

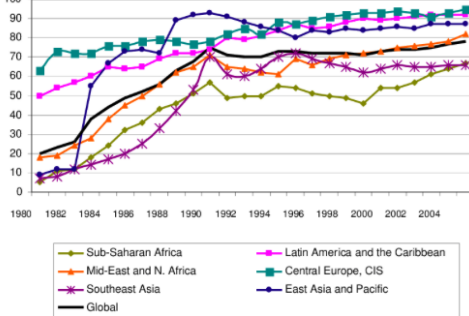
A synopsis of the vaccines and vaccinology scenario in Latin America

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Conflicts of interest

- None

Background



- In recent decades, Latin America and the Caribbean have achieved important goals in the control of diseases preventable by vaccination. About 174 000 deaths were prevented through vaccination of children under 5 years of age in 2006 – 2011 according PAHO estimates
- However, the region is diverse: while some regions have world-class vaccination schemes, others still have them rudimentary.

The search of evidence of vaccination

- Not simple because it depends not only on its benefits but also on its costs and the ability of governments to achieve good vaccination coverage and better conditions of purchase and delivery.
- Fortunately, there are good references, such as the Advisory Committee on Immunization Practices (ACIP) and the Commission for the Future of Vaccines in Latin America (COFVAL).

ACIP, birth to 15m, a good reference

Birth to 15 Months

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos
Hepatitis B¹ (HepB)	1 st dose	←2 nd dose→			←3 rd dose→			
Rotavirus² (RV) RV1 (2-dose series); RV5 (3-dose series)			1 st dose	2 nd dose	See footnote 2			
Diphtheria, tetanus, & acellular pertussis³ (DTaP: <7 yrs)			1 st dose	2 nd dose	3 rd dose			←4 th dose→
Haemophilus influenzae type b⁴ (Hib)			1 st dose	2 nd dose	See footnote 4		←3 rd or 4 th dose, See footnote 4 →	
Pneumococcal conjugate⁵ (PCV13)			1 st dose	2 nd dose	3 rd dose		←4 th dose→	
Inactivated poliovirus⁶ (IPV:<18 yrs)			1 st dose	2 nd dose	←3 rd dose→			
Influenza⁷ (IIV)					Annual vaccination (IIV) 1 or 2 doses			
Measles, mumps, rubella⁸ (MMR)					See footnote 8		←1 st dose→	
Varicella⁹ (VAR)							←1 st dose→	
Hepatitis A¹⁰ (HepA)							←2 dose series, See footnote 10 →	
Meningococcal¹¹ MenACWY-D ≥9 mos; MenACWY-CRM ≥2 mos)			See footnote 11					

ACIP, 18m-18y

18 Months to 18 Years

Vaccines	18 mos	19-23 mos	2-3 yrs	4-6 yrs	7-10 yrs	11-12 yrs	13-15 yrs	16 yrs	17-18 yrs
Hepatitis B¹ (HepB)	←3 rd dose→								
Rotavirus² (RV) RV1 (2-dose series); RV5 (3-dose series)									
Diphtheria, tetanus, & acellular pertussis³ (DTaP: <7 yrs)	←4 th dose→			5 th dose					
Haemophilus influenzae type b⁴ (Hib)									
Pneumococcal conjugate⁵ (PCV13)									
Inactivated poliovirus⁶ (IPV:<18 yrs)	←3 rd dose→			4 th dose					
Influenza⁷ (IIV)	Annual vaccination (IIV) 1 or 2 doses				Annual vaccination (IIV) 1 dose only				
Measles, mumps, rubella⁸ (MMR)				2 nd dose					
Varicella⁹ (VAR)				2 nd dose					
Hepatitis A¹⁰ (HepA)	←2 dose series, See footnote 10→								
Meningococcal¹¹ MenACWY-D ≥9 mos; MenACWY-CRM ≥2 mos)	See footnote 11					1 st dose		2 nd dose	
Tetanus, diphtheria, & acellular pertussis¹³ (Tdap: ≥7 yrs)						Tdap			
Human papillomavirus¹⁴ (HPV)						See footnote 14			

