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EDITORIAL

"Health supply chain personnel: an integral part of the health workforce."

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Approximately a third of the world population – and about half in the most underdeveloped settings – have been estimated to lack access to essential medicines and diagnostics [1]. Effective supply chains are vital to deliver essential health commodities. In high-income countries the availability of medicines in the public and private sector is taken as a given: quality assurance is managed by robust national regulatory agencies; supply and distribution are increasingly privatized, with performance measured against timeliness and cost. Conversely, in many low- and middle-income countries, stock-outs of essential commodities are commonplace, with a mean availability of core medicines in the public sector ranging from 38.2% in sub-Saharan Africa to 57.7% in Latin America and the Caribbean [2]. Vulnerability of supply chain functions also increases the potential for the entry of counterfeit and substandard products [3].

While availability of medicines is determined by multiple factors, there is a growing recognition of the need to address human resources requirements for supply chain systems [4]. A systematic review of the global pharmacy workforce revealed a dearth of evidence from low- and middle-income countries [5]. It also underscored several challenges, including inadequate numbers of pharmacists and pharmacy support workforce cadres, issues of maldistribution (across public and private sectors, and urban and rural areas), uneven implementation of education, staff management and retention strategies. Further, this study did not find evidence on the broader range of health logistics and supply chain managers. Other analyses focused on low- and middle-income settings have highlighted dramatic supply chain workforce shortages, with some countries facing vacancy rates up to 71% for public sector posts that would require accredited pharmaceutical training [6]. This situation is often determined by a combination of insufficient training capacity as well as 100-150% higher wages in the private sector as compared to the public sector.

Some of these problems reflect those affecting human resources for health more broadly. A cross-country analysis of the health workforce conducted in 2013 showed that multi-pronged strategies are required to improve forecasting, planning, education, deployment, retention and performance management of human resources for health [7]. Only by addressing these factors in an integrated manner, will it be possible for health systems to improve availability, accessibility, acceptability and quality of the human resources. This is a requirement to accelerate progress towards attaining universal health coverage.

Better health workforce intelligence and data can shape more effective planning, implementation and monitoring of such policies. A stronger evidence base on quantities, geographic distribution, competency frameworks, as well as the labour market conditions that determine the availability and performance of the health supply chain personnel, would similarly be required.

A more effective response to health supply chain workforce challenges therefore requires comprehensive and reliable data on availability, distribution, education curricula, competency frameworks, levels of remuneration, regulatory environment and supporting systems. Dedicated tools exist for assessment of operational and technical capacity in public health supply chain personnel [8], and related analyses have been conducted in some contexts [9,10]. There are also good governance initiatives focusing on legislation, transparency and integrity to reduce corruption and advance the professionalization of the supply chain profession [11]. Both these aspects are important, however existing initiatives have not yet fully captured the need for a leadership environment that promotes excellence and attracts talent, and that explicitly links the health supply chain system with a country’s broader public health goal of promoting equitable access to essential medicines.

In most countries a relative lack of comprehensive data on supply chain personnel (and especially on the administrators, logistics managers, warehouse and transport personnel, clerks and other support cadres) means that critical capacity gaps go unnoticed, and often neglected in national health and human resources policies and strategies. Nevertheless, the supply chain workforce should be fully embedded in the core functions of health workforce management, including the human resources for health information systems, planning and forecasting, performance management [12]. Achieving this integration can be facilitated by an enabling policy and governance framework at the country and regional level.

Some of the required actions to strengthen the health supply chain workforce may be similar to – or be implemented as part of – broader health workforce policies. This includes improving public sector pay and incentives [13]; establishing rural pipelines to education and training to facilitate education and deployment in under-served areas [14]; reforming education strategies to adapt content and modalities of training to current and emerging health system needs [15]; and exploring the potential of
greater delegation of tasks to cadres with shorter training [16]. Other interventions may need to be more specific to the supply chain workforce, such as mainstreaming relevant competencies in the pre-service education curricula of health personnel; scaling up training of pharmacists and pharmacy assistants; and professionalizing the personnel in administrative and management positions within the health supply system through more dedicated training (which may also help in countering the increasing burden on the functions of clinical staff). Key skills are particularly required in forecasting of needs, procurement, quality assurance, warehousing and distribution, stock management, with an overarching need for leadership and systems management. The implementation of conducive supply chain workforce policies may require additional financing commitments or re-allocation of available resources. However, considering the enormous levels of wastage associated with inadequate, ineffective and irrational procurement of medicines and other health commodities [17], investments in the health supply chain personnel may represent a strategy to improve the overall efficiency of health systems, and may therefore represent an area worth prioritizing [18]. In a nutshell, health systems throughout the world are progressively broadening their focus to non-communicable diseases, and are attempting to expand effective coverage to under-served populations through equity-focused policies and quality enhancement interventions. The emerging discourse on the Sustainable Development Goals in the context of the post-2015 agenda includes eliminating avoidable maternal and child deaths, controlling epidemic diseases, and explicitly refers to providing “access to affordable essential medicines and vaccines” [19]. Strengthening the supply chain workforce is an essential element of making this vision a reality. This special supplement seeks to expand the evidence base contributing to the 2nd People that Deliver Global Conference on Human Resources for Supply Chain Management (www.peoplethatdeliver.org). This event marks the beginning of a second phase of the People that Deliver Initiative, which will place growing emphasis on country-focused action.

References

COMMENTARY

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Human resources health supply chains and access to essential medicines
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With up to a third of the world’s population with limited access to essential medicines, it is clear that by 2051 many countries will not be able to achieve their health related Millennium Development Goals (MDGs) [1]. Of the eight MDGs, four explicitly discusses the availability of medicines at the primary care or service delivery point level [2]. It is pertinent because without access to and appropriate use of quality medicines, health systems would lose their ability to meet healthcare service needs. Though affordability of medicines and high prices are frequently highlighted as challenges to access to essential medicines, the weakness of health supply chains has remained a consistent barrier across a range of low and middle income countries [3-5]. Despite major investment over the past decades, national supply chains are often unable to respond effectively to existing demands, putting health outcomes at risk. Since the first Global
Forum on Human Resources for Health in Kampala in 2008 [6], the human resource focus has been on the doctors, nurses, midwives and community health workers. However, there is little focus on human resources to improve and sustain health supply chains.

A focus on the human resources is needed and in this context, in 2011, the People that Deliver (PtD) Initiative was founded. The International Pharmacy Federation (FIP) provided further evidence of the need for a HR focus in SCM through their Global Workforce Report in 2012 [7]. In that report they make a link between a lack of pharmacy personnel and inequities in access to medicines. For example in Sub-Saharan Africa, on average less than one pharmacist was observed for 10,000 population [8]. In October 2014 the 2nd Global Conference on Human Resources for Supply Chain Management (SCM) was held to demonstrate the achievement PtD has made in the recent years (www.peoplethatdeliver.org).

Launched in 2011, the PtD Initiative is a global partnership of over 80 organizations who have the joint vision of a world where an agenda for national health supply chain workforce is developed. (www. peoplethatdeliver.org). Specifically the goals of PtD are:

I. Global recognition that strong supply chains are essential for positive health outcomes and require a competent, recognized and supported supply chain workforce with significant technical and managerial capacity.

II. Government and national health institutions demand, recruit and retain appropriately qualified personnel for positions with supply chain responsibilities.

III. Adequate personnel from relevant cadres with appropriate supply chain competencies and qualifications are available.

IV. A repository of evidence-based resources for HR for SCM is established, accessible, used and disseminated.

Human resources are a key performance driver within public health supply chains. The effective management of a supply chain demands excellence in managing its human resources, an area particularly overlooked in resource poor environments. By proactively managing plans, policies and procedures associated with people, an organisation can improve supply chain performance. Such a systematic approach requires the need to plan, finance, develop, support, and retain the national workforces needed for the effective, efficient, and sustainable management of health supply chains [9,10].

The 2nd PtD Global Conference on Human Resources in Supply Chain Management Conference presented international and country-based work around five interrelated sub themes (Table 1).

The abstracts presented in this special issue highlight current global activity in this area and lay the foundation for the second phase of PtD 2015-2016. Some of the themes presented in the conference include, the increasing use of the HR for SCM assessment tool, application of SCM competency modelling, varied approaches to SCM workforce development, and local professionalization activities.

As the post 2015 development agenda moves its focus toward health equity, the world’s increasing population and expanding middle class will place even greater demands on health services. These increasing demands will put further strain on the health supply chains needed to provide these services. In resource constrained environments, the challenge will be to provide a business case to governments, convincing them of the need to invest in health supply chains. The international development agenda will require organisations involved in health supply chains to come together in a more coordinated fashion, working with governments to enact local, sustainable change. The People that Deliver Initiative will continue to provide a platform to ensure that HR for SCM remains on the international agenda.

References

Table 1(abstract I2) The five sub themes of the 2nd PtD Global Conference on HR for SCM

<table>
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<th>Assessment and planning</th>
<th>Assessing HR systems, creating policies, plans and standard operating procedures for an effective and sustainable SCM workforce</th>
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<td>Engaging powerful stakeholders and SCM leaders to put HR for SCM on the agenda and enact local change</td>
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<td>Workforce development</td>
<td>Developing the SCM workforce through contextualised pre-service education and continued professional development</td>
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<td>Increasing performance</td>
<td>Increasing the performance and retention of SCM personnel within an organisational context</td>
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ORAL PRESENTATIONS

O1 A business approach to transforming public health supply systems
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Background: While much attention is on relatively near-term goals (e.g. Family Planning (FP)) 2020, there is growing interest in and a need to address longer term, in-a-generation “end games” (e.g., to 2035), as well as post-2015 Millennium Development Goals (MDGs). The health supply
Discussion:
The core of an effective vaccine logistics management system is to strengthen, supporting the sector as a whole. The experience of SCMS in Ethiopia provides a framework for organizations seeking to improve personnel performance. While the examples are specific, the challenges are common and lessons learned are applicable in a wide range of settings. This case study provides concrete examples of enhancing personnel performance in the public sector SCM in general and within a primary partner (PFSA) in particular. The long-term and strategic approach that was undertaken supported the achievements that SCMS was able to accomplish.

