AFRICA CONFERENCE ON HEALTHCARE DELIVERY

(AHD CONFERENCE)

MAIDEN EDITION

AHD CONFERENCE BOOK OF ABSTRACTS

AND PRESENTATIONS

JUNE 2017

AHD Conference Book of Abstracts & Presentations 2017

Africa Conference on Healthcare Delivery
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ACKNOWLEDGEMENTS

We thank all those who made this conference possible

FOREWORD

On behalf of Organizing Committee of the Africa Conference on Healthcare Delivery, it is a great pleasure to welcome you to the inaugural 2017 conference with the theme ***"Advancing Effectiveness and Efficiency in Health Supply Chain Management for Improved Health Outcomes in the African Region."*** The conference brings together academic experts and policy makers from around the world to discuss key issues facing health product supply chains in the African region and their sustainable solutions.

The aims of this conference are three-fold. We want to:

a) raise awareness about the innovations that are being successfully tried in the African region

b) stimulate long-term sustainable thinking in the design of healthcare supply chains, and

c) facilitate meaningful exchanges between academia, policy makers and practitioners.

This year's conference focuses on four main themes.

- New models of healthcare delivery
- Bringing long term sustainability into the design of healthcare supply chains
- Strengthening and revitalization of primary healthcare supply chains
- Pharmacovigilance and role of supply chains in countering antimicrobial resistance

We have attempted to create a carefully curated set of sessions organized around these four topics. Each session brings together speakers, moderators and panelists from academia, policy and practice. We hope the diversity of perspectives will stimulate your thinking about ways in which we can improve health care supply chains in the region.

I sincerely hope that you will enjoy the sessions and ensuing discussions. I urge you to make sure that you do not let the conference talks and sessions become

"session over, and end of story." Engage the speakers, make them a part of your community, discuss highlights from the session over coffee breaks and write articles/blog/tweet about what you think.

Organizing a conference of this kind takes a significant commitment of time and hard work. I sincerely thank Prof. Ehijie Enato and his team for the immense effort they have put into bringing all of these together.

Prof. Prashant Yadav
Visiting Scholar, Harvard Medical School, USA
June, 2017

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AHD Conference 2017 Conveners

Prof. Ehijie F. O. Enato, PhD
Professor, Dept. Clinical Pharmacy & Pharmacy Practice
Faculty of Pharmacy, University of Benin, Nigeria
Program Convener/Chair

Pharm. (Mrs) Gloria M. Chukwumah
Director, Food & Drug Services Department
Federal Ministry of Health, Abuja, Nigeria
Program Co-Convener

Prof. Yehuda Bassok, PhD
Professor& Chair, Dept of Data Sciences & Operations
Co-founder, Center for Health Education& Applied Research (CHEAR), Marshall School of Business, USC, Los Angeles, USA
Chair, Global Health Supply Chain Summit
Program Co-Convener

Pharm. Linus Odoemene
National Coordinator, NSCIP/NPSCMP
Federal Ministry of Health, Abuja, Nigeria
Program Co-Convener

SCIENTIFIC COMMITTEE MEMBERS OFAHD CONFERENCE 2017

- Prof. Ehijie Enato– University of Benin, Benin City, Nigeria
- Prof. Yehuda Bassok– University of Southern California, USA
- Prof. Ananth Iyer –Purdue University, USA
- Prof. Ravi Anupindi– University of Michigan, USA
- Dr. Joseph Rhatigan – Harvard Medical School/Harvard School of Public Health; Division of Global Health Equity, Brigham & Women's Hospital, USA
- Prof. Prashant Yadav – Harvard Medical School, USA
- Dr. Teferi G. Fenta – Coordinator, Health Supply Chain Training Program, Addis Ababa University, Ethiopia
- Dr. Lloyd Matowe – Pharmaceutical Systems Africa, Zambia
- Dr. Edgar Barillas – Senior Manager, Systems for Improved Access to Pharmaceuticals & Services (SIAPS), Pharmaceutical& Health Technology Groups, Management Sciences for Health, USA
- Prof. Ntokamunda Kadima –College of Medicine & Health Sciences, University of Rwanda, Rwanda
- Prof. Mahama Duwiejua – Kwame Nkrumah University of Science & Technology, Kumasi, Ghana
- Dr. Obi Peter Adigwe – Executive Secretary, Pharmaceutical Manufacturers' Group of the Manufactures Association of Nigeria (PMG-MAN)
- Dr. Mohammed Z. Mahmud – National Primary Healthcare Development Agency (NPHCDA), Federal Ministry of Health, Abuja, Nigeria
- Prof. Titilayo Fakeye – University of Ibadan, Nigeria
- Prof. Azuka Oparah – University of Benin, Nigeria
- Dr. Valentine Odili – University of Benin, Nigeria
- Prof. Joshua Eniojukun – Niger Delta University, Bayelsa State, Nigeria
- Prof. Alex Dodoo – WHO Collaborative Center on Pharmacovigilance& University of Ghana, Accra, Ghana

LOCALORGANIZING COMMITTEE OF AHD CONFERENCE 2017

1. Pharm. Talatu Kassim – NSCIP/NPSCMP, FMoH, Abuja (Chair, LOC)
2. Miss. Lisa Iroh – AHD Conference 2017 Desk Officer, NSCIP, Abuja, Nigeria
3. Dr. Rhoda Atteh – NSCIP/NPSCMP, FMoH, Abuja
4. Pharm. Henrietta Bakura – NSCIP/NPSCMP, FMoH, Abuja
5. Rose Okonkwo – Senior Consultant, NSCIP, Nigeria
6. Grace Omole – Senior Consultant, NSCIP, Nigeria
7. Tochukwu Echeta – NSCIP/NPSCMP, Abuja, Nigeria
8. Dr. Ogaba Ogbu – NSCIP/NPSCMP, Abuja, Nigeria
9. Nonso Umeh – Consultant, NSCIP, Abuja, Nigeria
10. Hanifa Hamza – National Primary Healthcare Development Agency (NPHCDA), Abuja, Nigeria
11. Abdulrahman Kelani – UNICEF, Abuja, Nigeria
12. Kenny Otto – Deputy Country Director, GHSC-PSM, Abuja, Nigeria
13. Bravo Otohabru – National Agency for the Control of AIDs (NACA), Abuja, Nigeria
14. Uche Chukwudi – Catholic Relief Services (CRS), Abuja, Nigeria
15. Pharm Linus Odoemene – National Coordinator, NSCIP/NPSCMP, FMoH, Abuja, Nigeria
16. Prof Ehijie Enato – Faculty of Pharmacy, University of Benin, Benin City, Nigeria, & Chair AHD Conference

WELCOME CEREMONY FOR AHD CONFERENCE 2017

Abridged program here

WELCOME ADDRESS

Honorable Minister of Health,
PROF ISAAC FOLORUNSHO ADEWOLE, FAS, D.Sc.

AT THE WELCOME CEREMONY OF THE
AFRICA CONFERENCE ON HEALTHCARE DELIVERY
(AHD Conference) 2017

Sheraton Hotel, Ladi Kwali Abuja
On June 13, 2017

Welcome: It is with great pleasure that I welcome here today, top Government Functionaries, Directors and Staff of Federal, State and Local Governments, Heads of Development Agencies, representatives of the Global Fund, Development stakeholders and partners such as USAID, GHSC-PSM (Chemonics), UNICEF, Academic Institutions, the Private Sector, leading international experts in the field of healthcare delivery, Supply Chain Professionals, Heads of Departments, Students, the Press, ladies and gentlemen to this very auspicious occasion of the Maiden Edition of the Africa Conference on Healthcare Delivery taking place, the first of its kind in Abuja, Nigeria.

Background

1. The Africa Conference on Healthcare Delivery (AHD conference) is being convened to showcase the Nigerian local content success story to other African countries, and indeed, the rest of the world. It will bea platform that will give participants an opportunity to discuss new concepts and provide mentoring in the field of Health Supply Chain Management aimed at improving healthcare delivery, especially in resource-limited settings, using Nigeria as a case study and a model for other countries to learn from.

2. As we know, access to essential medicines is critical to reaching universal health coverage and is also recognized as a key building block of a strong health system. Medicines and health products are important for addressing health problems and improving quality of lives. They form indispensable component of health systems in the prevention, diagnosis and treatment of disease and in alleviating disabilities and functional deficiencies.

3. You may also wish to recall that in the recent past, the Ministry had noted that inefficiencies in procurement and supply management of medicines and other health products have resulted in commodity wastages, expiries and stock outs with significant amounts of commodities not getting to consumers at facilities.

4. Within the period 2015-2017, the Global Fund planned to disburse a projected one billion USD in aid to Nigeria to combat HIV, Malaria & TB. It is expected that about 50% of this aid will go to procurement and supply management of commodities which will put a significant constraint on the current supply chain.

5. During the same time, other donors, specifically the USG, GAVI, DFID, Bill & Melinda Gates Foundation will potentially contribute similar amounts.

6. The Ministry, in addition to other strategic interventions, is focusing on the last mile through the revitalization of the Primary Health Centers (PHCs) across the country.

Goals and Objectives

7. The main focus of the AHD Conference is to :
   i. Explore and provide an understanding of in-country health supply chain management and its impact on the overall healthcare system in Africa.
   ii. Review strategies for tailoring supply chain methodologies to challenging work-climates using the Nigeria lessons as case-studies.
   iii. Provide opportunity to the teeming number of supply chain practitioners in Nigeria to show-case their innovations while working at different levels of supply chain services in the country, and
   iv. Promote local participation in in-country supply chain management, and discuss local problems and solutions, the outcomes of which will be useful to the region and international audience.

Collaboration

8. The Conference is hosted in collaboration with other regional and international bodies with similar goals and objectives for the purpose of promoting effective and efficient healthcare delivery in the African continent.

Appreciation

9. I want to appreciate:

i. The Organizers of the Conference, the Nigeria Supply Chain Integration Project (NSCIP) of the Federal Ministry of Health in collaboration with the University of Benin, Nigeria
ii. Donors/Partners especially the Global Fund, USAID, DFID, UNFPA, BMGF, UNICEF, Private Sector Health Alliance of Nigeria (PSHAN), and
iii. Local and international participants/partners

Your contributions will surely remain veritable inputs for the initiatives of the Government of Nigeria and, indeed of other African countries, on issues of Supply Chain Management of Health Products to promote quality healthcare delivery especially in the rural communities.

Expectations

10. The Conference is conceived to promote local participation, innovation, continuous quality improvement and improvement of efficiency of healthcare delivery in the African region, especially in the area of Supply Chain Management of health commodities.

11. It is my belief that with the mix of local and international stakeholders here present, critical discussions, sharing of lessons and peer review in the course of the conference will surely lead to an even more robust health supply management across all levels and improvement of health indices in the region.

Conclusion: As you all interact and discuss on issues that will better the Supply Chain business in the country, I wish all participants a fruitful discourse and I call on you all to enjoy your stay in the Federal Capital and any form of entertainment or excursion outlined for your delight.

Thank you.

WELCOME ADDRESS

BY THE DIRECTOR, FOOD AND DRUG SERVICES,
FEDERAL MINISTRY OF HEALTH
PHARM GMO CHUKWUMAH

AT THE WELCOME CEREMONY OF THE AFRICA CONFERENCE ON HEALTHCARE DELIVERY, SHERATON ABUJA HOTE,
ABUJA, NIGERIA, 13 JUNE 2017

Welcome: It is with great delight that I welcome participants of the Africa Conference on Healthcare Delivery (AHD Conference) to the Federal Capital Territory Abuja, Nigeria. This conference, being the maiden edition in Africa, gives me great source of mirth as it is taking place in Nigeria. This implies that with the outcome of this event using local content derived indices, the country will be showcased as a model for other countries in the region and beyond.

Background: The conference is organized by the Nigeria Supply Chain Integration Project/National Product Supply Chain Management Program of the Department of Food and Drugs Services of the Federal Ministry of Health, in collaboration with the University of Benin, Nigeria, and other partners.

Focus of the conference: While offering a platform and opportunity for mid-level and high level supply chain specialists in healthcare, it gives room for students and interns to train and learn skills from experienced mentors. The detailed program is designed to build capacity, provide the right environment to share ideas, culture and enrich the contextual PSM skills of logisticians. It also gives opportunity to explore and provide an understanding of in-country health Supply Chain Management and how it can impact on the overall healthcare in the African continent.

Benefits: The conference's theme, which is anchored on effectiveness and efficiency, is timely. The nation is striving towards improving health indices of her citizenry, which can be achieved via availability of quality essential medicines and other healthcare commodities that are cost –effective for the end-user.

The conference promises to give value for money considering the vast and professional speakers from all over the world who are veterans in the field of Supply Chain Management.

As the country makes effort through the Health Ministry to reduce the disease burden and poverty level in Nigeria, and by extension in Africa, lessons learnt from here will be presented at other bigger international fora in due time.

Well wishes: As you participate, train, interact and network within the span of this program,I enjoin you to maximize opportunities and tap from the wealth of experience of the speakers and resource persons.

