Assessing Electronic Immunization Registries: The PAHO experience

Pan American Health Organization (PAHO)

(with support from the World Health Organization)
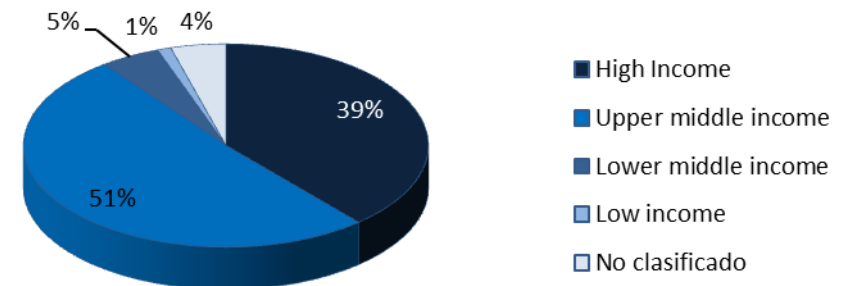
Utah, August 2018.

Outline

1. Background
Global and Regional Context: The PAHO Region

51 COUNTRIES AND TERRITORIES
15,251,000 ANNUAL BIRTH COHORT
992,139,000 TOTAL POPULATION
35 MEMBER STATES
12 MEMBER PARTICIPANTS
4 ASSOCIATED MEMBERS

Country population per income level*

5% 1% 4%

39%

51%

- High Income
- Upper middle income
- Lower middle income
- Low income
- No clasificado

*Source: UN Population Division. Population of 35 Member States.
World Bank list of economies (July 2016)
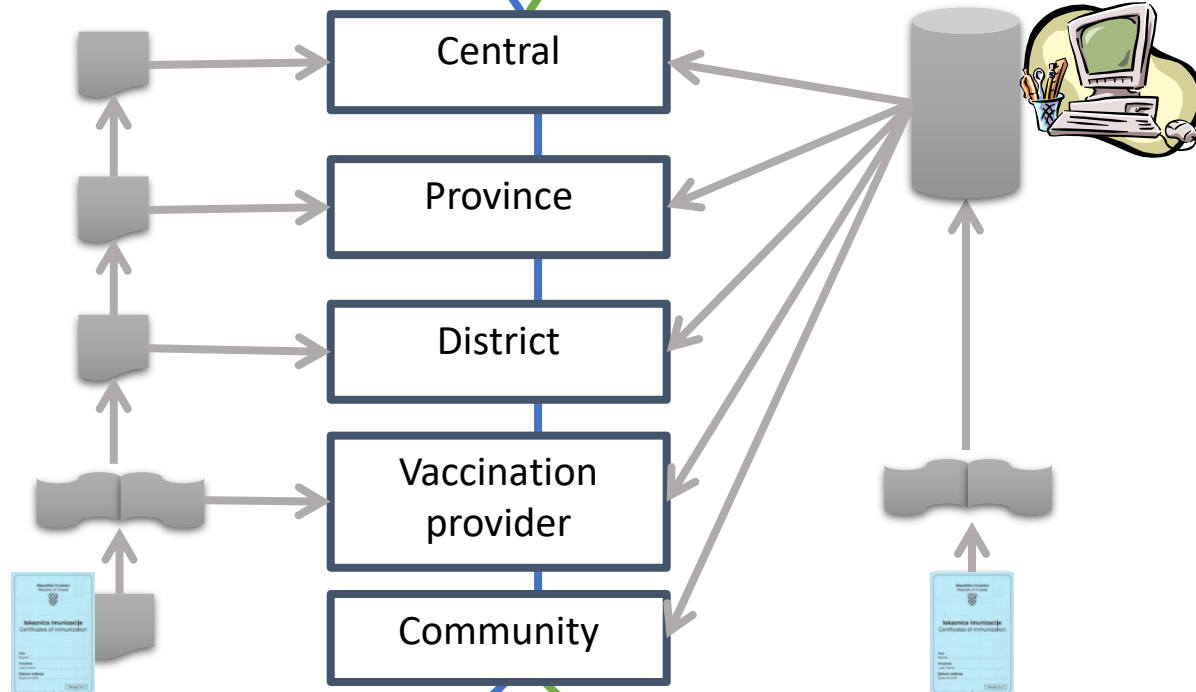
1. Background – Global and Regional Context
Immunization information systems

