

Uganda's Increasing Dependence On Development Partner Support For Immunization – A Five Year Resource Tracking Study (2012 – 2016)

Carol Kanya (✉ ckanya@idrc-uganda.org)

Makerere University School of Health Sciences <https://orcid.org/0000-0002-7882-4777>

Christabel Abewe

Health Net Consult

Peter Waiswa

Makerere University College of Health Sciences

Gilbert Asiimwe

IDRC

Faith Namugaya

International Development Research Centre

Charles Opio

IDRC

Stephen Lagony

Health Net Consult

Muheki Charlotte

Health Net Consult

Research article

Keywords: Immunization, Resource tracking, Financial flows, Uganda

Posted Date: March 18th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-17585/v1>

License:   This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Version of Record: A version of this preprint was published on January 19th, 2021. See the published version at <https://doi.org/10.1186/s12889-021-10178-0>.

Abstract

Background There are persistent weaknesses in obtaining accurate reliable and complete data on local and external investments in immunization and yet these are critical to estimate costs, resource needs and gaps so as to aid country financing, planning and resource mobilization. This study aimed to measure and describe the financial envelope for immunization activities and conduct an expenditure analysis at district level.

Methods The Systems of Health Accounts (SHA) 2011 methodology was used to quantify and map out the resource envelope for immunization. Data were collected at national and district levels from public and external sources of immunization through key informant interviews coupled with document reviews. Data were coded (SHA), categorized and disaggregated to allow for greater detail on the types of immunization activities. Financing methodology used was largely drawn from Guthrie et al, 2015.

Results Over a five-year period, funding for immunization has increased fourfold from US\$20.4 million in 2012 to US\$ 85.6 million in 2016. The increase in the resource envelope is attributed to the lift of the ban of Gavi funding to Uganda as well as new vaccine introduction. Gavi, the Vaccine Alliance became the biggest contributor (59%) in 2015 and 2016 with 66% of the funds managed by National Medical Stores. Eighty percent of the resources are spent on facility-based routine immunization which includes expenditure on human resources and immunization outreaches. At district level, the overall proportion of total funding to immunization was 15% of their Primary Health Care (PHC) Grant. The bulk (82%) of the PHC funds were spent on supervision to lower health centers (transport and distribution of vaccines) while majority (51%) development partner funds were spent on routine immunization activities (vaccine collection and per-diems/allowances to support outreaches).

Conclusion The increasing dependence on development partner support raises issues around sustainability alongside other challenges like misalignment and displacement This warrants an increase in financial commitment to immunization by Government of Uganda, prioritization of resources for immunization at district level, and also operationalization of the existing financial sustainability plan for immunization.

Background

Immunization is a cost-effective intervention that plays an important role in controlling and eliminating vaccine-preventable diseases. Globally, immunization is estimated to avert approximately 2–3 million deaths each year, and increasingly the hard-to-reach and vulnerable populations have access to immunization services [1]. In line with the Sustainable Development Goal 3.2 that seeks to end preventable deaths of newborns and children under 5 years of age [2], the Uganda National Expanded Program on Immunization (UNEPI) has increased access to immunization services nationally with gradual improvement in coverage since 2000. [3]. This has been possible with direct and indirect support from immunization partners like Gavi, the Vaccine Alliance, WHO, UNICEF, PATH, CHAI, CDC, JSI and

several non-traditional partners [4]. UNEPI receives support from different sources which include Gavi through partners, Government of Uganda (GOU) and Gavi grants (for specific new vaccine introductions or campaigns as well as cross-cutting technical assistance, health system strengthening, and cold chain equipment optimization).

The Global Vaccine Action Plan highlights the need to increase the total amount of funding for immunization from countries and development partners despite the fact that financing for immunization is primarily the responsibility of governments [5]. In order to ensure predictable and sustainable funding, annual resource tracking efforts are needed for government and partners [5]. Resource tracking in Uganda has been possible through the institutionalization of the National Health Accounts (NHA) that has provided evidence to aid monitoring of health financing since 1997 [6]. The current health expenditure estimates of 2015/16 highlighted an increase in public (from 13.8% to 15.3%) and private funds (from 41.4–42.6%) while development partner funds decreased (from 43.4–41.7%) within the same time period [7]. In addition to NHA, WHO/UNICEF have also jointly captured various domains on performance, planning, financing and quality indicators from member states through the Joint Reporting Form (JRF) so as to track implementation of the Global Vaccine Action Plan (GVAP) [8]. The JRF reported that Uganda's government spending on routine immunization per surviving infant had increased from \$3 (2006) to \$11 (2014) [9]. However, Uganda has not consistently reported on JRF indicators and therefore exacerbating the need for resource mapping exercises.

A mapping of financial flows for immunization in Uganda was conducted by Guthrie et al for 2009/10 and 2010/11 financial years in which costs and finances for immunization were assessed as part of the country Expanded Program on Immunization Costing (EPIC) study [10]. In this study, the total financing for routine immunization in Uganda increased from \$24.2 million to \$32.9 million in 2009/10 and 2010/11 respectively with the Uganda government contributing approximately half of all the finances [10]. Since this resource tracking exercise, there have been

few efforts to track financial flows specific to immunization especially in light of the newly introduced vaccines. Additionally, persistent weaknesses have been noted in obtaining accurate reliable and complete data on local and external investments in immunization and yet these are critical to estimate costs, resource needs and resource gaps. It is vital to have accurate data on funding flows and expenditure to aid country level planning, financing and also resource mobilization.

Gavi, the Vaccine Alliance (Gavi) commissioned a prospective evaluation of Gavi's support in four countries including Uganda with an aim of generating evidence regarding the relevance, effectiveness, impact and efficiency of their support. A key evaluation question was centered on identifying how Gavi resources are used and their relationship to other development partners and domestic resources. This paper therefore reports findings from a completed resource tracking exercise for immunization as a way of evaluating the effectiveness and efficiency of invested resources with illustration from the evaluation commissioned by Gavi. The objectives were: 1) To measure and describe the financial envelope for

immunization activities at national level in Uganda from 2012 to 2016, and 2) To conduct an expenditure analysis of the resources received and utilized in 2015 and 2016 at sub-national level.