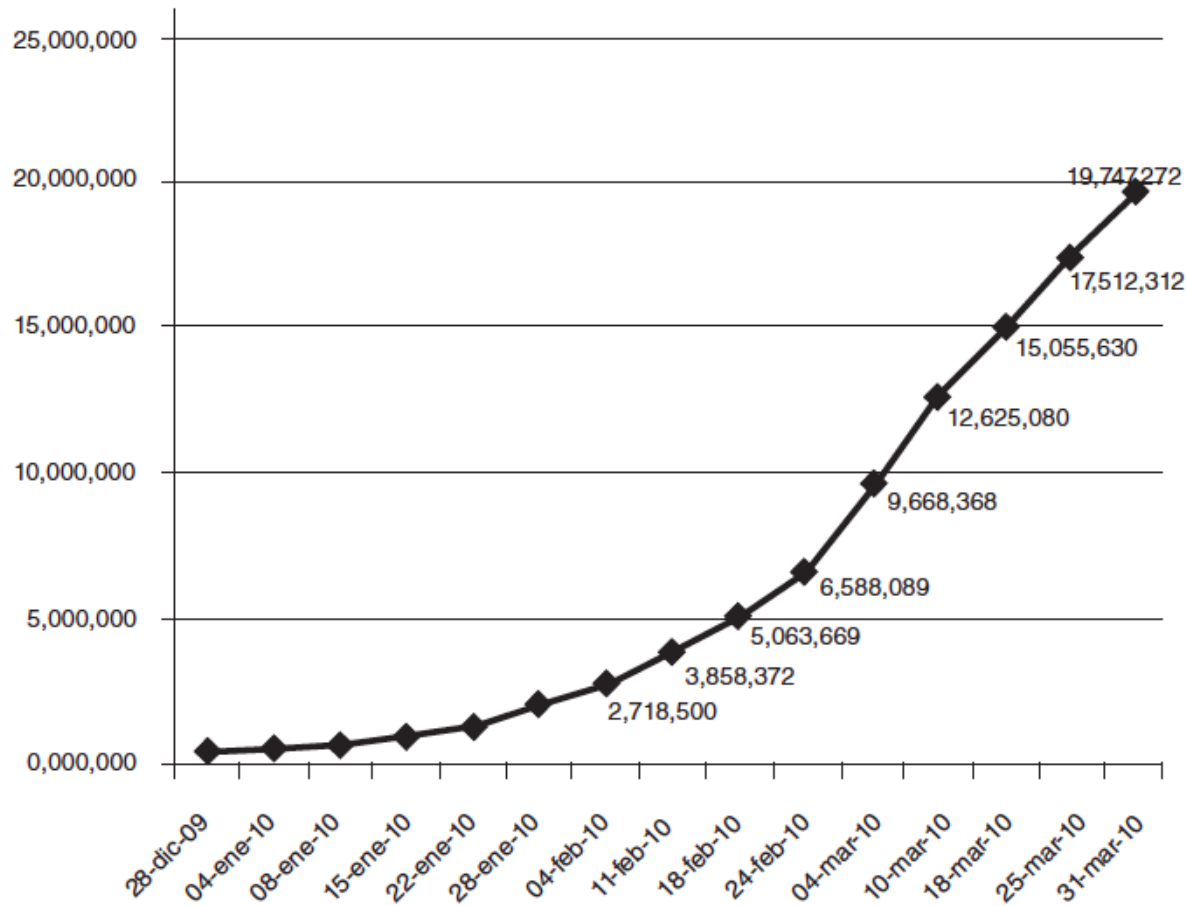
ACIP, adults

Vaccine	19-21 years	22-26 years	27-49 years	50-64 years	≥65 years
Influenza ¹	1 dose annually				
Tdap ² or Td ²	1 dose Tdap, then Td booster every 10 yrs				
MMR ³	1 or 2 doses depending on indication (if born in 1957 or later)				
VAR ⁴	2 doses				
RZV ⁵ (preferred)				2 doses RZV (preferred)	
or ZVL ⁵					or 1 dose ZVL
HPV-Female ⁶	2 or 3 doses depending on age at series initiation				
HPV-Male ⁶	2 or 3 doses depending on age at series initiation				
PCV13 ⁷					1 dose
PPSV23 ⁷	1 or 2 doses depending on indication				1 dose
HepA ⁸	2 or 3 doses depending on vaccine				
HepB ⁹	3 doses				
MenACWY ¹⁰	1 or 2 doses depending on indication, then booster every 5 yrs if risk remains				
MenB ¹⁰	2 or 3 doses depending on vaccine				
Hib ¹¹	1 or 3 doses depending on indication				

An advantage: the combined human/material resources in Latin America

- Although more training is required, many countries have good human resources in public, private, and non-governmental organizations (such as PAHO, SLIPE, or COFVAL).
- Material resources are often scarce but complemented with human resources, have made of Latin America an international leader of negotiation and action.

Another advantage: Latin America's people is receptive to vaccines

















