Paper-based aggregation → **Electronic immunization registries (EIRs)**

Data entry of monthly reports into some tool (Excel, others)

Aggregated paper monthly reports

In-health facility paper registries and tally sheets

Central

Province

District

Vaccination provider

Community

- Population based, individual data
  - Individual's identification, contact, characteristics
  - Individual's immunization history
  - National or subnational

Tally sheets, reports

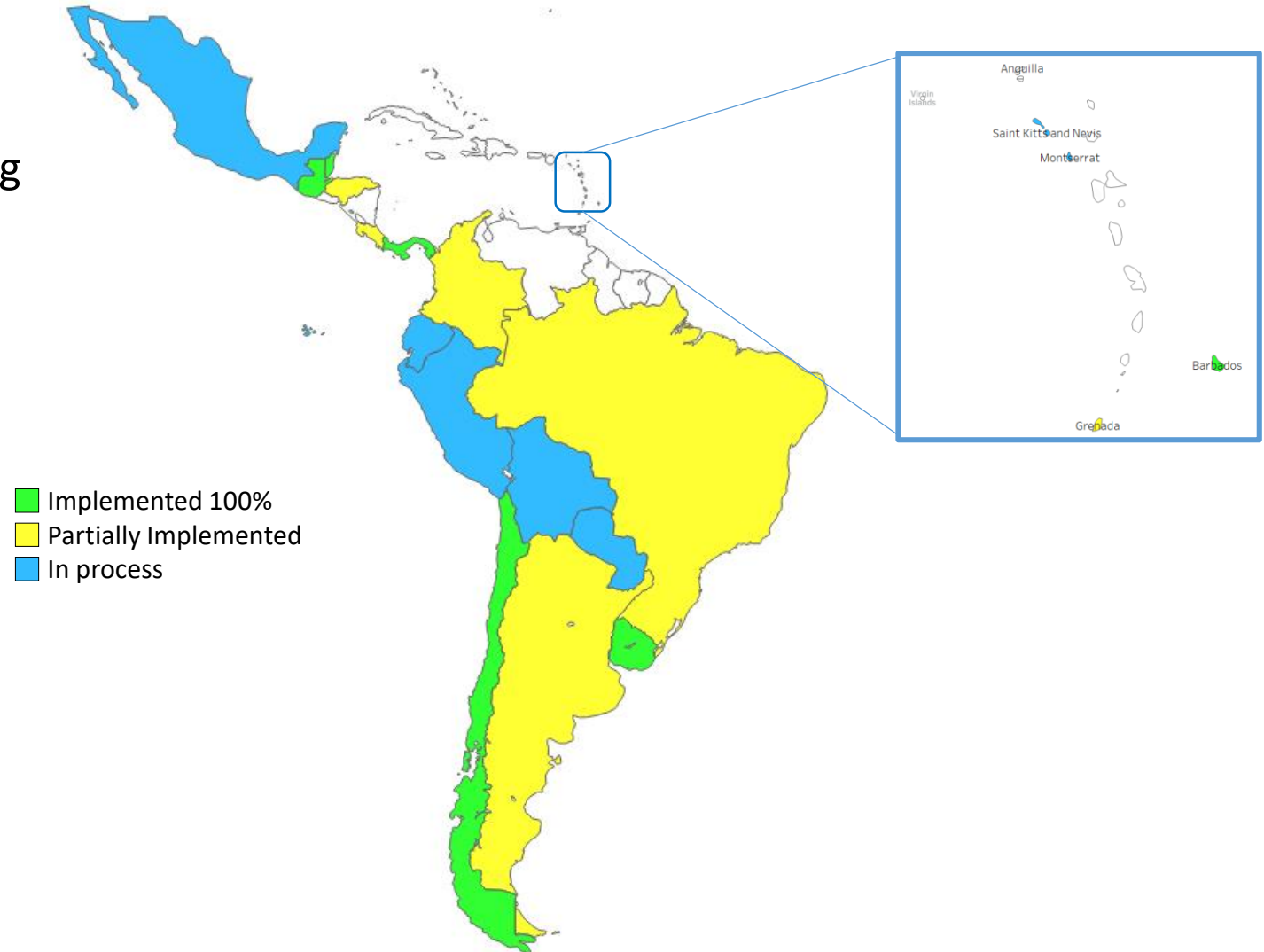HMIS
(Image: HISP/DHIS2)