Methods

Study site and population

This study was conducted at both national and sub-national levels in Uganda. At national level, the study enrolled immunization stakeholders from public entities, development partners and international non-governmental organizations. At sub-national level, the study enrolled District Health Officers (DHOs), Chief Administrative Officers (CAOs), Health facility managers and Expanded Program on Immunization (EPI) focal persons at the districts and the health facilities.

Quantifying the resource envelope at national level

Approach

To quantify the total resource envelope for immunization, a resource mapping methodology was used. This approach covers the mapping of both financial and non-financial (commodity and equipment) resources for immunization. As such, we identified key immunization stakeholders through document review and face to face interviews. These stakeholders were broadly categorized as (a) public entities, (b) development partners, and (c) international non-governmental organizations.

Following the broad categorization, stakeholders were further grouped into either financing sources, financing agents and service providers in line with the international System of Health Accounts (SHA) 2011 classifications as shown in the framework below (Additional file 1) [11]. Financing sources, agents, service providers, functions, and line items were coded using the SHA 2011 classification system. Further, the SHA code for the health care functions for immunization (HC.6.2) was further disaggregated to allow for greater detail on the types of immunization activities.

Scope

The scope of the analysis included all public and external sources of financing or commodities, and covered the financial years of 2011/12 (2012), 2012/13(2013), 2014/15 (2014), 2015/16 (2015), and 2015/16 (2016). Data were collected over 3 phases in 2013, 2014 and 2016.

Estimation

To estimate the total envelope of immunization funds, we summed the 1) total funds directly to support immunization (Funds from development partners + GOU contribution at national level) and 2) GOUs expenditure on salaried labor (% attributed to immunization) and proportion of Primary Health Care funds spent on immunization at sub-national level. Primary Health Care (PHC) funds in Uganda are part of the health sector grants provided to local governments and health facilities in order to facilitate the provision of health services to the population with emphasis on access, quality and affordability[12]. These funds include wage conditional grants, non-wage conditional grants, transitional development-sanitation and transitional development – Ad Hoc [12]. PHC funds are released on a quarterly basis from the Ministry of Finance to district local governments (DHOs and hospitals) and to individual health facilities.

Expenditure analysis at sub-national/district level

The main objective of the expenditure analysis at district level was to estimate and describe what immunization resources were received and how they were utilized over two financial years - 2015/16 (2015) and 2015/16 (2016). Data were collected from districts and health facilities.

District and health facility selection

Due to budgetary constraints, seven districts were studied in which data was collected from thirty-one sites (Health facility and District Health Offices). Districts were purposively selected based on the following criteria: i) Reach Every District (RED) categorization classification of districts (poor performing versus good performing districts)[13], ii) Representation from the five regions of the Uganda namely: North, West, South, Central and East, iii) DPT3 coverage performance, iv) whether it was a new or old district. Using this criterion, the following districts were sampled: (a) North: Lamwo and Abim, (b) West: Masindi, (c) South: Mitooma, (d) Central: Nakaseke, (e) East: Kween and Iganga. In each of the sampled districts, the DHO (n=7) was studied, including three purposively selected health facilities. These health facilities (n=24) were purposively selected based on their immunization performance/coverage of DPT3, level of care (Hospital, Health Centers IV, III and II) and ownership (public and private-not-for-profit facilities).

Estimation of Government of Uganda's support at sub-national level.

Estimation of government contribution can be largely be under-estimated if one considers the annual amounts GOU spends on vaccines and operational costs alone, and does not take into consideration the huge investment in human resources (responsible for service delivery) and other infrastructure. The estimation of funding for salaries was outside the scope of this work, given the required level of effort to estimate and apportion staff time to immunization service provision, within a setting of integrated service

delivery. Fortunately, a previous costing study made good effort in estimating Government's contribution to salaries for immunization service delivery for the year 2010/11 [14]. In this study, we used GOU's contribution to support immunization (salaried labor and PHC funds) estimated by the EPIC study and adjusted the estimates for inflation. Cost data were collected retrospectively and were captured in Ugandan shillings before being converted to US\$ using an average exchange rate of 1 US dollar to 3443 Ugandan shillings (US \$1: UGX 3443).

Data Collection and Analysis

Being a retrospective quantitative study, this exercise mainly relied on a combination of face-to-face Key Informant Interviews (KIIs), using the structured data collection tools, and review of documents provided by respondents. In order to quantify the resource envelope at national level, three data extraction tools (for sources, agents and providers) were developed and used for this study. The tools were adopted from similar exercises in Uganda [10]. At district level, two standardized tools were administered at district and health facility level. Data was collected by research assistants trained on the SHA methodology and in the use of the data collection tools.. Data were first captured using hard copies of the tools and then entered into pre-coded MS Excel® spreadsheets that would allow for easy aggregation. Level one data cleaning and verification was conducted on data entered in the Excel spreadsheets. Thereafter, data were entered into an Excel-based analysis screen and coded using the SHA (2011). Data were categorized according to the stakeholder function (Source, Agent or Provider) and further disaggregated into expenditure by program area as well as by immunization line items.

At the level of data collection, entering, and cleaning, the study relied on in-house peer review and supervision of activities by the project team leader. At the team leader ensured quality through review of data. This involved actual review of summaries of the data with the view to assess the robustness and accuracy of the data.

Results

Overview of financing for immunization in Uganda.