Lessons learned: Participatory processes strengthen ownership and enhance adoption of change. Clear communication at each stage is essential to facilitate changes that are supported and advocated by the personnel involved. Improving performance requires long-term investment in human resource development, improved management strategies and advocacy for change beyond primary partners.

O2
Building blocks for enhancing personnel performance: activities, best practices and lessons learned from Ethiopia
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Background: The Supply Chain Management System (SCMS) program has worked in Ethiopia since 2006 to strengthen the public health supply chain. Increasing the performance and retention of personnel within the organization, and its governmental partners, has been, and continues to be, a priority. Five building blocks that are crucial for achieving these objectives, namely: engaging stakeholders, optimizing policies and plans, developing the workforce, increasing performance and professionalizing supply chain management, will be explored with practice-based case studies.

Method: Each of the five building blocks (mentioned above) will be contextualized with the respective challenges being addressed. Following this, a concrete and practical example of an activity undertaken by SCMS is discussed, followed by logistics management principles for vaccines. Hence, human resources is an integral component of any conceptual design and implementation plan for a vaccine logistics intervention. Focusing solely on technology solutions will have a limited effect in public health programmes especially in resource-poor settings. User-friendly technology, and standardization of processes.

Results: eVIN is currently being piloted in two geographical locations catering to a population of 7.4 million, with one VCCM in each location. eVIN’s impact is being assessed and early results indicate high levels of system adoption by cold chain staff, and high stock data quality, driven by HR strengthening measures. eVIN has been adopted by the Ministry of Health, Government of India for the National Immunization Programme. The VCCM cadre is now being scaled in 3 major Indian states with a combined population of 345 million. The introduction of the VCCM cadre at the all-India level is currently being considered.

Discussion: The core of an effective vaccine logistics management system is supported and advocated by the public sector supply chain professionals, clarified responsibilities and helped determine performance measures. Advocacy of the public health system has resulted in paradigm changes with decision makers. The development and adoption of curricula, and institutionalization of training within tertiary educational bodies throughout the country has demonstrated improved acceptance. This has resulted in an alignment of teaching practice with the expectations of organizations and government in the learning content and expected outcomes. The skills and knowledge of graduates has been strengthened, supporting the sector as a whole.

Discussion: The experience of SCMS in Ethiopia provides a framework for organizations seeking to improve personnel performance. While the examples are specific, the challenges are common and lessons learned are applicable in a wide range of settings. This case study provides concrete

O3
Designing and implementing an intelligent vaccine logistics management system for India’s Universal Immunisation Programme (UIP) - ‘The eVIN Model’
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Background: India’s full immunisation coverage for infants is 61%. The availability of quality vaccines at session sites is a contributor to low coverage. Weaknesses in the current supply chain include lack of stock visibility, poor distribution planning, and improper storage conditions. A national vaccine logistic management system is required which provides visibility of real time stock levels across all cold chain points, and enables staff to apply logistics management principles for vaccines.

Method: With the objective of identifying weaknesses, and their root causes, in India’s vaccine logistics systems, ITSU conducted a Deep Dive Study in three states. ITSU then commissioned a feasibility study on involving private sector players to address identified gaps. ITSU used these findings to design and pilot the electronic Vaccine Intelligence Network (eVIN), which is comprised of trained Vaccine and Cold Chain Managers (VCCMs) integrated into a supportive supervision approach, user-friendly technology, and standardized processes.

Results: eVIN is currently being piloted in two geographical locations catering to a population of 7.4 million, with one VCCM in each location. eVIN’s impact is being assessed and early results indicate high levels of system adoption by cold chain staff, and high stock data quality, driven by HR strengthening measures. eVIN has been adopted by the Ministry of Health, Government of India for the National Immunization Programme. The VCCM cadre is now being scaled in 3 major Indian states with a combined population of 345 million. The introduction of the VCCM cadre at the all-India level is currently being considered.

Discussion: The core of an effective vaccine logistics management system is a well-supported operations team that uses technology platforms to make intelligent distribution decisions. Hence, human resources is an integral component of any conceptual design and implementation plan for a vaccine logistics intervention. Focusing solely on technology solutions will have a limited effect in public health programmes especially in resource-poor settings. User-friendly technology, when married to additional human resources, a defined supportive supervision plan and a rigorous training regimen for existing staff results in high adoption rates and high data quality, as evidenced by the eVIN pilot thus far.

Lessons learned: While designing eVIN, and piloting it thus far, it was learned that any vaccine logistics system which aims for sustainable performance and health systems strengthening in resource poor settings needs to adequately map the required workload, define measures to augment human resources, rigorously support existing staff, and define clear processes.

O4
MOH Drug SCM Strategy Development: a means to identify human resource training needs in Indonesia
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Method: To develop the National Drug Supply Chain Management Strategy (SCM) Strategy, BinFar formed a strategy team made up of key SCM partners and staff. A drug SCM situation analysis was undertaken in 14 units within the MOH, exploring SCM issues and concerns, including staff development. Based on the results of the situation analysis, a stakeholders meeting was held to determine the core substance of the strategy and build a consensus on the key issues, including human resource development.

Results: A national drug SCM strategy was developed to ensure drug availability, drug quality, and drug affordability for the public. The strategy framework included challenges and opportunities, a Vision, Mission and Goal statements, and developed strategy components based on the traditional SCM cycle. Based on the situation analysis results and in-depth discussion with stakeholders, the strategy reviews each SCM cycle component regarding challenges and current practices and experiences. Based on these factors, a specific component strategy was developed with several strategic measures. It was concluded that human resource development was essential to support the entire drug management system.

Discussion: To support the national drug SCM strategy, the following is needed:

1. Development of pharmacists competent as drug managers at all levels, including at health service facilities in hospitals and health centres.
2. Trained SCM personnel to ensure the smooth running of the drug management information systems.

The following strategies have been suggested to move this agenda forward:

1. Complete task analysis for every SCM competency required and develop pre-service and in-service training for pharmacists.
2. Stipulate a personnel standard for service locations that include pharmacists trained in SCM.

Lessons learned: A national drug SCM strategy is a good opportunity to identify human resource SCM needs. Obtaining consensus across programs and departments for a national drug SCM strategy requires strong baseline data and considerable dialogue. Human resource issues and solutions are the backbone of a national drug SCM strategy.

Improving access to health commodities by strengthening the supply chain Management workforce: the case of Namibia

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Background: The Ministry of Health (MoHSS) of Mozambique has been on the move to deliver quality health care services to its people. In 2011, the Ministry of Health (MoHSS) of Mozambique approached People that Deliver (PdD) for support in addressing supply chain management (SCM) workforce challenges at its central and regional medical stores (CMS/RMS). PdD leveraged the expertise of member organizations CapacityPlus and SCMS to provide technical assistance in planning, deployment, training and retention of the SCM workforce; document the process and lessons learned; and draft a case study on the process for PdD to share globally.

Method: The MoHSS and PdD partners collaborated on four key interventions to address SCM workforce challenges. These included developing a SCM competency framework, identifying the number and types of supply chain personnel required using the Workload Indicators of Staffing Need (WISN) tool, conducting targeted capacity building starting at the central medical store through the Supply Chain Performance Improvement (SCPI) program, and identifying context-specific incentives to encourage staff retention using the Discrete Choice Experiment (DCE) activity.

Results: Preliminary results indicate that there are opportunities and political will to reduce role overlap between pharmacists, pharmacist assistants, and clerks at CMS/RMS and to tailor in-service and pre-service training programs based on the newly drafted competency frameworks for these cadres. By the time of the conference additional results from the
November 2013–September 2014 collaboration will be presented on the number and types of staff needed to fulfill these three cadres at CMS/RMS, the package of salaries and incentives most likely to attract and retain them in these positions, and progress against a set of key performance indicators.

Discussion: This collaboration focused on three cadres within the CMS/RMS level of the supply chain; however, in the future expanding the application of activities to hospital and clinic levels will produce a more thorough picture of the SC workforce. The tools utilized in the Namibia pilot will be shared in order to apply this unique approach in other countries; currently Mozambique, Burkina Faso, and Liberia have plans to introduce a similar collaboration. The collaboration was possible due to the coordinating power of the PTI Initiative and is suggestive that similar opportunities for future innovative pilots in strengthening the SC workforce exist.

Lessons learned: This collaboration was successful due to a combination of MoHSS support and leadership, and the leverage of PTI in convening global expertise in HR and SCM. USAID regarded these activities as a “smart investment” given the minimal additional funding required and strategic use of in-country partner presence and tools.

07 Strengthening immunisation supply chain systems through the GAVI Alliance Immunisation Supply Chain Strategy
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Background: As countries expand immunisation programmes to include new vaccines and ensure increased coverage and equity, existing and potential constraints exist within the supply chain systems to manage an estimated four-fold increase in vaccine volume per fully immunised child and a five-fold increase in the cost of vaccines to fully vaccinate a child from 2010 to 2020. To address existing and anticipated future supply chain system challenges, the Alliance has developed a comprehensive strategy.

Method: The Alliance used a collaborative governance structure, drew upon extensive consultations, and priority working groups to develop the strategy. First, a governance structure included a Steering Committee comprised of Alliance leadership and a Task Force co-chaired by UNICEF and the GAVI Secretariat. Second, extensive consultations from countries, the global health community, Alliance and non-traditional partners via face-to-face meetings, forums, and informant interviews provided critical inputs. Third, working groups drew upon the work of experts and practitioners.

