**Human mobility and health**

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Faculty of Tropical Medicine
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In honor of our King

ASTMH in Thailand

- ASTMH members partnering with Mahidol University Faculty of Tropical Medicine in Bangkok for many decades
- Many research collaborations with ASTMH members in the region
- Partnerships with CDC GeoSentinel Sites in Chiang Mai and Bangkok
- Educational exchanges
- Asian Clinical Tropical Medicine Course
- Honored to be invited to JITMM

Human mobility and health

- Demographics of human migration
- Examples of diseases moving with migrants
- History of modern refugee crisis
- Offer care for refugees as a case example of best practices in migrant health
- Imagining our future in migration medicine

Conclusions

- Human mobility, infectious diseases and health are inextricably connected
- Travelers, refugees and other migrants are important groups to target for infectious disease surveillance, screening and treatment
- Doing so pro-actively is better for patients, countries and the world community

Human mobility and health: the globalization of health care, biomedical research and education

- High technology healthcare is going global (India, Thailand, South Africa)
- Populations at risk for "developed world diseases" are now distributed worldwide
- Migration brings L/LMIC individuals to neighboring countries and refugees worldwide.
- Global health equity requires a global focus.
Human mobility
• Human migration has occurred as long as humans have been on the planet – first left Africa > 60 million years ago

Humans and mobility
• More than 200 million people are migrants – they have lived outside their country of birth for more than one year
  • 3% of the world’s population
  • 5th most populated country in the world
• In US:
  • ~13% of population are 1st generation foreign born
  • Estimated 45.8 million were born outside the US

Foreign born as a % of total population

International tourists hit record 1.2 billion in 2015, says UNWTO

Globalization of infectious and chronic diseases: the impact of migration and movement on Thailand
• Tourist travelers – 29.9 M in 2015
  • 7.9 M Chinese (27%)
• Migrant workers – 1.4–4 M from Myanmar alone
• Medical tourism – 2.5 M in 2013 ($4.31 Billion USD)
• Human trafficking - migrant workers, sex trade
• Thai people traveling internationally – 6 M in 2014
• These same issues occur worldwide

Total 62 countries or territories

Tourism in Thailand:
https://en.wikipedia.org/wiki/Tourism_in_Thailand#Annual_statistics[33]

Thailand: Top twenty arrival countries for tourists

Source: www.migrationinformation.org
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Globalization of infectious and chronic diseases: the impact of migration and movement

“There are no local diseases”
Professor Joseph Ogong, Medical Geographer, interviewed on CNN regarding SARS 5/10/03

In Minnesota health care, the global is local:

- 81% of TB is in the foreign born
- 10% of HIV cases are in African born (<1% of population)
- Of the malarial cases with country of origin reported (31/48), 84% were foreign born

MDH Disease Control Newsletter
Vo 39,No1, Aug 2011

Migrants, whether legal or illegal, move with pathogens

Prevalence of Infectious Diseases of Immigrant Workers Receiving Health Examinations at Rajavithi Hospital


Infectious diseases in immigrant workers, Thailand, 2012

Table 2: The prevalence of infectious diseases in immigrants in Thailand, 2012

<table>
<thead>
<tr>
<th>Disease</th>
<th>Incidence Rate per 100,000 Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuberculosis</td>
<td>3.5</td>
</tr>
<tr>
<td>Leptospirosis</td>
<td>0.2</td>
</tr>
<tr>
<td>Hepatitis</td>
<td>0.1</td>
</tr>
<tr>
<td>Malaria</td>
<td>0.05</td>
</tr>
<tr>
<td>Cholera</td>
<td>0.0</td>
</tr>
<tr>
<td>Typhoid</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Note: Data is based on a sample of 10,000 immigrants. *Compared with Thais, p < 0.05. **Compared with Thais, p < 0.01.
N=7,792 migrants who crossed international borders for the purpose of resettlement and underwent a protocol-based health assessment at 2 US based GeoSentinel Surveillance network clinics

CID; 2013 Apr 1:56(913-24)

- Latent TB infection (LTBI) 43%
- Eosinophilia 15%
- Hepatitis B 6%
- Regional variations occurred
- Notable absence of infectious TB, malaria and STH (soil transmitted helminths)

Universal health problems:
- dental caries, anemia, hypertension

CID; 2013 Apr 1:56(913-24)