In Uganda, there are two financing schemes through which immunization funds for are channeled: "the government" and "rest of the world" schemes. The Government scheme represents public funds that are comprised of GOU funds and the on-budget funds from development partners targeted to support immunization activities. Financing agents for these public funds are Ministry of Health (MOH) / Uganda National Expanded Program on Immunization (UNEPI) and National Medical Stores (NMS). Providers of services funded by public funds are: MOH / UNEPI, DHOs, government health facilities, and Private Not for Profit (PNFPs) health facilities. With regards to the rest of the world scheme, development partners are the source of funds (including United Nations agencies, bilateral agencies, and international NGOs). Development partners manage the bulk of their funds, with a few exceptions (e.g. World Health

Organization and Gavi) whose bulk of the funds are managed by UNEPI and NMS (in the case of vaccine and supplies procurement and handling). Service providers for development partners funds are: UNEPI, DHOs, government health facilities, and NGO health facilities. In some cases, the development partners also serve as service providers.

Resource envelope at national level

Over a five-year period, funding for immunization increased fourfold from US\$20.4 million in 2012 to US\$ 85.6 million in 2016. (Figure 2). The main contributors to the resource envelope were the Government of Uganda and Gavi. On average, over the five years, the Government of Uganda contributed 43% while Gavi contributed 38% of the resource envelope in Uganda. Other sources of funding over the five year period included: WHO (9%), United Nations Children’s Fund (UNICEF) (6%), Centers for Diseases Control and Prevention (CDC) (2%) and other partners (1%).

Figure 1: Sources of funding and their percentage contribution from 2012 to 2016.

Notably, these immunization funds were managed (financing agents) by several public and non-public stakeholders including National Medical Stores (NMS), Ministry of Health, UNICEF, African Field Epidemiology Network (AFENET), Program for Appropriate Technology in Health (PATH), Maternal and Child Health Integrated Program (MCHIP), AFRICA Medical Research Foundation (AMREF) Uganda, Catholic Relief Services, SABIN Vaccine Institute and Clinton Health Access Initiative (CHAI). Figure 3 highlights that NMS has progressively managed more immunization funds from 36% (US\$ 7 million) in 2012 to about 66% (US\$ 52 million) in 2016. Similarly, UNEPI managed more funds from 6% (USD 1, million) in 2012 to 17% (13 million) in 2016.

Figure 2: Trends in financing agents for Immunization funds in Uganda from 2012 to 2016.

Providers of immunization services included; government owned facilities (health facilities at different levels of care including hospitals), District Health Offices (DHOs), other administrative agencies (Like National Medical Stores, UNEPI) and the multinational agencies (Bilateral, Multilaterals, foreign governments/entities). The largest proportion of providers of immunization services was government health facilities that provided an average of 70% (USD\$ 31million) of the immunization services over the

five- year period. Other providers of immunization services included the District Health Office (15%), other administrative agencies like NMS and UNEPI (12%) and the developmental partners (3%).

Immunization resources were further categorized by health care function (immunization activities/programs). As presented in Table 1, 80% (over the five-year period) of funding was spent on facility-based routine immunization which included expenditure on human resources and immunization outreaches. The second largest expenditure (14% over the five-year period) was on the immunization programs (Expenditure on Supplemental Immunization Activities, Family Health Days and Research). Immunization surveillance and activities that could not be disaggregated (expenditure on Health System Strengthening grant and New Vaccine Introduction) accounted for 2%. Other immunization activities like training, social mobilization and advocacy only accounted for 1% over the study period.

Table 1: Funding flows for immunization activities from 2012 to 2016.

Health Care Function	2012	2013	2014	2015	2016
Routine immunization (Facility based)	\$18,210,863	\$17,659,018	\$18,762,707	\$ 52,860,877	\$ 70,113,273
Immunization programs	\$929,422	\$4,676,155	\$ 4,821,377	\$ 10,920,709	\$ 9,613,709
Program management	\$ 58,089	\$29,044	\$ 261,400	\$ 203,311	\$ 290,444
EPI surveillance	\$377,578	\$ 232,356	\$ 580,889	\$ 464,711	\$ 1,336,044
Training	\$377,578	\$ 377,578	\$ 435,667	\$ 232,356	\$ 726,111
Not disaggregated	-	\$ 987,511	\$ 435,667	\$ 842,289	\$ 3,456,288
Supervision	-	-	\$ 145,222	\$ 290,444	
Social Mobilization and advocacy	\$464,711	\$ 87,133	\$ 29,044	\$ 232,356	\$ 145,222
	\$ 20,418,240	\$ 24,048,795	\$ 25,471,972	\$ 66,047,052	\$ 85,681,092

Expenditure analysis at District and Health Facility Levels

The study further conducted an expenditure analysis in order to quantify and describe the immunization resources received and utilized at district level and health facility levels for financial years -2015/16 (2015) and 2015/16 (2016). Expenditure analysis estimates present the expenditures for immunization activities at district and health facility level both by program area and by line item classification.

At district level, immunization activities were funded by two key players: (a) Government of Uganda through the PHC non-wage fund and (b) development partners and international NGOs. (Figure 4). Over the two-year period, total funds received by the districts varied from USD\$ 7,509 to USD\$ 113,704. Sources of these funds included WHO providing the largest proportion (57%). The PHC funds accounted for about 3% of the total resource envelope in the seven districts under assessment.

Figure 3: Sources of funding for immunization at district level.

The immunization resources are further broken down by program area (health care function) as well as by line item.

Public funds (PHC grant) from the Ugandan government allocated to immunization specific activities greatly varied by district. More than half (4 out of 7 districts) allocated less than 15% of their total funds (proportion of their Primary Health Care Grant) to support immunization activities with the proportion allocated ranging from 0% to 45% over the two years. One district (Lamwo) reported 0% allocation of the PHC grant to support immunization activities at DHO level over the two-year period.

When the public funds on immunization were broken down by program area, the bulk of funds (82%) were used for supervision of lower health centers. Other expenditures included cold chain maintenance (14%) and outreaches (3.5%) over the two-year period. By line item, the bulk (33%) of the funds was spent on fuel for vehicles to transport health workers and distribution of vaccines. The second largest expenditure was on per-diems/allowances for outreaches taking up 17.5% of the immunization funds.

