USAID GLOBAL HEALTH SUPPLY CHAIN PROGRAM
Procurement and Supply Management

Activity-Based Costing in Public Health Commodities Supply Chains

Methodology Uncovers True Costs of Operation, Gives Rise to New Management Approach

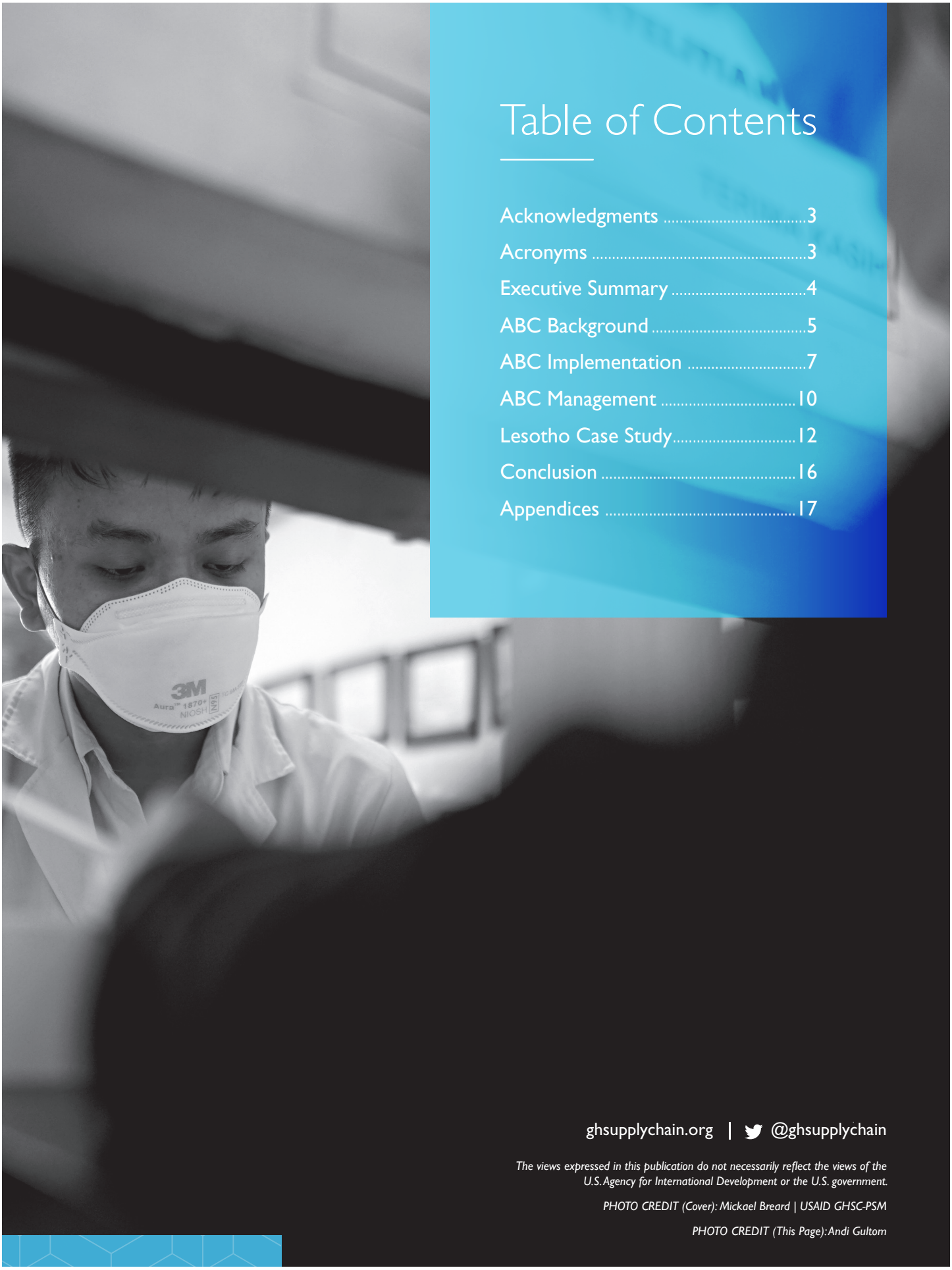
PRIVATE-SECTOR CONCEPTS

USAID FROM THE AMERICAN PEOPLE

PEPFAR U.S. President's Emergency Plan for AIDS Relief

USAID FROM THE AMERICAN PEOPLE CDC

U.S. President's Malaria Initiative



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Acronyms

3PLs	Third-party logistics providers
ABC	Activity-based costing
ERP	Enterprise resource planning system
GAAP	Generally Accepted Accounting Principles
GHSC-PSM	Global Health Supply Chain-Procurement and Supply Management project
KPI	Key performance indicator
MOH	Ministry of Health
NDSO	National Drug Service Organization
PDCA	Plan do check act
USAID	United States Agency for International Development
WMS	Warehouse management system

01.

Executive Summary

PHOTO CREDIT: Lan Andrian | USAID GHSC-PSM

A Traditionally Private-Sector Approach for Transforming Management and Controlling Cost

In public health supply chains, warehouses at the country level serve a key role, receiving large orders for medicines and medical products from the international supply chain, storing these products, and then packing and shipping smaller orders for distribution to local health facilities.

These warehousing activities require infrastructure, equipment, human resources and expertise, all of which bring significant costs.

Donors and country governments are beginning to use a traditionally private-sector approach to measuring warehousing costs as a way to better understand these cost drivers, identify inefficiencies in warehousing processes and costs, implement process improvements to lower costs, and continually evaluate performance for further improvements. This approach is called activity-based costing, or ABC, and it engenders a new way of managing called activity-based management.

For programs funded by the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), activity-based costing will be an emphasis in 2021 and beyond.

For countries that want to manage their own supply chains without hiring third-party logistics providers (3PLs) to provide warehousing services, implementing ABC is especially important to ensure that warehouse performance and costs are competitive with what 3PLs offer.

