Refugee Health and Immunizations

Global Vaccine Preventable Disease Burden and Outbreaks

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OBJECTIVES

- Global Migration and Outbreaks
- Immunization Challenges and
- Disparities for Refugees/Immigrants
- Interpret International Immunization Records

Why do we need Global Immunization?

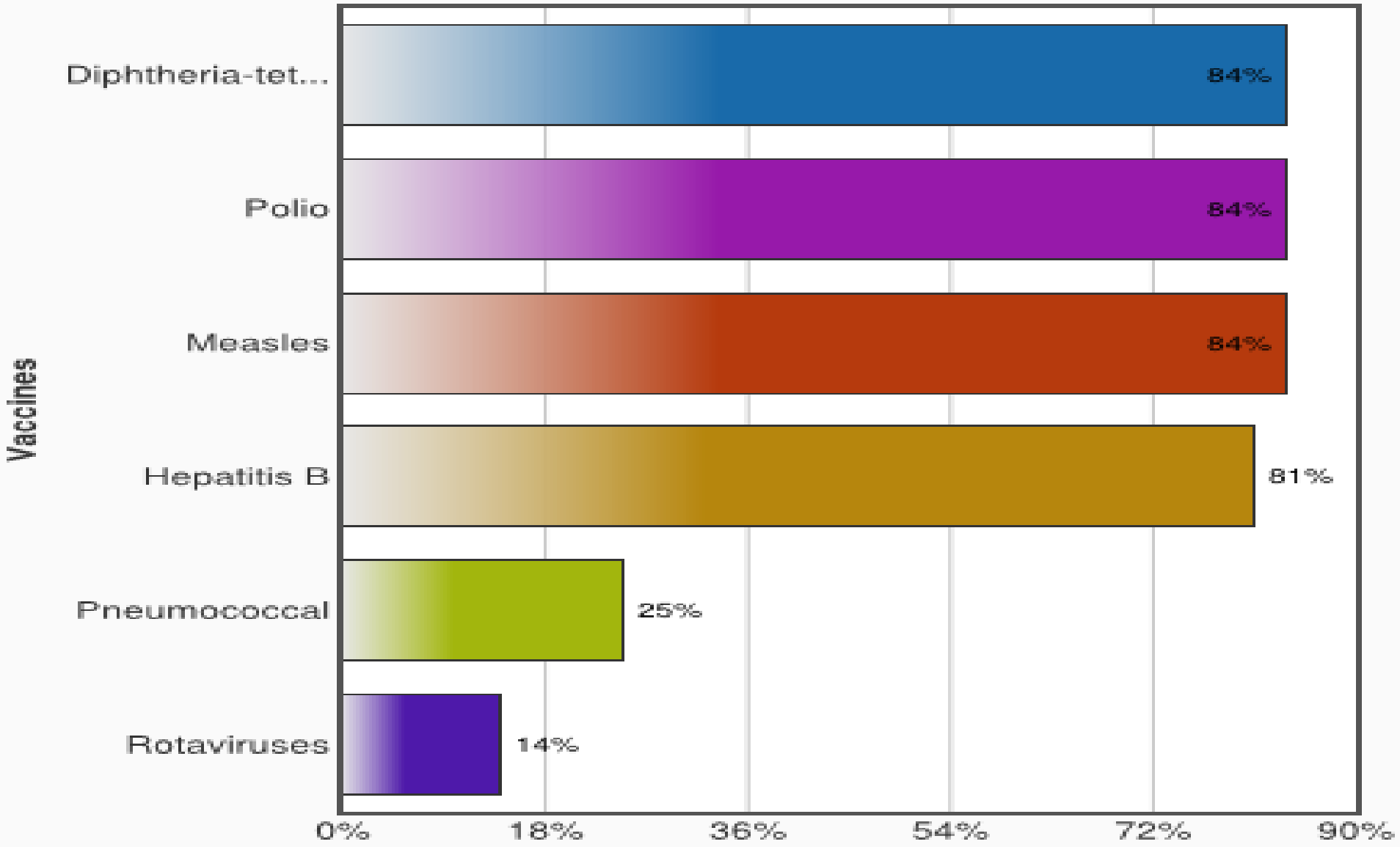
- Importation of infectious disease
- Global Disease Burden
- Varied Global Coverage
- Outbreaks
- Vaccine quality

Vaccination coverage, by vaccine and World Health Organization (WHO) region* — worldwide, 2013

