Immunization surveillance and data collection

Immunization modules integrated into the national health information system

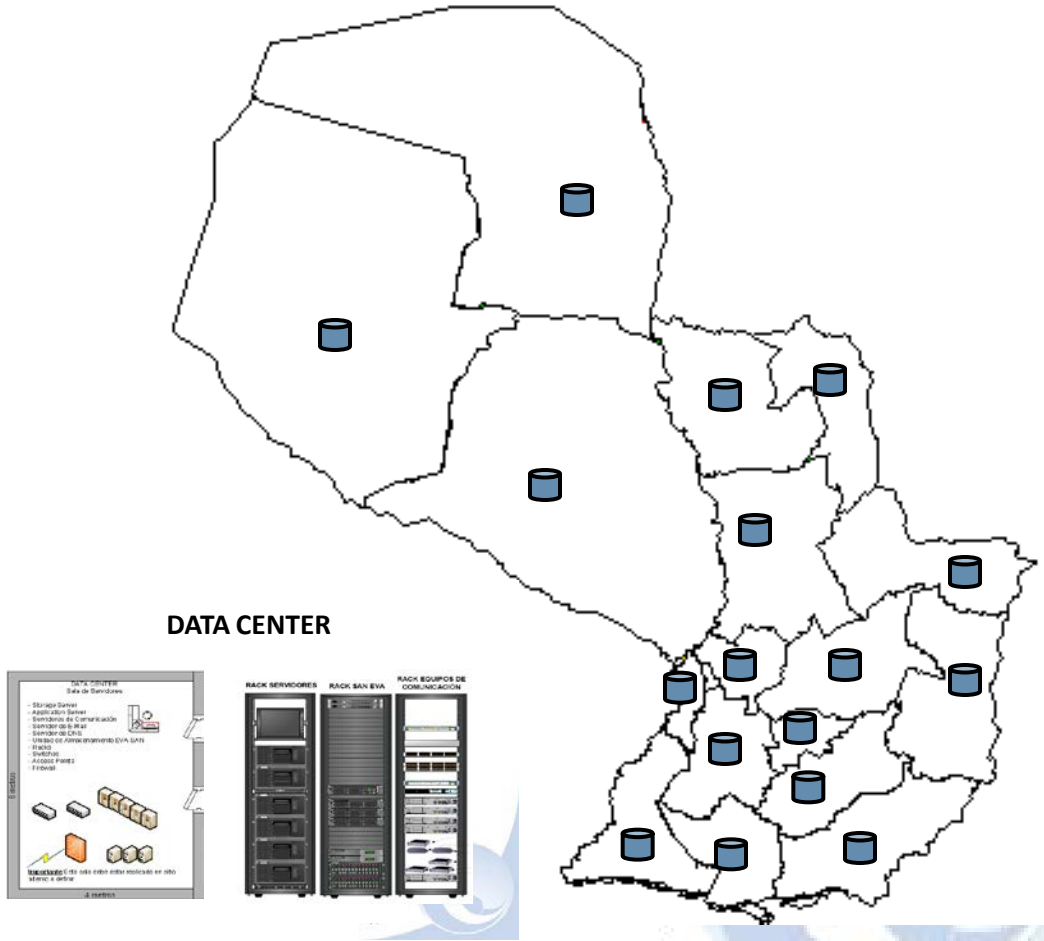
Meeting of the American Nominal Immunization Association

St. Paul, MN 19-20 September 2012

- Background of the Expanded Program on Immunization (EPI) information system

  Where are we?

- National Level: General Directorate for Strategic Health Information
- Regional Level: 18 sanitary regions (17 departments + 1 capital district)
- Municipal Level: 240 municipalities with about 1,800 health centers that vaccinate a total of 6.3 million people



The current EPI information system

- Operates three separate non-integrated sub-systems:
  - Coverage surveillance sub-system: PAI-Visual
  - Vaccine-preventable disease (VPD) surveillance sub-system: ISIS for polio and measles/rubella and database in Excel
  - Vaccine and syringe logistics sub-system: VSSM

Flow of information

Local Level
(Position/Health Center/All sectors)

- Vaccine registration on pre-determined forms by variables of:
  - Age
  - Gender
  - Vaccine
  - Dose
  - Residence municipality