Figure 4: District Expenditure of Public funds on immunization (by program area)

On the other hand, funds from development partners were mainly spent on routine immunization (51%). This included expenditure on vaccine collection and per-diems/allowances to support outreaches. Other expenditures included supervision to lower health centers, training, social mobilization, Other Supplemental Immunization Activities (SIAs), surveillance, cold chain maintenance and vaccine delivery and program management.

Figure 5: District Expenditure of development partner funds (by program area)

The study went on to further analyze the expenditure at health facility level to determine what proportion of the average annual public funds is spent on immunization activities.

Health services in Uganda are decentralized with districts and health sub-districts and structured into national referral hospitals, regional referral hospitals, general hospitals, Health Center (HC) IVs, HC IIIs, HC IIs and village health teams [15]. Hospitals provide technical back up for referral and support functions to district health services. The health sub-districts are housed at HCIV's whose responsibility is to plan, organize, budget and manage health services at the facility but also responsible for lower health center levels[15]. HCIIIs provide preventive, promotive and curative care while HCIIIs provide the first level of interaction between the health sector and the communities [15].

In the districts visited, hospitals spent an average of 3% of their total immunization budget on immunization related activities as a proportion of the average annual PHC funds received. On the other hand, HCIIIs spent 44%, HC IIIs spent 13.5% and HC IV's spent 26% on immunization related activities over the two-year period. Furthermore, the total PHC expenditure for each level of health facility (n=24) was estimated according to program area. Majority of the public funds were spent on outreach activities taking up 88% over the two-year period. When analyzed by line item, per diems/allowances took up 73% of the immunization funds. This was followed by transport and fuel expenditures and the rest of the funds were spent on social mobilization activities, cold chain facilitation and facilitation of vaccinators.

Discussion

The study presents the trend in the resource envelope for immunization over a five-year period; 2012–2016 and an expenditure analysis at district and health facility levels over a two-year period – 2015 and 2016.

The resource envelope for immunization has increased fourfold (from US\$ 20.4 million in 2012 to 85.6 million in 2016) over the five-year period with the biggest increment in 2015 and 2016. The increase in the resource envelope can partially be attributed to the lifting of the ban on Gavi funding. Uganda was approved for (ISS) cash support in 2000 for US\$ 9,230,520 over 2001–2004. However in 2006, the Gavi Secretariat suspended cash transfers to Government of Uganda following misuse of funds and this ban was later lifted after 2012 thus explaining the increase in Gavi funding [16]. Furthermore, the increase in the resource envelope can also be attributed to new vaccine introduction. Since 2013, Uganda has introduced several new vaccines in quick succession; including Pneumococcal Conjugate Vaccine (PCV) in 2013, Human Papilloma virus vaccine (HPV) in 2015, Meningitis A in 2016 and Injectable Polio Vaccine (IPV) in 2016 [17]. As of 2016, a total of US \$97 million had been disbursed to Uganda to support PCV,

HPV and IPV vaccine introductions [18]. In addition, Uganda had conducted a Meningitis A vaccine campaign in 2016 and was also implementing the Health Systems Strengthening (HSS) grant [18]. As a result of new vaccine introduction, Government of Uganda's contribution increased slightly by US\$ 580,000 between 2015 and 2016 due to co-financing commitments. Introduction of new vaccines raises routine program costs including vaccines and other related expenditures like cold chain, vaccine supply and transport costs [19]. Expenditure on new vaccine introduction can be corroborated by the baseline cost estimates in Uganda's cMYP also show a 49% expenditure on new vaccines [20]. As such, the new vaccine introductions by the EPI contributed significantly to the increase in the resource envelope over the five-year period.

In terms of financing sources, the Government of Uganda and Gavi are the main contributors to the resource envelope. The Ugandan Government was the greatest contributor of immunization resources (55%) from 2012 to 2014. However, in 2015 and 2016, Gavi contributed more resources for immunization (59%) as compared to the Ugandan government (24%). The study findings show a reduction in Government of Uganda's contribution when compared to other study estimates. The baseline immunization financing profile in Uganda's 2016–2020 cMYP shows Government of Uganda contributing 61% of the available financing largely driven by financing for human resource and for traditional vaccines [20]. To add onto, the financial mapping in 2010 & 2011 showed a 50% contribution from Government of Uganda to the overall resource envelope [10]. Additionally, the analysis of country multiyear plans (cMYPs) for 54 national programs also estimated government contribution to account for about 56% and 52% of the total routine program financing and non- vaccine financing respectively [19]. The cMYP analysis also estimates Gavi's contribution to routine program financing to be 48% for total vaccine financing [19] which is 10% lower than Gavi's contribution to Uganda's resource envelope. As such, the Government of Uganda's contribution as of 2016 has decreased despite their significant contribution towards human resource. It is apparent that there is still a substantial contribution of development partners in supporting the immunization program especially for operational EPI activities.

With Gavi and other development partners contributing the bulk of the funding for immunization, this raises issues on the sustainability of a critical national program in addition to challenges that come with relying on external funding.

The sustainability concerns are exacerbated by the projection of a 90% (US\$ 487.5 million) financial gap in the immunization resources required for Uganda over a five year period (2016–2020) when Gavi's contribution is excluded [21]. The achievement of sustainable immunization however, needs to be considered in the context of the broader health system financing landscape. Financing for health in Uganda is largely inadequate with the health expenditure which decreased from 8.9% in 2010/11 to 6.9% in 2015/16. [7], [22]. Despite this, the immunization financing as is, is not sustainable especially to maintain high coverage rates and this is exacerbated by the expensive vaccines that have been introduced and the other vaccines in the pipeline.

