Albania pilots an immunization information system

The Albanian Ministry of Health, in collaboration with project Optimize, developed a registry-based immunization information system (IIS) and piloted it in Shkoder district. This leaflet illustrates how the data the new system produces is used to improve the management of the vaccination program, how it is changing the way people collaborate, how it ensures timely and equal access to immunization for all children, and how it reduces the administrative burden on staff.

Before IIS, nurses made monthly lists of children due to be vaccinated by reviewing the health center's paper-based immunization registries. They used these lists to schedule the vaccinations, notify parents, and determine how much vaccine to order. They then recorded every vaccination on up to six forms and registers. At the end of each quarterly period, nurses produced vaccination coverage reports, and sent these to the district head of vaccinators, who reviewed and aggregated them.

Planning the month's vaccinations
A nurse examines her immunization registers to determine which children need to be vaccinated the following month.

Collecting the required vaccines
A nurse receives the vaccines for the month's planned vaccinations from the district head of vaccinators.

Bringing vaccines to children
Health post vaccinators transport vaccines for the monthly sessions in their village.

Administering a vaccine
A child is given a check-up before being vaccinated. The nurse must fill out six different forms and registers for each vaccination encounter.

Determining vaccination coverage
A nurse consults her immunization registry to count each vaccination administered during the previous quarter to produce a coverage report.

Aggregating coverage data
The district head of vaccinators aggregates all health center coverage reports to determine the overall rate.

Why change?

Despite the hard work of health staff, some errors in data collection and reporting were inevitable. There was also no easy way to keep track of children who move to another area of the country. In addition, staff at the national level only received summarized data that wasn't helpful to manage and improve the program. For example, they only received aggregated coverage estimates by district, when what they needed to know was who the unvaccinated children were, which community they belonged to, where they lived, and why they had not been vaccinated. With the introduction of new and more expensive vaccines, there was also a desire to better control the distribution and administration of vaccines. Therefore, the Albanian Ministry of Health, in partnership with project Optimize, developed and implemented an immunization information system—IIS—to provide this management information, and also automate much of the nurse's administrative work.

How the work of health staff has changed

Data about newborns and their caretakers (typically parents or guardians) is now registered in a central database. As soon as children are entered into the system, a schedule of their future immunization appointments is generated. When appointments are due, the children are automatically included in the monthly plan of the health center responsible for the child. This removes the need for nurses to review their immunization registries to find children due to be vaccinated. Instead, nurses can use the monthly plan to organize their work. As caretaker details are stored by IIS, nurses can send text messages or call them to confirm their appointments. The monthly plan also calculates the total number of vaccine doses required, and this information helps nurses to determine the right vaccine quantities to order.

Child **Leandra**
Health Center **Hajmel**

Vaccine	Schedule	Preliminary Dates
HepB-Hib-DTP - 1	2 Muaj	07/06/2012
OPV - 1	2 Muaj	07/06/2012
Pneumo - 1	2 Muaj	07/06/2012
Pneumo - 2	4 Muaj	07/08/2012
HepB-Hib-DTP - 2	4 Muaj	07/08/2012
OPV - 2	4 Muaj	07/08/2012
Pneumo - 3	6 Muaj	07/10/2012
HepB-Hib-DTP - 3	6 Muaj	07/10/2012
OPV - 3	6 Muaj	07/10/2012
MMR - 1	1 Vjec	07/04/2013
DTP - R1	2 Vjec	07/04/2014
OPV - R1	2 Vjec	07/04/2014
MMR - R1	5 Vjec	07/04/2017
OPV - R2	6 Vjec	07/04/2018
DT - R2	6 Vjec	07/04/2018

A child's immunization schedule
IIS automatically generates the future immunization appointments for newborns entered into the system.

Consulting the monthly plan
A nurse signs in to IIS through a web browser to view her monthly plan.

Child	Caretaker	Vaccine	Vaccine Schedule	Preliminary Date	SMS	Data e Vaksinimit	Lot i Vaksines
Ariel Ibrahimi	Kujtim Ibrahimi	Hep-B-1	Ne Lindje	15/06/2004			
Ariel Ibrahimi	Kujtim Ibrahimi	BCG	Ne Lindje	15/06/2004			
Ariel Ibrahimi	Kujtim Ibrahimi	DTP-1	2 Muaj	15/08/2004			
Ariel Ibrahimi	Kujtim Ibrahimi	Hep-B-2	2 Muaj	15/08/2004			
Ariel Ibrahimi	Kujtim Ibrahimi	OPV - 1	2 Muaj	15/08/2004			
Ariel Ibrahimi	Kujtim Ibrahimi	DTP-2	4 Muaj	15/10/2004			
Ariel Ibrahimi	Kujtim Ibrahimi	Hep-B-3	6 Muaj	15/12/2004			
Ariel Ibrahimi	Kujtim Ibrahimi	DTP-3	6 Muaj	15/12/2004			
Ariel Ibrahimi	Kujtim Ibrahimi	FR-1	1 Vjec	15/06/2005			
Ariel Ibrahimi	Kujtim Ibrahimi	DTP - R1	2 Vjec	15/06/2006			

