FROM VILLAGE TO VACCINE:
A tool for digital immunization microplanning

In many countries, especially where electronic immunization registries are not available or accessible due to limited internet connectivity, health workers face significant challenges creating accurate and efficient microplans for immunization.

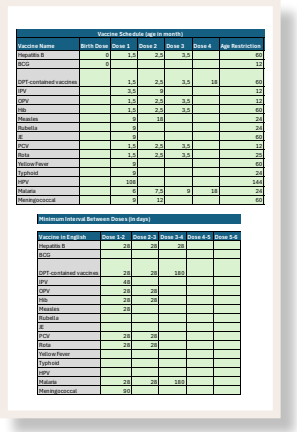
In Ukraine, for example, immunization microplanning at the village level is still conducted manually, relying on multiple handwritten logbooks, vaccination cards, and census records to track children's immunization histories. Each immunization provider is responsible for a designated set of local community children and spends substantial time locating and cross-checking information across sources to ensure no child is missed.

WHAT IS MICROPLANNING?

Microplanning is the development of an integrated set of components to support activities performed in the context of routine immunization at the facility, district, or other subnational level.

At primary health care facilities in Ukraine where local communities can access immunization services, nurses routinely prepare lists of children due for vaccination by cross-referencing census data from the village council, lists of registered but nonresident individuals, and lists of nonregistered residents. This information is then manually verified against vaccination records to identify which children are due for certain vaccines. Once the lists and data are reviewed, the next step involves preparing monthly vaccination schedules based on children due for vaccination and submitting vaccine requests from ambulatory clinics at the community level to primary health care centers, where the data are aggregated for the district or province. The data are ultimately submitted to the national level for planning and procurement for the following year.

This manual practice is not only labor-intensive and error-prone but also difficult for new staff to manage due to high turnover. These challenges highlight the need for a practical, accessible tool that can improve accuracy in identifying children due or overdue for vaccinations and simplify vaccine quantification, even in low-connectivity or paper-based environments.



Vaccine Schedule (age in month)

Vaccine Name	Birth Dose	Dose 1	Dose 2	Dose 3	Dose 4	Age Restriction
Hepatitis B	0	1.5	2.5	3.5		60
BCG	0					12
DPT-contained vaccines		1.5	2.5	3.5	18	60
IPV		1.5	2			12
OPV		1.5	2.5	3.5		12
Hib		1.5	2.5	3.5		60
Measles		9	15			24
Rubella		9				24
JE		9				60
PCV		1.5	2.5	3.5		12
Rota		1.5	2.5	3.5		20
Yellow Fever		9				60
Typhoid		9				24
HPV		108				144
Malaria		6	7.5	9	18	24
Meningococcal		9	12			60

Minimum Interval Between Doses (in days)

Vaccine in English	Dose 1-2	Dose 2-3	Dose 3-4	Dose 4-5	Dose 5-6
Hepatitis B	28	28	28		
BCG					
DPT-contained vaccines	28	28	180		
IPV	48				
OPV	28	28			
Hib	28	28			
Measles	28				
Rubella					
JE					
PCV	28	28			
Rota	28	28			
Yellow Fever					
Typhoid					
HPV					
Malaria	28	28	180		
Meningococcal	90				

Mission of the microplanning tool

PATH recognized the labor-intensive process and the layers of errors that could be introduced with multiple paper processes and collaborated with local health care workers to improve the microplanning process. PATH designed a microplanning tool to support health care staff in countries where electronic national immunization registries do not exist or where registries are inaccessible at primary health care centers due to limited or no internet connectivity. The newly developed tool provides a practical, low-cost solution to strengthen routine immunization management by:

» Tracking vaccination histories for children at the facility level.

» Identifying individuals due or overdue for vaccination, including children, zero-dose children, and under-immunized children.

» Estimating the quantity and type of vaccines needed at a facility.

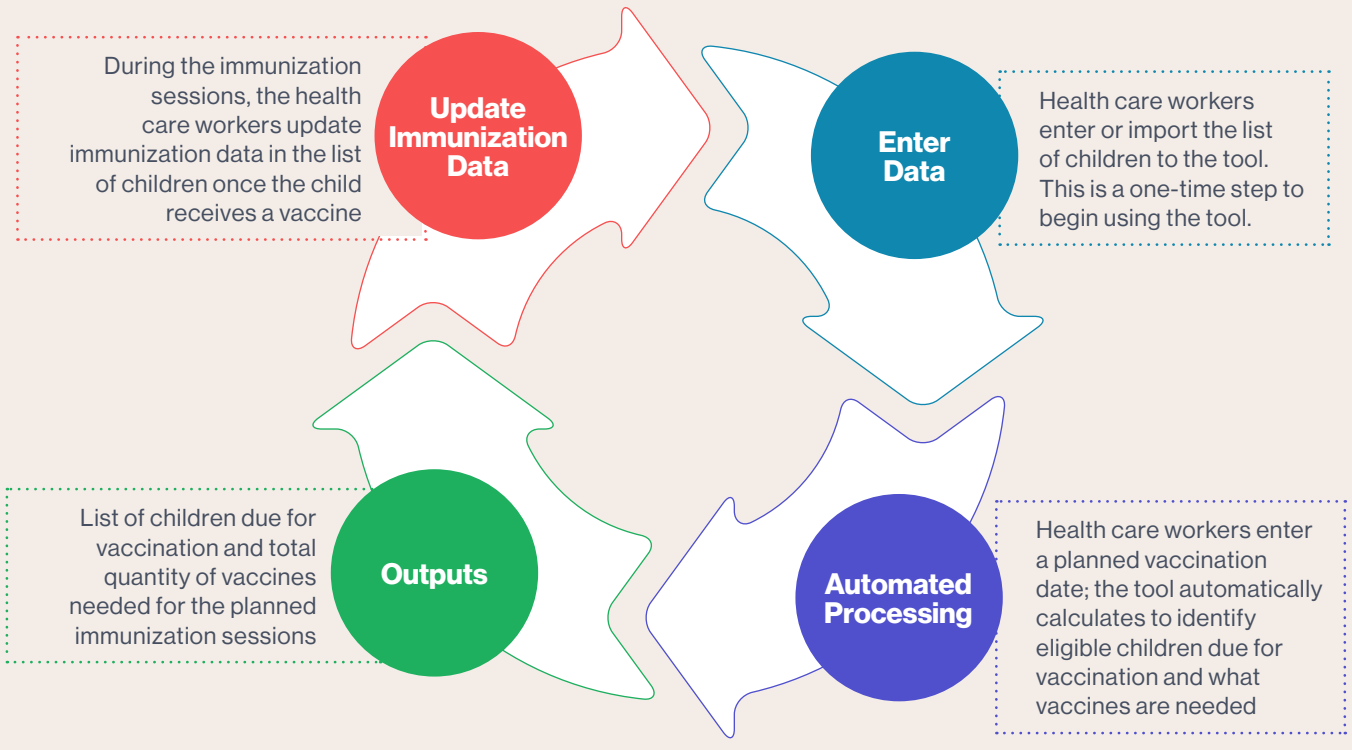
How does it work?