Inadequate financing for immunization coupled with the heavy reliance on development partner support not only raises sustainability concerns but also highlights other challenges that come with external funding. Majority of the funding from development partners is 'off-budget' making it difficult for the Ministry of Health to track these expenditures or coordinate efforts of development partners coupled with the lack of alignment to key country priorities [20]. Evidence also shows that support from development partners is often found to be unevenly targeted in terms of its developmental impact given that it is mainly focused on financing recurrent costs (vaccines and supplies) rather than long term improvements (infrastructure) [23]. Development partner support is expected to increase allocation of developing country resources towards health programs/immunization or even result into the same degree of benefit however, this cannot be guaranteed due to several complexities of the ability and willingness of governments to pay for health care [24]–[27].

In terms of immunization spending on specific program activities, findings showed that facility based routine immunization took up 80% which is driven by the expenditure on human resource which takes up a big proportion of service delivery. Human resources take up the bulk of Government of Uganda's financial contribution. These findings are similar to costing estimates that also showed facility based routine costs to take up majority (45%) of the expenditure specifically on human resource taking up 43% [28]. High personnel expenditure is a key driver especially for program resources right after the expenditure on vaccines and supplies (27).

The study also highlighted a change in management of funds at national level. As of 2016, National Medical Stores managed about 66% of the immunization envelope. The amount of funds managed by National Medical Stores has increased by 78% since 2010 [28]. This may be largely explained by the organizational changes and the increase in Gavi funds in 2015 and 2016. In 2013, the responsibility for supplies vaccine logistics management and vaccine quality and safety was shifted from UNEPI to the NMS in April 2012 [30] and as such this meant less financial flow of funds to UNEPI. However, due to the Health System Strengthening Grant and the several new vaccine introductions, UNEPI is also managing more funds (17%) despite the organizational changes when compared to the 8% it was managing in 2010 [28].

At district level, the district health office receives immunization funding from two sources including public funds (PHC grant) and funding from development partners including Gavi, UNICEF and WHO. From the seven districts visited, findings show that WHO provided the biggest proportion (57%) of the funds followed by UNICEF that provided about a quarter of the resources. Gavi provided an average of 15% of the funds at district level in the sampled districts. These findings also show the significant role development partners play even at district level. For the PHC grant however, more than half of the districts allocated less than 15% of the total annual resources to immunization activities which translates to US\$ 1,452 annually per district. The total PHC grant across the districts varied from US\$3,794 to US\$14,056 per year. Considering that the PHC grant is sent on a quarterly basis and is meant to support all the activities conducted by the Health Office, including immunization activities as well as support routine support supervisions to the health facilities, store and in some cases deliver vaccines to the health

facilities, maintain the cold chain systems at the health facilities, plan, budget and hold immunization specific meetings [12], these funds are inadequate. Allocation of the PHC grant to immunization at the districts is highly dependent on the degree of prioritization given the already stretched resources. In one district however, public funds were completely re-directed due to the presence of donor funds which was shown by a 0% allocation of the PHC grant to immunization because the district primarily relied on development partner support immunization activities. As such, the presence of development partner support for immunization in that district led to reallocation of the PHC grant to other health programs. This meant that the district was relying on additional funding from development partners to run several activities which emphasizes the need for more sustainable sources of funding.

At health facility level, the overall annual average expenditure on immunization (PHC grant) across all levels of care in the sample was 6% with the lowest health centers (HC IIs) spending the largest proportion (47%) of their PHC funds on immunization. Majority of the facilities spent their PHC grant on outreaches (88%) specifically on per diems/outreach allowances (73%) for staff to conduct the outreaches. These findings show an increase in resources allocated to outreaches when compared to an earlier costing analysis in 2011 that showed that health facilities (all levels) were allocating only 28% of their resources to outreaches [28]. In terms of service provision, majority of services are being provided by government health facilities of which the bulk of the funding supports facility based routine immunization activities (80%). This is consistent with Guthrie et al who also showed that the largest proportion of funding in 2011 was devoted to routine facility based immunization with an average of 40% across all levels of care [10]. Therefore, majority of the funds are still spent at the level of service delivery. Despite the fact that health facilities and District Health Offices provide the largest proportion of immunization activities, it is important to note that they do not manage an equally large proportion of funds as illustrated by the existing financing agents. This implies that the financing agents make decisions on how the funds should be utilized while service providers implement what has been decided upon.

Study Limitations

This study however, had limitations but they are unlikely to affect the main findings and conclusions from this exercise. The district level expenditure analyses only purposively sampled seven districts due to budget constraints and therefore findings cannot be generalized to all districts. Despite this, the study ensured that the districts selected accounted for performance in light of the Reach Every District Strategy, were geographically representative and ensured triangulation of findings at the different levels. Further, the Government of Uganda resources at sub-national level could have been underestimated given that it did not include the cost of salaried labor, purchase, storage, and distribution of vaccines. Despite this, this contribution was accounted for at national level using previous estimates from Guthrie et al.

Conclusions

Results highlight the increasing trend in the resource envelope for immunization since 2012. There is a substantial contribution from development partners in supporting the immunization program in Uganda with Gavi, the Vaccine Alliance being the biggest contributor. The bulk of funding from Government of Uganda is on human resource. Much as development partners have supported the EPI program the pattern of their contribution is largely unpredictable, often off budget and may at times not be fully aligned to key priorities. The immunization financing as is, is not sustainable especially to maintain high coverage rates and this is exacerbated by the expensive vaccines that have been introduced and other vaccines that are planned for introduction.

Recommendations

This warrants an increase in financial commitment to the immunization program by Government of Uganda, ring-fencing resources for immunization at district level, and also operationalization of the existing financial sustainability plan for immunization. Further financial mappings will be very crucial in the coming years. This study calls for continuous tracking of resources and increasing government expenditure in light of sustainability.