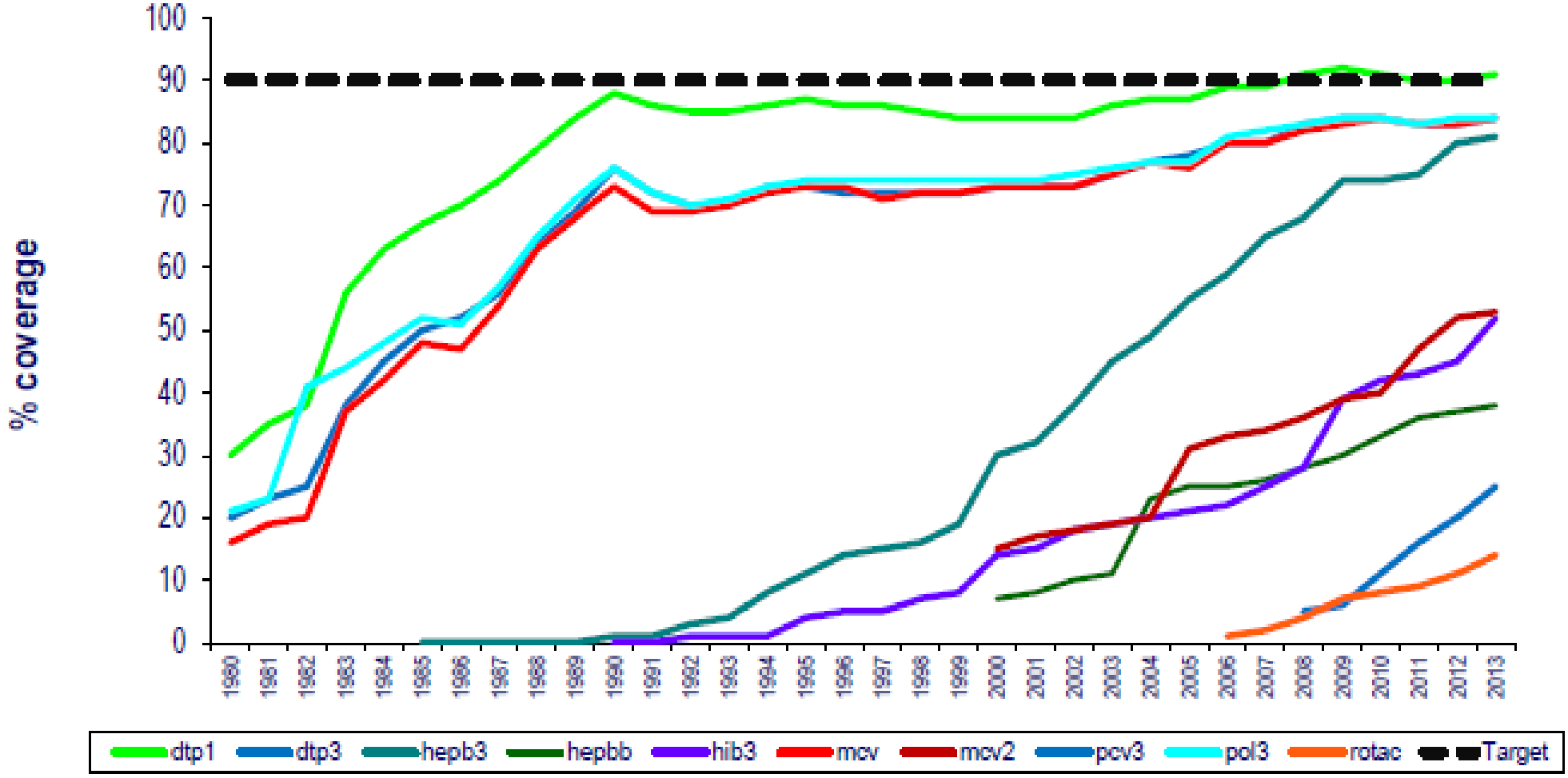
WHO Region	Vaccination coverage (%)									
	BCG	DTP 3	Polio 3	MCV 1	MCV 2	HepB BD	Hep B3	Hib 3	Rota last	PCV3
Total (worldwide)	**90**	**84**	**84**	**84**	**53**	**38**	**81**	**52**	**14**	**25**
African	83	75	77	74	7	11	76	72	12	35
Americas	94	90	90	92	46	71	89	90	70	77
Eastern Mediterranean	88	82	82	78	65	24	83	60	22	36
European	95	96	96	95	82	41	81	83	3	43
South-East Asia	90	77	76	78	53	26	74	27	0	0
Western Pacific	97	96	97	97	92	79	92	18	4	1

Abbreviations: BCG = Bacille Calmette-Guérin; DTP3 = 3 doses of diphtheria-tetanus-pertussis vaccine; Polio3 = 3 doses of poliovirus vaccine; MCV1 = first dose of measles-containing vaccine; MCV2 = second dose of measles-containing vaccine; HepB BD = birth dose of hepatitis B vaccine; HepB3 = 3 doses of hepatitis B vaccine; Hib3 = 3 doses of *Haemophilus influenzae* type b vaccine; Rota last = last dose of rotavirus series; PCV3 = 3 doses of pneumococcal conjugate vaccine.
* Weighted regional average.

Global Immunization Coverage 2013



Great progress in immunization, but still challenging to reach “the fifth child”…



World Health Organization

Vaccine Preventable Disease Burden

Total and vaccine preventable diseases cause specific deaths, children under age 5, by WHO region, 2008

	All cause	Pneumococcal diseases	Rotavirus diarrhea	Hib	Pertussis	Measles	Tetanus
AFR	4,202,000	247,000	217,000	94,000	84,000	25,000	27,000
AMR	284,000	13,000	8,000	1,000	2,000	-	1,000
EMR	1,237,000	68,000	90,000	32,000	19,000	7,000	14,000
EUR	148,000	7,000	3,000	3,000	-	-	-
SEAR	2,390,000	107,000	127,000	52,000	90,000	84,000	17,000
WPR	534,000	33,000	8,000	17,000	1,000	2,000	4,000
Total	8,795,000	476,000	453,000	199,000	195,000	118,000	63,000

Number rounded to thousand

MEASLES OUTBREAK:

UNVACCINATED PEOPLE AT RISK

More than 100 people in 15 states were diagnosed with measles in January, with 92% of the cases related to an outbreak that began before Christmas at Disneyland in California.

