Immunization Registries in Latin America and the Caribbean

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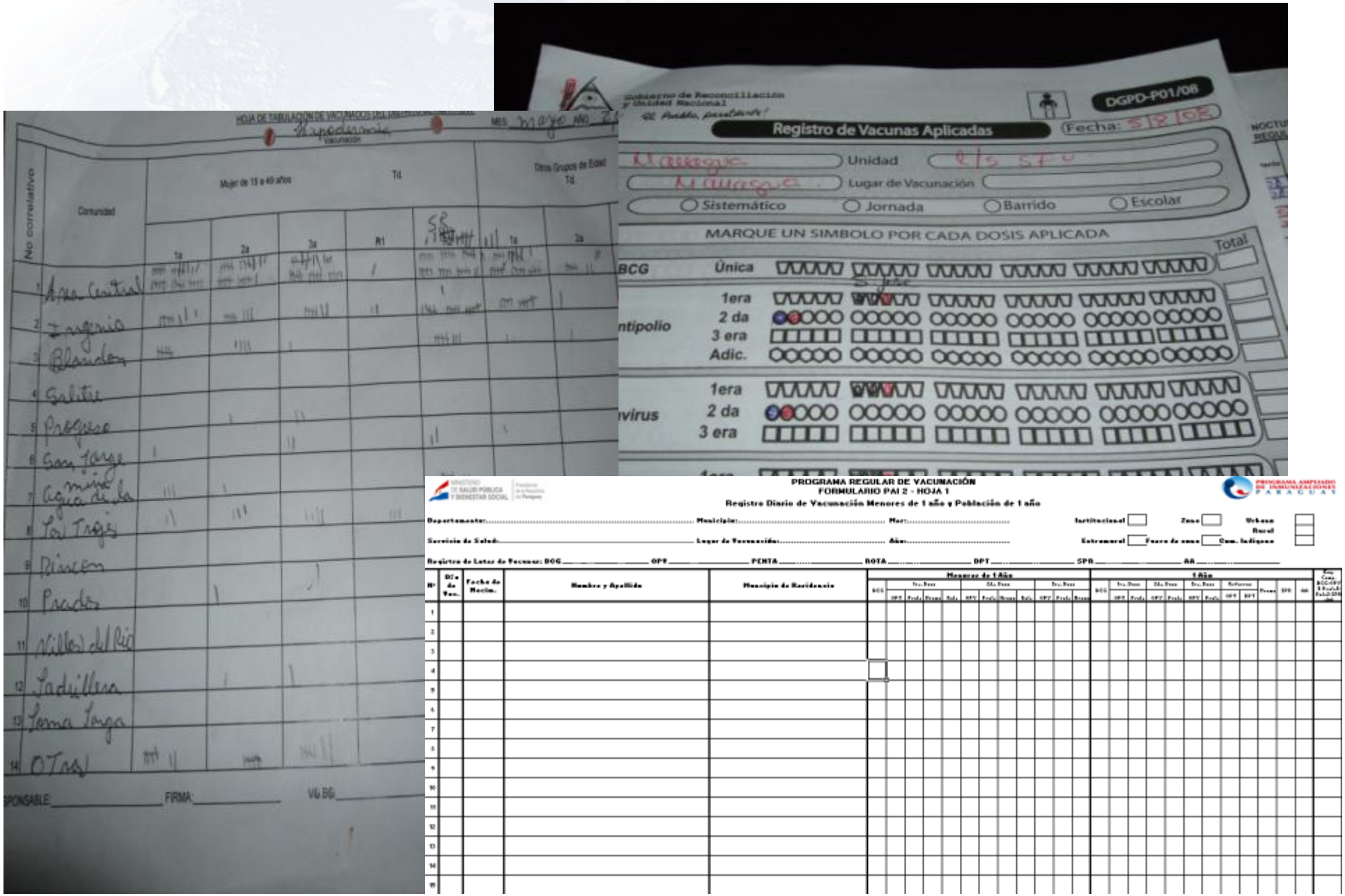
Comprehensive Family Immunization Unit

March, 2014

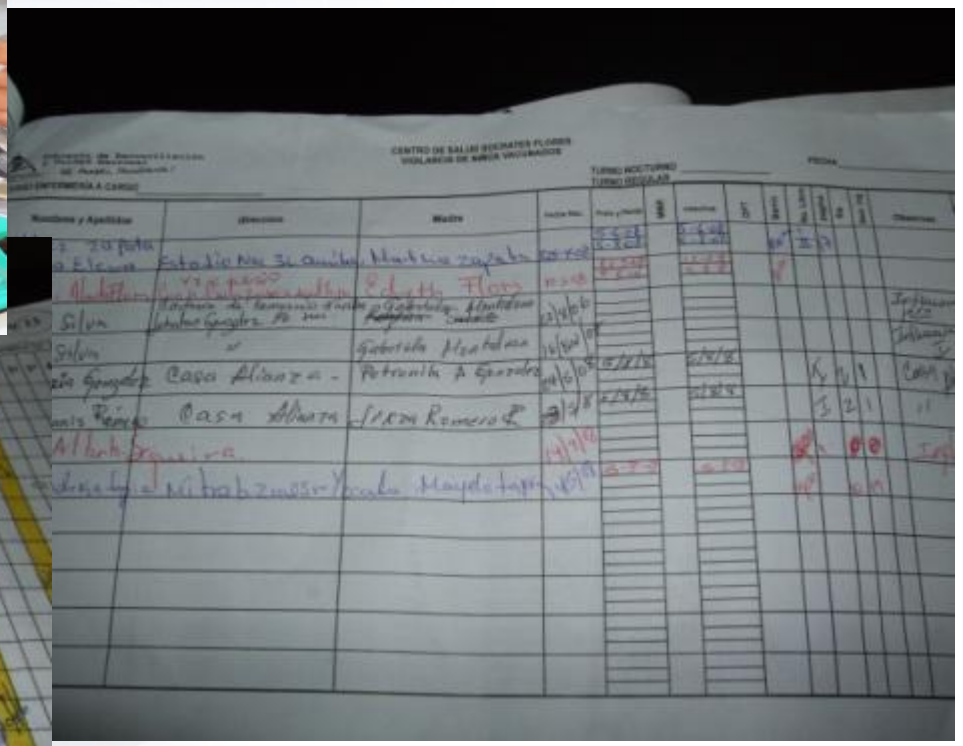
Pan American Health Organization
World Health Organization
Americas