Results: The GAVI Alliance Board has approved a comprehensive strategy that envisions that by 2020, all countries will have an immunisation supply chain system that provide potent vaccines efficiently to all with the ultimate goal to save children’s lives and protect people’s health by increasing access to immunisation in poor countries. Five pillars support the vision: people & donors to be leaders and change agents in strengthening HR for SCM (NPHCDA) leadership has moved ahead in addressing these challenges by engaging international partners, traditional and religious leaders nationwide, and donors to be leaders and change agents in strengthening HR for SCM at all levels. This focus is aimed to improve the efficiency and effectiveness of the immunization supply chain.

Method: The following steps were taken:

- Participating in national and state logistics working group meetings led by government, and including all key stakeholders.
- A literature review on capacity strengthening processes where NPHCDA engaged with key stakeholders at all levels, and how they relate to the programme.
- Review of documented experiences and reports from deliberations during inter-agency supply chain collaboration forums and technical working groups.
- Review of reports on the 2015 Forecasting Meeting and various other meetings organised by NPHCDA in collaboration with partners.
- Review of reports on Vaccine Management Training conducted across the country.
- Recent study on Strengthening Nigeria’s Vaccines Supply Chain by McKinsey.

Results: NPHCDA leadership is determined to strengthen SCM (Supply Chain Management), by engaging development partners at all levels in order to develop strong technical leadership and enact local change. Analysis shows the benefits of strong engagement of stakeholders’ who represent different perspectives and types of expertise, in health SCM. Increased engagement of stakeholders in SCM is visible in inter-agency technical committees, various working groups, planning and policy decision, forecasting and procurement, cold chain management, logistics, communication for development, social mobilization, monitoring and evaluation, data management, and service. This engagement has included secondments of supply chain specialists to work fulltime with NPHCDA HR for SCM to transfer knowledge, provide training, and technical assistance in key areas of collaboration.

Discussion: NPHCDA should continue engaging partners for SCM, and play the key leadership role and leverage partner support for advocacy at all levels in order to drive sustainable change in the supply chain. Engaging key partners representing different perspectives and expertise, to develop human resources capacity for SCM at all levels will help in building consensus and promote national and local ownership, leadership consistent and ensure a sustainable exist strategy. NPHCDA should set the agenda and support dialogues of accountability at all levels through its 2013 Accountability framework.

Lessons learned: NPHCDA’s increased collaboration with partners at all levels, has helped in increasing the immunization coverage by 50% over the past 3 years, because of strong leadership and focus, oversight from stakeholders and skills development of NPHCDA HR for SCM. Stakeholders have also played a key role in advocating for change at all levels and SCM is now acknowledged as a key driver for successful programme implementation.

08 Strengthening HR for SCM in the immunization supply chain in Nigeria through stakeholder engagement
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Background: Nigeria is the most populous country in Africa with an estimated population of 176 million people and employs the largest number of health workers on the continent. The availability of human resources is at optimal levels however the human resource capacity remains a challenge in Nigeria’s health sector. National Primary Health Care Development Agency (NPHCDA) leadership has moved ahead in addressing these challenges by engaging international partners, traditional and religious leaders nationwide, and donors to be leaders and change agents in strengthening HR for SCM at all levels. This focus is aimed to improve the efficiency and effectiveness of the immunization supply chain.

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09 Case studies in health supply chain workforce management
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Background: Logistics Management Institute (LMI) supports People that Deliver in developing case studies to illustrate how supply chain organizations manage their personnel and workforce. The intent of these case studies is to serve as a guide for other organizations in managing supply chain personnel effectively to improve supply chain performance.

Method: LMI created a questionnaire to cover the five building blocks of workforce development: engaged stakeholders, optimise policies and plans, workforce development, increase performance, professionalization of SCM (USAID|DELIVER 2013). In collaboration with PtD, we then contacted potential case study participants and, when agreed, conducted an interview using the structured questionnaire. LMI also collected relevant documents from the case study participants.

Results: Case study interviews have been conducted with two organizations to date: Sudan Central Medical Stores (CMS) and Imperial Health Sciences (IHS). Those case studies have been documented and compared, demonstrating a comprehensive approach to workforce management, including recruiting, performance management, training and development, and professionalization. The results illustrate differing focuses between the two organizations, with the Sudan CMS focusing more on meeting stakeholder objectives and IHS focusing more on workforce design and financial factors. LMI and PtD are working to add additional case studies to this series.

Discussion: The two studies illustrate the distinction between public and private sector workforce management. These case studies serve as examples of effective workforce management for others to review to identify practices that can improve their supply chain workforce. Both Sudan CMS and IHS use good workforce management practices; however, there is still room for improvement. Both organizations demonstrate that effective workforce management in health supply chains can be achieved with the right leadership and resources. The result is improved supply chain reliability and cost performance.

Lessons learned: Effective workforce management is essential for health supply chain success. Organizations that tailor workforce management practices to the needs of their supply chain develop more competent and knowledgeable staff. The result is a more effective supply chain operation that maintains quality, cost, and service with reduced management burdens.

O11 Creating the humanitarian professional: moving from certification to advocacy and endorsement

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Background: Field experience, literature review and focus group findings indicated that a Buddy Network could help to overcome the unique barriers encountered by senior medical supply workers in Pacific Island Countries, including chief pharmacists, central medical store managers and country program managers. Specifically it could: encourage shared problem solving, reduce professional isolation, provide a proxy of supervision and encourage self-direction, improve workplace confidence minimise training fatigue, and maximise application of training.

Method: Utilising the researchers existing relationships, senior medical supply workers in Pacific Island Countries were invited to join the Pacific Medical Supply Workers Buddy Network. Further invitations were sent as members identified suitable colleagues to join. Members committed to sharing work achievements and challenges with each other via email, the Network website http://pacificmed.net/ and a monthly newsletter. Quantitative and qualitative evaluation of satisfaction with, and performance of, the Network was undertaken at 6 and 12 months.

Results: Eleven newsletters have been published, based on approximately 2000 communication episodes. On a 7 point scale (1=not at all, 4=neutral, 7=very much) 9 of 23 members report that their initial hopes of the Network have been met ‘a lot’ (5.9/7). In descending order of positive response, members consider that the Buddy Network:

1. reduces professional isolation (6.2/7) (a lot).
2. improves workplace confidence (5.7/7) (a lot).
3. maximises application of training (5.3/7) (a little).
4. encourages shared problem solving (5.2/7) (a little).
5. provides a proxy of supervision and encourages self-direction (5.2/7) (a little).
6. minimises training fatigue (4.2/7) (neutral).

Discussion: The Network was established to help senior medical supply workers “learn from each other’s challenges and experiences – approaching our situation with new ideas”. Current membership includes 34 senior workers from 15 countries, representing medical supply systems serving more than 9 million people. The Network has shown positive influences on many aspects of member’s work, with the expectation that this will improve their ability to manage their countries medical supply systems and thereby improve access to medical supplies in their countries. Members consider unequal member contribution and difficult access to the website as the main areas requiring improvement in the Network.

Lessons learned: • Email is the preferred method of communication.
• The potential website benefits (resource library, chat, discussion forum) have not yet been realised due to restricted or expensive internet access and some unfamiliarity with technology.
• Active members expect greater contributions by less active members and look to the researchers to drive this.
greater advocacy, buy-in, recognition and endorsement for certification in the mainstream. HLA’s experience can be applied to other sectors like public health; IAPHL and PtD can build on and formalize the methods for professional certification and standards that have worked for HLA.

O12  
Incentivizing access to family planning in Senegal via the informed push model  
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Background: In Senegal, the absence of a well-functioning family planning (FP) product supply chain has acted as a significant supply-side barrier and contributed to Senegal’s low contraceptive prevalence rate (CPR) (12.3% in 2010) and high unmet need for FP among married women (29%). Recurrent FP product stockouts at nearly 80% of public service delivery points (SDPs) continue to hinder the government’s ability to achieve its goal of doubling CPR to 27% by 2015.  
Methods: In 2012, IntraHealth International conducted a pilot of the informed push model (IPM) in 2 Senegalese regions to improve family planning product distribution. IPM, a last-mile distribution mechanism, moves FP products monthly from national pharmacy depots to health facilities via dedicated private logistics professionals. By utilizing task shifting, IPM reduces stockouts, which allows health workers to focus on health service provision and client satisfaction. The initiative is currently being expanded nationally.

Results: IPM immediately reduced and maintained stockout levels below 2% throughout the six-month pilot period. In target districts, contraceptive consumption increased by 38% and key logistics data reporting rose dramatically from 0% to 100%. As IPM is being scaled up, health workers in the eight regions already utilizing the model have described it as a “revolution.” At the health facility level, clients are benefiting from a constant supply of FP products and increased focus on provider-client interactions, resulting in more satisfaction with FP services received. Providers have also expressed greater job satisfaction, improved workflow, and better-quality reporting of data.

Discussion: Improvements in the FP commodity supply chain have the potential to boost health worker retention, improve client satisfaction, and increase women’s access to contraceptives. With IPM, the logistics management burden is shifted from health workers to dedicated logistics professionals, leaving more time for providers to focus on service delivery quality. The model reintroduces a cost recovery system, which makes funds available so providers can ensure that clients have access to the methods they want. IPM also streamlines the supervision system by providing health workers with the opportunity to clarify their roles and responsibilities and improve workflow at the facility level.

Lessons learned: Shifting non-medical tasks from health providers to logistics professionals improves the service quality and provides women with a constant supply of family planning products. IPM strengthens public-private partnerships while incentivizing all parties to ensure that facilities and communities have access to family planning products.

O13  
Professionalization in the public sector health supply chain management: IAPHL’s present and future contribution  
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Background: In the 1990s, public sector technicians, mainly pharmacists, were gaining skills to fulfil their responsibilities in supply chain management (SCM) through different training sessions. Supply chain management was neither recognized as a unique profession nor institutionalized under Ministries of Health. The increasing need for global dialogue regarding health supply chain experiences, skills, and best practices was evident. To respond to this need and to strengthen the professionalization of supply chain management, the International Association of Public Health Logisticians (IAPHL) was created in 2007.

