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Cost of delivering routine immunization in Honduras

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**Pan American
Health
Organization**

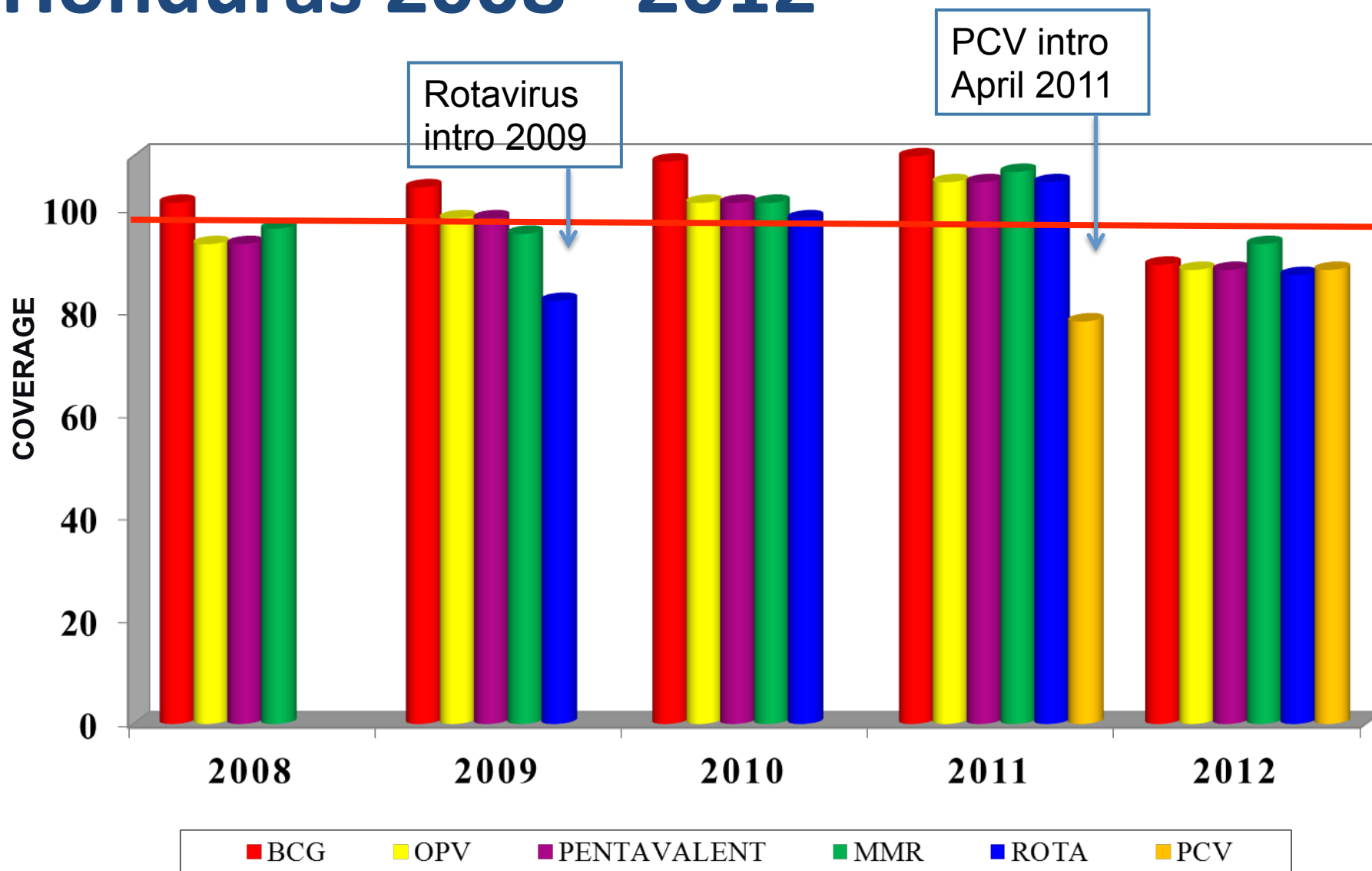


**World Health
Organization**
REGIONAL OFFICE FOR THE Americas

Objectives

- Generate unit costs, most importantly **cost per fully immunized child (FIC)**
- Explore **the determinants** of immunization delivery **costs at facility level** in Honduras
- Estimate the total economic costs of **routine immunization delivery** in Honduras for 2011