HOW CONTAGIOUS IS MEASLES?

Measles is one of the most contagious viruses. It can linger in the air, infecting non-immune people even two hours after an infected person leaves the room. How the average infection rate compares with other diseases:

MEASLES

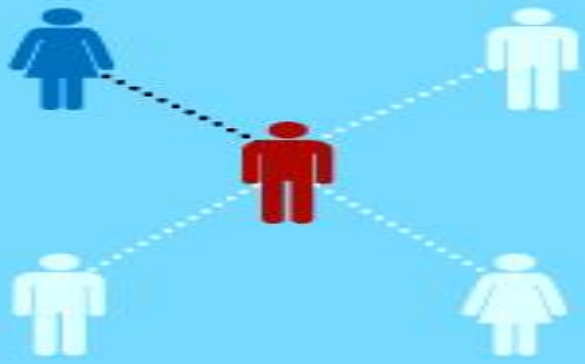
Each measles patient infects

12 to 18 people

INFLUENZA

Each influenza patient infects

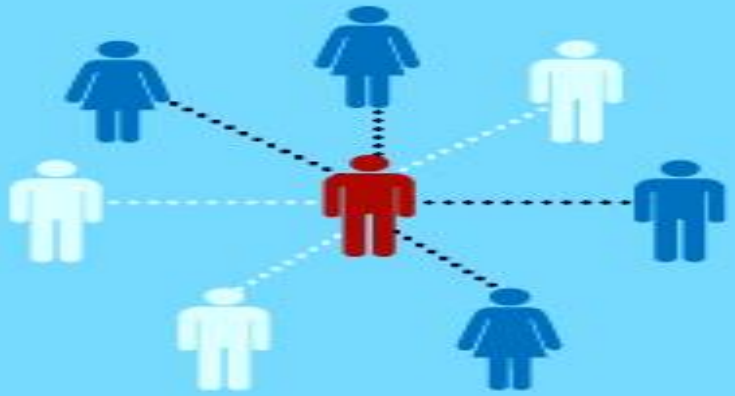
1 to 4



MUMPS

Each mumps patient infects

4 to 7



EBOLA

Each Ebola patient infects

1 to 2

GROWING NUMBER OF OUTBREAKS

Measles was declared eradicated in the USA in 2000, but sporadic outbreaks have been linked to travelers from other countries. Number of reported confirmed cases in states and the District of Columbia this year, based on state and media reports as of Feb. 5:

Polio Outbreak 2013

UN News Centre
with breaking news from the UN News Service

News | Radio | Television | Photo | Webcast | Meetings Coverage | Media Accreditation | Secretary

Africa | Americas | Asia Pacific | Europe | Middle East

Polio outbreak in refugee complex in Kenya being contained, say UN agencies

DADAAB, Kenya, 5 September 2013

unicef

Efforts to contain polio outbreak intensify around Kenyan refugee camp

Polio cases first reported this year in Somalia, then in Kenya, and lately in Ethiopia. There are now more than **140 confirmed cases** in the **three countries**, and the outbreak has **affected adults as well as children**.

