Influenza Vaccine Use In the Americas Network for Evaluation of Influenza Vaccine Effectiveness REVELAC-i

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Pan American Health Organization

World Health Organization
Americas

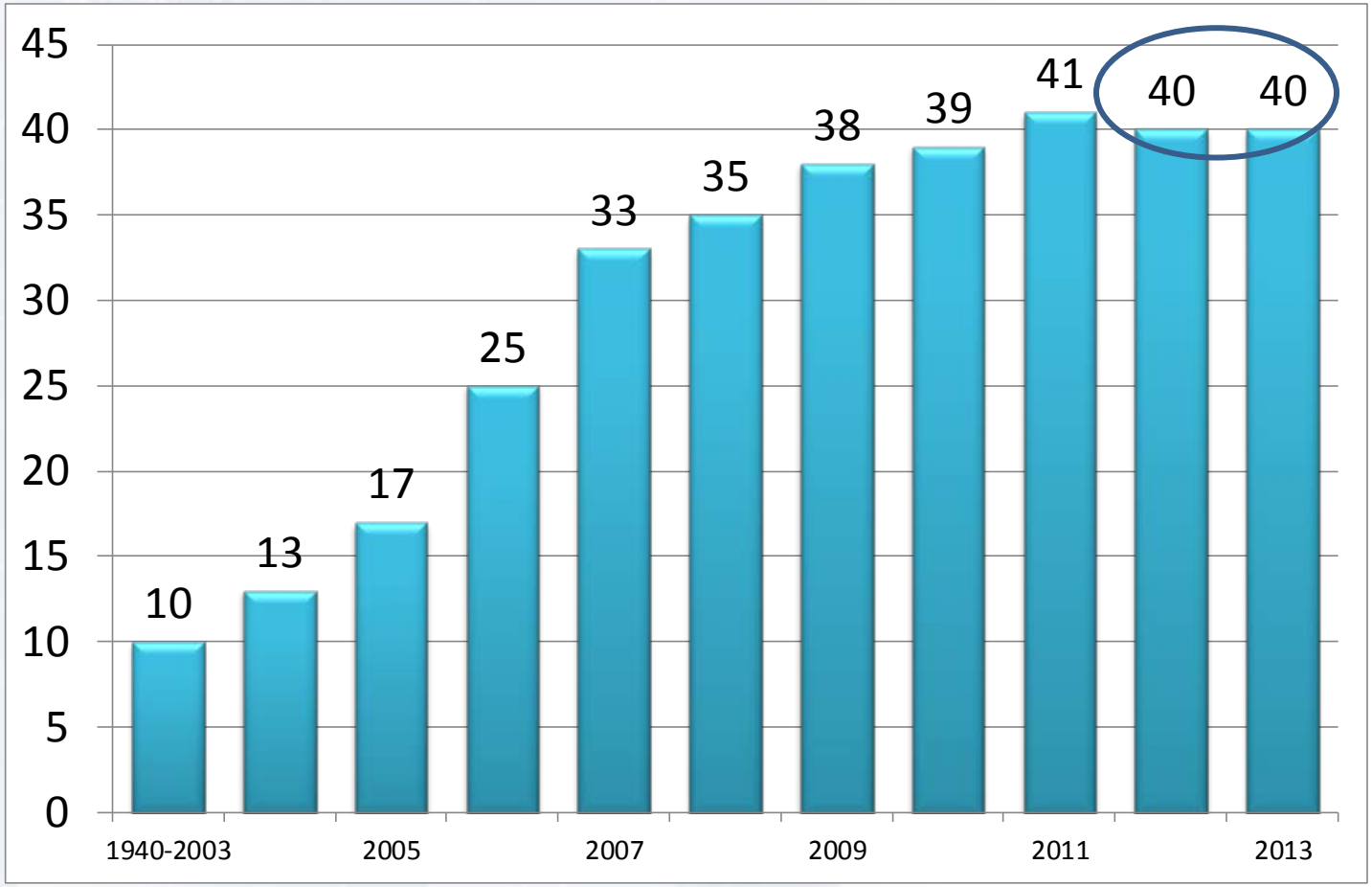
Outline

I. Uptake of Seasonal Influenza Vaccination in LAC

II. Background and progress of REVELAC-I network

III. Lessons learned, challenges and opportunities

Countries and Territories in the Americas with policies for seasonal influenza vaccination, 2003-2013



40/45

Pending of introduction:

Haiti, Guyana & St. Kitts & Nevis

Change in JRF Reporting status

Montserrat

St. Vincent

Vaccine introduction:

St. ***Marteen***

Source: Country Reports to PAHO, MOH web pages, PAHO/WHO Surveys

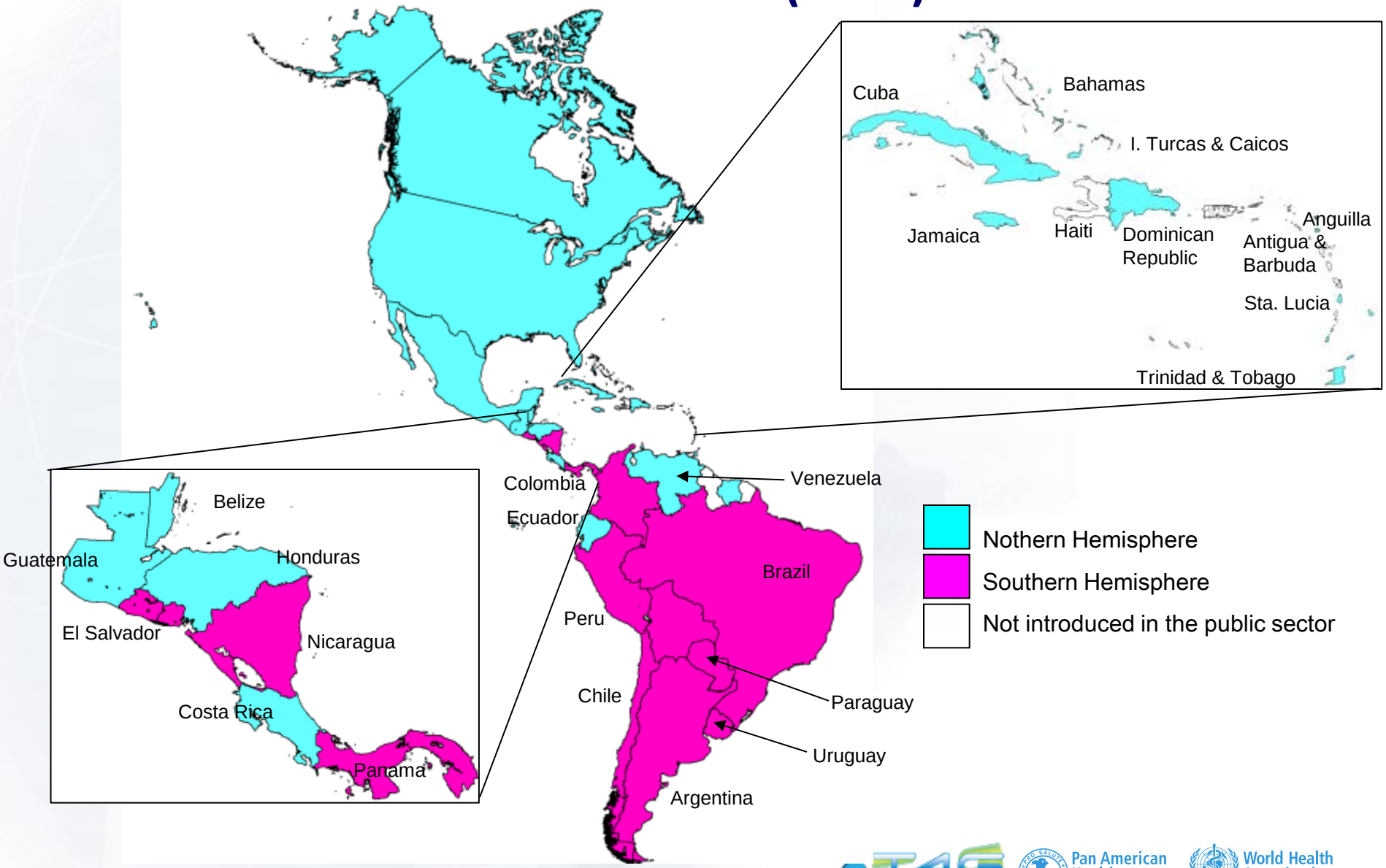
Note: Data was not collected from the French Departments (French Guiana, Guadeloupe, Martinique)

