Pediatric Immunization Challenges in Immigrant and Refugee Populations

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We, Sergut Wolde-Yohannes and Béatrice Martin, have been asked to disclose any significant relationships with commercial entities that are either providing financial support for this program or whose products or services are mentioned during our presentations. We have no relationships to disclose.

We may discuss the use of vaccines in a manner not approved by the U.S. Food and Drug Administration.

- But in accordance with ACIP recommendations
Objectives

- Summarize global refugee trends and U.S. refugee resettlement process
- Describe refugee health screening elements:
  - Overseas
  - Domestic
- Increase understanding of challenges associated with:
  - Refugee health assessment services
  - Pediatric immunization services
“Someone who is unable or unwilling to return to their country of origin owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group, or political opinion.”

(UNHCR)
Forcibly Displaced Persons
Global trends: End-2018

• 70.8 million displaced worldwide
  – 25.9 million refugees
    • 20.4 million under UNHCR protection
    • 5.5 million Palestinian refugees under UNRWA’s protection

• 41.3 million internally displaced

• 3.5 million asylum seekers

Global trends: End-2018 (2)

- **CHILDREN**: Every second refugee was a child, many (111,000) alone and without their families.

- **TODDLERS**: Uganda reported 2,800 refugee children aged five or below alone or separated from their families.

- **URBAN PHENOMENON**: Refugees are more likely to live in a town or city (61 per cent) than in a rural area or camp.

Global trends: End-2018 (3)

• **RICH & POOR:**
  – High income countries on average host 2.7 refugees per 1000 of population
  – Middle and low-income countries on average host 5.8 per 1000 of population
  – Poorest countries host a third of all refugees worldwide

Global trends: End-2018 (4)

• **DURATION:**
  – Nearly 4 in every 5 refugees are in displacement situations that have lasted for at least five years.
  – One in 5 have been in displacement situations that have lasted 20 years or more.

• **NEW ASYLUM SEEKERS:**
  – The greatest number of new asylum applications in 2018 was from Venezuelans (341,800).

Major source countries of refugees – 2017-2018


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Receiving countries: 80% of refugees live in countries neighboring their countries of origin


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Lasting solutions for forced migration

- Repatriation: Safe to go home
- Local integration: Safe to stay in country of refuge
- Resettlement: Accepted to a third country through lawful admissions process

Refugee Resettlement: Overseas to U.S. Communities
U.S. Refugee Resettlement Program

Medical Screening: Overseas
CDC’s Role in Medical Screening: overseas and domestic

Immigrant, Refugee, and Migrant Health Branch
• Provide guidelines for disease screening, prevention & treatment in the U.S. and overseas
• Technical Instructions for Panel Physicians
• Domestic Screening Guidelines
• Track and report disease
• Implement vaccination and presumptive treatment for parasites in refugees overseas
• Respond to disease outbreaks in the U.S. & overseas
• Advise U.S. partners about health care for refugee groups
• Educate and communicate with stakeholder groups

Overseas Medical Screening: Immigrants and Refugees (1)

- **Scope:** Technical instructions issued by CDC – for all persons entering the U.S. on permanent visa (immigrant, refugee)

- **Purpose:** To determine if the applicant has a condition that would exclude him/her from entering the US:
  - Communicable diseases of public health concern:
    - Active TB (untreated or incompletely treated)
    - Syphilis (untreated)
    - Other sexually transmitted diseases (e.g. chancroid, gonorrhea, granuloma inguinale, lymphogranuloma venereum)
    - Hansen’s disease (leprosy)
  - Current or past physical or mental disorders that are or have been associated with harmful behavior
  - Drug abuse or addiction

CDC. See https://www.cdc.gov/immigrantrefugeehealth/exams/ti/panel/technical-instructions-panel-physicians.html
Overseas Medical Screening: Immigrants and Refugees (2)


Thierry Falise / IOM - https://www.iom.int/newsdesk/20170123
Medical screening of US-bound immigrants includes vaccination

• Specific criteria by CDC for which vaccines individuals must show proof of receiving to obtain US immigrant visa.
  – Age-appropriate vaccines, based ACIP guidelines, with some modifications.
  – The vaccine must:
    • Protect against a disease that may cause an outbreak.
    or
    • Protect against a disease that has been eliminated or in the process of being eliminated.

