

Estimating Mesoamerican and Dominican Republic Supply Chain Costs

Overview

The governments of Mesoamerica and the Dominican Republic have shown a strong commitment to improving the availability of essential medicines, including contraceptives, in their public health supply chains.

Strong national leadership, commitment, and coordination—coupled with partnerships among civil society, nongovernmental organizations (NGO), and the private sector—have been pivotal. Underpinning this success has been the strength and robustness of increasingly integrated and sophisticated public health supply chains. Sustaining this success comes with challenges, such as the dwindling support of traditional donors to fund both commodities and supply chain improvements. As donor funding decreases, governments need to budget adequate resources to fund public health supply chains and ensure their populations have access to essential medicines, including contraceptives. A key question remains, however. How much should they budget to fund the supply chains needed to ensure product delivery?

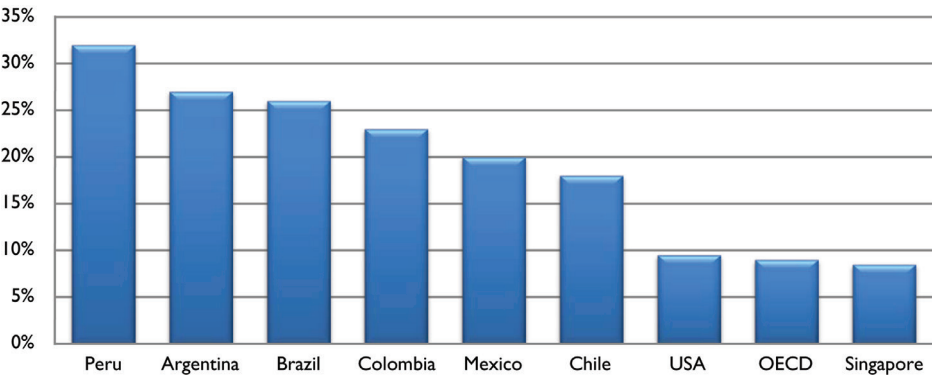
To answer this question, countries should estimate their supply chain costs. This requires an analysis of supply chain activities across administrative levels or tiers in the systems and different supply chain actors. In the absence of this detailed analysis, we adapted and updated an economic model first developed by the USAID | DELIVER PROJECT for the World Health Organization (WHO) in 2009. That model provided a macroeconomic estimate of the supply chain costs associated with helping 49 developing countries achieve their Millennium Development Goals (MDGs) in health (Sarley et al. 2009). The model was intended to give an idea of the total costs for supply chain to deliver essential medicines. The estimates derived from the model give a macroeconomic view of supply chain costs for initial budgeting purposes. More detailed analysis would be required in each country to validate these costs.

The updated model predicts that in Mesoamerica and the Dominican Republic, public health supply chain costs are between 33 percent of commodity values in countries with the lowest logistics performance and 13 percent in the best performing. We summarize our approach in this brief, the model used, and results generated.

Latin America is an expensive place for logistics

Research by Guasch (2011) at the Inter-American Development Bank (IDB) and the World Bank (WB) has highlighted that the cost of logistics in Latin America is very high in comparison to the United States of America (USA), Organization for Economic Cooperation and Development (OECD), and other emerging markets. As Figure 1 shows, logistics costs as a percentage of the value of products delivered ranges from 30% in Peru to 20% in Mexico and 18% in Chile. In comparison the level is 9.5% in the USA and 8.5% in Singapore. High costs in Latin America and the Caribbean (LAC) result from a number of factors including high shipping and transportation costs, incomplete infrastructure, a lack of competition among logistics providers, and the high cost of customs clearance.

Figure 1: Logistics Costs as a Percentage of Product Value, 2004



Source: Guasch 2011

Pharmaceutical logistics costs

Typically, the value of pharmaceuticals is higher, on average, than other products; thus, the logistics cost of moving essential medicines is lower. In the USA, with its high prices for pharmaceuticals, logistics costs for pharmaceuticals are estimated at 4 percent of the product value. Assuming a similar relationship between logistics costs for the whole economy and logistics costs for pharmaceuticals, this would suggest that pharmaceuticals logistics costs in LAC would also be less than those percentages shown in figure 1.

