Pan American Health Organization

Regional Office of the World Health Organization

Approaches to Adult Vaccination: Perspectives from PAHO

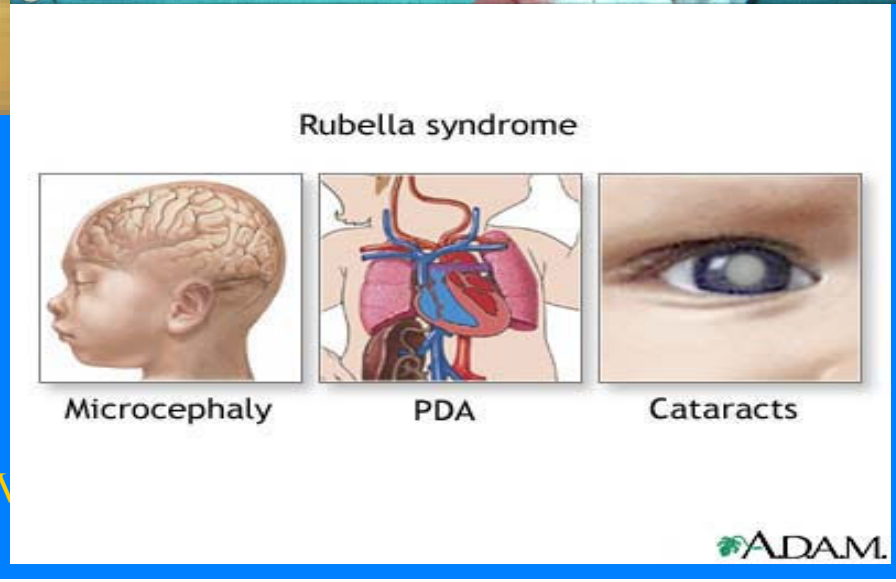
Immunization Conference
Augusta, Maine, USA
23 April 2012

Jon Kim Andrus, MD
Deputy Director, PAHO

Objectives

- Understand the role of adult immunization in global health, especially in terms of the transition from child to family immunization programs
- Define some key challenges in containing global VPD threats
- Understand specific issues relevant to the USA

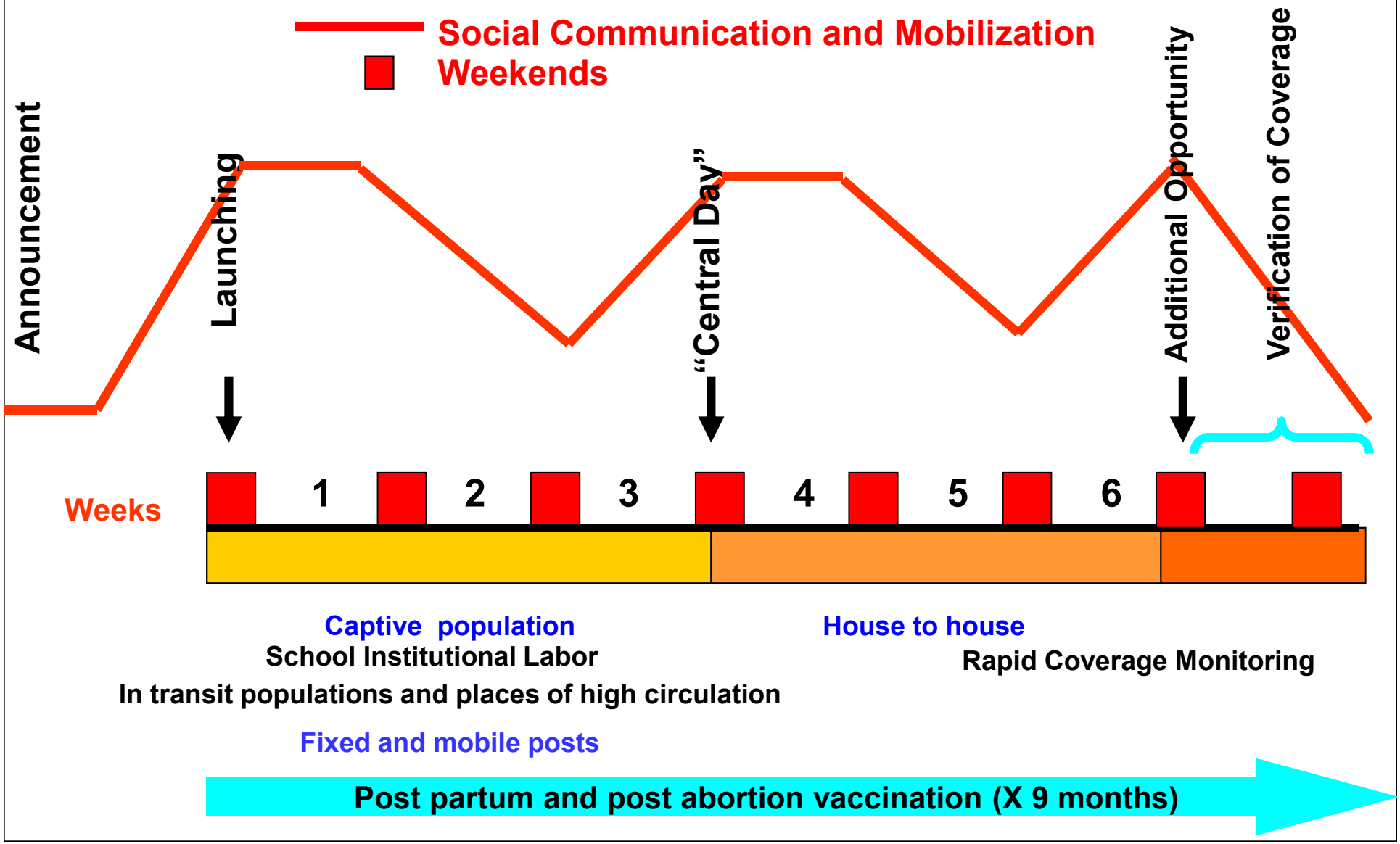
Congenital Rubella Syndrome



High morbidity rationale for immunization interventions

Rubella Project for Multihandicapped; Bellevue Hospital – 1968
Courtesy Dr. L. Cooper

Vaccination Campaign Phases for the Elimination of Rubella and CRS



High Political Commitment and Participation

President launching campaign

[A16] LIMA Lunes 6 de noviembre del 2006 El Comercio

Especial

La encuesta que preparó Apoyo en la capital del país, por encargo de América Televisión, muestra una evaluación positiva sobre la gestión de Alan García. Los programas de agua y vivienda son lo mejor

Los 100 días bajo la lupa de Lima

De los 100 primeros días del gobierno de Alan García:

¿Qué es lo mejor?
Respuesta asistida

		Nivel socioeconómico					Por sexo		Por edad		
		A	B	C	D	E	Masculino	Femenino	Entre 18 y 24 años	Entre 25 y 39 años	De 40 años a más
[illegible] vivienda	32	13	21	29	29	62	31	32	20	40	29
La vacuna contra la rubéola	30	13	18	32	39	30	27	34	46	29	24
[illegible] de telefonía fija	22	25	20	21	26	22	22	23	26	26	17
El reconocimiento público de su hijo	22	10	17	25	20	30	18	26	21	19	26
La reducción de la tarifa para sacar pasaporte	21	27	37	18	16	16	20	22	19	22	21
El manejo del TLC con Estados Unidos	19	18	25	23	14	11	19	19	19	15	22
La estabilidad económica	14	23	15	16	12	11	17	12	11	16	15
Medidas para mejorar la seguridad de transporte interprovincial	13	10	14	12	20	3	13	14	19	13	11
El manejo de la política exterior	8	17	16	8	5	3	10	6	11	8	7
La estabilidad política	5	18	6	8	1	3	8	3	2	7	5
La promoción de la descentralización	5	13	11	4	4	0	5	5	6	3	6
Otra razón	2	2	2	3	1	3	3	1	1	1	3
Nada	5	5	4	4	5	5	7	3	4	1	8
No precisa	2	2	1	0	5	3	2	2	0	1	5

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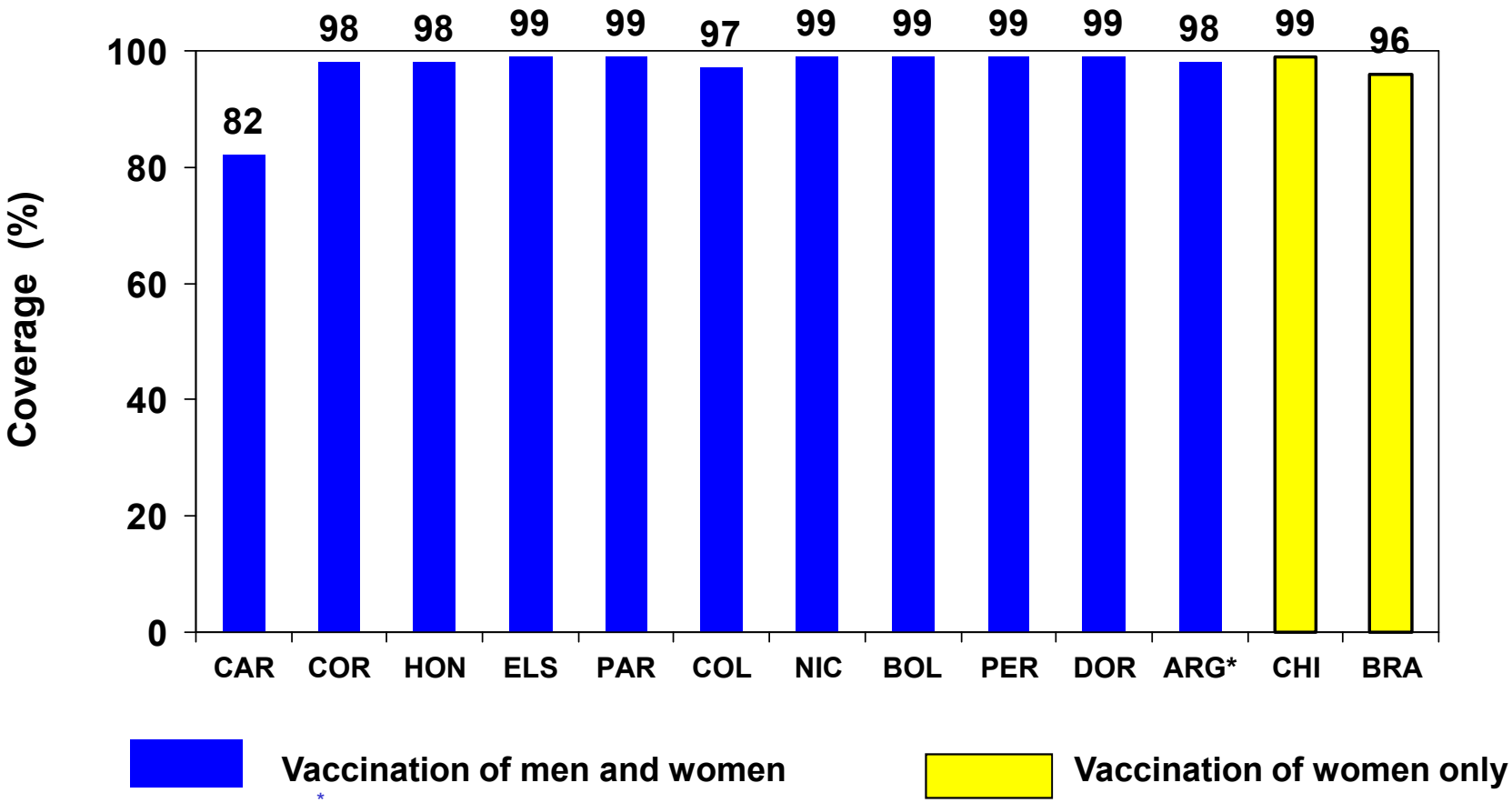
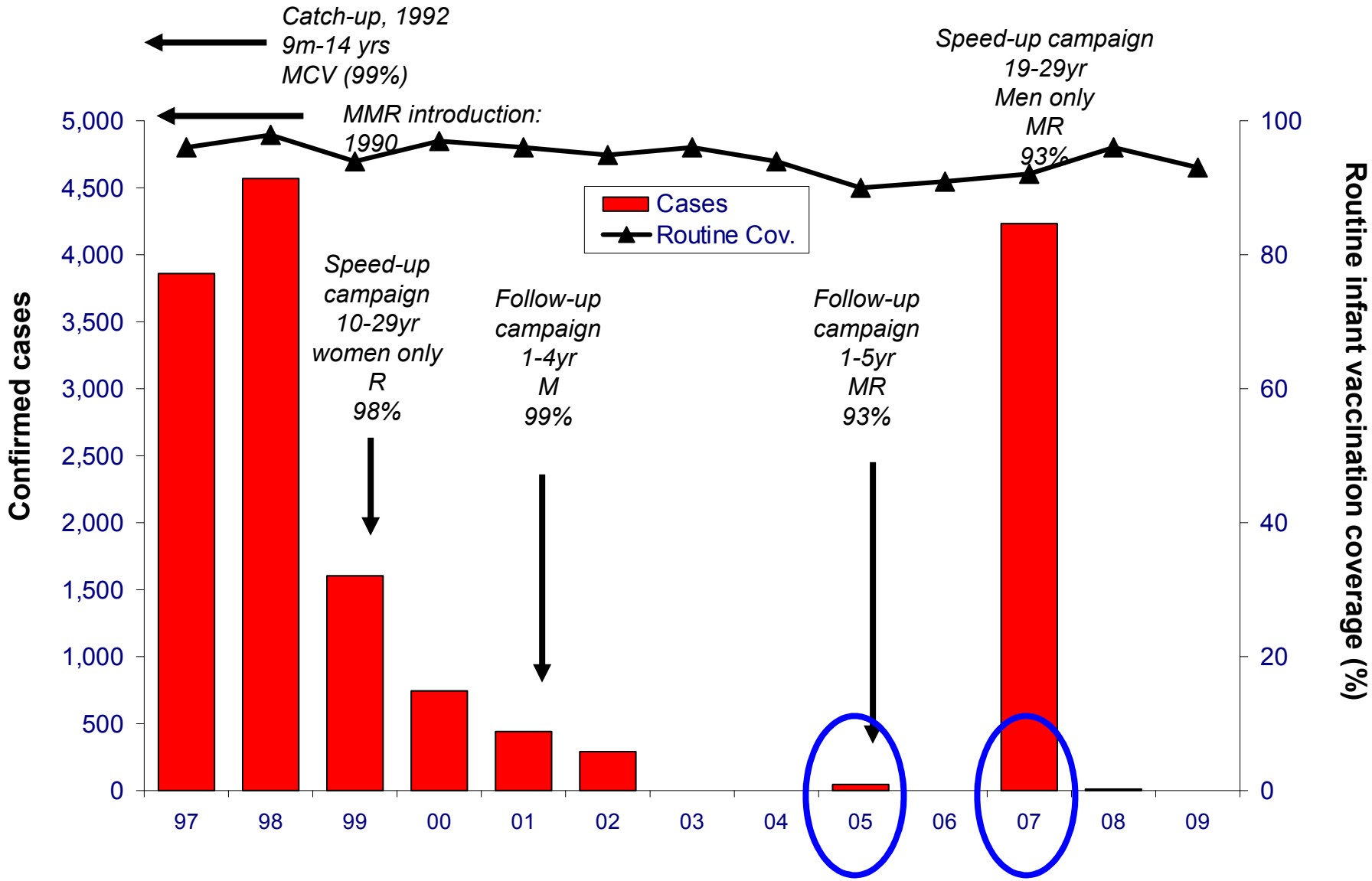
Rubella Vaccination Coverage in Selected Countries of the Americas,1997-2006



Source: Country reports
Andrus JK, et al. Vaccine 2008

Routine MCV1 Coverage, Measles-Rubella Elimination Campaigns and Confirmed Rubella Cases, Chile, 1997-2009*



*Data until EW 52/2009.
Source: Country reports to PAHO.