I wish us all a fruitful, happy and explorative encounter in the beautiful city of Abuja.

Thank you.

WELCOME ADDRESS BY PROF. EHIJIE ENATO
CHAIR, AHD CONFERENCE

It is my pleasure to welcome everyone present here today on this auspicious occasion of the Maiden Edition of the Africa Conference on Healthcare Delivery (AHD Conference). AHD Conference is designed to *advance sustainable value and innovations in healthcare delivery in the African region*, through advocacy, capacity building and learning, continuous mentoring and other educational initiatives. The conference is driven by Africans, with support from international experts/partners. With burgeoning health and developmental challenges in Africa, it has become imperative to develop innovative healthcare delivery solutions that are anchored on local context, knowledge and expertise, and driven by regional experts. We seek to promote local participation, innovations, continuous quality improvement and institutionalization of best practices in healthcare delivery in the African region. AHD Conference focuses on *Health Supply Chain Management*, and also deals with related issues in the field of healthcare delivery. The conference is being organized in collaboration with academic institutions, ministries of health, donor agencies, implementing partners, and other public and private sector organizations. We are committed to capacity building, mentoring and continuing education programs for professionals and students, through innovative best practices.

The idea of a regional conference to address the peculiar challenges in healthcare delivery in the African region was conceived about 3 years ago. As we all know, local problems can become too local to the extent that they are missed in international meetings. Through AHD conference, we intend to give voice to local problems and echo local solutions loud enough for others to hear and learn from. After all, there is the saying that “if you do not blow your trumpet, others will take it and blow it for themselves!” The initial thoughts and discussions on the idea of a regional meeting metamorphosed into concrete plans, steps and actions, the result of which we see today. Conceiving ideas, getting buy-in from the different multi- stakeholders and executing the plans are not easy at all, especially in the development world where everyone seems to be in competition. Nonetheless, great ideas always begin in small ways. AHD Conference and educational initiative are some of such ideas, and are conceived to change the narrative of healthcare delivery in the African continent. Let’s own it, let’s grow it, and let’s nurture it together!

Through *"AHD Conference," "AHD Journals," "AHD Connect,"* and other related initiatives, we hope to contribute to improving sustainable Supply Chain Management/Healthcare Delivery in the African region. The Theme of this year's conference, which is *"Advancing Effectiveness and Efficiency in Health Supply Chain Management for Improved Health Outcomes in the African Region"*was chosen to reflect the current health supply chain dynamics and innovations in the region. Under the leadership of the Honorable Minister of Health, Federal Republic of Nigeria, Prof Isaac Adewole, the Nigeria Supply Chain Integration Project (NSCIP) has grown to enviable heights. It is our hope that in no distant time, the achievements of the current supply chain effort of the Nigerian Government, through funding support of The Global Fund and other partners will not die; rather they will become veritable reference points for other African countries and indeed other parts of the world to learn from. To achieve this, we need to devise a sustainable mechanism for continuing the enthusiasm, interest, participation and advocacy long after the life of the project. Organizing an annual meeting for stakeholders, practitioners and academics to interact and share experience is one step towards achieving the much desired sustainability of our current effort. In the near future, I would like to see practitioners, graduate students and fellows from other parts of the world come to Nigeria for exchange programs and related professional and academic visits.

In the development world, we tend to focus more on meeting milestones and achieving deliverables as specified in the work plan, because they are major requirements to be signed off by the donor agencies. Thus, preparing well written, nice-looking and appealing reports are most often the norm. Good as these may be, at the end of the project, such reports are often left on the shelves of the funding agencies, the implementing organizations, and in some cases, the ministries of health. If no follow up actions or studies are planned in the coming years, no one ever makes any further reference to the reports. Sadly, such huge investments are left to gather dust on the shelves, because they were not sufficiently disseminated through publication in peer reviewed journals or presentation at scientific meetings. The implication of this is that findings and recommendations from such studies are hardly available to those who need to advance knowledge or make policy decisions. We are yet to see strong commitment in providing funding support to reverse this trend. AHD Conference and other educational initiatives hope to fill this gap, by providing a platform and support for professionals and students to disseminate their work through presentation at scientific meetings or publication in academic journals. We believe that the outcome of this initiative will contribute to improving health

programming, research and policy decisions in the African region. AHD conference will be an annual event, providing support and mentorship for professionals and students, connecting the industry with academic institutions and providing a platform for south-to-south collaboration. To this end, I wish to solicit the cooperation and funding support from donor agencies, implementing partners, ministries of health, other public and private sector organizations to enable us achieve the set objectives.

I cannot end this address without giving special thanks to the following persons who made this event possible: the Honorable Minister of Health, Prof Isaac Adewole; the Director, Food and Drugs Services, Pharm. Gloria Modupe Chukwumah; the National Coordinator NSCIP/NPSCMP, Pharm. Linus Odoemene; Abdulrahman Kelani (UNICEF); Pharm. Talatu Kassim and her team; the scientific committee members who spent valuable time supporting the conference planning and serving as peer reviewers for the submitted abstracts, and my Vice Chancellor, Prof. Osasere Faraday Orumwense and entire management staff of the University of Benin, Nigeria, for their support. Others include colleagues at NSCIP, NHPCDA, donor agencies, and implementing partners.

Finally, now is the D-Day! I encourage everyone participating in this conference to take the various sessions seriously, and I do hope that you will find time to relax after each day's hard work.

Thank you for listening and God bless!

Prof Ehijie F.O. Enato
Faculty of Pharmacy, University of Benin, Nigeria &
Chair, AHD Conference
Email: ehijieenato@gmail.com
June, 2017

OTHER REMARKS

HIGHLIGHTS OF KEYNOTE ADDRESS

"Advancing Effectiveness and Efficiency in Health Supply Chain Management for Improved Health Outcomes in the African Region"

Martin Ellis; Global Fund to Fight HIV/AIDS, Tuberculosis and Malaria, Geneva, Switzerland

We know that we need to offer more help to countries which lack national supply chain capabilities and capacity

- Global Fund and other donor and implementing partner reports have indicated that there are many failings in national supply chain operations
- A thematic report highlighted a need for The Global Fund to influence downstream supply chain activities to make them more efficient
- The countries we provide funds to have varying degrees of Supply Chain knowledge and operational maturity
- National supply chain inefficiencies result in a number of significant issues ranging from stock-outs and expirations to overstocking with associated high working capital and inventory management costs

There are many common / typical issues with national supply chains:

- High degree of paper systems in place which take time to review and fill in with opportunities for human error
- Inaccurate / Unavailable Demand and Inventory Data
- High Buffer Stocks = High Working Capital = Risk of Expiration = High Inventory Carrying Costs
- Inefficient warehousing leading to excessive intra-warehouse transportation and cost due to satellite warehouses
- Manual / Excel ordering not integrated into warehouse management systems
- Practical and meaningful KPIs are not being properly utilized
- Too many parallel supply chains.
- Many countries depend on Pharmacies and Health Facilities collecting supplies rather than scheduled delivery service
- Not enough supply chain professionals managing national supply chain
- Long replenishment frequency/periodicity at all supply chain levels is not conducive to optimizing levels of inventory which leads to high levels of inventory and expired products

- Unsafe transportation from District Pharmacies to Health Facilities - unsafe for the people transporting the product and for the products
- Stock-outs.

The private sector has vast expertise in logistics and supply chain management services - from simple transport and warehousing services to full blown third and fourth party (3PL and 4PL) holistic supply chain solutions. However, many developing countries lack private sector presence - not because there is a lack of will on their part but because protective barriers to entry exist. Two issues must be addressed:

1. Recognize the strengths and weaknesses of the MoH/national supply chain operations versus that of the Private Sector
2. Ensure there is an open and free market place for the Private Sector to enter

The GLOBAL FUND SUPPLY CHAIN LECTURE will discuss the difficulties and opportunities faced by the donor and implementing partners in their quest to ensure that programmatic health supplies get to patients in developing countries.

Recommendations for Advancing effectiveness and efficiency in health SCM

- Introduce Barcoding
- Introduce standardized eLMIS (electronic logistics management information system)
- Focus on the collation and analysis of accurate and timely Demand and Inventory data
- Establish leading practice and standardized forecasting tools
- Become more agile and increase the frequency of delivery
- Develop Standard Operation Procedures (SOPs) for all stages of the supply chain operations
- Right size efficient warehousing
- Improve warehouse safety
- Use private sector where available and economically feasible
- Introduce robust and agile warehouse management systems – standardize where possible
- Introduce practical and meaningful KPIs
- Work to reduce parallel supply chains
- Coordinate Implementing partners
- Move from collection to centrally coordinated delivery

- Place supply chain trust in highly qualified logisticians
- Grow national supply chain professionals through academia and private sector partnerships
- Improve transportation safety

Likely impacts of these measures on health outcomes in the African region

- Patients' needs will be met more often, thereby increasing the level of customer service
- Scarce resources will be used more efficiently enabling more treatments to be provided for the same level of donation
- Supply Chain costs per patient will remain stable or reduce while the level of service is enhanced
- Orders for pharmaceuticals will be procured more effectively, thereby reducing costs and increasing availability and patient satisfaction
- Evolvement of Responsive Supply Chains supporting the objectives of reduced costs and improved levels of service

DETAILED PROGRAM OF PRE-CONFERENCE TRAINING WORKSHOP: *"INTEGRATED SUPPLY CHAIN MANAGEMENT OF HEALTH COMMODITIES"*

Monday, June 12, 2017; Time: 7 am – 6pm;
Venue: Ladi Kwali Hall, Sheraton Abuja Hotel

Note: Due to logistical reasons, the training workshops have been revised and merged into one pre-conference training workshop for 2017 edition

Course Objectives

At the end of this course, participants will be able to:

- Describe supply chain management and public health supply chain management
- List the components and interrelationship of the logistics management system
- Describe the purpose of logistics management information system (LMIS) and outline the essential data needed for LMIS
- Describe the purpose of assessing stock status and list the needed data to assess stock status
- Describe the purpose of an inventory control system
- Describe the importance of and guideline for proper storage of health commodities
- Describe the purpose and components of a logistics management coordinating unit
- Describe integrated supply chain management of health commodities for ATMRH&V
- Describe warehousing and distribution of health commodities
- Discuss key performance indicators (KPIs) for benchmarking and quality improvement in health supply chain
- Describe leadership, coordination and strategy in health supply chain

To achieve the above learning objectives, participants are expected to study ahead of the training workshop. The training will be hands-on, with practical exercises and summary of key takeaway for the course participants

Course Outline and Facilitators - Didactic Lectures & Hands-on Practical Exercises

Session/Time	Topic	Facilitator	Moderator
7.00 – 8.10am	Arrival and Registration for the Workshop		
8.10 – 8.30am	Introduction to AHD Conference &Educational Initiative	Prof Ehijie Enato	
	Announcements, Learners' expectations, etc	Pharm Linus Odoemene/PharmTalatu Kassim	
8.30am – 1.00pm	**Module 01: Introduction to Supply Chain Management**		Prof Yehuda Bassok
8.30 – 9.10am	1.1: Introduction to supply chain management & public health supply chain management; Nigeria Supply Chain Integration Project/National Product Supply Chain Management Program, FMOH, Nigeria	Pharm Linus Odoemene	
9.10 – 10.30 am	1.2: Introduction to logistics system; Logistics management information system; Assessing stock status	Rose Okonkwo, & PharmTalatu Kassim/Tochukwu Echeta	
10.30 – 11.00am	***Tea Break***		
11.00am – 1.00pm	1.3 : (a) Maximum-minimum inventory control systems (b) Storage of health commodities	(a) Pharm Bravo Otohabru (b) Pharm Henrietta Bakura	
1.00 – 2.00pm	***Lunch Break***		
2.00 – 4.00 pm	**Module 02: Integrated Supply Chain Management of Health Commodities**		Pharm Linus Odoemene
2.00 -2.40pm	2.1: Logistics management coordinating unit (LMCU)	Dr Rhoda Atteh	
2.40 – 3.10 pm	2.2: Integrated supply chain management of public health commodities – ATMRH&V	Grace Omole	
3.10 –4.00 pm	2.3: Introduction to warehousing and distribution	Pharm Martin Onyia	
4.00 – 4.10pm	***Short break***		
4.10 – 5.30pm	**Module 3: KPIs & Quality Improvement in Health Supply Chain; Leadership, Coordination& Strategy in Health Supply Chain**		Prof Ehijie Enato/Prof Ravi Anupindi
4.10 – 4.50pm	3.1: Key performance indicators (KPIs) for benchmarking and quality improvement in health supply chain management	Tunji Odelola	
4.50 – 5.30pm	3.2: Leadership, coordination and strategy in health supply chain management	Bervery Chawaguta	
5.30 – 6.00pm	Closing remarks and presentation of certificates of participation	All	Pharm Gloria Chukwumah

MAIN CONFERENCE: Dates: June 13 -14, 2017;
Venue: Ladi Kwali Hall, Sheraton Abuja Hotel

Theme of the conference: *"Advancing Effectiveness & Efficiency in Health Supply Chain Management for Improved Health Outcome in the African Region"*