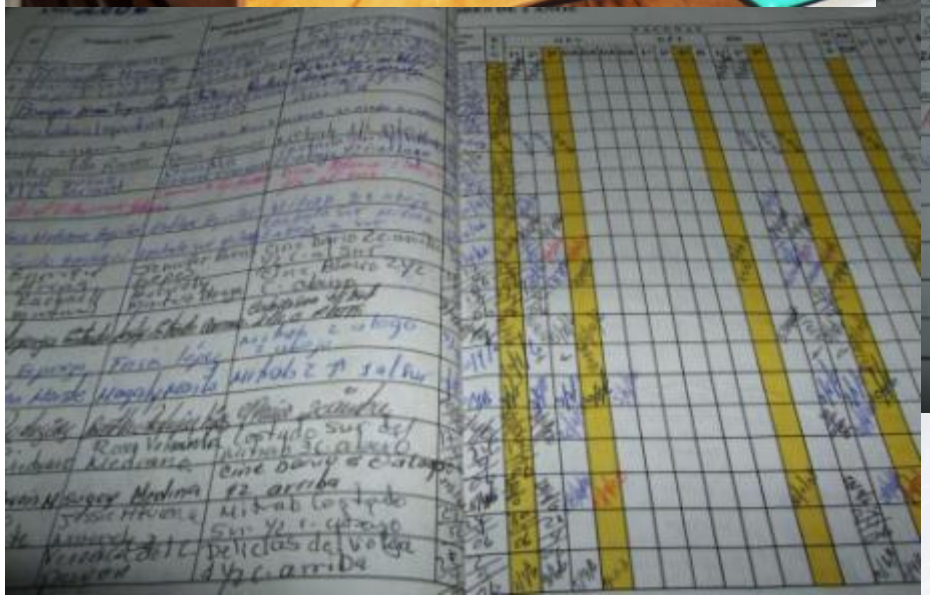
Vaccination Cards

Tally sheets or equivalent



Individual Records





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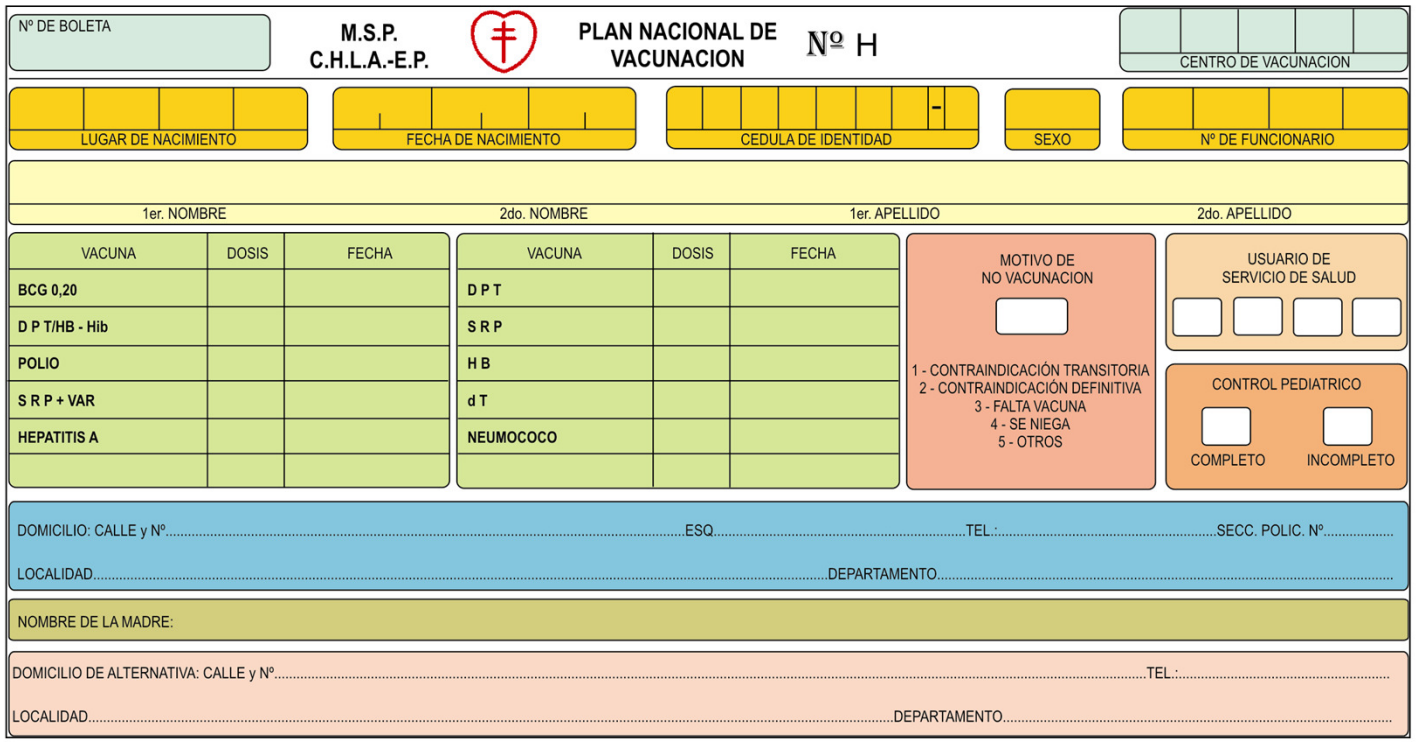
Example of an individual vaccination record – then entered into a computerized registry



Nº DE BOLETA

M.S.P.
C.H.L.A.-E.P.

PLAN NACIONAL DE VACUNACION Nº H

CENTRO DE VACUNACION

LUGAR DE NACIMIENTO | FECHA DE NACIMIENTO | CEDULA DE IDENTIDAD | SEXO | Nº DE FUNCIONARIO

1er. NOMBRE | 2do. NOMBRE | 1er. APELLIDO | 2do. APELLIDO

VACUNA	DOSIS	FECHA
BCG 0,20		
D P T/HB - Hib		
POLIO		
S R P + VAR		
HEPATITIS A		

VACUNA	DOSIS	FECHA
D P T		
S R P		
H B		
d T		
NEUMOCOCO		

MOTIVO DE NO VACUNACION

1 - CONTRAINDICACIÓN TRANSITORIA
2 - CONTRAINDICACIÓN DEFINITIVA
3 - FALTA VACUNA
4 - SE NIEGA
5 - OTROS

USUARIO DE SERVICIO DE SALUD

CONTROL PEDIATRICO

COMPLETO | INCOMPLETO

DOMICILIO: CALLE y Nº..... ESQ..... TEL.:..... SECC. POLIC. Nº.....

LOCALIDAD..... DEPARTAMENTO.....

NOMBRE DE LA MADRE:

DOMICILIO DE ALTERNATIVA: CALLE y Nº..... TEL.:.....

LOCALIDAD..... DEPARTAMENTO.....

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What is a National Electronic Immunization Registry (EIR)?

- **Immunization registries**: Electronic information system, confidential, population-based, with identification data sent directly from vaccination providers (Linkins et al, 2001 y Freeman et al. 2003).
  - Not to be confused with immunization information systems
- Population-based information system, confidential, with vaccination data (doses given) from an entire country
  - it had outputs to facilitate coverage monitoring by vaccine, dose, geographical area, age and provider
  - It supports individual (and timely) schedule follow-up

Public Sector

Social Security

Private Sector

Other providers

Electronic Immunization Registry

NATIONAL EPI

DEPARTAMENT/ REGION

DISTRICT

HEALTH CENTER

Pan American Health Organization

Organization Americas

Advantages of Electronic Immunization Registries

- Coverage monitoring by cohort ("dynamic denominator) instead of using an annual goal
  - Coverage may vary depending on time report is run
  - More precise coverage may facilitate vaccine and supply forecasting
- Allows for a detailed analysis of who is un/under vaccinated to tailor vaccination strategies
- Individual follow-up of persons with delayed vaccines
  - No more negative drop-out rates
  - It may facilitate timely vaccination
- If well designed and implemented can be easy to use and well accepted

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Characteristics of an Ideal Immunization Registry for Latin America

- **Inclusion of all persons at birth, or as early as possible**
- **Unique ID**
  - National ID or birth registration ID
  - Unique combination: names, parental names or their ID, birth date/place
  - Biometrics: fingerprints, iris
- **Information about each person, including info on geographical area of residence**
- **Information about the vaccines given, dates, and provider**
- **Allowing aggregation of data by geographical level, as required**
- **Allowing timely individualized follow-up**
- ***Data entry as close to vaccination as possible (time and place)***
- **Data security and protection of patient confidentiality**

