



SAFEMed

TECHNICAL BRIEF

JULY 2026



AGILITY UNDER PRESSURE: MODERNIZING UKRAINE'S HEALTH SUPPLY CHAIN FOR RESILIENCE AND IMPROVED ACCESS

About SAFEMed

Improving Ukrainians' access to safe and affordable medicines is a top government priority that is supported by ambitious health reforms. The Safe, Affordable, and Effective Medicines for Ukrainians (SAFEMed) project (2017-2026), funded by the U.S. Government, is backing this effort by applying health system-strengthening best practices and evidence-based interventions to institutionalize rational medicine selection; systematize public procurement of pharmaceuticals and commodities; support sustainable public-sector pharmaceutical financing; and strengthen the health commodities supply chain in collaboration with the government of Ukraine (GOU), civil society, and the private sector.

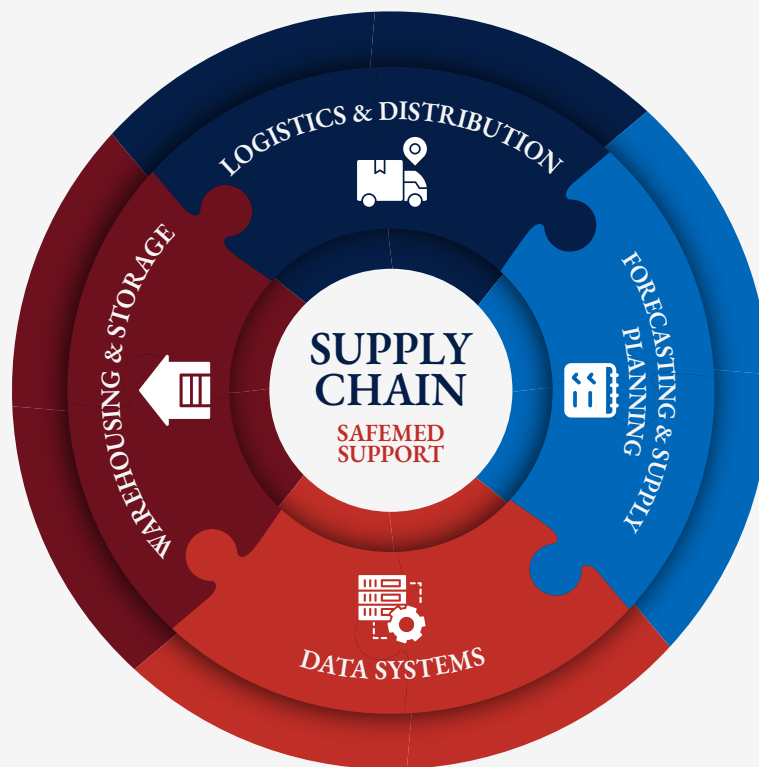
BACKGROUND

A robust national health supply chain maintains uninterrupted access to lifesaving medicines, including antiretroviral therapy (ART), tuberculosis (TB) drugs, and vaccines. These medicines support good health and help prevent the spread of infectious diseases.

In Ukraine, despite the ongoing war, health reforms continue to prioritize strengthening supply chain systems for timely, transparent, and accountable delivery of essential health products. SAFEMed supports national and regional coordination among the Ukrainian government, including the Ministry of Health (MOH), the Center for Public Health (CPH), the Medical Procurement of Ukraine (MPU), and others to optimize procurement, inventory management and distribution, data systems, and emergency response. This approach fosters sustainable local capacity, quantifiable supply chain progress, and system transparency and reinforces long-term health security as Ukraine transitions from aid-dependent systems to country-led, resilient, data-driven health supply chain management.

Ukraine's pharmaceutical supply chain has endured unprecedented stress with the COVID-19 pandemic in 2020 and then the full-scale invasion since 2022. Despite infrastructure damage, population displacement, disrupted logistics, and immense operational pressures, the system adapted. Operations such as emergency stock management, alternative distribution models, and agile planning evolved through intensified coordination that produced supply chain continuity and reliable medicine flows enabling frontline health workers to save lives every day.

These experiences make Ukraine a valuable example of how U.S. investment in supply chain agility, even in times of active conflict, can advance supply chain resilience. This case study also highlights the strategic value of investment in health supply chains as a component of broader health and economic security priorities; for example, SAFEMed's efforts have reduced the risk of large-scale supply disruptions impacting public health and promoted market stability. Ukraine's experience underscores how – even under extraordinary crisis conditions – practical expert advice and locally owned system development can improve resilience and generate valuable lessons for commodity security and supply chain sustainability.



SAFEMed's support for transforming Ukraine's health supply chain

OUR APPROACH

SAFEMed accelerates Ukraine's journey to self-reliance by boosting the health supply chain's maturity level in forecasting and supply planning, warehousing and storage, logistics and distribution, and data systems. Our approach turns fragmented, manual processes into an optimized, digitized, market-driven system leveraging private-sector efficiencies and powered by end-to-end data visibility. Specifically, SAFEMed works hand-in-hand with stakeholders to design interventions, continually assess progress, and course correct as needed, focusing on:

- **Data-Driven Prioritization:** Using real-time supply chain data to immediately identify and address system vulnerabilities.
- **Adaptive Planning:** Adjusting activities as circumstances unfold, including shifting geography focus to respond to wartime disruptions.
- **Stakeholder-Powered Response:** Fostering local ownership by engaging broadly with MOH and other government entities and the private sector to tailor interventions that respond to the evolving context.

