



Predictions 2035: The Role of Performance-Based Financing in Future Supply Chains in Developing Countries



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Abstract

As we come to the end of the current era of Millennium Development Goals, the global health community has begun making predictions about the future state of global health in the next twenty years. These bold predictions are based on current socioeconomic trends mainly in developing countries, which suggest a significant reduction in the burden of commonly prevalent maternal and child health conditions over time. An example of these predictions is contained in the work recently published by The Lancet Commissions in December 2013, titled “Global health 2035: a world converging within a generation.”

Global health development cannot be sustainably achieved without concurrent improvements in the performance of public health supply chains that deliver the health commodities required to maintain and improve health and well-being. Therefore, the gains in global health forecasted in The Lancet Commissions paper require us to make similar predictions about public health supply chains as well. The purpose of this paper is to provide these predictions. More importantly, we also aim to provide more context for these predictions by suggesting what implications they might have for the implementation of performance-based financing (PBF) schemes in public health supply chains. As examples of PBF schemes increase, evidence is beginning to emerge of their usefulness in improving access to health services in resource-limited settings. We aim to provoke thoughts among our target audience about how PBF might be useful for future developments in supply chains. Our target audience is key decision makers who actually have the responsibility for deciding on implementing the innovations we have predicted, or who will be at the forefront of commissioning funds for these initiatives. We begin by briefly summarizing the context for global health in 2035 as predicted by The Lancet Commissions report. We then delve into our own forecasts for the future of public health supply chains while identifying implication for PBF schemes under the functions of financing, supply chain design, information systems, storage and distribution, human resources, governance, and accountability.

Cover photo: A storeroom at Yejube Health Center, after new shelves and warehouse equipment were installed and the room reorganized. Ethiopia. Photo credit: USAID | DELIVER PROJECT.

USAID | DELIVER PROJECT

John Snow, Inc.

1616 Fort Myer Drive, 16th Floor

Arlington, VA 22209 USA

Phone: 703-528-7474

Fax: 703-528-7480

Email: askdeliver@jsi.com

Internet: deliver.jsi.com

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Acronyms

3PL	Third Party Logistics Provider
GIS	Geographic Information System
GPS	Geographic positioning system
LMIS	Logistics Management Information System
PBF	Performance Based Financing
RMNCH	Reproductive, Maternal, Newborn and Child Health
MOH	Ministry of Health
MOU	memorandum of understanding
NCD	noncommunicable diseases
NGO	nongovernmental organization
NMOH	National Ministry of Health
SCMS	Supply Chain Management Systems (project)
SDP	service delivery point
TA	technical assistance
USAID	U.S. Agency for International Development

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Introduction

As we come to the end of the current era of Millennium Development Goals, the global health community has begun making predictions about the future state of global health in the next twenty years. These bold predictions are based on current socioeconomic trends mainly in developing countries, which suggest a significant reduction in the burden of commonly prevalent maternal and child health conditions over time. An example of these predictions is contained in the work recently published by The Lancet Commissions in December 2013, titled “Global health 2035: a world converging within a generation.”

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We aim to provoke thoughts among our target audience about how PBF might be useful for future developments in supply chains. Our target audience is key decision makers who actually have the responsibility for deciding on implementing the innovations we have predicted, or who will be at the forefront of commissioning funds for these initiatives. We begin by briefly summarizing the context for global health in 2035 as predicted by The Lancet Commissions report. We then delve into our own forecasts for the future of public health supply chains while identifying implication for PBF schemes under the functions of financing, supply chain design, information systems, storage and distribution, human resources, governance, and accountability.

The 2035 Context for Public Health Supply Chains

The Global Health 2035 Report (Jamison et al. 2012) lays out a roadmap for achieving significant health gains in low- and middle-income countries by 2035. The report envisions the following four key elements of the future state of health systems, which provide the overarching context for the future of public health supply chains:

Continued economic growth in low- and middle-income countries will enable increased investment in health.

Strong economic growth in the past two decades, in part due to increased health investments, will continue through 2035, enabling increased public health financing in the context of important health systems reforms. This continued economic growth in low- and middle-income countries will increase government revenues, expand investments in transportation and information technology infrastructure, and enable an expanded role for the private sector in healthcare provision, pharmaceutical manufacturing, wholesale, and retail services and supply chain services. Economic growth will greatly decrease dependence on external aid and allow more countries to export health

technologies. Nonetheless, investments in health systems will need to keep pace with this broader economic growth.