The first 5 criteria described by *Gostin et al., JAMA 1995*

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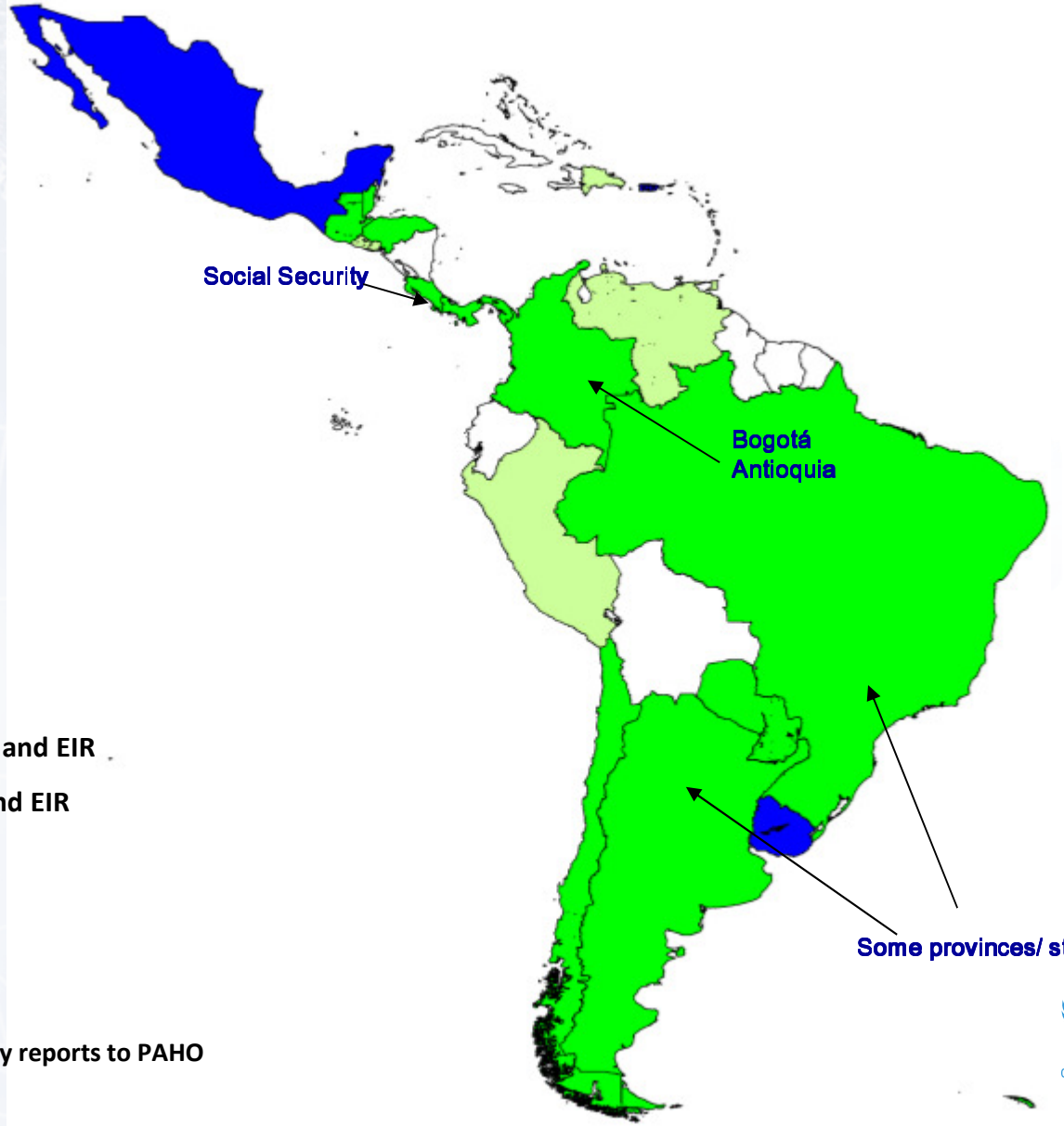
Electronic Immunization Registries in Latin America and the Caribbean, 2013



EIR situation

- Using and EIR
- Implementing and EIR
- Developing and EIR

Source: Country reports to PAHO

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Various Approaches

- Relation to national Health Information System (HIS)
- Development and maintenance
- Relation to other immunization systems
- Financing
- Software
- Data entry (usually from paper)
- Data flow
  - Web-based
  - “Disconnected version”

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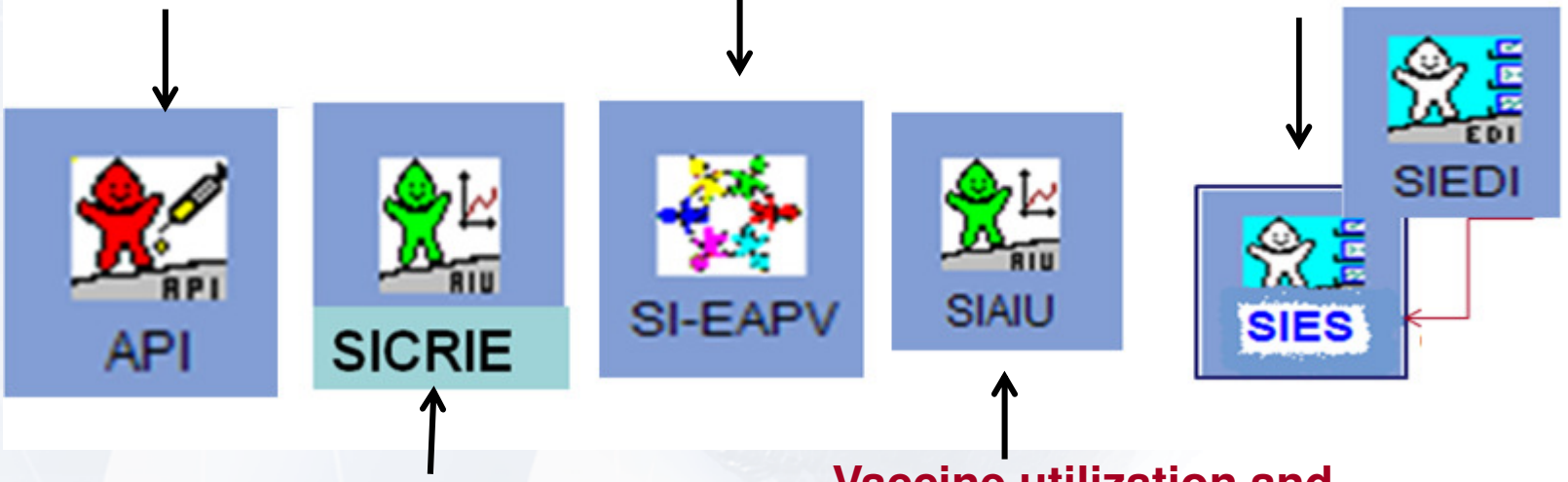
2000s: API* and other systems

Vaccination schedule for campaigns and routine (doses)

Adverse events following immunization (AEFI)

Stock and distribution of immunobiologicals



Reference Center of Special Immunobiologicals (CRIE)

Vaccine utilization and wastage

Large quantities of data but incompatible database systems

* API - System of administered doses. Source: MOH Brazil

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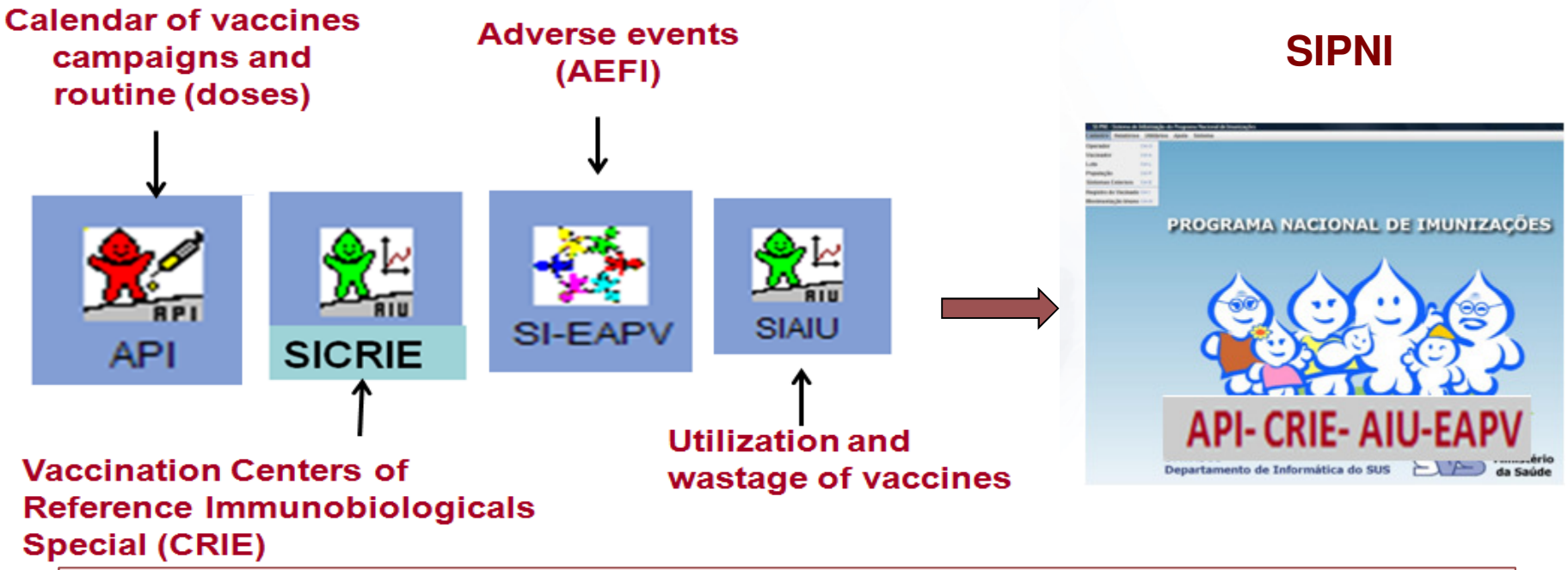
How to solve this problem?