https://www.cdc.gov/immigrantrefugeehealth/exams/ti/panel/vaccination-panel-technical-instructions.html
Vaccination requirements in the immigration application process

- Long, complicated process to apply for immigrant visa
- State Department recommends completing overseas medical exam, along with any required vaccinations, in preparation for interview
  - Must be with approved panel physician
- Medical exam, travel visa are time limited
  - Typically expire within 6 months
Overseas medical screening for US-bound Refugees

- **Visa Medical Examination**
  - Maximum of 6 months before departure
  - All refugees
  - Screening for inadmissible conditions

- **Pre-departure Medical Screening**
  - Approximately 2 weeks before departure
  - Refugees with Class B1 TB, Pulmonary conditions* and other significant medical conditions

- **Fit to Fly Pre-Embarkation Checks**
  - 24-48 hours before departure
  - All refugees
  - Presumptive albendazole and ivermectin treatment for intestinal parasites (select processing countries)

Vaccination Rationale: VPD affecting refugee resettlement

2003-2005: Measles, rubella, varicella, Côte D’Ivoire (Liberian refugees)
- Death of 1 child (measles)
- U.S.-born child with congenital rubella
- Delay of resettlement >6 m during outbreak control period

2005: Measles, Eastleigh, Kenya (Somali refugees)
- CDC recommended vaccination & waiting 1 incubation period before resettlement
- Recommendations not implemented due to cost concerns
- Results: Ill refugee arrives in U.S.; domestic outbreak response and surveillance

2006: Polio, Dadaab, Kenya (Somali refugees)
- Related outbreak control costs: $309,283

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- Related outbreak control costs: $309,283

2011: Measles, Kuala Lumpur, Malaysia (Burmese refugees)
- Symptomatic in-flight; transmission to 2 other children on the plane
- Several epidemiologically linked cases, including a case in a CBP officer
- Extensive overseas & domestic outbreak control and vaccination efforts
- Related costs ~$130,000
New opportunities for public health interventions overseas

• CDC invested in updating refugee medical exam process for prevention services

• Examples:
  – Expanded pre-departure immunization program for vaccine preventable diseases (VPD) – vaccines not required for refugees
    • Voluntary testing and management of hepatitis B virus (HBV) infection
  – Pre-departure presumptive treatment for malaria and parasites
Vaccination program for U.S.-bound Refugees (1)

• 2012: Initial program piloted in Kenya, Ethiopia, Thailand, Malaysia, and Nepal
  – Up to 2-3 doses of a vaccine series
  – First dose of vaccines given at the overseas medical screening exam, approx. 2-6 months before departure
  – Second vaccine doses possibly given 1–2 months after the first dose

• 2019: Coverage is 50-60% of U.S.- bound refugees
  – Now expanded to 21 countries
  – Future expansion to provide 100% coverage for all refugees in U.S. Refugee Admissions Program

Vaccination program for U.S.-bound Refugees (2)

- Valid historical vaccination records (such as camp vaccine cards) are counted toward the immunization schedule when applicable

- Refugees who undergo repeated medical examinations overseas may receive additional vaccine doses

- Live-virus vaccines will not routinely be administered less than 4 weeks before departure, except during disease outbreaks
  - CDC provides additional notification to states in most of these situations

## Vaccines given to eligible US-bound Refugees (depending on availability and eligibility)

<table>
<thead>
<tr>
<th>Age</th>
<th>Vaccines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth - adult</td>
<td><strong>HepB x 2 doses</strong></td>
</tr>
<tr>
<td>6 weeks - &lt;15 weeks</td>
<td><strong>Rotavirus</strong> x 2 doses (maximum age for dose 2 is 8 mos)</td>
</tr>
</tbody>
</table>
| 6 weeks - <5 years       | **Hib** (x 2 doses if <15 mos; x 1 dose if 15 mos-5 yrs)³  
|                          | **PCV** (x 2 doses if <2 yrs; x 1 dose if 2-5 yrs)⁴ |
| 6 weeks - <7 years       | **DTP** x 1 dose                              |
| 6 weeks - <11 years      | **Polio** x 2 doses (OPV, IPV, or one of each) |
| 7 years – adult          | **Td** x 2 doses  
|                          | **MenACWY** x 1 dose                          |
| ≥ 1 year – <20 yrs       | **Varicella** x 1 dose                        |
| ≥ 1 year - born ≥ 1957   | **MMR** x 2 doses                             |