challenging is the region's high number of children who have not been immunized

World Health Organization

UNHCR
The UN Refugee Agency

PRESS RELEASE

DADAAB 31 MAY 2013

Polio outbreak in Dadaab refugee camps being contained

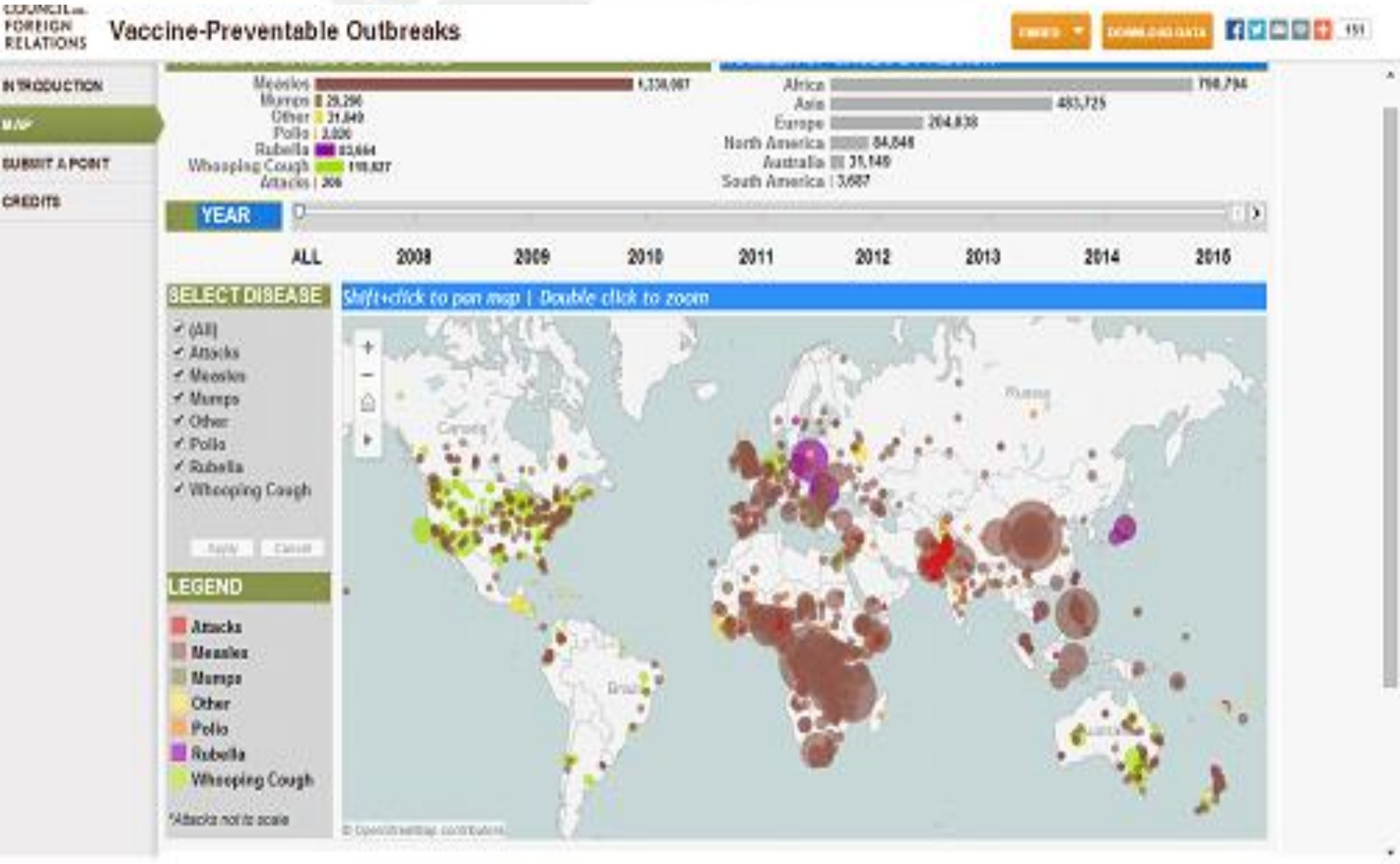
The current target group is children aged 0 to 15 years (a population of some 288,000).

The next vaccination round in one week's time will target the whole refugee population in Dadaab (some 424,000).

Vaccine Preventable Disease Outbreaks

- Measles
- Polio
- Meningitis
- Pertussis
- Varicella
- Viral Hepatitis
- Influenza
- http://www.cfr.org/interactives/GH_Vaccine_Map/#map

INTERACTIVE OUTBREAK MAP



War and Infectious Diseases
2011 Syria Civil war

6.5 m displaced to neighboring countries (Jordan, Lebanon,Turkey)

Infrastructure Destroyed

- Destroyed Facilities
- Shortage in Health Care personnel
- Shortage in medicines
- Lack of secure routes

Immunization Program hindered

Vaccination coverage decreased from 91% (2010) to <45% (2013)

36 cases of Polio (Eradicated for last 15 years)

7600 infected with WPV 1 (Same strain found in Pakistan, Cairo and Israel)

7000 confirmed cases of measles

Sharara AL, Kanj SS;PLOS Pathogens 10(11) e1004438 November 2014

Reported Cases of Communicable Disease 2011-2014

		Polio	Measles	Hep A	Typhoid
Syria	2011	0	n/a	n/a	n/a
	2012	0	13	2203	1129
	2013	**35**	n/a	n/a	n/a
	2014	1	n/a	n/a	n/a
Lebanon	2011	0	9	448	362
	2012	0	9	757	426
	2013	0	**1760**	1551	407
	2014	0	**219**	738	102
Jordan	2011	0	30	418	2
	2012	0	24	509	4
	2013	9	**205**	1082	4
	2014	n/a	n/a	n/a	n/a
Syrian Refugee Lebanon	2013	0	**232**	220	21
	2014	0	92	127	7

Sharara SL, et al plospathogens November 2014;10 (11)