Thai travelers are different from foreign travelers

CID; 2013 Apr 1:56(913-24)

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CID; 2013 Apr 1:56(913-24)

The highest levels of human displacement in history

Source: www.unhcr.org
Accessed 10/23/16

CID; 2013 Apr 1:56(913-24)

54% of refugees worldwide came from three countries

www.unhcr.org
Accessed 10/23/16
Syrian refugee crisis – one of the greatest human displacements in history

- Since civil war began in March 2011:
  - 6.6M internally displaced
  - 4.8M refugees fled to Turkey, Lebanon, Jordan, Egypt and Iraq
  - 1M requested asylum in Europe (Germany 300,000; Sweden 100,00)

http://syrianrefugees.eu/

A brief history lesson

- Modern refugee protection movement is less than 100 years old

- Protection of refugees has occurred since antiquity
- International protection began with the League of Nations (1921-1946)

https://www.icrc.org/eng/assets/files/other/727_738_jaeger.pdf

Convention on the International Status of Refugees - 1933

- First time the principle of non-refoulement acquired the status of international treaty law

Refugees after World War 2

- International Refugee Organization (IRO) 1946-1951
- Established by UN General Assembly to help resettle central European refugees to US, Canada, W Europe, Australia, Israel and Latin America

Photo: Wikimedia Commons: Passenger ship, possibly MS SKAUBRYN, berthed at a wharf (8400394605).jpg
IRO was meant to complete its work by 30 June 1950

“As soon became evident, it was unlikely – to say the least – that the problem of refugees would be solved by that date”

UN commissioned “A Study of Statelessness”

Modern protection of refugees

This study served as the main elements of the

UN Convention Relating to the Status of Refugees, 1951

Who is a refugee?

Someone who “owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality, and is unable to, or owing to such fear, is unwilling to avail himself of the protection of that country.”

1951 Refugee Convention establishing UNHCR

Refugees are different from other migrants......

“Migrants, especially economic migrants, choose to move in order to improve the future prospects of themselves and their families. Refugees have to move if they are to save their lives or preserve their freedom. They have no protection from their own state - indeed it is often their own government that is threatening to persecute them. If other countries do not let them in, and do not help them once they are in, then they may be condemning them to death - or to an intolerable life in the shadows, without sustenance and without rights.”

Refugees in Thailand after the Vietnam War (1975-present)
United States and migration:
- 1600's...Americans fleeing persecution since the Pilgrims
- 1948-1950: 250,000 displaced Europeans from WWII
- 1940's-50's – laws assisting those fleeing Communism (China, Hungary, Korea, Poland, Yugoslavia)
- 1960's- fleeing Cuba

A nation of immigrants
- 0.9% Native American
- 99.1% immigrants and their descendants

Photo credit: https://www.flickr.com/photos/dominiquejames/4621961395/

US Estimated Annual International Arrivals

US Refugee Admissions
- 3.25 M between 1975-12/31/15
- 69,933 in 2015
- In 1980, after the Vietnam War, we admitted 207,116 refugees

Photo credit: http://refugeecamps.net/CV61.htm

Top 10 Countries of Nationality for US-Bound Refugees, 2015

Total: 69,933

- Burma: 18,323
- Iraq: 12,608
- Somalia: 8,852
- DRC: 7,523
- Bhutan: 5,563

Photo credit: http://refugeecamps.net/CV61.htm
Refugees admitted to the US 1980-2015


Minnesota: home to many refugees

- Refugees comprise a large percentage of new immigration to the state
- Large Hmong and Somali populations
- Now seeing Iraqi, Syrian and Congolese....

Syrian Refugees

- US resettled 1,093 Syrians in FY15
- Obama Administration has committed to admitting at least 10K Syrian refugees in FY16
  - Majority will depart from Iraq, Jordan, Turkey, Lebanon, Egypt
  - Most refugees reside in urban or semi-urban settings
  - Additional processing site established in Erbil, Iraq (located closer to Syrian border)
- FY16 global refugee arrivals set at 85,000

Reactions to Syrian Refugee Resettlement

- Slides courtesy of Dr. Martin Cetron, DGMQ, CDC

Human mobility will always impact health

- The reality is that we have guaranteed job security in tropical and travel medicine/migrant and refugee health

Human mobility and health

- Demographics of human migration
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One example of how to approach human mobility and health:

- Offer the example of the US refugee health program as one model of a humanitarian public health response that is good for the patient, the host country, and the country of ultimate resettlement.