This handbook will:

- Help country governments understand what ABC is, the steps involved in implementing ABC, and the expected outcomes.
- Present a detailed case study on ABC implementation in Lesotho and the positive results that unfolded.
- Provide annexes with example tools that are used to implement and practice ABC.

Throughout the handbook, the term "distribution center" is used instead of "warehouse" to reinforce the idea that these facilities should not be points for long-term and costly storage of products but rather shorter-term intermediaries in continually moving products to the last mile and to clients. This change in concept is helping public health supply chains focus on more rigorous approaches to supply chain management within the storage realm.

02.

ABC Background

PHOTO CREDIT: Bobby Neptune | USAID GHSC-PSM

What Activity-Based Costing Is and Why It Is Important in Public Health Supply Chains

In public-sector supply chains, such as those for medicines that treat infectious diseases, distribution centers receive supplies of commodities that have been ordered in larger quantities to meet the needs of a local region.

Distribution center staff receive the commodities and move them into storage space and then they fulfill local orders by picking, packing and loading commodities for shipping to an interim or final destination.

Traditionally, the service fee established for these warehousing processes has been calculated as a percentage of the value of the commodities being received, handled, stored and shipped. This is known as value-based accounting. While straightforward, this approach is a more arbitrary determination of the costs to provide warehousing services. Not only can commodities themselves differ in value, but also storage costs can vary depending on how a commodity was delivered, where it is stored and even what season it is. Value-based accounting often does not factor in these variations, thus the costs assigned are not as accurate as they could be.

A basic example will demonstrate why commodity value is not an accurate indicator of the cost to provide distribution center services: A large box arriving at a distribution center may contain very lightweight commodities of low value — for example, cotton swabs. Calculating the distribution center service fee based on a percentage of this box's value would result in a relatively low fee. But the large box requires the same (or sometimes more) distribution center activities to manage its receipt, storage and ship as does a small box with high-value goods — for example, a box containing expensive medicines or laboratory reagents in relatively small containers. Additionally, the large box takes up more storage and shipping space, bringing its overall storage and handling costs even higher.

This video on volumetrics explains this concept further.

To determine a service fee that reflects a distribution center's true activity costs, a more rigorous costing methodology called activity-based costing (ABC) has become a focus for USAID and other public donors, and is being adopted in public health supply chains, particularly in distribution centers. Lesotho, Rwanda and Uganda have implemented ABC with guidance from the USAID Global Health Supply Chain-Procurement and Supply Management (GHSC-PSM) project, and Ghana is currently preparing for implementation. ABC identifies activities in an organization — in this case, receipt, put-away, picking, packing and shipping — and determines the direct and indirect (overhead) costs associated with a specific commodity for each of these activities. This exercise ascertains the true cost of receiving, storing and shipping a commodity, enabling distribution center managers to pinpoint a more representative service fee.

ABC is More Than a Costing Strategy

Public health supply chains often face more challenging budget limitations than those of the private sector. Constraints on donor and government funding are perpetual realities for many countries, making it more essential than ever for public-sector supply chains to be lean and efficient.

In addition to traditionally using the more arbitrary value-based accounting to determine service fees, health supply chains that are still developing often depend on reactive key performance indicators (KPIs), such as commodity stockouts at the facility level, to measure performance. Unfortunately, these indicators illustrate only the effect of a breakdown somewhere in the supply chain, rather than the cause.

By implementing ABC to determine the true cost of operations, not only can a more representative service fee be set, but also diagnostic KPIs can be established that reveal root cause issues and opportunities, enabling targeted improvement and more efficient supply chain management overall. By determining the actual costs to operate a distribution center, and understanding the cost drivers that impact those costs, those drivers can be adjusted to become more efficient and productive, ultimately reducing operational cost.

In this sense, activity-based costing is not just a costing methodology but a true shift in how an organization operates, leading to continual improvement and operational excellence. In other words, activity-based costing ideally evolves into activity-based management. Supply chain managers can prescriptively address problems before they create bottlenecks, stockouts and delays.

Activity-based costing is not just a costing methodology but a true shift in how an organization operates. In other words, activity-based costing ideally evolves into activity-based management.

DEFINITION OF DISTRIBUTION CENTER ACTIVITIES

re·ceipt - the physical receipt of products at a distribution center, inspection of the products for accuracy and quality assurance, determination of where the stock will be stored, delivery to that location and completion of receiving reporting.

put-a·way - taking incoming orders from the location where they are received to the storage area, placing them in storage units and recording their storage location.

pick·ing - retrieving items for an order from their storage location, taking them to be prepared for shipping and recording preparation of the order.

pack·ing - Packaging items in an order for shipping.

ship·ping - transport of an order from the distribution center to its destination.

Outcomes of ABC

A variety of positive outcomes are possible through ABC implementation.

First and foremost, by building knowledge of true supply chain operational costs (monthly and annually), ABC gives organizations a powerful tool to monitor, analyze and improve operational efficiency.

ABC also breaks down costs in several ways to provide a full picture of the impact of different costs on the organization:

- By function (e.g., receipt, put-away, picking, packing, and shipping) as a percentage of total costs
- By unit, as a percentage of the total commodity:
  - Per volume or weight of commodities
  - Per kilometer transported
- By costs of labor for functional areas (e.g., receipt, put-away, picking, packing, and shipping)

Activity-based management — operationalizing the efficiencies introduced through ABC into day-to-day management — is used in conjunction with ABC to identify areas that would benefit from process improvements. The activity rates determined through ABC provide valuable clues on where to focus improvement efforts. Benchmarking can also be used to determine whether these activity rates align with world-class standards of performance achieved by other organizations.

Fortified with a new understanding of true costs through ABC implementation and a focus on improving processes and building efficiencies, an organization can then implement strong and measurable KPIs that foster a cycle of continual improvement.