This approach transforms a desire to address supply chain challenges into measurable improvements in health commodities' security, fiscal accountability, and continuity of lifesaving services.

LOGISTICS AND DISTRIBUTION

SAFEMed's logistics and distribution interventions combine technical support with public-private partnerships to optimize cost-effective last-mile delivery of lifesaving medicines for HIV, TB, and viral hepatitis and for essential vaccines that rely on cold-chain logistics.

Last-Mile Delivery Model for HIV, TB, and Viral Hepatitis Commodities

Historically, Ukraine's regional distribution was a vulnerable link in the public health supply chain with poor transportation quality, inadequate delivery planning, limited stock visibility, and lack of compliance with Good Distribution Practice (GDP) standards. Health workers often had to organize their facilities' deliveries, which increased operational burden, delays, stock-outs, and improper transportation conditions.

To mitigate these challenges, SAFEMed engaged national private-sector logistics providers and implemented structured approaches to last-mile distribution. This initiative aimed to establish reliable, quality-assured

transportation of health commodities from regional warehouses to service delivery points. The model also promoted efficient resource allocation, adherence to international logistics standards and GDP, real-time stock tracking, and transparent data sharing among stakeholders.



Handover of TB commodities from the Kyiv region Specialized Medical Center warehouse to the driver for last-mile delivery. Credit: SAFEMed

The success of the first pilot of this approach, launched in Odesa region in 2019, led to gradual national scale-up, and by early 2022, the model covered 16 regions delivering to hundreds of HIV and TB healthcare facilities. This intervention significantly improved delivery regularity and transportation quality, reduced the burden on medical personnel, optimized stock availability, and enhanced the reliability of essential medicine supply chains.



5,623 deliveries of HIV/TB and other commodities across 18 regions worth **USD 8.52 million** (2021-2026)

During the full-scale invasion, the intervention proved highly adaptable and resilient. Despite severe security and infrastructure challenges, deliveries resumed within weeks in selected regions. To ensure treatment continuity for vulnerable patients, seven regions that were most in need were prioritized by 2026. Over the past seven years, the last-mile distribution has become a vital component of Ukraine's public health supply chain, with participating regions increasingly relying on the service for regular, quality-assured deliveries. The platform has also expanded beyond antiretroviral (ARV) and TB medicines to include rapid test kits (RTKs) and other essential supplies based on regional needs. ART and TB treatment interruptions can lead to drug resistance, disease progression, new infections, and death – for these patients, an uninterrupted medicine supply saves lives. The last-mile intervention became a critical lifeline, ensuring continuity of care even during active conflict.

Strengthening last-mile logistics not only improves transportation but also drives broader supply chain system development. The initiative raised regional awareness of modern logistics practices, reinforced the importance of GDP-compliant transportation and storage, promoted efficient use of healthcare resources, and demonstrated the value of partnerships with private-sector logistics providers. SAFEMed's experience informed ongoing national discussions on future supply chain reforms, including new regional logistics approaches for all national government-procured health commodities.

The distribution optimization approaches piloted in Ukraine offer replicable frameworks for other countries facing similar supply chain challenges. These practical solutions, tested under both routine and crisis conditions, provide actionable models for global health security efforts and demonstrate the value of sustained technical partnerships in building resilient health systems.

Temperature-Controlled Logistics Model for Immunization

A resilient immunization supply chain forms a cornerstone of national health security, ensuring vaccines reach populations safely, efficiently, and timely. Beyond just distribution, ensuring vaccine availability required parallel

investments in specialized cold-chain logistics. The COVID-19 pandemic exposed significant logistics problems in Ukraine's immunization program, particularly for products requiring strict cold-chain and ultra-cold-chain conditions such as Pfizer/BioNTech.

SAFEMed became a key partner in supporting the MOH to establish modern and scalable vaccine distribution mechanisms; for example, in 2021, SAFEMed engaged a private logistics provider for central-to-regional COVID-19 vaccine warehousing and distribution and helped develop ultra-cold chain management procedures.

Between April 2021 and September 2024, SAFEMed supported logistics for over 4.8 million doses of COVID-19 vaccines. The GOU subsequently institutionalized these emergency-response distribution processes and operational standards for all state-funded vaccine logistics. Moreover, given SAFEMed's success with COVID-19 vaccine management, the GOU requested support for the entire national vaccination program, including routine immunizations. SAFEMed introduced additional approaches including consolidated shipment schedules and national safety stock mechanisms to reduce imbalances and emergency redistribution. As a result, from 2022 to 2024, nearly 4.9 million doses of routine vaccines were distributed, including for urgent catch-up campaigns for children whose immunization schedules were disrupted by the war.

Concurrently, SAFEMed helped pilot alternative last-mile vaccine delivery models to determine the most effective national distribution approach. The pilot tested various configurations for moving vaccines from regional storage to service delivery facilities, comparing performance in terms of cost efficiency, timeliness, cold-chain integrity, and scalability. Direct region-to-facility delivery was compared to hub-based approaches with intermediate consolidation points. The pilot results continue to guide decision-making on optimal last-mile vaccine logistics under both routine and emergency conditions.