Still another advantage: The PAHO revolving fund for vaccine procurement

- RVFP: Established the working capital for the PAHO Re-volving Fund operations. 1978
- A transparent mechanism facilitating pooled vaccine procurement on principles of Pan-American solidarity, equitable access to high quality vaccines.
- (Under Dr. Ciro de Quadros, the PAHO EPI became the flagship of the Organization).

The PAHO re-volving fund for vaccine procurement (RFVP), 1978

- A cooperation mechanism for the joint procurement of vaccines, syringes and other supplies for the participating members
- All the members access to the same high-quality products offered through the RFVP at the lowest price regardless the country size or economy
- 41 countries and territories.

RFVP, some achievements

 Anguilla	 Antigua and Barbuda
 Argentina	 Aruba
 Bahamas	 Barbados
 Belize	 Bermuda
 Bolivarian Republic of Venezuela	 Bolivia
 Brazil	 British Virgin Islands
 Canada	 Cayman Islands
 Chile	 Colombia
 Costa Rica	 Cuba
 Curaçao	 Dominica
 Dominican Republic	 Ecuador
 El Salvador	 French Guiana
 Grenada	 Guadeloupe
 Guatemala	 Guyana
 Haiti	 Honduras
 Jamaica	 Martinique
 Mexico	 Montserrat
 Netherland Antilles	 Nicaragua
 Panama	 Paraguay
 Peru	 Puerto Rico
 Saint Kitts and Nevis	 Saint Lucia
 Saint Martin	 Saint Vincent and the Grenadines
 Suriname	 Trinidad and Tobago