Outbreaks in male populations!!!

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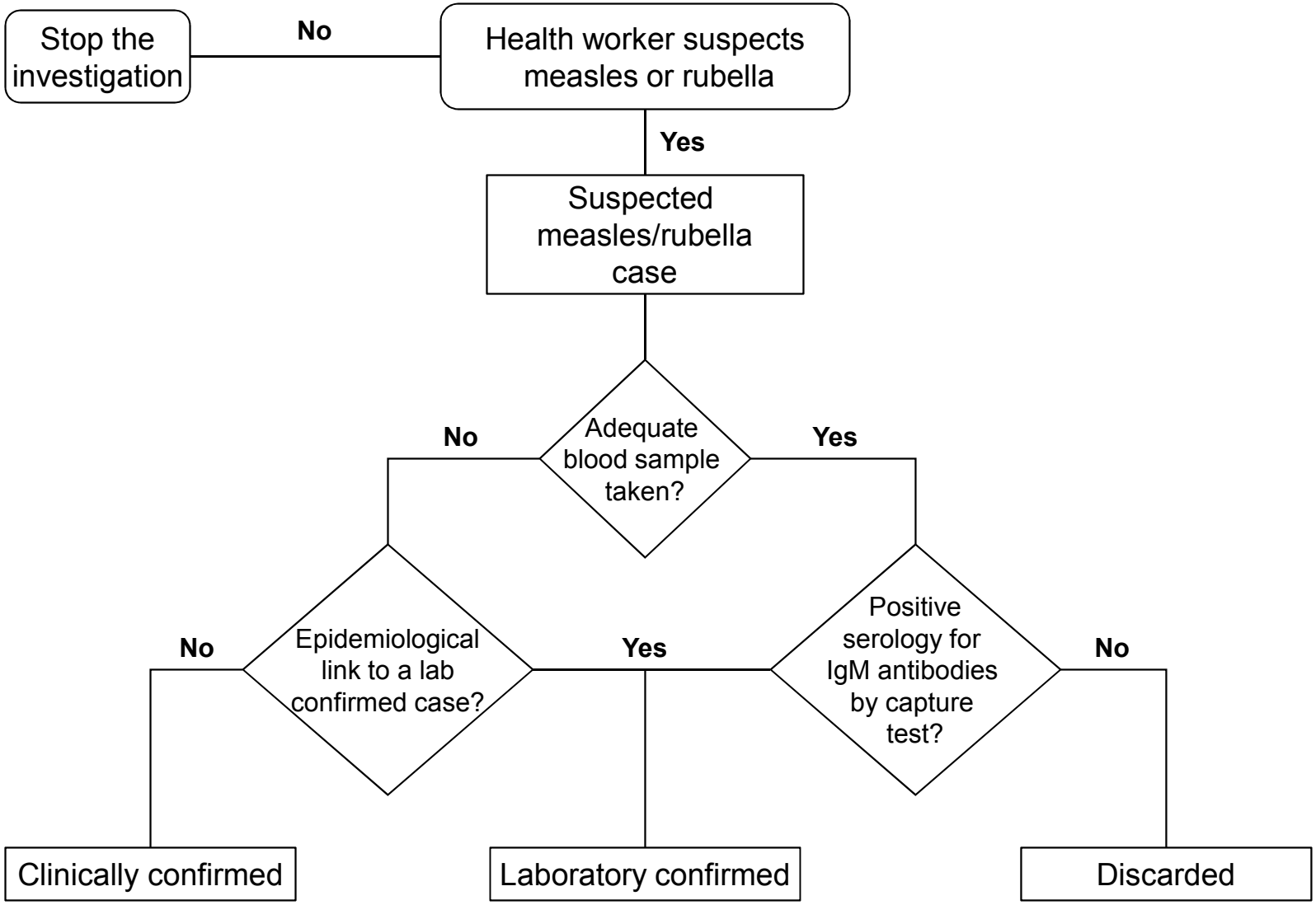
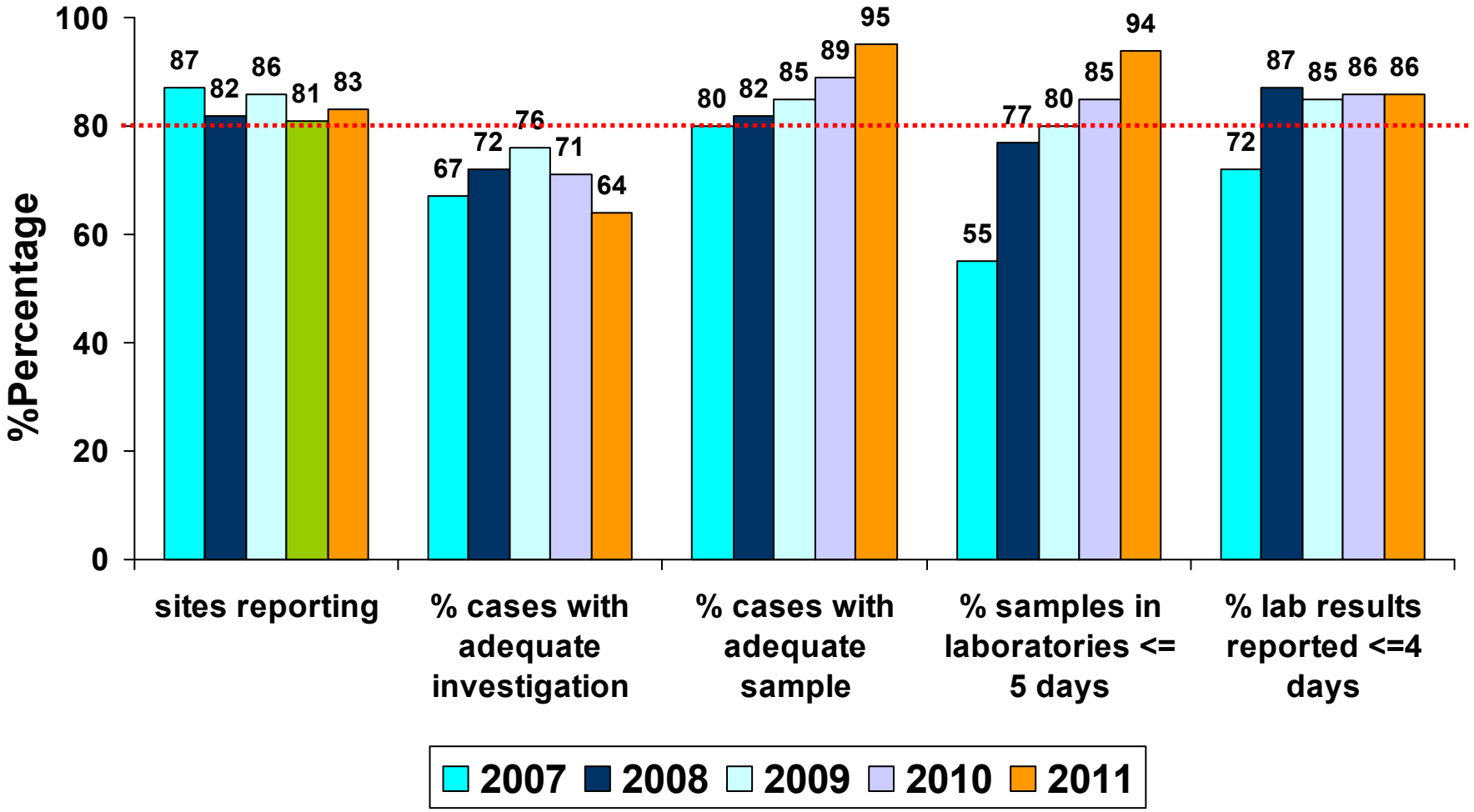
Figure 3. Surveillance strategy for measles/rubella cases



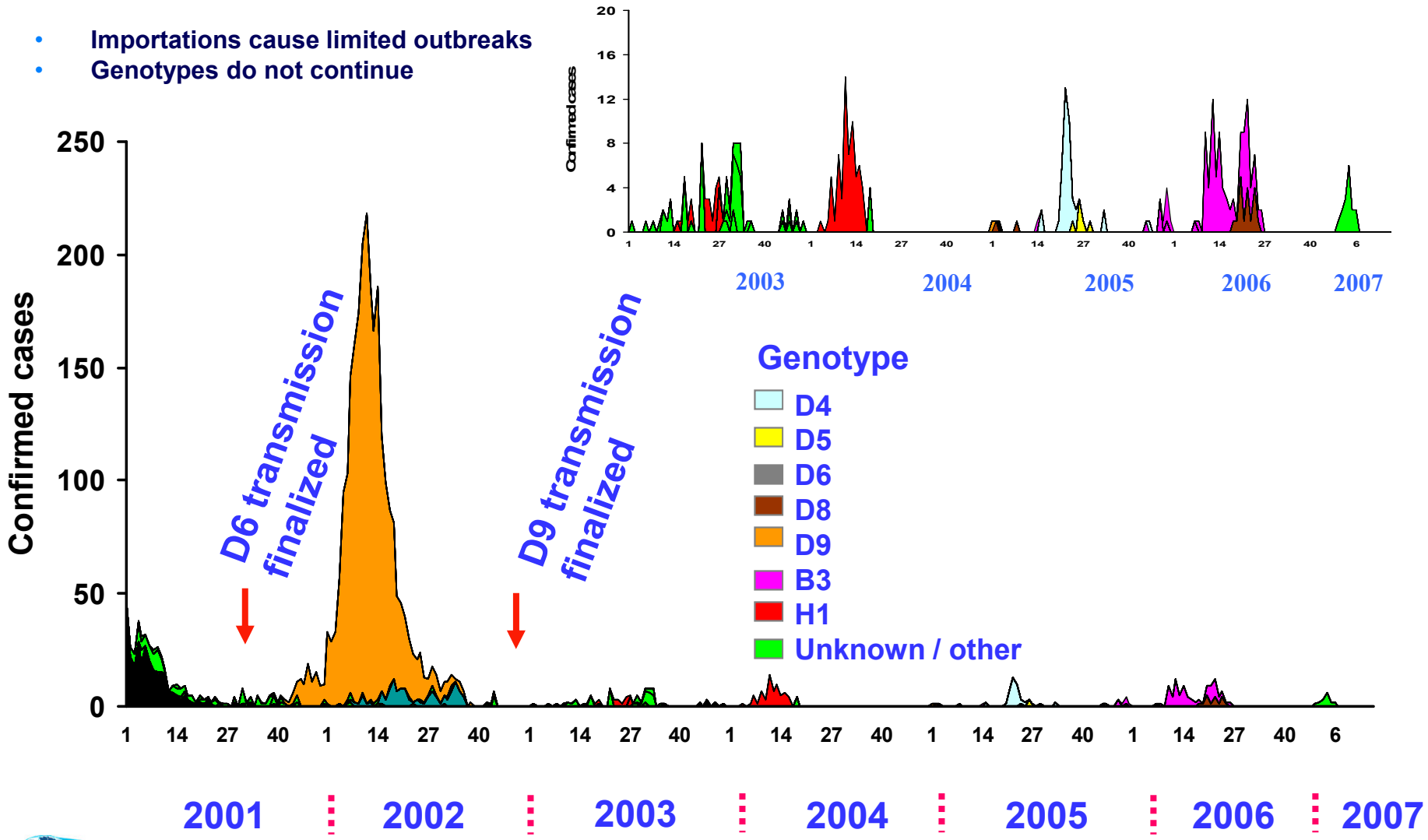
On going support to strengthen measles/rubella surveillance system Indicators, Region of the Americas, 2007-2011



Source: Country reports to PAHO.