SAFEMed's support demonstrated the importance of integrating practical distribution solutions with system-level optimization of supply chain design. The intervention also highlighted the value of public-private partnerships and modern cold-chain logistics in guaranteeing vaccine quality, improving system responsiveness, and strengthening national preparedness for future public health emergencies.

FORECASTING AND SUPPLY PLANNING

Reliable demand forecasting and quantification remain complex components of public health supply chain management. In Ukraine, HIV commodity planning has struggled with fragmented data sources, limited consumption awareness, and inconsistent forecasting approaches that affected procurement planning for ART regimens and HIV RTKs, risking stock shortages, overstocks, and inefficient resource use. Reliable ARV forecasting is critical for people living with HIV, as treatment interruptions can lead to viral rebound and drug resistance. SAFEMed's quantification strengthening efforts addressed this foundational challenge.

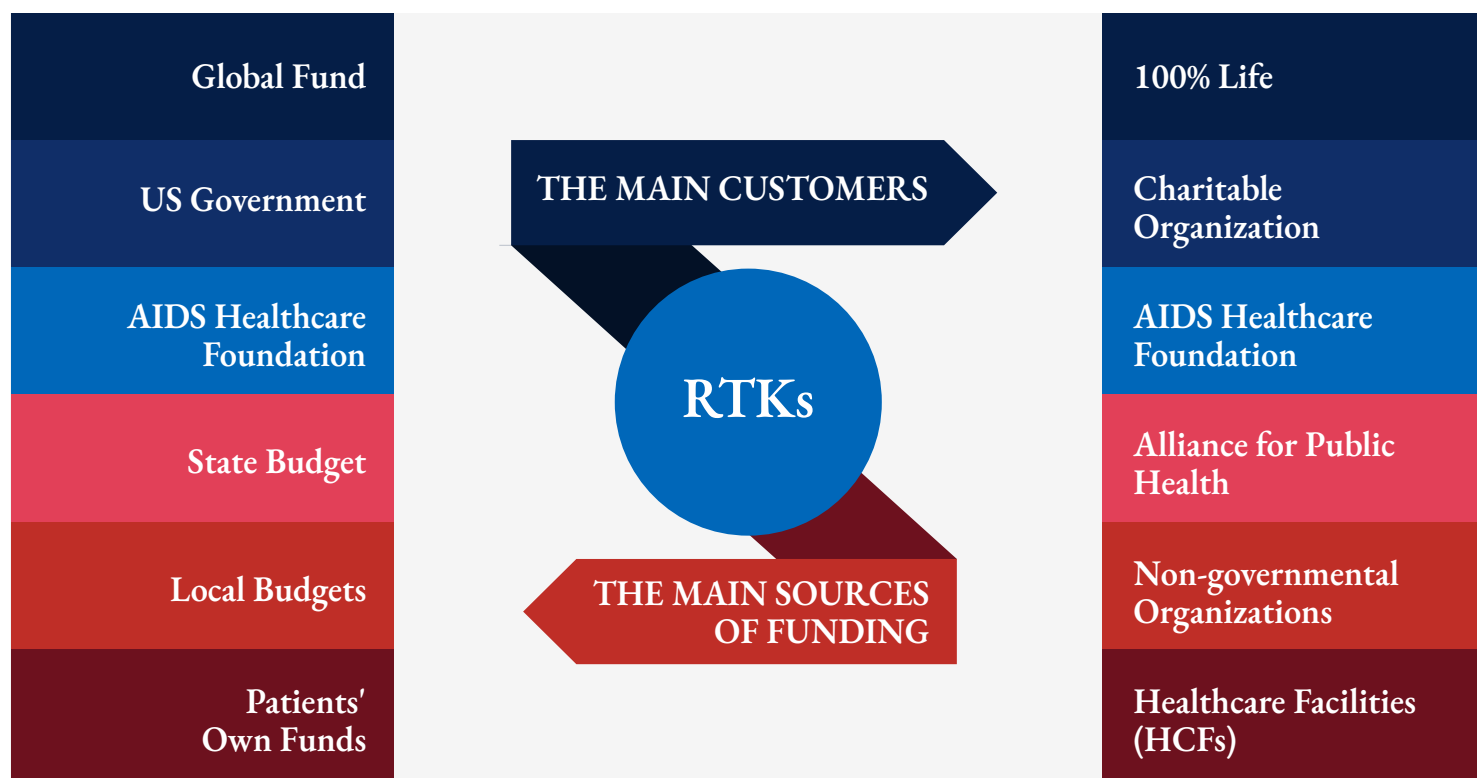
ARV Quantification and Donor-Funded Commodity Management

A major achievement was the development of the ARV Quantification Tool, an automated forecasting solution integrated with MedData, the national digital platform for managing medical commodity information. Developed collaboratively with the MOH, CPH, and MPU, this tool replaced fragmented forecasting with a standardized, transparent, data-driven approach. It leverages existing national data systems to minimize duplication, improve accuracy, and support evidence-based procurement.