Abbreviations

cMYP	Country Multi Year Plans
DHO	District Health Officer
EPI	Expanded Program on Immunization
Gavi	The Global Alliance for Vaccines and Immunizations
GOU	Government of Uganda
HC	Health Center
MOH	Ministry of Health
NGOs	Non-Government Organizations
NHA	National Health Accounts
NMS	National Medical Stores
PHC	Primary Health Care Grant
SIA	Supplemental Immunization Activities
SHA	System of Health Accounts
UNEPI	Uganda National Expanded Program on Immunization

Declarations

Ethical Considerations and consent to participate

Largely, this study posed no more than minimal risks to participants; nonetheless, ethical approval was obtained for the broader study (Gavi, Full Country Evaluation) from School of Medicine Research Ethics Committee in Uganda and the Uganda National Council of Science and Technology. In addition, permission was sought from the MOH, UNEPI, District Health Officers and health facility's managers for each of the sampled districts. All participants were enrolled in the study after providing written informed consent.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interest.

Funding

The study was funded by Gavi, the Vaccine Alliance under the bigger evaluation titled the Gavi Full Country Evaluation.

Acknowledgments

We wish to acknowledge support from the Uganda Expanded Program on Immunization, Ministry of Health, immunization partners and the districts that provided data for the study. Methodological design and analysis were adopted from Guthrie et al. with the significant technical support of Health Net Consult. Support from the Gavi, the Vaccine Alliance, IHME and PATH are also acknowledged.

References

- [1] World Health Organization, "WHO | Immunization," *WHO*. [Online]. Available: <http://www.who.int/topics/immunization/en/>. [Accessed: 12-Feb-2020].
- [2] United Nations, "Goal 3, Sustainable Development Knowledge Platform." [Online]. Available: <https://sustainabledevelopment.un.org/sdg3>. [Accessed: 12-Feb-2020].
- [3] World Health Organization, "WHO UNICEF coverage estimates WHO World Health Organization: Immunization, Vaccines And Biologicals. Vaccine preventable diseases Vaccines monitoring system 2019 Global Summary Reference Time Series: DTP3." [Online]. Available:

http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveredtp3.html.
[Accessed: 12-Feb-2020].

[4] Gavi Full Country Evaluations Team, "Gavi Full Country Evaluations: 2017–2018 Dissemination Report, Uganda." IDRC, 2018.

[5] World Health Organization, "WHO | Global Vaccine Action Plan 2011-2020." .

[6] Ministry of Health, "HEALTH SECTOR DEVELOPMENT PLAN 2015/16 - 2019/20," Ministry of Health, 2015.

[7] Ministry of Health, Uganda, "The Uganda Health Accounts. National Health Expenditure. Financial Years 2016/17 & 2017/18." Ministry of Health, 2017.

[8] World Health Organization, "Immunization, Vaccines and Biologicals. WHO/UNICEF Joint Reporting Process.," 2019. [Online]. Available:
https://www.who.int/immunization/monitoring_surveillance/routine/reporting/en/.

[9] SABIN Vaccine Institute., "Immunization Policy and Financing. Uganda.," 2019. [Online]. Available:
<https://www.sabin.org/programs/sustainable-immunization-financing/uganda?language=en#gsi>.

[10] Guthrie, T., Zikussoka C., Kwesiga B., Abewe C., Lagony S., Schutte C., Marianda E., Humpreys k., Mtologelwa K., Nombweu Z.C., Brenzel L., Kinghorn A., "Mapping financial flows for immunisation in Uganda 2009/10 and 2010/11: New insights for methodologies and policy.," *Vaccine*, vol. 7, no. 33, 2015, doi: 10.1016/j.vaccine.2014.12.053.

[11] World Health Organization, *A System of Health Accounts 2011 Edition: 2011 Edition*, vol. 2011. OECD Publishing, 2011.

[12] Ministry of Health, Uganda, "Primary Health Care Grants Guidelines." 2016.

[13] World Health Organization, "Microplanning for immunization service delivery using the Reaching Every District (RED) strategy." Expanded Programme on Immunization of the Department of Immunization, Vaccines and Biologicals, 2009.

[14] L. Brenzel, D. Young, and D. G. Walker, "Costs and financing of routine immunization: Approach and selected findings of a multi-country study (EPIC)," *Vaccine*, vol. 33 Suppl 1, pp. A13-20, May 2015, doi: 10.1016/j.vaccine.2014.12.066.

[15] Ministry of Health, "Health Sector Strategic & Investment Plan. 2010/11 – 2014/15," Jul. 2010.

[16] Gavi, Full Country Evaluations Team., "Gavi Full Country Evaluations: 2014 Dissemination Report, Uganda.," Seattle, WA: IHME, 2014.

- [17] Gavi, Full Country Evaluations Team., "Gavi Full Country Evaluations: 2016 Dissemination Report, Uganda.," Seattle, WA: IHME, 2016.
- [18] "Gavi country factsheet: Uganda." [Online]. Available: <https://www.gavi.org/country/uganda/>. [Accessed: 19-Jul-2018].
- [19] L. Brenzel and C. Politi, "Historical Analysis of the Comprehensive Multi-Year Plans in GAVI-Eligible countries (2004 - 2015)." World Health Organization, 2012.
- [20] Ministry of Health, Uganda, "The Uganda National Expanded Program on Immunization Multi Year Plan. 2016-2020." 2016.
- [21] Ministry of Health, "Financial Sustainability Plan for Uganda's Immunisation Program. 2016/17 - 2020/21," Ministry of Health, Uganda.
- [22] Ministry of Health, Uganda, "The Uganda Health Accounts. National Health Expenditure. Financial Years 2010/11 & 2011/12." Ministry of Health, 2017.
- [23] M. Kaddar, D. Levin, L. Dougherty, and D. Macelra, "Costs and Financing of Immunisation Programs: Findings of Four Case Studies.," *Univ. Res. Co LLC*, vol. 26, p. 60, May 2000.
- [24] C. Waddington, "Does earmarked donor funding make it more or less likely that developing countries will allocate their resources towards programmes that yield the greatest health benefits?" *Bulletin of the World Health Organization*, 2004.
- [25] S. Thomsaon, T. Foubister, J. Figueras, J. Kutzin, G. Permanand, and L. Brybdova, "Addressing financial sustainability in health systems." World Health Organisation, Europe., 2009.
- [26] World Health Organisation, "Economics of immunization: a guide to the literature and other resources." Department of Immunization, Vaccines and Biologicals, 2004.
- [27] P. Lydon *et al.*, "Introducing new vaccines in the poorest countries: What did we learn from the GAVI experience with financial sustainability?," *Vaccine*, vol. 26, no. 51, pp. 6706–6716, 2008.
- [28] T. Guthrie, C. Zikusooka, and B. Kweisga, "Costing and Financing Analyses of Routine Immunization in Uganda." *Health Development Africa*, 2014.
- [29] M. Van Hoang, T. B. Y. Nguyen, B. G. Kim, L. H. Dao, T. H. Nguyen, and P. Wright, "Cost of providing the expanded programme on immunization: findings from a facility-based study in Viet Nam, 2005," *Bull. World Health Organ.*, vol. 86, no. 6, pp. 429–434, Jun. 2008, doi: 10.2471/BLT.07.045161.
- [30] Gavi, Full Country Evaluations Team., "Gavi Full Country Evaluations: 2013. Dissemination Report, Uganda.," Seattle, WA: IHME, 2013.