46 vaccines



29 syringes and cold chain products



31 providers



41 countries and territories in Latin America and the Caribbean



Vaccination coverage in the Americas

93%

for diphtheria-tetanus-pertussis

Over 95% of vaccine costs covered with national funds

15 million

people vaccinated through the fund in 2013

Working capital of more than 120 million 60-day credit line to countries

RFVP prices, 2018



Revolving Fund Brochure



Revolving Fund Operating Procedures

Vaccine Prices 2018

Syringe Prices 2018-2019

Immunoglobulin Prices 2018

Safety Boxes Prices 2018-2019

  EXPANDED PROGRAM OF IMMUNIZATION VACCINE PRICES FOR YEAR 2018		
VACCINE	PRESENTATION (Doses)	WEIGHTED AVERAGE PRICE PER DOSE
BCG	10	\$0.2073
Cholera	1	\$1.8500
DPT	10	\$0.1685
DPT Hb Lyophilized	1	\$2.6500
DPT Hep B Hb (Pentavalent) Liquid	1	\$1.0830
DT (Adult)	10	\$0.0935
DT (Pediatric)	10	\$0.1670
DTaP Triple Acellular Adolescent/Adult	1	\$11.4663
DTaP Triple Acellular Pediatric	1	\$15.0000
DTaP-IPV (Tetravalent Acellular)	1	\$11.5000
DTaP-IPV-Hb (Pentavalent Acellular) Prefilled Syringe	1	\$14.2000
DTaP-IPV-Hep B-Hb (Hexavalent Acellular)	1	\$20.6000
Hepatitis "A" Adult	1	\$13.2000
Hepatitis "A" Pediatric	1	\$8.1150
Hepatitis B Recombinant Adult	1	\$0.3264
Hepatitis B Recombinant Adult	10	\$0.1815
Hepatitis B Recombinant Pediatric	1	\$0.2165
Hb Lyophilized	1	\$2.0500
Meningococcal ACYW135	1	\$20.3000
Human Papiloma Virus (HPV) Bivalent	1	\$8.5000
Human Papiloma Virus (HPV) Quadrivalent	1	\$9.5800
Inactivated Polio (IPV)	1	\$5.3000
Inactivated Polio (IPV)	5	\$2.0000
Seasonal Influenza Trivalent Southern Hemisphere 2018 - Adult - Korea Origin	1	\$4.2400
Seasonal Influenza Trivalent Southern Hemisphere 2018 - Adult - France Origin	1	\$3.5000
Seasonal Influenza Trivalent Southern Hemisphere 2018 - Adult - Korea Origin	10	\$2.1500
Seasonal Influenza Trivalent Southern Hemisphere 2018 - Adult - France Origin	10	\$2.6500
Seasonal Influenza Trivalent Southern Hemisphere 2018 - Pediatric - Korea Origin	20	\$1.0750
Seasonal Influenza Trivalent Southern Hemisphere 2018 - Pediatric - France Origin	20	\$1.3250
Seasonal Influenza Quadrivalent Southern Hemisphere 2018 - Adult	1	\$6.0000
Seasonal Influenza Quadrivalent Southern Hemisphere 2018 - Pediatric	20	\$2.5700
Measles-Rubella	1	\$2.2500
Measles-Rubella	10	\$0.6160
Measles/Mumps(Jeryl-Lynn)/Rubella	1	\$5.5900
Measles/Mumps(Zagreb)/Rubella	1	\$2.7500
Measles/Mumps(Zagreb)/Rubella	5	\$1.4300
Oral Polio Bivalent (bOPV)	10	\$0.1700
Oral Polio Bivalent (bOPV)	20	\$0.1292
Pneumococcal Conjugated Pediatric - 10 Valent (PCV-10)	1	\$12.8500
Pneumococcal Conjugated Pediatric - 13 Valent (PCV-13)	1	\$14.5000
Pneumococcal Unconjugated Adult - 23 valent	1	\$7.9800
Rabies Canine - France Origin	10	\$0.2950
Rabies Canine - Uruguay Origin	10	\$0.2750
Rabies Canine - Argentina Origin	20 or 25	\$0.2500
Rabies Vaccine Human Use / Vero Cells	1	\$12.8000
Rotavirus Liquid (2 dose immunization scheme)	1	\$6.5000
Typhoid Polysaccharide	20	\$9.0000
Varicella	1	\$14.4590
Yellow Fever	5	\$1.2800
Yellow Fever	10	\$1.4300

The expanded program of immunization, WHO 1974, PAHO 1977

- Vaccines are among the health actions that yield better dividends for public health and social justice. Any economical analysis has sustained such a claim
- Countries should work to grow their schemes continuously until achieving the desired Expanded Program of Immunization.

WHO: EPI for children, 1974 (by 1990)

- Diphtheria
- Whooping cough
- Tetanus
- Measles
- Poliomyelitis
- Tuberculosis.

EPI in the Americas: A success story

- Immunization coverage increased from 50 % in the 1970s to over 80 % by 1992.
- In 1994, became the first of the WHO regions to eliminate poliomyelitis.
- In 2015 and 2016, declared free of measles, rubella, and congenital rubella syndrome
- In 2017, declared free of neonatal tetanus.
- The introduction vaccines against pneumococcus, rotavirus, influenza, and HPV has been accelerated using evidence as the basis for decision-making.

