

Migration-Specific Aspects of GeoSentinel

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GEOSENTINEL
 The Global Surveillance Network of the ISTM and CDC



Talk Outline

- GeoSentinel overview
- Overview of global migrant health data in GeoSentinel
- Examples of two recent analyses
 - Syrian migrants
 - Eritrean migrants and *P. vivax*
- Conclusions and future directions



GeoSentinel Global Surveillance Network

- Established in 1995 by CDC and International Society for Travel Medicine (ISTM)
- Clinic-based global surveillance system
 - De-identified patient information
 - International travelers and immigrants
 - Central electronic database
 - Link time and place of exposure
 - Detect new infections and patterns
 - Monitor disease burden and distribution



Migrant-Relevant Variables Collected in GeoSentinel

Demographics

- Gender
- Age
- Country
 - Birth
 - Citizenship
 - Residence before age 10
 - Current residence

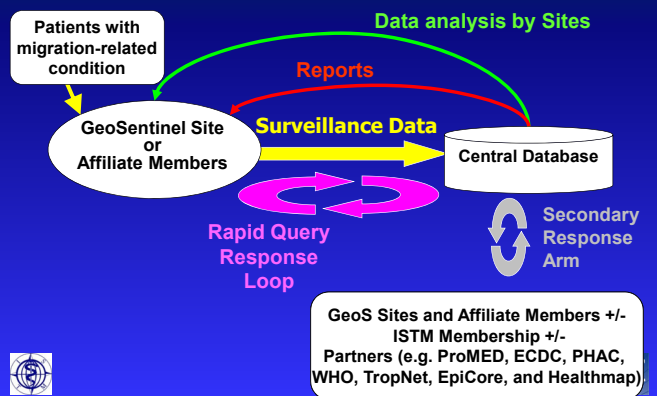
Travel History

- Migration history
- Country or countries of exposure to current illness
- Seen during migration or after immigration

Clinical Information

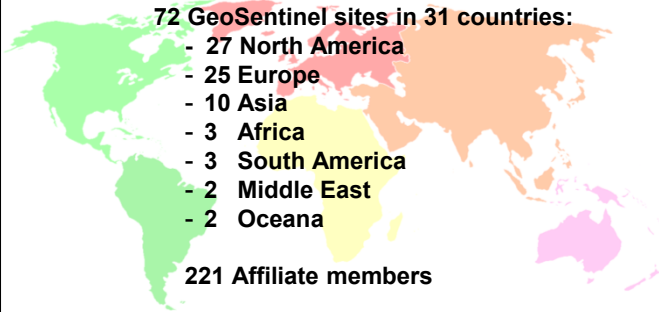
- Inpatient/outpatient
- Main presenting symptoms
- Underlying conditions
- Diagnosis
- Diagnostic method(s)
- Diagnosis status (C/P)
- Antibiotic susceptibility data (9 select pathogens)

How does GeoSentinel work?



Sentinel Sites Contributing Data (as of September 2018)

- 72 GeoSentinel sites in 31 countries:
- 27 North America
 - 25 Europe
 - 10 Asia
 - 3 Africa
 - 3 South America
 - 2 Middle East
 - 2 Oceania
- 221 Affiliate members



GEOSENTINEL



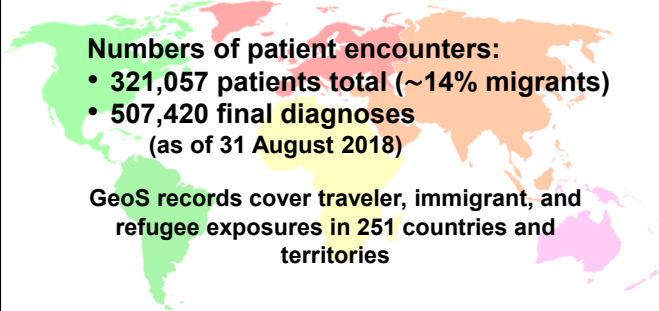
GeoSentinel Sites and Affiliate Members



Data Summary

- Numbers of patient encounters:
- 321,057 patients total (~14% migrants)
 - 507,420 final diagnoses
- (as of 31 August 2018)