Method: IAPHL provides a free membership association for logisticians to support one another by sharing information, experiences, and resources through an online listserv. Members participate in online discussions led by technical experts on topics suggested in the annual member satisfaction survey. Other than these community driven discussions and resources, IAPHL has also sponsored members to the annual Global Health Supply Chain Summit conference, where they had the opportunity to hear different ideas from academics, researchers and practitioners.

Results: The membership of the association has grown from 120 in October 2007 to 2656 in June 2014 in 114 countries, with increasing member engagement. Members have been actively participating in the discussions on the listserv, and in the past year alone the association has received 50 or more contributions per month consistently for 10 out of the 12 months. Out of the 160 respondents to the 2014 annual survey, 73% reported that the association has increased their SCM knowledge.

Discussion: The main goal of the association is engaging existing members and attracting a diverse group of new members. Consequently, expanding the portfolio of professional development activities and maintaining the quality of these services remain at the core of the association.

The results show that IAPHL has brought recognition and made contribution towards professionalization of health SCM in the public sector. Future contribution to professionalization will involve resolving a number of questions such as the measurement of the effectiveness of its professional development activities, sustainability and inclusion of potential non-English speaking members.

Lessons learned: Professional associations such as IAPHL can be great vehicles for promoting professionalization of public sector health supply chain managers and building their professional capacity to improve supply chain performance in their countries. Increased investment should be made to bolster such associations to ensure they provide services to shape the future of supply chain management, especially in the public sector.

O14  
Strengthening the capacity of and professionalizing human resources for supply chain in Indonesia through the SCM Provincial Network  
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Background: Indonesia is a large archipelago consisting of 34 provinces spread over 17 key islands. Because of its geography, addressing discrepancies in HR for SCM capacity over the entire country is a challenge. To professionalize and strengthen the capacity of its HR for SCM, the MOH, in collaboration with the People that Deliver (PtD) initiative, the World Health Organization (WHO), and the USAID | DELIVER PROJECT, developed the Provincial SCM Network in 2011.

Method: Stakeholder workshops to explore solutions to these challenges for HR for SCM resulted in the formation of the Provincial SCM Network. The goals of the Network are: capacity building of members, strengthening professionalism of supply chain managers, and development of the Network. Members include senior provincial SCM staff and/or province drug warehouse chiefs from provincial health offices. Members participate in national meetings and use an effective group communication system through the WHO Knowledge Gateway.

Results: Five national network meetings have been held since 2011 (one every four to six months). The meetings have succeeded in building a true network of public health supply chain managers. For instance, to help senior SCM professionals better understand the SCM needs of the disease programs and to improve collaboration with program managers regarding their drug management needs, meetings have covered such topics as drug management information for HIV/AIDS, malaria, TB, maternal/child health, and nutrition programs. Network meetings also built member capacity in such skills as advocacy, effective communication, and using the WHO Knowledge Gateway.
Discussion: In addition to providing opportunities for regular contact and effective networking among members, the Network has strengthened Indonesia’s commitment to building capacity and professionalism of HR for SCM. Participation in the Network has also galvanized provincial SCM leaders to continue their professional development. An ongoing challenge facing the Network is the cost and time needed to organize and attend meetings. While looking for more sustainable approaches, the MOH and its partners will continue and expand the program by using committed Network members to further strengthen SCM systems and act as agents of change for continued professional development.

Lessons learned: The Provincial SCM Network has proven to be an effective means to build SCM capacity and encourage professionalism among SCM staff. There is great interest in the Network by SCM staff because this is the first dedicated activity for SCM professionals which has engendered pride in their work.

**O15**

Bringing supply chain training opportunities closer to home—an experience with regional training institutes

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Background: Since 1994, USAID and JSI have provided introductory supply chain courses for international audiences. As demand for these courses continued to grow, it became apparent that local delivery would increase the cost-effectiveness and sustainability of global SCM trainings. Starting in 2007, the USAID | DELIVER PROJECT built the capacity of four Regional Training Institutes (RTIs) that now offer high quality supply chain courses to an international audience in three languages (English, Spanish, and French).

Method: The project developed detailed selection criteria to use when surveying and selecting RTIs, then trained and mentored the selected institutes in SCM, training/facilitation, marketing, and consulting. These capacity building interventions enabled the RTIs to design, package, price, market, and deliver capacity building programs; provide targeted technical assistance; and apply business savvy to their management and development activities.

Results: Over time, the RTIs have evolved as leaders in training for SCM and logistics; they continue to offer high-quality training solutions in developing countries. Based in Peru, Tanzania, Burkina Faso, and South Africa, the RTIs leveraged local talent to provide training in commodity security and supply chain management of health commodities to the areas that needed it most. Today, the RTIs are either working entirely on their own, or with minimal technical assistance from the project. Financial support for trainings comes mainly from participants’ fees with diminishing support from USAID funds.

Discussion: Project experience with the RTIs demonstrates that “facilitated outsourcing” of SCM trainings to regional training institutes can be a successful intervention to increase global supply chain training opportunities. While some objectives were met with quick success, others required significant technical assistance. RTIs have been successful in: recovering costs with their pricing structures, building consulting skills, forming a culture of entrepreneurship, and delivering high quality, highly rated courses. Challenges include: drafting adequate marketing plans to ensure sufficient enrolment, and ensuring ongoing quality control of courses.

Lessons learned: Positive results include: reduced donor costs, creation of local opportunities for SCM professionals, and more participants trained each year. Specific attention must be given to: course pricing flexibility to meet market demands, formal evaluation/cost analysis of RTIs for evidence-building, and potential market saturation.

**O16**

Assessing the feasibility of establishing a centre of excellence in health logistics in the East African Community

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Background: The East African Community (EAC) seeks to address challenges of vaccine and other commodities supply chain management by addressing weaknesses in human resource capacity. To achieve this EAC seeks to establish a Center of Excellence (CoE) with the objective of professionalizing health and immunization and related commodity logistics management in the region. The proposed framework for the CoE will be modelled according to the existing LOGIVAC reference center for health logistics for West African countries, in Benin. To advance this work AMP provided technical assistance to EAC to conduct a feasibility assessment.

Method: The assessment methodology was adapted from the Human Resources for Supply Chain Assessment Guide and Tool developed by USAID | DELIVER in conjunction with PtD, and the Competency Compendium for Health Supply Chain Management developed by PtD. Specifically, the approach used desk reviews, consensus workshops, key informant interviews and analyses of existing systems.

Results: In the East African Community, most SCM activities at the Central level are performed by pharmacists but non-pharmacists also play a significant role. At the facility level, SCM functions are mainly performed by nurses and midwives. In most countries EPI SCM functions are performed by public health technicians, clinical officers, nurses and midwives. In all but one partner state there is at least one school of pharmacy. Even though pharmacists are being trained, current curricula for the pharmacy training does not adequately address SCM functions. In addition, curricula for nurses and midwives contains limited SCM. In all EAC Partner States, SCM managers for EPI are mainly trained on the job.

Discussion: There are SCM training gaps in the EAC with most of the countries having inadequate numbers of pharmacists. Also, pharmacy assistants/technicians are in short supply across countries. In addition to insufficient numbers of SCM cadres, no course currently exists to train a specialized SC cadre. Institutions that provide courses in SCM exist but lack sufficient capacity to produce quality courses. In addition to the shortage of trained personnel, there are also insufficient numbers of SC/logistics management academics. Curriculum strengthening and academic capacity building initiatives are required to adequately address SCM HR challenges.

Lessons learned: A number of cadres, apart from pharmacists perform supply chain functions in the East African Community. Even though most EAC countries train pharmacists, these are in inadequate numbers and current curricula do not adequately prepare staff for SCM functions. Approaches to strengthen human resource capacity for SCM are necessary to streamline SCM efficiency in the EAC.

**O17**

Using e-learning to advance advocacy and leadership in supply chain management

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Background: Higher education programmes preparing health system managers for their jobs seldom include supply chain management (SCM) in the curriculum. However, SCM knowledge and skills are necessary not only for health workers, but also for managers and policy makers. Indeed, SCM awareness at decision-making level is essential to facilitate the establishment of policy frameworks giving SCM a place within health systems priorities and enabling the allocation of sufficient resources for SCM staffing and operations.

Method: i+solutions, in collaboration with the Swiss Tropical Institute of Public Health, developed an e-course on the Introduction to SCM in healthcare as part of a MBA in International Health Management. The course was offered on a comprehensive learning platform, based on a constructivist educational approach, where participants learn from each other and their experiences, in addition to basic theory. Formal academic assessment tools, academic assignments and students’ feedback were used to evaluate the outcome of the course.

Results: Participants came from global/public health backgrounds, development cooperation or other related fields with a majority without any previous knowledge of SCM. All participants successfully passed the final exam. The feedback on the pedagogic approach and the course content was positive. Furthermore, participants have contributed to the continual...
improvement of the course content by providing their varied perspectives, while learning from each other through interactions on discussion platforms. In addition to general SCM topics, the course helped appreciate people’s participation in healthcare systems and the significance of taking cultural perspectives into account.

Discussion: Future leaders in global health can be equipped with a basic understanding of SCM through affordable, low-impact interventions such as e-learning modules. While it remains to be seen whether this translates into SCM decision-making in their professional lives. Larger number of students would need to be engaged in such training in order to push SCM higher on the global health agenda and integrate in thoroughly in health systems design. IT based learning platforms have a distinct advantage over traditional teaching in that, even after training is completed, participants can continue to interact and exchange successes and challenges.

Lessons learned: Background concepts such as essential medicines, task shifting, and donor-funded health financing have to be defined and addressed in order to identify SCM challenges in a context understandable by all. Social learning has to be promoted to stimulate post-course online involvement and facilitate the assessment of the course impact in the field.