Efficacy of Pre-departure Measles Rubella Vaccination

TABLE 3. Results

	Immune to Rubella		Immune to Measles		Immune to Both Rubella and Measles	
	Number/Subjects With Known Serology	Percent (95% CI)	Number/Subjects With Known Serology	Percent (95% CI)	Number/Subjects With Known Serology	Percent (95% CI)
Total cohort						
All refugee children (1–18 yr) (N = 168)	139/164	84.8 (78.4–89.5)	143/163	87.7 (81.7–92.0)	119/163	73.0 (65.7–79.2)
Analysis by gender						
Males (N = 90)	70/88	79.5 (69.8–86.7)	73/88	83.0 (73.6–89.5)	58/88	65.9 (55.5–75.0)
Females (N = 78)	68/76	89.5 (80.3–94.8)	69/75	92.0 (83.2–96.5)	61/75	81.3 (70.9–88.6)
P	0.13		0.14		0.04	
Analysis by availability of vaccine documentation ("Health Manifest")						
With documented MMR vaccination (N = 58)	51/56	91.1 (80.2–96.5)	49/55	89.1 (77.7–95.2)	44/55	80.0 (67.4–88.5)
Without documented MMR vaccination (N = 110)	87/108	80.6 (72.0–87.0)	93/108	86.1 (78.2–91.5)	75/108	69.4 (60.2–77.3)
P	0.13		0.77		0.16	
Analysis by region of departure						
Departed from Africa* (N = 90)	78/88	88.6 (80.1–93.8)	74/88	84.1 (74.9–90.4)	65/88	73.9 (63.7–81.9)
Departed from SE Asia† (N = 67)	52/65	80.0 (68.5–88.0)	60/64	93.8 (84.4–97.9)	48/64	75.0 (63.0–84.0)
P	0.21		0.12		1.00	

*Tanzania (37), Uganda (14), Kenya (8), Nigeria (7), Zimbabwe (7), Ghana (7), Malawi (5), Guinea (3), Benin (2).

†Thailand (60), Malaysia (7).

Joshua PR et al Ped Inf Dis ;32(2) February 2013

International Vaccine Quality

- Regulatory Oversight
- Interchangeability
- Equivalence
- Safety
- Monitoring

Health Status of Immigrants & Refugees

- Domestic Refugee Medical needs based on
  - Country of origin
  - Country of transit
  - Length of time as refugee
  - Quality of health care
- Refugee Health depends
  - Chronic Disease
  - Nutritional Status
  - Immunizations status

Reasons of inadequate immunizations

- Immunizations schedule differ by country
- Limited health care access
- Interrupted health care secondary to war, chaos, natural disasters
- Limited services in adults and adolescents
- Lack of available vaccines and funding

Pre-departure Vaccine

- Review of available vaccine history by IOM
- Vaccine first dose at screening within 2-6 months of pre-departure
- Vaccine 2nd dose given after 2 months
- Some regions giving MMR prior to departure
- Parasite and Malaria presumptive treatment

Reasons for Re-immunization

- Falsification
- Immune Response
- Monovalent vaccines
- Inappropriate age of vaccination
- Inadequate intervals between dosages
- Outbreak

New Vaccination Criteria

- Changed December 14th 2009
- HPV and zoster vaccines not required
- MCV4 required for 11-18 years old
- MPSV and monovalent MCV not acceptable
- Influenza required for 6 months to 18 years and for 50 years and older during influenza season

Criteria for “required” Vaccine

- Age appropriate for the immigrant applicant
- Protection against a disease that has the potential to cause an outbreak
- Protection against a disease that has been eliminated or is in the process of elimination

Medical Exam Requirements

- Applicants must show proof of having received all required vaccinations.
- If not, they should receive the first dose of required vaccines at that initial visit
- Follow up with PCP to complete the series
- Immigrants in the US who are applying to change their status to become “permanent residents” must also have been vaccinated.

Criteria for “required” vaccines

- International vaccines valid in US
- **Self-reported doses of vaccines are not acceptable.**
- Written vaccine with dates of administration required
- Hepatitis B Screening and vaccination
- Laboratory evidence of immunity acceptable

Required Vaccines

- Mumps
- Measles
- Rubella
- Polio
- Tetanus
- Diphtheria
- Pertussis
- H influenza type B
- Hepatitis A
- Hepatitis B Rotavirus
- Meningococcal
- Varicella
- Pneumococcal
- Seasonal Influenza

Laboratory Evidence for Immunity

- Laboratory evidence of immunity is acceptable
  - Measles
  - Mumps
  - Rubella
  - Polio
  - Hepatitis B
  - Hepatitis A
  - Varicella

Varicella Seroprevalence

- VZV Seroprevalence US bound Refugee groups
- Bhutanese in Nepal
- Burmese on Thailand Myanamar Border
- Burmese in Malaysia
- Iraqi in Jordan
- Somali in Kenya

- Overall VZV Seroprevalence 97%
- 18-26 year old 92-100%
- 27-45 year old 93-100%

