Changing from the "Pull" to the "Push" System of Distributing Essential Medicines and Health Supplies in Uganda: Implications for Efficient Allocation of Medicines and Meeting the Localized Needs of Health Facilities

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Uganda has undergone several reforms in governance of the health sector. One of the profound reforms has been the radical shift in management of medicines from the "pull" approach—health facility staff participated in determining the medicines needed, to the "push" approach—the distribution of a standardized kit of essential medicine to health facilities irrespective of the disease burden and patient population. This paper is based on multi-site, mixed method cross-sectional study on governance in the health sector commissioned by Transparency International. It revealed that this shift affected delivery of essential medicines for rural and hard-to-reach frontline health facilities. Although there were indications that centralization had minimized inefficiency due to over invoicing, abuse of medicine funds and re-allocating funds meant for medicines to other recurrent items, it led to the supplying of large quantities of medicines that are not aligned to the disease burden and needs of some health facilities.

INTRODUCTION

Since the late 1990s, the Government of Uganda (GoU) has carried out a number of health sector reforms, including the adoption of the sector-wide approach (SWAp) and decentralization of health service delivery.[1,2,3,4] However, the processes for medicine supply were not reformed until 2002. In order to improve timely access, availability, and delivery of Essential Medicines and Health Supplies (EMHS), the Ugandangovernment has experimented with various supply chain models. Between 1985 and 2001, the health sector relied on the push approach, or essential drug kit supply systems, to deliver and distribute EMHS to all public health facilities.[5]

However, in 2002, the pull system was adopted; districts, local governments and health units requested medicines and health supplies that matched the disease burden, patient profile, and budget ceilings for EMHS for each respective budget cycle.[6] The shift to the pull system was accompanied by intensive capacity building in supply chain management at national and facility levels. The capacity building efforts were supported and funded byhealth partners,specifically the Danish International Development Agency (DANIDA) andthe United States Agency for International Development (USAID).[7]

After more than eight years of considerable investment inand experimentation with the pull system, it was abandoned in 2010 and replaced with a dual pull-push system. The pull system was maintained for Health Centre (HC) IVs and Hospitals, while the push system was adopted for rural and hard-to-reach health facilities— including HC III and HC II. The former (HC IVs and hospitals) were considered to have the human resources and technical capacity to effectively manage the supply chain,

while the latter were noted to have limitations in such capacity.[8,9]A study undertaken at Kilembe Hospital in the Kasese district compared the hospital's performance under the push and pull systems of drug supply; itindicated that the pull system reduced drug expiries and also improved the availability of and access to essential medicines and supplies.[10]Increased access to essential medicines through an effective supply chain management system at the primary health care level is seen by others as a strategy for minimizing waste, dealing with ill health and reducing mortality rates, increasing responsiveness and drug availability, increasing choices and utilization, and promoting rational drug usage.[11,12]

In this paper, we share insights related to the shift from the pull to push system of drug supply as seen through the lens of service users, frontline health workers and their supervisors, district and ministry of health officials, civil society representatives implementing health delivery monitoring programs, and other government officials linked to health services delivery and drug management in Uganda.

We explore issues and experiences related to shifts fromthe pull to the pushsystem of delivering EMHS. We also explore how the change from the pull to push system of EMHS was managed and perceived by stakeholders. We argue that oscillation from the pull to push system without paying attention to existing evidence and involving stakeholders may create confusion in management of EMHS supply chains, leading to wastage of scarce resources. In addition, we note that the centralized character of the push system negates the aims of decentralization by limiting participation of leadership and health service governance structures at the lower government level where service delivery occurs.

The study was informed bythe participatory development management approaches to policy and reform management, which emphasize participation and involvement of stakeholders in policymaking and health reform processes.[13]The Asian Development Bank conceptualizes participatory development as "a process through which stakeholders can influence and share control over development initiatives".[14]Our analysis of participation of stakeholders in policy shifts from pull to push is also informed by Arnstein's Ladder of Participation (1971), as well as byKanji and Greenwood (2001).