Sub-themes:
1). New Models of Healthcare Delivery;
2). Healthcare Supply Chain with Long Term Sustainability;
3). Primary Healthcare Supply Chain Strengthening/Revitalization;
4). Antimicrobial Resistance, Pharmacovigilance and the Role of Supply Chain

Session/Time	Topic	Speaker	Moderator	Panelist
		DAY ONE (13 JUNE 2017)		
7.00 – 9.00 am	***Arrival and registration of participants***	Registration stand		
#01; 9.00 am – 2.30 pm	1. ***New Models of Healthcare Delivery***			
9.00 – 9.10am	1.1: Brief Introduction of the Sub-theme: New Models of Healthcare Delivery	Prof Ravi Anupindi -Lead Speaker *(University of Michigan, USA)*	Session Moderators: Prof Yadav/Prof Anupindi& Dr Adigwe	
9.10 – 9.30am	1.2: New Models of Healthcare Delivery – Implications for Africa	Prof Ravi Anupindi *(University of Michigan, USA)*	Lead Speaker	
9.30 – 10.10am	1.3: Innovations in Healthcare Delivery - Short presentations			
	1. Polishing the Chain - How Technology is Solving Africa's Health Supply Chain Challenges *(15 mins)*	Dr Femi Kuti*(Kangpe, Lagos, Nigeria)*		
	2. Last Mile Vaccine Supply Chain Using Geospatial Solutions *(15 mins)*	Dami Sanoiki *(eHealth, Africa)*		
	3. Experience with Last Mile Delivery of Health Commodities in Hard –to- Reach Areas in Nigeria *(10 mins)*	Kabir Shagaya, *(Zippy Logistics, Nigeria)*		
10.10 – 10.25am	***Tea Break***			
10.25– 10.50am	1.4: Policy and Practice: Barriers and Facilitators to Developing Local Capacity for Medicines and other Health Commodities in Africa	Dr Obi Peter Adigwe *(Executive Secretary, PMG-MAN, Nigeria)*		
10.50 – 11.10am	1.5: The Role of the Private Sector in Effective and Efficient Healthcare Delivery	Dr Muntaqa Umar - Sadiq *(Chief Executive Officer, PSHAN)*		
11.10 – 11.30am	A Systematic Approach for Assessing Human Resources for Supply Chain Management	Musonda Kasonde *(Capacity Development Manager, UNICEF Supply Division, Copenhagen, Denmark)*		
11.30 – 11.50 am	Questions & Answers for the presenters			***All presenters***
11.50 –12.05 noon	***Short break/networking session***			

12.05 – 12.50pm	Panel Discussion: ***New Models of Healthcare Delivery*** - Summary, Conclusion and Recommendations			***Chair:*** GHSC-PSM/Chemonics& Private Sector Health Alliance of Nigeria (PSHAN); ***Other members:*** Prof Enato, Pharm Linus Odoemene
12.50pm – 1.30 pm	MENTOR/MENTEE FORUM – professionals& students			
12.50 – 1.05pm	Professional Advancement in Healthcare Delivery - Opportunities and Challenges in the African Region	Prof Ravi Anupindi – Lead Speaker *(University of Michigan, USA),*	Dr Obi Adigwe	
1.05 – 1.30pm	General Discussion – Questions& Answers			Profs Enato, Anupindi, Bassok, Yadav; Pharm Chukwumah; Martin Ellis; Dr Mahmud; Dayo Fatoke
1.30 – 2.30pm	***LUNCH BREAK***			
2.30 – 5.00 pm	***Welcome/Opening Ceremony***			
2.30 – 3.00pm	Recognition & Introduction of Guests		Master of Ceremony	
3.00 – 5.00pm	**Keynote Address** - Title: *"Advancing Effectiveness & Efficiency in Health Supply Chain Management for Improved Health Outcome in the African Region," to be delivered by:* ***Martin Ellis, The Global Fund, Geneva, Switzerland***	*1.* Hon. Minister of Health, Federal Republic of Nigeria *(Special Guest of Honor)* 2. Permanent Secretary, Nigeria Federal Ministry of Health *(Guest of Honor)* 3. Director, Department of Food & Drug Services, FMoH, 4. Executive Director, NPHCDA 5. Director General, NAFDAC 6. Tony Elumelu, *CON*, The Tony Elumelu Foundation, & Chairman UBA, Plc *(Distinguished Guest of Honor)* 7. Other dignitaries/Donor Agencies &IPs		
5.00 -6.00pm	Social event			ALL
DAY TWO (14 JUNE 2017)				
7.00 – 8.20 am	Arrival, registration and announcement			
#02; 8.20 am -12.00 noon	***2.0: Healthcare Supply Chains with Long Term Sustainability***			
8.20 – 8.50am	2.1: Health Supply Chains with Long Term	Prof Yehuda Bassok – *Lead Speaker (University*	Prof Yehuda	

	Sustainability in Africa – Opportunities and Challenges	*of Southern California, USA)*	Bassok&Pharm Linus Odoemene	
8.50 – 9.30 am	2.2: Efficient and Sustainable Health Supply Chain through Integration – Lessons from the Nigeria Supply Chain Integration Project	Pharm Linus Odoemene *(NSCIP/NPSCMP, FMoH, Nigeria)*		
9.30 – 10.00	Roadmap to Sustainable Health Supply Chains through Efficient Last Mile Delivery	Kenny Otto *(GHSC-PSM/Chemonics, Nigeria)*		
10.00 – 10.30 am	***Tea Break***			
10.30 -11.00am	2.3: Healthcare Financing and Sustainable Health Supply Chain in the African Region	Jiru Bako (*Country Director/Managing Director, Crown Agents, Nigeria Limited)*		
11.00 – 11.20am	Questions & Answers for the presenters			***All presenters***
11.20 – 11.50am	2.4: Panel Discussion: ***Healthcare Supply Chains with Long Term Sustainability*** - Summary, Conclusion and Recommendations			***Chair:*** The Global Fund to Fight HIV/AID, TB & Malaria, & Director, Food & Drug Services Department; ***Other members:*** Prof Bassok, Denise Lapoutre
11.50 -12.00 noon	***Short Break***			
#03; 12.00 – 1.30 pm	***3.0: Antimicrobial Resistance, Pharmacovigilance and Supply Chain***			
12.00 – 12.05pm	3.1: Brief Introduction of the Sub-theme: Anti-microbial Resistance, Pharmacovigilance & Supply Chain	Prof Alex Dodoo *(WHO Collaborative Center on Pharmacovigilance & University of Ghana, Accra, Ghana)*	Prof Enato	
12.05 – 12.15pm	Quality Assessment of Individual Case Safety Reports in the Nigeria National Pharmacovigilance Centre Database	Anthony I Obieze *(Pharmacovigilance/Post marketing Surveillance, National Agency for Food and Drug Administration and Control, Abuja, Nigeria)*		
12.15 - 12.45pm	3.2: Pharmacovigilance within the Supply Chain as a Strength Against Anti-microbial Resistance	Prof Jayesh Pandit *(Pharmacovigilance Country Head at Bayer East Africa)*		
12.45 –1. 00pm	3.3: Anti-malarial Resistance and the Shifting Sands of Chemotherapy in the Prevention and Control of Malaria in Pregnancy	Dr Wetkos Dayom*(University of Benin/University of Jos, Nigeria)*		

1.00 – 1.10pm	Questions & Answers for the presenters			***All presenters***
1.10 – 1.30 pm	4.3: Panel Discussion: ***Antimicrobial Resistance, Pharmacovigilance and Supply Chain*** - Summary, Conclusion and Recommendations	ALL		***Chair:*** United States Agency for International Development (USAID),&Director General, NAFDAC; ***Other members:*** Prof Enato, Prof Pandit/Dodoo
1.30 – 2.30pm	***LUNCH BREAK & POSTER SESSION***			
#04; 2.30 – 4.40 pm	***3. Primary Healthcare Supply Chain Strengthening- Revitalization***			
2.30 – 2.40pm	3.1: Brief Introduction of the Sub-theme: Primary Healthcare Supply Chain Revitalization/Strengthening	Dr Boubacar Dieng/Bervery Chawaguta*(UNICEF)*	Pharm Abdulrahman Kelani	
2.40 – 3.00pm	3.2: The Role of Primary Healthcare in the Attainment of Universal Health Coverage in Africa	Dr Mustafa Mahmud *(NPHCDA, FMoH, Nigeria)*		
3.00 – 3.10pm	**Short Break**			
3.10 – 3.20pm	Improving the Availability of Pediatric and Adolescent HIV Medicines and Supplies through Stock Redistribution across Facilities in the Public Sector in Uganda *(10 mins)*	Henry Kizito, *(Senior Supply SCM Officer of the USAID Strengthening Uganda's Systems for Treating AIDs Nationally (SUSTAIN) Project, Kampala, Uganda)*		
	A case study of Kaduna State Public Health Supply Chain Management (HSCM) Transformation Project - The Journey So Far *(10 mins)*	Mercy Boyis *(Kaduna State Ministry of Health, Kaduna, Nigeria)*		
3.20 – 3.40 pm	3.3: Revitalization of Primary Healthcare Supply Chain in Nigeria - Strategies and Action Plan	Pharm Abdulrahman Kelani *(UNICEF)*		
3.40- 4.00pm	Questions & Answers for the presenters			***All presenters***
4.00 – 4.40 pm	3.4: Panel Discussion: ***Primary Healthcare Supply Chain Strengthening-Revitalization*** - Summary, Conclusion and Recommendations		Abdulrahman Kelani	***Chair:*** UNICEF, & Executive Director/CEO, National Primary Healthcare Development Agency of Nigeria; ***Other members:*** Dr Dieng, Pharm Linus Odoemene; Henry Kizito

4.40 – 5.00pm	Closing Remarks & Vote of Thanks			
5.00 – 5.20 pm	MENTOR/MENTEE FORUM – Professional advancement in global healthcare delivery and mentorship	Informal discussion		All

NPHCDA = National Primary Healthcare Development Agency; PMG-MAN = Pharmaceutical Manufacturers' Group of the Manufacturer Association of Nigeria

AHD JOURNAL COMING SOON!!!

ORAL/PODIUM PRESENTATIONS

New Models of Healthcare Delivery

P01: New Models of Healthcare Delivery – Implications for Africa

Prof Ravi Anupindi, Michigan University, USA

Innovations in Healthcare Delivery - Short presentations

P02: Polishing the chain - how technology is solving Africa's health supply chain challenges

Dr Femi Kuti, Kangpe, Lagos, Nigeria

P03: Last Mile Vaccine Supply Chain Using Geospatial Solutions

Dami Sanoiki, Kazeem Owolabi, Wynfred Russell and Adeyemo Ayodele; eHealth, Africa

Background: Vaccines are critical to public health strategy in reducing child morbidity and associated mortality. Annually, vaccines prevent more than two million child deaths worldwide (WHO 2012)[1]. Still, vaccine-preventable diseases remain the most common cause of childhood mortality, and it estimated that 19.4 million infants in the world do not have access to vaccines (WHO 2015)[2]. The result of the Landscape Analysis of Routine Immunization (LARI), implemented by the International Vaccine Access Center (IVAC)[3] and its partners in 2011, suggested the deployment of geospatial technology solutions to improve the vaccine supply chain system in Nigeria (Wonodi *et al.*, 2012)[4]. eHealth Africa (eHA) utilized geospatial tools to ensure that vaccines reach last delivery units at high quality and sustainable cost.

Objective: To assess vaccine supply chain redesigned system and the associated cost in Kano State, Nigeria

Methods: Conducting fieldwork, eHA introduced the collection of administrative and attribute data (health facility name, ward name, local government area name,

services offered, classification, functionality, ownership [public or private], vaccine delivery records, warehousing and operational cost, and zonal cold stores) on 1,509 health facilities in Kano State.

Baseline analysis was conducted to determine the current distribution system within Kano, its cost, benefits, and limitations. Greenfield analysis was carried out to determine a recommended system, considering standard supply chain parameters. Scenarios were simulated to generate various options and their cost implication based on transportation and warehousing cost. The scenarios were weighed against one another based on their cost and limitation, and the most cost saving recommended.

Results: The baseline vaccine supply chain system included one state cold store, 6 zonal stores, 44 Local Government Areas (LGAs) stores, 427 parent facilities and 1,107 child facilities with a cost of N15.4m monthly. Out of the several redesigned options, the one that included one state cold store, 4 zonal stores, 427 parent facilities and 1,107 child facilities with a cost of N13.99m monthly proved to be the most cost-efficient one.

Conclusion: The redesigned option has the highest cost saving of N1.41m monthly, which amount toN16.92 million annually. Cost saving would have been more substantial if (a) the number of facilities served was decreased and (b) the cost of delivery to facilities was distance-based.