Leung J, Lopez, A et al J Immigr Minor Health Feb 2015; 17(1):310-3

Domestic Provider Challenges

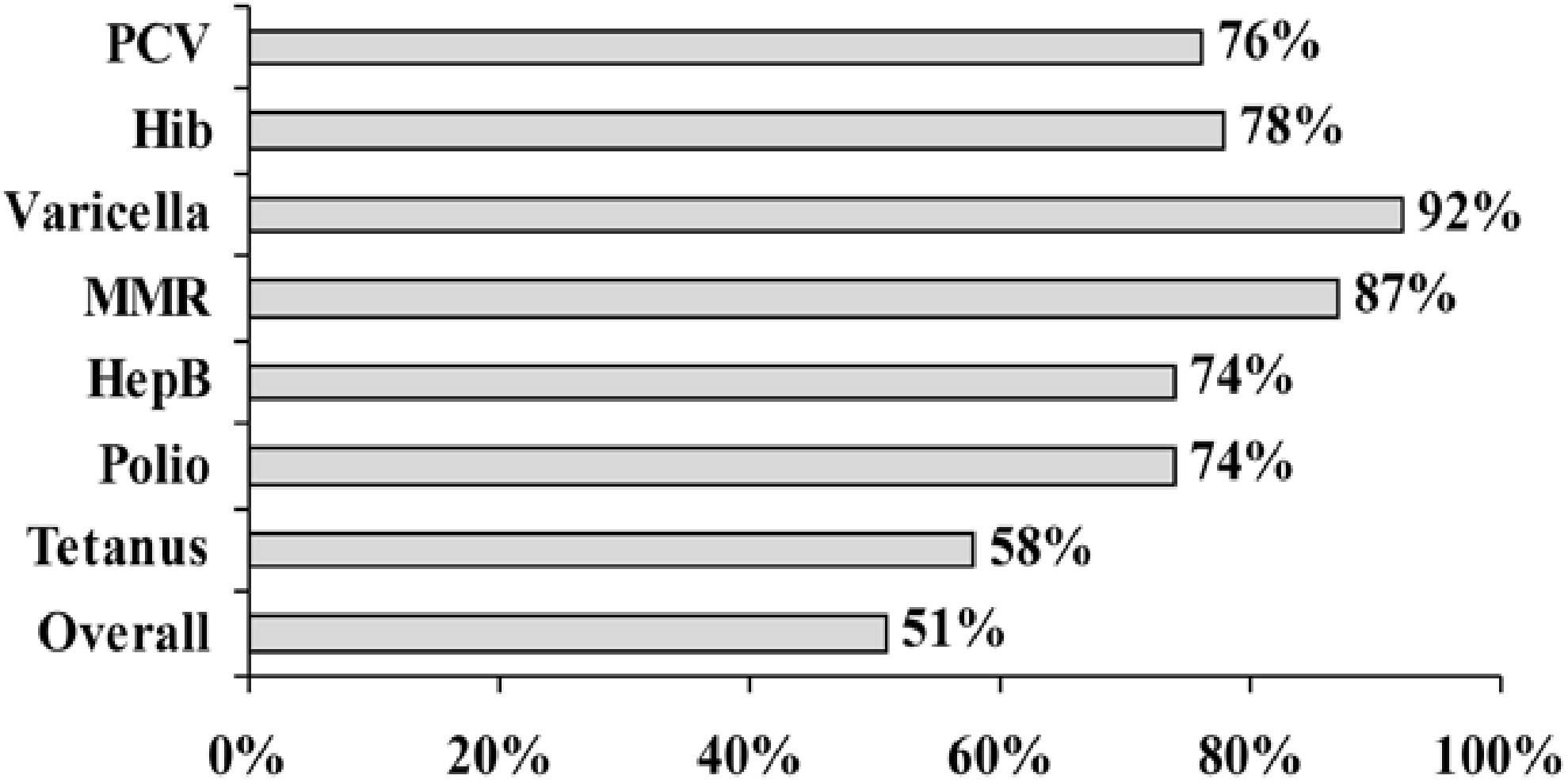
- Review of available records
- Knowledge of what immunizations to give
- Plan to give catch up immunization
- Right vaccines at the right time
- Ensure completion of vaccine series

Immunization Rates 1 year

- Retrospective chart review
- 86% (218/254) children seen at the clinic
- 198 children mean age 8.8 years
- 71% from Liberia
- 51% had follow-up care for one year

Watts, J. et al Medicine & Health 2011, 94(10): 290-293

Up-to-date immunization rates after one year



Watts, J. et al Medicine & Health 2011, 94(10): 290-293

The association of age & number of PCP visits with overall up-to-date immunization

		Unadjusted		Adjusted for age and # of visits	
		OR (95% CI)	**P value**	**OR (95% CI)**	**P value**
AGE	0-35 months	0.78 (0.28-2.21)	0.65	0.42 (0.13-1.36)	0.15
	36-83 months	0.48 (0.25-0.94)	0.03*	0.36 (0.17-0.77)	0.008*
	7 years and up	Reference Group	0.10	Reference Group	0.02
Number PCP Visit		1.32 (1.18-1.49)	0.00*	1.37 (1.20-1.56)	0.00*

*p < 0.05

Watts, J. et al Medicine & Health 2011, 94(10): 290-293

What are the Goals ?

- Eliminate Disparities in immunization rates
- Complete vaccine series
- Decrease disease burden

What are the Patient Barriers?

- **Health System Access**
  - Where to go
  - Why to go
- **Trust**
  - Who to go to
- **Cost**
  - Medical Insurance
  - Vaccine Coverage's
- **Health Literacy**
  - When to go

Cultural Iceberg


AH-HA! WE FOUND THE PROBLEM!
BIG INSURANCE
U.S. HEALTH SYSTEM
JOHN

Hep B Screening &Vaccination in Vietnamese Americans

Results:

- Factors associated with HBV screening
  - –Peer Influence of recommendation
  - –Lack of belief in HBV myths
  - –Perceived social approval of vaccination and screening outcomes
- Factors associated with prior receipt of HBV vaccination
  - –Ability to pay increased the odds to receive the vaccine by 23%
  - –Prior HBV vaccination was associated with reduced age
  - –Time spent in USA (17 years or more less likely to have one HBV dose)
  - –Positive Social approval
- Factors associated with intent to receive HBV vaccine (30% intend to complete)
  - –Low intention to complete or start series if HBV negative
  - –Peer recommendation and social approval
  - –Access to transportation
  - –Perceived chronic HBV infection seriousness