O18
Comparison of the cost effectiveness of pre-service training and in-service training in Ethiopia
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Background: Ethiopia has implemented the Integrated Pharmaceutical Logistics System (IPLS) since 2009, under the Pharmaceutical Funds and Supplies Agency (PFSA). Although more than 5,000 healthcare workers have been trained on IPLS, staff attrition and expanding service delivery has required ongoing training. To address this, partners provide mainly in-service training (IST); although, recently, pre-service training (PST) has been offered to graduating pharmacy technicians. However, data was not available to compare the cost effectiveness of PST versus IST.

Method: Graduating pharmacy technicians were given IPLS training in two locations. One year after training, the technicians completed a questionnaire; it included information about their current work place and the relevance of the training to their current roles and responsibilities. Costs to train PST trainees were calculated and compared to costs for IST. An assumption was made that IST and PST training were equally effective provided trainees were hired within one year of graduation.

Results: Training cost per IST trainee—per diem, transport, meals, trainer costs, and costs from removing trainees from their workplace—was six times that of a PST trainee, which only included trainer time and materials. One year after graduation, approximately 90 percent of PST trainees were working in the healthcare sector. Assuming similar knowledge retention (this was not assessed) PST is almost six times more cost effective. The breakeven point, where IST and PST are equally cost effective, is about 17 percent: if more than 17 percent of PST trainees are hired within one year, PST is more cost effective.

Discussion: In this instance, assuming knowledge retention levels are similar, PST is a cost-effective solution. PST is cheaper as trainees do not have transport or per diem costs; PST also reduces the time healthcare workers are away from their posts. While relative training costs and recruitment rates will vary from country to country, the data suggests that, in many settings, PST will be more cost effective. However, more research is needed to assess the effectiveness of training; our assumption (which has not been validated) is that training is equally effective if trainees begin work in pharmaceutical logistics within one year of training.

Lessons learned: Some assessment of comparative training effectiveness should be done to validate the assumption that PST and IST are equally effective, if trainees begin work within one year of training.

O19
Building workforce capacity to operate a web-based logistics management information system (LMIS) in Pakistan
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Background: To improve the availability of contraceptive supplies in Pakistan, the USAIDDELIVER Project worked with the Government of Pakistan (GoP) to develop a national web-based logistics management information system (LMIS), at all tiers of the supply chain. The LMIS automates the collection of data for contraceptives, tuberculosis, and vaccine products. The project also trains users in the skills needed to upload data, and orientates senior staff on the basic aspects of the system to ensure their support.

Method: To ensure the sustainability of LMIS training, the project developed a cadre of master trainers from government departments at the federal, provincial, and district levels. These trainers monitor the system and conduct roll out training. At each supply chain level, LMIS operators were also chosen to compile and upload data every month. Union council level staff were trained in paper-based reporting. The project provided training manuals, CDs, practical exercises, charts, and job aids to participants.

Results: The project trained 100 master trainers from all four provinces and three regions of Pakistan. Those master trainers, carefully selected from among qualified GoP staff, trained more than 2,000 LMIS users within health and population welfare departments. These operators enter data from federal, provincial, and district levels and from designated data entry clusters at the sub-district level. The participants’ level of understanding of the LMIS was measured through tests before and after the courses. Results showed significant and satisfactory scores for the majority of trainees. On average, the level of understanding of trainees increased 60-80 percent after the training.

Discussion: Securing local government commitment to ongoing capacity building and continuous monitoring was a key first step in building the human resources needed for new LMIS. We made a strategic decision to ensure sustainability by selecting the master trainers from within the GoP and developing their capacity to conduct trainings and provide supervision. Consulting with all stakeholders and working with master trainers to create province-specific training plans and materials was also important. Investing in the appropriate individuals from government departments ensured system sustainability and accuracy. Stakeholders now have timely, high quality data upon which to make critical supply chain decisions.

Lessons learned: Participants’ low level of computer literacy jeopardized the success of the training and the deployment of the LMIS. To remedy this, we added a computer orientation session and instituted on-the-job training and supervision during field visits. We will also provide quality assurance guidance and continued training to master trainers.

O20
Fast Forward. People development in Africa
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Background: Supply chain management training remains the most critical discipline in building capacity and ensuring competitiveness and sustainability of Africa in the global context. Imperial Logistics continues to play a significant role through the development of our Fast Forward initiative. While ensuring effective operations and best practice, the company further develops sustainable platforms and solutions to expand our reach and address future skills for continued industry growth and innovation.
The Imperial Logistics Academy aims to provide integrated, customised training and skills development programmes to Imperial Logistics employees. Imperial Logistics initiated an accreditation project with TETA in order to position the Imperial Logistics Academy as an Institute for Sector Occupational Excellence. With a vision to expand Fast Forward into Africa through focusing consistently on training and skills development for African countries, Imperial Logistics works through Imperial Health Sciences Supply Chain Academy as its primary implementation partner.

Results: The Fast Forward initiative contributes by providing: full learnership across occupational categories ranging from National Quality Framework education levels 1 – 7, specific training aligned to standards, SOPs and business requirements, a legal framework through institutional accreditation and registration processes, a comprehensive quality assurance function and the use of its quality management system, alignment with human resources strategies, reduced duplication of efforts through the use of existing material and programmes while pooling pockets of excellence, improved skills and operational competencies, career development, personal empowerment and job satisfaction, and improved supply chain performance.

Discussion: Imperial Logistics remains committed to consistent investment that fast tracks capability development in the African supply chain management industry. The establishment of the Imperial Logistics Academy in combination with ISOE accreditation activities, Ikaheng acquisition, and Imperial Health Science Supply Chain Academy activities in Africa has taken the Imperial Logisticts’ Fast Forward initiative to a new level.

Lessons learned: Through continuous development and building further credibility as a learning organisation, Imperial Logistics further distinguishes itself as an “Employer of Choice” and an industry leader in logistics and supply chain management. Utilising internal small and medium enterprises builds capability while promoting career development and succession planning, strengthening organisational capability. In addition, the increasing duplication of the framework and utilisation of existing infrastructure improves return on investment and allows for continuous improvement.

O21

Improving national pharmaceutical supply management in Liberia through strengthening the training of pharmacists

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Background: Under the Global Fund round 8 Grant, the Liberian Ministry of Health and Social Welfare (MoHSW) received funding for Health Systems Strengthening (HSS). This grant sought to contribute to scaling-up efforts to reduce morbidity and mortality associated with HIV/AIDS, TB, malaria and related diseases. The overall goal was to address the health manpower needs at all levels of the healthcare delivery system with improving the quality of curricula for the training of health manpower and standardizing it to conform to international standards as one of the objectives. As a sub-recipient to this grant Pharmaceutical Systems Africa (PSA) worked with local partners to develop a new curriculum for pharmacy at the School of Pharmacy in Liberia and to employ key staff for the School of Pharmacy.

Method: Working with international partners, PSA used consensus approaches to review existing modules in the pharmacy curriculum and used international experts to develop new contemporary modules. To finalize the curriculum review process an international expert was brought to Liberia to work on the process. To implement the new curriculum an experienced Dean was hired to head the School of Pharmacy in Liberia for a period of two years. To sustain the gains attained during this program, junior members of staff in the University were sent on postgraduate studies.

Results: A new curriculum for pre-service pharmacy and a new Dean are in place. The new curriculum has a complete semester module on supply chain management. In addition to this supply chain module, another semester is set aside for experiential learning programs on practice sites. Forty percent of this rotational placement is dedicated to supply chain experience. This includes spending time with the Central Medical Stores, the Supply Chain Management Unit, among other supply chain functionaries. In the final year of the program students spend half a semester on further clerkships that among other things seek to buttress their supply chain and clinical skills.

Discussion: A multi-pronged approach to strengthen the training of pharmacists in Liberia demonstrated that change is possible even in countries emerging from conflicts. The effect of the war in Liberia had resulted in battered health and education system with limited functionality. The pharmacy curriculum in Liberia before this intervention was a ten-page document with limited content. More importantly, none of the lecturers held any post graduate courses of repute or worked in the university full time, making the program a part time professional course. Our interventions succeeded in bring the training of pharmacists in Liberia close to regional levels, such as seen in neighbouring Ghana or Nigeria.

Lessons learned: Regional and local efforts, if adequately supported, can result in effective system changes. Currently three international partners who have employed our students in supply chain management roles have expressed satisfaction in the level of supply chain competences our students graduate with. Still, we have only graduated one stream based on the new curriculum and much more effort is needed to sustain the gains attained.

O22

Developing the SCM workforce in Nigeria through contextualised pre-service education and continued professional development

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Background: The human resource crisis extends into all areas of a health system—including the supply chain. Access to quality HIV commodities for testing, treatment and care can be impeded by staff lacking skills in health supply chain management (SCM) often resulting in stock-outs and expiries. In Nigeria, SCMS set out to build in-country capacity to accelerate current and future health workforce education in SCM through three distinct learning modalities.

Method: SCMS implemented a three-pronged approach to SCM education through pre-service, in-service and e-learning training by engaging: the incoming supply chain workforce by working with 12 pharmacy schools, health personnel by working with the Institute of Public Health at Obafemi Awolowo University Ife to implement a logistics management of health commodities course, and with the growing need for laboratory logistics skills by working with the K4Health project and two credentialing bodies to develop the SCM content.

Results: This approach has built the capacity of more than 30 instructors at 13 academic and training institutions reaching over 2,300 students with ongoing expansion to 20 schools (both public and private) with medical laboratory science undergraduate programme (BMLS), and eight state schools of health technology. Pre-service training in supply chain management has seen close to 400 pharmacy students graduate with this knowledge, as of March 2014. The Institute of Public Health, Obafemi Awolowo University has also completed three training rounds of the logistics management of health commodities course with a total attendance of 52 health personnel drawn from public and private organizations.

Discussion: The Nigerian health workforce gained critical SCM skills to ensure continued patient access to life-saving medicines. These new skills present a sustainable capacity building model given their full adoption by local institutions and faculty. This approach can be applied to other knowledge areas critical to the HIV workforce further enhancing country ownership. With low start-up and maintenance costs, this three-pronged effort has proven potential to save thousands of dollars by reducing dependency on costly in-service training.