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2. World Health Organisation, Immunization Coverage (Retrieved April 13, 2017)http://www.who.int/mediacentre /factsheets/fs378/en/

3. Chizoba W., Cecily S., Muyi A., Gbolahan O., Tope O., Muhammed A., Lois P. & Orin L.,(2012), 'Landscape Analysis of Routine Immunization in Niger' International Vaccine Access Center, Johns Hopkins Bloomberg School of Public Healthhttp://www.jhsph.edu/research/centers-and-institutes/ivac/projects/nigeria/IVAC-Landscape-Analysis-Routine-Immunization-Nigeria-Brief.pdf

4. Wonodi CB, Privor-Drumm L, Aina M, *et al.* Using social network analysis to examine policy decision-making on new vaccine introduction in Nigeria, Health Policy and Planning , 2012, vol. 27 Suppl. 2(pg. ii27-ii38)

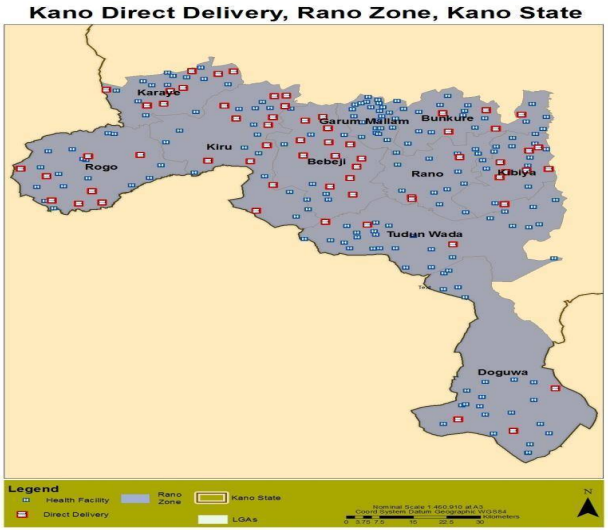


Figure 1: Map of Kano state showing the parent and child facilities in Rano Zone

Figure 1 shows the distribution of parent (Red) and child (Blue) health facilities in the supply chain process of the Rano zone as well as the various local government areas in the zone.
The parent facilities have Cold Chain Equipment (CCE) with solar fridges where vaccines are stored and distributed to child facilities that do not have CCE.

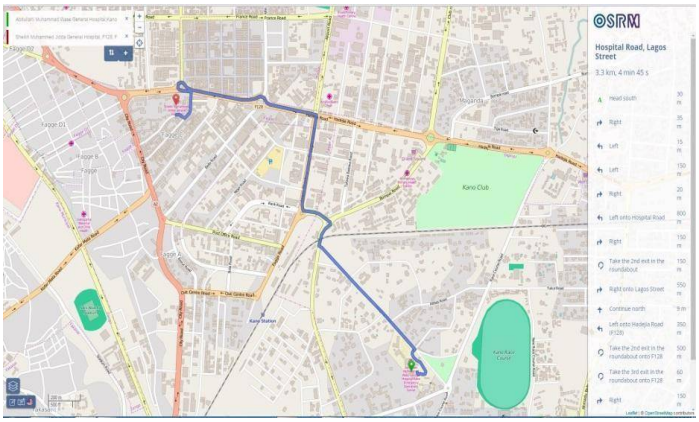


Figure 2: Calculating distance and travel time using OSRM

Figure 2 is a screenshot of the distance and travel time estimation process built on OSRM to help in route planning of the delivery officers. It shows the route from the Nassarawa State Coldstore to a parent facility.

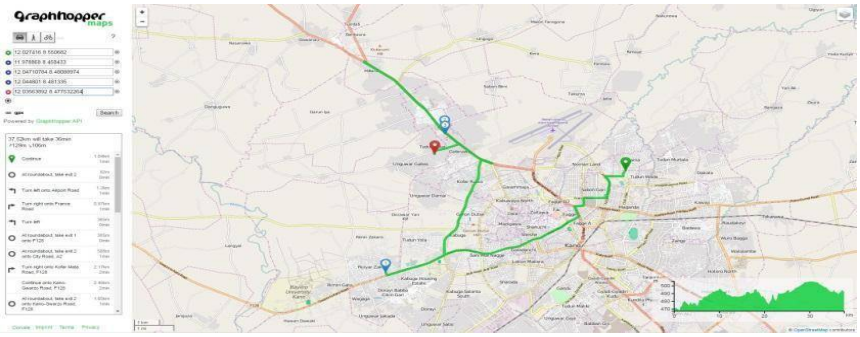
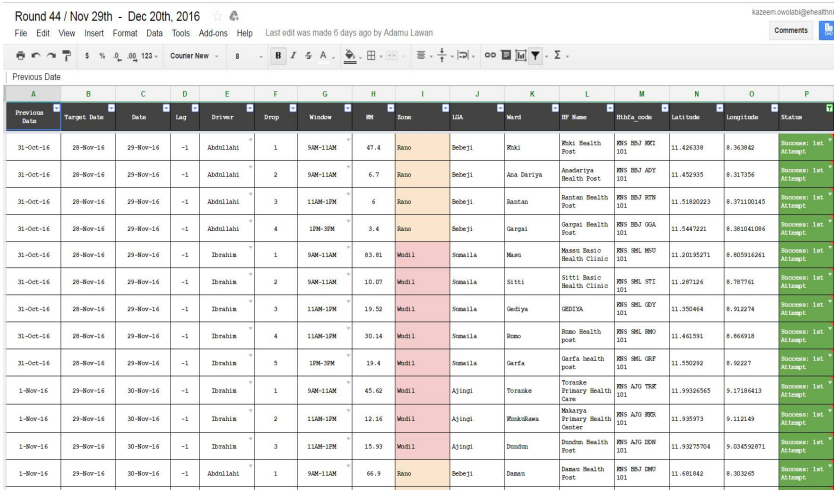


Figure 3: Calculating distance and travel time using Graphhopper

Using graphhopper, we have been able to use the distance matrix API to plan routes and delivery ordering using the travel salesman problem algorithm.



Round 44 / Nov 29th - Dec 20th, 2016

Previous Date	Target Date	Date	Lag	Driver	Drop	Window	KM	Zone	LGA	Ward	HF Name	Mlhfa_code	Latitude	Longitude	Status
31-Oct-16	28-Nov-16	29-Nov-16	-1	Abdullahi	1	9AM-11AM	47.4	Rano	Bebeji	Kwki	Kwki Health Post	KNS BBJ KKI 101	11.426338	8.363842	Success: 1st Attempt
31-Oct-16	28-Nov-16	29-Nov-16	-1	Abdullahi	2	9AM-11AM	6.7	Rano	Bebeji	Ana Dariya	AnaDariya Health Post	KNS BBJ ADY 101	11.452935	8.317356	Success: 1st Attempt
31-Oct-16	28-Nov-16	29-Nov-16	-1	Abdullahi	3	11AM-1PM	6	Rano	Bebeji	Rantan	Rantan Health Post	KNS BBJ RTN 101	11.51820223	8.371100145	Success: 1st Attempt
31-Oct-16	28-Nov-16	29-Nov-16	-1	Abdullahi	4	1PM-3PM	3.4	Rano	Bebeji	Gargai	Gargai Health Post	KNS BBJ GGA 101	11.5447221	8.381041086	Success: 1st Attempt
31-Oct-16	28-Nov-16	29-Nov-16	-1	Ibrahim	1	9AM-11AM	83.81	Wudil	Sumaila	Masu	Masu Basic Health Clinic	KNS SML MSU 101	11.20195271	8.805916261	Success: 1st Attempt
31-Oct-16	28-Nov-16	29-Nov-16	-1	Ibrahim	2	9AM-11AM	10.07	Wudil	Sumaila	Sitti	Sitti Basic Health Clinic	KNS SML STI 101	11.287126	8.787761	Success: 1st Attempt
31-Oct-16	28-Nov-16	29-Nov-16	-1	Ibrahim	3	11AM-1PM	19.52	Wudil	Sumaila	Gediya	GEDIYA	KNS SML GDY 101	11.350464	8.912274	Success: 1st Attempt
31-Oct-16	28-Nov-16	29-Nov-16	-1	Ibrahim	4	11AM-1PM	30.14	Wudil	Sumaila	Romo	Romo Health post	KNS SML RMO 101	11.461591	8.866918	Success: 1st Attempt
31-Oct-16	28-Nov-16	29-Nov-16	-1	Ibrahim	5	1PM-3PM	19.4	Wudil	Sumaila	Garfa	Garfa health post	KNS SML GRF 101	11.550292	8.92227	Success: 1st Attempt
1-Nov-16	29-Nov-16	30-Nov-16	-1	Ibrahim	1	9AM-11AM	45.62	Wudil	Ajingi	Toranke	Toranke Primary Health Care	KNS AJG TRK 101	11.99326565	9.17186413	Success: 1st Attempt
1-Nov-16	29-Nov-16	30-Nov-16	-1	Ibrahim	2	11AM-1PM	12.16	Wudil	Ajingi	KhukuKawa	Makarya Primary Health Center	KNS AJG KKR 101	11.935973	9.112149	Success: 1st Attempt
1-Nov-16	29-Nov-16	30-Nov-16	-1	Ibrahim	3	11AM-1PM	15.93	Wudil	Ajingi	Dundun	Dundun Health Post	KNS AJG DDN 101	11.93275704	9.034592871	Success: 1st Attempt
1-Nov-16	29-Nov-16	30-Nov-16	-1	Abdullahi	1	9AM-11AM	66.9	Rano	Bebeji	Daman	Daman Health Post	KNS BBJ DMU 101	11.681842	8.303265	Success: 1st Attempt

Figure 4: Sample Google dashboard

A screenshot of the planning document based on google spreadsheet - calculated field to track efficiency and delivery lags.

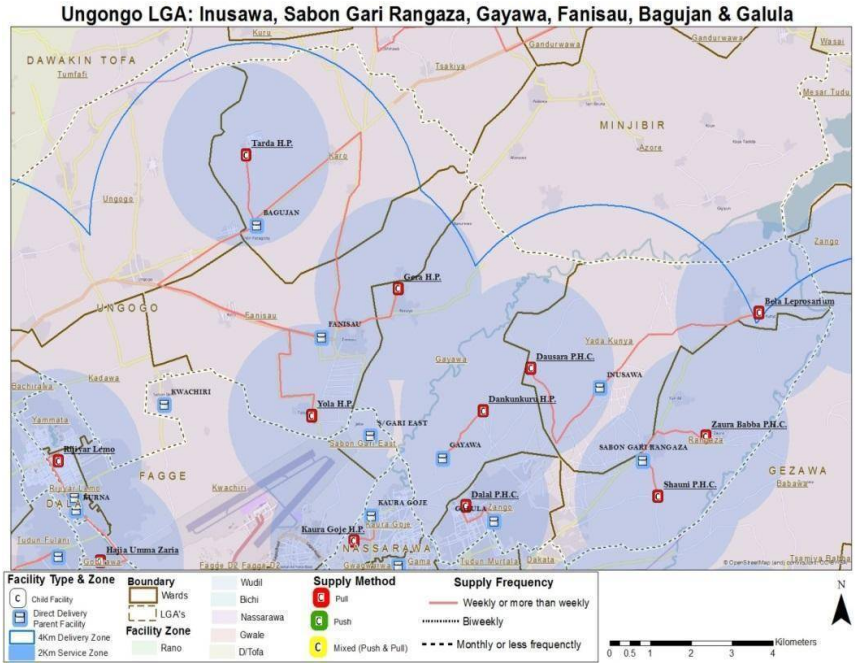


Figure 5: Map of Kano showing a cascade delivery system

Health facility clustering based on multi-criteria evaluation technique for grouping child facilities to receive from parent facilities based on distance and demanding population.

P04: Experience with Last Mile Delivery of Health Commodities in Hard –to-Reach Areas in Nigeria

Kabir Shagaya; Chief Executive Officer, Zippy Logistics, Nigeria

Bold and concerted steps are needed to create cost- effective supply chains that are responsive to the needs of patients, especially in rural and hard to reach areas.Supply chain management as a discipline is not fully developed in most low-income countries, where it remains weak, fragmented and ineffective in last mile delivery of life saving health commodities.

The lack of well-functioning transport is a key barrier to the health sector supply chain. A simple solution to this may well be partnering with a third party logistics company to distribute stock to rural areas. The logistics provider can offer various means of transportation to maneuver the different terrains with minimal or no

damage to the products, and better services and rates when compared to the cost of owning and operating a fleet.

Zippy Logistics is a full-service logistics services provider, headquartered in Lagos, with satellite offices in Abuja, Calabar and Uyo. We work with B2B and B2C clients across Nigeria and abroad in order to support the domestic logistics needs via road, sea and air transportation. We also offer services related to warehousing, distribution services, procurement, consulting and e-commerce back-end. Our approach to logistics and supply chain management is to deliver, enhance, innovate and protect the servicing environment of Zippy's clients through curated personalized solutions. The carefully - balanced combination of knowledge of the local conditions, the innovative approach to processes and technologies, and the experienced work in partnerships and customer relations, enhance Zippy's capabilities to effectively manage and serve its clients.