How much do public health logistics cost?

The WB has created a Logistics Performance Index (LPI) (Arvis et al. 2014) that ranks country performance around a number of key areas including customs, infrastructure, international shipments, logistics quality and competence, tracking and tracing, and time-liness (table 1). Ranked higher than Chile are the OECD countries, Singapore, Malaysia, South Africa, Thailand, UAE, China and Kuwait amongst others. While Estonia, Vietnam, and Bulgaria are ranked higher than Mexico.

The LPI contains a number of variables that may not be appropriate for public health supply chains. Therefore, we constructed a revised index that focused more on factors that would affect public health supply chain costs. This index included:

- An infrastructure score that reflects the better the transport infrastructure, the better the score and the lower the supply chain costs;
- Logistics competency reflects the capability of the private sector in the country and would likely lead to lower the costs for clearing and transportation;
- Population density would reflect the challenges of reaching rural populations. The greater the population density is, the easier it is to reach and the lower the costs of reaching them;
- The governance (USAID | DELIVER PROJECT 2009) score is a proxy for how well the public sector works. The better the governance that is in place, the more effective and efficient public supply chains are assumed to be, and;
- The gross national income (GNI) per capita reflects how much the economy is developed. The more that the economy is developed, the lower the supply chain cost will be.

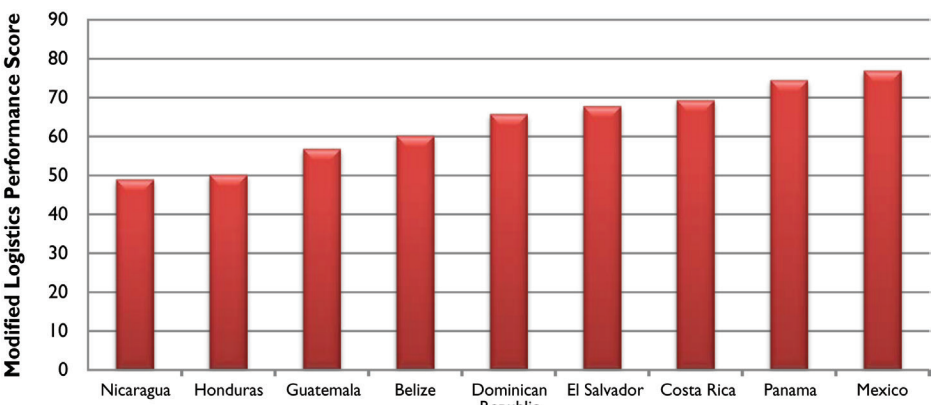
Table 1: Position of LAC Countries in the World Logistics Performance Index, ranking out of 160 countries.

Chile	42	Brazil	65	Nicaragua	95
Panama	45	Dominican Rep.	69	Colombia	97
Mexico	50	Peru	71	Honduras	103
Argentina	60	Guatemala	77		
El Salvador	64	Costa Rica	87		

Source: Arvis et al. 2014

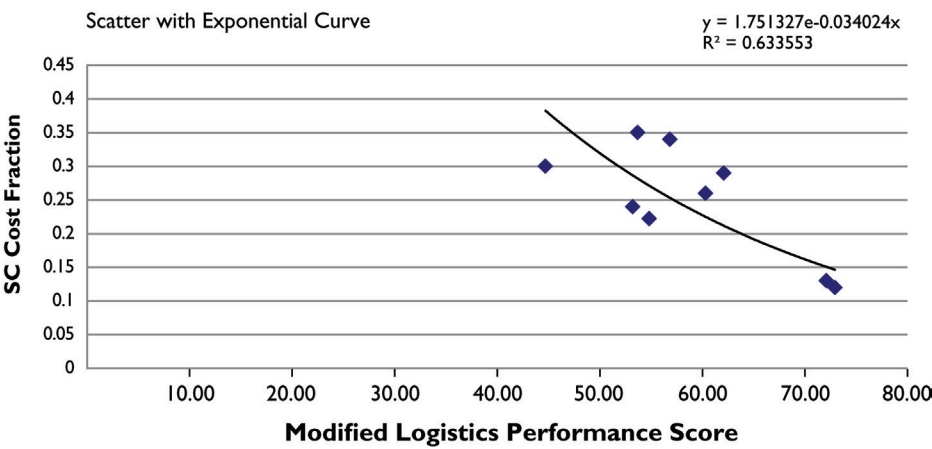
Mexico is ranked as having the highest modified LPI score for the 58 countries analyzed (figure 2). For comparison purposes, the score for El Salvador and Bangladesh are similar, while the score for Honduras places it between Kenya and Uganda.