According to this model, the intensity of participation is measured along the following parameters:compliance— where tasks with incentives are assigned but the agenda and process is directed by outsiders; consultation— where local opinions are sought, while outsiders analyze and decide the course of action; cooperation— where local people work with outsiders to determine priorities, the responsibility and to direct the process lies with outsiders; co-learning— where local people and outsiders share knowledge, create new understanding and work together to form action plans; collective action— where local people set their own agenda and mobilize to carry it out in the absence of outsiders.[15]

Despite some of the good intentions of the policy, the apprehension that some stakeholders have towards thepull to push shift modalities for managing medicine supply chains tend to reflect the tensions between the concentration of power at the national level at the expense of devolution at the district level.[16] In turn, the centralized character of the push system may negate the aims of decentralization by limiting

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participation of leadership and governance structures at the lower local government level where service delivery occurs.

METHODS

Setting

Data were collected as part of a larger, multi-site, mixed methods cross-sectional study on governance, accountability and transparency in the health sector, commissioned by Transparency International.However, in this paper, we only report the qualitative findings of the study. The study was conducted in 6 districts across the 4 regions (North, East, West and Central) of Uganda, from March to September 2010. The districts were selected taking into account regional representation, annual resource allocation[17], performance on the Ministry of Health (MoH) league table[18], and year of establishment as a Local Government (LG) unit(Table 1).[19]

TABLE 1: CRITERIA USED FOR SELECTION OF STUDY DISTRICTS

Region	Old versus New District(s)	Budget allocation	Performance League table
North	Oyam District (New)		Nebbi District (3rd Best Performing)
East			Bugiri District(5th Least performing)
West		Bushenyi District (High)	
Central	Masaka District (Old)	Kalangala District (Low)	

Study Population and Sampling Plan

The study population included serviceproviders, health services managers, and health services consumers. Key informants were drawn from the national and district health service delivery institutions including the MoH, the Medicines and Health Monitoring Unit (President's Office), the Coalition for Health Promotion and Social Development (HEPS-Uganda), Public Procurement and Disposal of Assets (PPDA), Joint Medical Stores (JMS), and the Centre for Justice and Sustainability (CJS). Other key informants included local government officials from the study districts, such as members of the District Health Management Team (DHMT) and Health Unit Management Committees.

Sample Selection

Study participants were purposively selected due to their knowledge and current work experience[20] as well as to reflect regional balance in terms of urban and rural

locations, budget allocation patterns to districts, and the performance of districts according to the Uganda Ministry of Health League table.

Data Collection Procedures

Data was collected using key informant interviews (KII), focus group discussions (FGD), and group interviews/discussions (GIs) using guides developed specifically for each method.Sixteen KIIs were conducted with stakeholders at the national and local government level. Focus group discussions comprising between 5 to 12 participants were conducted with District Health Management Teams (DHMT), District Health Committees (DHC), Ordinary Community members,and the Health Unit Management Committee (HUMC) at Health Centre (HC) IVs. A total of 11 FGDs were conducted with ordinary community members in all study districts. Two FGDs were conducted with Health Unit Management Committees of HC IVs in Nebbi and Bugiri districts. Additionally, a total of 11 group interviews comprising 2 to 4 participants were conducted with the DHMT and Health Unit Management Committee (HUMC) at Health Centre IIIs and IVs.

KII Participants were recruited at each study site by an interviewer associated with the project. Permission was sought from the relevant heads of departments. The department headidentified the appropriate officials that lead or participatein the implementation of relevant programs. Potentially eligible officials were asked if they would be interested in talking to the study interviewer. Those that agreed were introduced to the interviewer, who described the study to the participant, determined their eligibility, and obtained their written informed consent to participate.

KII participants completed interviews in English, while FGDs were conducted inLuganda, Luo, Alur, or Runyankole, (the most commonly spoken languages in each region) by trained interviewers in addition to English, with answers written in English.To ensure consistencyin interviews, all instruments were translated and back translated to check on accuracy.