This presentation discusses Zippy logistics procured services to the Clinton Foundation in collaboration with the Rivers State Government of Nigeria. We deliver health commodities, using modified tricycles capable of manoeuvring through the rough terrains of Rivers State, Nigeria, while distributing temperature sensitive medical equipment. Zippy distributes the cold chain vaccines to over 750 primary healthcare centres around the state on a weekly basis.

P05: Policy and Practice: Barriers and facilitators to developing local capacity for medicines and other health commodities in Africa

Dr Obi Peter Adigwe, Executive Secretary, Pharmaceutical Manufactures' Group of the Manufacturer Association Nigeria (PMG-MAN)

Access to medicines and related commodities for Africans remains a critical factor that influences universal health coverage on the continent. Currently, low life expectancy as well as high maternal and child mortality rates, are evidence of the poor health indices that characterize healthcare in many parts of Africa. In addition to the considerable burden of infectious diseases, there is also a significant and rapidly increasing prevalence of various relevant non-communicable diseases. This indicates the urgent need for decisive action to address healthcare issues.

Since therapy with medicines and related commodities still represent the most significant proportion of healthcare interventions, the development of effective policies which can ensure a sustainable supply of affordable, high quality

medicines and health commodities is a*sine qua non* for improving access to healthcare[1].

Several factors that influence the ability to develop local capacity with respect to medicines and commodities include policy coherence, access to markets, capacity for research and development, inadequate regulatory framework, access to finance for process and facility improvements and insufficient political will[2].

Over the years, a variety of policies have been formulated with a view to facilitating the development of local capacity to produce medicines on the continent. As healthcare settings vary significantly across various parts of Africa, an equally wide range of policies have also been identified in the various relevant healthcare settings that make up the continent.

However, despite the varying policies and settings, a theme that keeps reoccurring is the need to develop a contextual solution, which would guarantee sustainable access to affordable and high quality medicines for Africans. One emerging concept which seeks to address this is the Medicines' Security Concept. The concept which argues that developing local capacity is the most sustainable approach to addressing access to healthcare in Africa provides a new perspective to understanding existing policies as well as framing new ones.

References

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2. Donga, J., and Mirzaa, Z. (2016). Supporting the production of pharmaceuticals in Africa. *Bulletin of the World Health Organization*, *94*(1), 71.

P06: The Role of the Private Sector in Effective and Efficient Healthcare Delivery

Dr Muhammad Ali Pate, *Dr Muntaqa Umar- Sadiq, Ritgak Tilley-Gyado; Private Sector Health Alliance of Nigeria (PSHAN). *Correspondence

Context: The growth of the Nigerian health sector and its ability to improve and sustain health indices and outcomes has been hampered by numerous but critical market failures. With a weak primary healthcare system and poor referral

linkages, over 60% of Nigerians access care from a fragmented and largely un-coordinated private health sector. The result of this is many folds: policy and regulatory constraints distort the benchmarks that inform patient choice; choice often superseded by zero-option supply. With weak regulation, the quality of care is un-assured and in some cases reverses its intended role, often contributing to morbidities and mortality rather than preventing them. Secondly, while the public sector is under-funded as per the Abuja Declaration of 2001, according to the World Bank, current health spending per capita stands at $115 per year. This is sub-optimal relative to the health spending of developed economies yet it does represent a critical pool of resources for financing health if harnessed. However, a fragmented and inefficient market structure does not allow for interactions with purchasers and providers of care at scale, whether from the public or private sectors. Hence, even with increased health spend, service delivery and health outcomes remain poor. Large out-of-pocket expenditure, which is over 95% of private expenditure on health, drives individuals and families into poverty, which perpetuates the cycle teed off by financial barriers to accessing care. This is another reversal in the health sector, of the potential of domestic private sector resources to contribute to economic growth through an improved dependency ratio and ultimately, a demographic dividend for Nigeria.

The role of the private sector: Beyond the fragmented private health sector which plays a significant role in healthcare provision and includes private clinics and Proprietary Patent Medicine Vendors (PPMVs), the broader private (corporate) sector in Nigeria is growing rapidly with distinctive assets and capabilities to potentially offer the health system (e.g. supply chain and logistics infrastructure, marketing capabilities, mobile technology, distribution outlets and more). The corporate sector can also offer innovative approaches, such as innovative financing, data-driven performance management techniques and technology applications in ICT, to create greater efficiencies and breakthroughs in health system performance. Although, the broader private sector in Nigeria has traditionally played a role in health through Corporate Social Responsibility, often this is in the form of isolated interventions that either provide inputs for instance, medical equipment, infrastructure or commodities or outreach services to healthcare institutions and underserved communities. While these initiatives are laudable, touching lives within the local implementation context, there is more to be desired as contributions are not often coordinated, synergies are unrealized nor their gains maximized as a part of a broader system strengthening agenda. This is in part due to the amount of resources available for such interventions relative to the size of the country, its health system and population. Italso points to the limited coordination in the broader private sectors participation and contributions to health.

Future of health in Sub-Saharan Africa: As we look to the future of health in Sub-Sahara Africa, the transition from MDGs to SDGs provides a compelling opportunity for Nigeria and other countries to reflect on their aspirations, take stock on progress and inspire bold, innovative approaches and complementary non-traditional public private partnerships to disrupt poor maternal and neonatal outcomes and accelerate progress in achieving health SDGs. Early results from the work of the Alliance suggest a potential role of similar platforms in the future of health in other Sub-Saharan African countries. Indeed, Kenya is beginning to develop a similar vehicle for public private engagement in health. The Private Sector Health Alliance of Nigeria is poised to become a catalyst for broader sector reform through its, financial grip, recognition of market failures through a multi-sectorial lens and deep understanding of the private health and private corporate sectors by allowing it to respond using a pluralistic approach that will greatly aid Nigeria in its goal to achieve Universal Health Coverage for all.

P07: A Systematic Approach to Assessing Human Resources for Supply Chain Management

[1]Musonda Kasonde and [2]Bervery Chawaguta;[1]Capacity Development Manager, UNICEF Supply Division, Copenhagen, Denmark.[2]Procurement Services Specialist (Supply Chain Strengthening), UNICEF Nigeria

Description of the work being proposed for presentation: People make things work. In order to address the human resources (HR) challenges facing complex immunization supply chains (ISC) today, this initiative promotes a systematic and comprehensive view of HR-related factors that impinge on supply chain performance: A holistic approach that sees HR capacity development going well beyond knowledge and skills training of the supply chain workforce.

Human resources (HR) for health is an integral part of any health system and the immunization program is no exception. With the increasing supply of life-saving vaccines worthbillions of dollars in many countries, there is need to strengthen the in-country workforce, not only to effectively manage ISC activities but also to help ensure sustainability and ownership of these important tasks.

HR being cross-cutting, it is expected that through these approaches and interventions the overall supply chain will be strengthened as well. Furthermore, the assessment is applicable across programs and can be adapted accordingly to the context.

The HR rapid assessmentfor immunization supply chainsprovides a holistic approach to assessing HR needs covering three areas:

- **HR Planning**: Proper HR planning aims at having the right number of professionals in the right places. Key elements of HR planning are HR policy, vacancies and recruitment.
- **HR Management**: Managing the existing workforce in such a way that staff are supervised, motivated and performing optimally. Some of the factors contributing to motivation and performance of workers are working conditions, job descriptions, supervision and performance monitoring.
- **HR Development**: Covers aspects of Leadership Development, and Continuous Professional Development (CPD). Proper development of the existing workforce requires planned and informed training activities, as well as career and promotion opportunities for suitably qualified staff.

The assessment provides an in-depth look into HR challenges using evidence-based data for further improvement. This tool has been successfully administered in seven countries namely Ethiopia, Kenya, Malawi, Zambia, South Sudan, Uganda and Lesotho resulting in recommendations which have been factored intosupply chain strategic planning processes and continuous improvement plans for the ISC.

This topic is also of interest with ongoing plans to incorporate the questionnaire within the effective vaccine management assessment (EVMA) tool 2.0 or comprehensive EVMA which is the standard assessment for the ISC. A Comprehensive EVMA (cEVMA) has recently been conducted in Nigeria, applying elements of the questionnaire and providing strong quantitative and qualitative messages on the status of HR. Discussions are also ongoing to adopt the same approach for other well recognized national supply chain assessments.

Session outline

- An overview of the HR rapid assessment tool emphasizing its use in assessing HR planning, management and development for the supply chain.
- Findings from seven country studies, challenges, success stories and lessons learned including implementation of follow up actions.
- Integrating the HR Assessment into the cEVM (comprehensive EVM 2.0)

Discussion of how the proposed talk fits with the conference theme: The proposed talk fits well within the conference theme because HR is a key building block of the supply chain and is a critical enabler for*advancing effectiveness and efficiency in health supply chain management*, including ensuring ownership and sustainability.The HR assessment allows countries to take a comprehensive look at the status of HR planning, management and development, acknowledging that SC improvement is driven by the quality of HR and the ability to motivate them.

MENTOR/MENTEE FORUM: Professional advancement in healthcare delivery - opportunities and challenges in the African region

Lead speaker: Prof Ravi Anupindi, Michigan University, USA

Healthcare Supply Chains with Long Term Sustainability

P08: Health Supply Chains with Long Term Sustainability in Africa – Opportunities and Challenges

Prof Yehuda Bassok; *Chair, Dept of Data Sciences & Operations, Co-founder, Center for Health Education& Applied Research (CHEAR), Marshall School of Business, University of Southern California, Los Angeles, USA*

P09: Efficient and Sustainable Health Supply Chain through Integration: – Lessons from the Nigeria Supply Chain Integration Project (NSCIP)

[1]Pharm Linus Odoemene* and [2]Pharm Gloria M. Ckukwumah;*National* [1]*Coordinator, Nigeria Supply Chain Integration Project (NSCIP)/ National Product Supply Chain Management Program (NPSCMP), Federal Ministry of Health, Abuja, Nigeria;* [2]*Director, Food & Drug Services, Federal Ministry of Health, Abuja, Nigeria. *Correspondence*

Medicines and other health products form an indispensable component of health systems in the prevention, diagnosis, mitigation and treatment of diseases and in alleviating disabilities and functional deficiencies. Therefore, access to these vital health products remains critical to reaching universal health coverage, in addition to being recognized as a key building block of a strong health system.

Stakeholders in Nigeria have over the years recognized the need to address the numerous challenges facing the National Pharmaceutical Management Systems, especially within the public sector. While the country remained enmeshed in military rule prior to 1999, experts looked towards both *funding* and *system building* gaps as major impediments. However, the post military era witnessed a boom in government spending including unprecedented influx of foreign grants that led to explosion in the number of logistics management organizations and systems within a short interval of 10 years. A visitor to Nigeria in 2008 had noted satirically that the number of implementing partners (IPs) in HIV/AIDS program had exceeded the number of infected people. Apparently, Government had felt that those that paid the pipers were dictating the tunes while Donor Agencies thought it was the Government. Thus, coordinated effort to deliver quality

services became a big issue even as IPs struggled for individual identities and visibility in setting up vertical and "government-alienating" systems.

Warehouses multiplied in folds with no clear means of regulating standards of practice or infrastructure; data capturing and transmitting systems were organized (branded) by IPs and skewed upwards in developing "success stories"- thereby weakening the traditional feedback support to facilities. Again, hands-on supervision of facilities fell largely in the hands of National Programs and IP staff who did not have the requisite authority to reprimand, sanction or reward implementers. Grant releases took care of systems and equipment upgrades whilethe "human being" that operated the system was left as it were. These and more others led to the "*Paradox of investment boom*" in the public health sector i.e. increasing activity spending and decreasing value in service delivery, characterized by high rate of expiries and stock outs. In some cases product diversion and other system weaknesses persisted.

Summarizing this sort of situation, the PICKnPACK,[1] an excel based inventory management tool for TB health commodities, stressed the need to tailor approaches and methodologies to suit peculiar circumstances. "No matter how perfect a system design might be, it is the will(motivation) to implement the system that makes the difference between using so much to achieve very little or using *very little* to achieve *so much*". The motivated implementer seeks, obtains and absorbs capacity to deliver results; the poorly motivated tends to distort or frustrate the system to suit own situation.

The Supply Chain partners providing support/specialist services often exhibit such significant levels of self-interests that their actions/decisions get influenced by what they expect (to gain) or fear (to lose). As such, these require strongleadership and coordination linkages to make them align and synchronize structures and activities with the central model. Supply chain infrastructures also need to be rationalized, harmonized and strengthened to provide end to end visibility and accountability. Within the tiers of government, allocation of roles and empowerment should recognize comparative advantages of the respective operators to deliver services.

The Nigeria Supply Chain Integration was set up to lead the strengthening of institutions at the three tiers of government to provide effective leadership and coordination of their supply chains while promoting best practices, accountability and transparency in resource mobilization and utilization.

[1]*Obasanya J., Odoemene L, Nkem C, Ekpeno E, Gidado M, Kana I. (2012):- How to overcome work climate-aggravated challenges of human resource management in the delivery of quality procurement and supply management services. The Nigerian experience*.