Status of Measles Elimination, The Americas, 2001-2007*

- Importations cause limited outbreaks
- Genotypes do not continue

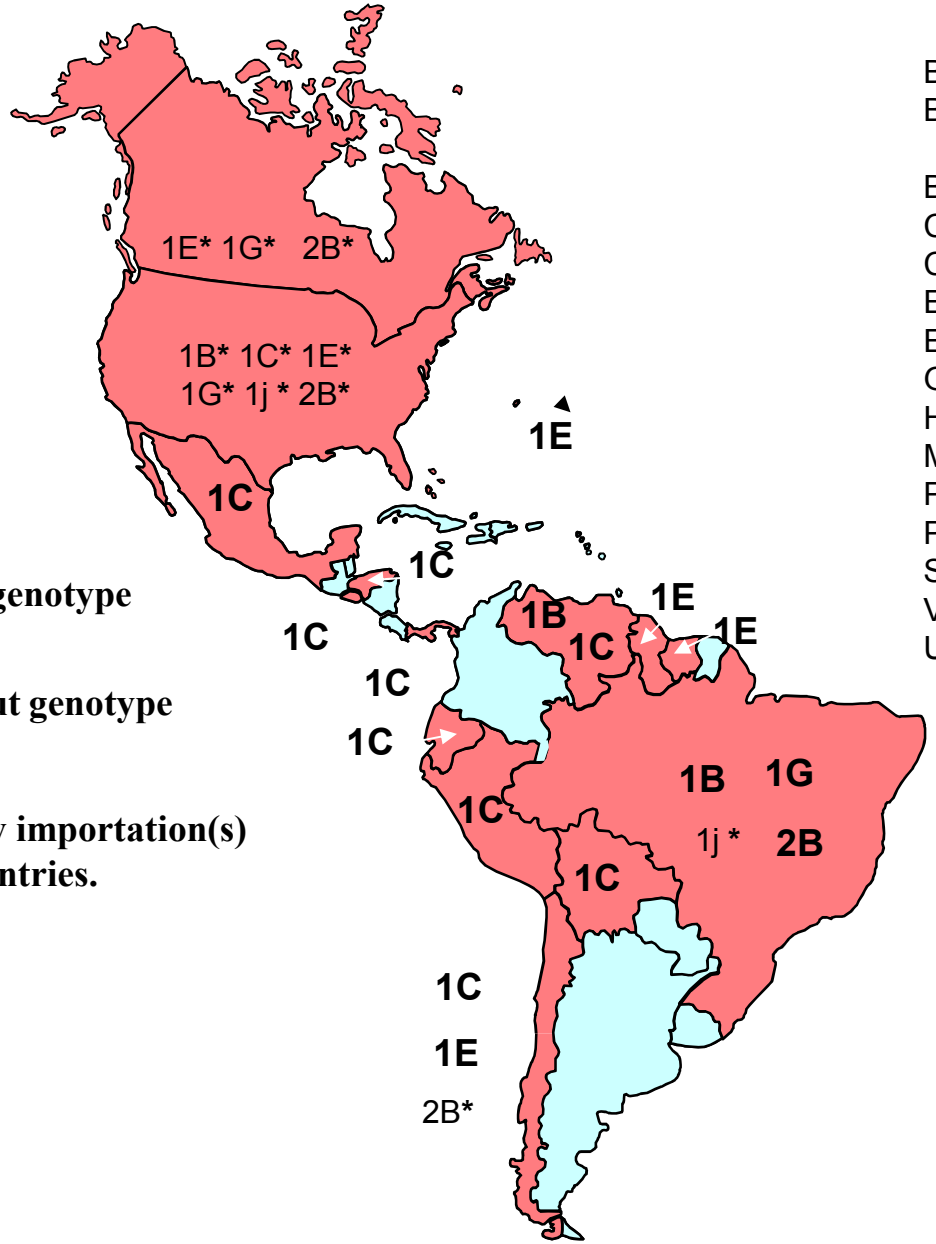


Pro-Vac Workshop, September 2006Pan American Health Organization

* Provisional data as of 24 February 2007.

Source: Country reports to PAHO, Global Measles Laboratory.

Wild-type Rubella Virus Genotypes Detected in the Americas--1997 through 2008



Countries with genotype information

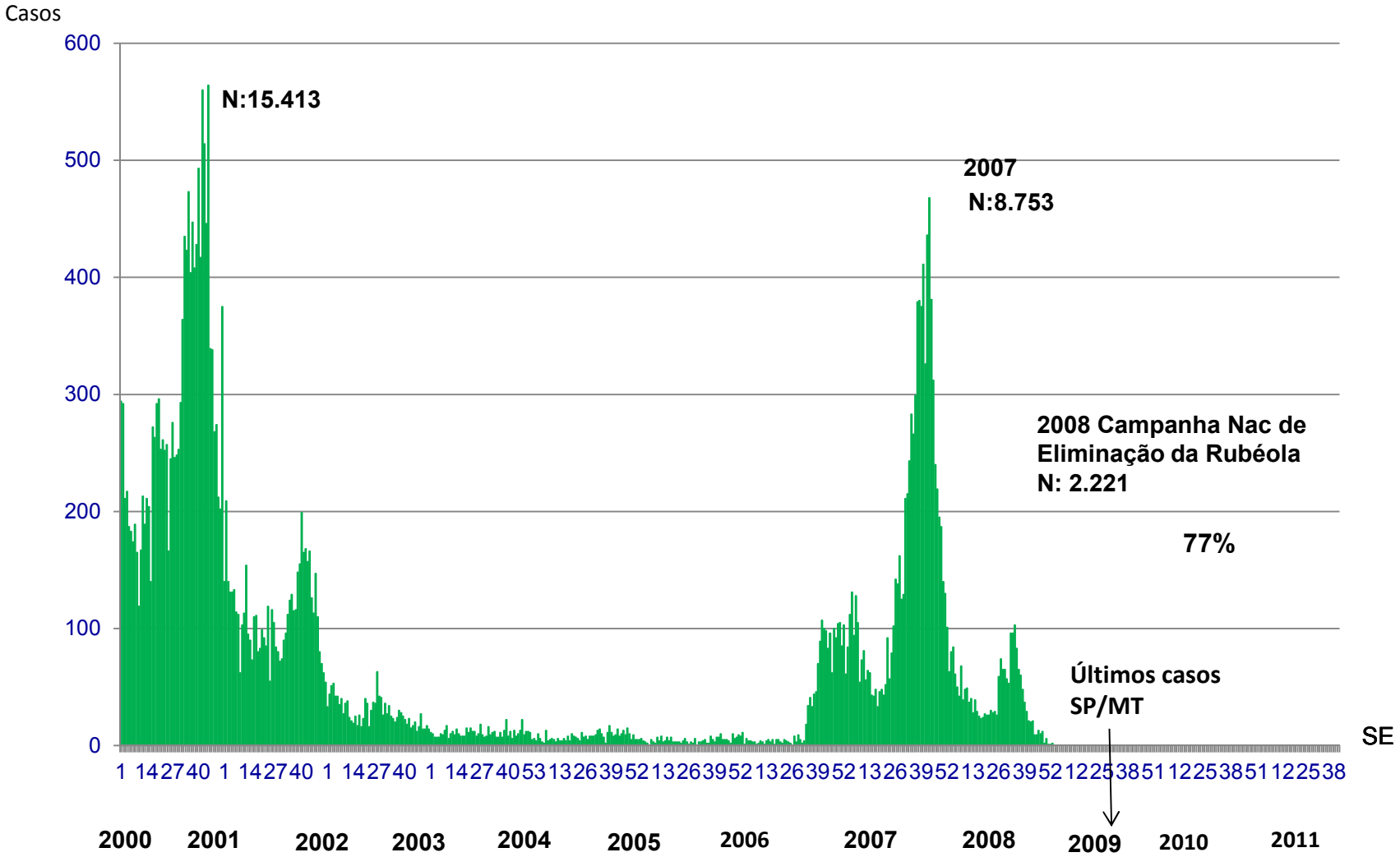
Countries without genotype information

*Known or likely importation(s) from other countries.

Bahamas:	1E--'97
Brazil:	1B--'97, '99;1G--'00, '01 1j*--'05;2B--'06
Bolivia:	1C--'02
Canada:	1E*--'97;1G*--'05;2B*--'07
Chile:	1C--'05;1E--'99;2B*--'07
Ecuador:	1C--'99
El Salvador:	1C--'00
Guyana:	1E--'97
Honduras:	1C--'99, '00
Mexico:	1C--'97
Panama:	1C--'99
Peru:	1C--'04, '05
Suriname:	1E--'98
Venezuela:	1B--'99;1C--'04
USA:	1B*--'99;1C*--'97 to '00; 1E*--'97, '98, '00, '05 1G*--'05, '07;1j*--'97,'02 2B*--'00, '07

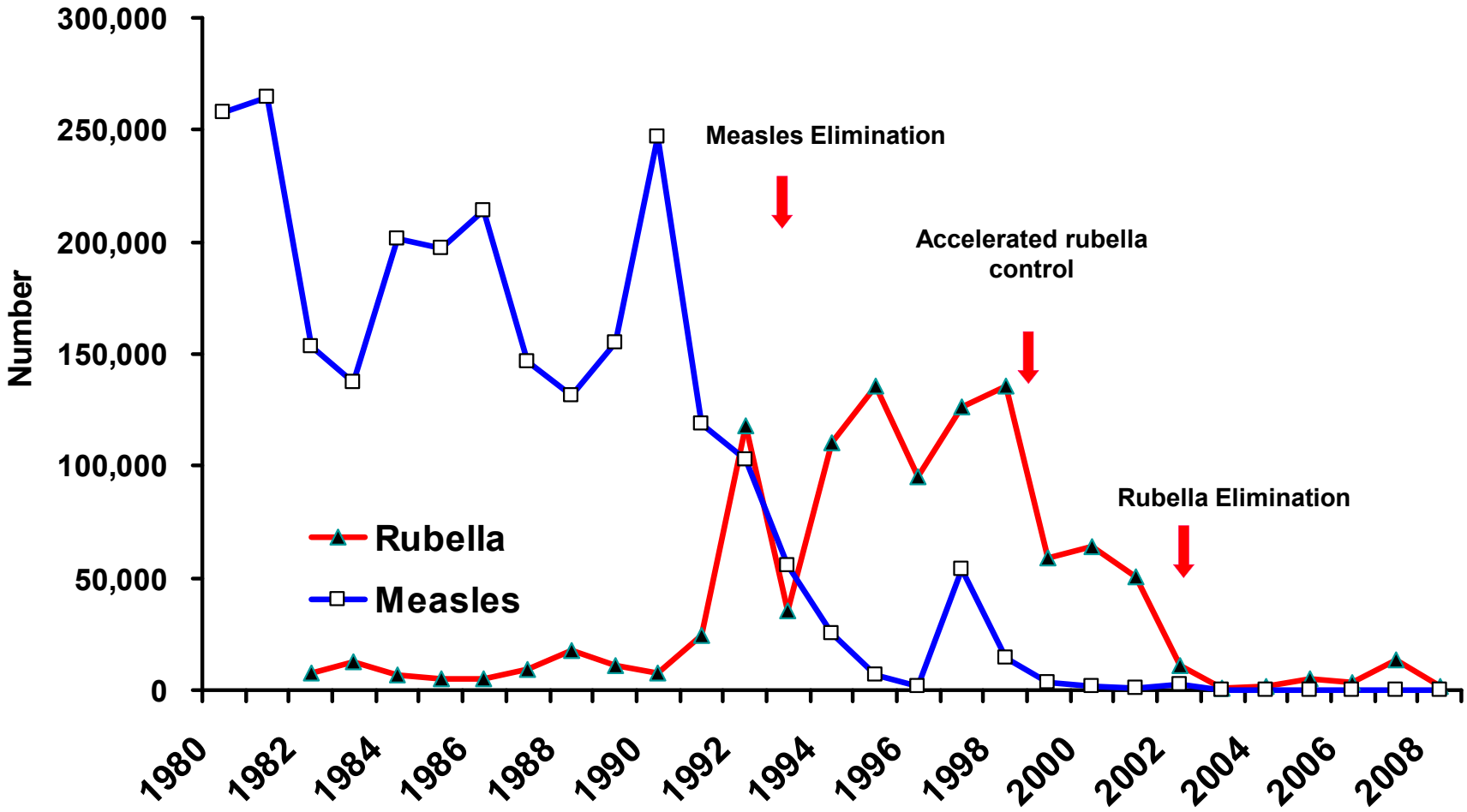
Source: Refrence LABS: CDC, Fio Cruz and countries

Distribution of confirmed cases in Brazil, 2000 - 2011*



Source: SVS/MS
* Preliminary data EW 40/11

Rubella and Measles Elimination, The Americas, 1980–2009



Source: Country reports

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IMMUNIZE AND PROTECT YOUR FAMILY

Immunization Newsletter

Pan American Health Organization

VOLUME XXIX, NUMBER 4 ► AUGUST 2007

IN THIS ISSUE:

Changing Lives: The EHDI Experience in Costa Rica

During activities on rubella immunization, conversations between Dr. Maria Luisa Aviles, then Costa Rican director of infectious diseases and now Minister of Health, PAHO Advisor Dr. Louis Z. Cooper, and Drs. Carlos Castillo-Solórzano and Jon Andrus from the PAHO Immunization Unit turned to the possibility of implementing an Early Hearing Detection and Intervention (EHDI) demonstration program in Costa Rica. Since congenital hearing loss is the most frequent manifestation of congenital rubella syndrome (CRS), an EHDI program would have the combined advantage of serving as an excellent surveillance instrument for CRS and for changing the lives of children found to be congenitally hearing-impaired, based on the new technologies for hearing testing and amplification, and early education.

Babies rely on hearing to develop spoken language. An infant's auditory system and brain are shaped by sound and by caregivers' voices long before a first word is spoken. However, because hearing loss is an "invisible" condition even trained health care professionals cannot reliably identify young children with hearing loss through observation alone. And when hearing loss goes undetected, early language learning is impeded and subsequent reading, academic, and social skills can also be severely compromised. This severe morbidity can now be prevented by EHDI, changing the lives of children and their families, and providing cost-saving benefits over their lifespan.

In the United States, 95% of infants are screened for hearing loss before hospital discharge or shortly thereafter. This represents a dramatic increase from fifteen years ago when only 3% of newborns received such screening. Due to advances in technology, screening for hearing has become the standard of care.

In a collaboration with the Costa Rica's Ministry of Health (MOH), PAHO, the American Academy of Pediatrics, the Costa Rican Pediatric/Neonatology Academy, and the US National Center for Hearing Assessment

Dr. Muñoz teaching newborn hearing screening.

XIX Meeting of the Central American Region, Mexico, and the Latin Caribbean

The XIX Meeting of the Central American Region, Mexico, and the Latin Caribbean on vaccine-preventable diseases took place in Santo Domingo, Dominican Republic, from 6-8 June 2007. Delegations from Costa Rica, Cuba, the Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, and Panama participated in the meeting.