Data was generated through a literature reviewof documents related to the study objectives/research questions. The literature review was based in a range of policy and program documents, including: annual health sector performance reports, sector analyses reports, health policies, strategic plans, district health records, and newspaper articles.From all these documents, we focused most on issues related to governance and accountability in the health sector as well as specific analyses of various mechanisms for distributing essential medicines and health supplies.

Ethical Considerations

Ethical approval was granted by the Uganda National Council of Science and Technology. All researchers were certified in human subjects' research. In addition, permission to conduct study activities was obtained from participating institutions or health units that served as recruitment sites. Written informed consent was obtained from all study participants in Luo, Luganda, Runyankole-Rukiga, or English, depending on their language of preference.

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Data Management and Analysis

Interview guides utilized open-ended responses. Interviewers translated and transcribed open-ended responses during the interview. All interviews were recorded, transcribed and entered in Microsoft Word.

Qualitative analyses were performed for theme identification using a content analysis approach. Each interview was read and coded for themes, which were analyzed for frequency. Short answer responses (SAR) were coded for key themes by two independent observers. Coder responses were compared and collapsed into similarly grouped categories. Ten percent of responses were dual-coded to ensure inter-coder reliability. Selected quotes are employed to illustrate typical cases for the major themesthat emerged.

RESULTS

Changes in EHMS Supply Modalities

Between 1985 and 2001, the health sector relied on the push system or essential drug kit supply system to deliver and distribute EMHS to all public health facilities.[21]Under this system, the quantity of drugs supplied to lower health units was fixed and did not vary with the disease burden or patient load. Health units expected replenishments every quarter. This system, however, was fraught with many challenges, including frequent stock outages of essential drugs. For example, commonly demanded and prescribed drugs (e.g., ciprofloxacin, chloroquine, quinine, and analgesics and malaria injectables) ran out before the stipulated replenishment period, as other studies have previously reported.[22,23] In addition, thetop-down nature ofthe push system was also considered inefficient, difficult to track, and prone to waste through expiration.[24]

In 2002, a demand-based(pull) system was adopted. The shift from the push to the pull system was informed by two studies, namely the Drug Tracking Study[25]and a Push-Pull Study.[26]Using the results from these two studies, a task force was set up to formulate an operational strategy for a transition from a supply system that was traditionally based largely on allocations of essential medicines pushed down from the centre to the districts, to a demand-based(pull) system.[27]

Under the pull system, two financing mechanism for procurement of medicines and health supplies were instituted. The government continued to channel budget resources (including donor budget support) to districts for non-wage recurrent health expenditures, with the guideline that 50 percent of these funds would be spent on medicines.[28] Second, there would be new earmarked budgets for each district for medicines purchased from the National Medical Store (NMS (or Joint Medical Stores (JMS) for Private-not-For Profit (PNFPs) organization) in the form of 'credit lines' backed by centrally held funds at the MoH.[29] Therefore, under the pull systems, districts and health units were given more autonomy to requisition for medicines and health supplies that matched the disease burden, patients served, and budget ceiling for EMHS for each respective budget cycle.[30] The shift to the pull system sought to minimize stock-outs while increasingaccess and availability of EMHS in a timely manner.

After more than 8 years of considerable investment in and experimentation with the pull system it was abandoned in 2010 and replaced with a hybrid "push-pull"system–which involves a mix of pull and push systems. At the hospital and Health Center IV (HC IV) levels, the pull system was maintained while at HC III and HCII level the push system was reintroduced. The re-introduction of the push system was intended to reduce delays in requisition and procurement of EMHS, minimize risks of corruption in medicines procurement, and address thechronic drug stock-outs at the primary care levels—HC IIs and HCIIIs.In addition, the shift was aimed at reducing the burden on frontline health workers associated with requisition of medicines and other health supplies.Study participants observed that many of the health workers at HC III and HCII levels lacked adequate training in medicines quantification (i.e.quantify medicines requirements), and EMHS supply chain management.