P10: Roadmap to sustainable health supply chains through efficient last mile delivery

Kenny Otto;*Deputy Country Director, GHSC-PSM/Chemonics, Nigeria*

P11: Healthcare Financing and Sustainable Health Supply Chain in the African Region

Jiru Bako, *Country Director/Managing Director, Crown Agents, Nigeria Limited*

Health systems overview: A health system consists of all organizations, people and actions whose primary interest is to promote, restore or maintain health. It consists of the six building blocks: leadership, healthcare financing, health workforce, medical products and technology, information and research, and service delivery. The health systems performs four functions: they provide services (service delivery); develop health workers (health workforce) and other key resources; mobilize and allocate finances (health financing), and ensure health system leadership and governance (stewardship).

Health financing: Health financing is one of the four functions of health systems. Health financing refers to the **collection** of funds from various sources (e.g. government, households, businesses, donors), **pooling** them to share financial risks across larger population groups, and **using (or allocating)** them to pay for services from public and private health-care providers.

The sources of financing for health are categorized into public, private and external sources of funding for health through various models such as national health service systems, social health insurance funds, private voluntary health insurance, community-based health insurance, and direct purchases by consumers

Supply Chain is the core expertise of CA, especially the delivery of value-for-money services. The understanding of this principle makes it much easier to appreciate that it is key to health financing because wherever the fund is coming from, the delivery of products and services must be timely, and the products must be of the right quality, right quantity and at the right cost.

The Member States of the African Region of the World Health Organization, are on average, still far from meeting key health financing goals such as the Abuja Declaration target of allocating 15% of the government budget to health. Out-of-pocket expenditure is still higher than 40% of the total health expenditure in 20 of the 45 countries studied, and in 22 countries the total health expenditure does not reach even the minimal level of US$ 44 per capita defined by the High Level Task Force on Innovative International Financing for Health Systems (HLTF). Only three countries have attained the Abuja Declaration and HLTF targets.[1]

Many countries have limited capacity for raising public revenue mainly because the informal nature of their economies makes collection of tax and contributions difficult. This limits their opportunities for investing in health. Innovative resource mobilization instruments and prioritization of government spending on health may bridge the funding gap to some extent. External funds will still remain critical in many contexts but more should be done to ensure their effective use through improved predictability of funding flows and harmonization of their allocation with national priorities and mechanisms

Case study 1: Crown Agents support for Improving health care in Zimbabwe with result - based financing.

Crown Agents in consortium with Health Research for Action (HERA) consulting firm has been delivering services since 2012 and since then **have rolled out the RBF program in 42 rural districts in 8 provinces serving a population of 6.6 million**.

Footnote

Total health expenditure per capita: The High-Level Taskforce on Innovative International Financing for Health Systems (HLTF) estimated that by 2009 a low-income country would need to spend on average US$ 44 per capita to strengthen its health system and to provide an essential package of health services [7]. We categorized countries in three groups based on spending: less than US$ 20, US$ 20–US$ 44 and more than US$ 44. This US$ 44 estimate was projected to rise to US$ 60 by 2015.

General government expenditure on health (GGHE) as a share of total general government expenditure (GGE) was categorized based on the Abuja Declaration where governments pledged to allocate at least 15% of their total budget to health. This shows the level of priority of health system funding in the overall national development agenda. Three categories were used for GGHE/ GGE expenditure: less than 10%, 10–15% and more than 15%.

Antimicrobial Resistance, Pharmacovigilance and Supply Chain

P12: Brief introduction of the Sub-theme: Anti-microbial resistance, pharmacovigilance & supply chain

Prof. Alex Dodoo;*WHO Collaborative Center on Pharmacovigilance & University of Ghana, Accra, Ghana*

P13: Quality Assessment of Individual Case Safety Reports in the Nigeria National Pharmacovigilance Centre Database

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Background: The Nigeria National Pharmacovigilance Centre (NPC) maintains a database of individual case safety reports (ICSRs). Only ICSRs that meets a minimum quality standard are considered for clinical evidence and regulatory decisions. The quality of ICSR depends on evaluated factors, which include the adequacy of the reporting tool. However, the quality and completeness of all reports in the Nigeria NPC database have not been systematically evaluated.

Objectives: To determine the quality of ICSRs and adequacy of the ICSR form for quality reporting.

Methods:A cross-sectional review was carried out on ICSRs randomly sampled from reports collected by the NPC, between 2005and 2015. Questionnaires were administered to 76 staff of the NPC to determine the adequacy of the ADR form. Completeness (C) score and penalty scale were adapted from VigiGrade tool. ICSR parameters evaluated included time-to-onset, indication, outcome, sex, age, dosage, suspect-concomitant drugs, reactions, institution-contact of reporter, and reporter type. Data transformation and descriptive statistics were used to analyze the ICSRs. Pearson Chi-Square was used to evaluate the adequacy of the ADR form.

Results: Out of 6,965 ICSRs analyzed, 3,035 (43.5%) were well documented (C-score ≥ 0.8). Quality trend declined from 2009 (59.6%) through 2015 (39.7%). Pharmacists had the most reports, but the quality was low (45%). Nurses and doctors had better quality reports 122 (74.8%) and 305 (60.2%), respectively. Time-to-onset, outcome and dosage parameters contributed the most to poor report quality. Out of 40 returned questionnaires, 33 respondents indicatedthat the ADR form was adequate for quality ICSR reporting. Their levels of education ($p = 0.049$) and training in ADR reporting ($p = 0.05$) had no significant association with their responses.

Conclusion: At least 43.5% of the ICSRs provided reasonably complete and well-documented clinical information that can inform regulatory and policy decisions. This suggests that the VigiGrade tool can be adapted for ICSR quality evaluation and improvement by national centers. Current ADR reporting form was found to be adequate for quality reporting.

Key words: Individual case safety reports, Pharmacovigilance, Quality

P14: Pharmacovigilance within the Supply Chain- a strength against anti-microbial resistance?

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Antimicrobial resistance (AMR) continues to threaten the great achievements that medical science has managed to make. Yet there are countries in the world where ‘older generation’ antimicrobials are only just being introduced / launched. The UN’s Sustainable Development Goals is threatened by AMR and urgently calls for global collective action. Is there any single magic bullet for this problem? No.

AMR is multi-factorial and hence needs great collaboration within specialities and disciplines. Supply chain integrity remains a key element that has to be focussed on, on a continuous basis, if we are to make any meaningful and sustainable impact. They need not be complex processes- there are simple ones already available on our continent and collectively can make a difference. The same supply chain provides a role for each one of us- whether we are manufacturers, distributors, retailers, regulators, patients and scientists- the most important being fulfilling them with integrity.

Pharmacovigilance- the systematic process of collecting, monitoring, researching, assessing and evaluating information from healthcare providers and patients on the adverse effects of medicines can be our strength in the fight against AMR. Pharmacovigilance is not only the reporting of "*side effects*" of medicinal products but rather has a widened scope that can help us today. Can AMR be a missed Adverse Event?

This presentation seeks to bring out the close resemblance of AMR and Adverse Events and provide us with some thoughts on how to proceed in Africa. The need to leverage on the intersection of supply chain, anti-microbial resistance and pharmacovigilance for sustainable human, material and financial resource mobilization for improved health outcome in the African region should be our focus.

P15: Anti-malarial resistance and the shifting sands of chemotherapy for the prevention and control of malaria in pregnancy

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Background: Malaria is a public health problem in sub-Saharan Africa with huge negative impact. Sulfadoxine/pyrimethamine-based intermittent preventive treatment (SP-IPT) is recommended for the prevention and control of malaria in pregnancy (MiP) and young children. However, this intervention is faced with resistance threat. Therefore, exploring an alternative approach in the prevention and control of MiP is both necessary and urgent in the African region.

Methods:SP-based IPT was evaluated and compared with Artemether-Lumfantrine (A/L)-based intermittent screening and treatment (IST) for the control of malaria in pregnancy in a multi-center study conducted in Edo State, Nigeria, between 2014 and 2015. A total of2267 pregnant women attending antenatal clinic at the selected facilities were enrolled and randomized into two treatment groups - S/P-based IPT and A/L-based IST treatment groups. Their baseline demographic, clinical and obstetric profiles were obtained. The S/P-IPT group received SP according to standard protocol, while A/L-IST treatment group were screened for malaria parasites (using RDT) and those with positive results were treated with A/L. This was repeated in subsequent scheduled antenatal visits and followed up till delivery, where clinical characteristics were again collected.

In addition, acceptability of both interventions was assessed among the women after delivery, using focused group discussion, and among healthcare providers, using in-depth interviews. Assessment of infrastructure that support the provision of IST intervention was undertaken using a check list. Data on the clinical study were analyzed using SPSS version 20. Chi-squared tests, Student's *t*-test, ANOVA, risk ratio, and risk difference were calculated as appropriate. Both "intention to treat" and "per protocol" analyses were performed on the data. The qualitative data were analyzed thematically.

Results: Out of the 2267 pregnant women enrolled in the study, 1,755 were followed up to delivery. The risk of late pregnancy anemia (LPA) and low birth weight infants (LBW) in the IST relative to IPT were RR=1.003([95%CI=0.74-1.35]; p>0.1), and RR=1.03([95%CI=0.63–1.69];p>0.1), respectively. The risk difference for LPA and LBW between IST and IPT were RD=0.03([95%CI=-0.031–0.032];p>0.1), and RD=0.11([95%CI=-0.034–0.056];p>0.1), respectively. The upper boundaries of the 95%CI of the risk differences all lie far below the 5% and 4% set for inferiority in this study, suggesting non-inferiority of IST to IPT. Pregnant women tolerated IST and preferred it to the IPT strategy. ANC care providers alsopreferred IST to IPT for the control of MiP. However, the infrastructure to support IST services was found to be inadequate in the study facilities.

Conclusion: AL-ISTp is as effective as SP-IPTp in preventing malaria related adverse pregnancy outcomes. Pregnant women and health providers prefer IST to IPTp as a malaria control strategy in pregnancy. AL-based IST is therefore not inferior to SP-based IPT in the control of MiP. Training of facility staff on MiP, especially with regard to IST is recommended.

Primary Healthcare Supply Chain Strengthening/Revitalization

P16: Primary Healthcare Supply Chain Revitalization – Are there lessons to learn from other countries?

Dr Boubacar Dieng/Bervery Chawaguta (UNICEF) –Lead Speaker

P17: The Role of Primary Healthcare in the Attainment of Universal Health Coverage in Africa

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The global community is desirous of developing health systems that allows all people to have access to quality health services anywhere and anytime without suffering financial hardship. This goal is defined as Universal Health Coverage (UHC). Further broken down, UHC consist of two interrelated components. The first one entails: coverage with quality health services, including promotion, prevention, treatment, rehabilitation and palliation; while the secondly component involves coverage with financial protection for everyone.From the foregoing, it is clear that UHC has both demand side and supply sides perspectives. Consequently, the demand side without the supply side cannot guarantee UHC. The existence of a well-functioning health system and a timely access to services is therefore critical for attaining UHC.

Since the times of Alma Ata in 1978, global health idea or concept has evolved gradually as primary healthcare (which basically is mainly the supply side of the equation), and then as health for all, culminating in health Millennium Development Goals (4, 5, 6), and ultimately as Sustainable Development Goal 3, which is universal health coverage. Within Africa, several similar supporting declarations to accelerate progress in health were made (Harare, Dakar, Bamako, Ouagadougou and Abuja Declarations). Though none of these goals have been achieved fully, the idea of primary health still resonates and remains relevant till today because of the 5 guiding principles and 8 components of essential health care it embodies.

To achieve the UHC feat beyond rhetoric, financial and geographical barriers to accessing quality health care must be surmounted. By providing risk protection

for all through some sort of health insurance, the financial barrier can be surmounted and primary health care interventions/componentscoverage can be scaled up to universal availability. The lofty idea of coupling financial protection into UHC will truly make PHC an affordable, equitable and socially acceptable essential health care that can address the needs of the greater majority with the greatest burden of diseases.

There are many pathways towards UHC and many African countries have implemented various shades of PHC and financial protection to some extent.Whatever the nature of the health system and scope of health services, adequate financing with risk pooling, supply chain strengthening, adequate human resources, technologies and vaccines, good referral systems, well maintained facilities, good governance and leadership are key essentials of a functional health system on which universal health coverage can be built.

This paper/presentationdescribesthe various trendsseen in some African countries that have met the health millennium goals and how they are matching towards universal health coverage. It provides good examples or case studies that could find application with other countries as evidenced by the coverage data of some high impact interventions and other important health outcomes achieved. It further provides a glimpse into their health expenditures in terms of financial protection against catastrophic health expenditure and impoverishment of the population. The hope is that these lessons will be useful inguiding other countries to strengthen their primary health care if they are to attain universal health coverage.

P18: Improving availability of pediatric and adolescent HIV medicines and supplies through stock redistribution across facilities in the public sector in Uganda

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Background: Supply chains for HIV commodities present a unique challenge given that HIV treatment requires lifelong therapy with high adherence rates. Moreover, few or no substitutions can be made for many commodities if a stock out occurs. It is against this back ground that the USAID/ SUSTAIN project

adopted the inter-facility redistribution strategy for key HIV commodities between the supported sites. This was done with a view of ensuring product availability at all times; to make for uninterrupted health service delivery while minimizing wastages. Baseline assessment in 2014 showed that only 60% of key HIV commodities were available across the project supported facilities.