Countries and territories in the Americas with policies for seasonal influenza vaccination

Number of countries with:	2004	2008	2013
- Vaccination of healthy children	6	- 22	- 25
• Vaccination of only children with chronic diseases	---	- ---	- 5
- Vaccination of elderly	12	33	39
- Vaccination of persons with chronic diseases	9	24	37
- Vaccination of health workers	3	32	39
- Vaccination of pregnant women	3	7	26

Source: Country Reports to PAHO, MOH web pages, PAHO/WHO Surveys
Note: Data was not collected from the French Departments (French Guiana, Guadeloupe, Martinique)

Use of Seasonal Influenza vaccine and formulation in the Americas (2013)



Source: Country reports to PAHO, MOHs Webpage, PAHO/WHO Surveys

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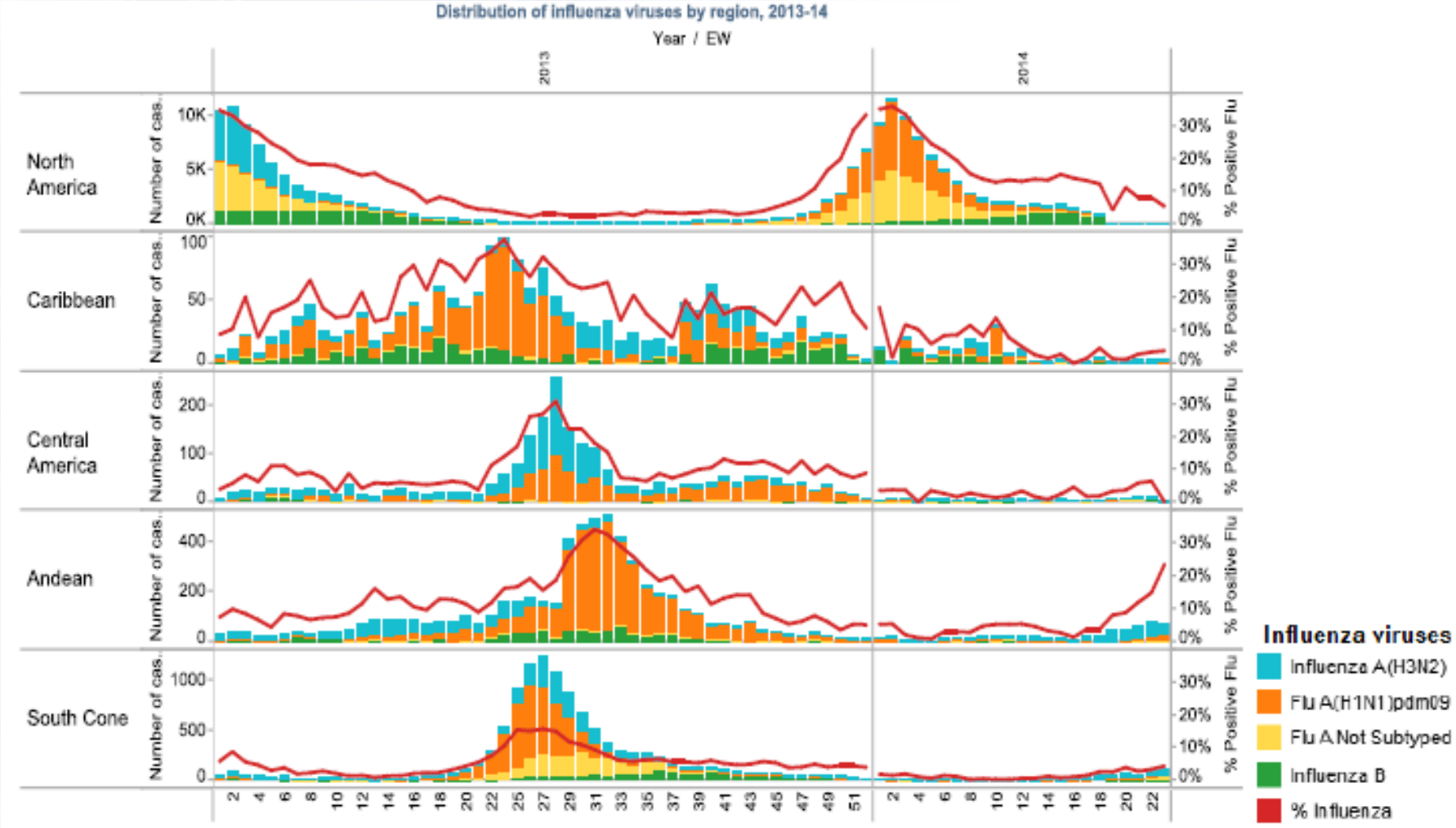
Influenza circulation by region. 2013-14



Regional Update EW 23, 2014
Influenza and other respiratory viruses
(June 17, 2014)