Immunization registry

Immunization card

EIR
(photo: BID Initiative)

1. Background – Current Implementation of EIRs in Latin America and the Caribbean (LAC)

- Patient / person registration, as close to vaccination as possible in time and place
- Registration of vaccinations and scheduling
- Planning / defaulter tracking
- Recalls/ reminders
- Coverage estimation
- Monitoring
  - Inequalities (disparities)
  - Vaccination timeliness
  - Vaccination coverage by birth cohort
  - Refusals
  - Adverse events following immunization
- Inclusion of vaccines and supplies
- Clinical decision support for immunization
- Notice board (or bidirectional communication)

Implemented 100%
Partially Implemented
In process

1. Background – PAHO Technical Cooperation on Data Quality and Use

Data quality and use

Human Resources

Processes

Tools

Governance/Sustainability

Country ownership

Facilitating processes and documentation of experiences

Peer-to peer-learning

Working WITH countries

Regional standards and definitions
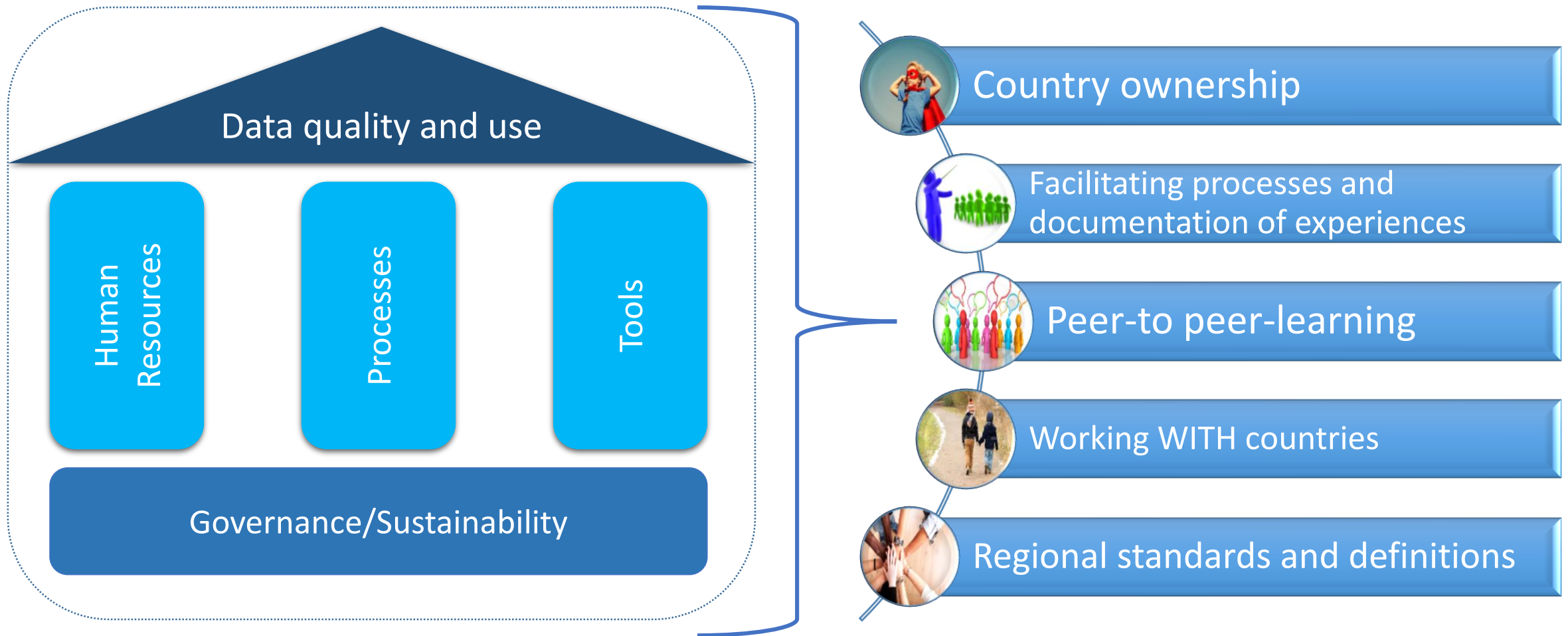
2. Objectives for a methodology to assess EIRs in LAC

- Low and middle-income countries (LMICs) are quickly moving towards using electronic immunization registries (EIRs).