Insurance will be a primary tool in achieving universal health coverage in low- and middle-income countries.

Current levels of insurance coverage are low in most countries, exposing hundreds of millions of families to potential financial catastrophe from medical bills. By 2035, publicly financed insurance will universally cover access of poor people to essential services, including against noncommunicable disease. A broader benefit package will cover all strata of the population, with exemptions for the poor.

Public health services will focus on serving the rural poor.

Today's public health systems skew toward urban, higher-income areas. Yet it is in rural areas, including in middle-income countries, where most poor people live and where preventable death is concentrated. In the future, governments will focus their services on these groups.

Noncommunicable disease will dominate disease burden.

In contrast to today's dominance of communicable disease in disease burden, by 2035 there will have been a profound shift to noncommunicable diseases such as injury and cardiovascular problems. To address this shift, secondary and tertiary healthcare institutions will play a greater role in lowering disease burden.

Supply Chain Predictions for 2035

Against the backdrop of these broader changes, we foresee the following 2035 state of public health supply chains and what the implications will be for PBF schemes.

Supply Chain Financing

The projected greater national investment in health services will increase investment in all health systems.

Public health supply chain operations in many countries are currently underfunded. By 2035, greater investment will help supply chains improve financial and operational performance and enable them to attract and retain a skilled supply chain management workforce, invest in information technology infrastructure and services, improve storage facilities, and use new transport modes. However, the increased burden of noncommunicable diseases (NCDs) will mean that demand for NCD services and products, and therefore supply chain services, will also increase.

Implications for PBF schemes: The increased requirement for health commodities will lead all stakeholders, including funders and clients, to demand for better utilization of financial resources. It will be increasingly necessary for all supply chain interventions such as PBF schemes to demonstrate their effectiveness and cost-effectiveness. Consequently, the design, monitoring, and evaluation of PBF schemes will need to include aspects of economic analysis, such as cost-benefit and cost-effectiveness studies.

Health insurance will cover commodity costs.

Currently, many countries lack sufficient funds to provide critical health commodities. By 2035, national health insurance schemes will improve access to affordable health commodities through the private sector for those commodities covered by insurance (particularly for routine healthcare: reproductive, maternal, newborn, and child health (RMNCH); minor primary care; and for priority NCDs such as diabetes, asthma, and hypertension).

Implications for PBF schemes: The increased significance of health insurance players in the financing of medicines in developing countries will mean the advent of performance-based contracts for private sector suppliers such as pharmacies and wholesale distributors. In such performance-based contracts, health insurance firms will draw up legal or formal agreements setting performance goals for the procurement of supply chain services from pharmacies and distributors. Such goals will include amounts to be reimbursed for the supply of health commodities and services to insured clients, with penalties set as disincentives for poor performance.

Expanded use of health insurance schemes to attain universal health coverage will result in improved public sector supply chain management financing through services fees and markup on sales.

Universal health coverage insurance schemes will increase private sector participation in healthcare, especially primary care. Community managed health schemes will also increase. Insurance schemes will negotiate prices and pay for services and supplies on behalf of their members. In the case of medicines or other supplies that are purchased by providers (including pharmacies) at the wholesale rate, and then sold to clients at the agreed (and published) insurance price, the wholesale rate will include supply chain costs as a markup on the commodity landed cost. Alternatively, insurance schemes' members will pay and be reimbursed for their supplies based on published price guidelines, but the markup for supply chain costs is still built into the published price. Prepaid vouchers might be used for select commodities—such as RMNCH commodities that are provided for free to the client—with the supply chain cost factored into the voucher value or added as a service fee. For any of these transactions, the most likely revenue stream will be via single payer electronic payment vouchers or other e-payment mechanisms tied to a universal health insurance member number and type of service and commodity provided, with commodity revenue channeled to the supplier (if a public agency and commodity is post-paid) or to the service delivery point (if commodity is prepaid by the facility). Point-of-service technology will interface with insurance information systems to facilitate timely flow of dispensing and sales data to the insurance information system and of funds to the appropriate accounts.