District Level
(Head District)

- Consolidates data in pre-determined forms and entered on the PAI-Visual system by variables of:
  - Age
  - Gender
  - Vaccine
  - Dose
  - Residence municipality
  - Vaccination center

Regional Level

- Consolidates municipal data in the database: PAI Visual Software. Maintains all consolidated variables

Central Level
(EPI Office)

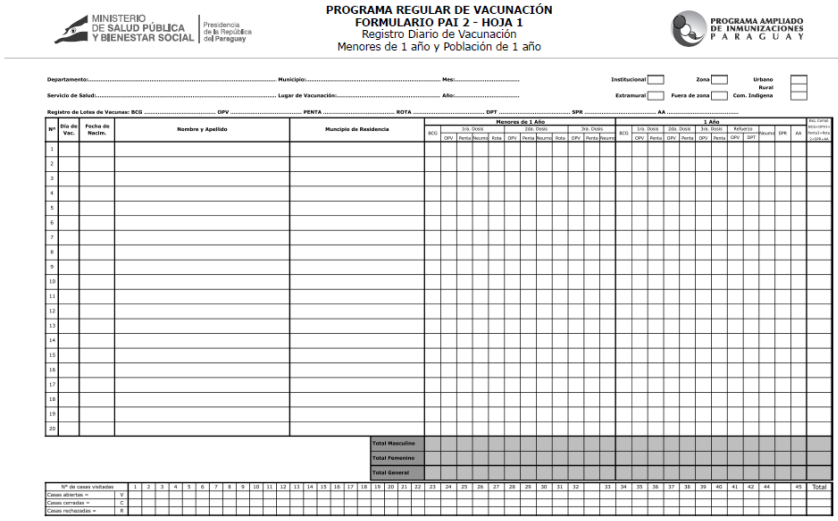
- Receives information in DBF format via internet, consolidates the national information, maintaining the variables of the data loaded. Municipalities are assigned the vaccinated population in other municipalities

The loading of data into the PAI-VISUAL System is performed on a weekly basis from Sundays to Mondays.
The report is completed monthly.

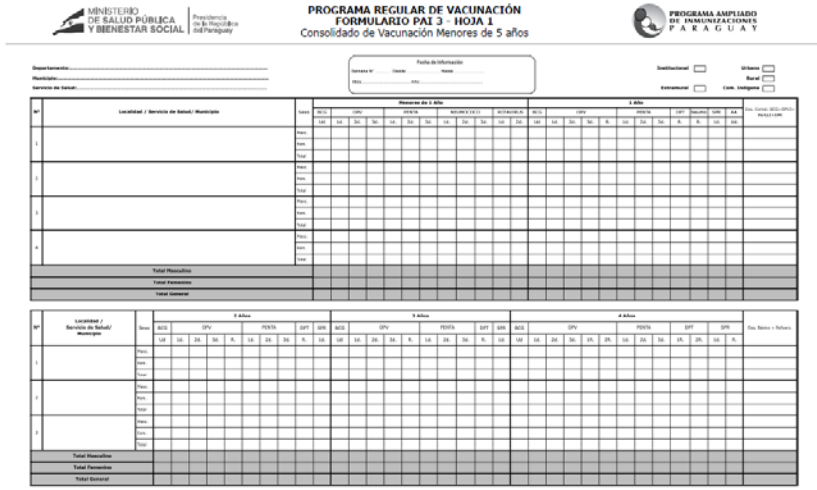
Local level: data collection

Health Services

U.S.F P.S. C.S. I.P.S.