 "Some people [health workers] in the health units did not know all the required documents in medicines procurement and management like dispensing books. In some cases, these documents were available but the health workers did not know how to use them. These tools [documents] are not clinical, they are accountability documents, and most health workers did not know what to do with them." (Group Discussion with Officials from Medicines and Health Services Monitoring Unit, Office of the President)

Perspectives on the Change from the Pull to the Push System

Study participants expressed mixed views about the move from the pull to the push system at HC II andIII.Some participants were in favor of the move; theyhad the perception that the push system would improve equity and timely delivery of medicines and health supplies.One key informant noted that:

"The push system promotes equity at the low levels in the sense that standard drugs are delivered and made available. Quantification is done once and standardized kits are delivered at the health facilities. The kit system improves efficiency in management of the supply chain. It saves time and makes operational costs cheaper...You can predict what you will need ...with the push system, you need data at the beginning of the period and then that is all; the next phases involve packaging and pushing medicines to health facilities. "

Similarly, another key informant at the district level observed that the push system is more effective and efficient in the delivery and supply of EMHS.He noted that "in the push system, drugs [medicines] are delivered in time as per the schedule and also drugs are transported up to the health center" (Member of District Health Team, Bugiri District,EasternUganda).

Other study participantsnoted that the push system is relevant in resource constrained settings because it does not require highly qualified personnel at the lower level health facilities to carry out quantification of medicines and essential supplies on a

continuous basis.Instead, EMHS are supplied to health units based on historical consumptionpatterns:

> "The push system does not need highly qualified staff [at the lower level health unit] to quantify medicines requirements because a standardized kit of EMHS is sent to health units....For pull system to be effective, health workers should have capacity to quantify according to need. Moreover, the medicines and health supplies' needs keep changing in the health facility and across the country and as a result you may have so many varying needs.The Pull system is highly intensive because every clinic [health unit] procures according to need, [according to client load and disease burden].Therefore health workers need to be trained in quantification. Thus pull is only effective at higher level health facilities" (KII, National level).

However, some study participants observed that the push system has a number of limitations in comparison to pull system. They noted that the pull system of medicines supply was more responsive to locally determined demand and disease burden.In the pull systems, health units were able to identify their specific needs and aimed at satisfying them as opposed to the push system where standard items and quantities are supplied irrespective of whether they were needed or not or sent to health units without determining what the specific need are at a particular time:

> "The push system has problems of delivering drugs that are not commensurate to the requirements or the disease burden of the area. Some time they even delay to deliver drugs in time and they do not use the same people to deliver drugs... In the pull system we used to stock drugs for ourselves and packaging problems were not there because we could pack the right quantities and the right drugs. Therefore there was physical follow up of what was needed unlike the push system where you just receive drugs the way they are and sign because we cannot take them back." (Key Informant, National level Civil Society Organization)

Others noted that the vertical supply of drugs does not take the consumption needs of the different health units into consideration, increasing the likelihood of under-supply or oversupply of some medicines.The latter may result into wastage and expiry of drugs that are not in high demand.

> "Sometimes they supply fewer quantities of very essential drugs such as antibiotics and anti-malaria drugs and high quantities of less required drugs such as ant-diarrhea drugs." (Official, District Health Management Team)

Tensions Arising from Change from Pull to Push Systems

The NMS is responsible for procurement and supply of thestandardized kits of EMHS to health facilities under the push system.One of the significant changes that occurred in medicine procurement was making NMS a self-accounting entity with a separate vote of account.Since then, funds for drug procurement and supply are disbursed directly to NMS rather than through the "credit lines"system. Under the credit line system funds were disbursed to MoH and payments made to NMS upon supply of EMHS and presentation of invoices.This created a shift in power-relations between NMS and Ministry of Health (MoH), with the ministry's role being limited to supervision and oversight, but with no control over resources for EMHS procurement and delivery. Study participants noted that the change in ministry power relationsmay have affected the morale, especially that of managers who provideNMS oversight.

The other significant change in EMHS supply management was the establishment of the Medicines and Health Services Delivery Monitoring Unit (MHSDMU) under the President's Office. The unit is mandated to: "improve the surveillance of medicines and service delivery."[31]The unit created tensions because it was perceived to be duplicating the oversight functions of MoH, as its mandate overlaps with that of the ministry.