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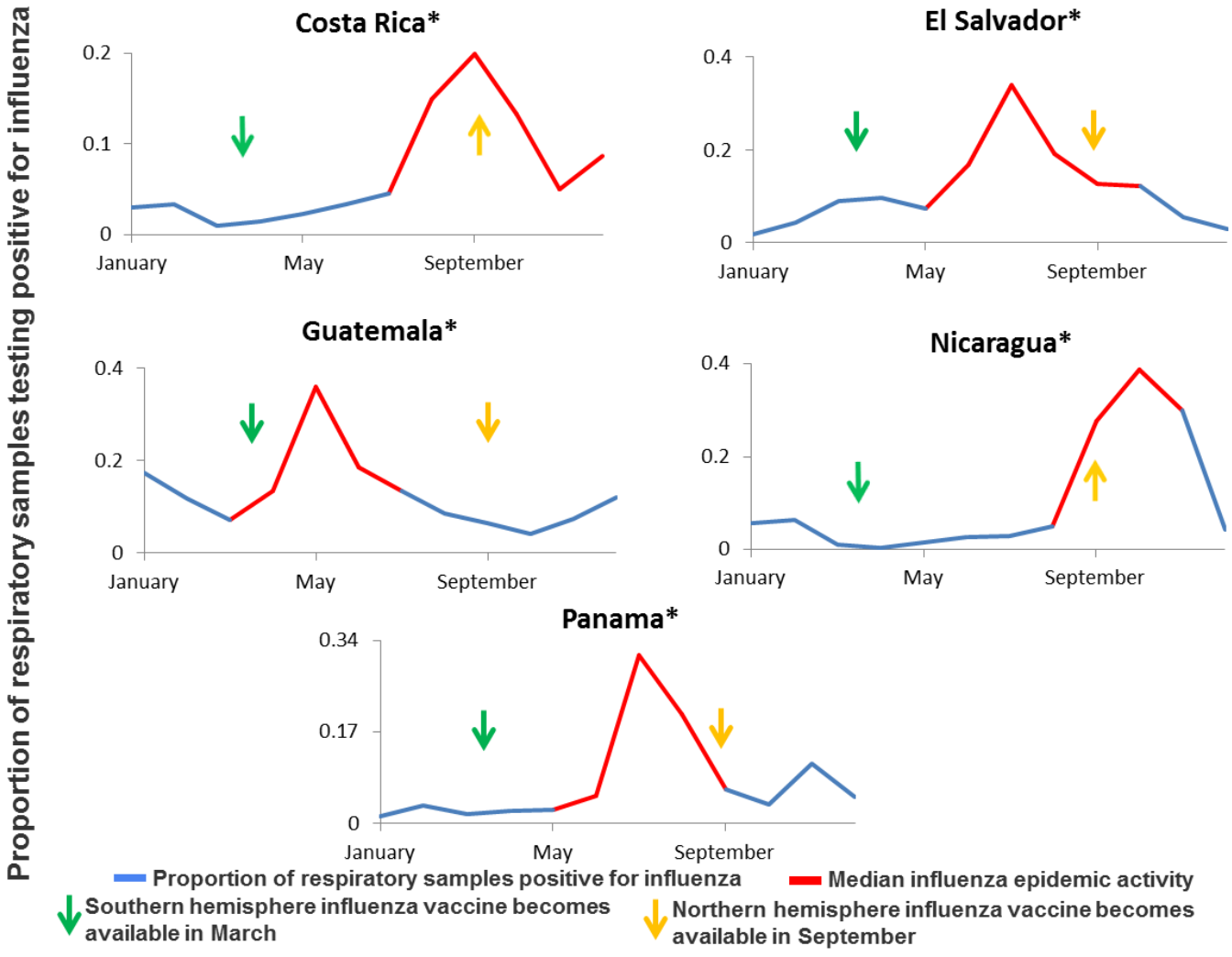
Influenza seasonality in Central America and vaccine availability



*Study years for each country: Costa Rica 2006-2008, 2011-2012; El Salvador 2011-2012; Nicaragua and Panama 2008, 2011-2012.

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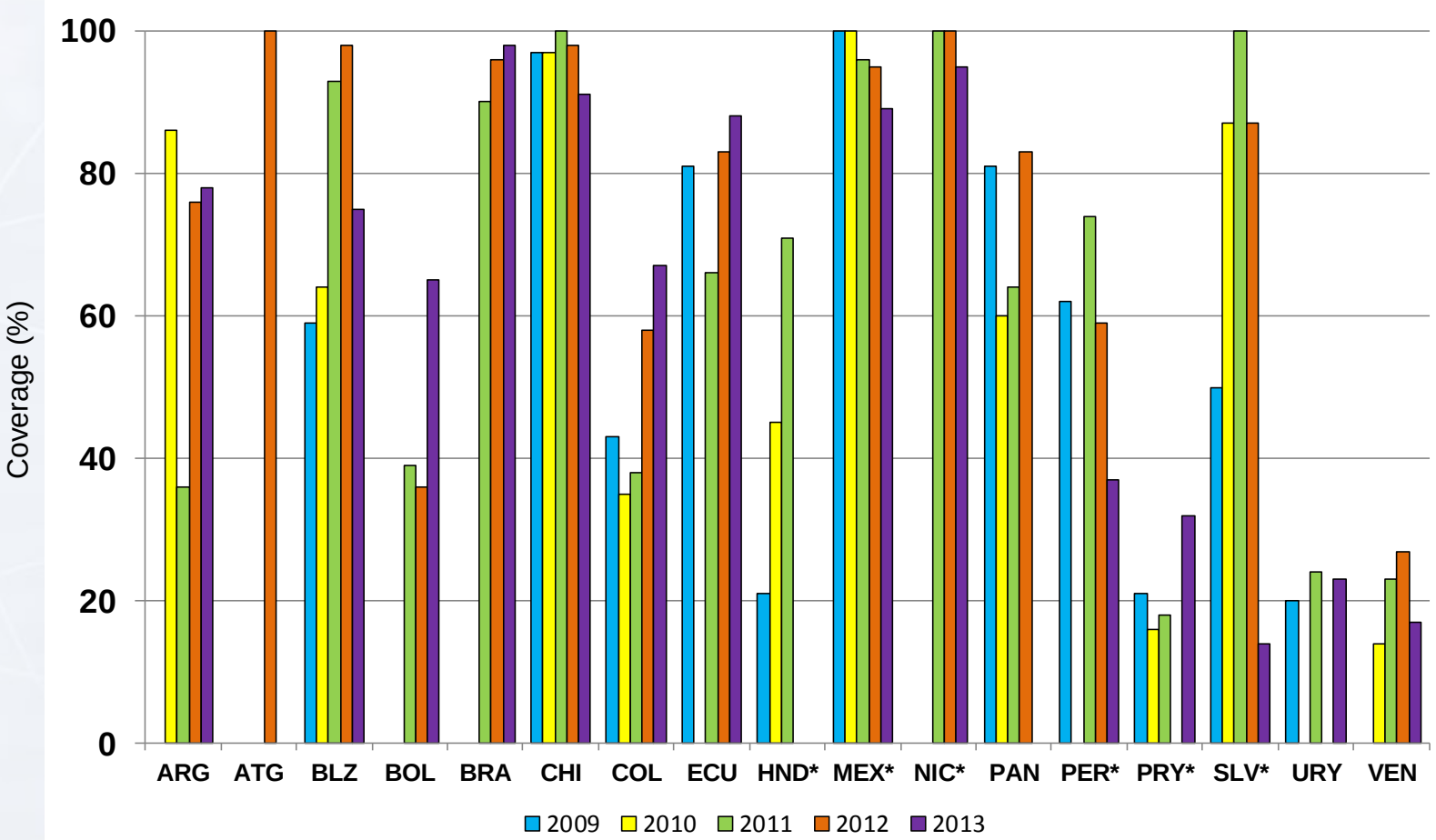
The predominant influenza strains circulating in Central America are frequently (81%) included in the Southern Hemisphere vaccine formulation *