GeoS records cover traveler, immigrant, and refugee exposures in 251 countries and territories



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Top 10 Diagnoses: Immigrants & VFRs (Last 2 Years)

Diagnosis	Number of Diagnosis	Percent
CHAGAS DISEASE, CHRONIC	170	19.6%
LATENT TUBERCULOSIS, POSITIVE IFN-RELEASE ASSAY (e.g. Quantiferon or T-SPOT) (NOT ACTIVE DISEASE)	97	11.2%
NEMATODE INFECTIONS, INTESTINAL	95	10.9%
SCHISTOSOMIASIS	70	8.1%
MYCOBACTERIUM TUBERCULOSIS	69	7.9%
EOSINOPHILIA	63	7.2%
HEPATITIS (VIRAL - CHRONIC)	49	5.6%
AIDS, HIV, SYPHILIS, GONORRHEA	25	2.9%
ECHINOCOCCOSIS	18	2.1%
DIARRHEA ACUTE parasitic	17	2.0%

Overview of GeoSentinel Migrant Health Data

- Data (purpose of travel = migration) extracted from the database for 1997 – August 2018
- Data stratified into major regions of origin
- Timing of migration analyzed by year for each major region of origin
- Top 10 diagnoses summarized for each major region



- Note of caution: this preliminary analysis uses data that have not been cleaned



Results: Demographics N = 33,862

- 45% female
- Mean age \pm SD: 32 \pm 17 years
 - Range 0– 103 y
- 87% seen as outpatients
- Top region of origins:
 - Sub-Saharan Africa (32%)
 - Southeast Asia (20%)
 - South Asia (12%)
 - South America (8%)
 - Caribbean and Middle East (6% each)

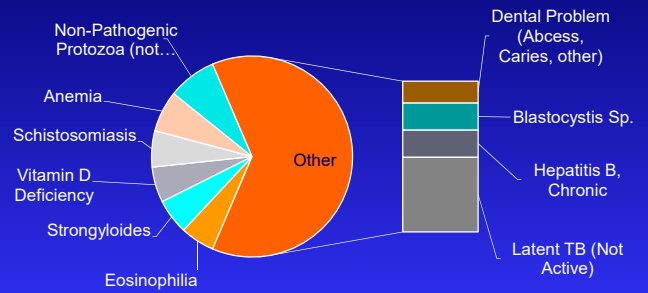


Results: Timing of Migration

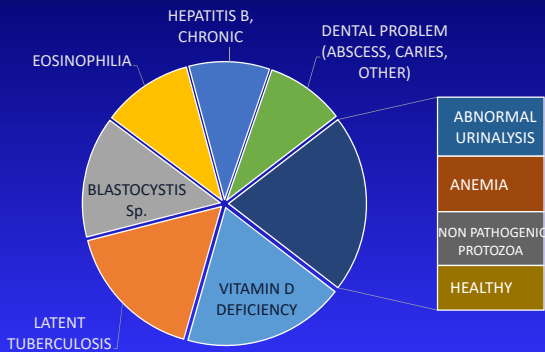
- **Sub-Saharan Africa**
 - Roughly similar proportions of immigrants seen at GeoSentinel sites since 2006
- **Southeast Asia**
 - Peak years of migration were 2002-2008 with steady proportions since then until 2015
- **South Asia**
 - Low proportions until 2010 then a steady flow until 2017