The tool's development was a multi-year process involving stakeholder consultations, iterative testing, and continuous refinement. In 2025, national validation and regional pilots drove further enhancements. SAFEMed also built capacity and consistent national application through training for regional forecasting specialists and developing instructional materials.

The ARV Quantification Tool reduced the time required to quantify national ARV needs from several weeks to a few days, which represented an estimated 60–70% reduction in planning time. Centralizing data into a single tool improved the consistency and transparency of assumptions and enabled earlier identification of supply risks. Prior to the tool's introduction, projections indicated that 20–30% of ARV regimens were at risk of stockout during the planning horizon.

Concurrently, SAFEMed addressed longstanding weaknesses in HIV RTK planning and supply management. A detailed 2022 RTK supply chain assessment involving broad stakeholder input identified inconsistencies in demand collection and consumption monitoring practices. Based on these findings, SAFEMed and CPH developed and piloted a standardized quantification methodology for HIV RTKs that was formalized by a 2024 MOH Order. Supporting materials, including trainings and instructional resources for healthcare workers, facilitated the new approach's nationwide implementation.



HIV RTK procurement as of 2022

In addition to advancing HIV forecasting and quantification systems, SAFEMed expanded its support to strengthen TB commodity forecasting and supply planning. As part of this effort, the project organized an intensive three-day national workshop where more than 50 regional TB specialists enhanced their forecasting and supply planning skills using the QuanTB platform.

Our experience showed that improving quantification is not solely a technical exercise but also requires alignment of data systems, institutional roles, and operational practices with user engagement. The introduction of standardized forecasting approaches and digital tools contributed to more transparent planning, better-informed procurement decisions, and greater confidence in the reliability of national supply planning for HIV and other commodities.

DATA SYSTEMS

SAFEMed significantly advanced the digitalization of Ukraine's public health supply chain, enhancing transparency, efficiency, and data-driven decisions. The MedData digital platform forms a core component of this effort. Evolving from a simple stock reporting tool for commodities procured by MPU, MedData now supports procurement planning, inventory management, distribution, and program monitoring across a broad range of national health programs. These include medicines and medical devices for oncology and hematology, rare diseases, HIV/AIDS including RTKs, tuberculosis, viral hepatitis, cardiovascular and cerebrovascular diseases, immunization, maternal and child health, blood services, and transplantation.

MedData Platform Evolution

MedData's adaptability proved crucial during the COVID-19 pandemic. In 2020, SAFEMed quickly adapted the tool to monitor personal protection equipment, essential medicines, and equipment for COVID-19 treatment, collecting real-time stock data from 645 hospitals nationwide. This provided decision-makers with timely visibility into commodity availability that enabled efficient resource allocation.

As digital tools became increasingly important for supply chain management, SAFEMed strengthened users' ability to benefit from new information systems. Together with MPU, the project supported user education on MedData, emphasizing accurate and timely reporting of stock, consumption, redistribution, and demand data. These sessions helped healthcare facilities better understand how data quality directly influences forecasting, procurement planning, deliveries, and patient access to treatment.

Vaccine Stock Data Digitalization

SAFEMed helped develop a dedicated stock management module within MedData for COVID-19 vaccines, which later expanded to cover all vaccine products, thereby improving data quality for supply planning, reducing manual

reporting, and facilitating data exchange with the country's other core national information systems like eHealth¹ and Diia². By June 2026, the vaccine stock module was the primary national system for monitoring vaccine stock and consumption across over 2,500 healthcare facilities. Continuous improvements integrated fragmented processes into a single data management environment that improved document flow, stock tracking, and distribution planning. SAFEMed also modernized the national COVID-19 Vaccine Registry to enhance interoperability with international systems and align Ukraine's immunization infrastructure with global best practices. This unified system strengthened accountability and coordination in vaccine supply chain management.

To make it easier for national and regional managers to use the data, SAFEMed integrated analytical dashboards into MedData that provide near real-time insights into vaccine availability, consumption, forecasting needs, and stock levels.



Crisis Response: Humanitarian Aid Tracking

MedData's flexibility has proved vital during the full-scale invasion of Ukraine. In just one month, SAFEMed rapidly developed a humanitarian aid module within MedData, enabling systematic tracking of over USD 500 million in health sector humanitarian assistance that involved approximately 12,800 tons of medicines and medical supplies over 18 months. In late 2023, SAFEMed transitioned full management of the humanitarian assistance supply chain to national counterparts. This experience demonstrated the value of investing in flexible digital infrastructure for national priorities during crises.

As the country took on full ownership of the humanitarian response, SAFEMed's digitalization priority became strengthening systems for planning and managing donor-funded commodities, particularly for the HIV program. Disruptions from the pandemic and war highlighted the need for accurate forecasting and reliable supply planning to ensure patients maintained uninterrupted access to ART.