Lessons learned: The program’s success is due to stakeholder engagement and buy-in, strategic use of existing educational structures, professional bodies and MOH’s commitment. In-service training for 30 participants ranges from US$31,000-$50,000 which must be repeated over time while pre service training and e-learning require one-time costs for initial implementation with minimal continuous costs.
O23
Introducing an enhanced cadre of pharmacy assistants to improve dispensing, management, and availability of medicines at the health centre level in Malawi
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Background: VillageReach, in partnership with the Malawi Ministry of Health, the Malawi College of Health Sciences and the University of Washington Global Medicines Program, is addressing key barriers to medicines availability by implementing a new approach to training, deployment, and support of an enhanced pharmacy assistant cadre. Key aspects of the program include curriculum redesign to include more content to enhance skills in supply chain management and an extensive practicum component at public health facilities.

Methods: Student enrolment and examinations are monitored by the college. A baseline assessment and monthly data collection are conducted at health facilities prior to and during student practicum placements. Information on stock-outs, reporting timeliness and accuracy, dispensing quality, and pharmacy and storeroom conditions are collected during supervision visits. A population-based survey examining access to medicines at the community level was conducted at baseline and will be repeated annually as part of an impact evaluation.

Results: All 50 students from the first cohort successfully completed their first year of coursework and practicum and 100 new students enrolled in 2014. District hospitals that hosted students experienced improved pharmacy and storeroom conditions, increased on-time reporting, and improved dispensing standards. By the time of this conference, six months of data will be available from practicum health centres including: stock-out rates, changes in storeroom conditions, storeroom management guidelines and amount of clinical staff time spent on logistics tasks. Baseline data on community access to and use of medicines from the population-based survey will also be available for presentation.

Discussion: The training program is designed such that students rotate through practical settings after 10 weeks of in-class coursework. This allows for more skills-based training and for more immediate improvements at the health facilities. With 100% student retention coupled with improved supply chain performance at practical training sites, the Pharmacy Assistant Training Program is a promising solution for countries with limited health workforce and supply chain challenges. We expect even greater improvements at health centres over time where students will have more direct control over supply chain management for public health facilities.

Lessons learned: The program is showing promise that skills-based training of pharmacy certificate students improves the performance of medicines supply chain and increases access to medicines in public health facilities.

O24
Combined on- and off-site training contributes to strengthening the unified pharmaceutical system in the Dominican Republic
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Background: With support from USAID-funded projects, the Dominican Republic (DR) started organizing a unified pharmaceutical system (SUGEMI) in 2010. Implementing SUGEMI included developing standard operating procedures (SOPs) for all system components, appointing personnel for national and regional pharmaceutical units, and training on-site staff responsible for pharmaceutical supply management. Strengthening and sustaining SUGEMI is now dependent on in-depth training of public health system staff responsible for supply management functions.

Method: SIAPS involved key personnel early in the elaboration of SOPs and training activities and helped design and implement a 12-week on-site/off-site certificate course on pharmaceutical supply. Each of the six program modules includes preparatory activities (reading Management Sciences for Health’s Managing Drug Supply textbook and SUGEMI SOPs); on-site sessions (discussing readings and instructions for on-the-job practice); and on-the-job site practice (situation analysis of the students’ institutions and identification of alternative interventions to address problems).

Results: Rapid capacity building has contributed to a nationwide implementation of SUGEMI in less than three years. Major outcomes were: National and Regional Pharmaceutical Unit staff members were trained to replicate trainings for SUGEMI implementation in 1,105 primary care facilities and 143 hospitals, and two on-site/off-site site courses have been completed (2012/2013 public university course for 35 students, and 2013/2014 private university course for 33 students). All students successfully fulfilled the academic requirements to obtain their certificates. Half of the graduates in the first course and all in the second were employed in a public health facility.

Discussion: Basic training in operational procedures is a necessary first step when implementing a national pharmaceutical system. However, workforce education and sustainability demands professionals with in-depth knowledge of concepts and tools commonly used in supply management. A hybrid on-site/off-site approach directed toward health workers in the public sector assures: reinforcement of the theory through practical experience, implementation of a national pharmaceutical system, and immediate introduction of good pharmaceutical management practices in their particular labour sites. All trainings had an immediate operative purpose—the implementation of particular SUGEMI component—fixing knowledge, through practice.

Lessons learned: Implementing a national pharmaceutical system offers a unique opportunity to consolidate theoretical concepts with practical on-the-job experiences. Involving personnel in the elaboration and training in implementing SOPs, and an on-site/off-site course simultaneously strengthens SUGEMI and builds capacity of personnel in pharmaceutical supply management.

O25
Building the capacity of Sierra Leoneans in supply chain on the National Pharmaceutical Procurement Unit (NPPU) project (a case study)
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Background: A need to strengthen the supply chain and capacity of local supply chain professionals in Sierra Leone was identified following a supply chain assessment in 2010. In 2012, Crowd Agents was contracted to undertake a project to set up and manage the National Pharmaceutical Procurement Unit project and build local capacity over a 3 year period. The project team consists of international supply chain professionals and their Sierra Leonean counterparts to whom they are tasked with building capacity.

Method: The project team implemented a detailed capacity development plan, designed specifically to meet the individual development needs of the local Sierra Leonean counterpart executives. Each development plan was tailored to ensure that the counterparts’ capacities were built through mentoring, on the job training, attendance on accredited external professional training courses, regular monitoring and evaluating. Additionally, capacity development to strengthen the existing non-executive workforce in other department was also delivered.

Results: The counterparts received specific “on the job” training and learning which they were able to sufficiently apply to everyday situations in order to make significant improvements to the medical supply chain. Additionally counterparts attended external supply chain specific accredited courses in procurement and supply chain management. The mentoring was useful as it taught the counterparts how to meet challenging workloads and effective liaise with people at all levels from teams that they may manage to development partners and officials in various government ministries.
Discussion: During the project’s implementation the counterpart management team received effective capacity development to allow them to undertake their specific supply chain roles with confidence and provide effective support to their management team. The mentoring programme meant that learning and development was always available and the counterparts were able to gain firsthand experience of planning approaches, meeting deadlines and effective management in supply chain on a daily basis. Additionally the counterparts gained exposure to other areas of supply chain management including stakeholder relations.

Lessons learned: It is important to undertake an initial comprehensive assessment of the development requirements of the counterparts in order to plan the development plan to be implemented. It is important to review this plan regularly with the counterpart to see if any changes may need to be made to address any new development areas.

O26

Other duties as required: efficient use of human resources in Mozambique

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Background: The crisis in human resources for health in low-income countries has been documented many times over by research and experience. A fundamental issue in human resources in the vaccine supply chain is the system in which the health worker is working, which requires more than training and revised guidelines to address.

Method: To improve vaccine supply chain management in Mozambique a Dedicated Logistics System (DLS) was trialled. This system works through providing dedicated personnel to consolidate supply chain functions at the provincial level where limited resources are more likely to be available. These dedicated personnel distribute vaccines directly to health centres based on actual consumption, collects data, provides supportive supervision and assists with preventive maintenance.

Results: With the DLS, supply chain tasks are consolidated to a few dedicated personnel, using two to three vehicles and the corresponding resources to achieve direct delivery to all health centers in order to achieve higher vaccine coverage rates. For comparison, a multi-tiered system which follows standard administrative levels requires a vehicle, driver and vaccine specialist at each level, and about 100 health centre staff who perform supply chain tasks as a minimum part of their overall responsibilities.

Total equipment and human resource requirements is 11 vehicles, the accompanying fuel, and more than 130 personnel who are adequately trained and skilled in supply chain management.

Discussion: Engaging dedicated, trained logisticians to manage supply chain functions requires less forecasting skills from health workers and frees up their time to focus on patient care. As such, training and provision of technology can be focused on these specialists. The placement of these personnel matches the reality of the system as financial resources required for distribution are more likely to be available at the provincial level than the district level. An estimated 138 staff days/month per province are required for logistics duties with the DLS, compared to 348 staff days/month for a multi-tiered system.

Lessons learned: The effectiveness of dedicated personnel is largely due to its synergy with the overall system which has been specifically adapted to the on-the-ground realities of these provinces in Mozambique. Dedicated positions were created to fit the context, available resources at the appropriate levels, and the system design itself.

P2

Supply chain management of laboratory commodities for tuberculosis in Indonesia: using assessment results to strengthen staff capacity

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Background: High quality laboratory diagnosis is critical for any tuberculosis (TB) control program. Reliable and accurate laboratory testing depends on collecting high quality specimens, using careful collection methods, and properly storing and transporting specimens. Although various guidelines for proper collection and handling exist in Indonesia, there was no data on health worker compliance with these guidelines. Such data could help the Ministry of Health ensure staff capacity to carry out high quality laboratory diagnosis.

Method: In September 2013, the USAID|DELIVER Project conducted an assessment of specimen handling from collection to storage, transport, and holding at receiving sites. The assessment also covered the availability of equipment for the storage, packaging, and use of personal protective equipment (PPE); infectious waste handling; and the availability of standard operating procedures (SOPs). The National Tuberculosis Program (NTP) will use the results to strengthen the TB program and build staff capacity.

Results: Packing of TB sputum specimens and transport to referral sites is ongoing in the Drug Resistant TB project and in other sentinel health

POSTER PRESENTATIONS

P1

Analysis and findings from the Zimbabwe supply chain human resource assessment

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centres in Indonesia. However, no uniform standard operating procedures (SOPs) exist or are enforced for the handling and transport of specimens. Most collectors are not using cold chain with thermometers in the shipment. Also, there are no measures to protect the community and the environment during transport of specimens, as required in United Nations/WHO regulations. Many collection sites and receiving laboratories need additional cold chain equipment, especially refrigerators, for specimen storage. Staff members need basic training.