WHO: EPI for children, from 2010 (some additions)

- Hepatitis B
- Haemophilus influenzae type b
- Pneumococcal conjugate vaccine
- Rotavirus
- Human papillomavirus
- The programs aims to expand the targeted groups to include older children, adolescents and adults.

Vaccination program Argentina, 2018

Calendario de vacunas 2018

Personal de Salud: Antigripal (dosis anual), Triple Viral (iniciar o completar esquema), dTpa (personal de salud que asista a menores de 12 meses)

Embarazo	Posparto Posaborto	Recién Nacido	2 meses	3 meses	4 meses	5 meses	6 meses	12 meses	15 -18 meses	Ingreso escolar 5 - 6 años	11 años	Adultos	65 años o más
Lactancia Materna (Primera vacuna)													
Triple bacteriana acelular (*)	(1) Doble viral o Triple Viral	(2) BCG (única dosis)	Quíntuple o Pentavalente (1ª dosis)		Quíntuple o Pentavalente (2ª dosis)		Quíntuple o Pentavalente (3ª dosis)	Hepatitis A (única dosis)	Quíntuple o Cuádruple (Refuerzo)	Anti poliomielítica (2ª Refuerzo)	Triple bacteriana acelular	(5) Doble bacteriana (Refuerzo cada 10 años)	
Antigripal (dosis anual)	Antigripal (*)	Hepatitis B (en las primeras 12 hs. de vida)	Anti poliomielítica (1ª dosis)	Meningococcica (1ª dosis)	Anti poliomielítica (2ª dosis)	Meningococcica (2ª dosis)	Anti poliomielítica (3ª dosis)	Triple viral (1ª dosis)	Anti poliomielítica (1ª Refuerzo)	Triple bacteriana (2ª Refuerzo)	Virus del Papiloma Humano (2 dosis)	(6) Hepatitis B (iniciar o completar esquema)	Antigripal (dosis anual)
Hepatitis B (iniciar o completar esquema)			Rotavirus (****) 1ª dosis		Rotavirus (****) 2ª dosis		Antigripal (de 6 meses a 2 años)	Anti-neumococcica 13v (Refuerzo)	Varicela (Única Dosis) 15 meses	Triple viral (2ª dosis)	Meningococcica (Única dosis)	(3) Hepatitis B (iniciar o completar esquema)	Anti-neumococcica
			Anti-neumococcica 13v		Anti-neumococcica 13v				Meningococcica (Refuerzo) 15 meses		(4) Triple viral (iniciar o completar esquema)	Doble viral o Triple viral (iniciar o completar esquema)	