Aggregate data are sent on a weekly basis to the head district



Daily registry according to Variables:

- **Age**
- **Gender**
- **Vaccine**
- **Dose**
- **Residentcemunicipality**
- **Municipality (outside of area)**

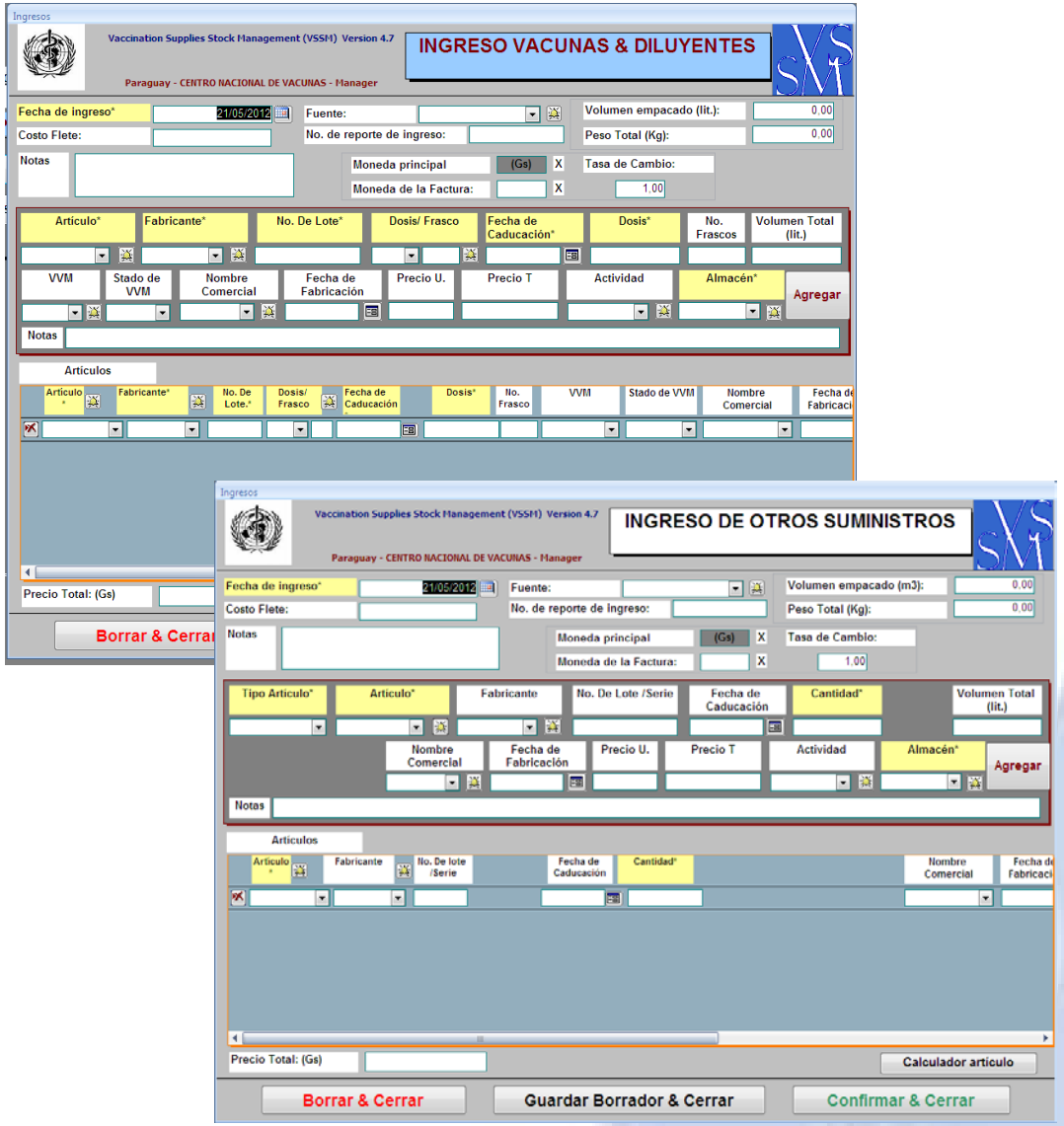
Removes data of people vaccinated living in other municipalities (outside of area)

VPD Surveillance

- Until the late 90s: reported through the service system borrowed from the Ministry of Public Health's Statistics Dept.
- Late 1990: began monitoring indicators through PESS and MESS, the other VPD on an Excel database
- 2012: implemented ISIS system for diseases subject to eradication and elimination (Polio, measles/ rubella)
- Diseases under control : cards are sent to the EPI and entered into an Excel database
- New vaccines: operates in sentinel sites (VIMENE) using software VINUVA