- There is limited guidance and no standard methodology on how to assess the EIR quality and usefulness, nor to gauge progress on EIR implementation.

- To assess EIRs in Latin America and Caribbean (LAC), adopted a methodology nicknamed "DQS Plus".

  - The World Health Organization (WHO) data quality self-assessment (DQS) is a commonly used tool to assess immunization data quality in LMICs, but used for information systems that produce aggregate immunization data

3. Approach

In 2014, PAHO:

- Reviewed available tools to assess IIS:
  - Literature review
  - Review of the performance of Routine Information System Management (PRISM) framework
- Convened an ad hoc working group
- Agreed on a methodology nicknamed DQS Plus
  - It is an adaptation of the DQS tool, used in Latin America/the Caribbean since 2005 that adds elements from the PRISM methodology
  - It was informally tested by the Health Secretariat of Bogota (in Colombia)

DQS plus was used in countries:

- Panama in 2014 and Honduras in 2015, and
- In Grenada in 2018 (experience not included here)

3. The DQS Tool

1. Data desk review
2. Workshop and pilot testing to adapt questionnaires
3. Field work
4. Consolidation of results and report writing, formulation of recommendations
5. Presentation of findings and recommendation to national authorities
6. Plan of action (usually integrated to other national plans)

Recommendations

Team work

Analysis of results

National level
Subnational level
Local level
- Quality
- Accuracy
- Completeness
- Timeliness

Tools applied

To see how the system works in the field

Questionnaire edits

Team work

Pilot test

Questionnaires design
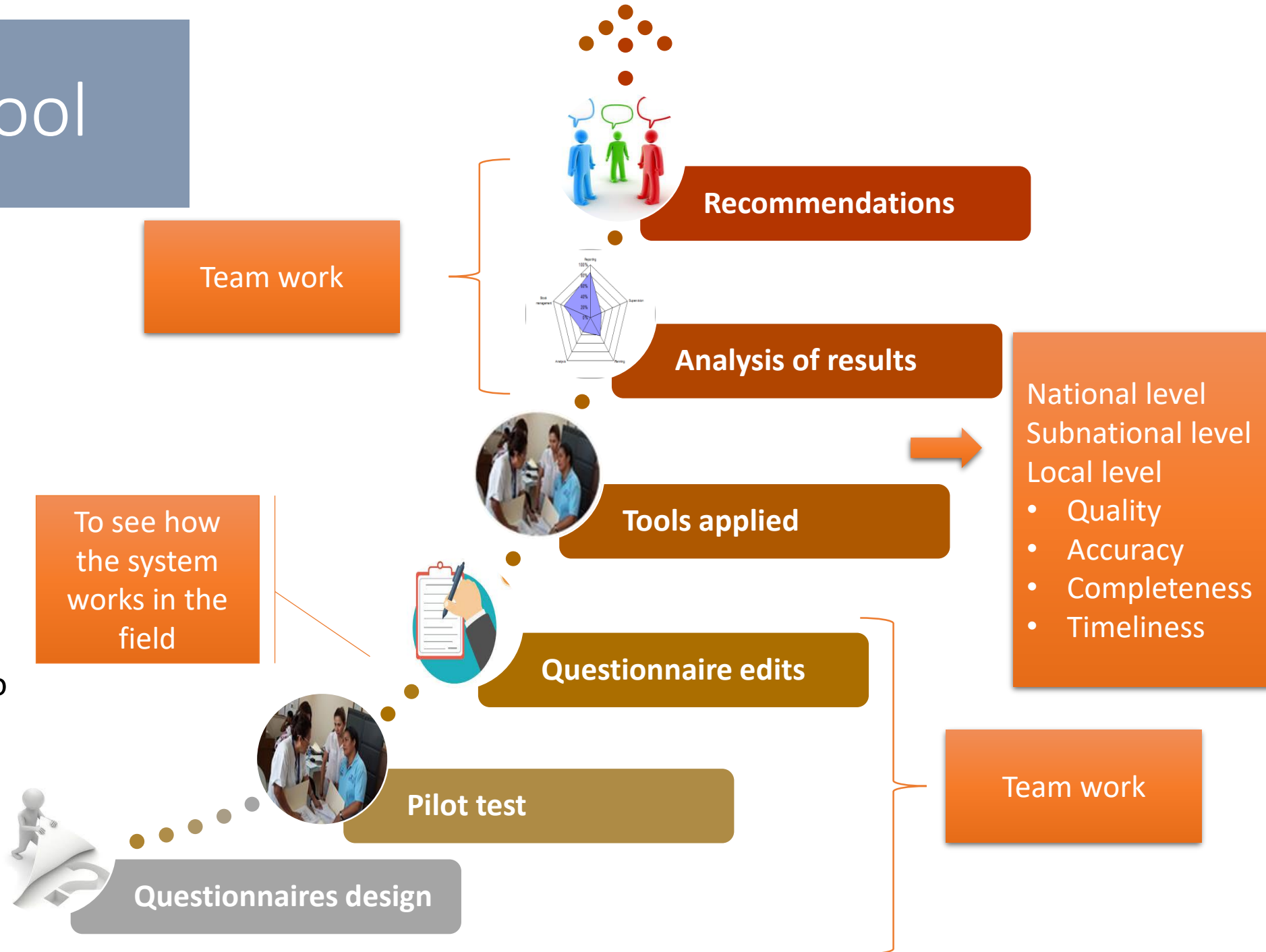
3. What is added to the DQS Plus