	Number of years in which the predominant strain was included in hemisphere's vaccine		Years with data*
	Southern H.	Northern H.	
Costa Rica	7 (88%)	4 (50%)	8
El Salvador	4 (80%)	2 (40%)	5
Guatemala	5 (83%	4 (67%)	6
Honduras	4 (80%)	4 (80%)	5
Nicaragua	3 (75%)	2 (50%)	4
Panama	3 (75%)	2 (50%)	4
Total	**26 (81%)#**	**18 (56%)#**	**32**

*Years with data: Costa Rica 2005-2012; El Salvador 2005-2007, 2010-2011; Guatemala 2006-2011; Honduras 2005-2007, 2009-2010; Nicaragua 2007, 2010-2012; and Panama 2005, 2007, 2010, 2012.

#$\chi^2 = 4.66$, $p=0.03$

Seasonal influenza coverage in children 6-23 months of age* in reporting countries, LAC, 2009-2013



Source: Country reports to PAHO

* El Salvador in 2012, administered to children 6-59m; **Mexico administered to children 6m-59m;
Peru administered to children from 7m; Paraguay from 2008-2009 administered to children 6-23m and from 2010-2011 administered to children 6-35m;
In 2013, Honduras and Nicaragua administered only to children with chronic disease

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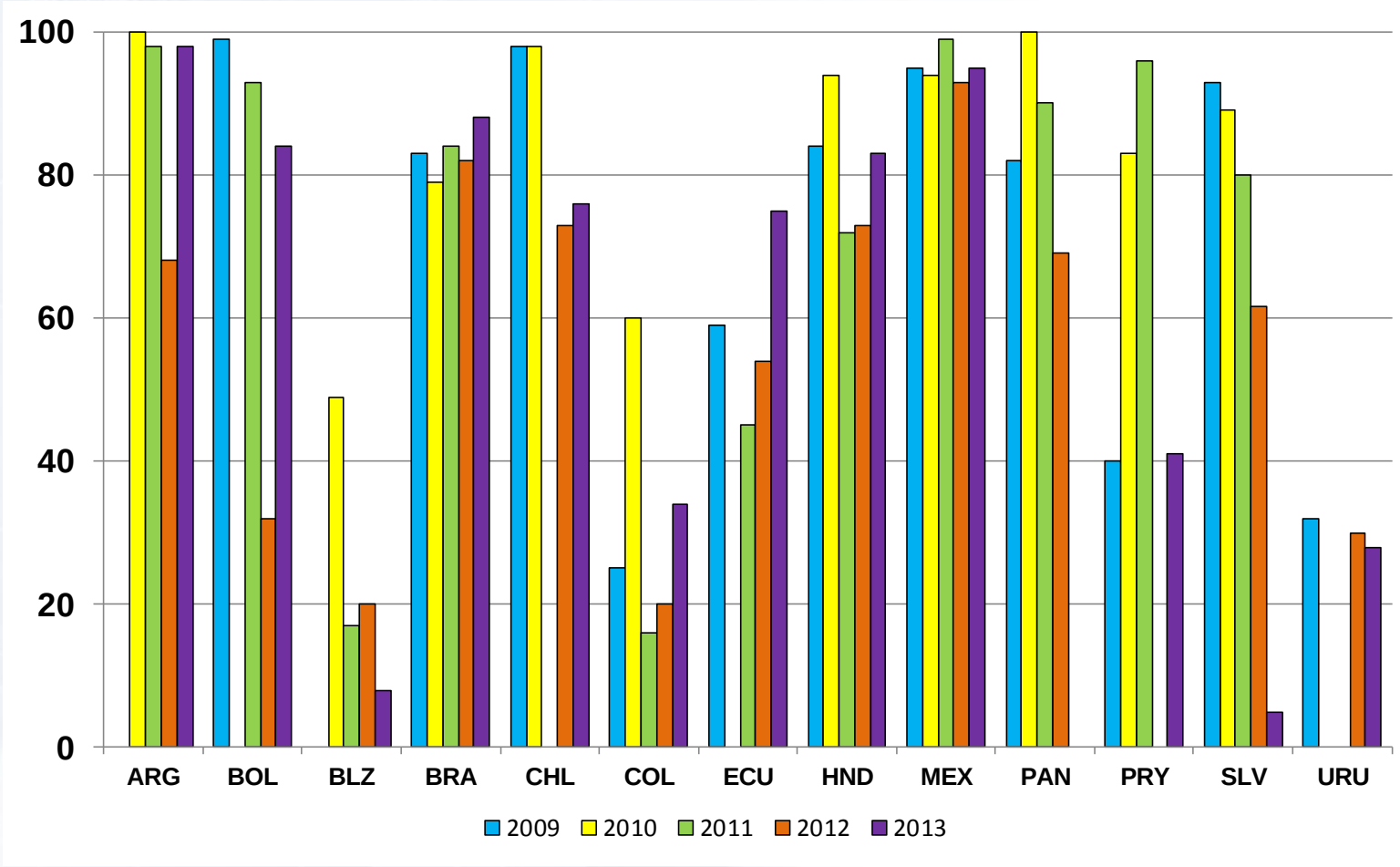
Seasonal influenza vaccination coverage among elderly in reporting countries, LAC, 2009-2013