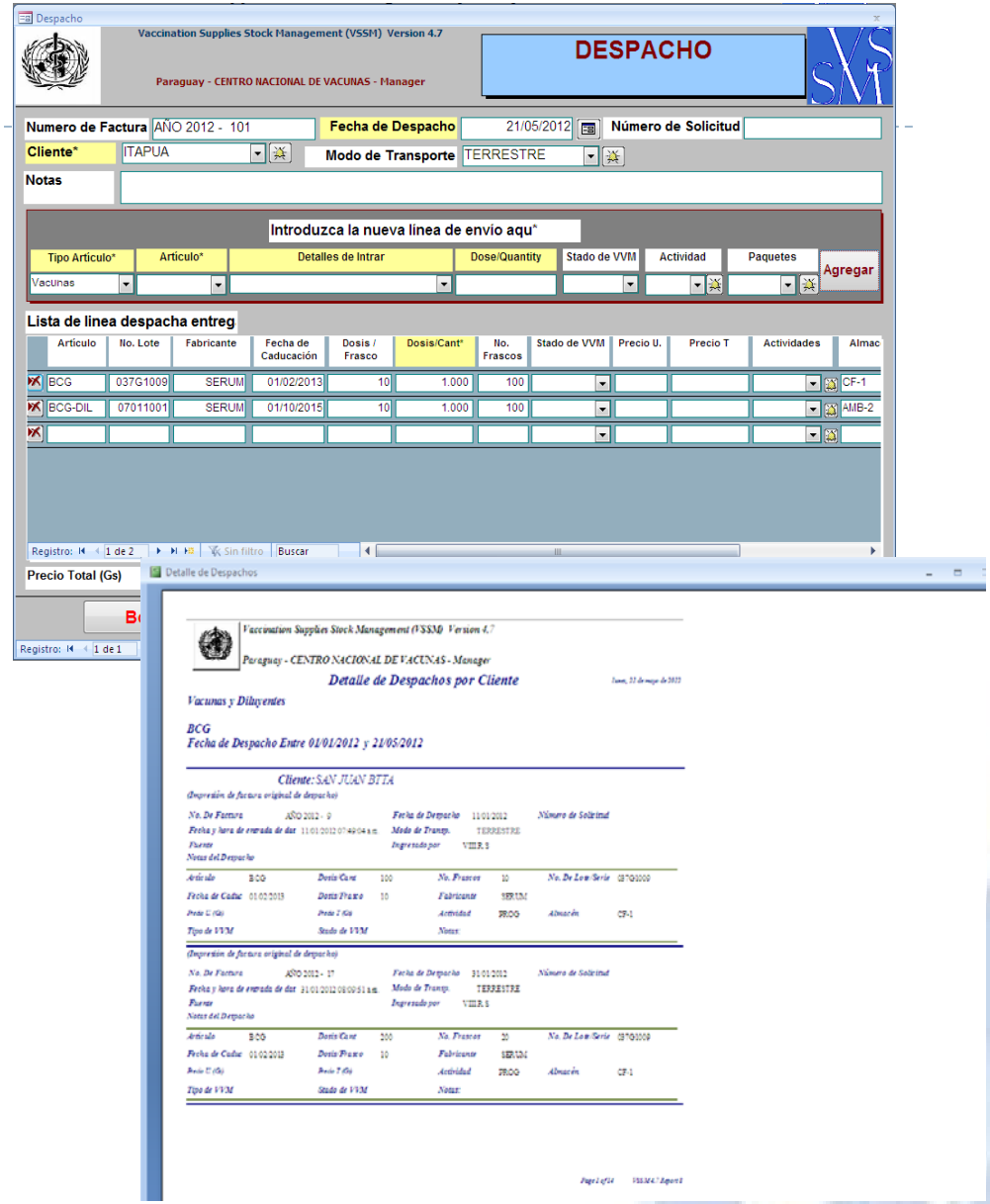
Monitoring vaccine and syringe logistics

- Until 2010: monitored vaccines and supplies through Excel spreadsheet
- 2010: implemented the Vaccine Supplies Stock Management – VSSM
- 2011: evaluated the implementation and operation of the VSSM