Integrated Information System Impact and Sustainability

SAFEMed continues to support efforts to increase the transparency and comprehensiveness of supply chain data within MedData. Historically, health commodity flow information was fragmented, with information scattered across various systems and stakeholders, which limited coordinated planning and accountability. Building on successful COVID-19 vaccines and humanitarian assistance modules, SAFEMed is now collaborating with national partners to expand MedData's role as a unified information platform for all public health commodities across all commodity categories. This expansion includes enhancing real-time views of stock levels and consumption patterns and developing analytical capabilities to make better evidence-based allocation and distribution decisions. At the central level, MedData provides the MOH and MPU with a consolidated view of needs, deliveries, stock balances, and consumption across regions and facilities, enabling decision-makers to identify shortages and near-expiry stock, compare requested quantities with actual availability, and initiate redistribution before authorizing new purchases. At the regional level, health departments can validate facility requests, detect local imbalances, and redistribute commodities from facilities with surplus stock to those facing shortages, escalating unresolved gaps to the central level with reliable data rather than fragmented spreadsheets and phone-based reporting. Creating a more complete and integrated data environment lays the foundation for increased transparency throughout the supply chain. As the system matures, this foundation will facilitate more transparent information sharing with external stakeholders, including development partners, while continuing access to reliable, real-time data for national decision-making and program accountability.

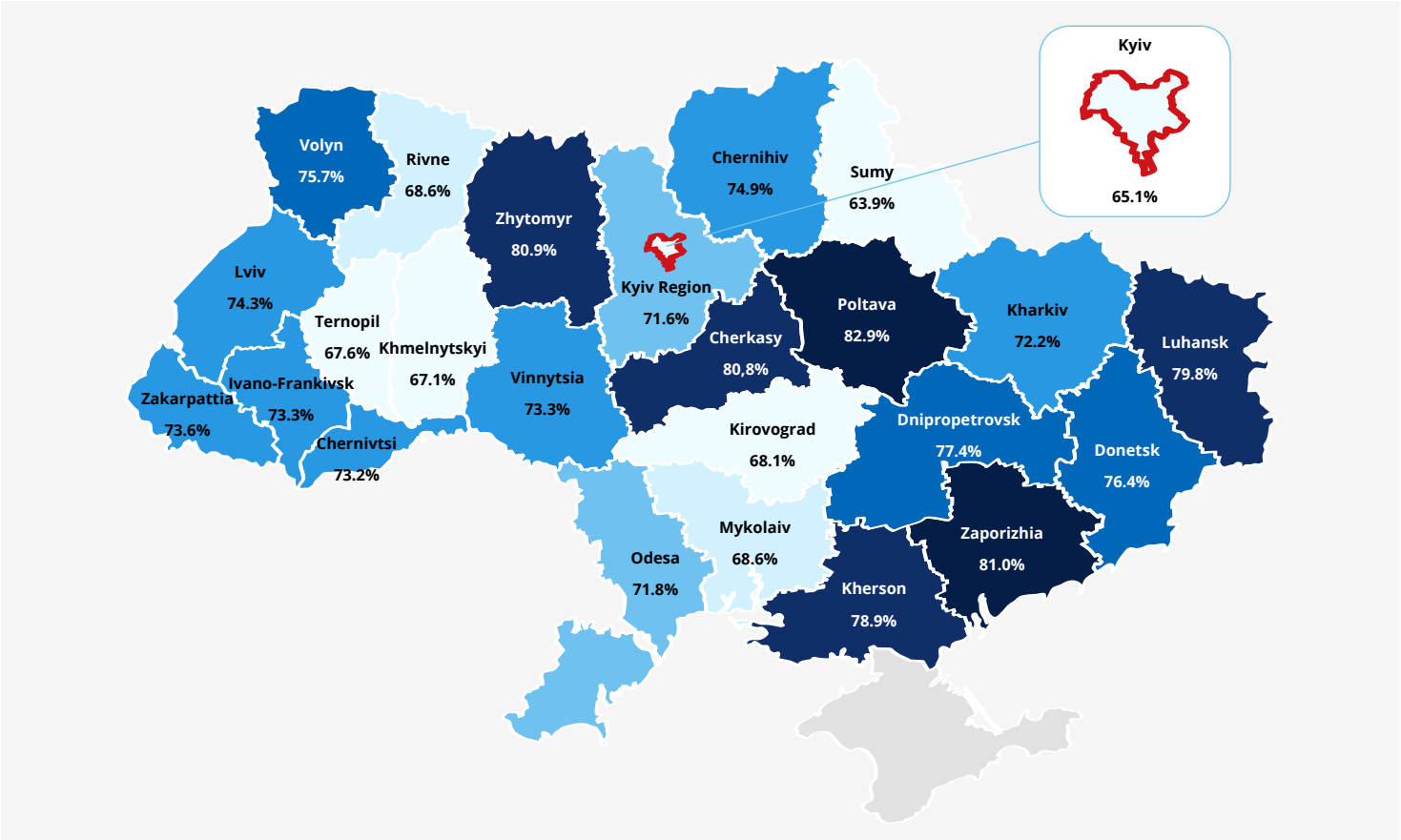
SAFEMed investment in MedData and related digital solutions modernized information systems and truly transformed how Ukraine makes supply chain decisions. SAFEMed's investment in MedData and related digital solutions modernized information systems and truly transformed how Ukraine makes supply chain decisions. Effective digital tools combined with strong governance and integration into routine decision-making enable resilience and institutional coordination. As Ukraine creates a more patient-focused health system aligned with European standards, these digital investments create more responsive, data-driven, and accountable management of public health commodities from procurement through last-mile delivery.