Implications for PBF: As the private sector becomes more involved in direct financing of various aspects of the supply chain, it will become increasingly more important to monitor the equity of service provision in private sector-led supply chain models. The increase in private sector players in the public sector supply chain comes with the inherent danger that such players might focus more on profitability than building supply chains to reach the most vulnerable populations. PBF schemes will need to measure the equity of services. The design and monitoring of PBF schemes will therefore have to include the measurement of markers of socioeconomic disparity in order to evaluate whether these interventions are having a positive or negative impact on equity of services.

Universal health coverage insurance schemes will encourage and enable the private sector retail pharmacy market (and private health services) to expand, especially in urban and peri-urban areas (where market concentration makes it economically feasible).

Access to essential commodities through the private sector is currently uneven in many countries. By 2035, private sector expansion will reduce the burden on public health supply chains and enable the public sector to focus on rural areas. Universal health coverage insurance schemes will enable timely payment to private pharmacies, improving their market position within a geographically segmented market. With universal health coverage insurance schemes, segmentation by wealth will be less significant than by geographic location and access to quality private services.

Implications for PBF: This development will present an opportunity to design PBF schemes that encourage private pharmacies to expand their services to remote and hard-to-reach populations. Such schemes will provide incentives for private pharmacies to overcome barriers to setting up their trade in remote areas. These incentives could include reimbursements or subsidies for costs of operations of certain aspects of the supply chain, such as transportation, warehousing, and distribution.

Donor funding (grants and in-kind) will be focused on fewer low income countries as more countries achieve middle income status and are more able to self-finance their health services and systems.

Insurance schemes funded through general revenue or payroll tax are already the norm in middle-income countries, and as more countries enter the middle income group, donor focus and support will reduce. This has been the trend over the last twenty years in Latin America, Asia, Central and Eastern Europe, and the Middle East. Therefore, countries with growing economies will be expected to self-finance the health sector without recourse to many of the grants and in-kind services and supplies they receive today. They will still have access to loans and international tiered pricing agreements, but will need to have the financial capacity to procure the majority of their health commodity needs. At the same time, as is the case in most countries with robust insurance schemes, Low and middle income country health schemes will be faced with the need to control costs and avoid cost inflation by maintaining limits on coverage. Supply chains within the country will be expected to be wholly self-sustaining and cost-efficient for both operational and capital investment needs. In low-income countries, donor investments currently ongoing will have built supply chain capacity and infrastructure that will need to be carefully maintained. As global health indicators continue to improve, donors will be focusing more on the poorest performing countries, and on emergency funding to mitigate the impact of climate change, support failed or failing states, and address areas of conflict or natural disaster. In each of these scenarios, health supply chains will be recognized as a driver of improved health outcomes and therefore a major focus, but the number of countries receiving assistance will be significantly fewer than today, will emphasize emergency response, and will be concentrated primarily in sub-Saharan Africa.

Implications for PBF: The reduction in donor support for supply chain operations in developing countries will implicitly challenge developing countries to find other resources. It is likely that governments of developing countries will fund the healthcare system from resources generated through general taxation. Currently, most supply chain PBF schemes are heavily funded by development partners. Going forward, proponents of PBF schemes will need to convince governments to invest in PBF schemes as part of a broader approach to improving performance management in the supply chain.

Supply Chain Design

Commercial drug manufacture will be widespread in low- and middle-income countries.

Outside of a few middle-income countries, domestic drug manufacturing is currently limited. By 2035, more domestic production of health commodities—particularly generics—will increase the pool of suppliers, with potential for vendor managed inventory and/or direct delivery by supplier through framework contracts/e-procurement (Chile model). This will reduce dependence on public sector supply chain organizations and improve availability of commodities in both public and private sectors.

Implications for PBF: The kinds of incentives embodied in PBF schemes are more or less commonplace in private, commercial supply chains and in the relationships between manufacturers, distributors, and retailers in the commercial sector (Serumaga, Smith, and Rosen 2013). Such relationships have typically been absent in the main sources of supply for current public health supply chains, where national governments procure principally from large international suppliers. National supply chains in the future are much more likely to be able to source their medicines from domestic manufacturers. This will increase the probability that performance incentives can be put in place in agreements between manufacturers and public health supply chain buyers, either at the national level via framework contracts or via direct

agreements between health facilities and local manufacturers. Local manufacturers will likely be more willing to participate in PBF schemes than their international counterparts will. These factors should facilitate greater use and acceptance of PBF programs.