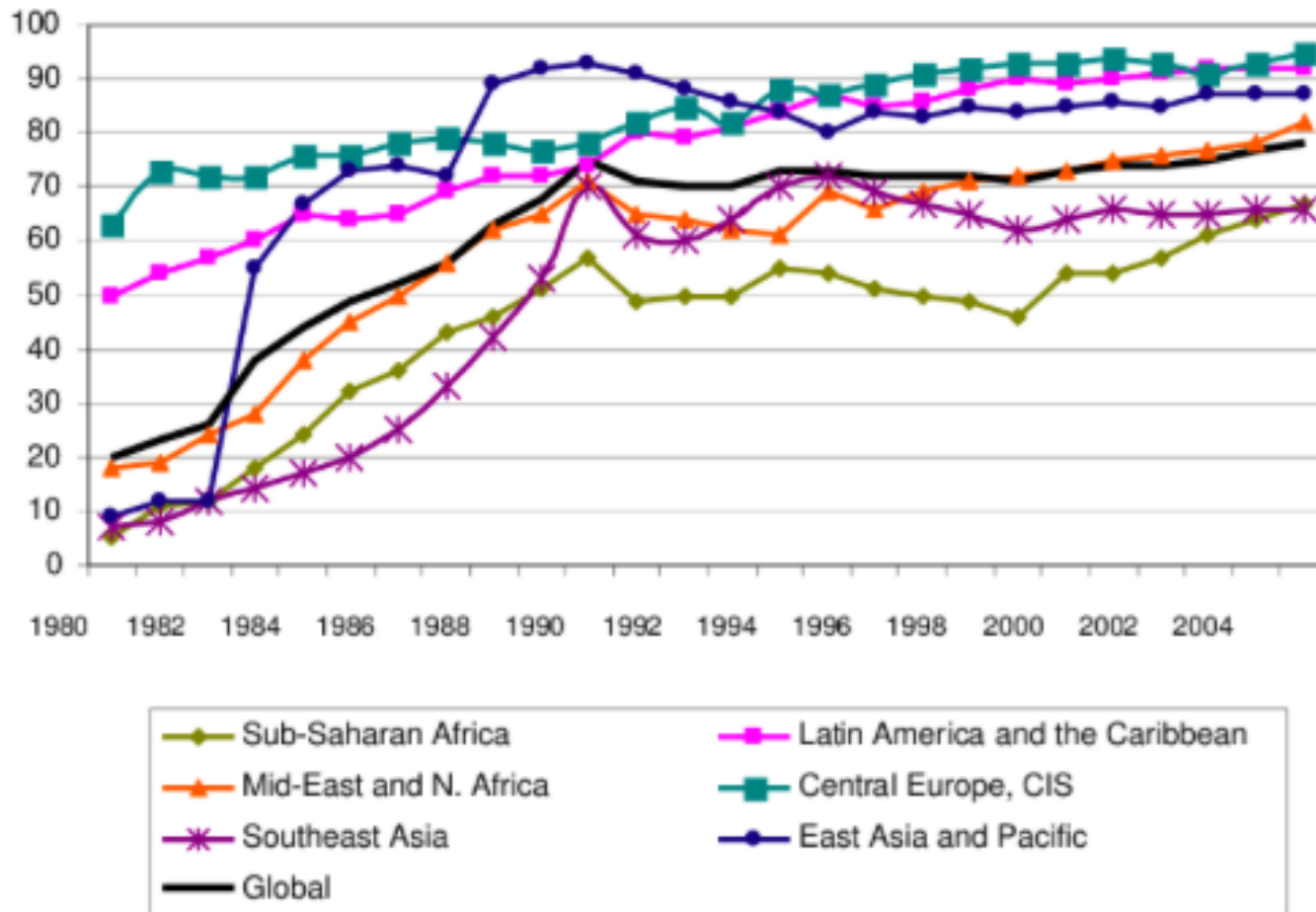
Vaccination program, México, 2018

Esquema Nacional de Vacunación				
Nacimiento	BCG	Hepatitis B		
2 meses	Pentavalente acelular	Hepatitis B	Rotavirus	Neumococo conjugada
4 meses	Pentavalente acelular		Rotavirus	Neumococo conjugada
6 meses	Pentavalente acelular	Hepatitis B	Rotavirus	Influenza
7 meses	Influenza segunda dosis			
12 meses	SRP			Neumococo conjugada
18 meses	Pentavalente acelular			
24 meses (2 años)	Influenza refuerzo anual			
36 meses (3 años)	Influenza refuerzo anual			
48 meses (4 años)	DPT (refuerzo)			Influenza refuerzo anual
59 meses (5 años)	Refuerzo anual influenza (octubre-enero)			
	OPV (pollo oral) de los 6 a los 59 meses en 1ª y 2ª Semanas Nacionales de Salud*			
72 meses (6 años)	SRP (refuerzo)			
11 años o quinto grado de primaria	VPH (Virus de Papiloma Humano)			