1. System Scope

- Included population (children, adults, risk groups)
- Routine program, supplementary immunization activities (SIAs), vaccines not included in the regular immunization schedule, but that may be used (e.g. By the private sector, for risk-groups, etc.)
- How is the EIR to be used during outreach activities
- Are historical vaccination histories to be included?
- Previous cohorts (from paper or electronic systems)
- Vaccination history of new people as they are being added into the EIR

2. Normative and Legal Context

- National eHealth strategy in place
- EIR system compliance with national norms
- Mandatory use of the EIR (including private and other sectors)
- Legislation framework for data privacy and confidentiality

Note: In LAC, EIR development, implementation and maintenance approach varies from in-house (MOH) to outsourcing

3. Architecture

- Integration with other health information systems
- Integration with birth registration or civil registration systems
- Integration with other EPI information systems
- Software type; database type
- Online – offline options
- Periodicity of data updates and database synchronization
- Location of the database (where are the servers)
- Technical specifications for computers to have the system
- Inclusion of a module for Short Message Service (SMS) or linkages with mHealth

3. What is added to the DQS Plus

4. Maintenance and Sustainability
- Information management (responsible institution or department)
- Plan for scale-up and capacity (hardware, software, telecommunication)
- Data security (backup protocols, etc.)
- Management of software updates and improvements
- Management of errors or users' questions (helpdesk and troubleshooting)
- Documentation up-to-date
- Financial plan for maintaining the EIR

5. Human Resources
- Profile of data entry personnel
- Profile of personnel responsible for validating the data and monitoring potential duplicate records
- Profile of software developers
- Profile of trainers
- Profile of personnel in charge of maintaining hardware and telecommunication infrastructure
- Profile of database administrator(s)
- Support (Helpdesk)

6. Modules Included in the System
- Immunization registry (recording of vaccines given)
- Logistics and supply chain management
- Cold chain inventory
- Surveillance of adverse events following immunization (AEFI)
- Vaccine-preventable disease (VPD) surveillance
- Training module
- Other modules

3. What is added to the DQS Plus

7. EIR functionalities

- Following individual vaccination schedules
- Coverage/ vaccine administration monitoring
  - By age
  - By condition (pregnancy, chronic diseases, etc.)
  - By geographical area
  - By ethnicity/minority group
  - By health facility vaccinating
  - By vaccinator
  - By health system affiliation (social security, insurance, etc.)
- Tracking of vaccine lot number
- Recall/reminders (automated generation)
- Reports
  - Ad hoc reports
  - Pre-defined reports