The private sector will play a much greater role in the public health supply chain.

Commercial supply chain capacity is currently limited in most countries. By 2035, expanded private sector third party logistics provider (3PL) services and capacity will reduce dependence on government-owned resources and increase outsourcing as a primary mode of health commodity distribution, including a mix of direct distribution by suppliers (via framework call-offs and e-procurement systems), vendor managed inventory, and scheduled deliveries. Governments will focus more on contract management and supply chain stewardship, and less on direct control of all supply chain assets and operations.

Implications for PBF: As noted, commercial supply chains commonly use PBF programs to align objectives among the various links of the chain. Such a commercial sector perspective is lacking in almost all public health supply chains. However, these supply chains will increasingly “privatize” by 2035. This can only mean greater opportunities for employing PBF schemes similar to those seen currently in the private sector. The greater reliance on outsourcing of government logistics functioning will also require good contract management on the part of government officials managing these outsourcing contracts.

Supply chains will carry much broader range of products, particularly those that treat noncommunicable diseases.

Today’s supply chains focus relatively little on commodities for NCDs. As focus expands to address the burden of these diseases, the volume and range of commodities required will increase (e.g., to treat diabetes, asthma, hypertension), particularly with new treatments and diagnostic technologies that cater to diagnosis and treatment of NCDs in low resource settings. Surgical requisites, particularly for treating injury, will be in higher demand at secondary facilities (district hospital) and some higher level health centers. New vaccines or new therapies for infectious diseases may also result in increased diversity of products and throughput volumes, but introduction of temperature stable vaccines in single-dose applicators (replacing multidose cold chain–dependent vaccines) will reduce reliance on cold chain equipment.

Implications for PBF: PBF schemes are not limited, in theory, to any particular product group. Nonetheless, most of the focus of today’s supply chains is on the movement of “program” commodities related to specific priority disease conditions such as HIV/AIDS, family planning, malaria, and tuberculosis. The number and variety of these “program” commodities is likely to increase with the expanded focus on NCD. The resulting more complex supply chains will require more complex PBF design and implementation. They will rely more heavily on information systems that will have to increasingly draw information on a broader range of commodities. These newly added commodities may likely be low-profit commodities. This means that PBF schemes will increasingly need to encourage distribution of these low-profit commodities, which will compete with the scarce resources of the supply chain that will naturally be attracted to higher profit commodities moving through the system. In sum, the broader array of commodities deemed critical to public health will have major implications for PBF schemes.

Information Systems

Management information system integration and enterprise architecture will be the norm, enabling total supply chain visibility and routine data exchange with other health information systems.

Many public health supply chains are automating data collection and processing, but large gaps remain in the ability to collect, use, and interpret data on a wide range of supply chain indicators. In twenty years, supply chain management information systems will be fully integrated and enable total visibility from procurement and planning to prescription and dispensing. The Logistics management information system (LMIS) will include warehouse management systems and inventory control systems data from every level and site, will include point of sales/dispense data, as well as prescription data from medical records, to monitor and promote adherence to standard treatment guidelines and rational use. Systems will routinely use biometrics to identify who handles commodities within each supply chain process and prevent diversion. Global positioning systems (GPS) for vehicles will be ubiquitous, with route planning software used routinely to optimize distribution networks. Countries will also integrate financial data with logistics and medical records information systems, linking dispensing to individual health insurance account, facility account, and supplier accounts. Improved information technology access in rural areas enables automated inventory management at the point of care through inexpensive, resilient point-of-service technologies.