WAREHOUSING AND STORAGE

National supply chain performance ultimately depends on the capacity of regional warehouses and healthcare facilities that manage commodity storage. These institutions are the primary source of information on stock availability, consumption, and future demand, while also serving as the final link between nationally procured commodities and patients. As Ukraine upgrades its supply chain systems, strengthening regional and facility-level warehousing remains an essential component of SAFEMed's approach.

To ensure interventions responded to actual operational needs rather than perceived challenges, SAFEMed invested considerable effort in assessing warehousing practices and capacities across the country. Beginning in 2021, SAFEMed coordinated a nationwide assessment of 79 regional distribution centers responsible for storing HIV, TB, and hepatitis commodities to evaluate compliance with Ukrainian legislation and international Good Storage Practices. The results showed substantial regional differences in storage conditions, quality management practices, and logistics capacity.

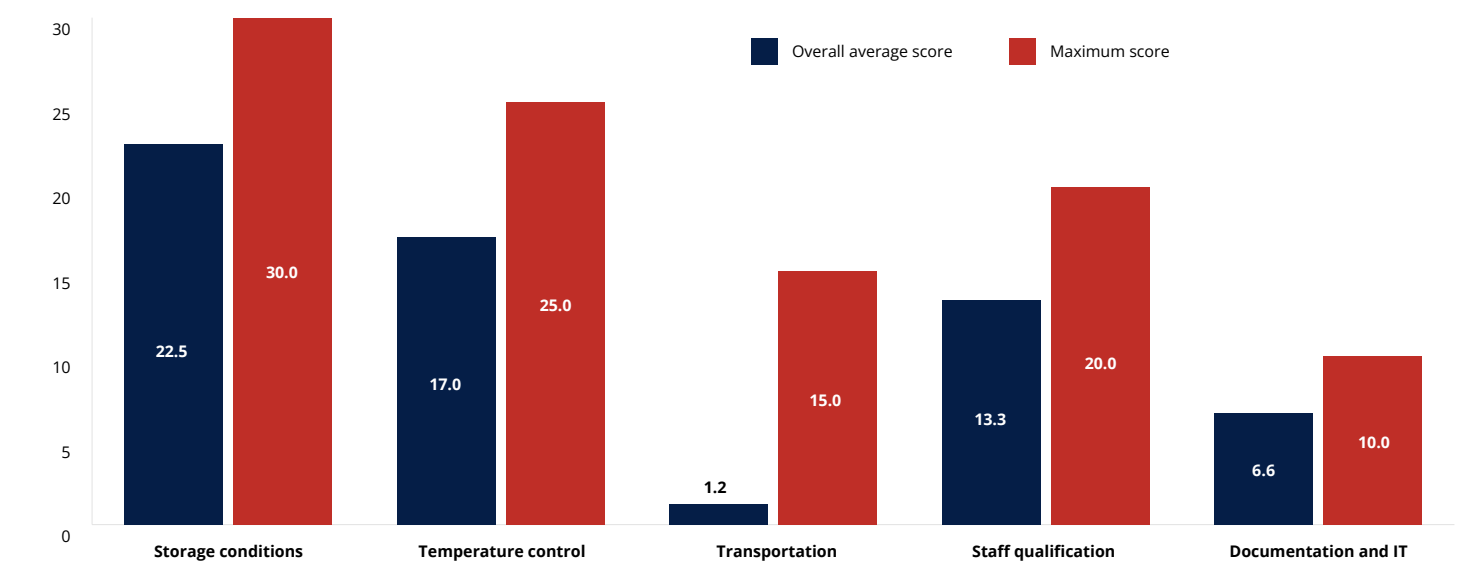
Building on this work, SAFEMed supported a series of targeted assessments of facilities receiving state-funded, centrally procured commodities. In 2024, as the GOU explored options for modernizing regional distribution models and strengthening last-mile logistics, SAFEMed supported a comprehensive assessment of 48 regional-level healthcare facilities that are major recipients of centrally procured commodities. Beyond compliance with storage and handling requirements, we also sought to determine whether these facilities possessed the infrastructure, systems, and operational capacity necessary to expand logistics functions within future supply chain models.



Average scores by region based on results of the regional assessment 2024

The assessment revealed large regional variation in readiness. While most facilities demonstrated adequate storage infrastructure, SAFEMed identified insufficiencies in quality management systems, transportation capacity, documentation practices, information systems, emergency preparedness, and staff training. The map below presents the average scores by region based on the results of monitoring visits conducted in regional healthcare facilities. Color intensity reflects performance, with lighter shades indicating lower average scores and darker shades indicating higher average scores.

Recognizing the importance of understanding challenges at the final point of commodity receipt and use, SAFEMed further assessed 46 subregional healthcare facilities across 21 regions between November 2024 and January 2025. SAFEMed evaluated storage conditions, temperature control, transportation, staff qualifications, and documentation and information systems. On average, facilities met 60% of assessed requirements. As presented below, while storage conditions were generally good, transportation capacity emerged as the weakest area. Common challenges included inadequate infrastructure, weak temperature monitoring systems, limited staff capacity, and inconsistent use of MedData for inventory management and reporting.