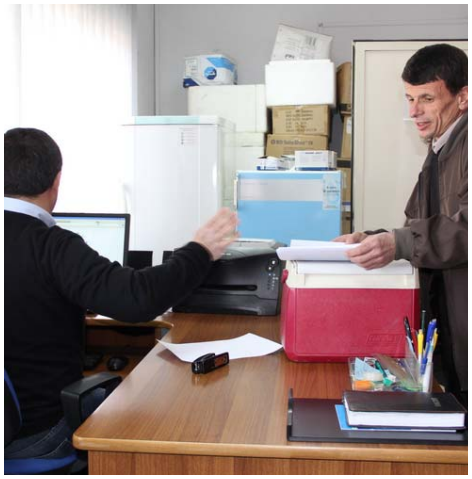
Vaccine Doses Required

Vaccine Code	Quantity
BCG	1
DT	2
DTP	35
DTPb	4
FR	2
Hep-B	3
HepB-Hib-DTP	30
MMR	36
OPV	70
Pneumo	30

How much vaccine is required?
The monthly plan groups all appointments for a nurse that month. The bottom box shows the vaccines that will be needed.

As children are vaccinated, nurses with access to a computer can update their immunization status directly into the monthly plan, by completing the vaccination date and the vaccine lot they used. Because IIS is also used for stock management, the system can show the lots every health center should have in store, and deduct their balance every time a nurse uses a certain lot for immunization.

The district head of vaccinators also prints out the monthly plans for every health center and health post, and distributes them to nurses together with the vaccines. In this way, nurses who don't have access to a computer can use the paper plan to organize their work and report back on the vaccinations they have administered, by taking note of the vaccination date and the lot they used in the columns provided on the form.



Distributing vaccines and monthly plans
A commune health center nurse receives his vaccines for the month from the district supervisor, together with the monthly plans for all the villages in his area.

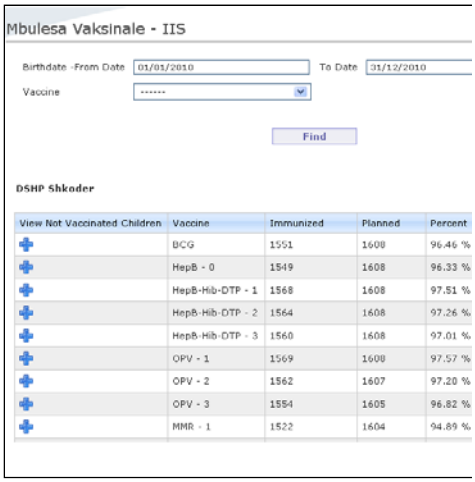
Distributing vaccines and a monthly plan
Together with the required vaccines, the health center nurse passes on a copy of the monthly plan to a village health post nurse.

Monthly report print-outs
The print-out of the monthly plan allows for the nurse to record the date and vaccine lot used for each vaccination.

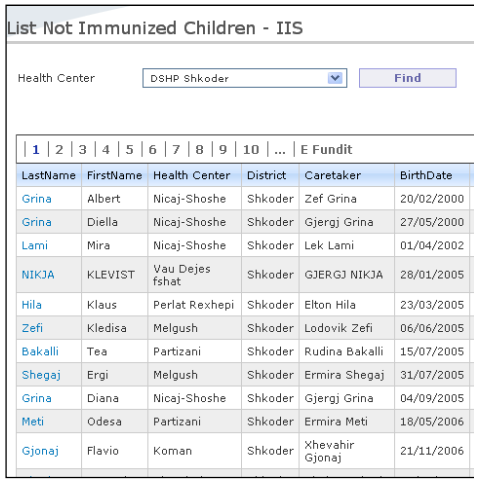
Of course, not every vaccination can be planned for, and so IIS enables nurses to retrieve and update the vaccination records of any child in the system, for example using the 10 digit national identification code of the mother, or the child's name or date of birth. Children who move within Albania can thus be reassigned to their new health center.

Benefits

IIS simplifies the monthly planning and reporting required of nurses. But there are other benefits to tracking the immunization status of individual children. Firstly, IIS not only generates coverage reports automatically, it is also able to show exactly which children have been registered but have not yet received all their doses. This enables nurses to actively look for and quickly identify these defaulters. Timeliness of vaccination has already increased in the IIS pilot district.