**Hepatitis B** (HepB); **Haemophilus influenzae type B** (Hib); **pneumococcal conjugate vaccine** (PCV); **diphtheria, tetanus, pertussis** (DTP); **oral polio vaccine** (OPV); **inactivated polio vaccine** (IPV); **tetanus, diphtheria** (Td); **meningococcal conjugate vaccine with protection against serogroups A, C, W, and Y** (MenACWY); **measles, mumps, and rubella** (MMR)

1 For some sites in Asia, those ≥6 months old (including adults) may receive the inactivated influenza vaccine (1–2 doses depending on age and vaccination history)

2 Refugees are tested for hepatitis B virus infection (HBsAg) before vaccination, and are vaccinated only if negative (and if a dose is due).

3 One dose of Hib vaccine will be recommended for unimmunized asplenic persons regardless of age, and for unimmunized HIV-positive patients up to age 18 years.

4 When available, PCV13 will be given to children 6 weeks to <5 years of age. A second dose will be given to children up to age 2 years. One dose of PCV13 will also be recommended for all immunocompromised persons, regardless of age.

5 Children residing in refugee camps often receive several doses of whole-cell pertussis (DTwP) as part of the Expanded Program on Immunization (EPI). Children participating in the Vaccination Program for U.S.-bound Refugees will receive only 1 dose of DTwP/DTaP from International Organization for Migration panel physicians, if due, in order to reduce the risk of severe local reactions associated with over-vaccination with these vaccines.


MIAP 2019
CDC response to global measles outbreak

- CDC issued measles alert in early 2019 for individuals traveling from Ukraine
- By September 2019, activated measles management recommendations for refugees in 28 countries
  - Non-pregnant, immunocompetent refugees age 6 months -> born > 1957 receive at least one dose of live measles virus-containing vaccine
  - If 28 days since first dose, refugees > 12 months may receive a second dose overseas
- Live measles virus-containing vaccines may be given < 4 wks before departure
- Overseas doses are documented
Hepatitis B pre-vaccination testing

• All refugees tested for hepatitis B virus (HBV) infection by HBsAg
  – HBsAg results documented on the overseas forms

• HBsAg-positive persons:
  – Do not receive hepatitis B vaccination overseas
  – Counseled about the infection and about transmission prevention
  – Positive results are documented on the overseas forms

• HBsAg-negative persons:
  – Receive up to two hepatitis B vaccine doses overseas, if due and there are no known contraindications.
  – HBsAg-negative household contacts of HBsAg-positive persons may be given an additional (third) dose of hepatitis B vaccine overseas to complete the series for full protection.
U.S. Refugee Arrivals
Refugee arrivals by Initial State of Residence - FY 2019*

* Data for FY 2019 are partial and refer to resettlement between October 1, 2018 and April 30, 2019.  
**Source:** MPI analysis of State Department WRAPS data.

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**Texas:** 48%
- New York: 9%
- California: 6%
- Washington: 6%
- North Carolina: 6%
- Ohio: 6%
- Kentucky: 4%
- Georgia: 4%
- Michigan: 4%
- Arizona: 4%
- Other states: 4%
Refugee U.S. Entry and Arrival Notification

Overseas
Visa issued/Cleared for travel

US Ports Of Entry/Arrival
Quarantine officers review documents
Documents to CDC/DGMQ electronically (pre/post arrival)

State & Local Jurisdictions
DGMQ notifies state/local public health electronically via EDN

MDPH notifies local public health via MAVEN [when resettlement address is known]
Refugee arrival notification: Massachusetts

MAVEN event

Electronic via MAVEN

Division of Global Populations
Regional Coordinator

Community Health Worker

Refugee Health Assessment Program Provider

LBOH Nurse

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Refugee arrivals: Massachusetts