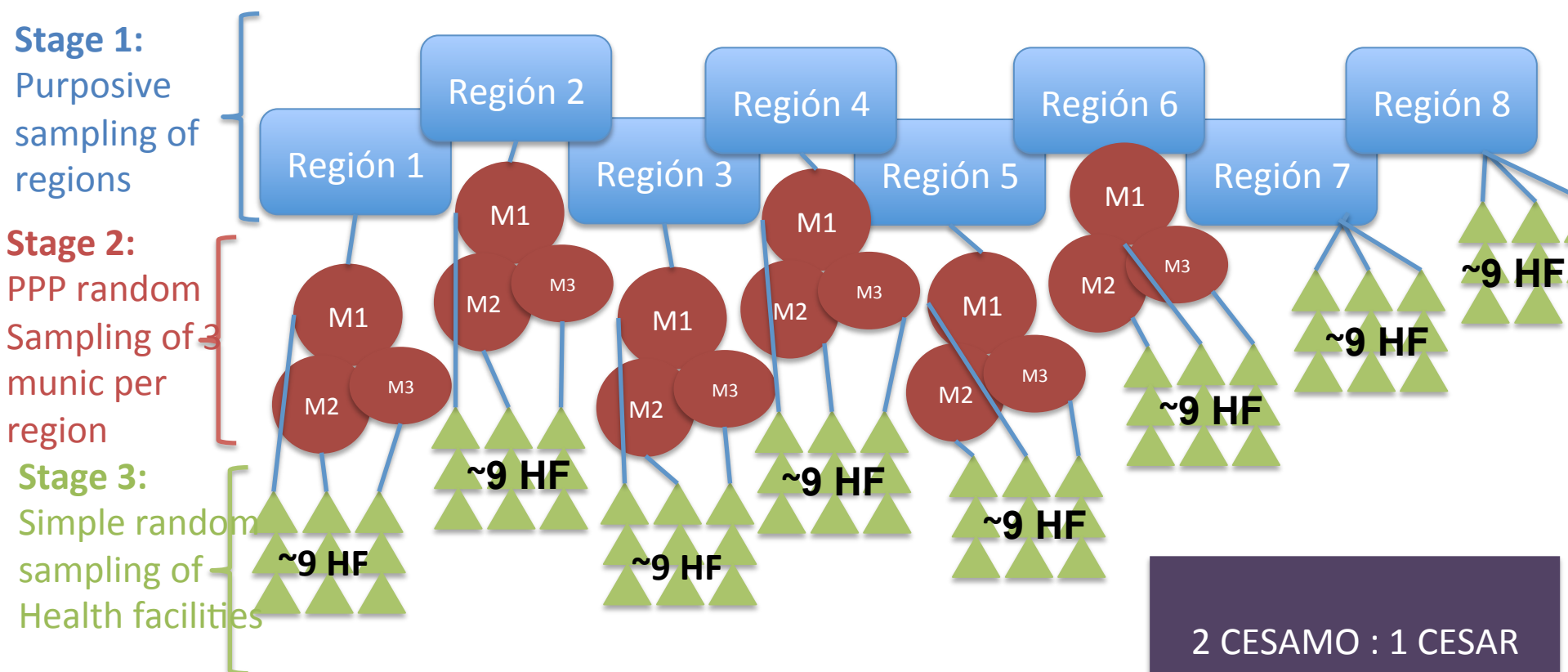
Vaccination coverage in <2 years, Honduras 2008 - 2012



Source: Honduras Secretary of Health EPI

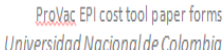
Sample design

Universe: 20 sanitary regions, 298 municipalities, 1458 public sector immunization providers



2 CESAMO : 1 CESAR
(2 URBAN : 1 RURAL)

Recurrent and capital costs (annualized @ 3%) collected in Lempira and converted to 2011 US\$



Encuesta a las instituciones vacunadoras del PAI de Honduras (CESAMO lider): R1M1F1-5711

Esta encuesta es usada para identificar información del uso de recursos del Programa Ampliado de Inmunizaciones (PAI) para la administración de la vacunación en Honduras. Por favor complete los datos de forma tan precisa como le sea posible. Le recomendamos que para responder estas preguntas se base en los reportes administrativos y otros “datos oficiales” cuando se encuentren disponibles. Si no cuenta con “datos oficiales” se recomienda reportar el mejor dato o “estimación” posible por parte los expertos de su establecimiento. El Estudio de costeo del PAI se realiza para 2011.

Formulario 1. Identificador para la Herramienta de Costeo del PAI

1. Nombre Establecimiento	El Porvenir
2. Dirección Establecimiento	
3. Región Sanitaria	Atlántida
4. Municipio	El Porvenir
5. Persona entrevistada	

6. Contactos claves para el seguimiento. Identifique 2 personas que puedan ser contactadas para seguimiento del presente estudio.