Discussion: Currently, there are no SOPs to protect the community and environment during transport of TB specimens in Indonesia. This includes the use of safe transport devices and labels for infectious material or hazardous substances, as required in UN/WHO regulations. Because the TB program will most likely be expanded to sites far from the current referral laboratories, more referral labs for cultures and drug susceptibility testing (DST) should be prepared and a more effective referral system developed. The MOH also needs to establish uniform SOPs for the way equipment/support devices are used by staff working on a variety of programs.

Lessons learned: The MOH should prioritize improving the country’s ability to perform TB cultures, including staff capability to handle DST. SOPs should clearly state when, where and at what temperature the cold chain is needed for sputum and isolates. These new SOPs should be imparted to staff and enforced.

P3

HR factors affecting the availability of medical products in developing countries: a systematic literature review

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Background: Developing countries face many complex challenges in the provision of essential medicines. The objective of this review was to establish what the existing literature says about in-country, public health supply chain factors which affect the availability of medicine at the point of service delivery in developing countries.

Method: A systematic literature review methodology was adopted to find, evaluate, analyse and synthesize literature in a transparent, replicable manner. Retrieved articles were categorized by the following topics: year of publication, journal name, whether from practice or academia, research methods employed, and country of residence of the corresponding author, in order to establish trends in publications from 1970 to date. A series of keyword searches were conducted on electronic databases beginning in May 2012 and July 2012. The literature obtained was evaluated against specified criteria for relevance and quality. Reference lists from articles that met the selection criteria were used to locate further literature; grey literature from other sources was also assessed against the specified criteria for relevance and quality.

Results: The importance of the role of supply chain is clearly established. The study identified a number of factors that affect medicine availability at service delivery points in developing countries and proposes a set of propositions that can be used for empirical investigation. Although effective SCM requires a focus on supply chain functions, Human Resources (HR) is a cross-cutting issue, touching every function in the supply chain from quantification to service delivery. HR It was found to be one of the challenges to ensuring medicine availability.

Discussion: Peer-reviewed publications on factors affecting medicine availability are few, and many of those reviewed focused on other thematic areas such as the insurance, financing, affordability, regulations, selection, and rational use of medicine, as well as the health workforce and intellectual property rights. Less than half of all publications were written by authors residing in developing countries. While it was possible to identify the factors in the thematic analysis the study did not fully investigate the impact and the scale of the impact on availability by different factors. Further research is needed to determine this.

Lessons learned: This is the first attempt to relate supply chain to World Health Organization (WHO) health systems strengthening building blocks and is the most comprehensive presentation of public health supply chain literature.
Association of Public Health Logisticians (IAPHL) was designed to interact with a large variety of countries globally.

**Method:** Under the theme of ‘Systematic Approaches to Human Resources for Health Supply Chains’ three content experts were asked to prepare a two page evidenced brief addressing one of three sub themes. Over a four week period (April – May 2014), each brief was presented to IAPHL members and seeding questions used to promote asynchronous discussion. Moderators engaged in the discussion and used a process of thematic analysis to assess the discussion.

**Results:** 103 contributions were made (Av. of 9 [1-17] contributors per question), 24 countries were represented (av. of 7 (1-12) per question). Several sub themes emerged from the three topics:

- HR as a barrier. A lack of supply chain strategy and unclear patterns in decision making responsibilities dominated, with an underestimation of the SC managerial competencies required.
- A systematic approach. A need for SCM champions and medium-to-long term HR and SCM strategies was clear, with professionalization of the SCM workforce identified as the most significant challenge.
- Education and continual professional development. Pre service education was seen as an early foundation that must be built on by competency based in-service training. A lack of resources was seen as the main barrier.

**Discussion:** It is clear that HR issues are a barrier to the effective running of health supply chains in many countries. Improving the professionalization of health supply chain cadres is seen as a priority by a number of countries with appropriate combinations of pre-service foundation training and competency based in-service training called for. Country based support is required to allow governments to systematically assess HR aspects of their supply chains while competent health supply chain leaders are needed to enable improvement plans to be successfully implemented.

**Lessons learned:** Issues concerning HR for SCM exist across a range of countries. The IAPHL discussion platform proved to be an effective forum to engage a variety of country based stakeholders concerning issues around HR for SCM.

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**P6**

**GAVI supply chain strategy people and practice evidence review**

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**Background:** It is estimated that in some cases up to 50% of vaccines are wasted by not being administered, where these supply chain inefficiencies may be contributing to the deaths of 1.5 million children each year from vaccine-preventable diseases. The GAVI Alliance partners and Secretariat, WHO, UNICEF, and the Bill & Melinda Gates Foundation are currently designing a supply chain strategy to increase investment, coordinate global activities, and ensure more children receive the vaccines they need.

**Method:** This study adopted a systematic review of 47 documents using three techniques: bibliographic online searches using keywords, use of websites of international organizations that support, fund or monitor issues related to health supply chains, and finally, a grey literature search used to unearth further information by examining and following up sources from different websites. A working group consisting of health supply chain specialists provided the author with expert advice and guidance on both the GAVI strategy and sources of literature.

**Results:** Although many significant results have been achieved and important targets are on their way to be reached, there is recognition of the existence of multiple challenges, which are representative of the immunization systems in developing countries. They have been identified as: ministries of health leadership and staff are not empowered to make critical decisions, the supply chain management organization is inadequately designed to face the increasing complexity, lack of qualified staff performing supply chain functions with limited access to adequate training, absence of a proper incentive and performance management system, poor logistics practices resulting in wastage and stock-outs.

**Discussion:** A clear direction arises from this study, which combines Human Resource for Health (HRH) practices and supply chain management capabilities. The issues discussed in each hypothesis are in reality interconnected in a complex web, which HRH theory goes some way to explain. While human resources issues in immunization supply chains need to be considered in conjunction with other critical supply chain areas including: system design, data management, cold chain equipment, transport and distribution.

**Lessons learned:** This report has revealed, using a snapshot of the existing literature, that there is a paucy of research on human resources for global health supply chains in developing countries.

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**P7**

**Human resource development in supply chain management- what do the UN agencies say?**

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**Background:** Efficient and well trained health workers are required for successful functioning of a supply chain that ensures equitable access to health commodities and universal coverage. Various UN organizations have identified this need as referenced to in a variety of online UN resources. This research aims to collect and analyse this extensive literature systematically and provide evidence for core strengthening parameters of human resources.

**Method:** This research employed a ‘Realist Review’ methodology involving a systematic search of the literature in the publicly available websites of UNICEF, UNFPA, WHO and People that Deliver. These documents and reports were then subjected to manual thematic analysis and common themes emerged were extracted and analysed.

**Results:** A total of 707 documents underwent initial title screening, with 379 retained. These articles were then subjected to executive summary screening with 182 documents retained. Finally, these remaining documents were retrieved in full, and a total of 128 documents were retained to undergo thematic analysis. This broad thematic analysis led to the extraction of the following five themes: engage stakeholders, optimize policies and plans, workforce development, increase performance, and professionalize supply chain management. Most of this evidence was pertaining to optimizing policies and plans (48 documents), with the theme of professionalizing supply chain management having the least amount of evidence (4 documents).

**Discussion:** The five themes generated from this research are similar to those documented in the USAID Report on Human Resource Capacity Development in Public Health Supply Chain Management and the Human Resources for Health Action Framework- Technical Brief 12. This review synthesizes the UN evidence supporting the importance of these five themes in human resources for health supply chains. Strengthening of these five core parameters as suggested in the above mentioned documents and by the UN agencies is important to ensure sustainable human resources development in this sector. Governments seeking to strengthen their health supply chain systems should consider building up on these five competencies for an effect human resource development.

**Lessons learned:** The reports and publications by the UN agencies are a rich source of expert information that should be considered for relevant knowledge synthesis. The five core parameters as found in this research, form a set of building blocks to consider HR for SCM in a systematic way. More evidence needs to be generated to support the professionalizing aspect.

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**P8**

**Development of a sustainable access to medicine model in the Caribbean: a case study of the chronic disease assistance program**

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**Lessons learned:** The reports and publications by the UN agencies are a rich source of expert information that should be considered for relevant knowledge synthesis. The five core parameters as found in this research, form a set of building blocks to consider HR for SCM in a systematic way. More evidence needs to be generated to support the professionalizing aspect.
Background: The Caribbean region is one where there is a marked increase in non-communicable diseases and at the same time there are significant financial constraints. This study seeks to develop a methodology for a sustainable supply chain mechanism for medicines which can be implemented in these countries. To develop this, the chronic disease assistance programme currently implemented in Trinidad and Tobago was assessed and a template was developed around this.

Method: Data was collected via both Primary and Secondary sources. Primary data was collected via a structured questionnaire as well laboratory test on the quality of drugs found in the Supply Chain. Secondary data was taken from country reports, scholarly journal published articles and trade articles.

Results: It was found that in the Trinidad and Tobago case, the engagement of the private sector has significantly reduced the patient waiting time in the hospital. It has assisted with the human resource deficiency in the public sector. However, there are significant systemic accountability gaps which need to be rectified in both the short term and long term to ensure a proper working system. The quality of medication in the parallel system was found to be of a good quality.

Discussion: It was found in this study that in addition to financial limitations, there are other issues that require addressing such as bottlenecks in drug procurement and supply; lack of trained manpower; lack of co-ordination between various ministries and departments implementing the program as well as the inefficient use of technology in the appropriate implementation of the program. We have made suggestions for resolving these issues and if implemented would lead to creating a robust, sustainable transparent supply chain in the Caribbean.

Lessons learned: There are numerous components to drug supply chain management in the Caribbean. However one needs to be very innovative in a financially, human resource and technology strained environment.