Source: Country and territory reports to PAHO

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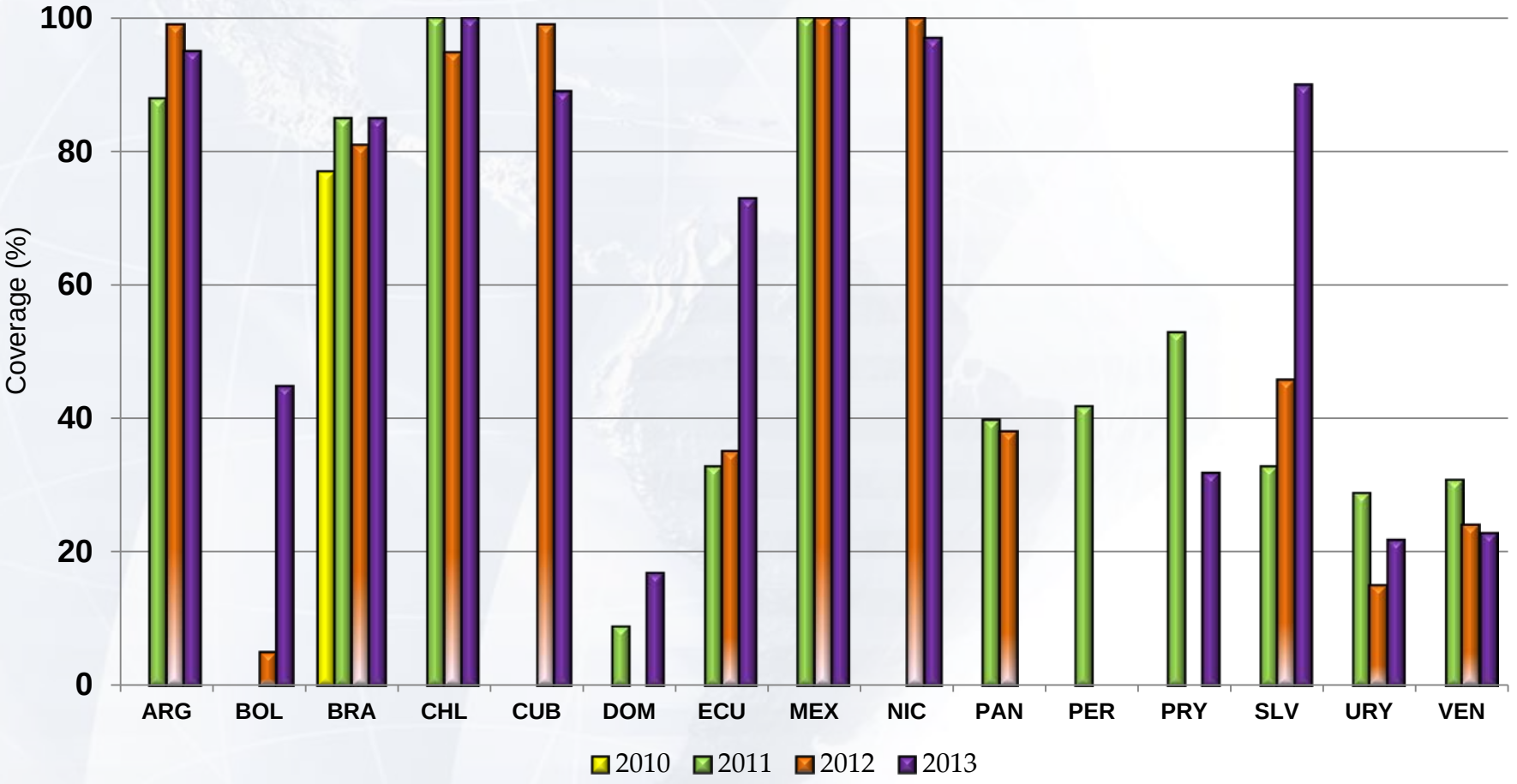
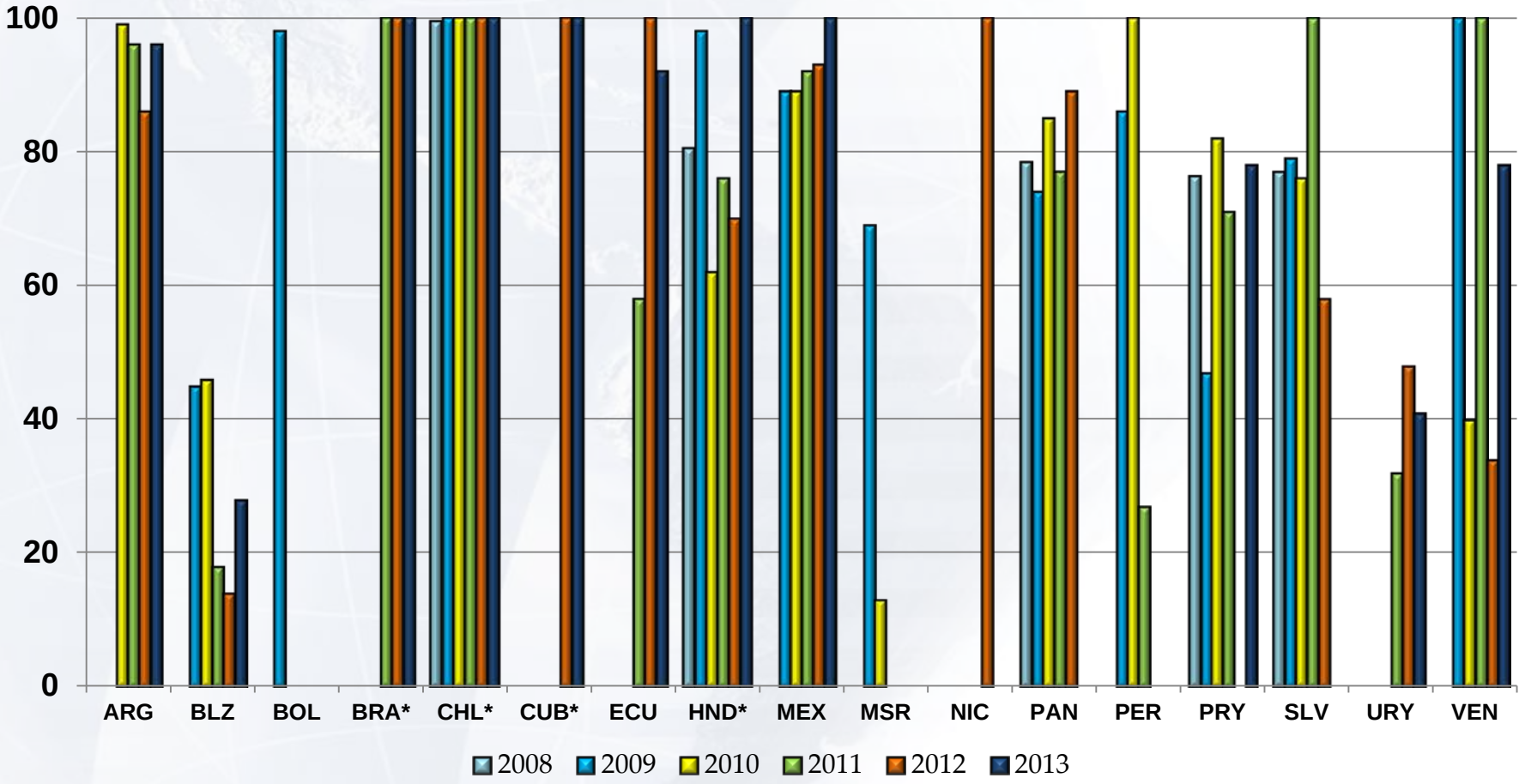
Seasonal influenza coverage in pregnant women in reporting countries, LAC, 2010-2013