Logistics subsystem

- The VSSM allows:
  - Monitoring and tracking vaccines from arrival in the country to the regional levels
  - Include new vaccines
  - Maintaining updated stock of vaccines and syringes in real time
  - Check items available
  - Issue alerts for shortages and expiration risks
  - Maintains the movement of biologicals updated (maximum and minimum)

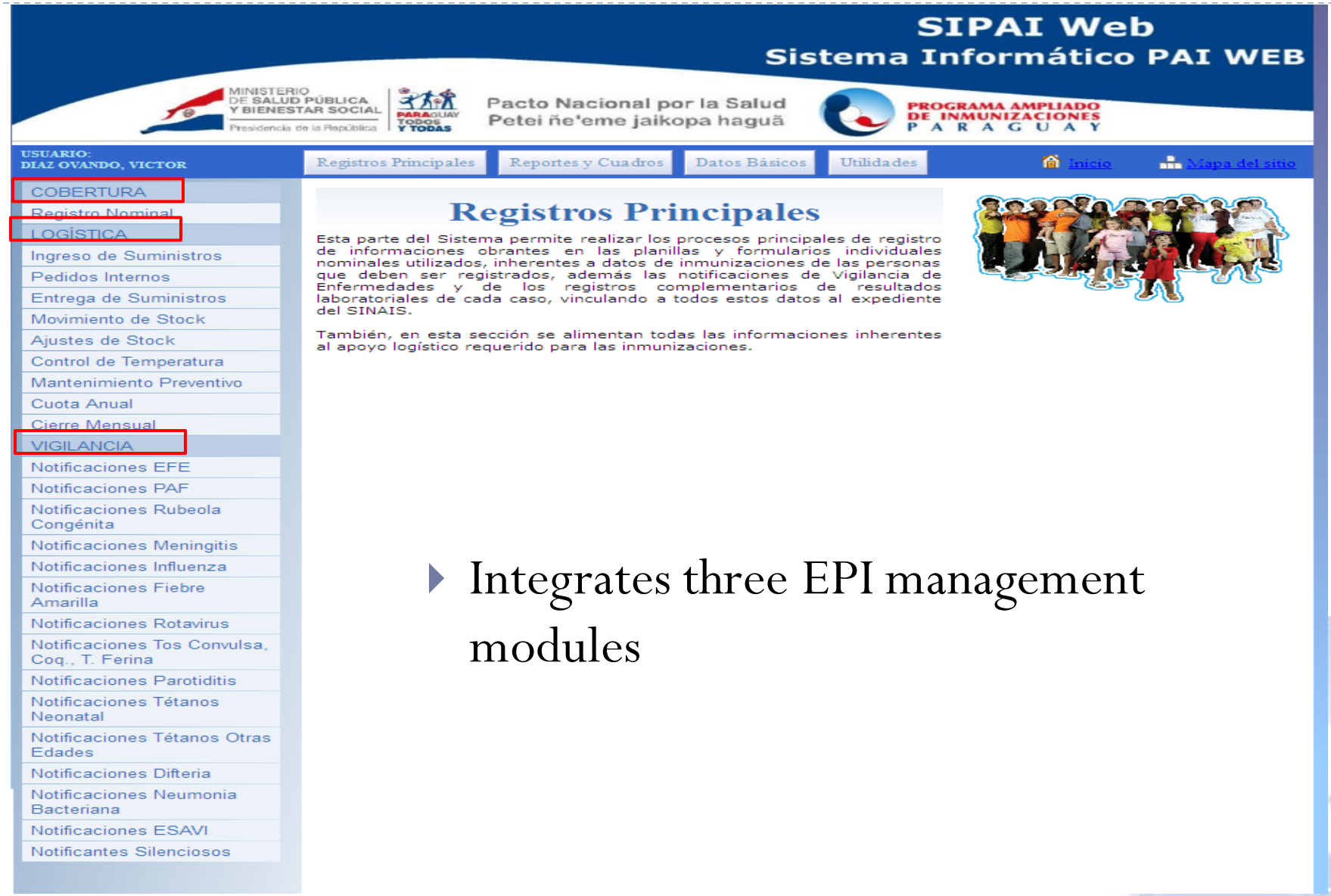


Limitations

- Systems that do not operate in an integrated manner
- Duplicated information
- Lack of technology and training at all levels, limited by the number of systems that operate at once
- Different data flow

- Nominal Immunization Information System Where are we headed?