Assessment outcomes by criteria in 46 subregional healthcare facilities: 2024-2025

SAFEMed also supported specialized assessments in priority public health program areas. For example, in 2024, the project assessed national, regional, and subregional capacity to manage opioid substitution therapy and identified important gaps particularly in storage practices and regulatory compliance. Within the immunization program, SAFEMed conducted joint regional and site-level monitoring visits with the MOH and CPH. The first visits took place in 2024 and 2025 looking at regional warehouse operations, cold-chain systems, coordination mechanisms, communication with healthcare facilities, and compliance with regulatory requirements. These visits covered all regions and identified practical gaps affecting vaccine supply chain performance.



Vinnitsia regional warehouse. Credit: SAFEMed

In 2026, SAFEMed, together with CPH and the World Health Organization, started additional visits to monitor implementation of the updated National Immunization Schedule, effective since the beginning of 2026. These visits assess regional and facility-level readiness, including vaccine distribution practices, cold-chain capacity, pharmacovigilance, data use for planning and decision-making, and healthcare workers' practical needs. The visits help national and regional stakeholders better judge implementation progress and pinpoint areas for additional support.

Assessment outcomes

The findings generated through these assessments and monitoring visits directly shaped SAFEMed's capacity-strengthening interventions. Rather than applying a uniform approach nationwide, SAFEMed tailored its support to address the most critical operational gaps identified at regional and facility levels, such as storage and quality management. In response to regional and subregional assessments, in 2025, SAFEMed worked with MPU and the State Service of Ukraine on Medicines and Drugs Control to organize a national webinar on medicine storage, handling, and GDP requirements. The event attracted approximately 1,400 participants across multiple platforms, including pharmacists, warehouse managers, and healthcare administrators.

The interest generated by this event led to further training activities. In 2026, SAFEMed helped put together a webinar on medical device quality and safety with experts from MPU, State Service of Ukraine on Medicines and Drugs Control, conformity-assessment bodies, and regulatory specialists attended by more than 580 healthcare professionals. The exceptionally high participation in the webinars illustrated the demand for practical guidance on regulatory compliance and quality assurance throughout the healthcare supply chain. The interest generated by this event led to further training activities. In 2026, SAFEMed supported a webinar on medical device quality and safety featuring experts from MPU, the State Service of Ukraine on Medicines and Drugs Control, conformity-assessment bodies, and regulatory specialists. The webinar was attended by more than 580 healthcare professionals. The exceptionally high participation in the webinars illustrated the demand for practical guidance on regulatory compliance and quality assurance throughout the healthcare supply chain.

Beyond webinars, separate training programs in 2025 for opioid substitution therapy regulatory and storage requirements, pharmaceutical management practices, and pharmacovigilance reached more than 70 healthcare professionals from all regions of Ukraine. To sustain outcomes from these trainings, SAFEMed developed standard operating procedures on TB and opioid substitution therapy commodity management, including receipt, storage, dispensing, inventory management, and disposal processes.

CROSSCUTTING AREAS OF SUPPORT

Legal and Policy Support

SAFEMed provides legal and policy support to MOH, CPH, and other national stakeholders to strengthen the regulatory framework governing pharmaceutical and vaccine supply chains including development and implementation of MOH orders, Cabinet of Ministers (CMU) decrees, and amendments to laws. This support helps translate technical reforms into institutionalized policies, clearly defined roles and responsibilities, and sustainable national systems, contributing to the development of a country-owned and -led supply chain system.

Notable achievements included CMU Decree No. 473, which transferred responsibility for regional vaccine logistics and inventory management to regional centers for disease control and prevention (rCDCs) and MOH Order No. 1822, which established new procedures for vaccine distribution and reporting. SAFEMed also assisted in developing regulations governing vaccine warehousing, cold chain management, digital reporting, and the use of MedData to strengthen vaccine supply chain visibility and decision-making.

In addition, policy reforms strengthened access to essential medicines and improved supply planning; for instance, SAFEMed contributed to important updated HIV legislation adopted in 2023 that modernized Ukraine's HIV response and established the legal basis for more patient-centered service delivery models, including licensed retail pharmacies' distribution of ARVs. As well, MOH Order No. 1901 institutionalized the national methodology for forecasting HIV RTK needs and strengthened evidence-based planning for HIV commodities.

In response to challenges with wartime humanitarian assistance, SAFEMed also helped develop legislative proposals to improve the distribution and redistribution of humanitarian medical commodities. The proposed amendments to the Law of Ukraine "On Humanitarian Aid" and related regulations aim to remove legal barriers, expand eligibility for healthcare providers to receive humanitarian assistance, simplify redistribution procedures, and improve uninterrupted access to priority medicines and health products across the country.

SAFEMed's efforts help embed supply chain reforms within Ukraine's legal framework and align them with national health priorities, which are essential for sustainable, accountable, and resilient health commodity management systems.

Laboratory Network Optimization

SAFEMed supported the MOH and CPH to prepare a long-term strategy for optimizing laboratory diagnostics services for HIV, TB, and viral hepatitis. The work included a comprehensive assessment of Ukraine's laboratory network, analysis of international best practices, and economic evaluation of alternative organizational and equipment models to improve efficiency, sustainability, and access to diagnostic services.