During the opening ceremony, Dr. Gina Tambini, Area Manager, Family and Community Health, PAHO, spoke of the need for countries to dispose of information to orient their decisions regarding completion of the unfinished agenda in immunization. She also underscored the usefulness of the international evaluation methodology for immunization programs. Representatives of the Centers for Disease Control and Prevention of the U.S. (CDC), the U.S. Agency for International Development (USAID), the Church of Jesus Christ of Latter-day Saints, and UNICEF also were in attendance.

In a special session, Dr. Tambini and Dr. Cristina Nogueira, PAHO/WHO Representative in the Dominican Republic, presented the President of the Republic, Dr. Leonel Fernández, and the Secretary of Public Health, Dr. Bautista Rojas Gómez, with certificates for their commitment to the National Immunization Days conducted from 30 October to 10

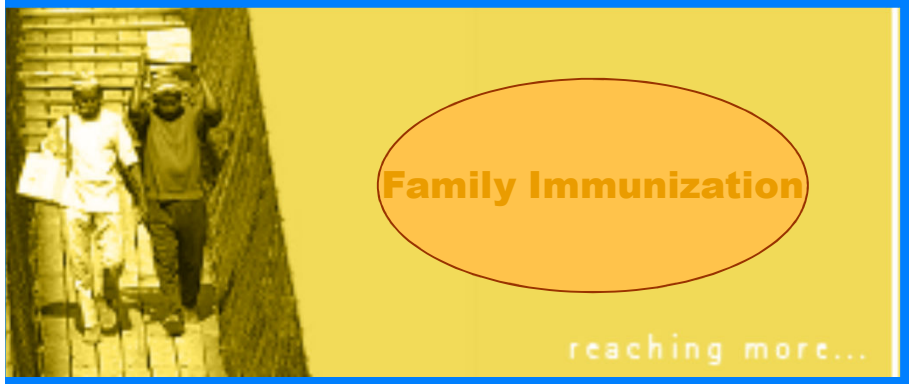
See MEXICO page 2

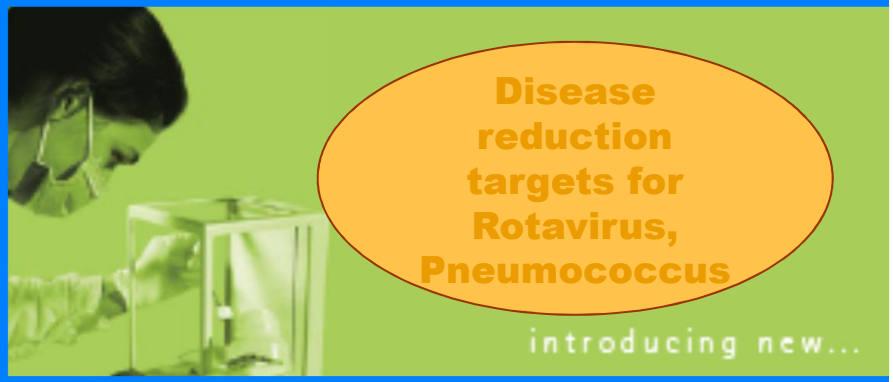
Rubella elimination and primary health care

PAHO. Changing lives: The EHDI experience in Costa Rica. EPI Newsletter August 2007;29(4):1.

Castillo-Solorzano C, Andrus JK. Rubella elimination and improving health care for women. Emerging Infectious Diseases 2004;10(11):17-21.

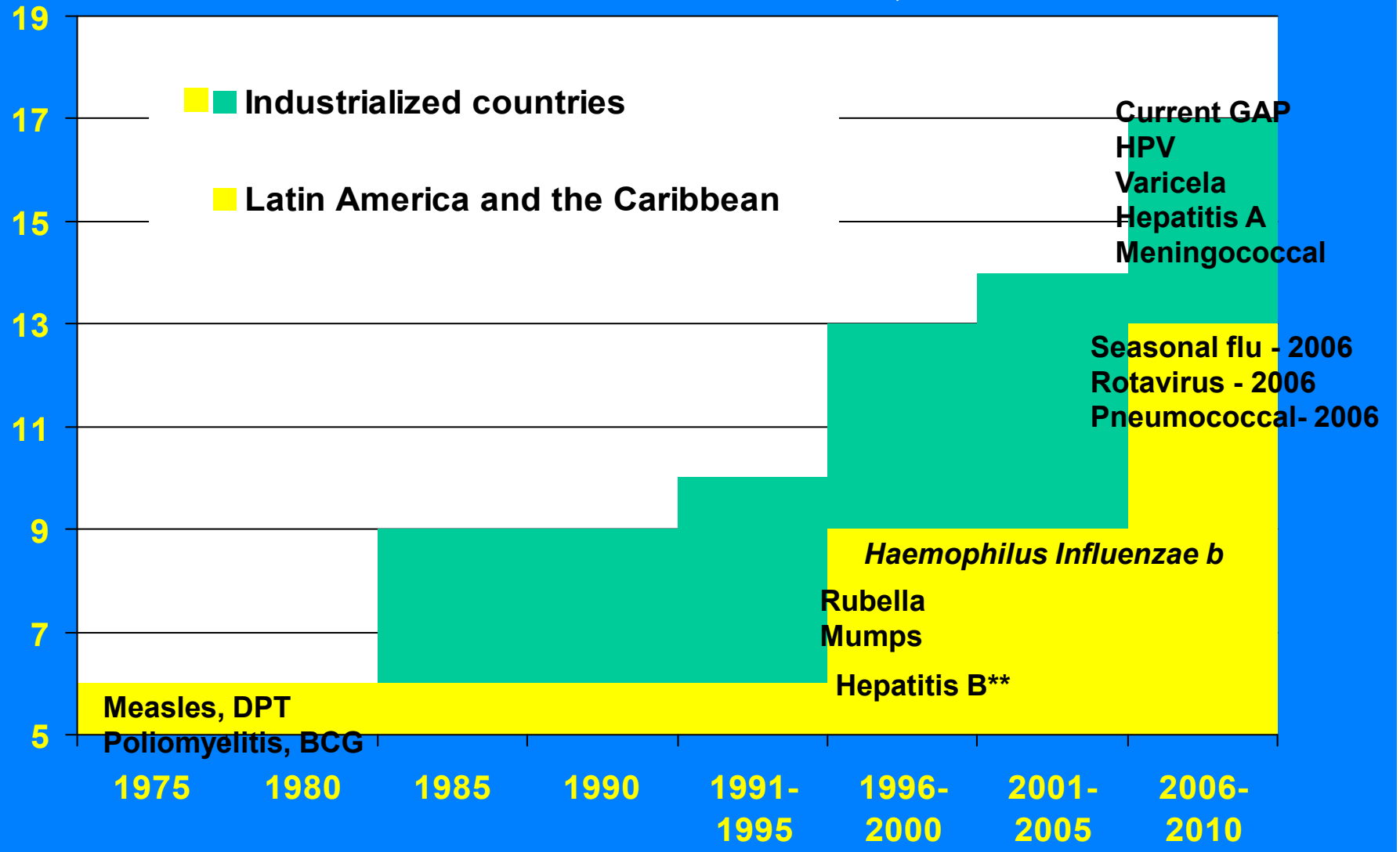
Global Immunization Vision and Strategies (GIVS)



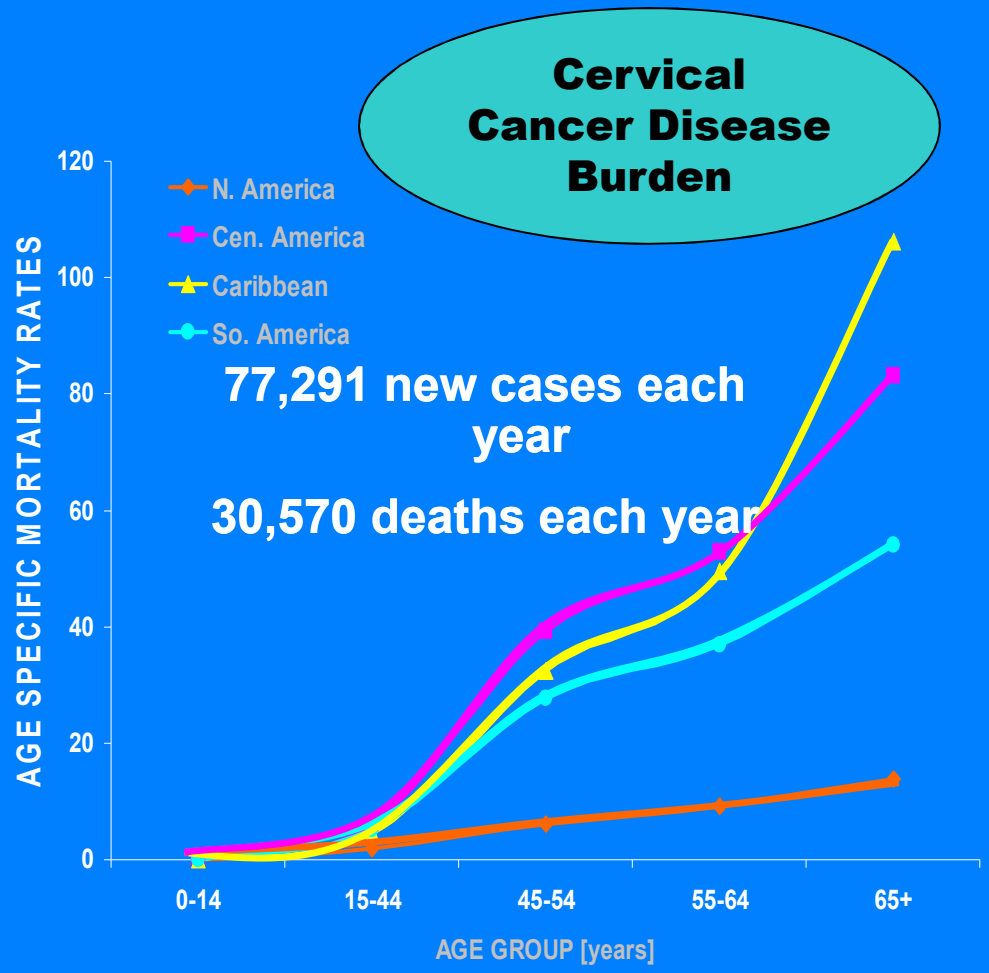


Millennium Development Goals 2015

Number of childhood vaccines routinely used industrialized countries and in Latin America and the Caribbean, 1975-2010



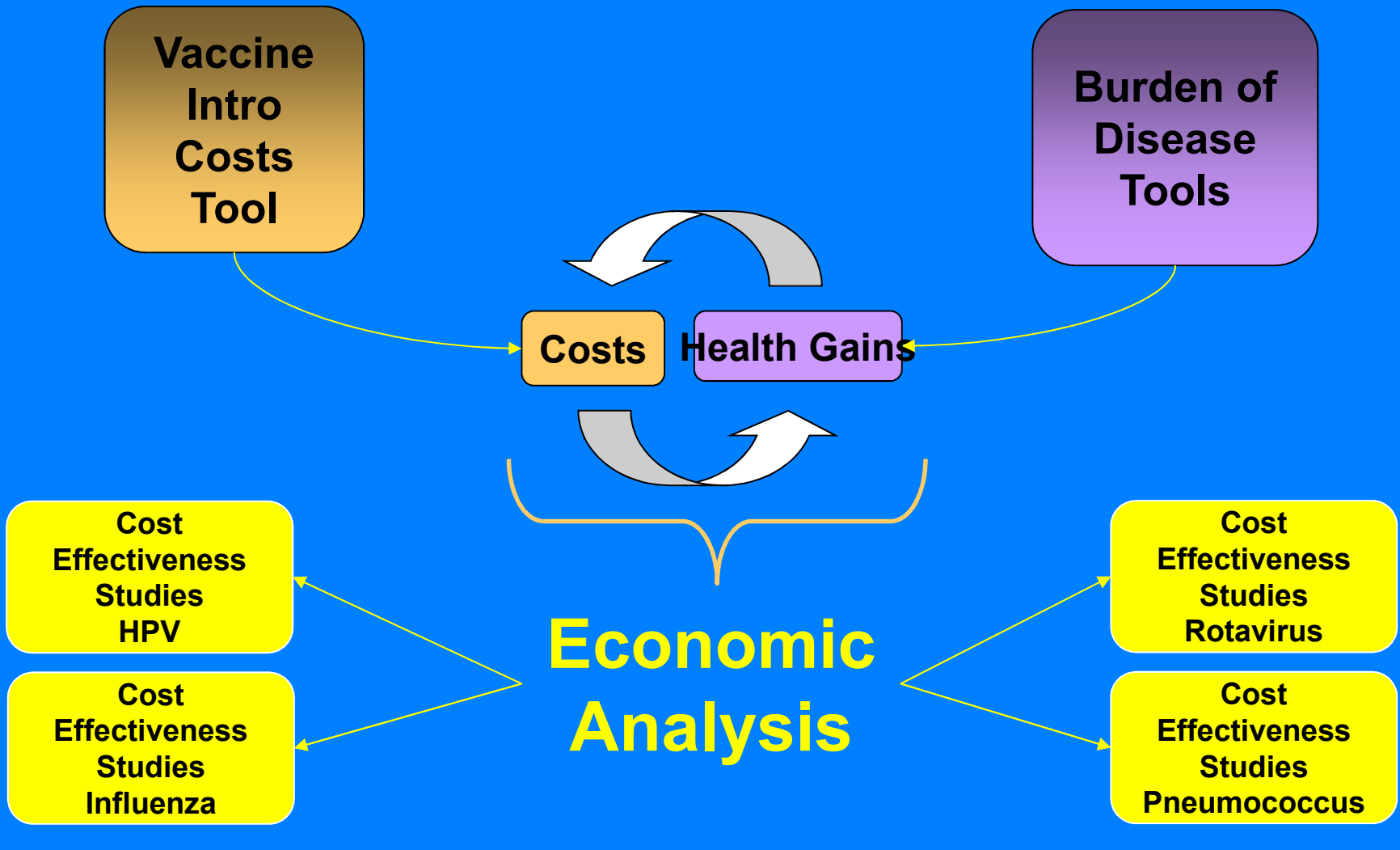
Applying Success Factors to New Challenges
Example of HPV vaccine and cervical cancer