Figures

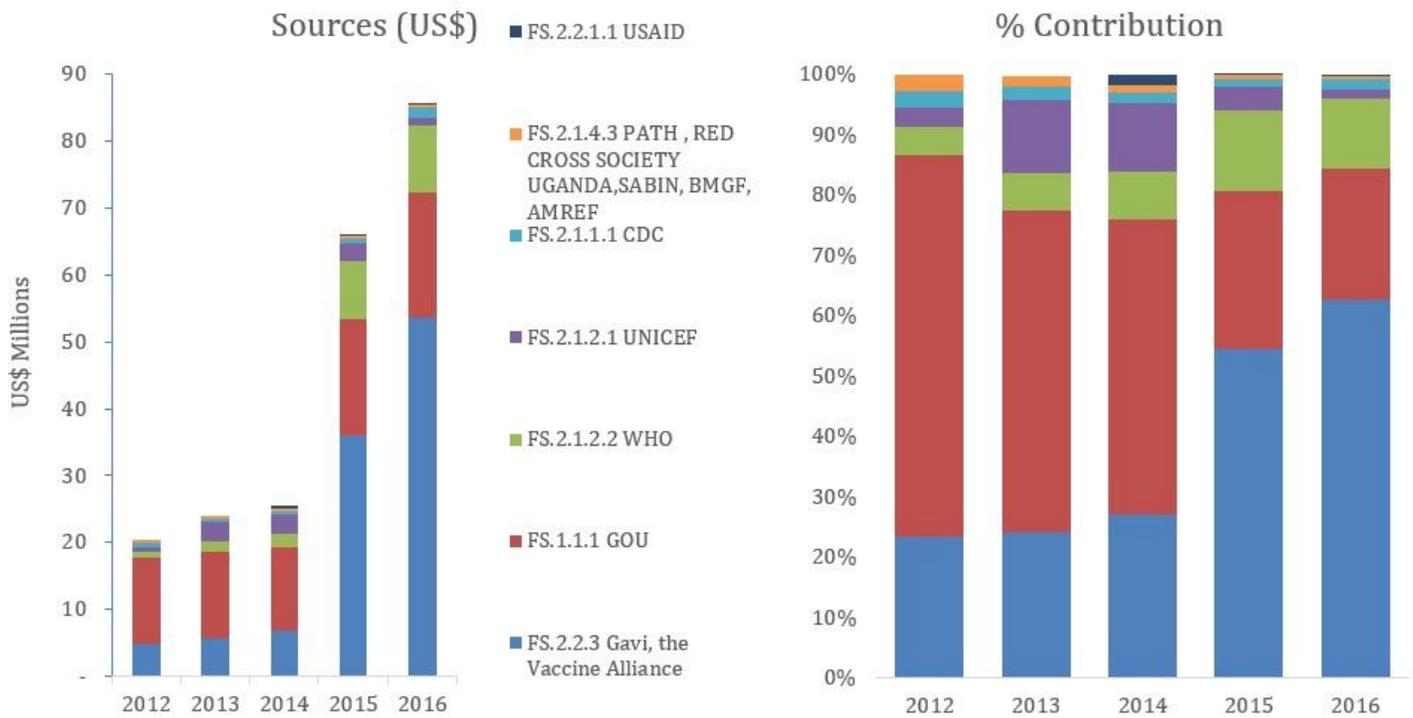


Figure 1

Sources of funding and their percentage contribution from 2012 to 2016.