In addition, there was a general perception among study participants, especially at the local government level, that they were not involved in the process of deciding on the shift from the pull to the hybrid "push-pull"system.Key informants at the district, especially members of the DHMT, noted that their participation in such policy changes was limited to being informed about shifts, what to do, and enlisting their buy-in as opposed to being involved in the entire policy change process.As a result the shift was viewed with uncertainty and suspicion. In addition, the change was so sudden and drastic that the staff responsible for controlling the drugs from the Ministry of Health, the district and health unit, were for some time not sure of what would come next. They were concerned that changes would lead to changes in roles and eventually lead to loss of institutional and personal power that came with having control over the drugs and medical supplies.

Limited or no consultation with stakeholders on the policy at both the national and local government level affected the development and nurturing of a shared vision in respect to pharmaceutical management reforms. This may explain why some stakeholders developed apathy and are still grappling with this system of medicines management. Limited involvement of stakeholders has therefore affected ownership of policy reforms. It was also noted that the system is bureaucratic and less flexible in terms of accommodating context specific changes needed at the level of implementation. For example it was reported that if one health centre has medicines it does not need but are needed by another health centre, the exchange of such medicines has to be approvedby the National Medical Store (NMS). This creates unnecessary delays that could be avoided if the District Health Team (DHT) had this mandate.

DISCUSSION

This study argues that while the push and pull systems of pharmaceutical management have context-dependent merits, the way they were implemented appears to be less systematic and therefore had several limitations.

The study reveals that the push system was implemented in a drastic fashion, as opposed to a systematic and gradual process involving all stakeholders. This engendered negative attitudes among staff and created resistance to change. The culture of originating policies from the top without meaningful participation of stakeholders, especially in the context of decentralization, institutionalizes top-bottom approaches that inhibit development of sustainable policy and institutional frameworks.[32] As a result, in resource-constrained settings like Uganda, such drastic policy shifts do not get owned by stakeholders and may not lead to desired outcomes.

Our data show that limited participation of frontline health workers at HC III and II, may render them less likely to share in the vision, which as has been argued elsewhere stifles policy implementation and sustainability.[33,34,35]Evidence shows that when individuals don't feel appreciated and involved in creating the change likely to impact their lives, they tend to be demotivated and thus unable to appreciate and participate in change processes.[36, 37]

Our study demonstrates that the push system improved availability of essential medicines. This is in line with findings of a recent assessment of the kits-supply order system, which indicated that there was improved availability and access to vitalEMHS at the primary care level. Additionally, it reduced average stock-out days per month for all EMHS in the facilities from 20 days to 5 days.[38] However, 63% of items were oversupplied with the risk of expiry; 18% and 22% of the EMHS supplied in the HC II and HC III kits, respectively, were inappropriate for the primary care level and should only be used at a higher level of care (HC IV and hospital).[39]Under the push system, the kit does not vary with disease burden and patient load. Furthermore, over supplied drugs are not easily exchangeable at the district level without NMS involvement, which is bureaucratic.

CONCLUSION

Our findings suggest that despite the progress made over the years in implementing reforms in pharmaceutical management systems to improve access to health services, there are still institutional bottlenecks to effective performance of EMHS.

Our study argues that regardless of the pharmaceutical supply and management system adopted, the involvement of stakeholders in EMHS policy reforms, especially local government health managers, frontline health workers and health users, is crucial for developing a shared vision, acceptability and ownership of the reform processes and outcomes. A reflection on the model of participation by Kanji and Greenwood indicates that the policy processes that characterized the management change from pull to the hybrid pull-push fell short of most of the participatory tenets. Our findings suggest that the limited responsiveness of the push system to the local and context-specific needs of frontline health facilities is a critical limitation that needs to be addressed in order to improve delivery and access to EMHS. Our study also points to the need to streamline communication strategies for policy and reform processes in order to minimize anxiety, uncertainty, suspicion and resistance from stakeholders. In addition, our findings indicate that the centralized character of the push system negates the aims of decentralization by limiting participation of leadership and health service governance structures at the lower government level where service delivery occurs. This may affect

capacity building and developing institutions at the local government level to effectively manage EMHS.

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