Objective: To ensure uninterrupted availability of key HIV-related commodities at 11 regional referral Hospitals in Uganda.

Rational of the intervention: Sometimes, facilities do not make accurate orders for certainsupplies from the Central warehouse (NMS), and therefore go out of stock of certain supplies before the end of the two-month time supply interval.

How is it implemented? The project requests that each facility reports the exact numbers of stock at their store. The Pharmacist and Laboratory in-charge submit the stock updates to the project Pharmacy technical lead and the Lab technical lead at the end of every month. The supply chain management team - the Pharmacy technical lead and Lab technical lead - uses an Excel spreadsheet tool to determine which facilities are overstocked or understocked; each status is identified with a different color. The project delivers stock updates to the supported facilities via email and mobile phone SMS. If a facility is particularly understocked, the project supply chain management team will call and inform them which facilities have the necessary supplies. Then, supported facilities can internally request supply orders directly to overstocked facilities via letter. The project logistics team schedules and transports the delivery from the overstocked to the understocked facility, normally during already-scheduled mentorships and site visits.

Who is involved? Pharmacist and Laboratory in-charge manage the stock updates at the facility andsubmit them to the project at the end of every month. The project supply chain management teamreceives the updates from the facilities and uses the Excel tool to determine those who are over- or understocked. They share this information with the facilities for stock requests.

Results: Following the intervention (targeted redistribution), there was a significant improvement in the availability of key HIV supplies to about 90% in June 2016 across all the sites.
The losses to expiries were also significantly reduced. The expiry rate of key HIV commodities at SUSTAIN supported hospitals reduced from 40% to 5%.

Conclusion: Routine stock monitoring is essential in identifying risks and guaranteeing security of health commodities. Stock redistribution has the effect of minimizing stock outs and reducing expiries of medicines and other medical supplies.

P19: A case study of Kaduna State Public Health Supply Chain Management (HSCM)Transformation Project: The Journey So Far

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Background: The assessment of Kaduna State public health commodities supply chain system in 2015 indicated only 14.4% availability of life saving medicines. This situation was observed to be primarily due to the existence of parallel supply chain systems, low supply chain management capacities and weak coordination of state supply chain partners. The state-led Sustainable Drug Supply System (SDSS) and Free Maternal and Child Healthcare (FMCH) Essential Medicines Program do not have visibility of the supply chain system.

Objective: To transform into a highly visible, efficient, and well-coordinated Health Supply Chain Management System (HSCMS), through an empowered team.

Methods: There is an ongoing project to transform the Kaduna State Public HSCMS with funding support from Bill and Melinda Gates Foundation. The transformation project is being implemented using 8 guiding principles; State level ownership, systemic thinking, definition of success, fact-based interventions, intervention and collaboration, engagement of capable technical assistance, use of lessons, commitment and sustainability. These guiding principles lead the pre-implementation stage (baseline assessment), implementation stage (select, test and launch solutions for 28 selected pilot facilities comprising 23 PHCs (one from each of the 23 LGAs in the state) and 5 first generation secondary health facilities, and post implementation stage (evaluation of a performance for scale up to more facilities and transit to the statutory Ministry Department Agencies). The USAID |DELIVER PROJECT Supply Chain Costing Tool was used to analyze the cost of procurement, storage, transportation and management of SDSS/FMCH program.

Results: Preliminary results indicated a change in leadership style from bureaucratic totransformational, resulting in Kaduna State signing off the RACI

for HSCMS and the Central MedicalStores (CMS) becoming reorganized. A steering committee was established to oversee the overall process of the implementation stage. The three tiers (CMS, LGA Medical Stores and Service Delivery Points-SDPs) baseline SCM cost for the SDSS/FMCH Health Intervention Scheme were 45% for management, 30% for storage, 24% for transformation and 1% for procurement.

Conclusion: Preliminary findings show that an empowered team can sustainably lead to a SCM transformation.

P20: Revitalization of Primary Healthcare Supply Chain in Nigeria - Strategies and Action Plan

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Primary Health Care (PHC) in Nigeria is accessed at approximately 30,440 PHC Clinics and Health Posts. In addition, 775 General Hospitals and some tertiary hospitals provide specialized treatments.To ensure provision of universal health coverage (UHC) for the over 180 million citizens, the Federal Government of Nigeria (FGoN) announced plans to revitalize one functional, 24-hour PHC Centre in each ward in the country. Government aimed to revitalize 110 PHC Centres in 2016 and another 1,000 PHCs in 2017, before scaling it up to 10,000 PHCs, over a period of 2-4 years. To guide implementation, Government created a PHC Revitalization Concept Paper and identified 7 key components of a revitalized PHC system; the second component being “Strengthening Logistics and Supply Chain Management” (SCM).

This paper presents Nigeria’s efforts towards strengthening logistics and SCM to meet the goals of PHC revitalization strategy. This presentation details actions taken, challenges identified, progress made, lessons learned and results/next steps.

Several parallel SCM systems exist for each of Nigeria’s PHC programs. Facilities receive supplies from multiple, uncoordinated supply channels (e.g. essential medicines, family health, HIV/AIDs, malaria, vaccines and immunization supplies), each with different operating models, planning processes, and implementing partners. Therefore, multiple government agencies, at state and federal levels, need to interact to oversee the different parts of SCM for PHC commodities. At the Federal level, Department of Food and Drug Services/National Product Supply Chain Management Program (NPSCMP) is

working towards the integration of supply chain management of 5 public health programs –ATMRH&V, through the operationalization of Logistics Management Coordinating Units (LMCUs) in the states. The NPHCDA is responsible for technical support for PHC development, planning, management and innovation in the country.

In 2016, Government and partners identified the following challenges confronting PHC SCM: (1) limited access to quality commodities and services, (2) weak national logistics systems for managing PHC commodities; (3) insufficient financing for PHC commodities and services, (4) insufficient coordination mechanisms between partners in the country; and (5) substantial national and operational barriers to commodity security. Consequently, in December 2016, the Government of Nigeria, in collaboration with development partners, convened a two-day workshop to discuss PHC SCM challenges and agreed on establishing a PHC Revitalization Supply Chain Committee (PHCrSCC) to technically advise Government on strengthening SCM for the 10,000 revitalized PHCs under the revitalization initiative. This committee was inaugurated on 9 March 2017 with its terms of reference, and five thematic areas to advise government.

The committee is currently developing PHC SC strategic document. The PHCrSCC took a strategic, long-term, multidisciplinary, and multi-stakeholder perspective on PHC commodity security (CS) and identified different elements, including integration, policy environment, capacity, data availability, coordination, and financing, as prerequisites to achieving commodity security. The strategic document aims to establish an integrated PHC SCM system, with joint-implementation of planning (including quantification and forecasting), budgeting, procurement, storage/warehousing, transportation and distribution across all PHC program areas. The strategy aims to improve government procurement practices for PHCs health commodities and strengthen local capacity to manufacture quality assured medicines. Local pharmaceutical manufacturing companies are key to sustainable availability of health commodities at affordableprices in the country. Furthermore, the strategy includes buildinglocal capacity in supply chain management, implementation of standardized Logistics Management Information System (LMIS) across all PHC commodity areas, and operationalization of coordination mechanisms that will manage interfaces between stakeholders and providers,and the ongoing linkage among all parties.

POSTER PRESENTATIONS

#PP01: Assessment of unmet needs for National Health Insurance Scheme: Case Study of Kwara State, Nigeria

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Background: The national health insurance scheme (NHIS) is one of the potent tools with prospects for achieving universal health coverage. Universal health coverage attempts to eliminate all barriers to health access. NHIS aims to address specifically financial barriers to healthcare access. This is done through spreading the risk of incurring health expense over a group of contributory individuals or households. Nigeria began full NHIS implementation in 2005 although the bill was signed in 1995. Many Nigerians still seek health care via out-of-pocket expenses with its attendant impoverishment outside NHIS coverage.

Objectives: This study assessed the availability of NHIS services and their distribution in Kwara State at the end of year 2016.

Methods: All health facilities registered under the NHIS in Kwara State were examined for the type of NHIS services accessed by enrolees. An observational checklist was also used in identifying types of cases accessed from specialized diagnostic laboratories and pharmacies that have secondary health provider status under the NHIS.

Results: There were 15 health service areas (Dentistry, ENT, ECG, General Surgery, Internal Medicine, Laboratory, Obstetrics and Gynaecology, Ophthalmology, Orthopaedics, Paediatrics, Pharmacy, Physiotherapy, Psychiatry, Radiography and Ultrasound) covered by NHIS in Kwara State. A total of 65 public and private health facilities at the primary, secondary and tertiary health care levels offered these services. Several health facilities offered more than one health service area which were accessed from 118 service delivery points (SDPs) in the state. Out of the 65 health facilities identified, 54 (83%) were located in Ilorin, the State capital which is composed of 3 out of the 16 LGAs in the State. However, the ratio of SDPs insured population in Ilorin metropolis was 3.52 per 10,000 against 1.31 per 10,000 for the entire state.

Conclusion: There is a skewed distribution of SDPs and available services between LGAs in Kwara State with rural LGAs being underserved due to lower coverage for primary and secondary healthcare services. There is a need to increase the mix of health service areas, number of health facilities and associated SDPs offering financial cover under NHIS in Kwara State.

PP02: Mama kit forecasting in high maternal mortality setting: Case study of Kano State

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Background: Nigeria contributes 19% to the global burden of maternal deaths. This is the highest worldwide. Within northern Nigeria, Kano state has the highest population with a projected population of 13, 689,447 people for year 2017 made up of 44 local government areas and 484 wards. As the most populated state in northern Nigeria which has worse maternal health outcomes than the south, Kano was chosen for this study. Mama kits contain sterilized equipment used for pregnant women at the point of delivery by skilled birth attendants to aid child birth. It has been reported to reduce maternal deaths globally.

Objectives: The study was an attempt to improve mama kit forecast methodology in a high maternal mortality burden country like Nigeria.

Methods: The methodology for misoprostol forecasting based on demographic data was adopted. Misoprostol is usually administered during child deliveries to manage mother's bleeding. Nigeria's population is estimated to grow at 3.2% per annum with 5% of the total population made up of pregnant women. Projected population up to the ward level was obtained from the vaccine tracking program of Kano for 2017. This was further projected for 2018. In Kano, 12.9% of child births occur in hospitals. This was used to estimate the actual number of pregnancies that will be delivered in hospitals. The normal forecasting model estimates products need per annum. However, this study updated the model to include pregnancies from the last 9 months in 2017 that will run into 2018 as deliveries. This step is important as it helps to increase accuracy of forecast for 2018.

Results: It was observed that the total estimated mama kits forecast derived from the updated model (157,345) varied from the regular model (91,122). Total estimated need increase by 42% in Kano in the updated model. The updated forecast had 53 wards, compared to 21 wards from the former, which had a projected need of at least 100 deliveries per week (5,200 mama kits per annum).

Conclusion: This method can thus be useful to stakeholders in planning maternal, reproductive, newborn and child health interventions in Nigeria.

PP03: Challenges of Distribution of Medicines: A survey on the Distribution of Antiretroviral Drugs in Health Facilities in Lagos State

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Background: Nigeria is presently undergoing a massive scale up in its activities to prevent the spread of HIV/AIDS. However, the problem associated with funding, organizing and delivering of the antiretroviral (ARV) drugs has placed great pressure on the largely manual systems and processes that aim to ensure an uninterrupted supply of commodities to service delivery points (SDPs) throughout the country.

Objective: To investigate the challenges of distribution of ARVs in selected health facilities in Lagos State.

Methods: This is a descriptive cross-sectional study to investigate the challenges of distribution of ARV in the ARV and Prevention of Mother to Child Transmission of HIV (PMCT) facilities which covered primary health care facilities, State General Hospitals and Private facilities in Lagos state. Structured self administered questionnaire and modified checklist of USAID logistic assessments tool (LIAT) for ARV was used in collecting information from 44 facilities that participated in this study. The questionnaire assessed information on the use of ARV drugs, the commodity data collection and reporting system, the ordering, receiving, storing, distribution, and stock keeping practices while the checklist observed the storage condition practices. Data generated were analyzed using SPSS Version 17.0.