Ultimately, implementing ABC will lead to long-term cost savings as efficiencies are realized — savings for both distribution center operations and donors.

03.

ABC Implementation

PHOTO CREDIT: Andi Gultom

Implementing ABC: A Phased-In Approach

Because ABC is a fundamental shift in costing and organizational management, implementing ABC requires support for the change throughout all levels of the organization, and a commitment to maintaining new business processes in the long term.

As such, ABC implementation is best done in phases, allowing time within the operation for adaptive learning and continual improvement, as well as building of capacity and ownership ABC implementation is best structured in four phases. Generally, implementation takes place over six months, with four to six weeks between phases.

Phase 1: Overview and Discovery

Phase 1 lays the groundwork that will inform implementation of ABC. Advisors experienced in ABC implementation work with distribution center and operations managers, supervisors and other key staff — in person or by remote — to provide an overview of ABC and conduct discovery of key information. This phase requires about 10 days and entails the following activities:

Build Awareness and Education

Because ABC is not simply a change in costing calculations but also leads to a culture change in how an organization is managed, implementing ABC should be understood as a change management process. Hence, the first step is for the ABC advisors to educate supply chain personnel on what ABC is, how it will be implemented as a multi-phased change management tool and how financial data will be used to support supply chain operations and understand how decisions affect costs.

Determine the Commodity Mix and Characteristics

In this step, the ABC advisors interview key stakeholder staff to determine which commodities have similar characteristics or requirements to enable commodity categorization, and how day-to-day categorization of products occurs in the distribution center. As ABC is implemented, this knowledge can help the distribution center manage those categories more efficiently.

For example, in the global health supply chain, distribution centers often handle both donor-funded products, such as antiretroviral drugs (ARVs) to treat HIV, and essential medicines, such as antibiotics. Because of the bulk ordering common in public health supply chains, donor products tend to make up a larger portion of inventory and tend to stay in the distribution center longer, potentially constraining available storage space. In some cases, if storage space becomes too limited, countries may have to add on costly external storage units. Excess inventory also poses a higher risk of product expiry or damage and higher insurance costs. Understanding this potential source of increased cost and risk associated with the largest commodity category can help the distribution center advocate for adjusting ordering schedules in line with storage space to help lower cost and risk and ensure efficient supply chain management.

Categorizing commodities by common characteristics also enables those characteristics to be measured and factored into the ABC model as additional data points for determining true operational costs. Characteristics that could be identified in public health commodities include whether the commodities have particular

requirements for how they are handled or stored, how fragile they are or whether they are sensitive to light exposure. These characteristics can often be identified and measured by analyzing information in the distribution center's existing systems, such as the warehouse management system (WMS) or enterprise resource planning (ERP) system.

Identify Data Gaps Before Implementation of ABC

Finally, the ABC advisors collaborate with distribution center staff to develop a roadmap of what information will be needed in Phase 2, such as volumetric data requirements and job codes (see Annex 1 for a list of the typical data needed), and determines if any gaps need to be addressed prior to implementation.

Phase 2: Implementation

In **Phase 2**, direct labor is defined and allocated, and ABC is implemented. This process requires about 10 days of remote or in-person support and encompasses the following activities:

Implement a Daily Plan-Do-Check-Act Planner To Define Direct Labor and Enable Continual Improvement

This daily planner (*See Annex 2 for an example*) is the centerpiece of ABC implementation. It is the tool that drives the organizational change needed for ABC to be successful.

The model used for the daily planner is called plan-do-check-act (PDCA), a four-step process for carrying out change. By conducting these four steps each day, guided by the daily planner, an organization gains visibility into what is and is not working and can take iterative steps to improve processes and achieve efficiencies.

In the context of ABC implementation in a public health distribution center, the PDCA daily planner is used to measure the main operational functions of the distribution center, meaning those that touch freight/commodities — receipt, put-away, picking, packing and loading for shipping. These functions are defined as direct labor and are the cost drivers in a distribution center. By splitting out these functions and understanding how they work and interact, the distribution center can then eliminate overlaps or wastage in labor in each functional area to increase productivity and reduce unnecessary cost.

The process can work like this: at the end of each day, the supervisors for each functional area of the distribution center meet and use the daily planner to plan for the next day, taking into account the volume of commodities that are expected to move through the distribution center and the level of staffing that will be needed to complete these tasks (plan). The next morning, supervisors again meet briefly to ensure the plan from the previous day is still in place, and staff are then allocated to conduct tasks according to the day's plan (do). At the end of the day, the supervisors meet again to analyze and discuss how well that day's plan worked (check). If something did not work as planned — for example, if a shipment that was scheduled to arrive that day did not arrive, resulting in staff in the receiving department not having the expected level of work —supervisors can quickly identify this inefficiency and then determine a solution for the next day — for example, strategizing how to re-allocate staff with unexpected free time to another area where assistance is needed (act).

As this PDCA cycle is conducted each day with the daily planner, distribution center supervisors and managers begin to understand the interactive nature of distribution center functions and to operate more as a team. They learn to identify, respond to and even anticipate inefficiencies, continually improving processes over time. Working as a team and having direct input into processes also helps build staff morale.

CONTINUOUS IMPROVEMENT
The PDCA Cycle

PLAN
Set a target for improvement.

DO
Implement the plan.

CHECK
Ensure the implementation is going well. See if actions have had the intended effect.

ACT
Make this the new standard.

As such, this PDCA practice and tool, once established, is truly the foundation to a lean supply chain and drives the distribution center's evolution to activity-based management.

Develop a Draft Labor Report for Direct Labor

The direct labor report (see Annex 3 for an example) captures a distribution center's direct labor costs by each functional area, compared to the cost of (the hours used) moving commodities through the distribution center, to measure productivity.

An output of the labor report is throughput, which is a "grade" on how the distribution center managed labor against received and shipped product. Throughput is calculated as total units received and shipped, divided by the total hours used to perform those tasks. This measure of productivity provides insight as to when resources are used most efficiently.