➢**2009: NIP and the Department of the Ministry of Health Informatics developed a new information system, combining all of the old systems into one.**



Unifying the database systems

Source: MOH Brazil

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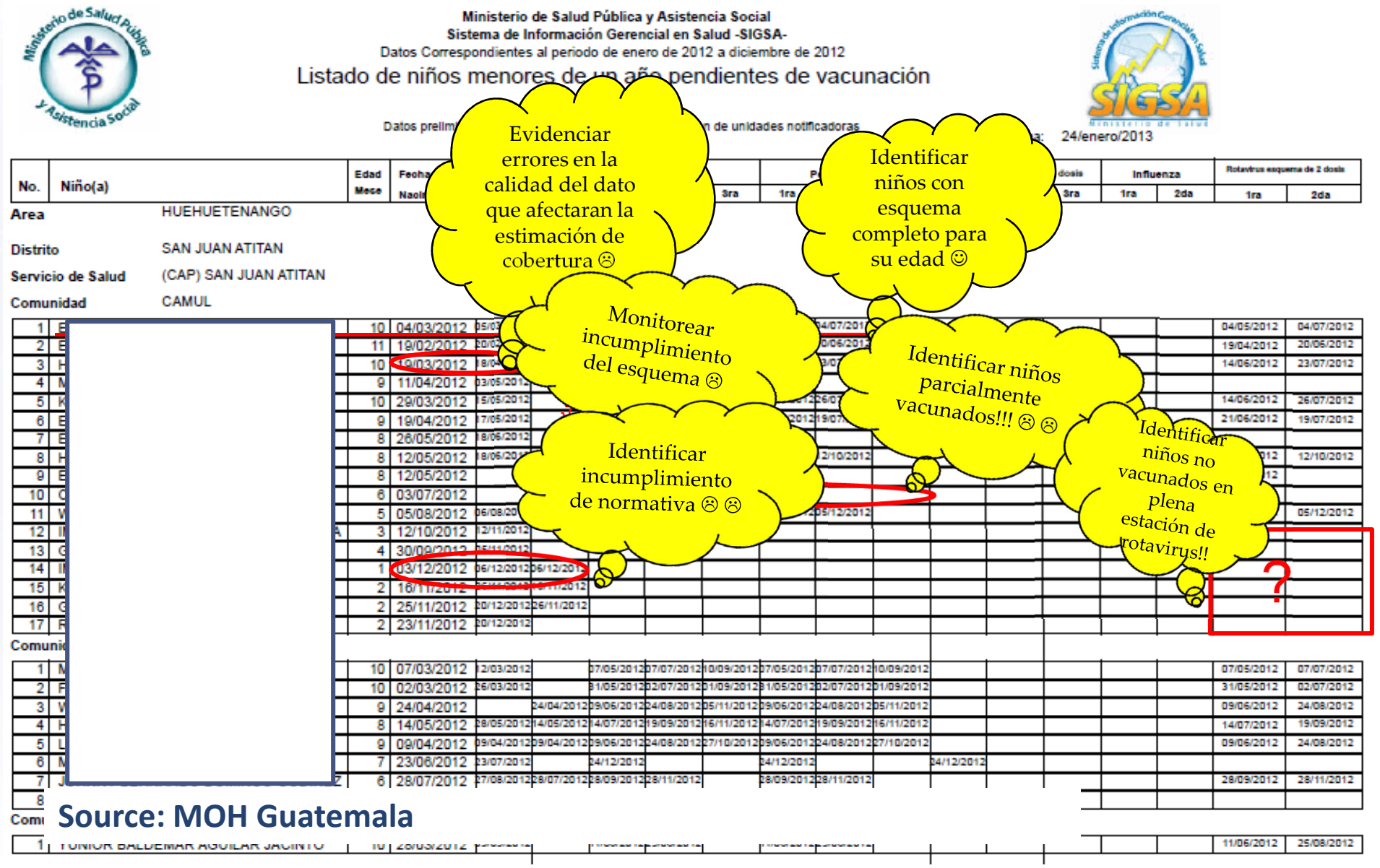
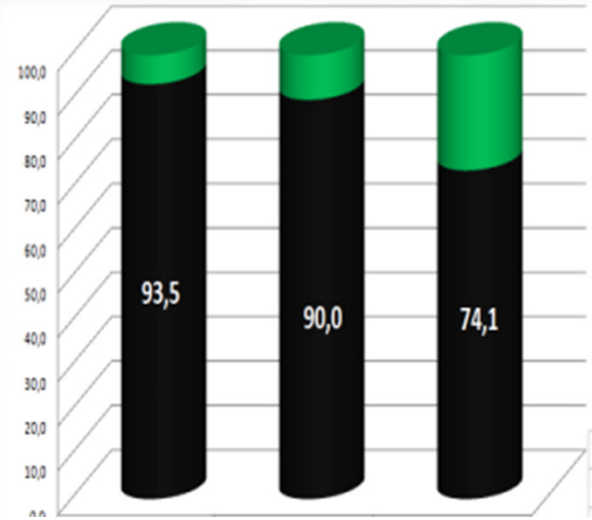
Practical Uses of an Immunization Registry



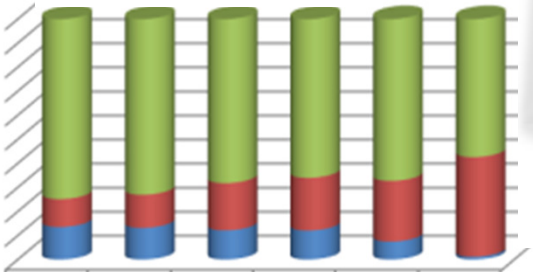
Source: MOH Guatemala

EPI ON THE WEB, DATABASE FOR TRACKING BIRTH COHORT

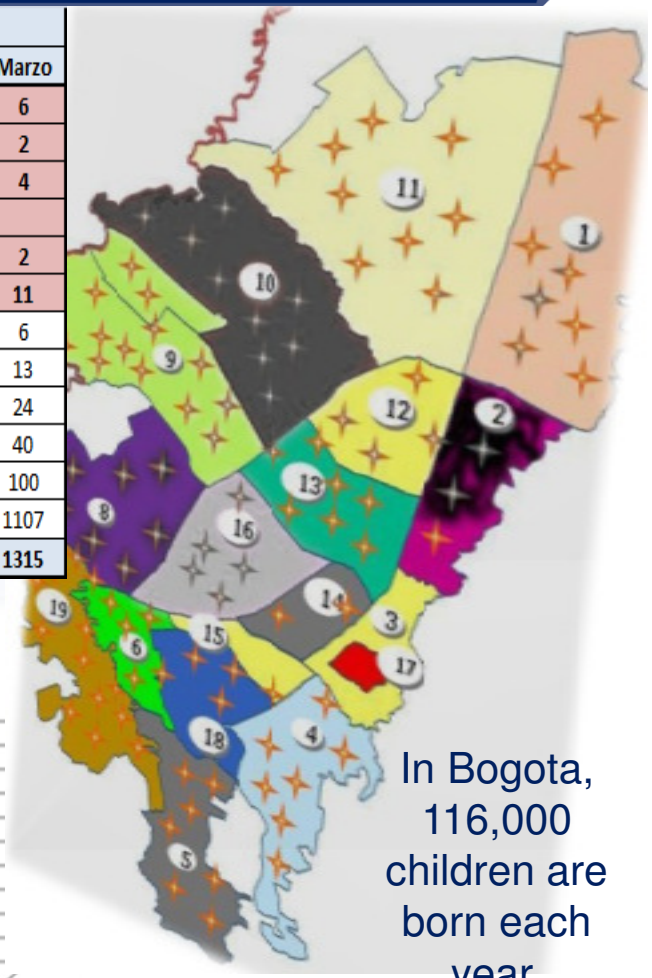
2011	COHORTE	2011										2012		
		Marzo	Abril	Mayo	Junio	Julio	Agosto	eptiembr	Octubre	Noviembr	Diciembre	Enero	Febrero	Marzo
Enero	6294	5232	857	103	33	16	9	6	2	2		2	4	6
Febrero	5557		4564	778	97	38	17	7	7	3	2		2	2
Marzo	6324			5023	1042	112	45	25	6	5	2	1	1	4
Abril	5940				4688	992	125	28	18	8	7	5	1	
Mayo	6239					4837	1033	128	30	6	7	5	4	2
Junio	6008						4929	745	75	35	15	9	4	11
Julio	6159							4930	846	103	35	27	7	6
Agosto	6469								5039	1086	102	48	19	13
Septiembre	6632									5310	924	143	49	24
Octubre	6003										4585	1089	124	40
Noviembre	5768											4838	704	100
Diciembre	5775												4526	1107
TOTAL	73168	2947	3114	3366	3173	3200	3293	3106	3201	3493	3091	6176	5445	1315



Vaccination timeliness



	1	2	3	4	5	6
% Oportuna	74,4	72,9	68,0	65,9	67,1	57,1
% No vacunado	11,5	13,7	19,6	21,9	25,2	41,2



In Bogota, 116,000 children are born each year.