CDC Enhanced Refugee Health Programs – enhanced detection and presumptive treatment:

- Addressing healthcare needs of US bound refugees
- Presumptive pre-departure treatment for malaria, intestinal parasites, expanded TB and HIV diagnostic and treatment programs, immunizations
- Successful prevention of thousands of cases of intestinal parasitosis, malaria, vaccine preventable diseases and hundreds of cases of TB among US bound refugees.

Locations of CDC’s Overseas Refugee Health Programs:

- Nairobi, Kenya (2007)
- Amman, Jordan (2016)
- Bangkok, Thailand (2006)

Mobility: time for refugee health interventions:

- Prevention, surveillance & Intervention opportunities
- Quarantine Stations
- Resettlement Communities

U.S.-bound Refugees: Medical Evaluation:

- Panel physicians (DoS)
  - Required overseas medical examination
    - 2-6 mos
  - Recommended domestic examination in US (DIFFERENT from overseas exam)
    - 1-3 mos
- State health dept
Healthy Resettlement Promotes Health Security: Overseas Tuberculosis Screening

Directly observed therapy for TB, Kenya

TB cultures, Nepal

Slide courtesy of Dr. Martin Cetron, DGMQ, CDC

Horn of Africa Migration Movement: Why Migration is a Health Concern

- Migration out of Somalia is global
- In 2001, MDR-TB cases surged in Dadaab and Eastleigh, Kenya
- Most (>80%) were migrants from Somalia seeking treatment

TB Rates in Refugee Populations US refugee program 2014

<table>
<thead>
<tr>
<th>Screening location</th>
<th>Primary Populations</th>
<th>Refugee Examinee</th>
<th>TB Cases</th>
<th>Cases with Drug Resistance</th>
<th>TB Rate per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td>Iraqi, Syrian, Sudan</td>
<td>3,301</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Somali</td>
<td>7,051</td>
<td>13</td>
<td>2</td>
<td>186</td>
</tr>
<tr>
<td>Iraq</td>
<td>Iraqi</td>
<td>15,680</td>
<td>14</td>
<td>0</td>
<td>186</td>
</tr>
<tr>
<td>Jordan</td>
<td>Iraqi, Syrian</td>
<td>24,487</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Kenya</td>
<td>Somali, Congolese</td>
<td>7,051</td>
<td>13</td>
<td>2</td>
<td>186</td>
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<td>Nepal</td>
<td>Somali, Burmese</td>
<td>7,051</td>
<td>13</td>
<td>2</td>
<td>186</td>
</tr>
<tr>
<td>Thailand</td>
<td>Burmese</td>
<td>6,971</td>
<td>36</td>
<td>6</td>
<td>86</td>
</tr>
<tr>
<td>Turkey</td>
<td>Iraqi</td>
<td>3,607</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Uganda</td>
<td>Congolese</td>
<td>3,607</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Limitations of overseas TB screening (CXR and AFB smear) among US bound Vietnamese refugees 1998-1999

- Sensitivity 34.4%
- Specificity 98.1%
- PPV 76.8%
- NPV 89.1%

- Nearly 2/3 of immigrants with positive cultures were not identified overseas using the standard algorithm.

MDR TB in Hmong refugees resettling from Thailand to the US 2004-2005

- Dec 2003 resettlement program for 15,700 Hmong living in a temple in central Thailand
- Not an official refugee camp, no public health or medical care infrastructure
- Ability to access care limited by finances of the Hmong in the camp, many supported by US Hmong families

Timeline for resettlement of Hmong refugees and identification of tuberculosis cases – Thailand and US December 2003-2005

**TB Technical Instructions (2007 TB TI)**

- **Sputum smears and cultures (3)**
  - All (-) One or more (+)
  - Valid for travel within 3 months
  - DOT until cured
  - Class A Waiver

**Class A Waiver**

- If TB rate ≥20/100,000 or 2-14 years of age:
  - TST ≥10 mm or positive IGRA
  - HIV or TB signs or symptoms

**Tuberculosis Cases, United States, 1995-2014**

**TB on Thai-Myanmar border**

- High prevalence area
- Many groups caring for patients: 5 provincial hospitals, NGOs and refugee camps
- Migrants with active TB are traveling for care - between Tak Province, Bangkok and Yangon
- Refugees have better access than other migrants to care
- Thailand’s Compulsory Migrant Health Insurance helps some people access care