Source: Country reports to PAHO

Seasonal influenza coverage in healthcare workers in selected reporting countries, LAC, 2008-2013*



Source: Country reports to PAHO
* 2013 data >100% coverage

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Background REVELAC-i

Justification

- Since 2004, the uptake of seasonal influenza vaccines in Latin America and the Caribbean has markedly increased. Nevertheless, few reports of vaccine effectiveness (VE) studies have been published from LAC to date.
- Influenza vaccines are reformulated every year, and VE varies between seasons depending on the vaccine match with circulating strains, in addition to factors such as age and health status of vaccine recipients, or the product used.
- Assessing VE systematically, especially against severe illness, can provide valuable information for Ministries of Health (ex. To implement complementary measures in seasons of low VE).

Multicenter evaluation of influenza vaccine effectiveness in Latin America* - REVELAC-i

2012 Pilot phase

Country	Target groups	
	Children	Elderly
Costa Rica	6 months – 10 years with chronic diseases	≥65 years
El Salvador	6–59 months	≥60 years
Honduras	6–35 months with chronic diseases	≥60 years
Panamá	6–59 months	≥60 years

CDC, Influenza Division
CDC-CAR, Influenza Program
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Protocol piloted in 18 sites

2013 Implementation

REVELAC-i

Red para evaluación de la efectividad de la vacuna en LAC - Influenza

Argentina
Brazil
Chile
Colombia
Costa Rica
Cuba
El Salvador
Honduras
México
Panamá
Paraguay
Uruguay
Nicaragua

*Case-control (test-negative design) based on hospital sentinel SARI surveillance

TAG 2014 · Pan American Health Organization · World Health Organization Americas

Multicenter evaluation of influenza vaccine effectiveness in Latin America* - REVELAC-i

Objectives:

- Estimate the effectiveness of influenza TIV in preventing severe acute respiratory infections (SARI) laboratory-confirmed for influenza among EPI target groups during influenza seasons.
- Also, to estimate VE per type/subtype of influenza virus (lineage where available), per Sub-region (Central-, South-America), and Country (sample size allowing).

Methods:

- Building upon the existing regional SARI surveillance platform.
- Using a common protocol, case-control (test-negative design).
- RT-PCR laboratory confirmation for influenza.
- Multidisciplinary efforts integrating influenza surveillance teams, refence laboratories and immunization programs.

Prerequisites for country participation in the REVELAC-i multicenter vaccine effectiveness evaluation

- A sustainable SARI sentinel surveillance system that reports quality data in a timely manner
- Strengthening of multidisciplinary work and data integration between influenza surveillance, EPI, and reference laboratories
- Adaptation of the national SARI case-report forms in order to complete vaccination history
- Availability of nominal vaccination registries or other vaccination records/documents

Study population

Country	Target group		N hosp
	Children	**Elderly**	**117**
Argentina	6–24 months	≥65 years	4
Brasil	6–23 months	≥60 years	29
Chile	6–23 months	≥65 years	6*
Colombia	6–23 months	≥60 years	7
Costa Rica	6 months–10 years **with chronic diseases**	≥65 years	6*
Cuba	6–23 months	≥65 years	TBD
El Salvador	6–59 months	≥60 years	4*
Ecuador	6–23 months	≥65 years	TBD
Honduras	6–35 months **with chronic diseases**	≥60 years	3*
México	6–59 months; 3–9 years **with chronic diseases**.	≥65 years	46
Panamá	6–59 months	≥60 years	10*
Paraguay	6–35 months	≥60 years	2

*All SARI surveillance sentinel sites included.

- Sentinel hospitals selected based on: surveillance quality, SARI patients volume among target groups, reporting of PCR results for influenza, representativeness, availability of vaccination records at local level etc.

REVELAC-i - Enrollment in 2013

influenza status	region		Total
	Central-A	South Ame	
control	92	1,276	1,368
	6.73	93.27	100.00
case	45	402	447
	10.07	89.93	100.00
Total	137	1,678	1,815
	7.55	92.45	100.00