National Nominal Immunization Information System



- Integrates three EPI management modules

Characteristics of the EPI National Nominal Immunization Information System

- Integrated to National Health Information System (SINAIS)
- Real time information
- Features a unique ID
- Identifies if you have insurance (public, private)
- Protected by the Vaccine Act 4621/12

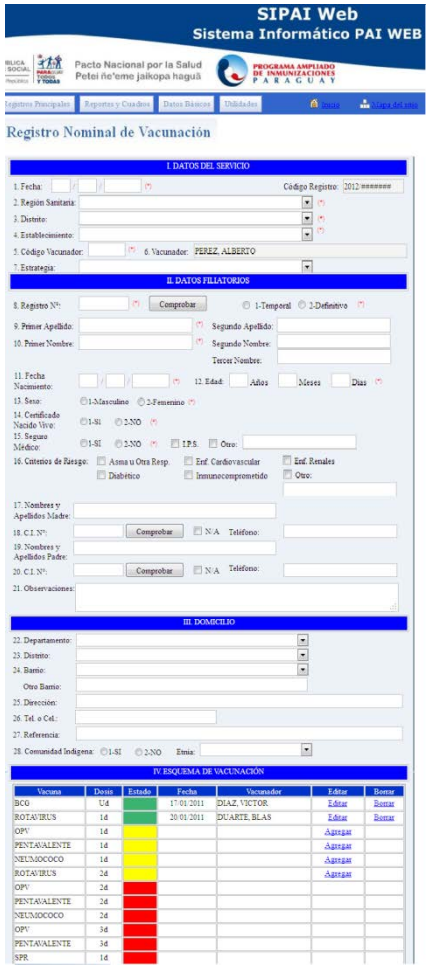
- Interface Software: Authentication and authorization method for unified access to the Application
- Communication Interface: Uses a browser and relational database centralized in the Ministry of Public Health
- Programming Language: open and free (PHP, JavaScript, AJAX, Xajax, Jquery)
- Application Server: APACHE
- Database: Postgres SQL
- Server Operating System: DEBIAN

Immunization Registry Module

- Nominal immunization registry, designed in a Web environment
  - It allows monitoring the vaccination history of each user through a single people registry.
- Enables three gateways:
  - Person with a history of previous vaccination who attended the health service for a different reason
  - Person attending a vaccination center
  - Person vaccinated at home or permanent outreach post
- The registry allows:
  - Adding vaccinated people (previous dose, other countries)
  - Unsubscribe people from the system (deaths and migration)

Entering the user into the information system

Registration of vaccine administered in the session



IV. ESQUEMA DE VACUNACIÓN

Vacuna	Dosis	Estado	Fecha	Vacunador	Editar	Borrar
BCG	Ud		17/01/2011	DIAZ, VICTOR	Editar	Borrar
ROTAVIRUS	1d		20/01/2011	DUARTE, BLAS	Editar	Borrar
OPV	1d				Agregar	
PENTAVALENTE	1d				Agregar	
NEUMOCOCO	1d				Agregar	
ROTAVIRUS	2d				Agregar	
OPV	2d					
PENTAVALENTE	2d					
NEUMOCOCO	2d					
OPV	3d					
PENTAVALENTE	3d					
SPR	1d					
NEUMOCOCO	1r					
OPV	1r					
DPT	1r					
AA	Ud					
OPV	2r					
DPT	2r					
SPR	1r					
ANTI-INFLUENZA	1d					
ANTI-INFLUENZA	2d					
ANTI-INFLUENZA	1r					
ANTI-INFLUENZA	2r					
TD	1r					
TD	2r					