Results: The assessment showed stock outs of ARVs and expired drugs for first line (20.5% and 72.7%), second line (34.1% and 65.9%), Peadiatric (77.3% and 59%), Nevirapine syrup (22.7% and 61.5%), Cotrimoxazole 480/960 mg (27.3% and 51.2%) and Cotrimoxazole syrup (35.8%% and 64.1%), respectively. However, supply of the drug commodity was significantly ($p<0.05$) related to timely submission of report by the facilities. The assessment also showed that 22(54.6%) of the facilities have had transportation issues such as difficulty scheduling use of vehicles (15.9 %) and funds for fuel (4.5%), or for repair of vehicles (4.5%). All the facilities have personnel with knowledge on ARVs logistics management.Reports on consumption/issue and stock of ARV and OI drugs are usually submitted monthly (45.4%) or bi-monthly (36.3%) to higher level facility. According to the facility staff, the quantity of supply to order is majorly determined by the facility (77.2%) or higher facility (22.8%). The report or order is mostly sent by mail (51.2%), picked up by higher level (46.2%) or sent by going in person (46.2%), while the facility either arranges for collection of the drugs (59%) or the drug is delivered by higher level (36.5%) using facility vehicle (81.8%). Safe and secured storage areas are maintained in most of the facilities (90.9%).

Conclusion: Results of the assessment showed problems in the supply chain which could be confronted by effective transportation through provision of more vehicles and adequate maintenance of the existing ones. Cases of drug stock - outs and expiration need to be reviewed, while timely submission of reports by the facilities needs to be encouraged.

PP04: Nausea and Vomiting During Pregnancy: The Tale of the Black Woman's Experience in the Journey towards Procreation.

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Background: Nausea and or vomiting in pregnancy (NVP) are the most common complains during pregnancy and can impact negatively on the Quality of Life (QoL) of sufferers. Despite this, it is often a neglected medical condition in pregnancy, both from the perspective of health services and the provision/supply of the needed medications.

Objectives: To assess the prevalence, severity, risk factors and management of NVP.

Methods: This study was conducted in 3 prenatal clinics in Edo State, Nigeria. Preliminary studies involving in-depth interviews among healthcare providers to explore management of NVP, and focused group discussions among pregnant women to assess attitudes on NVP were conducted. A total number of 160 women ≤ 16 weeks pregnant were asked to complete structured questionnaires constituting the 24-hour Pregnancy Unique Quantification of Emesis (PUQE) which measures severity of NVP, and the Nausea and Vomiting in Pregnancy Quality of Life (NVPQOL).

Results: All participants were within 18-45 years. The proportion of women with NVP was 61.8%; 9.4% of the women had mild symptoms, 28.8% experienced moderate symptoms while 0.6% had severe symptoms. There was a significant reduction in the mean NVPQoL scores between those who experienced NVP 112.02±29.16 and those who did not (62.23±28.59, $p<0.0001$). About 53.5% of those who experienced symptoms expressed their willingness to take drugs to relieve symptoms. Education was the only risk factor found to be significantly associated with NVP; age, oral contraceptive use, income and gravidity were not associated with NVP. All of the healthcare providers either used metoclopramide or promethazine as antiemetics to manage NVP, while none has used the recommended doxylamine/vitamin B6 combination as first line for treating NVP.

Conclusion: This study revealed a high prevalence of NVP with its associated reduction in the QoL among those affected. Adherence to the current treatment protocol for NVP was surprisingly absent, as healthcare providers are yet to comply.

PP05: Cost-Cause Evaluation of Expired Medicines in the Last 5 Years in University of Abuja Teaching Hospital (UATH), Gwagwalada.

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Background: Medicines and their management are important health system components necessary for maintaining and improving health. However, wastage

of essential medicines due to expiry is still a major public health problem, posing a great financial burden on hospitals globally. This highlights a problem with the supply chain. This study was aimed at describing the cost and causes of expiry of medicines and assessing the impact of expiry on efficiency of service delivery in University of Abuja Teaching Hospital (UATH).

Methods: This is a mixed method study with a quantitative retrospective aspect, involving the use of a data extraction tool developed in Microsoft Excel which consisted of the medicine name and class, expiry date and quantity, and unit cost for each item, and was exported into SPSS for statistical analysis. For qualitative data, a self structured questionnaire that covered participants' experience, inventory management practices and perceived reasons for expiration was employed and exported into Microsoft Excel to help with coding and thematic content analyses of the data.

Results: Expired drugs record from 7 of 9 pharmacy outlet was obtained, whereas 75%(n=stakeholder with >5 year experience) of the stakeholders responses wereanalyzed. The calculated value of medicines that had expired within the period was N2,183,770 (7125USD), with a total number of 7712 drugs belonging to up to 75 different classes based on the WHO pharmacologic classification of drugs. Three main themes were identified as reasons for expiry of medicines:(i) lack of implementation of standard procedures of inventory management (ii) donations and procurement of short-dated drugs, (iii) poor stock rotation and haphazard minimum and maximum order levels. About 90% of stakeholders identified negative impacts on the efficiency of service delivery with the effect that treatment outcomes were poor due to unmet drug needs of the patients.

Conclusion: This study found that economic loss due to drug expiration is high in UATH. Rigorous vigilance in inventory management, strict compliance with the international guideline for the donation of medicines, and use of predictive analysis as principal basis for decision making as it relates to medicine expiry are paramount for reducing financial losses and improving health outcomes.

PP06: Mothers' knowledge, attitude and practice towards monitoring of adverse events following immunization (AEFI) in selected healthcare facilities in Abuja, Nigeria

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Background: The administration of immunization to infants and young children to prevent childhood diseases is the most successful and cost-effective intervention in preventive health care. With increasing availability of newer and combination vaccines in immunization programmes, there is the need to improve passive and active surveillance in order to maintain the safety and confidence of the users and care givers. Vaccine safety surveillance is critical as monitoring and reporting of AEFIs allows for their proper management. In addition, it prevents inapt responses to reports that can otherwise create unnecessary panic and loss of confidence in the healthcare services.

Objectives: The study evaluated the knowledge, attitude and practices (KAP) of mothers towards immunization and AEFI surveillance in Abuja, Nigeria.

Method: A cross-sectional study was conducted using a structured interviewer administered questionnaires. Mothers' KAP towards immunization and AEFI surveillance were evaluated in 14 health facilities in 6 Area Councils in Abuja, Nigeria. A total of 1,178 mothers were recruited and interviewed. A structured questionnaire, containing 26 questions was used for the study. The study was carried out, between March 2016 and March 2017.

Results: Results showed that 47% of the mothers had tertiary education, 40% and 8% had secondary and primary education, respectively, while only 5% had no formal education. Although 88% of the mothers claimed to have understood what immunization is, 46%, 39% and 15% of them had poor, adequate and excellent knowledge, respectively about the different types of vaccines and the diseases they protect against. While 94% of mothers knew the possible adverse events that could occur in their children after immunization, 6% were unaware of the adverse events. While 99% of mothers were willing to report AEFIs to the nurses in the immunization clinics, 69% of the respondents said they had actually witnessed AEFIs in their children. Out of those who witnessed AEFIs, only 42% took their children to the health centre to report. Eighty nine percent (89%) of the mothers preferred to report AEFIs by visiting health facility with their children as against 10% that preferred to send report by telephone and 1% who preferred to send their husbands/family members. All respondents mentioned that the occurrence of previous AEFI experience in their children will not affect their future immunization decision.

Conclusion: The mothers had fair knowledge that immunization helps prevent childhood diseases, and knowledge about the common AEFIs that could occur in children after immunization. However, they had poor knowledge of the types of vaccines and the diseases they protect against. They also had poor reporting culture regarding identified AEFIs. There is the need to continuously sustain and improve the quality of immunization information given to mothers during health talks. Further initiatives to improve education should be the development of pictorial IEC materials in local languages that will convey the need to report AEFIs.

PP07: Weekly Stock Status Monitoring Tool - a Strategy for Preventing Stock - outs in SMACHT Project Sites of Southern Province, Zambia

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Background: The "Stop Mother and Child HIV Transmission" (SMACHT) project is implemented in Southern province of Zambia by the University of Maryland, with support from the US Centers for Disease Control and Prevention (CDC). Churches Health Association Zambia (CHAZ) is one of the key partners in the project which seeks to contribute to the elimination of mother - to - child transmission of HIV by ensuring availability of essential commodities at Service Delivery Points (SDPs). However, the existing national platform for reporting and requisition of commodities i.e. the electronic Logistic Management Information System (eLMIS),does not provide 'real time' data for prompt decision making. This initiative, therefore, aims at developing and operationalizing a weekly stock status monitoring tool that would close the gap in monitoring stock availability in SDPs.

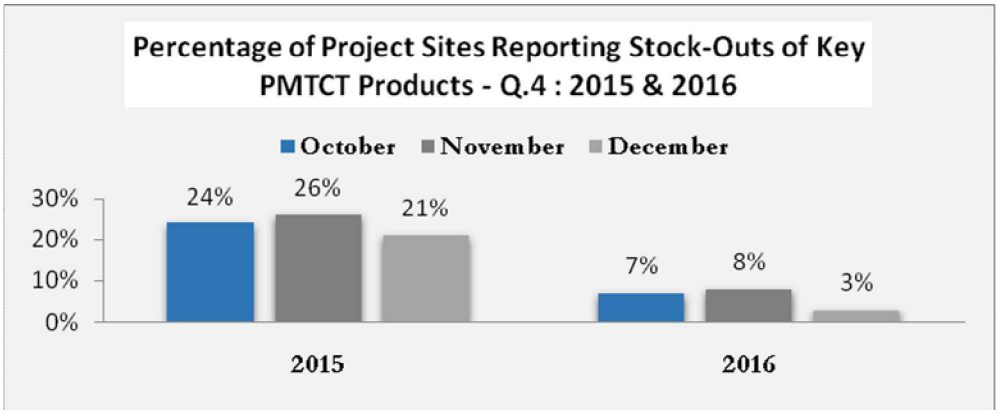
The tool is a simple excel spreadsheet with a list of SDPs which is updated electronically, capturing data on key Pharmaceutical and Laboratory commodities for each SDP in terms of Stock On Hand (SoH) and Average Monthly Consumption (AMC). The two indicators facilitate the determination of the Months of Stock (MoS) at SDP in "real time." The MoS indicator informs the team on the actions to undertake to prevent any possible supply-related interruptions in the SDPs. Costs encountered in this initiative included those of airtime and redistribution of commodities which accounted for about 2.8% of the total budget.

Objective: To develop and operationalize weekly stock status monitoring tool for facility stock availability

Methods: This CHAZ initiated tool was deployed as follows:

- By the end of the third quarter 2015, the project team designed and deployed the tool to capture the 'real time' data on the stock status.
- The project team oriented health facility staff on ensuring the availability of accurate data for stock status reporting.
- The tool was updated weekly and facilitated prompt responses to ensure stock safety by redistributing excess stock in overstocked SDPs.
- In the early stages of implementation, the common challenges included inconsistencies in data submission and poor network for calling the SDPs in remote areas. To counter this, Short Message Service (SMS) platform was used as alternative to send information to logistics officers. This is what will be used on a government supported central platform (program *mwana*) in sending information to district supervisors going forward. Program *mwana* messages are cost free as long as one's cell phone number is configured.
- Over the year, the team monitored the stock status trends.

Results: For a period of one year, a notable reduction in stock outs rates in supported sites was noted as shown in the graph below, which compares fourth quarter 2015 data with that of the same period in 2016:



Conclusion and recommendations: The tool helped reduce commodity stock outs by providing 'real time' data that facilitated prompt action by logistics officers in collaboration with Ministry of Health (MoH) officers by moving stock from overstocked SDPs to those that were understocked. The tool can therefore be used to improve health care service delivery because it promotes commodity availability.

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PP08: Adverse drug reaction in multi-drug resistant tuberculosis (MDR-TB) patients at Mainland Hospital, Yaba, Lagos

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Background: Adverse drug reactions (ADRs) are common in patients on MDR-TB treatment, and this may result in patient non-adherence to the use of their medications. Therefore, knowledge about known and unknown ADRs in MDR - TB therapy ensures prompt management, reduces frequency and severity of the ADRs, and promotes patient adherence and positive treatment outcomes.

Objectives: The objectives of the study were to assess the prevalence of adverse drug reactions among MDR-TB patients, and to evaluate the influence of co-morbidities associated with MDR-TB on the occurrence of adverse drug reactions.

Methods: The study was conducted in Mainland Hospital, Lagos, Nigeria. Medical case notes of 110 MDR-TB patients enrolled in the hospital were reviewed for the period between April 2012 and August 2014. A structured data collection form was used to extract and record information on the patients; descriptive and inferential statistical analyses were carried out with the aid of SPSS version 20.0. Categorical data and association between variables were evaluated using Chi-squared tests.

Results: The most common adverse drug reactions recorded were gastrointestinal discomfort (29.59%) and ototoxicity (27.81%), which was followed by musculoskeletal disorders (18.34%) and neurotoxicity (16.57%). Diabetes mellitus (16.67%) and HIV (14.58%) were the two most commonly encountered co-morbidities with MDR-TB. There was no association between the types of ADRs and the number of co-morbidities recorded. However, there was an association between the age of respondents and the occurrence of co-morbidities.

Conclusion: Adverse drug reactions, including gastrointestinal discomfort, ototoxicity, musculoskeletal disorders and neurotoxicity, are common with MDR TB treatment. Diabetes and HIV were the most common co-morbidities with MDR-TB. Improving patients' knowledge of the ADRs in order to prevent non-adherence to treatment protocol is recommended.

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