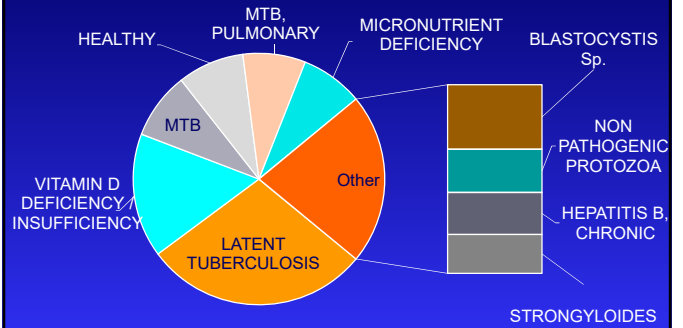
Sub-Saharan Africa: Top 10 Diagnoses



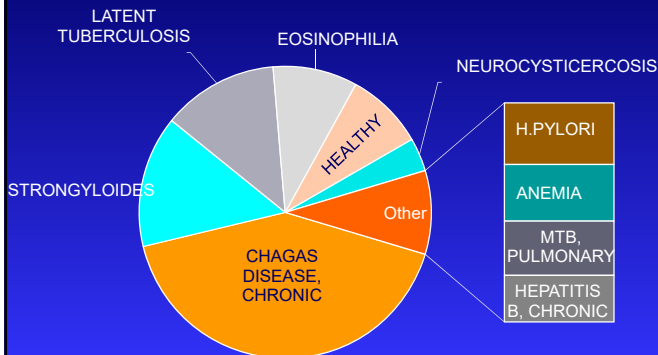
SE Asia: Top 10 Diagnoses



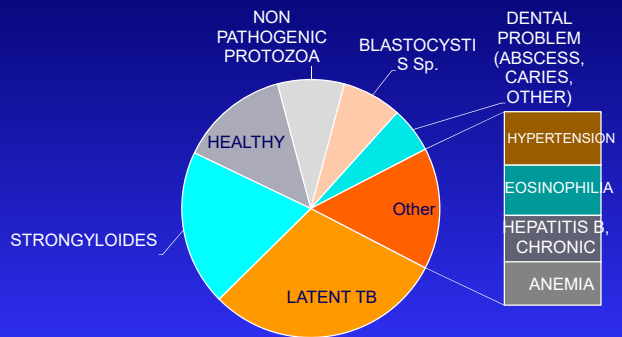
South Asia: Top 10 Diagnoses

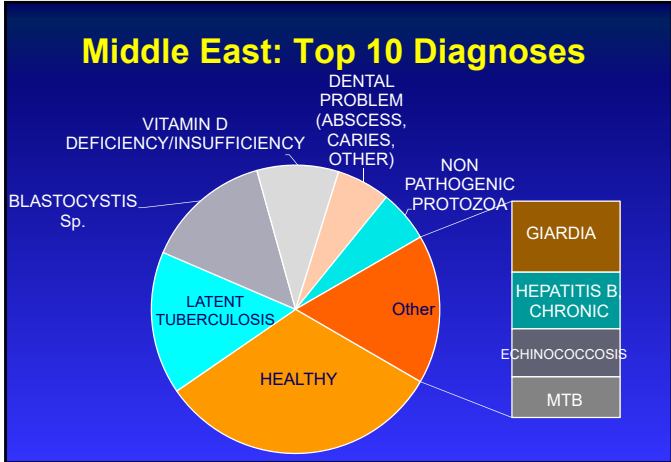


South America: Top 10 Diagnoses



Caribbean: Top 10 Diagnoses





- ### Major Regional Similarities
- Common health problems:
 - Latent TB infection
 - Anemia
 - Eosinophilia
 - Dental problems
 - Chronic hepatitis B
 - Carriage non-pathogenic protozoa
 - Vitamin D deficiency

- ### Major Regional Similarities and Differences
- Notable differences between regions
 - Schistosomiasis (sub-Saharan Africa)
 - Active tuberculosis (South Asia)
 - Strongyloidiasis (SSA, SE Asia, Middle East, Caribbean)
 - Chagas disease (South America)
 - Neurocysticercosis (South America)