**TB on Thai Myanmar Border**

- “Dreamlopements”
- 90% of migrants in Tak province are uninsured
- NGO offering $3/month health insurance for migrants
- Could be used as a model worldwide

**Presumptive Treatment for Intestinal Parasites, Dadaab Refugee Camp, Kenya**

Slide courtesy of Dr Martin Cetron, DGMQ, CDC
Prevalence of intestinal parasites in Minnesota refugees: the impact of presumptive Albendazole

Changes practice

Overseas Refugee Presumptive Parasite Treatment

- Ivermectin for Strongyloides
- Praziquantel for Schistosomiasis in African refugees
- Artemether/lumefantrine for malaria

Overseas Presumptive Treatment: Who is Getting What and Where?


Refugee Vaccination Program: Overview

- Up to 2012 - Many refugees arrived in U.S. with no vaccinations
- Reports of VPD’s in newly arrived refugees
- Missed opportunity to vaccinate between overseas health exam & US arrival (4-6 months)
- Partnership between CDC, DOS, implemented by IOM, vaccinating against 11 diseases
- 2012 – began in 5 pilot countries: Malaysia, Nepal, Thailand, Ethiopia and Kenya
- 2016 and beyond – continuing to roll out globally with intentions of reaching 100% of USRP refugees

Slide courtesy of Martin Cetron, MD, Director, DGMQ, CDC
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Imagining our future

- A world where upstream public health work is supported, and assessment and interventions occur during migration and before refugee resettlement

Imagining Our Future

- A world where we work for peaceful resolutions of international conflicts (so that we don’t have refugees…)
  
  Photo: Arcadia University

Imagining Our Future

- A world where we honor key principles of international refugee law
  
  Photo Credit: University of Baltimore School of Law

April 6, 2016

Imagining Our Future

- A world where governments, IO’s and NGO’s are prepared for high volume, long term tragedies such as the Syrian conflict

Photo: Arcadia University
Imagining Our Future

• A world which views refugee situations as the indescribable human tragedies which they are, and which responds with generosity and compassion

Imagining Our Future

• “Refugees are not the danger – they are in danger”
  Pope Francis
  Vatican City
  May 28, 2016

Imagining Our Future

• A world in which medical providers are prepared for humanitarian crises abroad

Imagining Our Future / Domestic Refugee Health

○ A world where we have fingertip access to the knowledge we need about diseases seen in each refugee group

Imagining Our Future / Domestic Refugee and Migrant Health

○ A world where providers are trained in the body of knowledge which encompasses refugee and immigrant health, including clinical tropical medicine and traveler’s health

Knowledge which didn’t exist 35 years ago....
CDC Refugee Health Guidelines and Community Profiles

www.cdc.gov/immigraterefugeehealth/guidelines/refugee-guidelines.html

www.cdc.gov/immigraterefugeehealth/profiles/index.html
  • Bhutanese, Congolese, Iraqi, Burmese
Knowledge which didn’t exist 35 years ago

Imagining Our Future/
Domestic Refugee and Migrant Health

- A world where providers have access to colleagues and experts which is timely and easy to access, and where we leverage that expertise more effectively

Refugees telling their stories

Imagining Our Future

- A world where providers routinely ask “Where were you born, and where have you traveled?”... and know what to do with the answer

Photo Credit: IOM via WHO

Imagining Our Future

- A world where we remember that migration is circular – and we routinely ask “are you planning to travel back home?” (the Visiting Friends and Relatives or VFR traveler)

Conclusions

- Human mobility, infectious diseases and health are inextricably connected
- Travelers, refugees and other migrants are important groups to target for infectious disease surveillance, screening and treatment
- Doing so pro-actively is better for patients, countries and the world community
Advocacy for migrant populations actually can make a difference—
for both the person, and for the country receiving that person

President Barack Obama,
on his final foreign trip, Nov. 2016

• “We have to guide against a tribalism built around “us” or “them”
• “The future will be decided by what we have in common, rather than what leads us in to conflict”

Krop khun mak, kha

He once made a promise and it was delivered.
“we will reign with righteousness for the benefits and happiness of the Thai people”

King Bhumibol
The Heart of Thailand