P10
Using the media social Facebook to increase the community voluntarism and engagement to monitoring ARV in Indonesia

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Background: In Indonesia issues of late deliveries and expiry of antiretroviral (ARV) medicines are significant. Indonesia with 7 main islands and 14,000 islands has a number of distribution difficulties. In addition there is a lack of appropriately qualified personnel handling ARV logistics. Seeing this situation the Indonesia AIDS Coalition (IAC) sought to initiate ARV monitoring through social media (Facebook) in 2011. Within the Indonesian there are 75 million internet users and 62 million who use Facebook. The Facebook community used to oversee the availability of ARV is called “Monitoring ARV” with 384 members including: people living with HIV in the community, doctors, professionals, activists and non-government organisations working in AIDS response.

Method: In the beginning the Monitoring ARV Facebook Group only consisted of ten people, quickly growing to 384 members. In the absence of funding the socialization around this group has only spread by social media and other organizational activities or in meeting activities with other stakeholders. ARV stock out reports are received by Facebook group members and are then reported to the Ministry of Health, Sub directorate AIDS through e-mailing a Facebook screenshot, but only after they are verified. These reports are then followed up by the IAC.

Results: Since this project began there has been improved two way communication between the IAC and the AIDS sub directorate. Before this project medicines delay problems took 15-25 working days to solve but since the instigation of Monitoring ARV these problems are resolved in approximately seven working days. The Monitoring ARV project has increased the community voluntarism and engagement to complete ARV monitoring. Through Monitoring ARV communities are reminded to always check the medicine quality, amount received, packaging and expired date as this knowledge is limited within the community.

Discussion: We can see that there is two way communication between community and government in securing ARV medicines availability. This has not happened before. There is discretion from the community to do the reporting through the Monitoring ARV in Facebook without unhindered bureaucracy. This approach is has been quiet economical, especially when considering the geographical challenges of Indonesia. Community engagement through voluntarism has resulted in a shared responsibility for monitoring ARVs.

Lessons learned: The problem of ARV availability can be solved with good cooperation and communication between community and government. The community engagement in supply chain management of ARVs is very important. Community engagement could be extended from the national level to the district level through voluntarism.
P11 Embedding problem solving and use of data with routine supply chain procedures: District leadership and team-based approaches improve product availability in Rwanda

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Background: In Rwanda, 30,000 volunteer community health workers (CHWs) treat children under five for pneumonia, diarrhoea and malaria. A 2010 community supply chain (SC) assessment identified a lack of SC skills and poor coordination between CHWs, health centres (HCs) and districts as barriers to CHW product availability. SC4CCM tested standard resupply procedures (RSPs) and multi-level quality improvement teams (QITs) to strengthen coordination and problem-solving between levels to improve supply chain processes and outcomes.

Method: In 2013, SC4CCM conducted a mixed-methods midline evaluation and an endline study in 2014 to understand sustainability and scalability of the QIT approach. A quantitative survey measured key supply chain indicators to compare results 12 months after launching the intervention (at midline), and another 12 months later to understand if results were sustained. Qualitative data at endline assessed enabling factors and barriers for scale up after the MOH began implementing RSPs and QITs nationally.

Results: Midline results showed that the team-based approach led to improved outcomes. CHWs in QIT districts had 25% greater availability of the five community health products on the day of visit than the comparison group. Qualitative results confirmed the importance of multi-level teams and a structured approach in achieving results. Endline findings confirmed the role of district leadership in maintaining and scaling this intervention. While CHWs in all districts affirmed the value of the approach, establishment of QITs in new districts and continued use of data relied on leadership of HC staff, frequently predicated upon district staff engagement and participation.

Discussion: Product availability and performance of SC tasks among CHWs can be improved by establishing multi-level teams that aid coordination and communication across levels in the health system and use data to prioritize areas for problem solving and develop local solutions. To establish and maintain meetings, leadership and on-going engagement from district staff ensures HC staff call meetings and prioritize the activities among their many other tasks. Meetings should have a known agenda, be short, and have a consistent approach to the use of data for performance monitoring and identification of problems and solutions within the team’s ability to address.

Lessons learned: CHWs are often isolated from the mainstream health system, strengthening their connections with HC and district staff through teams improves coordination and sets a culture of continuous improvement. Engagement by district coaches is necessary to establish QITs and ensure HCs provide the necessary leadership to sustain meetings and the approach.

P12 Incorporating pharmaceutical supply management modules in the pre-service curriculum of the BPPharm program, of the University of Namibia, School of Pharmacy

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Background: Namibia faces a chronic shortage of pharmaceutical personnel. The high burden of HIV and AIDS, coupled with increased numbers of patients needing antiretroviral (ARV) services, has further exacerbated this shortage. Skills related to PSM are essential for ensuring continuous availability of essential medicines for public health programs, including HIV and AIDS and TB. Pre-service education allows students to develop their competencies in supply chain, reducing the need for future investments in expensive in-service training.

Method: The USAID-funded SIAPS Program facilitated open discussions with University of Namibia lecturers and ministry of health staff to identify PSM components critical for management of medicines at health facilities and include them in the BPPharm curriculum. Findings from the discussions, coupled with SIAPS’ prior experience in developing PSM modules for pre-service training in Vietnam, allowed the development of the PSM components, a course outline, method of delivery, and schedule for teaching theory and administering practicals.

Results: Teaching materials were developed covering 10 procurement and supply chain management (PSM) topics. For each topic, learning objectives, pedagogical techniques, and content summaries were developed. Draft modules for these topics were shared with key stakeholders and workshops conducted to discuss feedback and validate appropriateness for inclusion in the curriculum. The workshops were attended by 15 stakeholders representing University of Namibia, Ministry of Health and SIAPS. As a result, the lecturer’s guide and student materials will be finalized and distributed in July 2014. SIAPS will then collect feedback from lecturers and students and make required improvements.

Lessons learned: The curriculum has been designed to address the SCM and include them in the BPharm curriculum. These gaps have been largely attributed to lack of competency in SCM, resulting in stock-outs, especially of paediatric ARV formulations. SIAPS has worked collaboratively with stakeholders to enhance pre-service training in PSM. This will ensure that graduates are exposed to PSM techniques necessary to avoid supply chain problems, thus avoiding stock-outs. Cross-linkages between PSM and rational medicine use themes have also been established ensuring that available products are appropriately used.

Background: Prior to 1993, Nepal had a vertical health logistics system. Logistics was not a government priority. No logistics curricula had been developed, no staff had been trained, and no logistics information systems existed at any level. After the establishment of the Logistics Management Division in 1993, the lack of trained manpower in logistics was realized. With support of USAID funded projects (implemented by John Snow Incorporated through Family Planning Logistics Management (FPLM), Nepal Family Health Program, and DELIVER), logistics training was institutionalized within the National Health Training Centre of Ministry of Health and Population.

Method: With support from USAID, the National Health Training Centre and Logistics Management Division have worked to institutionalize logistics training. Trainers were trained and Regional Health Training centres have been conducting logistics training. Logistics training is included in National Health Training Centre’s annual work plan and approved by the National Planning commission. Logistics practices have been incorporated in the pre-service and in-service curricula and health logistics training has also been incorporated in the training management guideline of the National Health Training Centre.

Results: Logistics practices have been incorporated in the pre-service and in-service curricula. Technical assistance is being provided to establish or maintain training within a national training system and efforts are being made to build the capacity of government healthcare providers to manage...
training events. Ten standardized Health Logistics Training packages have been institutionalized into the National Health Training Centre system to train human resource needed for the logistics management of the country and computer based self-paced training (CD-ROM), has been developed.

**Discussion:** The Ministry of Health has recognized the importance of the not only logistics management but also the need for quality training. The Ministry of Health has initiated and is continuing provision of logistics training from its own financial resources ensuring sustainability of the program to some extent. From 1993 to 2013, a total of 27,734 government personnel have been trained in the health logistics trainings. Through the training important logistics interventions like Pull System of Health Commodities and web-based LMIS were successfully implemented in all 75 districts of the country.

**Lessons learned:** Frequent turnover of trained storekeepers and a lack of effective supervision after training remain concerns. The misconception among health workers that training will solve all performance problems hinders their ability to analyse gaps and subsequently address them; and overall governance and accountability of the Government are continued issues.

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**P15**

Pilot projects empower district supply chain management staff to strengthen health services in Indonesia

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**Background:** Indonesia comprises 17,000 islands and 495 districts. Decentralization mandates district health services, but ensuring proper supply chain management (SCM) capacity at the district level is a challenge. The ministry of health developed and implemented SCM training modules and guidelines; however, weaknesses in the system remain, particularly related to human resources. The ministry in collaboration with universities and funders, piloted two projects that empower SCM staff. It will use the results to strengthen SCM at the district level.

**Method:** Two pilot projects, with different timeframes and funding, focused on staff empowerment, local ownership, team work, local problem solving, and enhanced professionalism. The pilots were built around a standard SCM cycle and used self-assessments to identify gaps in the SCM system. The approach also facilitated team work to develop and implement a corrective action plan.

**Results:** The pilot sites exhibited the same gaps. Which included: limited human resource capacity, and a lack of appropriate standard operating procedures (SOPs). A three-month internship for newly graduated pharmacists and pharmacy students, with SCM skills, was used to strengthen HR capacity. SCM training conducted by the interns for district SCM personnel proved effective, improving staff performance. Other interventions included reviewing and revising both SOPs and a quality assurance check list for SCM. Collaboration among SCM staff and managers was intensified, using an Integrated Drug Management approach. All the pilot sites now use standard SCM SOPs and have an Integrated Drug Management team.

**Discussion:** The internship program was very effective in increasing SCM performance and pharmacy services at the district level. We confirmed that SOPs are critical tools that should be used to facilitate standard, good quality performance. Empowering district personnel to review their own SCM program in a systematic manner and to prepare a follow-on action plan proved highly successful; this approach will now be used in expanded efforts to improve the district level SCM system and staff capacity.

**Lessons learned:** Empowering SCM staff through local ownership and self-assessment is an effective and sustainable way to create SCM interventions tailored to district needs. It also builds district staff commitment and confidence. Newly graduated pharmacists with SCM skills can act as change agents for improving SCM.
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