Figure 2: Mesoamerican and Dominican Republic Logistics Performance Scores (2014)



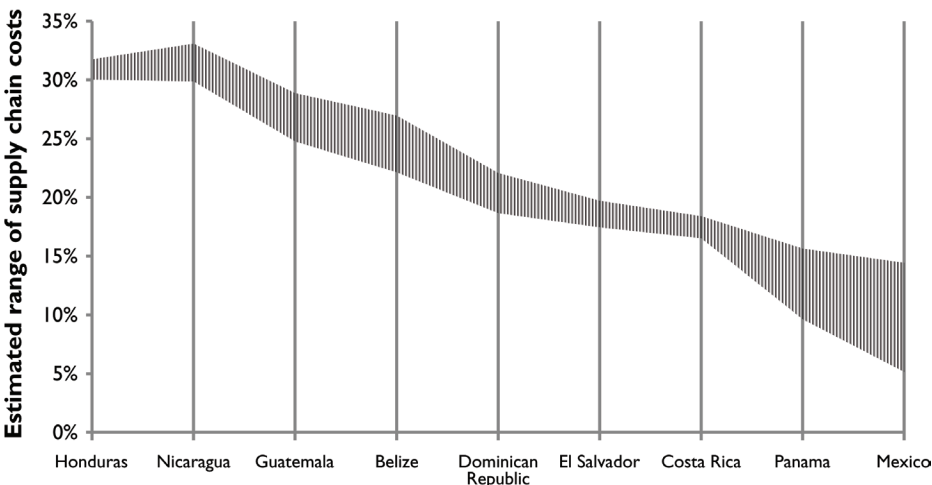
We then modeled this new LPI against results from the limited number of supply chain cost studies available from African and Asian countries. We then fitted a regression curve. While based on a small number of observations, the estimated curve has a relatively good predictive power as shown in figure 3.

Figure 3: Supply Chain Cost Ratio



The regression equation in the figure below was then applied to the modified LPI scores calculated for Mesoamerica and the Dominican Republic to generate predicted logistics cost ratios expressed as a percentage of the product value. These ratios are displayed in figure 4 and show a range similar to the range discussed by Guasch. The scale ranges from 5-14 percent (least costly) to 30-33 percent (most costly). With the best logistics performance in the region, Mexico is likely to require supply chain costs of between 5 and 14 percent of commodity value. Panama is estimated to require costs 10-16%, Costa Rica 17-18%, El Salvador 17-20%, Dominican Republic 19-22%, Belize 22-27%, Guatemala 25-29%, Honduras 30-32% and Nicaragua 30-33%. They represent guidelines that Mesoamerica and the Dominican Republic could take into consideration until more detailed cost analysis can be conducted of logistics costs for ensuring product availability at service delivery points throughout the country, including hard to reach rural areas.

Figure 4: Estimated Predicted Supply Chain Cost Ranges as a Percentage of Product Value for Mesoamerica and the Dominican Republic



Governments should set aside and allocate sufficient funds to deliver products. Otherwise, money spent on commodities will risk being wasted as products cannot get to the populations they are intended to reach.

