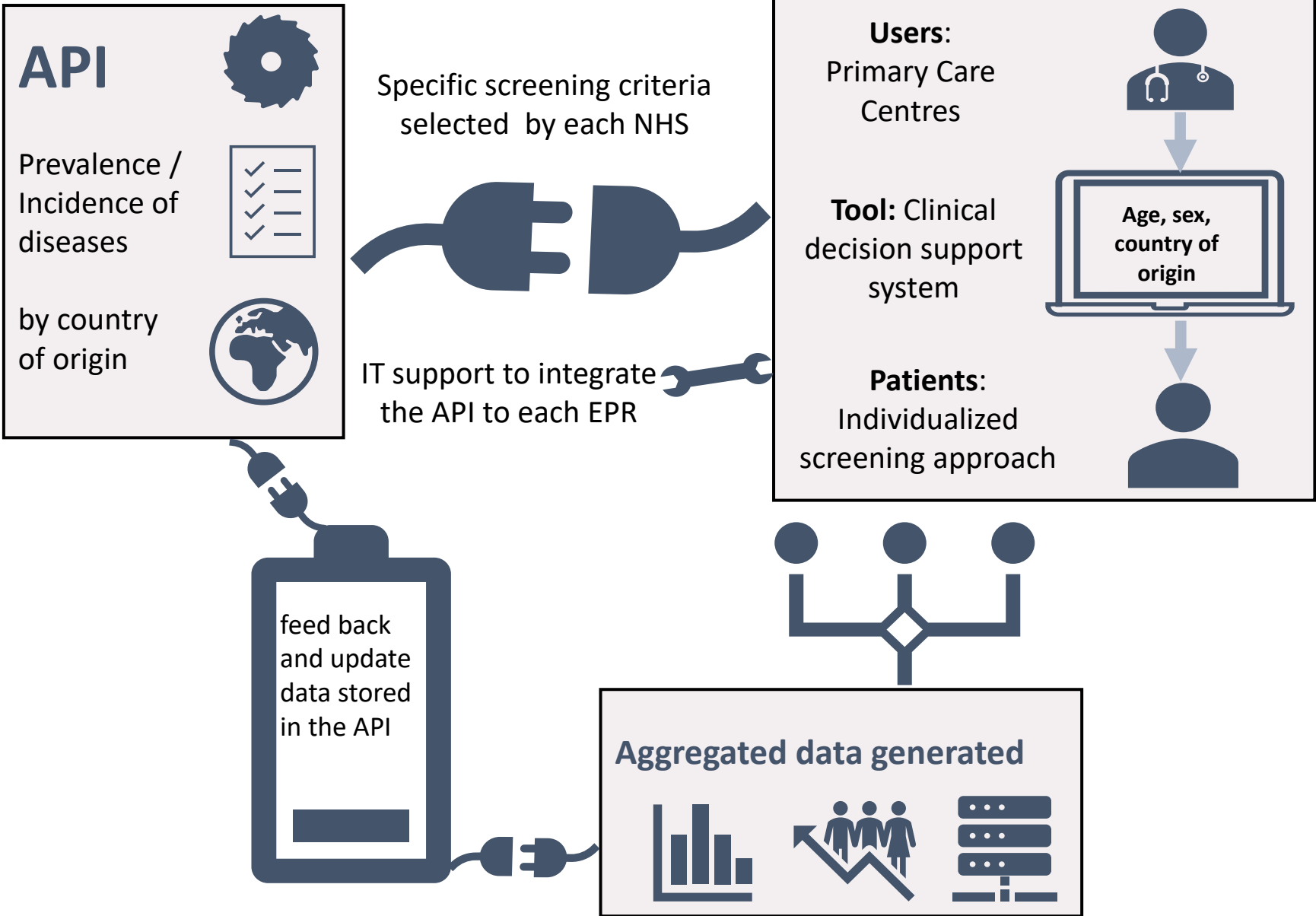
Natural Language Processing (NLP)  
Text Mining automatically extraction



Automated screening algorithms

Decision support system to identify  
individuals at high-risk of certain  
infections

# Future perspectives



# Thanks!

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**LEAVE  
NO ONE  
BEHIND**