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Bottom up

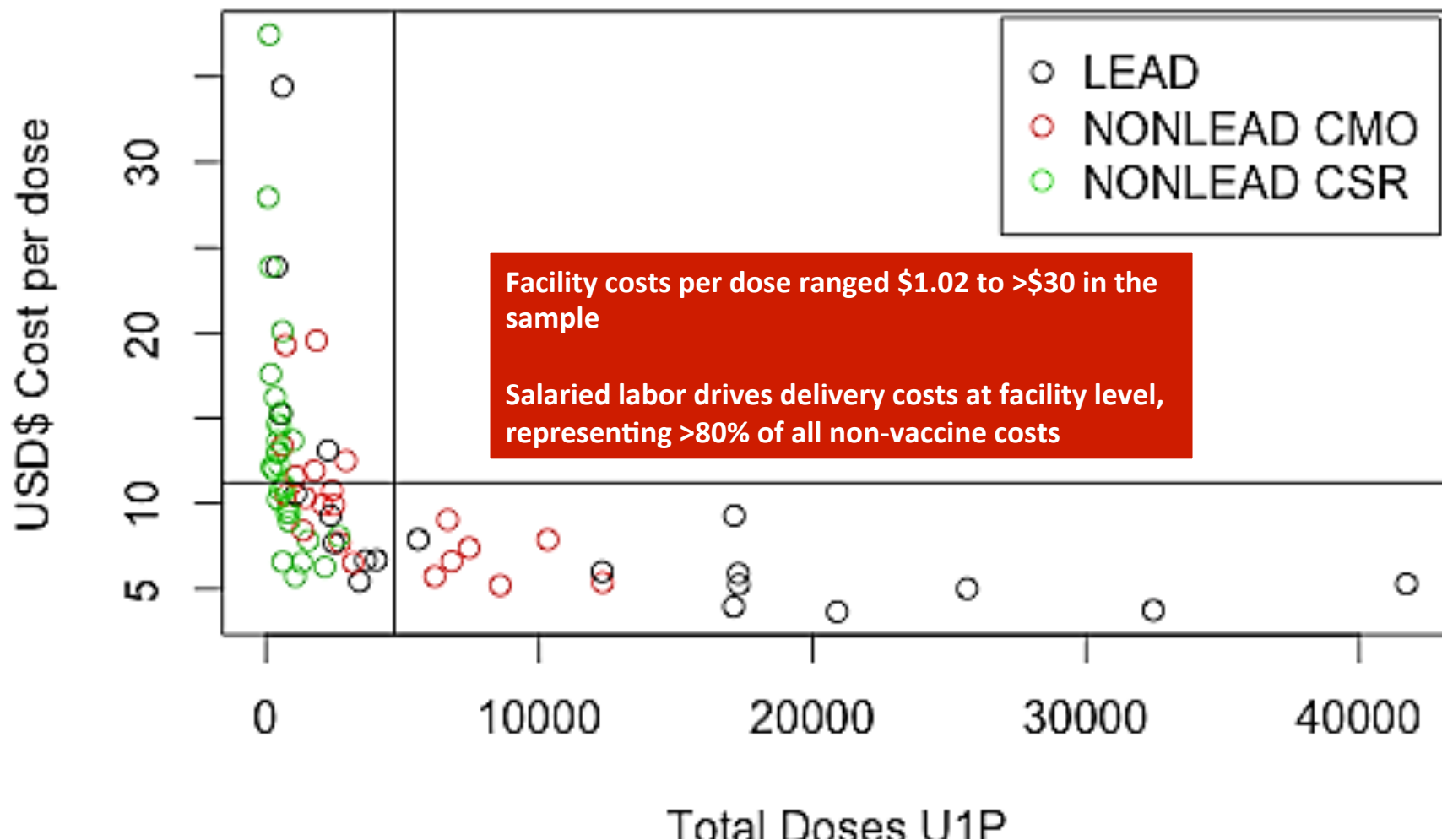
- Vaccines and supplies
- Human resources
- Cold chain
- Buildings
- Vehicles