- Validation modules (monitoring errors – logical or against EPI norms)
- Duplicate management (de-duplication protocols)
- Georeference data and map generation
- Access for external users (e.g., Parents, users)
- Communication between EPI and EIR users (unidirectional or bidirectional)
- Information dissemination
  - Public
  - Health workers
- Clinical decision support for immunization

4. Results

Overall

✓DQS Plus was easily implemented

✓The time and human resources needed remained almost the same as for a regular DQS

    ✓Including an information system specialist to the team was needed

✓It allowed making actionable recommendations

✓Limitations relate to lack of agreed upon standards

4. Results

Panama (main findings)

- User satisfied with *Software PAI* (national EIR), since its inception in 2007
  - It saves time for data reporting
- Several shortcoming were identified in *Software PAI*
  - Not used by all sectors (SS, Privates)
  - Missing key EIR functionalities
  - Lack of integration with other systems
  - Limited infrastructure at all levels
  - Risks regarding sustainability

DQS Plus results from Panama, 2014

Quality index Health facilities Region 1

	YES	NO	%	
Health Facility	197	100	66%	IC
Availability of Hardware	72	33	6.9	
Infraestructure	41	43	4.9	
Human Resources	48	24	6.7	
Data Collection	36	0	10.0	

Quality index Health facilities Region 2

	Si	No	%	
Health Facility	477	120	80%	IC
Availability of Hardware	195	21	9.0	
Infraestructure	96	72	5.7	
Human Resources	114	27	8.1	
Data Collection	72	0	10.0	

Quality index Health facilities Region 3

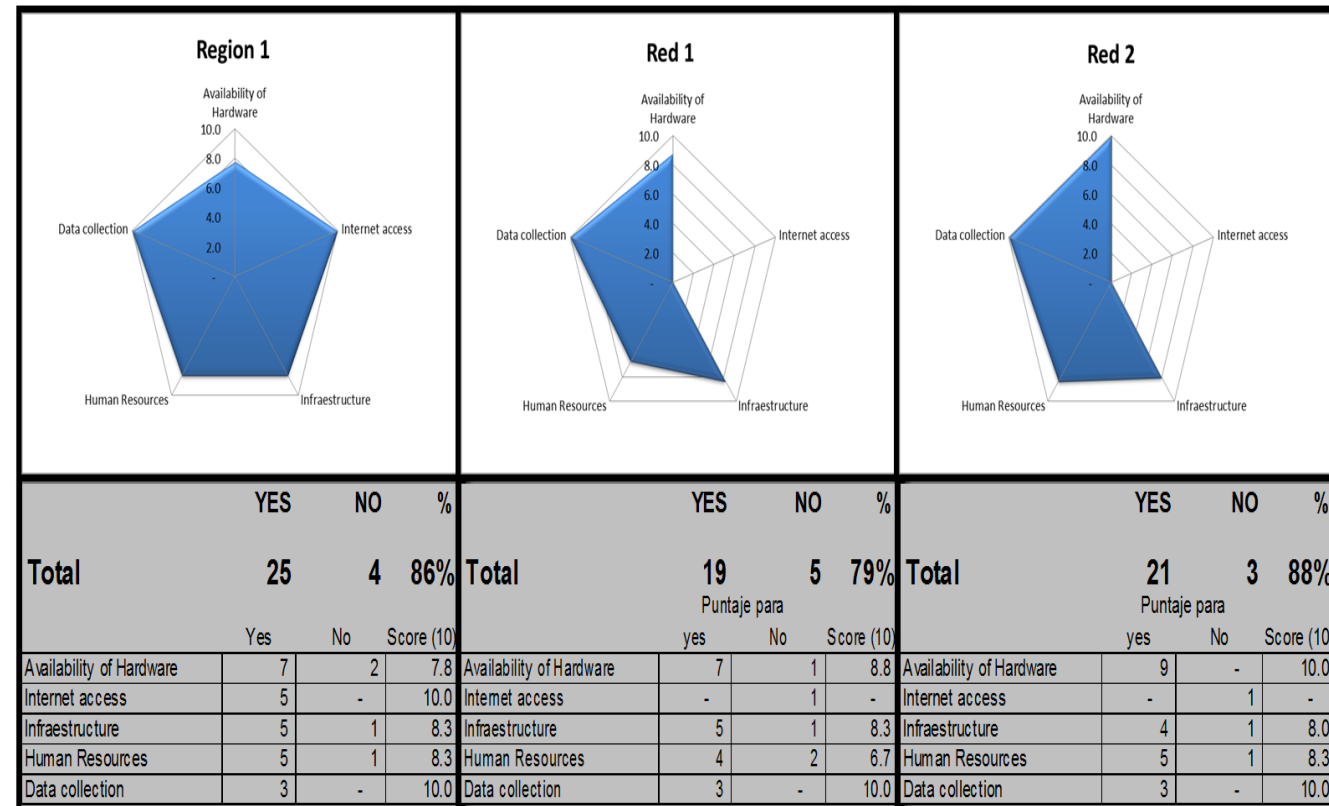|	Si	No	%	
Health Facility	429	156	73%	IC
Availability of Hardware	186	21	9.0	
Infraestructure	84	84	5.0	
Human Resources	93	51	6.5	
Data Collection	66	0	10.0	