The labor report is customized to fit each distribution center operation.

Allocate Direct Labor

In this step, the ABC advisors and distribution center team calculates salary levels for all direct labor employees involved in handling and moving product in the distribution center.

AM (Activity Measured) ÷ H (Hours) = TP (Throughput)

This information is used to assign actual costs to an activity.

Phase 3: Customization

In **Phase 3**, data on indirect costs allows ABC to be customized to the particular distribution center. The following activities, requiring about 10 days of remote or in-person support, will take place:

As this PDCA cycle is conducted each day with the daily planner, distribution center supervisors and managers begin to understand the interactive nature of distribution center functions and to operate more as a team.

Collect All Indirect Labor and Transportation Costs

In this step, the ABC advisors and distribution center management team collect information on indirect costs, which are made up of two types of costs:

- Payroll costs for staff who perform overhead functions — that is, functions such as procurement, order entry and customer service that are not directly tied to the main operational functions of the distribution center
- Transportation costs, such as fuel, maintenance, depreciation and driver per diem
- Software and hardware

This exercise provides raw data for customizing the ABC costing model.

Develop a Database to Allocate Indirect Costs to Distribution Center Functions

Next, the ABC advisors work with the finance and distribution center managers to create a database of these indirect costs and connect it with the organization's payroll system to create customized hours-tracking reports by function. These reports are used to align indirect costs to a specific distribution center function on the direct labor report.

This activity is the critical point for future ABC efforts for the direct labor portion of the ABC model, as this is when all distribution center and transportation employees are assigned to a specific distribution center function.

Determine Indirect Labor Allocation to Distribution Center Activities

Finally, the ABC advisors and distribution center management team will conduct interviews to ascertain the percentage of support to a specific activity driver for all indirect labor costs.

Phase 4: Finalization

This last phase, Phase 4, which requires 5 to 10 days of remote or in-person support, is when the ABC advisors, distribution center operations manager and director of finance review the ABC model, further customize it as needed and finalize it.

PHASES OF ABC IMPLEMENTATION

Phase 1: Overview and Discovery
The groundwork for implementation begins

Phase 2: Implementation
Direct labor is defined and allocated

Phase 3: Customization
Data on indirect costs allows customization

Phase 4: Finalization
Management and finance agree to final customization

04.

ABC Management

PHOTO CREDIT: Tafadwa Ufumeli | USAID GHSC-PSM

Evolving From ABC Implementation to Activity-Based Management

ABC is more than a costing strategy. It is designed to be woven into critical management systems as a framework for continual improvement of an organization's products, services and processes.

This requires a fundamental change in organizational culture that is supported by employees at all levels.[1]

This is why ABC advisors conduct implementation in phases to allow for orientation of all employees to the principles and mechanics of ABC, what the organization is trying to achieve and how the new approach will be used in their jobs. It's also important that an organization phase out old management processes as the new processes are fully adopted. Additionally, the daily decision-making process — aided by the daily PDCA planner — and the supervisors involved in this process must be clearly defined, and performance measurement and employee incentive programs should be tied to the new ABC structure.[2]

Employees may understandably resist this change based on uncertainty over how their jobs could change, how lines of authority could shift, and how their performance could be measured. However, a gradual implementation process allows time for education about ABC, understanding of the benefits to employees and to patients at the last mile of delivery, and assimilation of the new approach.[3]

The most essential activity to establishing activity-based management long term is determining diagnostic, measurable KPIs that reveal the root causes of challenges or inefficiencies in the supply chain. Identifying root causes provides the opportunity for managers to strategize and implement targeted improvement efforts. Over time, this continual improvement mindset and approach can result in reduced operational costs and overall more efficient supply chain management — always the ultimate goal in a public health supply chain.[4]

An executive dashboard (see Annex 4 for an example) — a reporting tool that provides a visual display of organizational KPIs, metrics and data — helps ensure that these KPIs are fully adopted and utilized as input for continual monitoring and improvement. Executive dashboards give managers and executives accessible, at-a-glance visibility into business performance across all units.

Using this tool, managers and executives can establish routine meetings — ideally weekly, biweekly or monthly — to review the KPIs, identify gaps and inefficiencies, and develop and implement solutions. Solutions can then be monitored for effectiveness and further improved, as needed.

In the next section, a case study from Lesotho demonstrates in detail how implementation of ABC to determine true distribution center costs and a reflective service fee successfully evolved into activity-based management, and the positive results seen over the longer term.

[1] Joseph A. Ness and Cucuzza, T.G. "Tapping the Full Potential of ABC" *Harvard Business Review*, July-August 1995. Online: https://hbr.org/1995/07/tapping-the-full-potential-of-abc

[2] Ibid.

[3] Ibid.

[4] Ibid.

BENEFITS OF ABC

ABC helps drive a public-sector distribution center team to operational excellence in the following ways:

- Determine the true costs of warehousing activities
- Determine the true cost of commodities to inform pricing and purchasing policy
- Identify individual products that are wasteful
- Reveal unnecessary costs to eliminate
- Enable products to "pay their way" through understanding of cost and storage
- Establish definitive KPIs and continual improvement plans
- Instill activity-based management throughout the organization
- Develop enterprise logisticians
- Discover private-sector operations skills
- Drive operational proficiency
- Build capacity in supply chain management

PHOTO CREDIT: Bobby Neptune | USAID GHSC-PSM

Activity-based costing can be applied to any warehouse or facility throughout the public health supply chain.

CHALLENGES AND CONSIDERATIONS

Warehouse managers should fully consider four key factors before launching ABC.