Source: Health Secretariat Bogota

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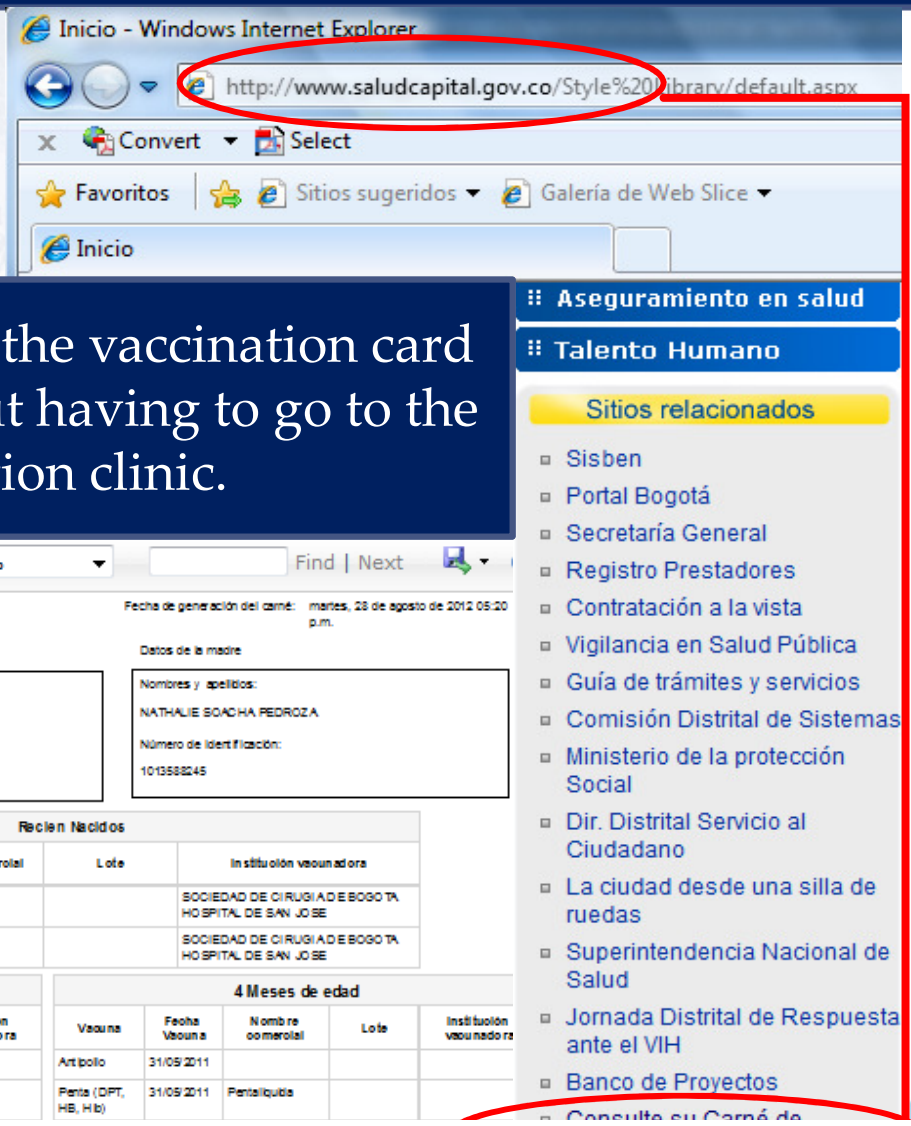
EPI ON THE WEB, GETTING A VACCINATION CARD

Parents can access the vaccination card and print it without having to go to the vaccination clinic.



Source: Health Secretariat Bogota

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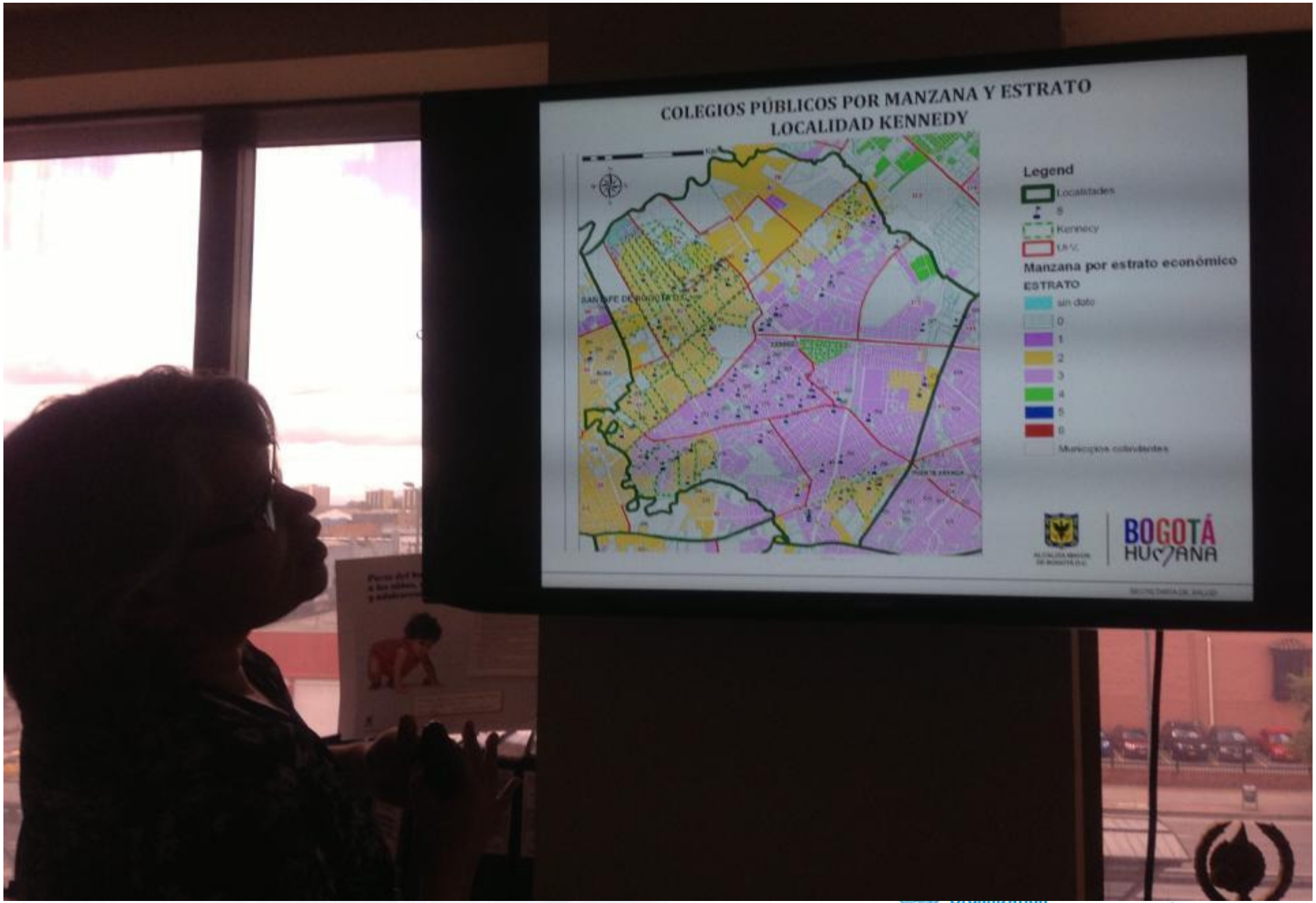
COLEGIOS PÚBLICOS POR MANZANA Y ESTRATO
LOCALIDAD KENNEDY
Legend
Localidades
Kennedy
Manzana por estrato económico
ESTRATO
sin dato
0
1
2
3
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5
6
BOGOTÁ
HUMANA

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Vaccine

journal homepage: www.elsevier.com/locate/vaccine

Review

Effectiveness of the 7-valent pneumococcal conjugate vaccine against vaccine-type invasive disease among children in Uruguay: An evaluation using existing data