- Taking advantage of new technologies while enhancing approaches to screening to reduce mortality of this disease of poverty
- Reducing the developing country uptake time lag >2 decades
- Expanding fiscal space

Source: IARC 2002 estimates

Tools for Economic Analysis



Rubella Elimination: Cost Savings

- Elimination of rubella and congenital rubella syndrome (CRS) costs 7% of what it would take the health systems of countries to care and provide rehabilitative services for babies born with CRS

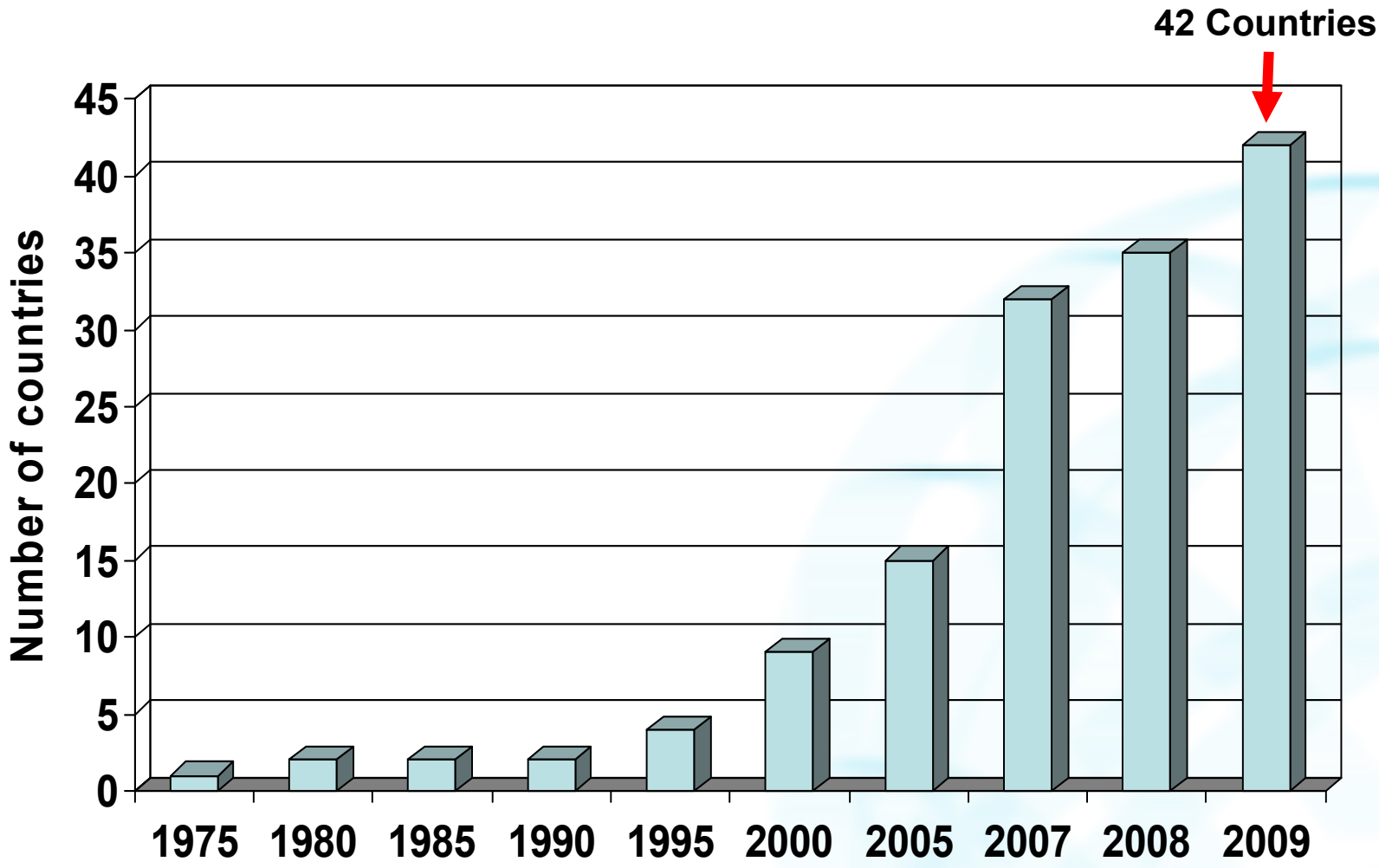
- Not all immunization interventions are cost-saving e.g. rotavirus vaccine at current prices

Irons B, et al. AJPH 2000;90(10):1545-1549

Year of universal introduction of pneumo, rota and HPV vaccines in LAC countries and territories (updated Dic 2011).

Year	Rotavirus	Pneumococus	HPV
2001	NA	EUA	NA
2002	NA	CAN	NA
2006	BRA, ELS, EUA, MEX, NIC, PAN, VEN	-	USA
2007	ECU	COR	BER, CAN
2008	BOL	MEX, URU, BER, GUY FRA	PAN
2009	COL, HON, PER, ISL. CAIMAN	PER, BAR, ISL. CAIMAN	-
2010	GUT, GUY, PAR	ARU, BRA, ECU, ELS, PAN, NIC	-
2011	-	HON, GUY , CHI, COL, CUR	PER, ARG
	16 countries and territories	17 countries and 4 territories	

Number of Countries with Seasonal Influenza Vaccination Programs in the Americas, 1975-2009



Risk of Virus Importations from Other Regions, including CRS Cases

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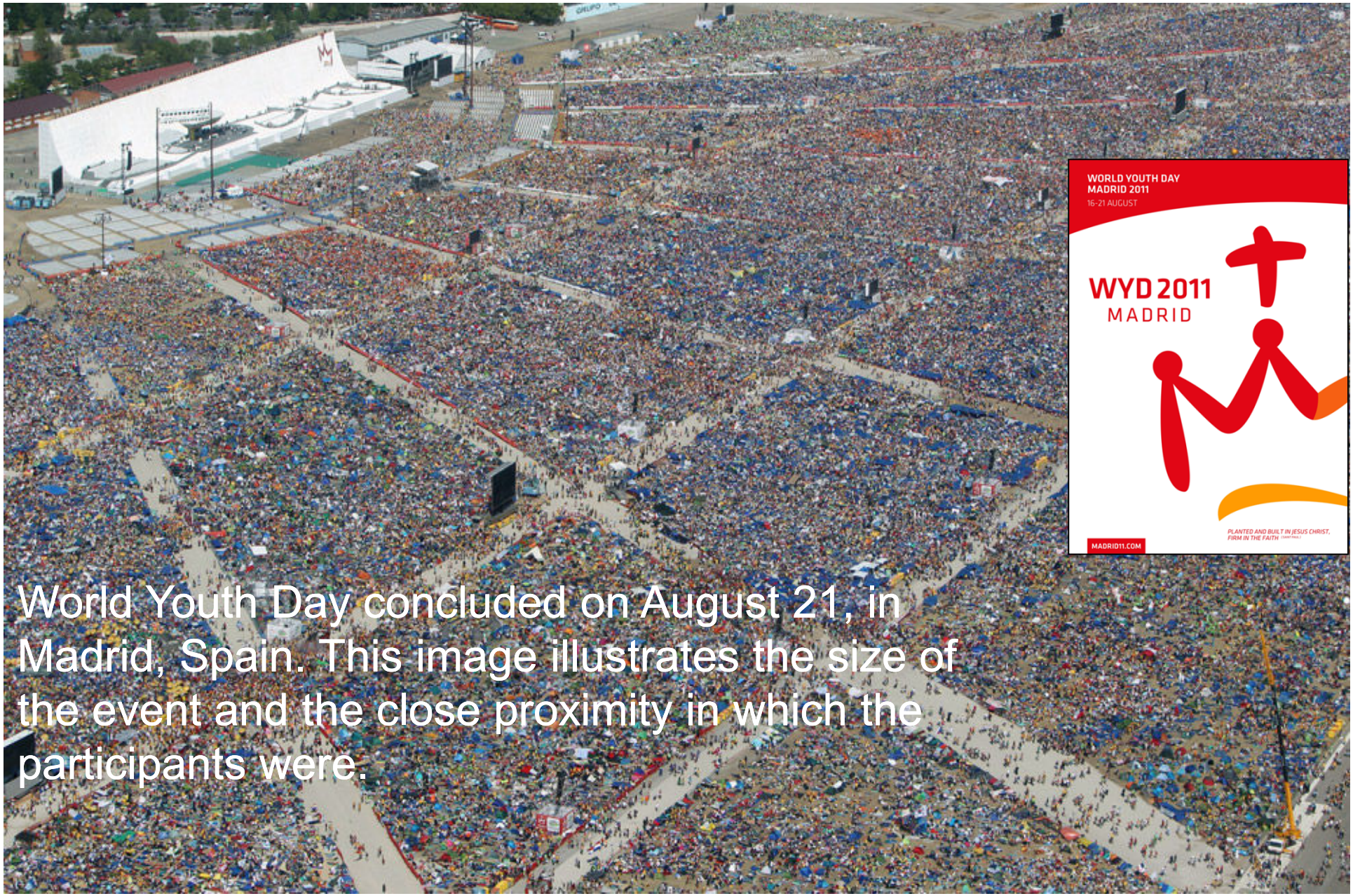

World Youth Day concluded on August 21, in Madrid, Spain. This image illustrates the size of the event and the close proximity in which the participants were.

July 1- 24

June 18 – July 10

July 29 – August 20

September 23 – October 2

August 16 –21

October 2 –15

Epidemiological Alerts

- **Mass-gathering events**
  - **Evidence of immunity to measles and rubella for international travelers.**
  - **Travelers should take notice of symptoms.**
  - **What to do if the traveler believes that they have measles or rubella.**
- **Recommendations on awareness of immunization**
- **Entry points of the countries (i.e: airports)**
- **Strategic alliances with key stakeholders to maximize alert dissemination** (airlines, travel agencies, etc.)

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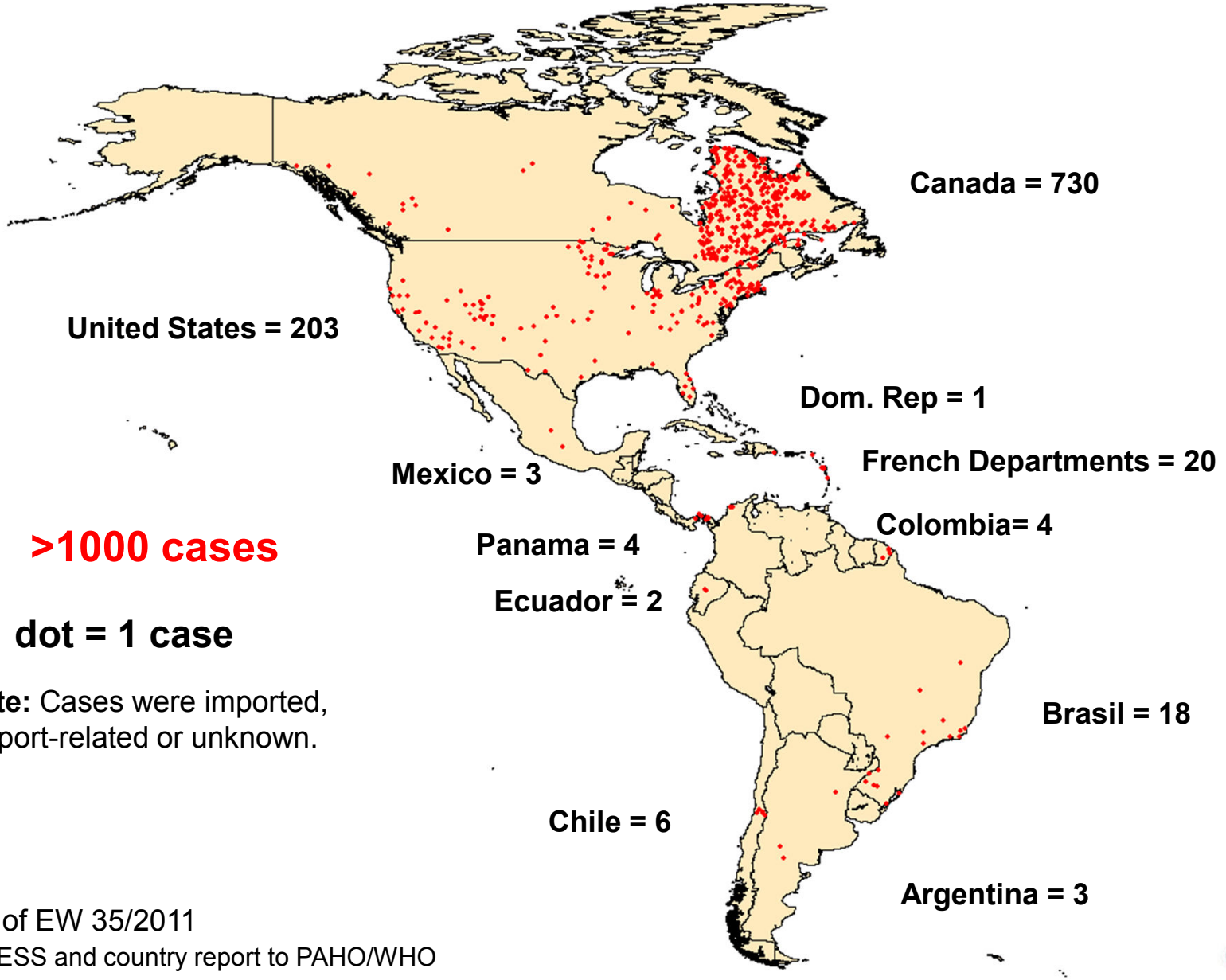
Confirmed measles cases in the Americas, 2011*



>1000 cases

1 dot = 1 case

Note: Cases were imported, import-related or unknown.