Data received as of March. 28 2014

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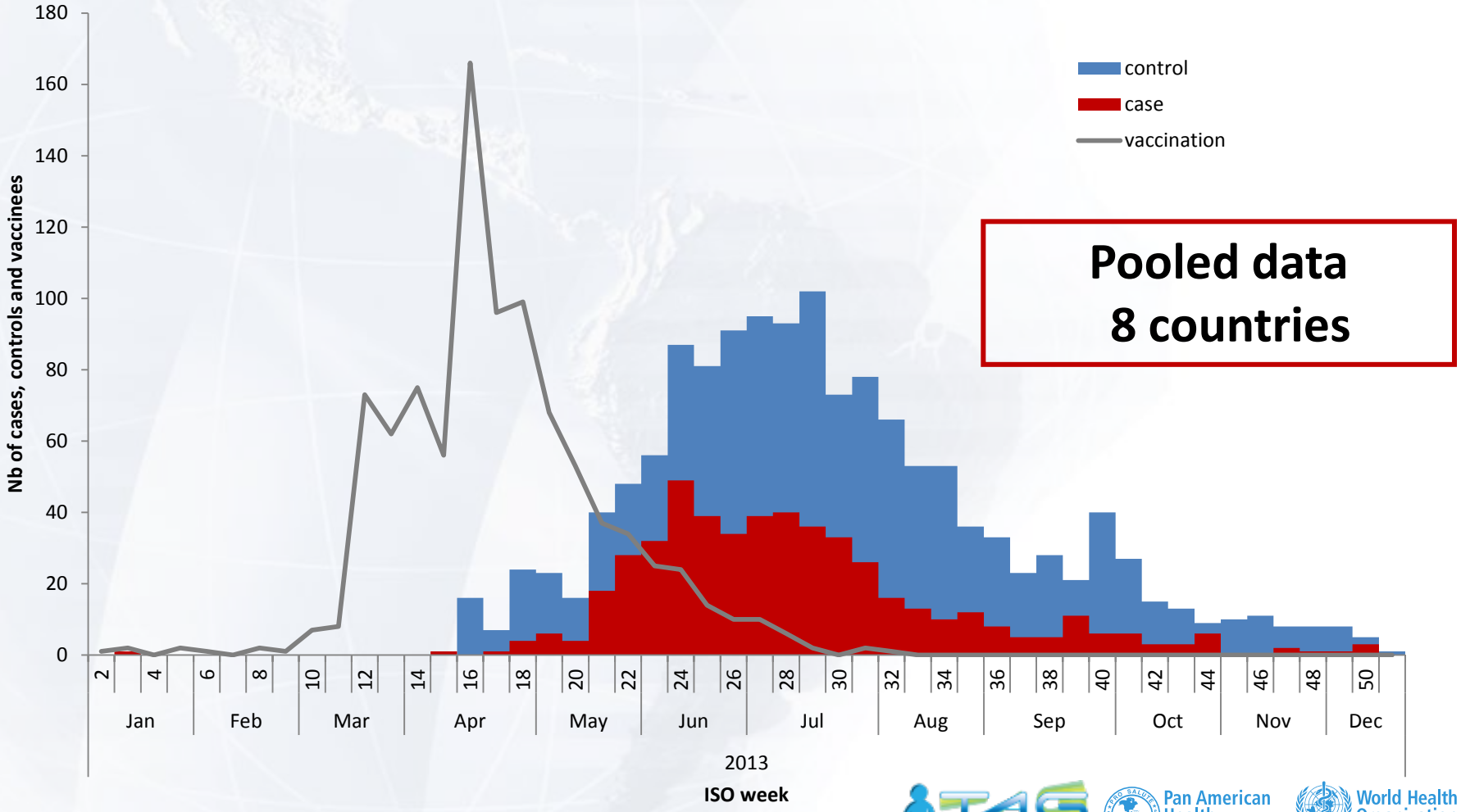
Distribution of cases and controls by month of initiation of symptoms, REVELAC-i 2013 (n=1,900)



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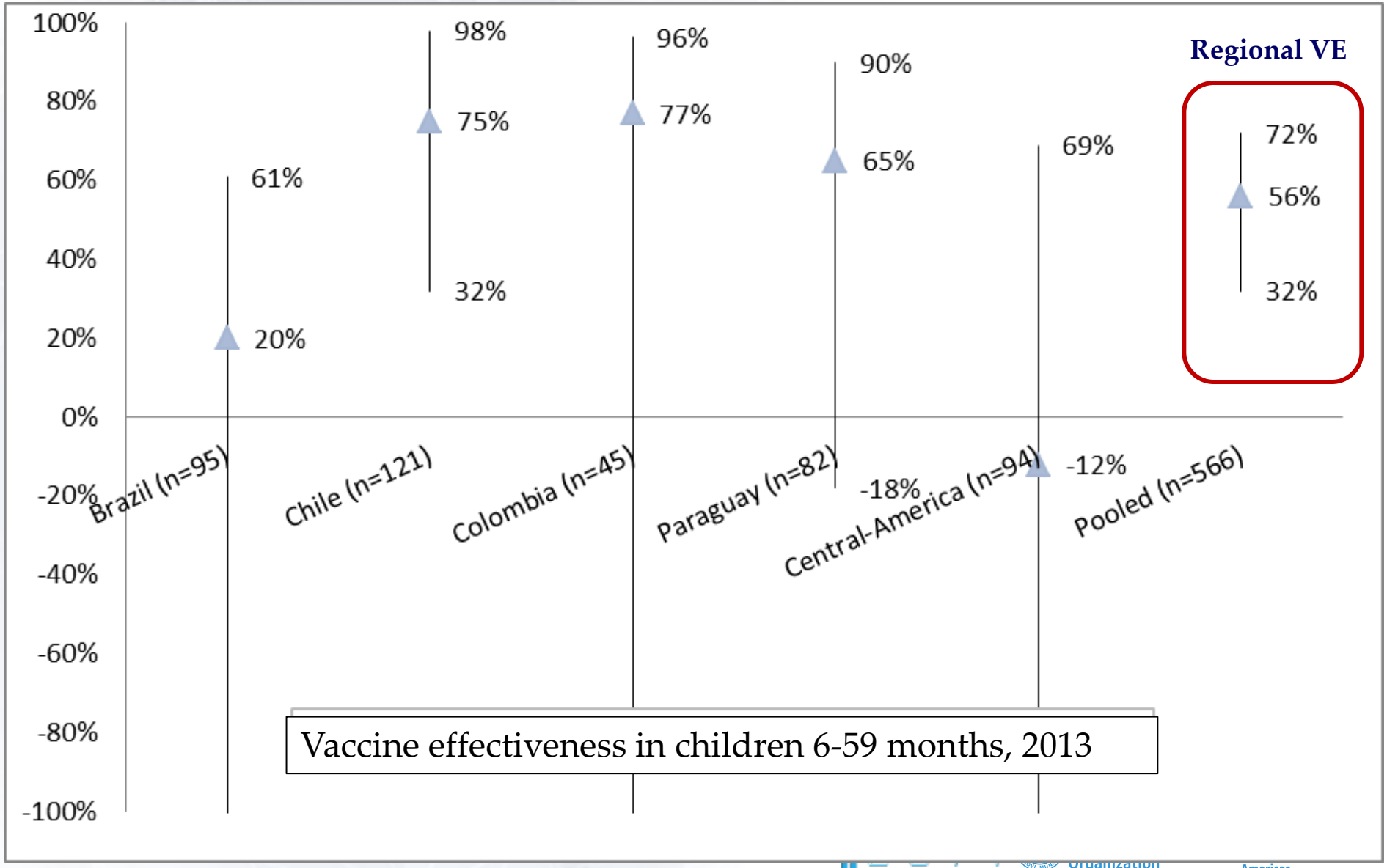
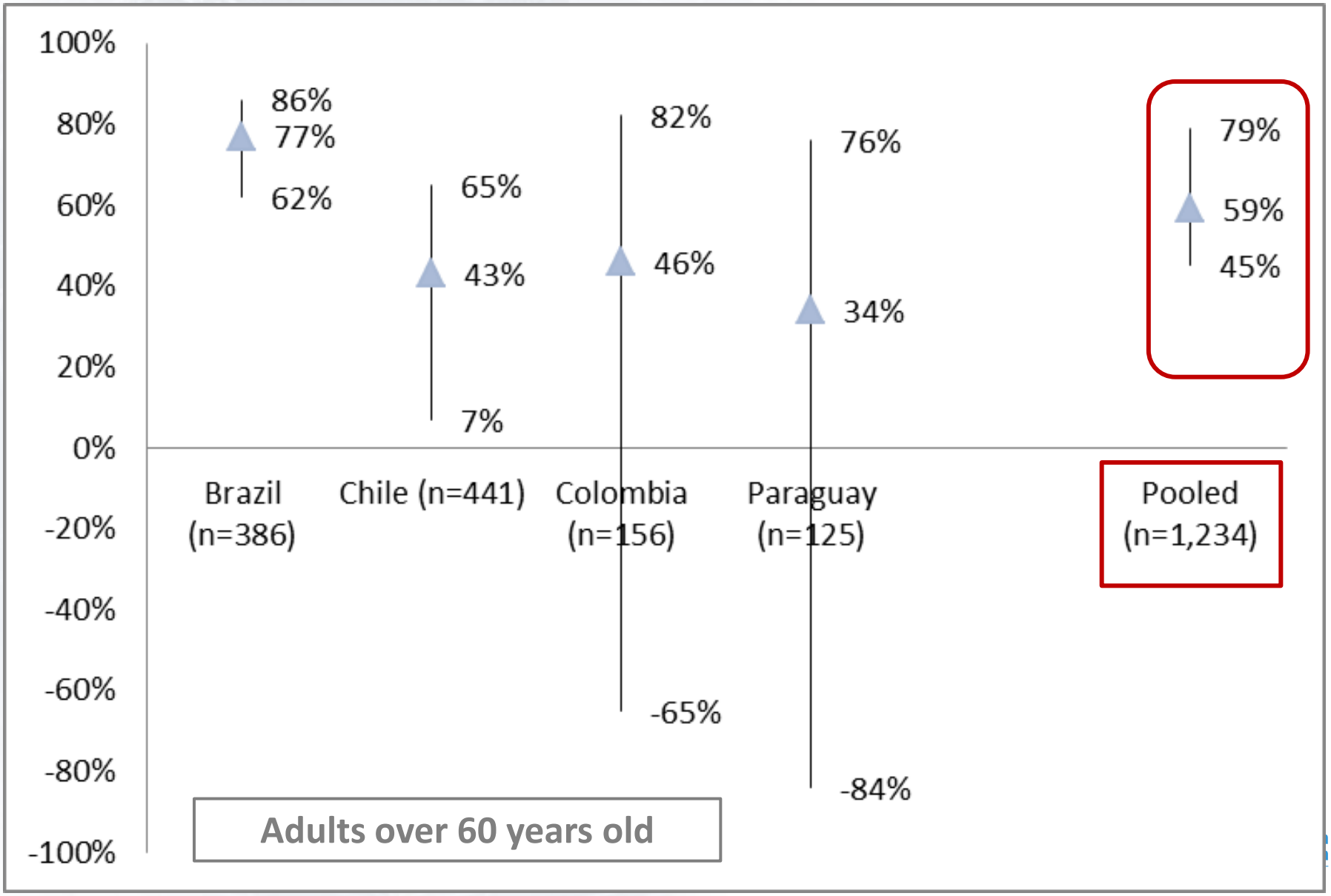
Regional vaccine effectiveness, REVELAC-i 2013