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ABSTRACT

The 7-valent pneumococcal conjugate vaccine (PCV7) was introduced into the routine immunization program in Uruguay in March 2008 with a 2-dose primary series (given at 2 and 4 months) plus a booster (at 12 months) and a catch-up campaign (two doses given at 15 and 17 months). We used a case–control methodology and existing laboratory surveillance and immunization registry data from Uruguay to evaluate PCV7 effectiveness against vaccine-type invasive pneumococcal disease (VT-IPD). Cases of VT-IPD (with pneumococcus obtained from a normally sterile site) were identified through the National Reference Laboratory. Age- and neighborhood-matched controls were obtained through a national immunization registry in which all children are enrolled at birth regardless of vaccine receipt; all eligible controls were included. Immunization status of cases and controls was assessed through the immunization registry, and conditional logistic regression was used to calculate PCV7 effectiveness. Between April 2008 and February 2010, 44 cases of VT-IPD among children < 5 years were identified; 43 (98%) of those children were located in the registry. Among located case patients, 7 (16.3%) were age-eligible to have received at least one dose of PCV7. A total of 637 matched controls were included. Vaccine effectiveness was 91.3% (95% CI: 46.4, 98.6) for ≥1 PCV7 doses and 94.8% (95% CI: 43.1, 99.5) for ≥2 PCV7 doses. Using existing data we demonstrated high effectiveness of PCV7 against VT-IPD in Uruguay–a middle-income country using a 2-dose primary series plus a booster dose and a limited catch-up campaign. These data also highlight the utility of surveillance and high-quality immunization registries for evaluating the effectiveness of vaccines.

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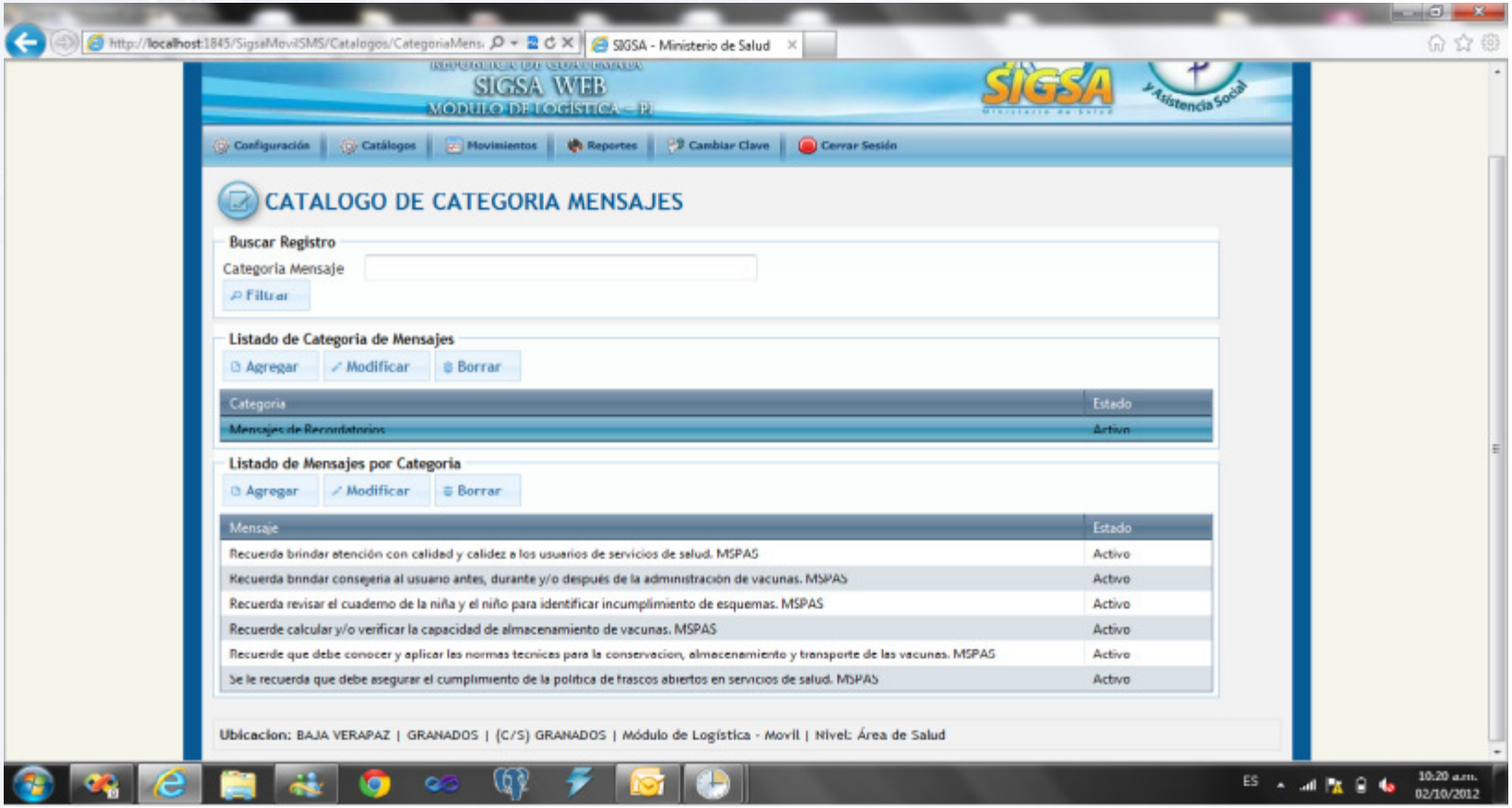
Linking mHealth to EIRs



Source: MOH Guatemala

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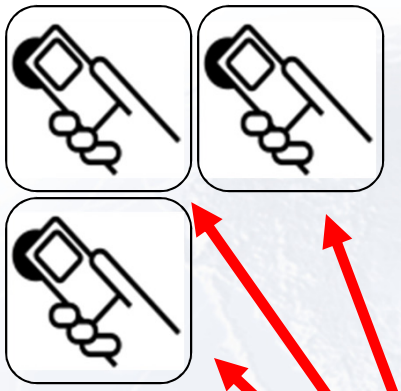
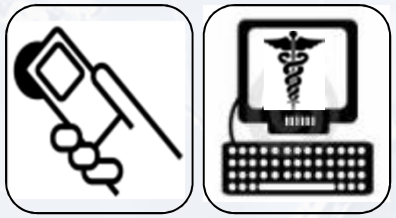