*Data as of EW 35/2011

Source: MESS and country report to PAHO/WHO

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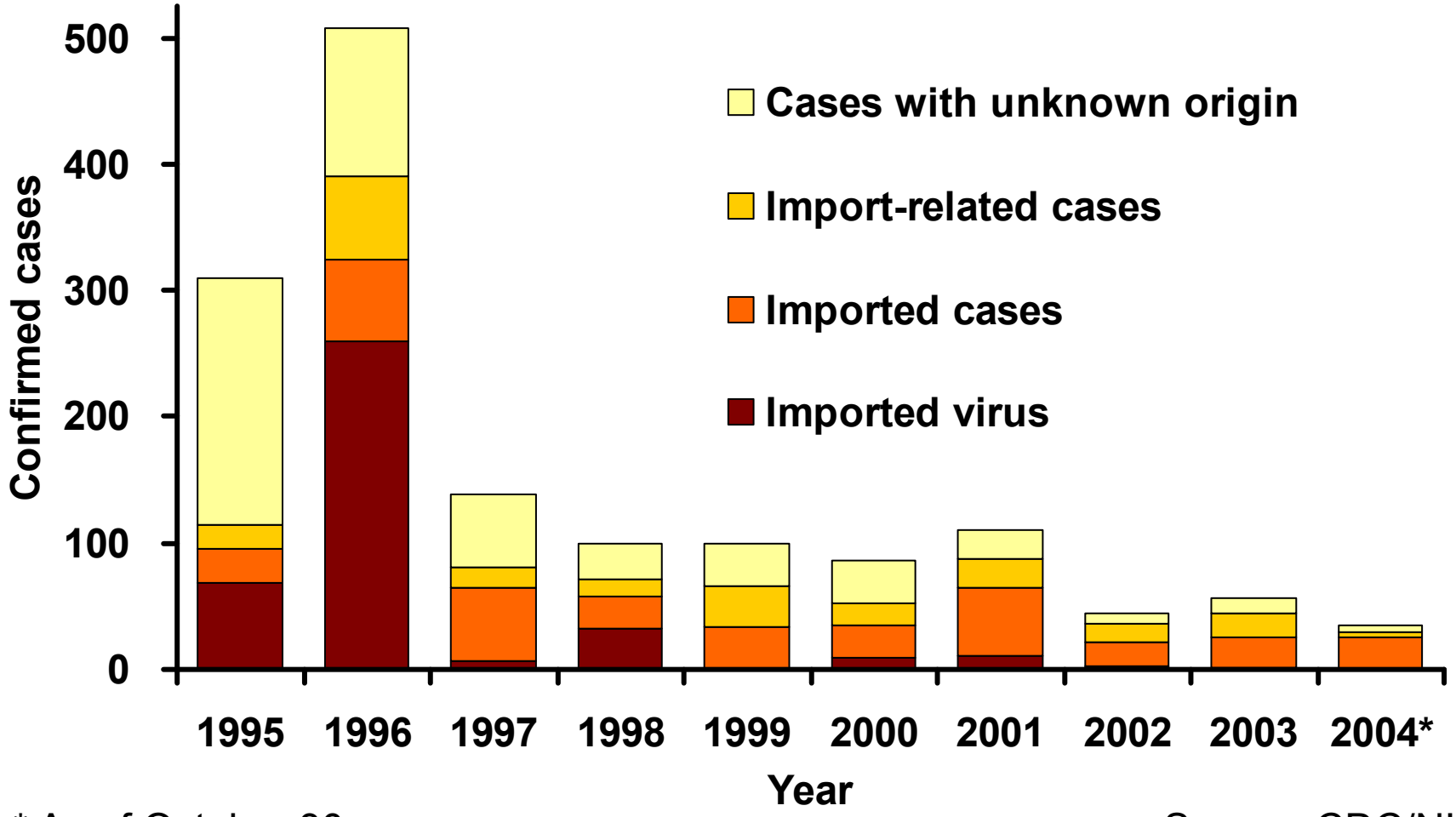
Measles Cases by Infection Origin United States, 1995-2004



* As of October 30.

Source: CDC/NIP

Number of import/imported related measles and rubella cases per country, The Americas – 2011*

	MEASLES			RUBELLA		
Country	Import	Import related	Unknown	Import	Import related	Unknown
Argentina	1	2	0			
Brazil	7	8	3			
Chile	3	3	0	1	1	
Canada**	13	23	694			1
Colombia	1	3	0			
Dominican Rep.	1	0	0			
Ecuador	1	1	0			
Guadalupe***	7	5	1			
French Guiana	2	2	0			
Martinique	2	0	1			
Mexico	3	0	0			
Panama	4	0	0			
United States	103	82	18	2	1	1
Total	148	128	717	3	2	2

** It does not include clinical cases reported.
*** Five cases have been notified in the island of Saint Martin (1 import and 4 import-related).

*Data as of EW 35/2001

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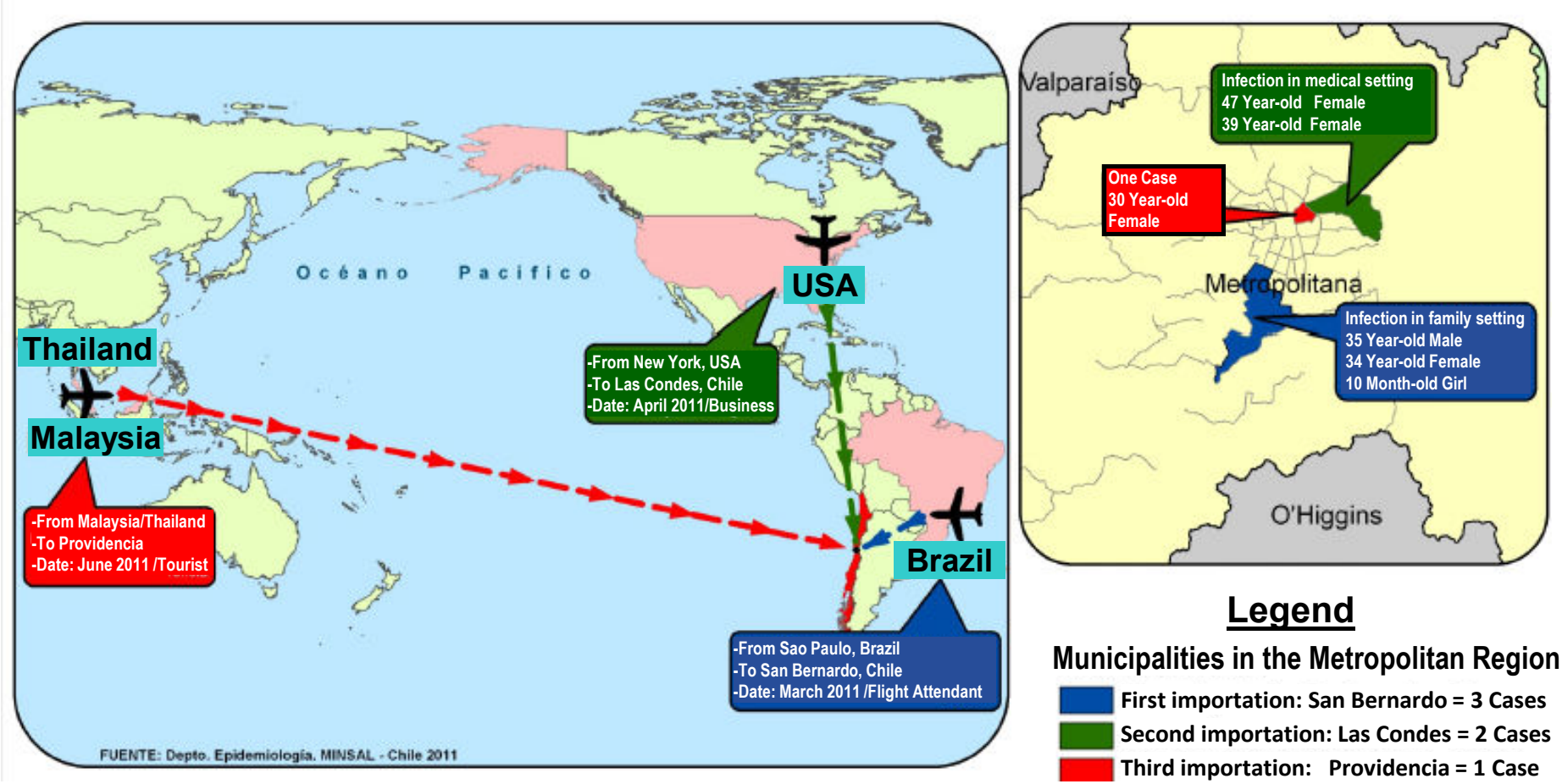
Route of Importation of Measles Cases to Chile, 2011



3 importations: 1 from Asia (D9), 1 from Brazil (D4) with 2 secondary cases, and 1 from United States (D4) with 1 secondary case.

Data as of EW 35/2011
Source: Ministry of Health, Chile

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Mass Gatherings and the Follow-up of International Contacts, 2010

Meeting of Walmart stakeholders in Fayetteville, AR

- Attendee from India arrives on 30 May 2010. Male, 29-years old, with ROD on 2 June, 2010
- Lab results confirm IgM+ for rubella with 2B virus identified.
- Over 15,000 people attended the conference.

Index case potentially in contact with 5,000-6,000 participants in corporate conference

FCH/IM sends alert to 10 countries with Walmart stores (on 14 June) and IHR/PAHO sends alert to all countries.

International contact tracing identified contacts in…
-CHI (126 individuals, including 3 pregnant women);
-COR (25 individuals); and
-HON (11 individuals)

No secondary cases identified after follow-up with contacts.

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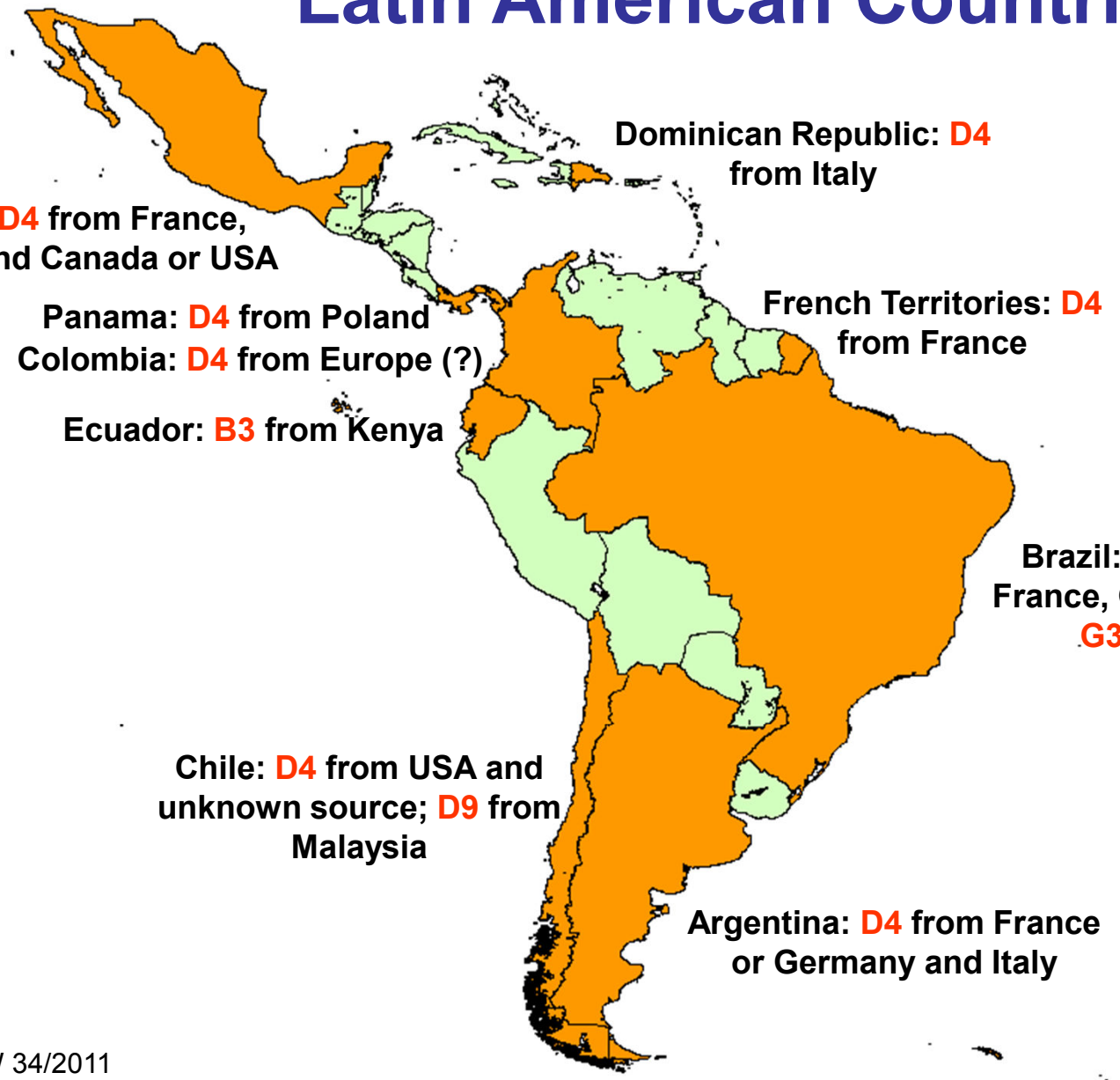
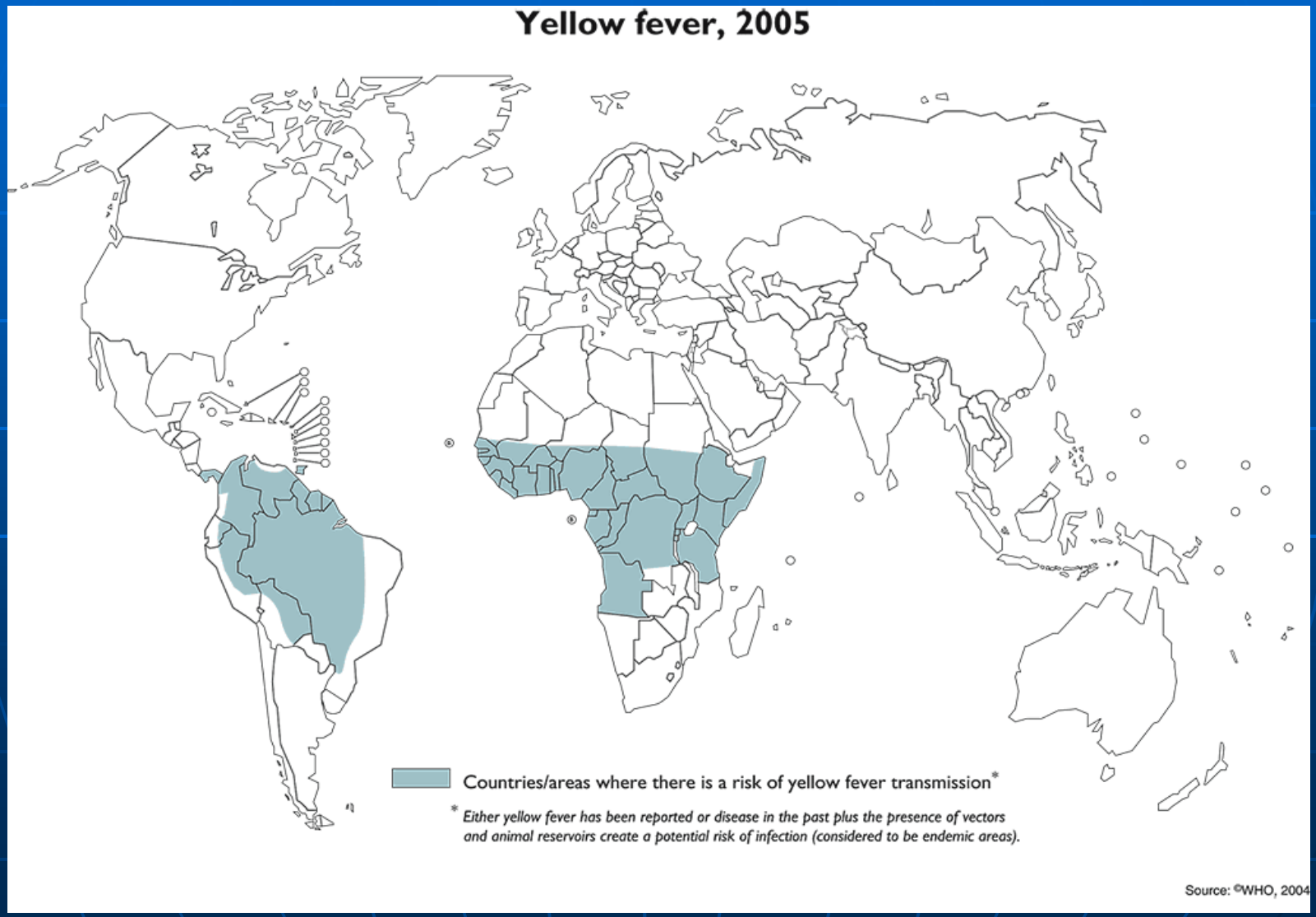
Measles Genotypes in Selected Latin American Countries, 2011