Vaccination program, El Salvador 2018

ESQUEMA NACIONAL DE VACUNACIÓN, EL SALVADOR 2018							
RECIENTE NACIDO	2, 4 Y 6 MESES	12 MESES	15 A 18 MESES	4 AÑOS	ADOLESCENTES, ADULTOS Y ADULTOS MAYORES	MUJERES EMBARAZADAS	GRUPOS EN RIESGO Y PERSONAS CON ENFERMEDADES CRÓNICAS
							
BCG Previene formas graves de tuberculosis	PENTAVALENTE Incluye: Difteria, Toserina y Tétanos, Haemophilus influenzae tipo B, Hepatitis B	TRIPLE VIRAL TIPO SPR Sarampión, Paperas, Rubéola	PENTAVALENTE Incluye: Difteria, Toserina y Tétanos, Haemophilus influenzae tipo B, Hepatitis B	DPT Difteria, Toserina, Tétanos	Td Tétanos y Difteria Toda persona debe recibir 1 dosis cada 10 años a partir de los 10 años de edad	Td Tétanos y Difteria Toda mujer embarazada con esquema completo de vacunación hasta los 4 años de edad, aplicar 1 dosis de Td a partir de la 16ª semana de gestación	Td Tétanos y Difteria
HB Hepatitis B al nacimiento	POLIOMIELITIS 2 y 4 meses: IPV 6 meses: OPV	NEUMOCOCO CONJUGADO Meningitis, Neumonía y Otitis media	POLIO ORAL Poliomielitis	POLIO ORAL Poliomielitis	NEUMOCOCO Todo adulto mayor de 60 años debe recibir 1 dosis de neumococo	Tdpa Tétanos, Difteria, Toserina acetular. Aplicar 1 dosis a partir de los 36 semanas de gestación	HB Hepatitis B SR Sarampión y Rubéola
	ROTAVIRUS NEUMOCOCO CONJUGADO Meningitis, Neumonía y Otitis media			TRIPLE VIRAL TIPO SPR Sarampión, Paperas, Rubéola		INFLUENZA HEMISFERIO SUR Niños de 6 meses a 59 meses, adultos mayores de 60 años y personal de salud	INFLUENZA HEMISFERIO SUR En su primer control del embarazo no importando la edad gestacional
CAPI Comité Asesor de Prácticas de Inmunizaciones	Comite Nacional de Certificación de erradicación de la Poliomielitis					NEUMOCOCO a personas mayores de 2 años con lactancia de riesgo y adultos mayores de 60 años	

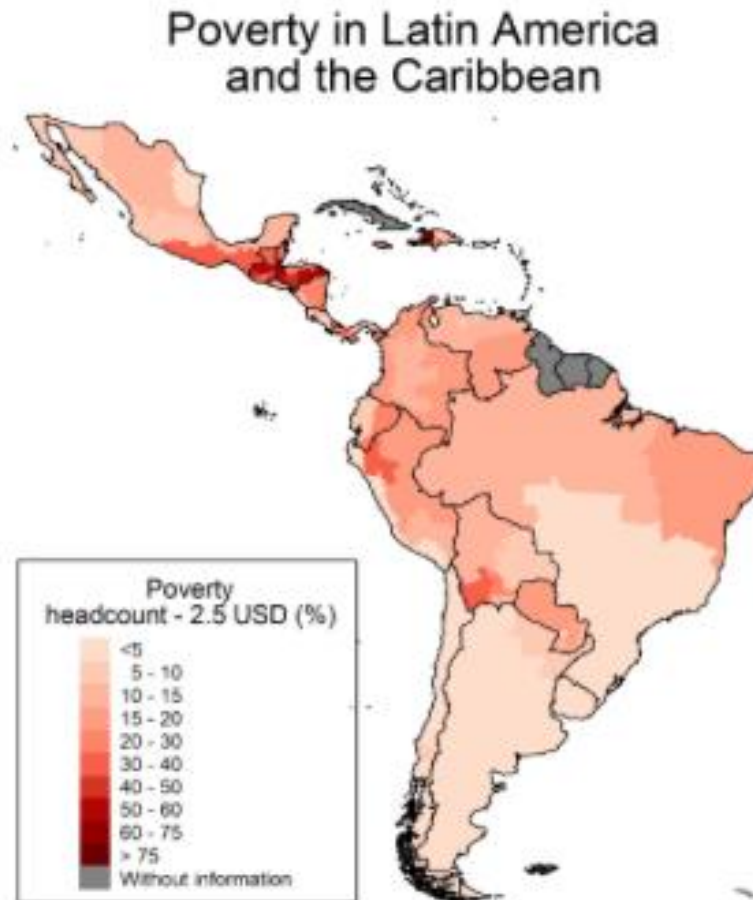
Latin America and the Caribbean, among the best in vaccination