Health post/ health care worker

-SMS
-MMS
-GPRS

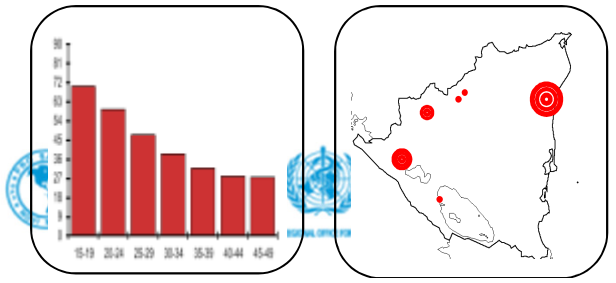


Health facility

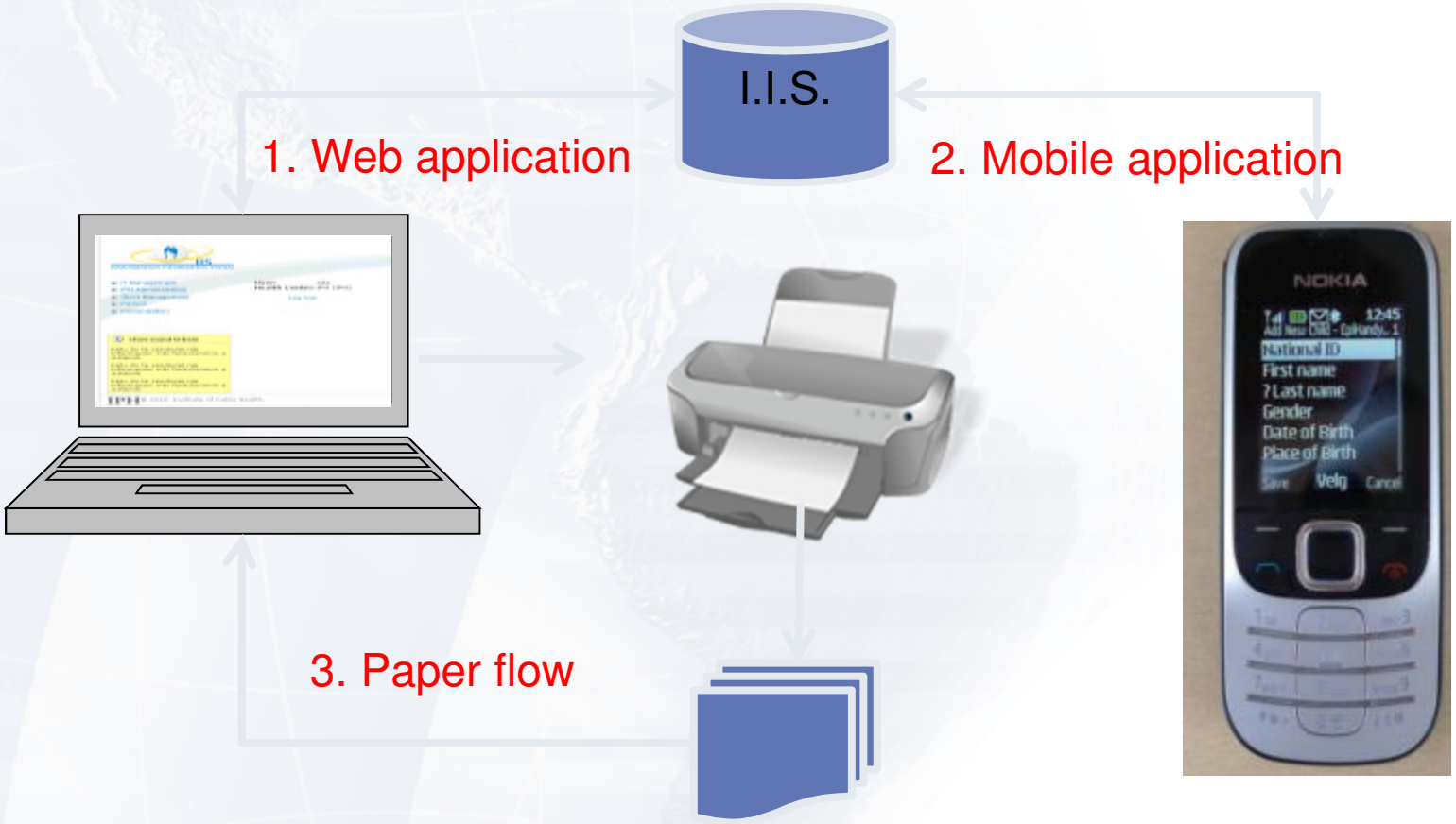
District / Department

Slide by Heather Zortnetzer, SSI

National Level



Access to Data



Slide by Jan Grevendonk, PATH

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Innovations

Mobile Data Entry Clerk: An Innovative Idea Worth Exploring

n the context of project Optimize,[1,2] the Ministry of Public Health and Social Welfare of Guatemala proposed and developed guidelines for the use of mobile data entry clerks. Each clerk would be responsible for visiting closest health facility with access to Internet. Each clerk would be required to possess a valid driver's license, maintain up-to-date antivirus software on his or her computer equipment, and sign in and sign out all equipment. Clerks would work under the direct supion of a municipal health authority and electronic data system and in those where having computers and Internet in each health post may not be feasible. However, possible risks include accidents, robberies, and loss of data. A program using mobile data entry clerks has yet to be evaluated in the field in the Americas. ▮

Immunization Information Systems
Clinical Decision Support

Recommended Immunization Schedule for Persons Aged 0 Through 6 Years—United States • 201

For those who fall behind or start late, see the catch-up schedule

Vaccine ▼ Age ▶	Birth	1 month	2 months	4 months	6 months	12 months	15 months	18 months	19–23 months	2–3 years	4–6 years
Hepatitis B[1]	HepB	HepB			HepB						
Rotavirus[2]			RV	RV	RV[2]						
Diphtheria, Tetanus, Pertussis[3]			DTaP	DTaP	DTaP	see footnote[3]	DTaP				DTaP
Haemophilus influenzae type b[4]			Hib	Hib	Hib[4]	Hib					
Pneumococcal[5]			PCV	PCV	PCV	PCV				PPSV	
Inactivated Poliovirus[6]			IPV	IPV	IPV						IPV
Influenza[7]					Influenza (Yearly)						
Measles, Mumps, Rubella[8]						MMR		see footnote[8]			MMR
Varicella[9]						Varicella		see footnote[9]			Varicella
Hepatitis A[10]						HepA (2 doses)				HepA Series	
Meningococcal[11]										MCV	

Range of recommended ages for all children except certain high-risk groups

Range of recommended ages for certain high-risk groups

This schedule includes recommendations in effect as of December 15, 2009. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Considerations should include provider assessment, patient preference, and the potential for adverse events. Providers should consult the relevant Advisory Committee on Immunization Practices statement for detailed recommendation http://www.cdc.gov/vaccines/pubs/acip-list.htm. Clinically significant advers events that follow immunization should be reported to the Vaccine Adverse Eve Reporting System (VAERS) at http://www.vaers.hhs.gov or by telephon 800-822-7967.

Potential Problems with Admin Coverage and with Immunization Registries

Administrative (aggregated data)

- Errors (voluntarily and involuntary) recording vaccine doses
- Errors in aggregating data
- Errors in data entry
- Inaccurate denominators
- Not including doses given by the private sectors or other providers

Immunization Registry

- Errors (voluntarily and involuntary) recording vaccine doses
- Errors in data entry
- Incomplete registry or duplicates
- Not including doses given by the private sectors or other providers

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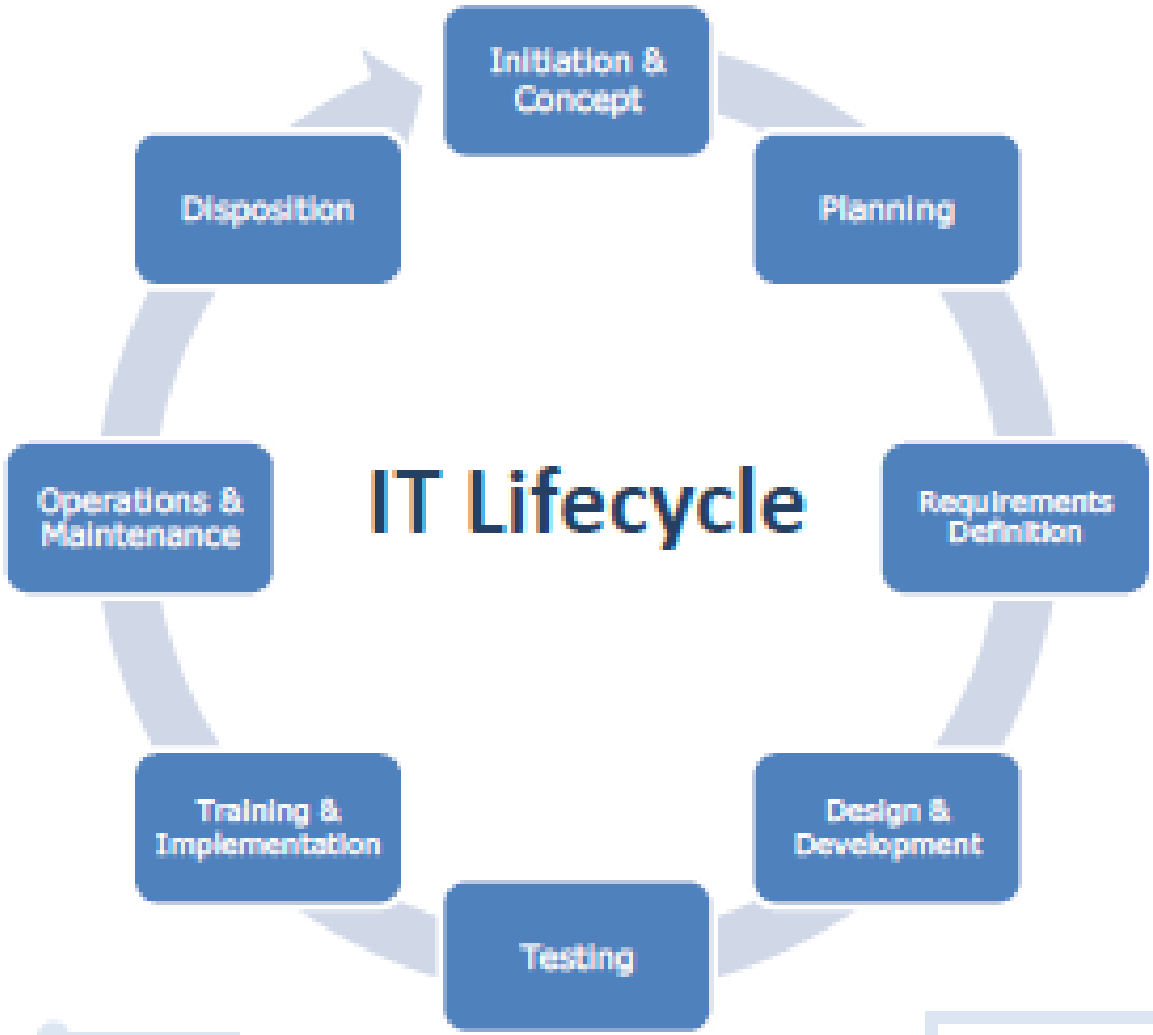
World Health Organization Americas