- **Change Management.** ABC is a fundamental organizational change that requires commitment from leadership and buy-in from all stakeholders, especially employees. Developing a change management strategy to guide this process is essential to overcoming resistance to change and helping ensure a successful and sustainable transition.
- **Question of Benefit for a Cost-Conscious Organization.** Changing an accounting system can be difficult. In particular, a cost-conscious organization may not feel that the benefits of ABC outweigh the time and costs of implementation. In this case, an ABC system likely cannot realize its potential without full organizational support.
- **Unfamiliar Numbers.** ABC produces categories of numbers that may be unfamiliar to managers who work with traditional cost systems. Additionally, ABC does not automatically point to root causes but identifies underperforming activities; therefore, it is important not to misinterpret unfamiliar numbers as indication of root causes.

  Providing continual guidance on unfamiliar numbers and reports throughout ABC implementation helps build understanding and capacity in the organization. Distribution center staff with an eye for data and analytics may be helpful here to build this capacity in others.
- **Generally Accepted Accounting Principles (GAAP).** ABC does not conform to GAAP, because it can exclude some organization-sustaining costs and include some indirect costs in its calculations. In such cases, two costing systems may be needed, with ABC serving as a supplement to a traditional cost system to identify areas where improvement can be made, as opposed to serving as a bottom-line financial tool.

05.

ABC Case Study

PHOTO CREDIT: Andi Gultom

LESOTHO

Successful ABC Implementation

Since its founding in 1979, Lesotho's National Drug Service Organization (NDSO) has been at the forefront of procurement, warehousing and distribution of essential medicines to health facilities owned by the Lesotho government and those affiliated with the Christian Health Association of Lesotho.

A parastatal organization, NDSO is financially autonomous from Lesotho's Ministry of Health (MOH).

To cover costs of its monthly deliveries to 10 health districts and five principal hospitals, NDSO established markups on donor-funded products and essential medicines. These health districts and principal hospitals were then responsible for conducting last-mile delivery of the medicines to health facilities.

However, in 2016, due to ongoing challenges in medicines being delivered from the health district level to the facility level, the MOH tasked NDSO with monthly last-mile delivery to approximately 220 health facilities. Last-mile deliveries can often be the most difficult and expensive segment in a supply chain due to increased distance, poor infrastructure, lack of paved roads and limited communication.

Challenge: How to Make Last-Mile Delivery Viable Financially

Intuitively, the additional costs associated with last-mile delivery would require NDSO's markups to be revised. An increased markup, however, would likely upset NDSO's customer base (donors), which might look for cheaper alternatives. But NDSO's senior management was also concerned that the service fee for donor-funded products was insufficient to cover NDSO's actual handling, storage and transportation costs. They were further concerned that the reimbursement for essential medicines had been set too low to ensure financial stability.

At the time, NDSO's financial cost models lacked the ability to accurately track actual operating costs by functional cost center or to quantify the effect of unforeseen disruptions in the supply chain. An example of such a disruption that needed to be accounted for in budgetary projections and costing models was PEPFAR's call to action to achieve the United Nations' 90-90-90 HIV/AIDS program targets, with their increased emphasis on laboratory services and the introduction of test-and-treat, an intervention strategy that called for earlier treatment of individuals diagnosed with HIV. Transition to these strategies initially challenged supply chain planning globally by changing the mix and increasing the volume of commodities flowing through the system. Until supply chains adjusted, the new strategies stretched resources at many levels, including in Lesotho.

Understanding Current Performance

With the support of USAID GHSC-PSM, NDSO began a multi-year initiative in 2016 to better understand overall operating expenses and the cost differences in product handling, storage and last-mile delivery requirements for donor-funded products and essential medicines. The goal was to identify opportunities to streamline processes, achieve cost efficiencies and enhance performance.

To do so, NDSO and GHSC-PSM prepared for application of the ABC model.

First, GHSC-PSM needed to collect baseline information. The project:

- Reviewed warehousing standard operating procedures
- Identified, implemented and mentored NDSO staff in warehousing best practices
- Developed KPIs to monitor distribution center performance
- Reviewed the NDSO cost recovery scheme and prepared options to achieve financial sustainability
- Analyzed data that included distribution center activities for ABC and data collection for distribution network optimization
- Carried out foundational work for the distribution network optimization and cost recovery assessment
- Helped NDSO prepare for implementation of a systems-strengthening strategy, including a modified push model, last-mile delivery and biweekly deliveries
- Created a roadmap for ABC implementation with next steps and suggested interventions
- Reviewed the existing enterprise resource planning (ERP) tool and identified gaps in its use
- Built NDSO capacity by:
  - Providing the operators with a suite of tools to manage distribution center and transportation performance in conjunction with existing ERP and payroll systems
  - Teaching them how to take financial ownership of the supply chain

Implementing ABC to Determine True Costs

Next, to understand NDSO's true costs, GHSC-PSM applied ABC performance and accountability tools at the financial, distribution center, transportation and customer-service levels, ensuring capacity building and true ownership of the operator. Using ABC methodologies allowed for the supply chain to charge donors a service fee for the actual activity and not a commodity value-based "tax."

Pharmacists entering consumption data. PHOTO CREDIT: 5Fifty Production | USAID GHSC-PSM

GHSC-PSM introduced unique tools to measure the costs of all NDSO activities:

Labor Reporting Tool

This tool is used for reporting throughput performance by period (monthly) for the fiscal year and can be used as a forecasting tool for future years. GHSC-PSM trained the NDSO finance manager and other key staff to accurately track:

- Throughput — the movement of goods and the time expended by function
- Expenses per function, expressed as a financial value and as a percentage of the service provided
- Impact of overtime on financial performance (if applicable)

Distribution Center Self-Assessment Tool

This Excel-based tool measures qualitative efforts to follow best-in-class distribution center practices, such as the 5S system; WHO's good warehousing practices; and quantitative checks against adherence to systems, health and safety, and processes. The self-administered tool is applied monthly, reinforcing best practices and assisting the user in developing improvement plans.