Diseases preventable by vaccination: Things to be improved in Latin America

- Indicators for the epidemiological surveillance DPV
- Indicators to measure the burden of DPV
- Knowledge of the coverage and effectiveness of the programs
- Local and regional research, development and production of vaccines
- Knowledge of the human and material resources required for the programs.

Latin America is a very diverse region



Source: SEDLAC (CEDLAS and The World Bank)

Inequalities in coverage...

Inequalities in vaccine coverage both between and within countries.

	Belize	Costa Rica	El Salvador	Guatemala	Honduras	Mexico
BCG (national)	100	91	72.7	97.6	98	85.4
BCG (poorest 20% ^a)	100	–	76.1	97.9	96	87.4
DPT (national)	98.3	73	64.7	62.6	97	82
DPT (poorest 20% ^a)	100	69	65.3	72.0	98	83.5
Polio (national)	96.6	78	67.4	67.3	96	85.2
Polio (poorest 20% ^a)	100	82	69.3	74.7	97	87.6
Measles (national)	91.5	83	54.4	74	85	70.7
Measles (poorest 20% ^a)	84.6	94	54.5	76.7	85	74
Pneumo (national)	97	85	54	75	94	80.8
Pneumo (poorest 20% ^a)	–	–	–	–	–	–
Rotavirus (national)	0	0	0	0	0	0
Rotavirus (poorest 20% ^a)	–	–	–	–	–	–

Challenges for Latin America and the Caribbean

- Ensuring universal access to vaccines, especially for the most disadvantaged
- Responding to vaccine hesitancy
- Maintaining immunization as a high political priority (including research/production)
- Use every opportunities for vaccination
- Ensuring equitable access by managing the high cost of new vaccines.

Vaccines are victims of their success in Latin America

- As vaccines succeed in eliminating diseases, social awareness of their benefits recedes and political motivation for extending coverage also decreases.
- The revolving fund have become rigid and financially limited
- Training and education for vaccine providers and other healthcare personnel are deficient and out of date, contributing to variation in quality and coverage.

2015, PAHO Secretariat and Member States commitment

- “To extend by 2020 and beyond the full benefit of immunization to all people, regardless of where they are born, who they are or where they live”.
- This commitment was accompanied by a new plan of action for 2016 – 2020
 - (i) protect and sustain the achievements
 - (ii) complete the unfinished agenda
 - (iii) tackle new challenges
 - (iv) strengthen health services for the effective delivery of immunization.

The need of working together

- Countries of Latin America should work together in sustainable plans, with medium and long-term measurable goals in research, development and production, to achieve better vaccination programs.
- We have great institutions such as PAHO (and its RFVP), SLIPE, COFVAL.
- Such a work would certainly reduce the burden of disease and inequality that exist today.

Gracias/Thank you!

@doctormacias



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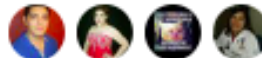
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Anuncio de la FDA que extiende la aprobación de la vacuna Gardasil papiloma VPH para personas hasta 45 años, de ambos sexos (En EEUU se usa la de 9 tipos vírales). Antes de indicaba solo hasta los 26 años.
[fda.gov/NewsEvents/News...](https://www.fda.gov/NewsEvents/News...)

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