4. Results

Honduras (main findings)

- EIR is being used in 6 out of 20 health departments [by the time of the assessment].

- Several shortcoming were identified in *SINOVA*

  - Limited infrastructure

  - Limited human resources for data entry and to support, maintain and troubleshoot of the system.

  - Not yet used by all sectors (SS, Private sector) and all health facilities

DQS Plus results from Honduras, 2015

Region 1	YES	NO	%
Total	**25**	**4**	**86%**

	Yes	No	Score (10)
Availability of Hardware	7	2	7.8
Internet access	5	-	10.0
Infraestructure	5	1	8.3
Human Resources	5	1	8.3
Data collection	3	-	10.0

Red 1	YES	NO	%
Total	**19**	**5**	**79%**

	Puntaje para		
	yes	No	Score (10)
Availability of Hardware	7	1	8.8
Internet access	-	1	-
Infraestructure	5	1	8.3
Human Resources	4	2	6.7
Data collection	3	-	10.0

Red 2	YES	NO	%
Total	**21**	**3**	**88%**

	Puntaje para		
	yes	No	Score (10)
Availability of Hardware	9	-	10.0
Internet access	-	1	-
Infraestructure	4	1	8.0
Human Resources	5	1	8.3
Data collection	3	-	10.0

5. Next Steps

PAHO vision and proposed next steps (1/2)

- Leverage data monitoring and evaluation
  - Equity (through assessing disparities)
  - Routine immunization
  - Vaccination campaigns
- Leverage data quality monitoring and evaluation
  - Data quality self-assessments (DQS)
  - DQS + External reviews of the Expanded Program on Immunization (EPI)
  - DQS plus
  - Data quality review as part of routine supervision
- Share lessons learned
  - Among countries in the Region of the Americas
  - With other WHO Regions
  - With partners

PAHO vision and proposed next steps (2/2)

- Support countries with their decision-making processes, design, testing, implementation, and M&E of their EIR
  - Leverage the use of the EIR guidance document
  - Pilot the use of the EIR guidance document
  - Build on existing networks to establish communities of practice
- Document experience, lessons learned and best practices for regional and global dissemination
- Support and document experiences with mHealth use and individualized registries
  - For data entry and/or for automated recall/reminders
- Support intersectoral and interprogrammatic work to ensure data quality and use in a sustainable manner.

Pan American Health Organization

World Health Organization

REGIONAL OFFICE FOR THE Americas

Thank you!

www.paho.org/immunization

EXTRA SLIDE – 3. The DQS Tool

1. Data desk review
   - Numerators and Denominators
   - Information system (legal framework, design, Standard Operating Procedures, data collection forms, data flow, tools, etc)
   - Advances from previous DQS
2. Workshop and pilot testing to adapt questionnaires
3. Field work
   - Visits to health facility, sub-national health departments
     - Data verification, interviews with vaccinators/data entry persons/ local authorities
   - National interviews (Immunization program, Statistics/ Epidemiology Department, Stakeholders)
4. Consolidation of results and report writing, formulation of recommendations
5. Presentation of findings and recommendation to national authorities
6. Plan of action (usually integrated to other national plans)