RAPID COMMUNICATIONS

Profile of illness in Syrian refugees: A GeoSentinel analysis, 2013 to 2015

FP Mockenhaupt¹, KA Barbre², M Jensenius³, CS Larsen⁴, ED Barnett⁵, W Stauffer⁶, C Rothe⁷, H Asgeirsson⁸, DH Hamer⁹, DH Esposito², P Gautret¹⁰, P Schlagenhauf¹⁰

Euro Surveill. 2016;21(10):pii=30160. DOI: <http://dx.doi.org/10.2807/1560-7917.ES.2016.21.10.30160>

2 groups of Syrian refugees analyzed:

- 488 minor Syrian migrants screened in Berlin from 2013 to 2015
- 44 ill adult Syrian migrants seen in 8 countries between 2011 and 2015

- ### GeoSentinel Syrian Minors: Results (N = 458)
- 94% male
 - Age ranges:
 - 16-17 y - 64%
 - 13-15 y - 28%
 - 6-12 y - 8%
 - Number of transit countries varied from 1-7 with Turkey, Greece, Serbia, Macedonia, and Hungary most common

Syrian Minors: Diagnoses

- No diagnosis: 66%
- 1+ GI protozoa: 22%
 - Giardia: 7%
- Eosinophilia: 17%
- Anemia: 7%
- Schisto (+ serology) 1%
- Dental problems 5%
- Other: fungal skin infections, scabies, URI



GeoSentinel Analysis: Syrian Migrants (N = 44)

- Age range: 1 – 67 y (median 35 y)
- 66% male
- Main countries of evaluation: Norway (15); USA (9); Denmark (7); Canada (6)
- Most common diagnoses:
 - Cutaneous leishmaniasis (32%)
 - Active TB (11%)
 - Chronic viral hepatitis (9%)
 - Latent TB infection (9%)
 - Vitamin D deficiency (9%)



Malaria in Eritrean Migrants: A GeoSentinel Analysis

Schlagenhauf P et al. under review

- Identified 146 malaria cases in Eritrean migrants from 1999 – Sept. 2017
 - Marked increase in 2014-15
- 10 sites reported patients - mainly in Norway, Switzerland, Sweden, Israel, and Germany
- Majority were young male refugees/asylum seekers



Malaria in Eritrean Migrants: Species and Transit Routes

- *P. vivax* (84%), *P. falciparum* (8%), and *P. ovale* 3%
- Severe malaria (6%) (5/9 with *P. vivax*)
- Country of acquisition of malaria difficult to define
 - Possibly Eritrea or in transit through Ethiopia or Sudan
 - Major transit routes through Egypt, Turkey, Uganda, and Syria



Malaria in Eritrean Migrants

- About 1/3 had malaria during migration
- Most had onset of symptoms median 39 days after arriving in their host country
- Analysis highlights several challenges:
 - Complex migration routes
 - Difficulty identifying country of exposure
 - Delay in diagnosis and treatment



Conclusions

- GeoSentinel network includes centers that see migrants for screening and/or evaluation of acute illness
- Useful for comparing differences based on country of origin, migration route, and differences in screening procedures
- Great potential for multi-site studies
- Recent GeoSentinel migrant data will be presented by Dr. Elizabeth Barnett this afternoon (IDs in Migrants session 15:30)



Challenges With Collection of Migrant Health Data

- Variable definitions and understanding of refugee/migrant status
- Confidentiality issues (e.g. migration route)
- Difficulty associating specific diseases with country of origin vs. migration route
- Site differences in approach to evaluating migrant health issues (e.g. screening procedures, evaluation for NCDs)
- Limited data on psychiatric illness, trauma



Future Directions for GeoSentinel

- Special projects on specific aspects of migrant health (e.g. missed opportunities for screening NCDs, micronutrient deficiencies)
- Chagas disease (lead = Clara Crespillo, Madrid)
- Schistosomiasis (lead = Emmanuel Bottieau, Antwerp)
- Strongyloidiasis (lead = Andrea Boggild, Toronto)



Acknowledgments

