Immigration and Infectious Disease

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Outline

- Historic perceptions and treatment of migration and infectious diseases
- Media reporting of infectious disease and migration
- Reduced health services implications for infectious disease
- Immigration and specific infectious disease
  - Tuberculosis
  - Measles
- Summary
Historically, immigrants (or foreigners) have been perceived as a risk to native populations because of the infectious diseases they may introduce.
“Frontier-based” Approach to Infectious Diseases and Immigrants

1. Focus on protection of recipient population

2. Screening and exclusion at time of arrival

3. Disease based, mostly infectious with immediate infection risk (e.g., TB, cholera, plague).

4. Not effective for long latency diseases.
Biased Media Reports on Migration and Infectious Diseases

“7,000 new cases of leprosy in the U.S over a recent three-year period. This increase in leprosy was due in part to unscreened illegal immigrants coming into this country”

Lou Dobbs Tonight (April 14, 2005)
Public Perception (or Biased Reporting) is not Supported by the Facts

Source: HRSA
Immigrants and Infectious Diseases

The hordes of illegal immigrant minors entering the U.S. are bringing serious diseases—including swine flu, dengue fever, possibly Ebola virus and tuberculosis—that present a danger to the American public as well as the Border Patrol agents forced to care for the kids, according to a U.S. Congressman who is also a medical doctor. This has created a “severe and dangerous” crisis.

Phil Gingrey. July 8, 2014
"Tremendous infectious disease is pouring across the border," "The United States has become a dumping ground for Mexico and, in fact, for many other parts of the world."

Donald Trump, July 6, 2015.
Population Mobility and Global Health

Population mobility but not immigration is a major driver behind many global disease challenges, e.g.

- SARS
- H1N1
- TB (XDR)
- Malaria,
- HIV/AIDS
- Ebola, Zika
37.4 million commercial flights in 2014
>100,000 flights/day
Major Emerging and Reemerging Infectious-Disease Outbreaks, Epidemics, and Pandemics, 2002 through 2015

Infectious Diseases and Immigration Challenges

- A border exclusionary approach is of limited effectiveness.

- Many health surveillance systems do not currently record migration-related information (e.g., country of birth, travel).

- Some high-risk immigrant groups are likely missed by surveillance systems.

- For most diseases, incidence or prevalence data on specific migrant groups are unavailable.
Worldwide Ebola Cases
Zika Virus Distribution, January 2016
Infectious Diseases and Immigrants

Some migrants may also be at ongoing risk of infections after arrival to host country

- Especially, migrants maintaining links with family and friends in their country of origin
  - More likely to stay with family or friends
  - More likely to have contact with local populations
  - Longer duration of trip
  - Repeated travel to same area
### Mexican immigrant adults lack connection to health care facilities, California

<table>
<thead>
<tr>
<th>Category</th>
<th>Doctor's office or health center</th>
<th>Clinic</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recent Mexican Immigrants</td>
<td>42.4%</td>
<td>14.5%</td>
<td>39.6%</td>
</tr>
<tr>
<td>Longer-stay Mexican Immigrants</td>
<td>20.9%</td>
<td>46.2%</td>
<td>31.1%</td>
</tr>
<tr>
<td>Mexican American</td>
<td>14.7%</td>
<td>66.3%</td>
<td>14.7%</td>
</tr>
<tr>
<td>U.S.-Born Whites</td>
<td>9.2%</td>
<td>79.4%</td>
<td>9.0%</td>
</tr>
</tbody>
</table>

Source: California Health Interview Survey
Age 65 & over with no influenza immunization past year, U.S.

Measles Vaccination Rate Estimates (Percent of Population)

<table>
<thead>
<tr>
<th>Country</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>92%</td>
<td>91%</td>
</tr>
<tr>
<td>Mexico</td>
<td>99%</td>
<td>89%</td>
</tr>
<tr>
<td>Guatemala</td>
<td>93%</td>
<td>85%</td>
</tr>
<tr>
<td>Honduras</td>
<td>93%</td>
<td>89%</td>
</tr>
<tr>
<td>El Salvador</td>
<td>93%</td>
<td>94%</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>99%</td>
<td>99%</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>90%</td>
<td>91%</td>
</tr>
<tr>
<td>Belize</td>
<td>96%</td>
<td>99%</td>
</tr>
<tr>
<td>Panama</td>
<td>98%</td>
<td>92%</td>
</tr>
</tbody>
</table>

Confidence Levels:
- **High Confidence**
- **Medium Confidence**
- **Low Confidence**
Tuberculosis

In many developed countries, a high % of TB cases are immigrants
- In Canada, 60%
- In Australia, Europe and U.S: immigrants and refugees 4-10 fold greater risk of developing TB than native population

Risk of developing TB persists for an extended period after arrival
- TB reactivation most likely because of socio-environmental circumstances (rather than new infection)

Minimal evidence to suggest immigrant to native transmission
Reported TB Cases, United States, 1982–2013*