Implications for PBF: Successful PBF schemes rely heavily on data on supply chain performance. The current sporadic availability of supply chain information upstream and downstream and relating to information of all types hampers the ability to design and implement PBF schemes. The supply chain world of 2035 will be a data rich environment. The design of PBF schemes will be facilitated by greater access to data on current system performance to define and prioritize problems and to gain insight into the underlying causes of poor performance. It should make it easier to include supply chain management and performance indicators in existing PBF for service delivery-focused schemes. Implementation of schemes will be made easier in a number of ways. It will be easier to measure the performance of the overall supply chain, specific levels, units, and individuals within those units. It will make it easier to validate performance on the chosen indicators. It will make it harder for supply chain actors to game the system. It will make it easier to assess the budget implications of the PBF scheme. It should make it easier to evaluate the impact of PBF schemes (including impact on supply chain performance, cost, and cost-effectiveness, and return on investment/economic evaluation of PBF schemes). In sum, such measurement capability will strengthen incentive schemes, make the results more reliable, and make it easier to tie performance to incentives

Governments will use geographic information system information to optimize their networks, increase transparency of supply chains, and use this information in bids and contracting.

Network optimization is likely to increase the role of the private sector and 3PLs. Governments will make geographic information system (GIS) information and GPS tracking systems a requirement in their requests for proposals for 3PL services, particularly for transport or distribution.

Implications for PBF: The increasing use of GIS and GPS tracking systems will present an opportunity to design PBF schemes that monitor and reward improvements in transport and distribution functions of the supply chain. GPS tracking systems will enable the collection and analysis of accurate, reliable, and real-time data on transport and distribution operations. This will make it even more difficult for transportation logisticians, whether in-house or outsourced, to make inaccurate claims about the efficiency of their operations. It will also be easier to analyze patterns

of poor scheduling and transportation decisions and to provide solutions to rectify them. This should spur innovation in the long run.

Storage and Transportation

Better transport networks will reduce transport time and cost.

For today's supply chains, transport—especially to the last mile—remains a big challenge to supply chain performance. By 2035, due to development of the economy at large, many more roads will be paved in order to improve access of raw materials and agricultural products to the market for export. Improved road access to (and from) rural areas—particularly in medium-income countries and agricultural and mining regions of low-income countries—will reduce cost of travel times for health commodity transport, and reduce vehicle operation, maintenance, and repair costs.

Implications for PBF: Better transportation networks will make it easier and cheaper to travel to remote locations to carry out verification visits for PBF schemes. A cornerstone of successful PBF schemes is the ability of scheme managers to verify results in a timely and accurate manner. This often involves teams traveling to the sites of beneficiaries of the scheme, such as health centers or distribution centers, to carry out verification. Improvements in transportation facilities will make this easier.

Current “alternative” transport technologies will be commonplace.

By 2035, many commodity transport vehicles will be using alternative fuels (e.g., liquefied natural gas) and hybrid vehicles, reducing operating costs after initial upfront investments for vehicle replacement or engine conversion. For hard-to-reach areas, delivery drones will become commonplace; the cost of drones will enable low- and middle-income countries to leapfrog extensive investment in roadways, paving, and maintenance. Drones are already highly automated using GPS to find destinations and return to base. Although they might be unwelcome in some countries due to privacy or security concerns, commercial transport and distribution applications of drones in high-income countries will have proven their potential.

Implications for PBF: The advent of new transport technologies will create an opportunity to design PBF schemes that encourage their use and adaptation to appropriate settings. Such schemes will reward innovations if it can be proven that the use of this new technology has led to significant improvement in supply chain operations and, ultimately, better commodity availability.

Supply Chain Human Resources and Leadership

Supply chain competencies and positions will be well defined but human resources for supply chain management will still be a problem due to attrition of skilled workers.

Many of today's public health supply chains struggle to recruit, retain, and motivate workers possessing the appropriate skills. By 2035, the supply chain management cadre will be recognized, appreciated, and institutionalized with well-defined competencies, position descriptions, etc. but human resources will still be problematic, especially in low-income countries. Recruiting and retention will be easier since more positions will be in the private sector (due to outsourcing) and therefore more competitive with the broader labor market for supply chain skills. The most critical gaps will be in rural facilities, which will continue to struggle to find and retain health workers. Increased automation will put a premium on staff with some technology skills, but this will be

mitigated through user-friendly and robust management information system tools at the service delivery point, increased use of automated inventory control systems (using radio frequency identification, barcodes, and point of service technology), and increased reliance on vendor-managed inventory.