Top down

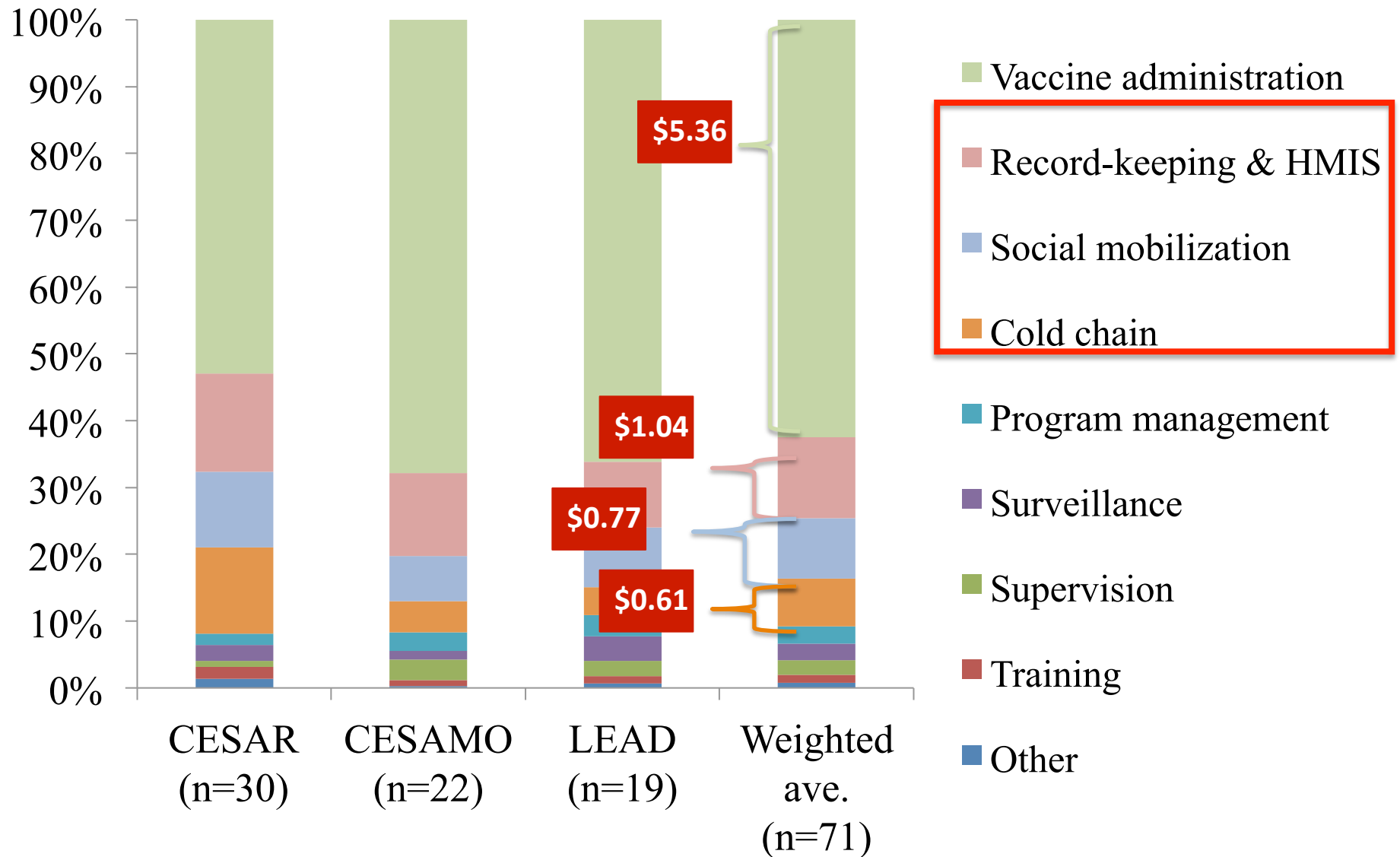
- Meetings
- Office materials
- Per diems, travel allowances

Characteristic	Sample		Frame	Nationwide
Number of central office	1		1	1
Number of regional offices	8		8	20
by type: non-metropolitan	6		6	18
by type: metropolitan	2		2	2
Number of health facilities	71		678	1458
by type: CESAMO	37		194	411
by type: CESAR	31		474	1020
by time: HOSPITAL	3		10	27
Total under-one population	63,632		102,709	177,000
Total doses applied	541,862		2,117,356	3,822,055
	Metro	Non-metro		
mean doses applied by type: CESAMO	15,104	4,792	6,822	5,270
mean doses applied by type: CESAR	1,926	1,089	1,160	1,182
mean doses applied by time: HOSPITAL	20,133	20,646	24,390	16,671
Fraction of total doses applied during PIRI	0.0988		0.0972	0.0927
Fraction of total doses applied to children under-one	0.6149		0.6416	0.6498

Facility cost per dose and total doses applied, by facility type (US\$ 2011)



Activity cost structure, by facility type (US\$ 2011)