*Updated as of June 11, 2014
TB Incidence Rates

Estimated incidence rates per 100,000, all forms of tuberculosis:
- 0-24
- 25-49
- 50-99
- 100-299
- ≥300
- No estimate
In 2014, a total of 66% of reported TB cases in the United States occurred among foreign-born persons. The case rate among foreign-born persons (15.4 cases per 100,000 persons) in 2014 was approximately 13 times higher than among U.S.-born persons (1.2 cases per 100,000 persons).
<table>
<thead>
<tr>
<th>Country</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>721</td>
<td>32</td>
</tr>
<tr>
<td>Philippines</td>
<td>439</td>
<td>20</td>
</tr>
<tr>
<td>Vietnam</td>
<td>248</td>
<td>11</td>
</tr>
<tr>
<td>China</td>
<td>160</td>
<td>7</td>
</tr>
<tr>
<td>India</td>
<td>125</td>
<td>0</td>
</tr>
<tr>
<td>Korea, South</td>
<td>67</td>
<td>6</td>
</tr>
<tr>
<td>Guatemala</td>
<td>53</td>
<td>0</td>
</tr>
<tr>
<td>El Salvador</td>
<td>39</td>
<td>3</td>
</tr>
<tr>
<td>Cambodia</td>
<td>38</td>
<td>0</td>
</tr>
<tr>
<td>Laos</td>
<td>38</td>
<td>2</td>
</tr>
<tr>
<td>Thailand</td>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td>Peru</td>
<td>25</td>
<td>1</td>
</tr>
<tr>
<td>F. Soviet (Ukraine, Armenia, Soviet U)</td>
<td>21</td>
<td>8</td>
</tr>
</tbody>
</table>
Infectiousness and health care access: foreign-born TB cases in California, n=289

<table>
<thead>
<tr>
<th>Reason presented</th>
<th>Documented</th>
<th>Undocumented</th>
</tr>
</thead>
<tbody>
<tr>
<td>= symptoms</td>
<td>172 (78%)</td>
<td>63 (93%)*</td>
</tr>
<tr>
<td>Smear positive or cavitary</td>
<td>92 (47%)</td>
<td>36 (53%)</td>
</tr>
<tr>
<td>Time from symptom start to diagnosis</td>
<td>65 (46%)</td>
<td>20 (36%)*</td>
</tr>
<tr>
<td>- Within one month</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health insurance</td>
<td>111 (69%)</td>
<td>15 (25%)*</td>
</tr>
</tbody>
</table>

*Statistically significant

Bright Spot – Revised Overseas TB Screening and Treatment

Major Changes:

- Culture performed in addition to smear
- Drug susceptibility testing guides treatment
- U.S. treatment standards
- Treatment observed by health care workers (DOT)
- Treatment completed prior to travel
- Child screening
<table>
<thead>
<tr>
<th></th>
<th>Old screening</th>
<th>New screening</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>2115</td>
<td>3671</td>
</tr>
<tr>
<td>TB disease</td>
<td>87 (4.1%)</td>
<td>27 (0.7%)</td>
</tr>
<tr>
<td>Culture +</td>
<td>82%</td>
<td>56%</td>
</tr>
</tbody>
</table>

*from Philippines, Vietnam, Mexico with B-notification*
Rush Limbaugh blames measles outbreak on immigrant children

By Jon Greenberg on Thursday, February 5th, 2015 at 11:33 a.m.
Measles

- **Prodrome (2-4 days)**
  - Fever (up to 105°F)
  - Cough, Coryza, and/or Conjunctivitis (the three “C’s”)
  - Enanthem (Koplik spots)

- **Rash ~14 days after exposure (range 7-21 days)**
  - Maculopapular
  - Spreads from head to trunk to extremities
  - May become confluent
  - Lasts 5-6 days and fades in order of appearance
Global Burden of Measles

- **Deaths**
  - Estimated 2.6 million deaths/year in 1980
  - 75% decrease in estimated deaths from 2000 to 2013
    - 145,700 deaths in 2013 (~400 deaths/day)
  - Remains a leading cause of vaccine preventable deaths in children < 5 years old

- **Complications with sequelae include blindness**

- **Cases**
  - Estimated 20 million per year
  - 72% decrease in reported measles incidence from 2000 to 2013
Immunization coverage with 1st dose of measles containing vaccines in infants, 2014

Date of slide: 16 July 2015
Measles, United States, 1996-2014*
(Importations indicated by red bar, available since 2001)
What Was the Cause of the Disneyland Outbreak

The index case was never identified, but serotyping suggests it was someone who had traveled to the Philippines.

Dissemination of the outbreak was promoted by low vaccination rates.

- Herd immunity required 96-99% vaccination rate
Percentage of US Resident Measles Cases who were Not Vaccinated

Reason for not receiving measles vaccine:
- Philosophical/Religious beliefs
- Ineligible
- Missed opportunities
- Other
CDC Official Dismisses Claim That Undocumented Immigrants Bring Measles Into The U.S.

False Narrative on Measles Outbreak

By Dave Levitan  Posted on February 5, 2015

No, illegal immigrants probably aren't responsible for the measles outbreak
Conclusions

- An exclusionary approach to infectious diseases among immigrants is generally ineffective.
- Immigrants are not responsible for an epidemic of infectious diseases in the US.
  - International travel can spread infectious diseases
- Immigration may be responsible for some diseases that come from countries with higher endemic rates.
- Vaccination rates among immigrants are often equal to or higher than those in the U.S.
- Public health efforts are often substandard for immigrants, particularly those without documentation.
Thank you!

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