Calculating coverage
The immunization status of children in any given cohort can be calculated automatically.



Identifying defaulters
Children who miss a certain vaccine dose can be easily identified.

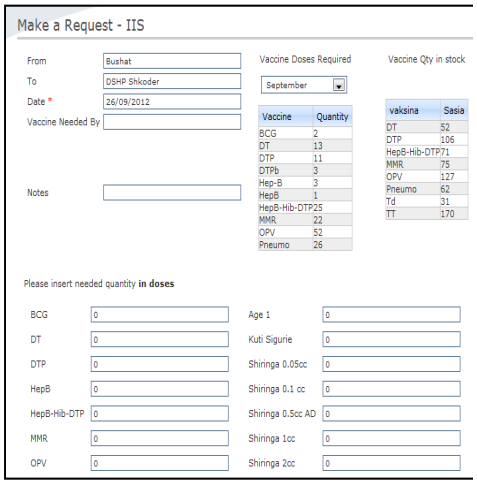
Ensuring that all children are vaccinated
A "patronage nurse" visits the home of a child to remind the parent of an upcoming or missed vaccination appointment.

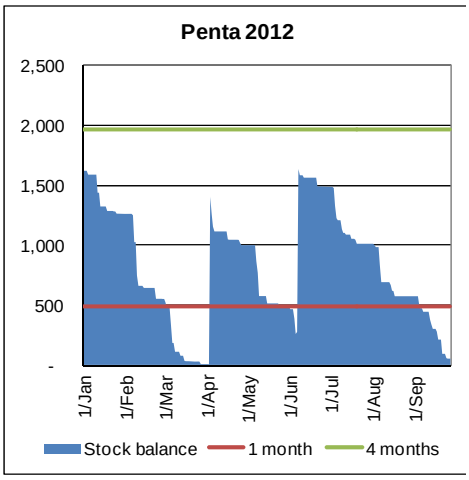
Secondly, coverage rates are now more accurate, with previous rates shown to be implausibly high. More importantly, analysis of immunization records reveals in more detail the reasons why some children are not being immunized, which

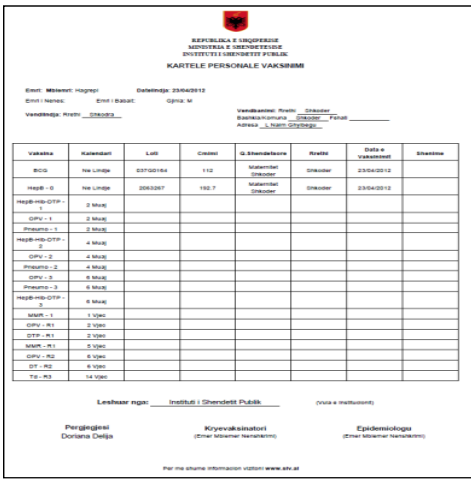
community they belong to, and to what extent factors like parental refusal play a role (reasons for refusing a vaccination can be entered into IIS).

Thirdly, IIS manages the stock of vaccines and consumables, which allows the Ministry of Health to monitor levels of buffer stock, expiry dates, distribution and usage of ever more expensive vaccines. Because IIS can calculate how many children need to be vaccinated each month, the quantities of vaccine that need to be distributed and kept in stock can be kept to a minimum. By linking the vaccine lots to individual child records, lots can be traced through the stores and eventually to any children who have received a dose from a particular lot. This is essential for issues of vaccine safety.

Finally, there are also benefits for parents, as they are able to access the system themselves to download a vaccination certificate for their child, required for school and visa applications.







Ordering vaccines
Nurses base their vaccine order on their current stock and the quantity they will need next month. This keeps buffer stock levels at a minimum.

Monitoring vaccine stock
Supervisors can monitor stock balances and wastage in IIS, and so manage stock more efficiently. The chart shows stock levels in a district store, compared to recommended minimum and maximum levels.

Vaccination certificates
A child's vaccination certificate can be downloaded by parents. It keeps track of the lots used and shows the cost of each dose for information.

Feasibility beyond Albania

Immunization managers in many low and middle income countries are looking for ways to improve their immunization information systems, and some have developed or are exploring registry-based systems like IIS. The following conditions would facilitate the implementation of such a system:

- A registry culture, in which health workers already tend to register children in a paper book or card. Supporting existing processes is easier than implementing new ones through an information system.
- Some way to identify children or their parents, through national ID numbers, names, dates and places of birth, telephone numbers, etc. A number or a barcode could also be added to existing immunization cards.
- A minimal level of internet access, either through computers or cell phones, at least down to the district level. Remote health centers can be served through appropriate paper systems.
- Access to the knowledge, tools, and support to acquire or develop, scale and maintain a computerized information system.