Lesson Learned – EIRs take time

	2007	2009	2010	2011	2012
WEB	Análisis, modelamiento y diseño del sistema.	Construcción del aplicativo WEB. 3 meses(Oct-dic) Sin pruebas	▪Pruebas, ajustes TRES (3) módulos priorizados ▪ WEB. ▪Capacitación	▪Pruebas, ajustes al WEB. ▪Capacitación ▪Inicio Implementación acompañada en Neiva.	▪Pruebas, ajustes a incidencias en marcha WEB. ▪Mejoramiento en la infraestructura ▪Fortalecimiento talento humano. ▪Implementación en 1493 de 2732* puntos a implementar.
DESCONECTADO		.	▪Definición y construcción del Desconectado TRES (3) módulos priorizados	▪Pruebas y ajustes al Desconectado.	▪Mejoras al Desconectado.

Source: MOH Colombia

Lesson Learned – IT Developments have cycle: Skipping a step may affects quality and/or costs and/or time



Source:PHII

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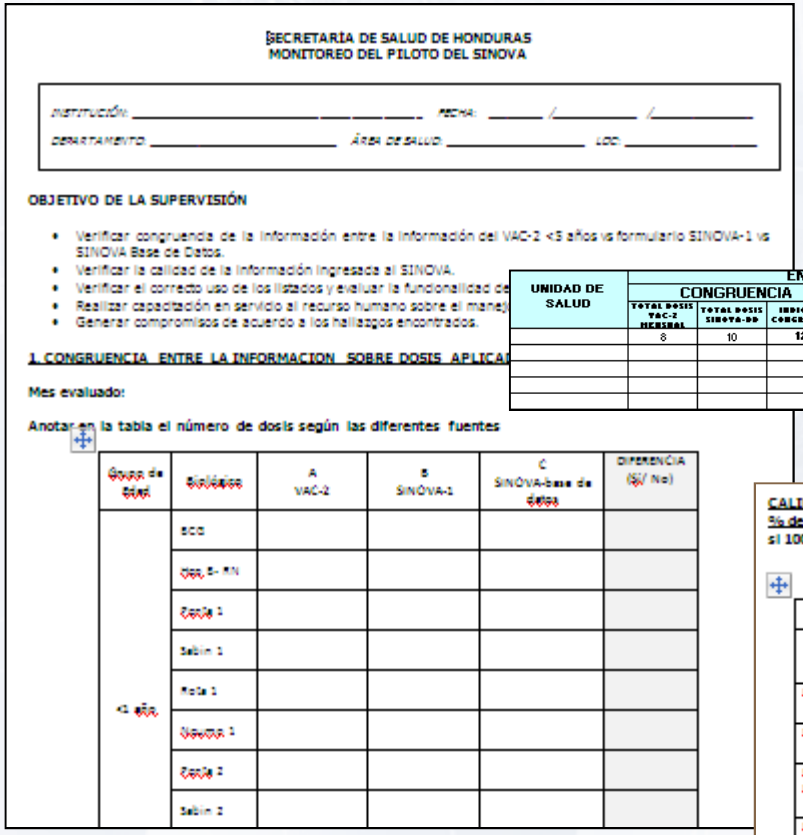
Américas

Lesson Learned – EIR implementation must be closely monitored



SECRETARIA DE SALUD DE HONDURAS
MONITOREO DEL PILOTO DEL SINOVA

INSTITUCIÓN: _____ FECHA: _____ / _____ / _____

DEPARTAMENTO: _____ ÁREA DE SALUD: _____ LOC: _____

OBJETIVO DE LA SUPERVISIÓN

- Verificar congruencia de la información entre la información del VAC-2 <5 años vs formulario SINOVA-1 vs SINOVA Base de Datos.
- Verificar la calidad de la información ingresada al SINOVA.
- Verificar el correcto uso de los listados y evaluar la funcionalidad de
- Realizar capacitación en servicio al recurso humano sobre el manej
- Generar compromisos de acuerdo a los hallazgos encontrados.

1 CONGRUENCIA ENTRE LA INFORMACION SOBRE DOSIS APLICA

Mes evaluado:

Anotar en la tabla el número de dosis según las diferentes fuentes

Grupo de Edad	Biológicos	A VAC-2	B SINOVA-1	C SINOVA-base de datos	DIFERENCIA (Si/ No)
<1 año	BCG				
	Hep. B- RN				
	Polio 1				
	Sabin 1				
	Penta 1				
	Neumo 1				
	Polio 2				
	Sabin 2				

UNIDAD DE SALUD	ENERO_2012						FEBRERO_2012						MARZO_2012					
	CONGRUENCIA			CALIDAD			CONGRUENCIA			CALIDAD			CONGRUENCIA			CALIDAD		
	TOTAL DOSIS VAC-2 MENSUAL	TOTAL DOSIS SINOVA-DD	INDICADOR CONGRUENCIA	TOTAL REGISTROS REVISADOS	TOTAL ERRORES	% DE ERROR	TOTAL DOSIS VAC-2 MENSUAL	TOTAL DOSIS SINOVA-DD	INDICADOR CONGRUENCIA	TOTAL REGISTROS REVISADOS	TOTAL ERRORES	% DE ERROR	TOTAL DOSIS VAC-2 MENSUAL	TOTAL DOSIS SINOVA-DD	INDICADOR CONGRUENCIA	TOTAL REGISTROS REVISADOS	TOTAL ERRORES	% DE ERROR
	8	10	125	56	17	30			#DIV/0!			#DIV/0!			#DIV/0!			#DIV/0!

CALIDAD DE LA INFORMACIÓN

% de Registros a revisar dependiendo de número de registros: 50% si <100 registros en el mes; 20% si 100-199 registros; 15% si 200-399 registros; 10% si >=400 registros.

NÚMERO DE REGISTROS REVISADOS:_____

DATOS PERSONALES		UBICACIÓN GEOGRÁFICA		DOSIS APLICADAS	
Variable	Total de registros con errores o sin el dato	Variable	Total de registros con errores o sin el dato	Variable	Total de registros con errores
Unidad		Departamento de residencia		Vacuna <1 año	
Sexo		Municipio de residencia		Vacuna 1 - 4 años	
Fecha de Vacunación		Departamento de vacunación		Vacuna adicional (DT, Salk)	
Fecha de la cita		Municipio de vacunación		Vacuna A	
Otro dato		Localidad de vacunación			
		Teléfono			
TOTAL					

- **Process**
- **Data quality**
- **Problems faced by users**

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GESTOGRAMA
Con la vacuna BCG que protege a los niños de las formas graves de tuberculosis (la meningia y miliar).
Comiendo alimentos nutritivos como: carnes, menudencias, leche, huevo, queso, leguminosas, frutas y cereales.
Tapándose la boca al toser.
No escupiendo en el suelo.
Ventilando y manteniendo limpia nuestra vivienda.
Apoyando a todo enfermo con tuberculosis para que cumpla el tratamiento hasta su curación.
La Tuberculosis se puede curar
Movilizados por el Derecho a la Salud y la Vida
LLACASA
YPICHULLO
HUATCHIL
2008
2009

Open Research Questions

- Impact of EIR on program performance in different settings
- Usefulness of data for performance monitoring
- Feasibility of implementation and maintenance
  - How to make sure that systems become institutionalized in the health system and are sustainable

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Registry Data for Research

While more research is needed, registries can also produce the data that is required for effective research into:

- Vaccine effectiveness
- Vaccine hesitancy
- Vaccine safety
- Equity
- Program efficiency

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Acknowledgments

- Countries of the Americas
  - In particular, immunization programs
- PAHO: Immunization, Health Analysis and Statistics and KMC
- WHO
- Partners (CIDA, CDC, BMGF, UNICEF, GAVI, TEPHINET, IMeCA, Optimize)

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Thank You!!

www.paho.org/immunization

Pan American Health Organization

World Health Organization
Americas