Data as of EW 34/2011

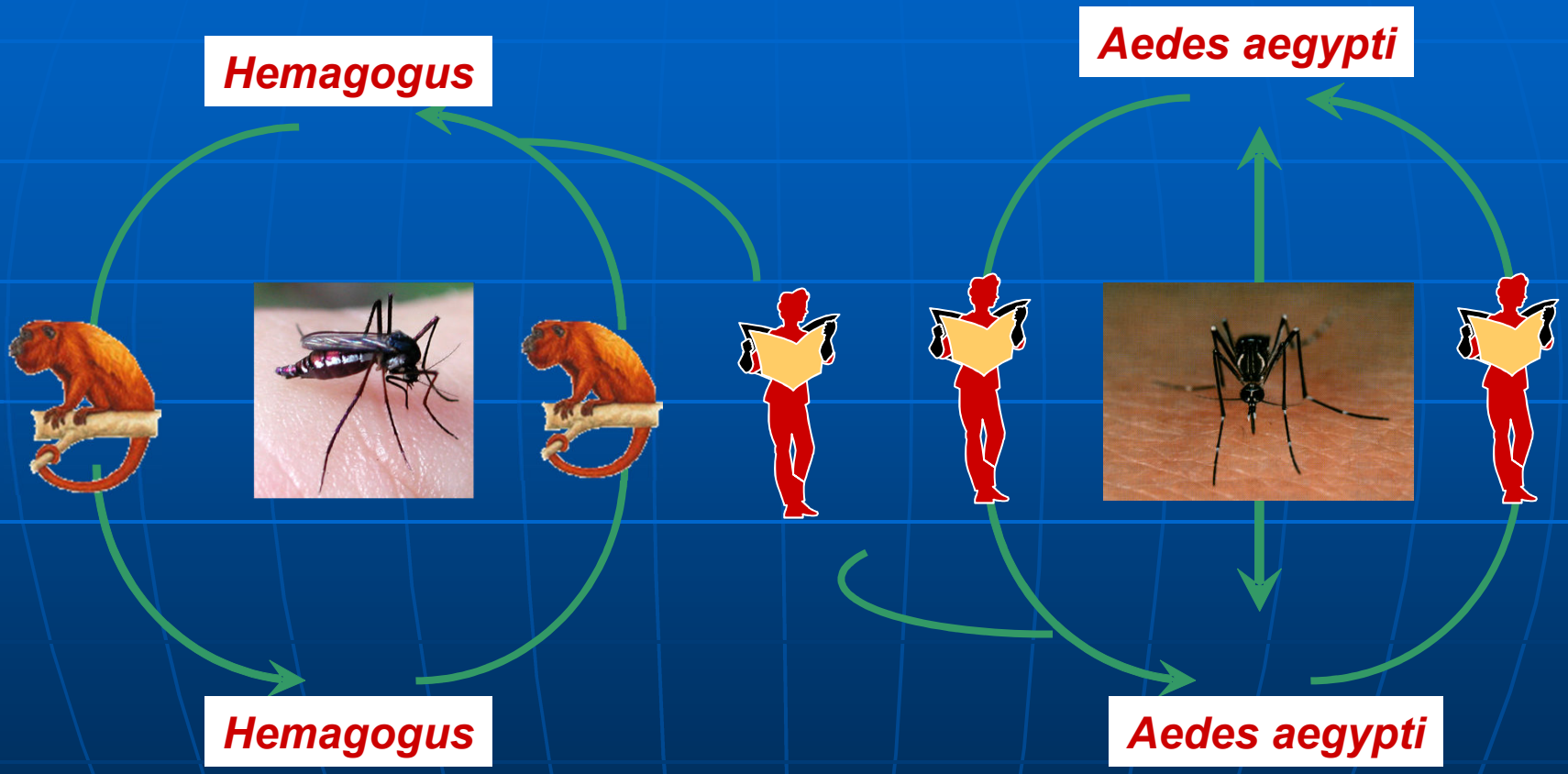
Source: Country reports to PAHO/WHO and CDC Global Measles Laboratory.

Countries with Yellow Fever Enzootic Areas



http://www.who.int/ith/maps/yellowFever2004_en.gif

Transmission cycles of yellow fever in South America



Urban cluster of yellow fever deaths, Paraguay, 2008

- A urban cluster of human YF, Asunción Metropolitan area*.
  - 10 deaths
  - Median of age: 24 years (11-39)
  - Female: 55%
  - Infestation Index by *Ae. Aegypti*: 23%

***Laurelty, Central Department**

Social unrest in Asuncion due to vaccine shortage

Population vaccinated:
800.000 in Asuncion in 3 days

Adult Vaccine Preventable Diseases (VPD)

- **Vaccinations needed throughout lifespan to reduce burden of VPD**
- **High burden of VPD remains among adults in the United States**
  - From 3,000 to about 49,000 influenza-related deaths per year
    - ~90% among adults 65 years and older
  - 9,419 cases of acute hepatitis B in 2009
  - 43,500 cases invasive pneumococcal disease (IPD) in 2009, including ~5,000 deaths
    - 85% of IPD and nearly all IPD deaths among adults
  - Over 27,000 cases of pertussis reported in US in 2010
    - 6,640 among adults, 4% of which are hospitalized
  - About 1 million cases of zoster annually U.S.

1. CDC. Active Bacterial Core Surveillance. http://www.cdc.gov/abcs/reports-findings/survreports/spneu09.pdf
2. Huang et al . Vaccine 2011
3. 2009 NNDSS
4. Thompson AJPH 2009
5. CDC. Prevention of Herpes Zoster. MMWR 2008. 57(RR-5): p. 1-30

Adult Immunization Schedule

- **Published at least annually since 2002**
  - **2012 published early February 2012 in**
    - **Annals of Internal Medicine**
    - **MMWR**
- **Adult Schedule approved by :**
  - **American College of Physicians (ACP)**
  - **American Academy of Family Physicians (AAFP)**
  - **American College of Obstetrics and Gynecology**
  - **American College of Nurse-Midwives**
  - **Advisory Committee on Immunization Practices (ACIP) and CDC**

Pneumococcal Disease

- Second most common cause of vaccine-preventable death in the U.S. (after influenza)
- Major clinical syndromes include pneumonia, bacteremia, and meningitis

CDC's Pink Book on VPDs 2008

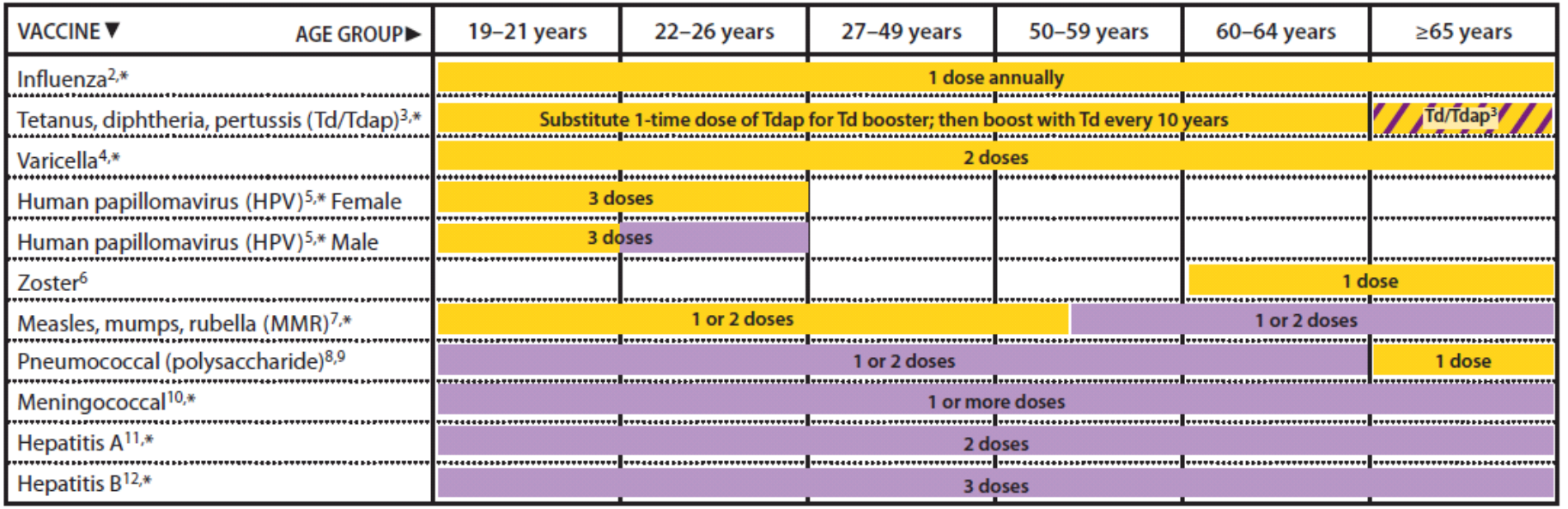
Pneumococcal Polysaccharide Vaccine Missed Opportunities

- **>65% of patients with severe pneumococcal disease had been hospitalized within preceding 3-5 years yet few had received vaccine**
- **May be administered simultaneously with influenza vaccine**

CDC's Pink Book on VPDs 2008

2012 ACIP Adult Immunization Schedule, Age-Based Recommendations

FIGURE 1. Recommended adult immunization schedule, by vaccine and age group[1] — United States, 2012



* Covered by the Vaccine Injury Compensation Program

For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

Tdap recommended for ≥65 if contact with <12 month old child. Either Td or Tdap can be used if no infant contact

No recommendation

2012 ACIP Adult Immunization Schedule, Age-Based Recommendations

FIGURE 1. Recommended adult immunization schedule, by vaccine and age group[1] — United States, 2012

VACCINE ▼ AGE GROUP ▶	19–21 years	22–26 years	27–49 years	50–59 years	60–64 years	≥65 years
Influenza[2,*]	1 dose annually					
Tetanus, diphtheria, pertussis (Td/Tdap)[3,*]	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 years					Td/Tdap[3]
Varicella[4,*]	2 doses					
Human papillomavirus (HPV)[5,*] Female	3 doses					
Human papillomavirus (HPV)[5,*] Male	3 doses					
Zoster[6]					1 dose	
Measles, mumps, rubella (MMR)[7,*]	1 or 2 doses			1 or 2 doses		
Pneumococcal (polysaccharide)[8,9]	1 or 2 doses					1 dose
Meningococcal[10,*]	1 or more doses					
Hepatitis A[11,*]	2 doses					
Hepatitis B[12,*]	3 doses					