Frew PM,Alhanti B et al Yale J of Bio and Med 87(2014); 455-471

Patient Barriers

- Competing priorities
  - What is more important?
    - » **Income/Jobs**
    - » **Basic needs**
- Language
  - Who is the interpreter?
- Cultural Issues, Diversity
- Nativity
- Race/Ethnicity
- Gender Concordance

Provider Barriers

- Knowledge
  - Refugee health needs
  - Catch up immunization
  - Vaccine availability
- Systems
  - Staff training

–Time

–Nursing Support

  - Access
  - Health Insurance and vaccine coverage's

Challenges

- Follow up
  - Mobility
  - Availability of vaccine
  - Recognition of issue
- Documentation of success/failure
  - Define refugee in demographic data

Mexico Vaccines

Transcribing official immunization records (Mexico)

Cartilla Nacional de Vacunacíon (2007-)

Transcribe these immunizations in the *Vaccination Quick Entry* screen.

Cartilla Nacional de Vacunacíon (2000-6)

Transcribe these immunizations in the *Vaccination Quick Entry* screen.

Source: El Consejo Nacional de Vacunación (CONAVA) – conava.gob.mx

Foreign Immunization Card

Tips on Interpreting Mexico's National Immunization Record (Cartilla Nacional de Vacunación)

The Mexican Immunization Record is the official document used nationally to record immunizations provided to children and adolescents in Mexico (birth to 19 years of age) in the public and private sector.

This document also helps parents and family members to know their children's basic immunizations and the recommended ages for each vaccine.

Demographic Information

The first section on the inside of this document contains demographic information.

- Name Section Includes "primer y segundo apellido (first and second last name)" or paternal and maternal last names, respectively.
- Dates in Mexico are written Day/ Month/ Year. For instance 20/ 1 /2003 = Jan 20, 2003

Basic Immunization Schedule

The second part of the document contains information on the basic childhood immunization schedule, outlined in 5 columns:

1-VACUNA (Vaccine)
2- ENFERMEDAD QUE PREVIENE (Preventable Disease)
3- DOSIS (Dose)
4-EDAD (Age)
5-FECHA DE VACUNACIÓN (Date of Vaccine Administration).

- Dates of vaccine administration are recorded in pen.
- Next due date is always recorded in pencil.
- Clinic stamp or signature of person administering vaccine & title, are recorded next to the date of vaccination.

Private Sector Vaccines

Vaccines administered in the private sector are recorded in the grey section: OTRAS (other)

MEXICO (Private Sector)			USA	
Recommended Schedule	Vaccine	Preventable Disease	Vaccine	Recommended Schedule
2m, 4m, 6m	Pentavalente DPT + HB+ Hib Pediarix is not available in Mexico	Diphtheria Pertussis Tetanus Hepatitis B Hib / Diphtheria Pertussis Tetanus Hepatitis B IPV	Pediarix DTaP + IPV + Hep B	2m, 4m, 6m
Hep B + Hib Vaccine Not used in Mexico		Hepatitis B H influenzae b	Comvax Hep B + Hib	2m, 4m, 12-15m
12-18 months	Varicela	Varicella	Varicella	12-18 months
2m, 4m, 6m, and 12-15m	Antineumocócica Conjugada (7 serotipos)	Pneumococcal Disease	Pneumococcal Conjugate Vaccine	2m, 4m, 6m, and 12-15m
1 yrs, and 6m after dose #1	Hepatitis A*	Hepatitis A	Hepatitis A	1 yr, and 6m after dose #1
Single antigen not used. Only available as part of "Pentavalente" given at 2, 4, and 6 months of age.		H influenzae b	Hib	2m, 4m, 6m, and 12-15m
Yearly, after 6 months of age	Influenza	Influenza	Influenza	Annual for children 6-23 month of age.

About Vaccines Available in Mexico in Private Practice

Although the majority of vaccines included the Mexican Immunization Record are administered in the public sector, some patients may opt to receive additional shots recommended by their pediatricians (private sector). These Vaccines are also recorded in the National Immunization Record in the gray section named "OTRAS" (other vaccines) of the Vaccine column.
Listed in the table to the left are some of the vaccines available in private practice. Combination vaccines available in Or and Mexico are also included in the table (different vaccine components in Pentavalente and Pediarix vaccines are highlighted in color).
*Twinrix (Hep A/B) schedule is 3 doses after 1 year of age. (In Mexico)

Produced by the San Diego Immunization Branch in collaboration with the San Diego-Tijuana Binational Immunization Initiative. Revised for Oregon with premission by Marion County Rev.03/06

Foreign Immunization Card

Binational Immunization Guide:

Interpreting Immunization Schedules

Mexico → USA

This Guide provides information on Mexico's Immunization Schedule, including number of doses and recommended ages. Mexico's schedule is compared side-by-side to the "Recommended Childhood and Adolescent Immunization Schedule" followed by healthcare providers inOr. The Guide also includes information on vaccines available in Mexico in the public sector (this side) and private sector (back).