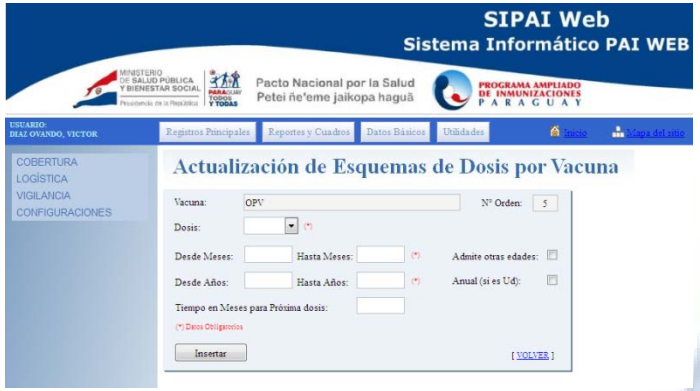
cuerpo

Agregar Otras Vacunas | Filtrar: | Filtrar Datos

(*) Datos Obligatorios

Guardar Datos

[VOLVER]



Vaccine Module Reports

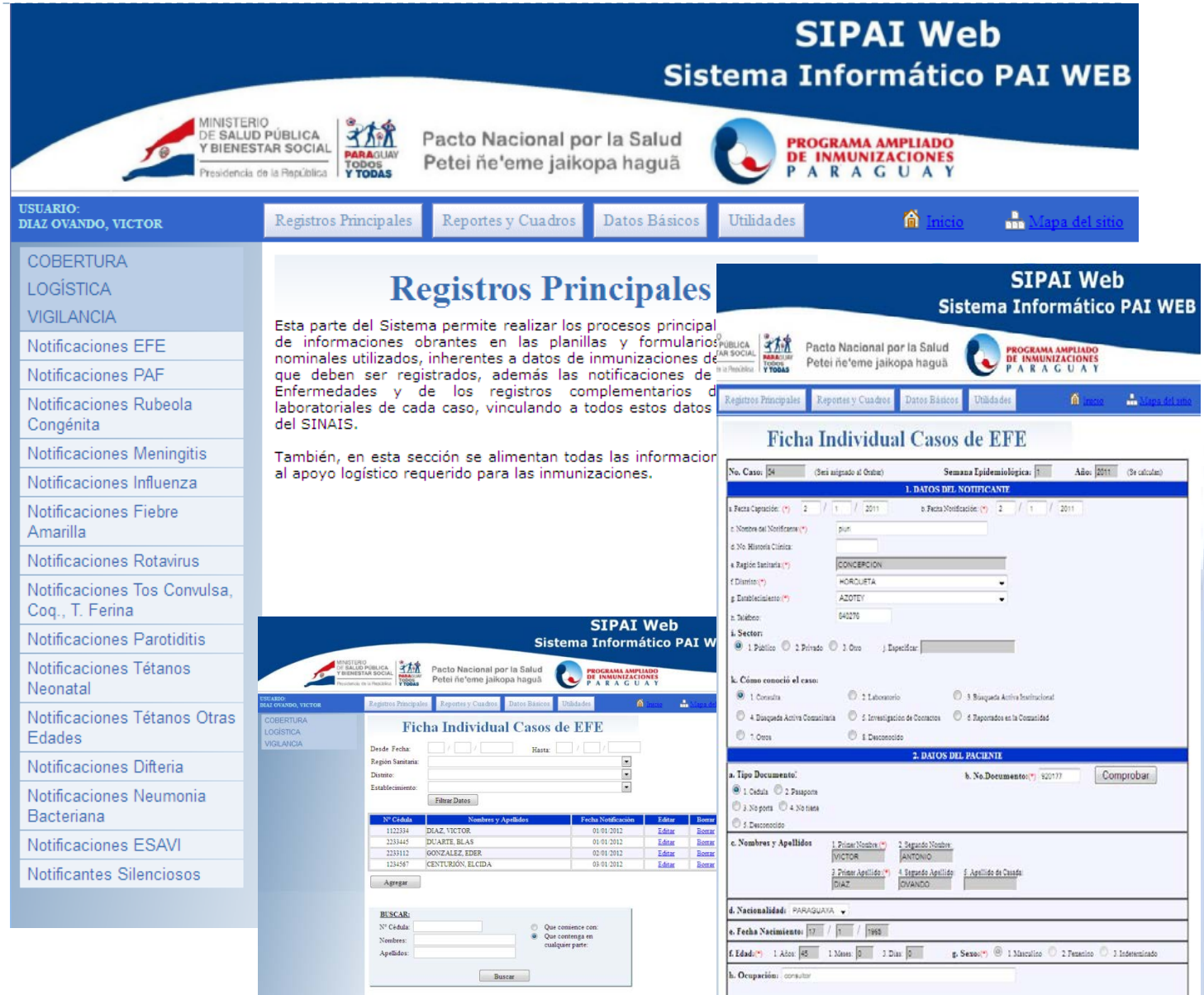
- Vaccination coverage of all vaccines by:
  - Vaccines
  - Dose
  - Age groups
  - Gender
  - Type of areas (urban, rural)
  - Ethnicity
  - Place of residence (by communities, neighborhoods)
  - Risk criteria
  - Type of strategy, vaccinator, other.
- Drop-out rates
- Children with complete schedules
- Defaulters
- Municipalities and areas with low coverage