Executive Dashboard

This tool provides senior management with a monthly snapshot of the following KPIs:

- Financial year-to-date trends and averages for all operational costs
- Expense as a percentage of the service provided or the cost of goods for transportation and warehousing
- Results of a monthly NDSO assessment of all aspects of operations (process, organization, health and safety) that identifies challenges and enables staff to determine and implement solutions, fostering continual improvement

ABC Tracker

This tool differentiates the true cost per commodity unit by category (donor-funded products or essential medicines) to receive, store, pick, pack and ship. All activities

Activity-based costing gives managers a new perspective on how best to utilize human and financial resources. PHOTO CREDIT: Mickael Breard | USAID GHSC-PSM

for donor-funded products and essential medicines are segregated and quantified.

The actual costs for both commodity categories are identified for the fiscal year to date.

Draft Service Fee Calculator With Incentive Structure

At NDSO's request, GHSC-PSM developed a draft Excel-based calculator using the NDSO ABC model. The calculator demonstrates the actual impact of all distribution center and transportation costs per month, with an emphasis on incentives for the donor to optimize procurement schedules to help improve the rate of inventory turnover and mitigate the adverse impact of long-term, slow-moving inventory storage on performance and costs.

Compiling and Leveraging the Data

GHSC-PSM taught NDSO operators how to continue to collect and compile the data using the above tools. By continuing to track all direct and indirect costs, the reporting output allows NDSO leadership to fully understand the current cost structure. This reporting can be updated at any time by local staff and provides:

- Costs by function — procurement, receiving, storage, selection, transportation
- Management costs as a percentage of total supply chain costs
- Costs by unit per commodity
- Costs as a percentage of the total commodity value
- Per dollar (local currency) of value, volume or weight of commodities
- Per kilometer transported
- Costs by supply chain tier (central level, regional level, clinic, or urban vs. rural)
- Costs of labor for procurement, transportation, storage and management

With the above processes and tracking tools implemented in Lesotho, NDSO management tracked costs at the activity level. The model gave insight into donor-funded products and essential medicines, and the total volume of the mix of both product categories.

With this knowledge, NDSO moved from a reactive state, in which it lacked visibility into the drivers behind its financial performance, to a proactive state, understanding the impacts of its markup decisions on future performance. ABC provides the foundational work to understand what is happening and why.

Lessons Learned and Recommendations

A successful and sustainable transition to ABC requires commitment from local leadership, buy-in from all stakeholders — especially employees — and a change management strategy.

Early on, a focus on quick wins during the initial work with the ABC advisors helped gain employee trust. However, that did not allay NDSO employee suspicion that the ABC effort would be used as pretense for staff reductions. Senior management worked hard to explain and assure staff that this was not the intention, but rather that improving patient outcomes was and is the drive for ABC. That has been proven over time by senior leadership's commitment to retaining current positions and promoting from within.

Strong in-country GHSC-PSM leadership and collaboration with NDSO's senior management, driven by the NDSO general manager, were key factors in the initiative's success. The general manager's buy-in also

Strong GHSC-PSM leadership and collaboration with NDSO's senior management, driven by the NDSO general manager, were key factors in the initiative's success.

RESULTS OF ABC IMPLEMENTATION IN LESOTHO

TIME SAVING
NDSO reduced its internal distribution center order entry to dispatched cycle time from two weeks to four days.

SELF-RELIANCE
NDSO transitioned to true activity-based management, exercising full control of its supply chain and operating in a state of continual improvement, requiring no outside intervention.

TRANSPARENCY
NDSO routinely monitors the costs of every aspect of its operations and better monitors and controls its expenses, resulting in a threefold improvement in financial performance.

EFFICIENCY
By gathering, measuring, reporting and analyzing true costs generated, NDSO became more resilient and efficient.

STAFF MORALE
NDSO staff became more engaged in process changes, worked together as a team and had direct input into the evolving processes, boosting morale.

meant GHSC-PSM was granted access to sensitive financial data and existing system information. If the general manager or other senior managers were not forthcoming with information, the ABC study would not have realized the success that it did.

Results

ABC implementation in Lesotho led to a number of results:

Time saving

Over the ABC initiative's duration, NDSO reduced its internal distribution center cycle time for order entry to dispatch from two weeks to four days. Its year-over-year financial performance and stability also continue to improve.

Shift to Self-Reliance

Completion of the ABC work saw NDSO transition to true activity-based management. The senior leadership was empowered to operate the supply chain with full knowledge of how decisions they made immediately affected service for the end recipient. By using ABC/activity-based management, NDSO executive leaders exercise full control of their supply chain and operate in a state of continual improvement, requiring no outside intervention.

Operational and Financial Transparency

Before ABC adoption, NDSO lacked visibility into exactly which distribution center functions accounted for what portions of its recurring expenses. Like many developmental logistics supply chains, NDSO only had access to top-line annual costs totaled for all functions. Now, NDSO routinely monitors the costs of every aspect of its operations and better monitors and controls its expenses. The fiscal year ending 2017 saw a very positive outcome in bottom-line financial performance. By the end of 2018, NDSO's more efficient processes and reduced costs resulted in a threefold improvement in financial performance.

With visibility into operating costs, NDSO senior managers could improve efficiency and curtail costs to the point that they "broke even" while maintaining the same markups. They could also contemplate establishing a strategic capital investment fund to become more autonomous in the future and fund infrastructure expansion improvements. (A capital investment strategy for a supply chain uses some of the money available at end of the fiscal year, due to the high-level performance against past actual outcomes, to sustain and improve the facilities.)

Resiliency and Efficiency

By gathering, measuring, reporting and analyzing true costs generated, NDSO became more resilient and efficient. Overall, reduced operational costs allowed limited donor and MOH monies to be spent on other areas to help further improve supply chain performance and ensure greater access for patients.

Staff Engagement and Morale

Once staff understood the intention and benefits of ABC implementation and bought into the change, they became more engaged in the process changes, worked together as a team and had direct input into the evolving processes. This made staff feel empowered and improved morale.