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Panama: 2013, Ministry of Health Budget

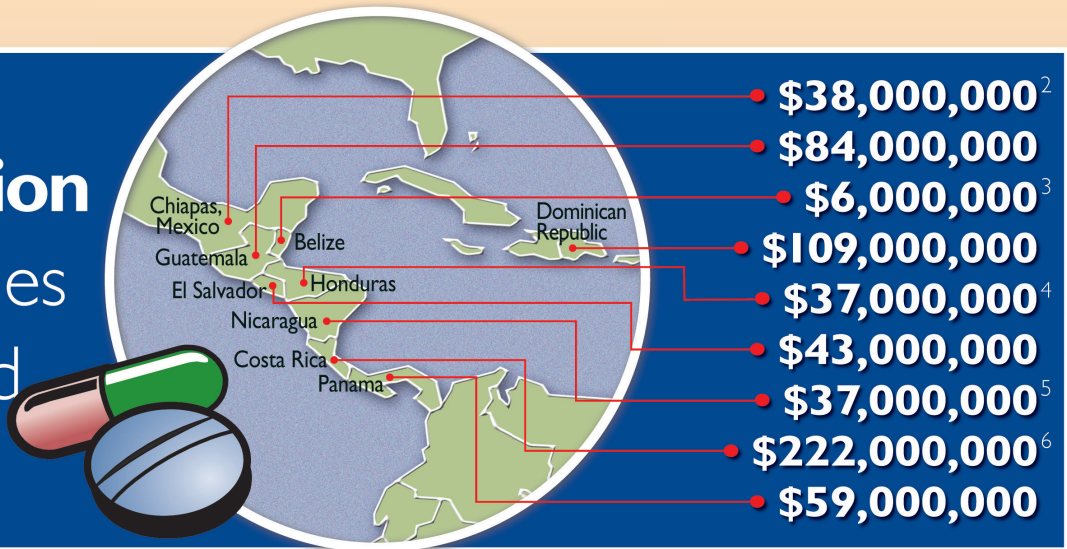
Dominican Republic: 2013, Ministry of Health Budget

GETTING ESSENTIAL MEDICINES TO CUSTOMERS

Why Mesoamerica and Dominican Republic Should Increase Their Investment in Supply Chains

Countries Invest in Essential Medicines

An Estimated U.S. **\$600 Million** Invested in Essential Medicines Each Year in Mesoamerica and Dominican Republic¹



1. Numbers by country are approximate estimates and have been rounded to the nearest million. • 2. Data from Chiapas, Mexico was taken from 2012 version of this same infographic as new data was not obtained. • 3. This sum represents what was allocated for the procurement of essential medicines as expenditure data was not made available to the authors. • 4. Data from Honduras was taken from 2012 version of this same infographic as new data was not obtained. • 5. This sum represents what was allocated for the procurement of essential medicines as expenditure data was not made available to the authors. • 6. This sum represents what was allocated for the procurement of essential medicines as expenditure data was not made available to the authors.

Without Supply Chain Funding, Products Can't Reach People

Initial investment gets medicines to the central warehouse but not into the hands of customers. More efficient and protected funding to strengthen supply chains can help get health products to people.



Regional Level

Regional and local warehouses must store and distribute health products on time and in good condition.



Customer Level

Customers must receive health services and products when and where they need them.



Central Level

Program manager and policymakers must select, quantify, and procure health supplies. Warehouse must store and distribute products.



Facility Level

Health facilities must store and dispense products to customers, and need trained staff members to monitor product availability.



Strong Supply Chains Help Achieve Health Objectives

Supply chain investments can strengthen health programs by getting products to people, accelerating progress toward meeting our current development goals and the post 2015 development agenda.

- Maintain eradication of childhood diseases
- Reduce maternal and child deaths
- Reduce unwanted pregnancies
- Reduce HIV and AIDS prevalence



What Governments Can Do

Allocate and spend between **\$0.05** y **\$0.33** cents for the supply chain functions for every **\$1.00** spent on essential medicines. These resources will help deliver health products to people and protect the country's investment in medicines.