• In FFY19, 517 refugees resettled in Massachusetts
  – Total is 693 when all visa statuses eligible for refugee services included

• Arrivals primarily from the Democratic Republic of Congo, Ukraine, Afghanistan, Haiti
  – Smaller numbers from Ethiopia, Sudan
Top refugee resettlement communities, Massachusetts, 2018 (N= 628*)

- Lowell (12%)
- Boston (11%)
- Worcester (14%)
- Springfield (12%)
- Westfield (10%)
- Northampton (4%)
- West Springfield (4%)
- Agawam (4%)

*Includes persons with known address and length of stay >30 days

Source: MAVEN, MDPH

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Domestic Refugee Health Assessment
Continuum of care for refugees from overseas to arrival

Children's Hospital of Philadelphia. Available at https://policylab.chop.edu/file/refugee-health-webinar-continuumpng-0.
Goal for domestic health assessment

• All refugees should have access to a quality domestic health assessment
  – Informed by overseas exam
  – Organized within a public health framework
  – Facilitating linkage to primary care
  – Provided through contracted hospitals and community health centers
Refugee health assessment

• First point of contact with US health care system
• Public health screening protocol
  – History and Physical
  – Testing for health conditions
  – Immunizations
  – Mental health screening
    • Refugee Health Screener – 15 (RHS-15)
  – Treatment of any urgent or acute health problems
  – Referral to primary care
Refugee health assessment sites in Massachusetts

- Participate in the Vaccines for Children Program/MDPH Immunization Program
- Follow all adult and childhood vaccine schedules and guidelines from the MDPH Immunization Program and Advisory Committee on Immunization Practices (ACIP)
- Review current ACIP/MDPH Immunization Program recommendations for routine and catch-up vaccination of children and adults and requirements for school attendance.
Immunizations

• Review previous vaccines, lab evidence of immunity, or history of disease.

• Review vaccine doses for validity – age and spacing must be per accepted ACIP or state schedules.

• Give age-appropriate vaccines as indicated. Complete any series that has been initiated.

• If patient has no documentation, assume refugee is not vaccinated.

• Laboratory evidence of immunity is an acceptable alternative, as determined by the provider.

CDC. Available at https://www.cdc.gov/immigrantrefugeehealth/guidelines/domestic/checklist.html
Partnership with Immunization Program

Sharing refugee immunization information:

• Overseas vaccinations:
  – Uploading overseas immunization information to MIIS since 2016

• Domestic health assessment:
  – Immunization information entered in MIIS by refugee health assessment providers since 2017
Refugee: Adjustment of Status examination

- Timing: one year after U.S. arrival, exam must be conducted by a US civil surgeon approved by USCIS
  - USCIS Form I-693, Report of Medical Examination and Vaccination Record completed by Civil Surgeon [see https://www.uscis.gov/i-693]

- Vaccination requirements only*
  - Applicants are required to document vaccinations as recommended by the ACIP
    - Waivers for not age appropriate, contraindication, insufficient time interval, not flu season

*If refugee had Class A condition at arrival, full exam required.*
# Immunizations requirements for adjustment of status