National Drug Service Organization (NDSO) staff in Lesotho conduct daily planning of distribution center activities as part of ABC implementation. PHOTO CREDIT: USAID GHSC-PSM

06.

In Conclusion

PHOTO CREDIT: Andi Gultom

Keeping the Public Sector Competitive With the Private Sector

Without implementing and managing a supply chain with ABC, the public sector will face future competition from the private sector, who likely already use the methodology to provide an efficient and cost-effective service.

In public health supply chains, implementing ABC in distribution centers establishes the true cost of operation, which enables a more informed, proactive management approach to be built on this essential knowledge. Improved costing and management practices tie directly to improved supply chain management overall.

For countries that want to manage their own public health supply chains, adopting an ABC approach is an important way to ensure this is possible. Without such an approach, inefficient costing and management could potentially lead to competition from 3PLs that can offer Ministries of Health much more efficient distribution center services for a lower cost. This may be a viable or necessary option for some countries, but for those that want to maintain control of the supply chain and support continued employment of distribution center staff, ABC offers a practical solution.

Appendices

Section .07

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ANNEX 1 | **Typical Data Requirements for ABC Implementation**

Distribution centers will need to gather data for ABC implementation. The type of data typically needed appears in the table below.

Req. #	Requirement	Description	Necessary/ Preferred
1.	Narrative of Programs & Characteristics	Unique handling/storage/transporting/administrative product or service characteristics	Necessary
2.	Direct Labor Costs	All expenses related to the effort of handling a specific unique product/program based on characteristics	Necessary
2.a.	Warehouse hours per mission (receiving, put-away, retrieval/replenishment, picking/selection, staging, loading, etc. for a specific product by characteristic	Effort and cost to determine true financial impact by characteristic type	Necessary
2.b.	Fringe Benefits per 2.a.	Value of holiday pay, insurance scheme paid by unit, etc. per all functions listed in 2.a.	Necessary
2.c.	Average Wage Rates and Overtime costs per all functions of 2.a.	Financial costs per specific mission	Necessary
2.d.	Transportation variable costs for a specific product by characteristic: Per Diem, Wages, Overtime costs, Fuel, vehicle maintenance, etc. *not to include Administrative use of fleet for non-product deliveries.	All variable costs for specific product by characteristics to transport last mile.	Necessary
3.	Indirect Costs	All costs not directly associated to handling or transporting product	Necessary
3.a.	Administrative salaries	All non-direct labor wages (management, inventory control, finance, customer service, etc.)	Necessary
3.b.	Administrative Fringe Benefits cost	Value of holiday pay, insurance scheme paid by unit, etc. per all functions listed in 3.a.	Necessary
3.c.	% of effort by function to support product specific characteristics for 3.	What amount of effort is split between the specific product types to manage the outcome?	Necessary
3.d.	Depreciation of all Capital Assets schedule	What is the remaining book value of all Capital Assets?	Necessary
3.e.	% of cost by Capital Asset to support product specific characteristics.	Example: what % of the cost is spent to use a forklift for a given product characteristic?	Necessary
3.f.	Rent/Lease facility	Costs associated to use the warehouse, etc.	Necessary
	% of cost by specific facility to support product specific characteristics.	How much of the facility rent should be allocated to a specific product characteristic?	Necessary
3.g.	Utilities (electrical, gas, water, sanitation, etc.)	Self-explanatory	Necessary
3.h.	% of cost of utilities to support product specific characteristics.	Example: How much of the electricity usage is expended to support a specific product type?	Necessary
3.i.	Insurance costs for storage and in-transit to support product specific characteristics.	Example: Product A requires special insurance coverage that Product B does not	Necessary
3.j.	Transportation costs not associated with product delivery	Self-Explanatory	Necessary
4.	Financial	Specific Financial documents	Necessary
4.a.	Income Statement	Profit and Loss, Cost of Goods (by specific product), Sales, Revenue, (by specific product), etc.	Necessary
4.b.	Balance Sheet	Capital, Intangible and Tangible Capital, Current Assets and Liabilities, etc.	Necessary
4.c.	Overhead	Schedule of Operating Expenses	Necessary
4.d.	Ratio Analysis	Current Ratio, Acid Test Ratio, Inventory Turnover, Accounts Receivable Turnover, Accounts Payable Turnover	Necessary
4.e.	Trial Balance	Detailed Account Level Profit and Loss	Necessary
5.	Data	All information allocated to a specific product characteristic	Necessary
5.a.	Quantity Received, Stored, Picked/Selected, Shipped by specific product characteristic	Example: Product A has X volume for X activity and Product B has X volume for X activity	Necessary
5.b.	Volumetric information aggregated for specific product characteristics	What is the cubic value of Product A? What is the cubic value of Product B?	Necessary
5.c.	Total kilometers incurred for a specific time frame for the transportation fleet	All kilometers incurred for product specific deliveries. If product is delivered co-mingled (all products shipped together, an estimation of the % incurred for all categories will be determined).	Preferred

ANNEX 2 | Example of a PDCA Daily Planner

The PDCA (plan do check act) daily planner is the foundation of a lean supply chain. It distinguishes the main operational functions of the distribution center. These functions fall under what is called direct labor, which are functions and activities that touch freight/product. These areas are the cost drivers in a distribution center, and once the operations team understands how these drivers work and interact, they can then begin to adjust them to increase productivity and reduce unnecessary cost.