The microplanning tool is an Excel-based application tailored for use in health facilities where children receive routine vaccinations. PATH created a generic tool that is flexible to allow for adjustments to national vaccine schedules and eligible age groups. To start, health workers enter or import a list of children, including demographic details and vaccination history (e.g., name, date of birth, address, caregiver information, contact information, vaccines given, and contraindications). Health care workers enter the date for which vaccination sessions are planned, and the microplanning tool identifies the children who are due for vaccines, along with estimates of the vaccine quantities needed for daily, weekly, or monthly schedules. The final output is a list of children due for vaccinations and the total quantity of vaccines needed for a given period.

The microplanning tool enhances the efficiency and quality of routine immunization services by reducing the workload of health care workers to track vaccination histories, identify children due for vaccination, and plan immunization sessions. Using the tool can help identify and track under-immunized children so that additional outreach can be provided. Furthermore, the tool is capable of providing accurate estimates of vaccine and immunization supplies needed using the information entered. The tool reduces the risk of stockouts caused by errors due to hand enumeration, helping ensure uninterrupted service delivery and reliable protective services for the community.

Figure 1.

The continuous process of microplanning



Improved reliability helps bolster trust and rapport between the community and the health sector.

Introducing the microplanning tool requires time for health care workers to learn the concepts and how to use the tool efficiently. Not all health care workers are familiar with Excel, which means additional training is required. To address these issues, PATH prioritized master trainings to build a technical support network at the local level, enabling focal points to provide ongoing technical assistance and on-site coaching for health care workers after cascade trainings.

Ideally, each health facility introducing the microplanning tool will nominate two staff members—one responsible for developing the immunization plan and another with strong computer and Excel skills—to attend the training. During the training sessions, attendees learn how to handle data entry and serve as backups for colleagues or in case of staff turnover. This approach ensures sustainable skills transfer, continuous support, and smooth operation of the tool in the long term.

Before the microplanning tool, health care workers relied on several logbooks to track routine immunization data.

Impact in Ukraine

PATH adapted the microplanning tool specifically for the Ukrainian immunization schedule and health care system before training 29 health workers on how to use the tool. While the tool requires users to work with Excel, PATH provided additional computer support to help build capacity for health care workers using the tool. After the training, PATH provided on-the-job support for users and now provides ongoing assistance remotely and during supervision visits. All 6,990 children in the Dubrovytska hromada are entered into the microplanning tool for vaccination planning. The tool has been implemented in all vaccination service points and the data are being used to plan for the upcoming year.

The regional Center for Disease Prevention and Control (CDC) expressed interest in using the microplanning tool across all primary health care centers in the oblast. PATH organized three additional trainings, reaching 59 representatives from healthcare facilities across the region. These cascade trainings will continue until all vaccination service providers in Rivne oblast are reached.

The regional CDC of Chernivetska, a neighboring oblast, requested PATH support for a training on the microplanning tool. PATH led a workshop for 30 representatives of primary care facilities and Chernivetksa oblast regional CDC representatives who are beginning to implement the tool in their health facilities.

PATH staff will remain available to health care workers to provide support and answer questions about the microplanning tool. Additionally, the focal point from the regional CDC Immunoprophylaxis Department will provide technical support for continued use of the tool.

Planning ahead

The microplanning tool is recommended for health care workers at the facility level in countries without an electronic immunization registry or in areas with limited or no internet connectivity. It is particularly useful for staff responsible for registering and tracking children in their catchment areas, generating daily or monthly lists of children due for immunization in line with the national vaccination schedule, and estimating the quantity of vaccines and related supplies needed for each immunization session. By streamlining these tasks, the tool supports efficient session planning, reduces missed opportunities for vaccination, and helps ensure timely protection of children and their local communities.

The microplanning tool captures all essential vaccination data thereby reducing the workload of health care workers in Ukraine.

Conclusion

The microplanning tool provides a practical, low-cost, and scalable solution for strengthening frontline routine immunization services—the foundation of the national immunization program. The adaptability to each country's national vaccination schedule and specific age cohorts allows it to be easily adapted across diverse country contexts. By streamlining planning and tracking, it enables health workers to reach every eligible child, optimize vaccine use, and improve immunization coverage.

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