* Covered by the Vaccine Injury Compensation Program

For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection

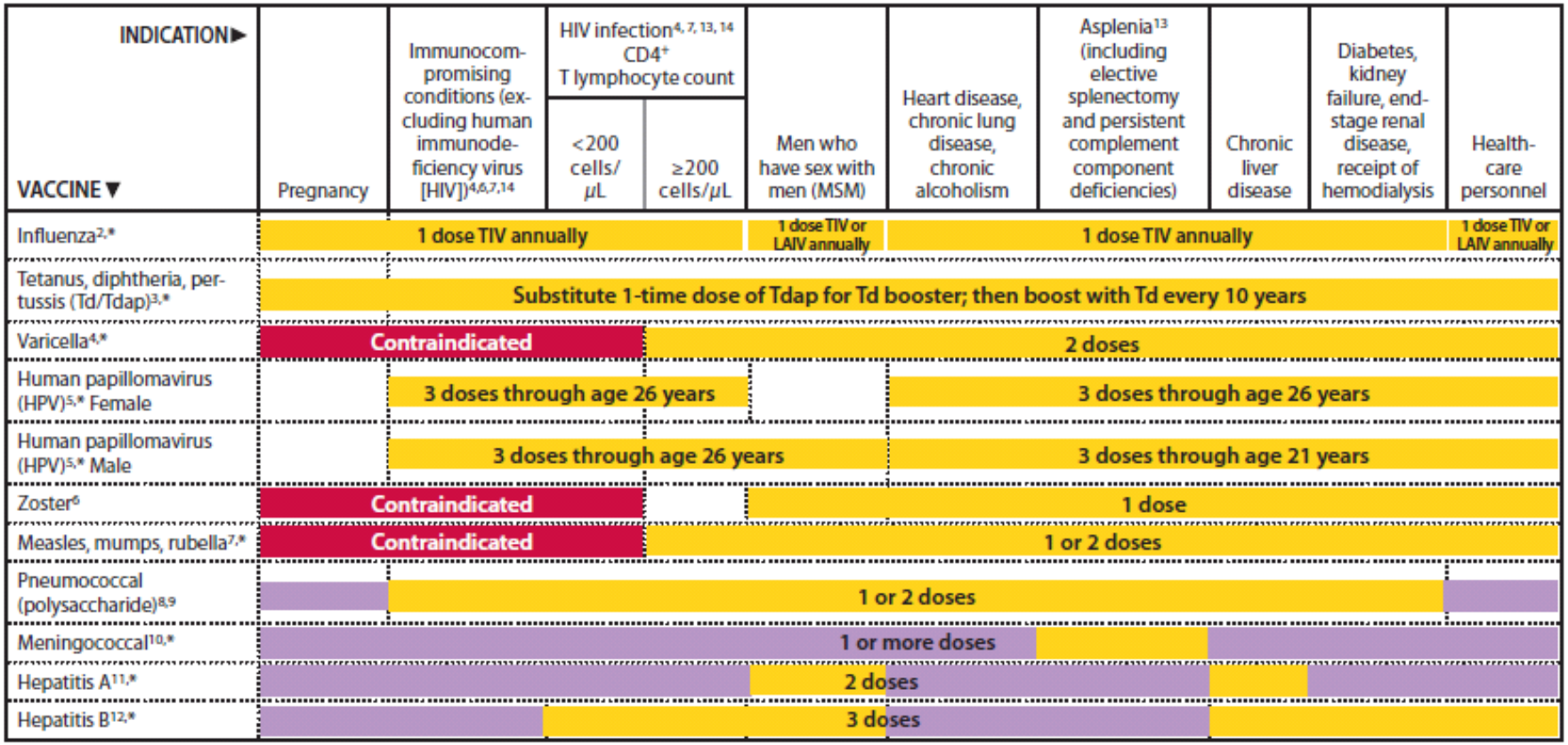
Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

Tdap recommended for ≥65 if contact with <12 month old child. Either Td or Tdap can be used if no infant contact

No recommendation

2012 ACIP Adult Immunization Schedule, Medical, Occupational and Behavior-Based Recommendations

FIGURE 2. Vaccines that might be indicated for adults, based on medical and other indications[1] — United States, 2012

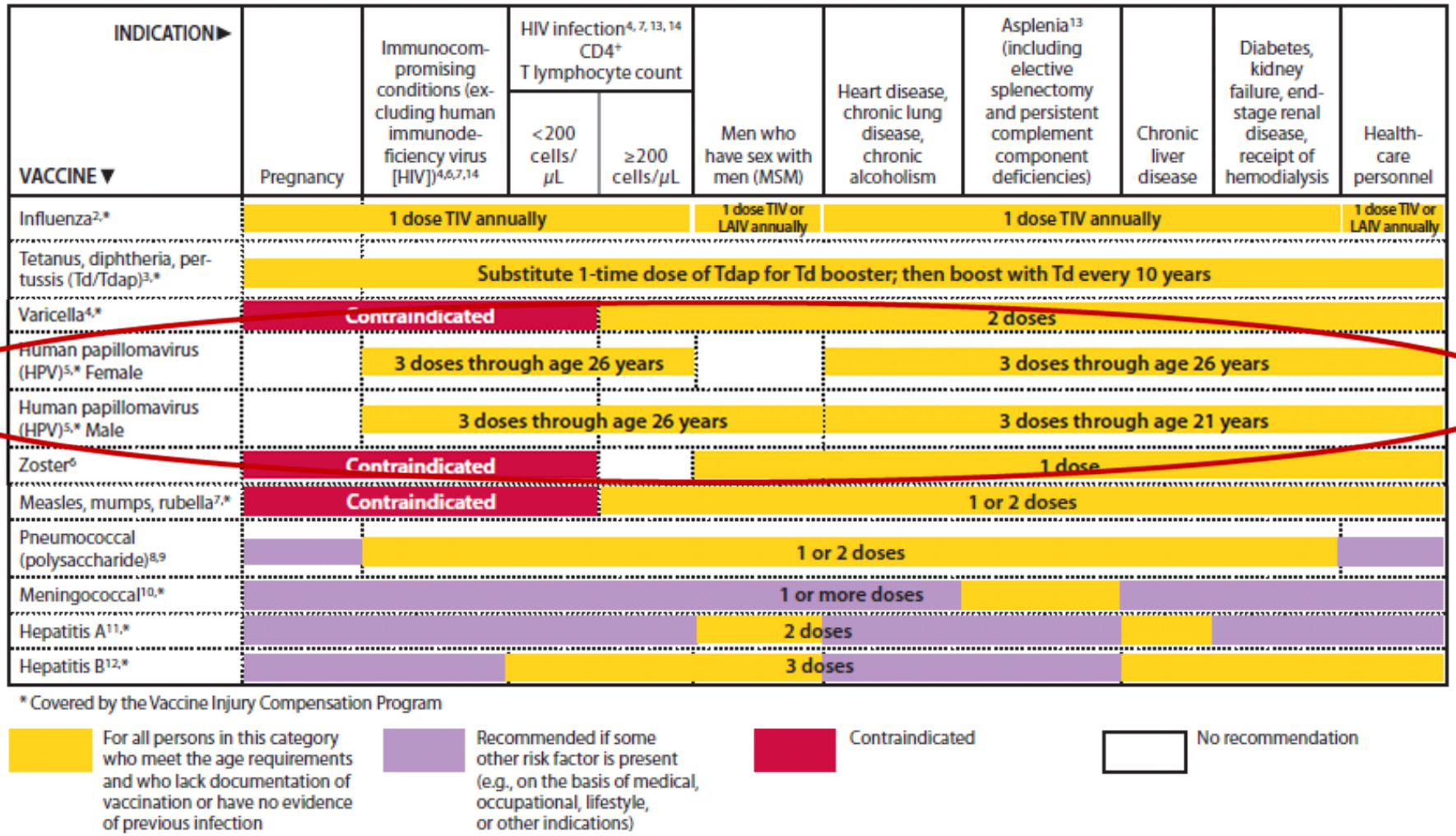


* Covered by the Vaccine Injury Compensation Program

- For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection
- Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)
- Contraindicated
- No recommendation

2012 ACIP Adult Immunization Schedule, Medical, Occupational and Behavior-Based Recommendations

FIGURE 2. Vaccines that might be indicated for adults, based on medical and other indications[1] — United States, 2012



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For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

Contraindicated

No recommendation

Adult Highlights (1)

- Tdap once to all persons age 19 years and older; then Td every 10 yrs
- Varicella 2 doses for all adults if non-immune and not previously vaccinated (anyone born before 1980 essentially immune)
- Zoster 1 dose at 60 years regardless of shingles or varicella history
- HPV until 26 years for females; until 21 for all males, 22-26 for high risk males

Adult Highlights (2)

- Influenza yearly for all 6 months and older
- Pneumo 19-64 years if high risk conditions (e.g. renal failure, asplenic, immunocompromized).
- Pneumo for all at age 65 years (or 5 years after prior dose)
- HB vaccine for high risk – now includes those with diabetes

Immunization Contraindications

- **Pregnancy, known immunodeficiency, HIV infection with CD4 <200 for live vaccines: varicella, MMR, zoster vaccines, live attentuated flu vaccine**

- **Other chronic medical conditions (asthma, DM, CHD, CKD): live attentuated influenza vaccine**

U.S. Influenza Vaccine Coverage 2007-2011, BRFSS

Flu season	07/08	08/09	09/10	10/11
≥18 years	**37.2**	**40.2**	**40.4**	**40.5**
±95% CI	0.4	0.6	0.4	0.4
18–64 years	**30.5**	**33.4**	**34.4**	**34.8**
±95% CI	0.6	0.6	0.4	0.6
18–64 high-risk	**44.3**	**47.9**	**46.2**	**46.7**
±95% CI	1.4	1.4	1.0	1.4
18–49 years	**25.4**	**28.2**	**29.9**	**30.5**
±95% CI	0.6	0.8	0.5	0.6
18–49 high-risk	**35.7**	**38.7**	**38.2**	**39.0**
±95% CI	2.2	2.0	1.3	2.2
≥65 years	**71.8**	**73.6**	**69.6**	**66.6**
±95% CI	0.8	0.6	0.6	0.6

Seasonal Influenza Vaccination Coverage by Race/Ethnicity: 2008-09 -- 2010-11 Seasons, BRFSS and NIS

Group	2008-09 (%) [1]	2009-10 (%) [2]	2010-11 (%) [2]
Race/ethnicity (adults)			
White, non-Hispanic	39.7	43.8	**43.3**
Black, non-Hispanic	26.8	31.3	34.9
Hispanic	25.6	30.6	32.4
Race/ethnicity (children)			
White, non-Hispanic	24.9	42.5	46.3
Black, non-Hispanic	20.0	35.5	47.9
Hispanic	18.4	43.9	**55.3**

1. BRFSS estimates, (19 states for children; 43 states plus DC for adults) online at: http://www.cdc.gov/mmwr/PDF/wk/mm5839.pdf and CDC, unpublished
2. BRFSS and NHFS estimates, 2009-10; BRFSS and NIS estimates, 2010-11, both years for 50 states plus DC for children, 43 states plus DC for adults. In press, MMWR, June 10, 2011

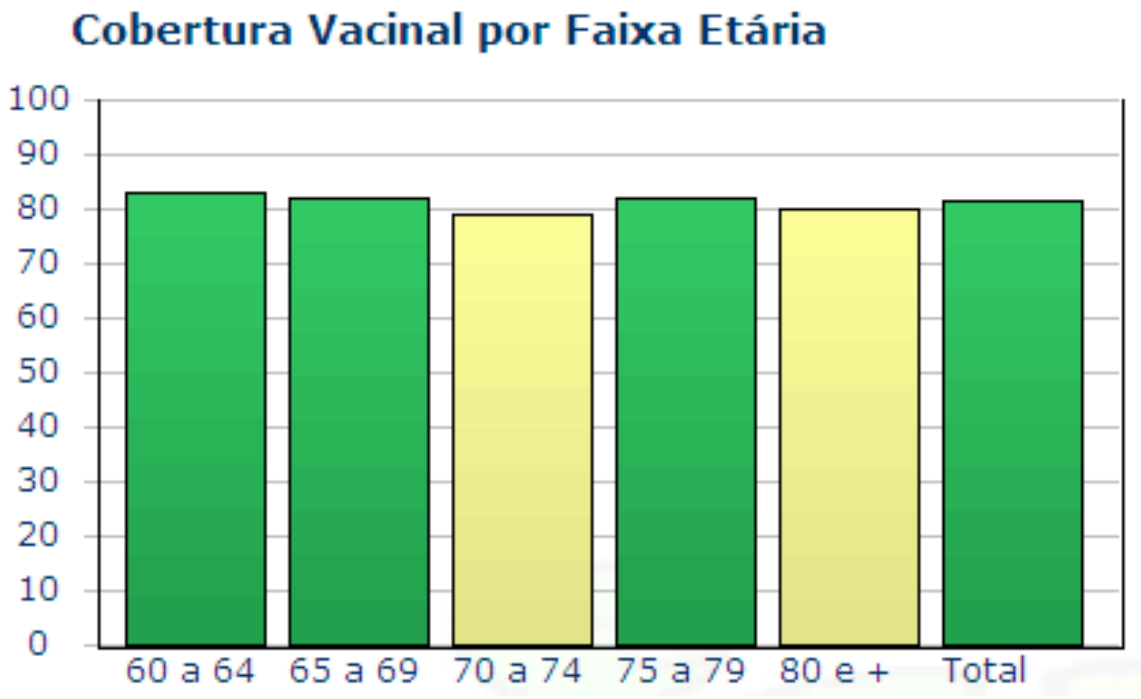
Meta-Analysis of Interventions to Increase Use of Adult Immunization

Intervention	Odds Ratio*
Organizational change (e.g., standing orders, separate clinics devoted to prevention)	16.0
Provider reminder	3.8
Provider education	3.2
Patient financial incentive	3.4
Patient reminder	2.5
Patient education	1.3

*Compared to usual care or control group, adjusted for all remaining interventions

Stone E. Ann Intern Med 136:641-51, 2002

Vacina contra influenza em idosos (≥ 60 anos de idade) por Unidade Federada, Brasil, 2009*



Fonte:pni.datasus.gov.br (dados sujeitos a alterações)
* dados em março de 2009

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Travel Notices

Please Note Travel Notice Definitions

Outbreaks

- **Updated** Rabies in Bali, Indonesia
  March 20, 2012
- **Updated** Dengue in Tropics & Subtropics
  March 15, 2012
- Cholera in Haiti
  January 09, 2012
- Cholera in the Dominican Republic
  December 15, 2011

In the News

- **Updated** Polio, Global Status
  March 22, 2012
- **New!** African Trypanosomiasis in Kenya
  March 12, 2012
- Polio Outbreak in China
  February 14, 2012

Contact Us:

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Control and
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1600 Clifton Rd
Atlanta, GA 3033

800-CDC-INFO
(800-232-4636)
TTY: (888) 232-6

New Hours of
Operation
8am-8pm ET/Mor
Friday
Closed Holidays

cdcinfo@cdc.gov

Malaria Case Management Hotline
Health care providers needing assistance wi the diagnosis or management of suspected cases of malaria, may call the CDC Malaria Hotline: **770-488-7788** or to

Objectives

- Understand the role of adult immunization in global health, especially in terms of the transition from child to family immunization programs
- Define some key challenges in containing global VPD threats
- Understand specific issues relevant to the USA

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www. paho.org/immunization

Pan American Health Organization

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