Regional vaccine effectiveness, REVELAC-i 2013



Lessons learned 2012-2013

- It is feasible to use the SARI surveillance platform to measure VE yearly through:
  - A common SARI surveillance protocol
  - Surveillance forms that include clinical, epidemiological, and laboratory variables for an estimation of VE
  - This is the most sustainable option for generation of annual evidence

Challenges:

- Vaccination data
  - Frequently missing on forms. Adoption of nominal registries will facilitate VE evaluations
  - New regional SARI protocol included updated forms.

- Sample size difficult to achieve (for estimations by target group, sub-region or by virus type/subtype/strain)

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Opportunities

- Translating the evidence on influenza VE for public health decision making
- Impact evaluation- CDC's model and others
- Maternal immunization outcomes (birth weight, small for gestational age, prematurity)
- Seasonality and vaccination in tropical countries
- KAP and other operational evaluations
- REVELAC-i contribution to global networks

Countries and networks reporting vaccine effectiveness annually

Study	Setting	Study population	Case definition	Vaccination status
REVELAC-i	Regional SARI sentinel network	Children and elderly	PAHO/CDC case definition, respiratory samples taken ≤10 days, RT-PCR results only.	Immunised: Receipt of 1 dose >14 days prior to SARI symptoms onset. In children vaccinated for the first time, only able to assess partial immunization i.e. receipt of 1 dose. Ascertainment: EPI nominal registers, vaccination cards, and medical records.
I-MOVE multicentre case control study (Ireland, Germany, Hungary, Portugal, Romania, Spain)	Primary care sentinel networks	All age groups. GPs select patients to swab in a systematic way	EU case definition for ILI (swab taken <8 days after symptom onset).	Immunised: Receipt of 1 dose >15 days prior to ILI symptom onset. Ascertainment: medical registry or self-reported.
US/Flu VE Network case-control study	United States (Michigan, Pennsylvania, Texas, Washington, Wisconsin) Outpatient clinics	All age group Systematic recruitment of patients seeking outpatient medical care for ARI with cough, Illness duration ≤ 7 days	**Cases:** Medically attended ARI and RT-PCR influenza **Controls:** Medically attended ARI but negative for influenza	Immunised: 1 dose ≥14 from illness onset (or 2 doses since 07/2010 for aged <9) Confirmed by medical record or registry
Canada	100s of community-based practitioners from British Columbia, Alberta, Manitoba, Ontario and Quebec.	Patients presenting to a sentinel site within 7 days of ILI onset defined as acute onset of fever and cough and one or more of sore throat, arthralgia, myalgia or prostration	Eligible participants whose specimen tests positive for influenza; controls test negative for all influenza types/subtypes	Reported vaccine receipt 2 weeks or more prior to ILI onset
New Zealand (SHIVERS Hospital)	2 hospitals in Auckland City	Population aged > 6m hospitalised with influenza or pneumonia	Case: Hospitalised with PCR (92%) or viral culture (8%) confirmed influenza. Noncase: Next hospitalised adult with ILI but negative test for influenza (1:1)	Ascertainment: Self-reported. Immunised: 1 dose ≥14 days prior before date of admissions
Spain	Spanish Influenza Surveillance System (SISS) (17 primary care sentinel networks)	All age groups. Systematic swabbing of all patients over 64 years and of the first two patients less than 65	EU case definition for ILI	Immunised: Receipt of 1 dose ≥15 days prior to ILI symptom onset Ascertainment: medical registry or self-reported

2nd Meeting of REVELAC-i, Colombia, 28 March 2014

Antigua

http://www.paho.org/revelac-i/

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