## Vaccine Requirements According to Applicant Age

<table>
<thead>
<tr>
<th>Vaccines by applicant age</th>
<th>Birth–1 month</th>
<th>2–11 months</th>
<th>12 months–6 years</th>
<th>7–10 years</th>
<th>11–17 years</th>
<th>18–64 years</th>
<th>≥65 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTP/DTaP/DT</td>
<td>NO</td>
<td>YES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Td/Tdap</td>
<td>NO</td>
<td></td>
<td></td>
<td>Sometimes*</td>
<td>YES (substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polio** (IPV/OPV)</td>
<td>NO</td>
<td></td>
<td></td>
<td>YES</td>
<td>NO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles, Mumps, and Rubella</td>
<td>NO</td>
<td>YES, if born in 1957 or later</td>
<td></td>
<td>NO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotavirus***</td>
<td>NO</td>
<td>YES, 6 weeks to 8 months</td>
<td></td>
<td>NO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hib</td>
<td>NO</td>
<td>YES, 2 through 59 months old</td>
<td></td>
<td>NO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>NO</td>
<td>YES, 12 through 23 months old</td>
<td></td>
<td>NO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis B</td>
<td></td>
<td>YES, through 18 years old</td>
<td></td>
<td>NO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal (MenACWY)</td>
<td></td>
<td>NO</td>
<td></td>
<td>YES, 11 through 18 years old</td>
<td>NO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella</td>
<td>NO</td>
<td></td>
<td></td>
<td>YES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal</td>
<td>NO</td>
<td>YES, 2 through 59 months old (administer PCV)</td>
<td></td>
<td>NO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influenza</td>
<td>NO, if less than 6 months old</td>
<td>YES, ≥6 months (annually when flu vaccine is available in country of exam)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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DTP=pediatric formulation diphtheria and tetanus toxoids and pertussis vaccine; DTaP=pediatric formulation diphtheria and tetanus toxoids and acellular pertussis vaccine; DT=pediatric formulation diphtheria and tetanus toxoids; Td=adult formulation tetanus and diphtheria toxoids; Tdap=adolescent and adult formulation tetanus and diphtheria toxoids and acellular pertussis vaccine; "Children 7-10 years old sometimes need a dose of Tdap depending on their vaccine history. See Diphtheria, Tetanus and Pertussis-Containing Vaccines Catch-Up Guidance on CDC’s website for additional information); IPV=inactivated poliomyelitis vaccine (killed); OPV=oral poliomyelitis vaccine (live); Hib=Haemophilus influenzae type b conjugate vaccine; MenACWY=quadrivalent meningococcal conjugate vaccine; PCV=pneumococcal conjugate vaccine; PPSS=pneumococcal polysaccharide vaccine. ** Please see posted Addendum to Technical Instructions for Panel Physicians for Vaccinations on CDC’s website for changing guidance about polio vaccine. ***Rotavirus vaccination should not be initiated for infants aged 15 weeks 0 days or older.

This table describes vaccine requirements for U.S. immigrant visa and status adjustment applicants only and does not include recommendations for other clinical purposes. See the Immunization Schedules on CDC’s website for number and spacing of doses for required vaccines.

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Connections and collaborations

• Refugee resettlement agency:
  – Makes connections with health assessment and assisting in integration of refugees in communities, providing case management support

• Department of Public Health:
  – Connects refugees to primary health care, mostly through community health centers.

• Community
  – Supports refugee integration for school entry, ESL and being welcoming community
Refugee health assessment challenges

- US health care system is all new to refugees
- Social adjustment over medical concerns (competing priorities)
- Refugees may move out-of-state soon after arrival
- Limited transportation
- Limited health literacy
Case scenario: Vaccine hesitancy in Somali community

**SOMALI VACCINATION RATES FALL**

The Somali backlash against the measles vaccine is new; their kids' vaccination rates matched the general population until 2008, when fears of a link between the vaccine and autism sparked a reaction among Somali parents.

![Graph showing declining vaccination rates for Somali-born children compared to non-Somali children.](source: Minn. Dept. of Health)
Case scenario: Measles outbreak in Ukraine

• Nearly 55,000 cases reported in 2018
• Complexity of factors leading to current epidemic in country
  – Shortage of vaccine, delivery disruptions starting in 2016 (since remedied)
    • Only 42% of infants vaccinated in 2016, with just 31% of 6-year-olds receiving recommended second dose
  – Faulty vaccine linked to storage challenges, insecure power supply
• Hesitancy to vaccinate fueled by perceived death, risks related to the MMR vaccine
  – Increasing distrust of government, health care, vaccine makers
Case scenario: Opportunities for Hepatitis B prevention

• Perinatal Hepatitis B follow-up, in partnership with Immunization Program
  – All pregnant women screened for Hepatitis B
  – HBsAg-positive moms are reported to the DPH for follow up, education
  – Goal is to ensure appropriate vaccines at birth, prevent vertical transmission

• Potential barriers to immunization
  – Hesitancy to discuss, sensitivity of taboo subject
  – Misunderstanding around modes of Hepatitis B transmission
  – Mistrust of health care system

• Language and culturally sensitive health education can overcome barriers
Questions?