The Guide facilitates the interpretation of Mexico's Immunization Record and assists healthcare providers, school staff, and childcare providers in assessing immunization records of binational children.

This document follows the format of the "Cartilla Nacional de Vacunación" or National Immunization Record, one of four National Health Records (see below) used throughout Mexico.

	MEXICO					UNITED STATES		
	ESQUEMA BÁSICO DE VACUNACIÓN				Equivalency	BASIC IMMUNIZATION SCHEDULE		
	VACUNA (Vaccine)	ENFERMEDAD (Disease)	DOSIS (Dose)	EDAD (age)		PREVENTABLE DISEASE	VACCINE USED IN US	SCHEDULE
Primary Immunization Series Administered by 1 yr	BCG	Tuberculosis	Única (only one)	Birth	≠	Tuberculosis	Not Used in US	
	Sabin (OPV)	Poliomielitis	Primera (1)	2 m	≡	Polio	IPV *or*	2 m, 4 m, 6-18 m
			Segunda (2)	4 m			Pediarix DTaP + IPV + Hep B	2 m, 4 m, 6 m
			Tercera (3)	6 m				
	Pentavalente DPT + HB + Hib (DTP-Hep B-Hib)	Difteria Tos Ferina Tétanos Hepatitis B Infecciones por H influenzae b	Primera (1)	2 m	≡	Diphtheria Pertussis Tetanus Hepatitis B Hib	DTaP	2 m, 4 m, 6 m
							Hep B	2 m, 4 m, 6 m
			Segunda (2)	4 m			Hib	2 m, 4 m, 6 m^
							Pediarix DTaP + IPV + Hep B	2 m, 4 m, 6 m
			Tercera (3)	6 m			Comvax Hep B + Hib	2 m, 4 m
	Triple Viral SRP (MMR)	Sarampión Rubéola Parotiditis	Primera (1)	1 yr	≡	Measles Rubella Mumps	MMR	12-15 m
	ESQUEMA COMPLEMENTARIO DE VACUNACIÓN					COMPLEMENTARY IMMUNIZATION SCHEDULE (Boosters and Catch-up Schedule)		
Booster Doses and Catch-up Schedule for Children > 1yr	Sabin (OPV)	Poliomielitis	Additional (Additional)	Twice a year (up to 5th yr)	≈	Polio	IPV	4-6 yrs
	DPT (DTP)	Difteria Tos Ferina Tétanos	Refuerzo 1 (Booster)	2 yr	≡ +	Diphtheria Pertussis Tetanus	DTaP (Acellular Pertussis)	12-18 m
			Refuerzo 2	4 yr				4-6 yr
	Triple Viral SRP (MMR)	Sarampión Rubéola Parotiditis	Segunda (2)	6 yr	≡	Measles Rubella Mumps	MMR	4-6 yr
	Td	Tétanos Difteria	Refuerzo (Booster)	Booster after 12 yrs	≡	Tetanus Diphtheria	Td or Tdap	11-12 yr
	ANTIHEPATITIS B* (Hep B)	Hepatitis B (HB)	Primera (1)	12th b-day	+	Hepatitis B	Hep B*	11-12 yr (2 or 3 doses ❸)
			Segunda (2)	1 mo. after 1st				
	SR* (MR)	Sarampión Rubéola	Adicionales (Additional)	Booster	≠	Measles Rubella	Not Used in Oregon	
	No booster doses administered for Hib vaccine. An additional dose needed for children > 1 year of age.				+	H. Influenzae type B (Hib)	Hib *or*	12-15 m
							Comvax Hep B + Hib	12-15 m

≠Not Used in US ≡Equivalent Schedule + Additional Doses Needed ≈Different Schedule, but Valid Doses

* These vaccines are part of a catch-up schedule for older children and adolescents. ^ Dose may be skipped if Pedvax HIB is exclusively used

❸Number of doses depend on brand of vaccine used and age of patient. Adolescents between the ages of 11-15 years may receive only two doses.

Table: Requirements for routine vaccination of immigrants examined overseas who are not fully vaccinated or lack documentation.

Vaccine	Age						
	Birth–1 month	2–11 months	12 months–6 years	7–10 years	11–17 years	18–64 years	≥65 years
DTP/DTaP/DT	NO	YES		NO			
Td/Tdap	NO			YES, ≥7 years old (for Td); 10–64 years old (for Tdap)			
Polio (IPV/OPV)	NO	YES				NO	
Measles, Mumps, and Rubella	NO		YES, if born in 1957 or later			NO	
Rotavirus	NO	YES 6 weeks to 8 months	NO				
Hib	NO	YES 2–59 months old		NO			
Hepatitis A	NO		YES 12–23 months old	NO			
Hepatitis B	YES, through 18 years old					NO	
Meningococcal (MCV4)	NO				Yes 11–18 years old	NO	
Varicella	NO		YES				

Adapted from ACIP Recommendations

What are we recommending?

- Narrow the disparity gap
- Funding of whole life vaccines
- Funding of health care services
- Community engagement and education
- Identifying “refugee” in databases
- Refugee service coordination and immunization delivery in primary care
- Primary care provider education