Predicting facility level costs

Variables	Dep. Var.: ln Total Economic Cost, Facility Level	
	Model (1)	Model (2)
In vaccine doses delivered (Continuous)	0.379**** (0.056)	0.527**** (0.063)
Local coverage exceeds 95% of target Referent: facilities with less than 95% coverage	-0.214** (0.096)	-0.139** (0.056)
CESAR facility type Referent: CESAMO and Hospitals	-0.594**** (0.120)	-0.304** (0.131)
Metropolitan location (SPS or TGU) Referent: non-metro regions	0.413** (0.162)	0.312* (0.181)
Very low volume (<500 doses per year) Referent: 500 or more doses per year	0.592**** (0.157)	0.513**** (0.118)
Fraction of doses delivered during national outreach days (Continuous between 0 and 1)		-0.326 (1.09)
Average annual wage of 1 full-time EPI worker (Continuous)		0.0000536*** (0.000017)
Ratio of Immunization Doses to Outpatient Visits (Continuous between 0 and 1)		-0.771**** (0.156)
Constant	6.89**** (0.425)	5.53**** (0.507)
R-squared	0.746	0.83
**** p < 0.001, *** p < 0.01, ** p < 0.05, * p < 0.1		

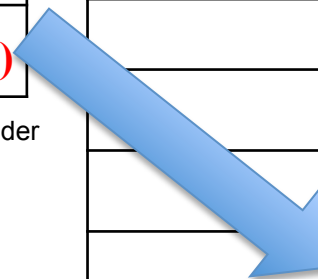
Total costs national immunization program in Honduras, 2011 US\$ in thousands

TOTAL COSTS				
Category	Facility	Regional	Central	TOTAL
Vaccine*	\$0	\$0	\$7,990	\$7,990 (25%)
Labor	\$15,404	\$1,800	\$449	\$17,653 (54%)
Volunteers	\$713	\$0	\$0	\$713 (2%)
Cold chain	\$982	\$246	\$42	\$1,270 (4%)
Vehicles	\$113	\$115	\$86	\$314 (1%)
Buildings	\$833	\$104	\$23	\$960 (3%)
Other	\$1,049	\$1,056	\$1,484	\$3,589 (11%)
TOTAL	\$19,094	\$3,321	\$10,074	\$32,486 (100%)

*Note: Total vaccine costs reflect the following assumptions. PCV13 and rotavirus price per dose consider GAVI-manufacturer price agreements of US\$7.00 per dose and US\$2.50 per dose, respectively. Vaccine and supply costs for PPV23 (2011 donation) were excluded.

If you only consider doses administered to children under the age of one...

CHILD PROGRAM COSTS	
<i>TOTAL</i>	
	\$7,738 (36%)
	\$9,709 (46%)
	\$392 (2%)
	\$699 (3%)
	\$173 (1%)
	\$528 (2%)
	\$1974 (9%)
	\$21,213 (100%)



Cost per FIC @ 1 year of age (US\$ 2011)

**COST
PER
DPT3
\$128**

Vaccine	Doses/U1	Price/Dose	Total Cost
BCG	1	\$ 0.10	\$ 0.10
Hepatitis B	1	\$ 0.23	\$ 0.23
Oral Polio	3	\$ 0.21	\$ 0.63
Pentavalent	3	\$ 3.19	\$ 9.57
Rotavirus	2	\$ 2.50	\$ 5.00
PCV 13	3	\$ 7.00	\$ 21.00
MMR	1	\$ 1.60	\$ 1.60
<i>Vaccine only</i>	14		\$ 38.13
with CIF, Syringe, Sbox & Oth supply			\$ 46.01
with waste	17.11		\$ 48.67
<i>All other resources employed for delivery (labor, cold chain, infrastrucur, etc) by dose</i>			
Central administration		\$ 0.51	\$ 7.12
Regional administration		\$ 0.81	\$ 11.33
Facility delivery		\$ 4.65	\$ 65.13
TOTAL for delivery			\$83.57
TOTAL ECONOMIC COST PER FULLY IMMUNIZED CHILD			\$ 132.24

Summary

- **Estimated FIC cost much higher than previously reported** and in line with recent findings from other LAC countries, which share similar schedule (**DPT3 good proxy for Honduras for FIC**)
- **Labor costs are substantial**, accounting for 80% of non-vaccine costs @ facility
 - Shared labor fully dedicates to EPI during Vaccination Week in the Americas, incl. high skill
- **Rural immunization services may consume more resources** than immunization in urban areas
 - Fixed labor, infrastructure costs

Limitations

- Sample weights limited to frame (8 of 20 regions)
- Shared FTE between programs defined via informant interviews --- recall bias
- Limited robust measures of performance at facility level to characterize cost variations identified



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Gracias

**Templo Maya, Plaza ceremonial,
Copán, Honduras**