PDCA-Plan, Do, Check, Act-Daily Planner

Day of the Week | **Date**

Receiving / Off Loading

# of Eaches	Required # of empl.	# Empl Used
32000	9.2	8

Name

1 Khalid
2 Kate
3 Susi
4 Eliza
5 Xavier
6 Chris
7 Sean
8 Juan
9
10
11
12

Put-Away / Replinishment

Required # of empl.	# Employee Used
6.9	7

Name

1 Scott
2 Andrew
3 Gurivi
4 Allan
5 Steve
6 Nagesh
7 Stefania
8
9
10

Dispatch/Loading

# of Cartons	Required # of empl.	# Employee Used
68500	8.5	8

1 John
2 Dan
3 Ashley
4 Swaroop
5 Mohammad
6 Paul
7 Ella
8 Michael
9
10
11
12

Picking

# of Eaches	Required # of empl.	# Empl Used
270	0.2	8

1 Ralph
2 Jamey
3 Rene
4 Max
5 Kate
6 Ishan
7 Maqsoda
8 Ryan
9 Cherif
10
11
12
13
14
15
16

Required Hours	198
Employees Used	39

Comments for Receiving / Off-Loading:

Comments for Put-Away:

Comments for Picking:

Comments for Dispatch & Loading:

ANNEX 3 | Example of a Direct Labor Report

The direct labor report captures direct labor cost compared to the cost of goods handled per month. Throughput is an output of this report, a grade, per se, on how labor was managed against received and shipped product. Throughput is simply total units received and shipped, divided by the total hours used to perform that task. It is a measure of productivity and provides insight into when financial performance is maximized. The labor report is customized to the fit each operation.

Example of Labor Report

Monthly Labor Report-Throughput & Activity Based Financial Performance Tracking

Month Ending	June				
Period Number	3			Period to Date	
Actual	% to $			Actual	% to $
$ 57,286,900			Sales	121,703,503	
			Receiving		
450,339			Units	2,670,902	
1,730			Regular Hours	5,190	
1,862	7.09%		Total	5,624	7.72%
66,141		0.12	Cost	200,944	0.17
242			Throughput	475	
			Put-Away		
210,508			Units	626,038	
692			Regular Hours	2,076	
786	11.96%		Total	2,481	16.32%
19,633		0.03	Cost	64,387	0.05
140			Throughput	132	
			Selection		
228,086			Units	612,875	
1,557			Regular Hours	4,498	
1,676	7.10%		Total	4,945	11.32%
40,046		0.07	Cost	125,338	0.10
80			Throughput	110	
			Loading		
228,086			Units	612,875	
692			Regular Hours	2,076	
767	9.78%		Total	2,291	9.38%
27,087		0.05	Cost	80,618	0.07
572			Throughput	541	
			All		
888,933			Units	3,909,815	
6,649			Regular Hours	19,764	
7,189	7.51%		Total	21,743	9.10%
268,415		0.47	Cost	831,931	0.68
124			**Throughput**	**180**	

ANNEX 4 | Example of an Executive Dashboard

An executive dashboard is a reporting tool that provides a visual display of organizational KPIs, metrics, and data. The objective of executive dashboards is to give directors and executives an at-a-glance visibility into business performance across all units.

Example of Executive Dashboard

Year to Date Sales		
Actual	Projected	Variance
$ 380,992,044	$ 279,289,565	$101,702,479

	Distribution Center					All	Transportation/Customer Service								All
Cumulative	Monthly Sales	Throughput	Wages	Overtime %	Labor % of Sales	DC Assesment	Wages	Labor % of Sales	Fuel $	Fuel Usage	Fleet Cost	Kilometers	$ per Kilo	Fleet Yield- U.P.H.	Kilos per Litre	Labor % of Sales
November	$ 22,919,094	144	$ 325,796	17.34	1.42	82.7	$ 79,418	0.0035	$ 80,990	7,632	55,743	63,891	$0.30	294	8.37	1.423
December	$ 148,083,516	417	$ 256,832	4.89	0.17	83.76	$ 79,418	0.0005	$ 69,616	6,567	55,743	48,266	$0.24	259	7.35	0.171
January	$ 12,734,618	221	$ 257,823	5.14	2.02	86.29	$ 79,418	0.0062	$ 72,532	6,761	55,743	45,191	$0.22	289	6.68	2.026
February	$ 13,626,858	130	$ 236,778	0.86	1.74	84.2	$ 79,418	0.0058	$ 59,214	5,817	55,743	47,976	$0.25	241	8.25	1.746
March	$ 60,277,238	424	$ 251,348	4.59	0.42	85.16	$ 79,418	0.0013	$ 75,451	7,189	55,743	54,046	$0.26	305	7.52	0.421
April	$ 10,062,444	197	$ 253,421	5.14	2.52	75.78	$ 79,418	0.0079	$ 63,380	6,437	$55,743	53,485	$0.27	248	8.31	2.528
May	$ 12,940,872	116	$ 254,640	5.65	2.07	N/A	$ 79,418	0.0061	$ 58,281	6,307	$55,743	56,472	$0.29	253	8.95	2.076
June	$ 12,273,654	178	$ 254,640	3.38	2.07	N/A	$ 79,418	0.0065	$ 65,968	6,934	$55,743	45,615	$0.23	301	8.74	2.076
July	$ 18,645,976	134	$ 307,479	13.32	1.65	N/A	$ 79,418	0.0043	$ 49,269	5,640	$55,743	49,269	$0.27	228	8.74	1.654
Agust	$ 37,677,188	207	$ 262,637	5.07	0.7	N/A	$ 79,418	0.0021	$ 63,905	6,934	$55,743	52,527	$0.26	368	9.22	0.702
September	$ 20,755,726	166	$ 288,533	9.48	1.39	N/A	$ 79,418	0.0038	$ 60,122	7,002	$55,743	52,731	$0.27	281	8.59	1.394
October	$ 10,994,860	146	$ 290,759	8.69	2.64	N/A	$ 79,418	0.0072	$ 47,286	5,351	$55,743	33,065	$0.18	245	8.84	2.647
Average	$ 31,749,337	207	$ 270,057	6.96	1.57	82.86	$ 79,418	0.0054	$ 61,541	$ 6,437	$55,743	49,038	$0.25	276	8.77	1.73