Characteristics of vaccine module reports

- Compilation of configurable and automatically generated statistical tables
- Customized statistical graphs based on the frequency table configured for the system.
- All questions, reports, and charts can be viewed through the screen, printed by Web browsers, exported to an electronic form, PDF documents and/or copied on a word processing or presentation software.
- The coverage is shown in maps.

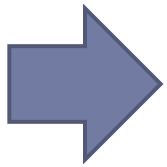
VPD and Adverse Reaction (ESAVI) Surveillance Module

- Based on ISIS and integrates the previous data reported to the system:
  - Reporting unit
  - Demographic data
  - Vaccination history



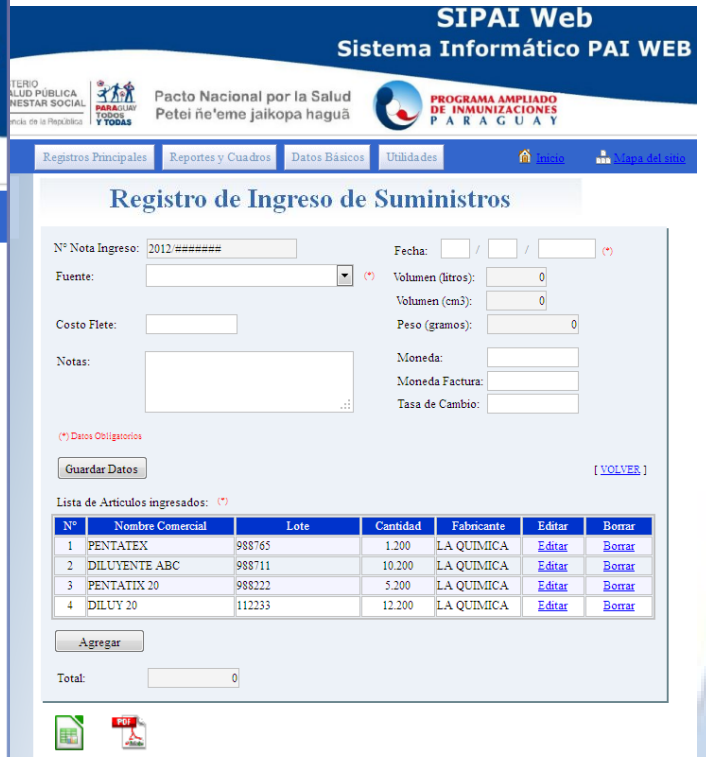
Surveillance Module Reports

- Surveillance indicators
- Silent municipalities
- Data from the investigation
- Intervention conducted
- Laboratory results
- Final classification of the case



- Measles and rubella
- Acute Flaccid Paralysis (AFP)
- Diphtheria
- NNT / Tetanus other ages
- Pertussis
- Yellow fever
- Hepatitis B
- Rotavirus
- Meningitis and bacterial pneumonias
- ESAVI

Logistics Module for Vaccines and Syringes



Final considerations

Next steps

- Complete the process of adjustments and tests
- Train regional and local human resources
- Initiate a process of gradual implementation of the system, maintaining the current system (PAI-Visual)
- Conduct verification and control of data
- Supervise
- Implement at the nation level

System limitations

- It is not comprehensive
- Need updated equipment at all levels
- Requires permanent Internet connection
- The bandwidth is limited in some locations
- Requires skilled human resources
- Should complete a period of transition until implemented at the national level

- Thank you

www.mspbs.gov.py/pai