Implications for PBF: PBF schemes are all about improving performance, so the better that supply chain organizations are able to define performance and to identify who should do what for proper supply chain functioning, the easier it is to set appropriate parameters necessary for the success of PBF schemes. The traditional lack of clarity in supply chain job descriptions hampers clear-cut design of PBF programs. By 2035, it is expected that there will be improvement in job descriptions and corresponding increase in professionalization and recognition of the unique role supply chains play. This clarity of roles will make it easier to design PBF programs with clear performance targets for individuals and teams. Moreover, lines of authority over supply chain decision making and accountability will be clearer, aiding in the design process by pinpointing those performance indicators over which specific employees or teams have control. This will enable the development of more commercial sector-like schemes, where individual bonuses play a role in PBF design and implementation. The implications of all this for PBF schemes is profound and positive.

Supply chain leadership will be better and supply chain consulting service providers the norm in many low- and middle-income countries.

Leadership quality is currently haphazard and most health ministries undervalue supply management as a strategy for achieving health gains. In twenty years, ministries of health will have recruited and retained supply chain executives into positions with near-equal stature as department directors and chief medical officers. These individuals will be more able to use data on demand, supply, supply chain performance, and financing to advocate for the resource they need to ensure efficient, cost effective supply chain operations and long-term investments. They will function as stewards of the diverse supply systems for health commodities, focused on collaboration and coordination rather than traditional command and control. They will see supply chain diversity and multiplicity as a benefit to leverage resources and reduce risk of supply disruption. Logistic management units will still exist but will be leaner and efficient, focusing more managing data and contracts; pooled procurements among smaller countries may become more common. Supply chain consulting services will continue to expand, with more indigenous organizations providing consulting services to both public and private sector health supply chains. These services will be recognized value-additions, particularly by supply chain stewards.

Implications for PBF: PBF schemes are not easy to design and manage, requiring skilled leadership and specialized technical expertise. The current lack of leadership and technical expertise thus hampers the introduction of such programs without significant external technical assistance. With the expected increase in such local leadership and technical skills by 2035, it should be easier to design and implement PBF schemes.

Supply Chain Governance

Regulation will be strong and better ensure drug quality.

Regulation of drugs is now weak in most countries. By 2035, improved capacity of national drug authorities in quality assurance and market surveillance will increase consumer and government confidence in the pharmaceutical retail sector as a major source of supply, reducing dependence on public sector supply chains. Harmonization of standards across different countries will make it more difficult for counterfeiting and for substandard products (e.g., ongoing East African regulatory harmonization project). Increased technology (e.g., barcoding) will enable supply chains to track

products from manufacturer to health facility. Improved regulation will also enable local manufacturers to access markets in other countries and regions, and significantly shorten pipelines.

Implications for PBF: Better regulation of the pharmaceutical sector in developing countries will present an opportunity to design PBF schemes that target improvements made in ensuring the quality of health commodities along the supply chain. To date, such PBF schemes are rare, mainly because of the inability of developing countries to fully implement and monitor rigorous regulatory requirements.

Public Demand for Accountability

Universal healthcare will strengthen public demand for quality services and empower the consumer to influence the market.

The advent of health insurance schemes with published commodity prices will empower consumers to select service providers based on quality of services (including availability of commodities) rather than simply location or cost. Public-private partnerships, in which clinicians work for themselves or under contract with the insurance scheme but lease public facilities (particularly in rural areas, as in Romania's model), will be commonplace and promote competition among providers within the same geographical areas. Expansion of private pharmacies and franchising arrangements will also promote competition. Market conditions will therefore benefit consumer choice, with increasing demand for quality services—including availability of quality commodities—driving improved service delivery.

Implications for PBF: The monitoring and evaluation of PBF schemes will have to include aspects of detailed economic analysis in order to verify their cost-effectiveness to the general population. As the general population in developing countries become more empowered, they will demand for evidence that PBF schemes have favorable benefits compared to their costs, and that they are a more cost-effective alternative to or in addition to other interventions aimed at improving supply chain performance.

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For more information, please visit deliver.jsi.com.

USAID | DELIVER PROJECT

John Snow, Inc.

1616 Fort Myer Drive, 16th Floor

Arlington, VA 22209 USA

Phone: 703-528-7474

Fax: 703-528-7480

Email: askdeliver@jsi.com

Internet: deliver.jsi.com