Using scenario modeling and a national Delphi expert consultation process, SAFEMed investigated multiple options for organizing laboratory services, including maintaining the existing decentralized network, regional centralization, supra-regional clustering, equipment standardization, and engagement of private laboratories. The analysis showed significant opportunities to improve efficiency and reduce long-term operating costs by consolidating and restructuring laboratory services. Based on consensus, the regional centralization model was selected as Ukraine's most appropriate approach. Under this model, regional diagnostic centers would be established within existing rCDCs, while specimen collection would remain decentralized to maintain patient access.

SAFEMed used these findings to draft an implementation roadmap outlining the organizational, technical, regulatory, and financing reforms needed to optimize the laboratory system. The roadmap was submitted to MOH and CPH as a strategic framework for strengthening diagnostic services, improving resource utilization, and ensuring the long-term sustainability of laboratory services. More importantly, this work established evidence-based groundwork for national decision-making on modernizing the laboratory network and a practical pathway to a more integrated, efficient, and resilient diagnostic system for HIV, TB, and viral hepatitis in Ukraine.

Essential Commodities for Emergency Preparedness and Response

To sharpen emergency preparedness and response, the MOH asked SAFEMed to assess existing policies and practices, identify regulatory and operational gaps, and make recommendations to strengthen coordination and commodity management during public health emergencies. Further, SAFEMed helped revise major regulatory documents governing emergency preparedness, response coordination, and communication mechanisms. To address needs for evidence-based preparedness planning, SAFEMed developed lists of priority medicines and medical products for healthcare facilities and Ukraine's network of rCDC response teams as well as a methodology for calculating emergency stock requirements. The methodology introduced a risk-based approach that considers facility type, location, and potential threats to achieve more appropriate stock levels and improve readiness for biological, chemical, radiological, and nuclear emergencies.

LESSONS LEARNED

Following are several important lessons and examples from SAFEMed's support to Ukraine's health supply chain during a period marked by both the COVID-19 pandemic and full-scale war.

1. Resilience Through Private-Sector Agility

Combining public-sector stewardship with private-sector expertise “builds in” resilience. For example, by leveraging professional logistics providers for last-mile delivery, the health system gained the flexibility to reroute supplies and resume operations within weeks of a major conflict, proving that market-driven solutions are more adaptable than state-only infrastructure in times of crisis.

2. Digital Maturity Requires System Integration

MedData's evolution proves that digitalization is most effective when it moves toward an integrated maturity level. Rather than functioning as standalone tools, digital investments must create a unified, interoperable information ecosystem. True system maturity is reached when real-time data visibility is paired with institutional ownership, thereby transforming reporting tools into proactive decision-support systems for forecasting and redistribution.

3. Sustainability is Anchored in Policy Institutionalization

Technical solutions are only as permanent as the policies that support them. For supply chain reforms to outlast donor intervention, they must be codified in the national legal framework. SAFEMed's alignment of technical milestones with MOH orders, CMU decrees, and amendments to laws guaranteed that improvements in vaccine logistics and ARV procurement became standard national practice – a decisive step on Ukraine's journey to self-reliance.

4. Supply Chain Transparency as a Component of National Security and Trust

A modernized, transparent health supply chain is a pillar of national stability. The ability to systematically track over USD 500 million in humanitarian aid and maintain treatment continuity for vulnerable populations reinforces fiscal accountability and public trust. Investments in supply chain transparency protect not only public health but also the nation's broader economic and social security.

5. Concurrent Capacity Strengthening at All Levels

Sustainable reform requires simultaneous attention to policy, process, and people. A high-functioning national public health supply chain is only as strong as its weakest regional warehouse or facility. SAFEMed's tiered approach combines national-level policy support with intensive regional and subregional preparation to maintain standardized quality management (e.g., GDP) and data accuracy to the final stage of patient care.

THE PATH FORWARD

SAFEMed's success lies in its emphasis on sustainability, focusing on locally owned, market-driven systems that are built on professional standards and digital transparency. In future investments, further institutionalizing these gains will become a lasting national asset. Future directions in supply chain support include the following:

- Fully optimize supply chain information technology investments and integrate them with the broader health ecosystem to streamline data management and decision-making that provide healthcare facilities with the medicines they need when they need them.
- Complete regional-level upgrades to comply with GDPs, improve warehouse conditions and temperature monitoring, and strengthen regional logistics capabilities and performance. This will increase product quality while reducing waste and further the country's readiness to manage public health emergencies.
- Turn more to the private sector for supply chain solutions – beyond distribution – to expand health system resilience; for example, private pharmacy chains could be incentivized to place new pharmacy outlets in rural and underserved areas.
- Continue to plan for the conditions whereby Ukraine will take over the financing and procurement of all public health commodities, including those currently covered by donor funds.

Ukraine's dramatically stronger health supply chain, forged during a pandemic and war, offers a global health security blueprint for sustainable transformation. The shift from manual and outmoded systems to automated, transparent, and GDP-compliant systems will transition Ukraine from aid recipient to regional leader in health supply chain and offer a replicable model for resilient health systems worldwide.

Learn more at msh.org/projects/safe-affordable-and-effective-medicines-for-ukrainians/