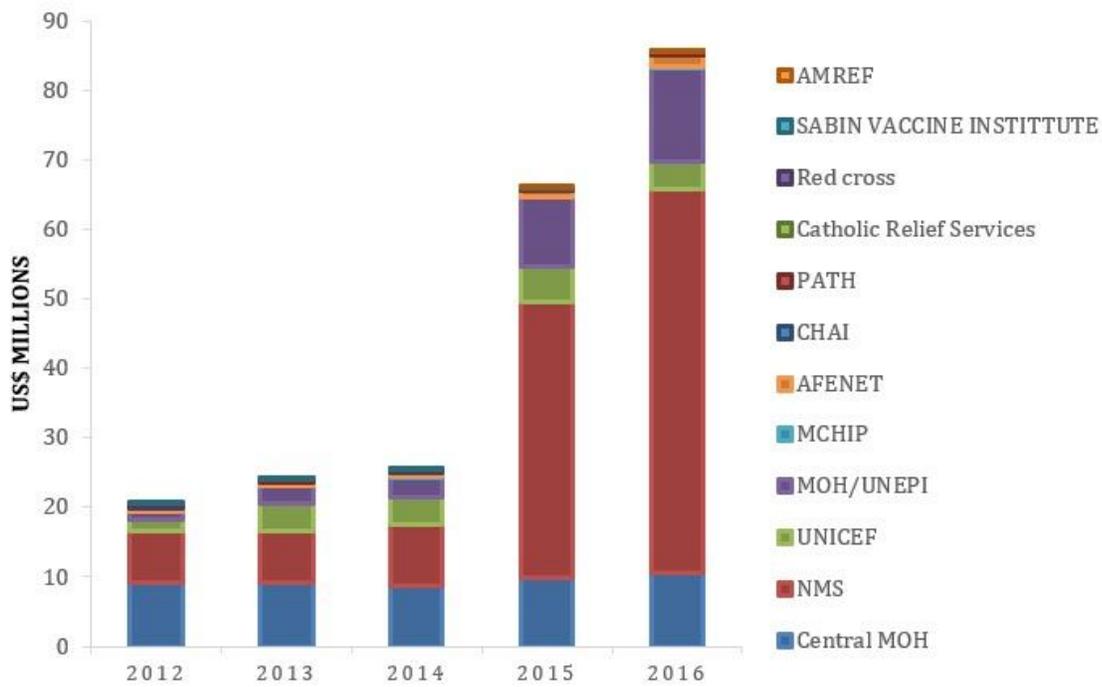


Figure 2

Trends in financing agents for Immunization funds in Uganda from 2012 to 2016.

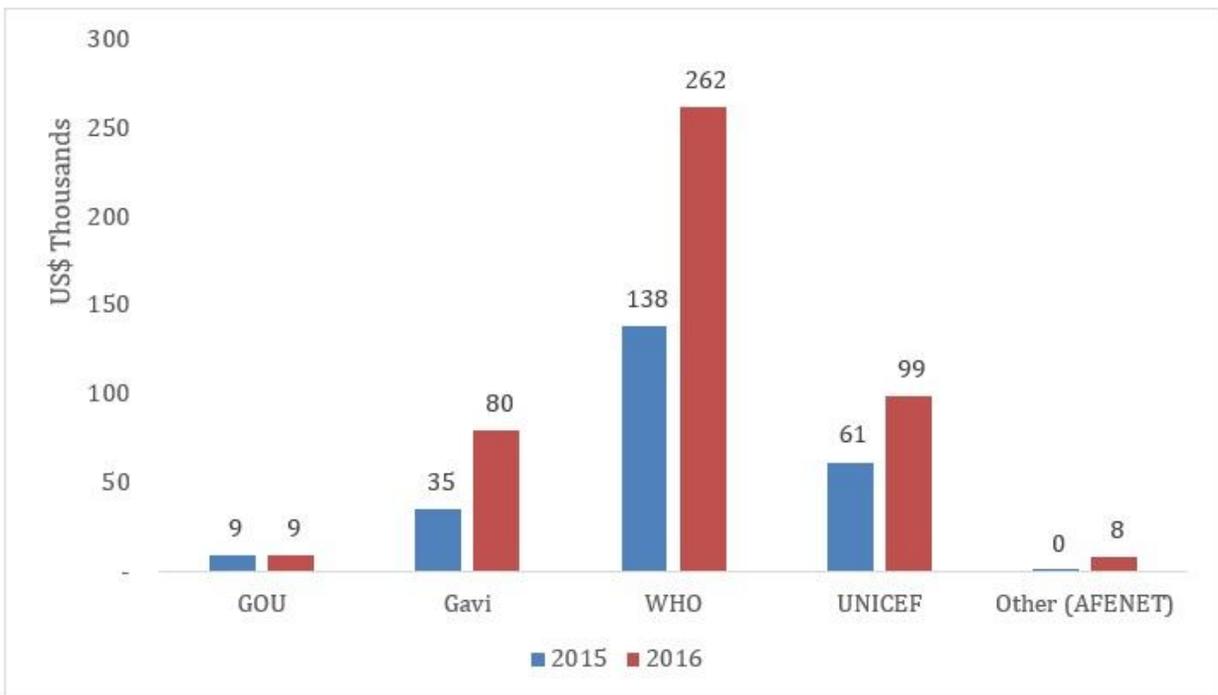


Figure 3

Sources of funding for immunization at district level.

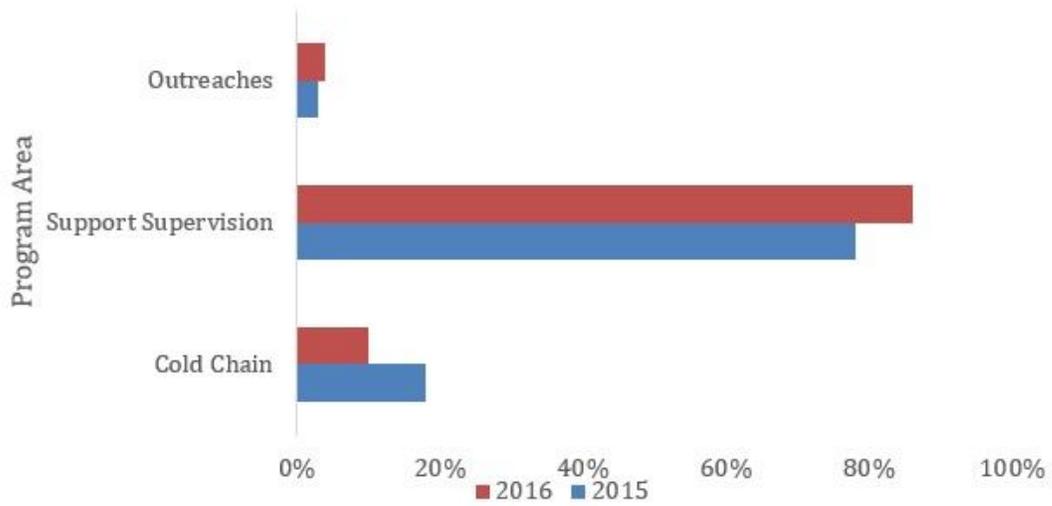


Figure 4

District Expenditure of Public funds on immunization (by program area)

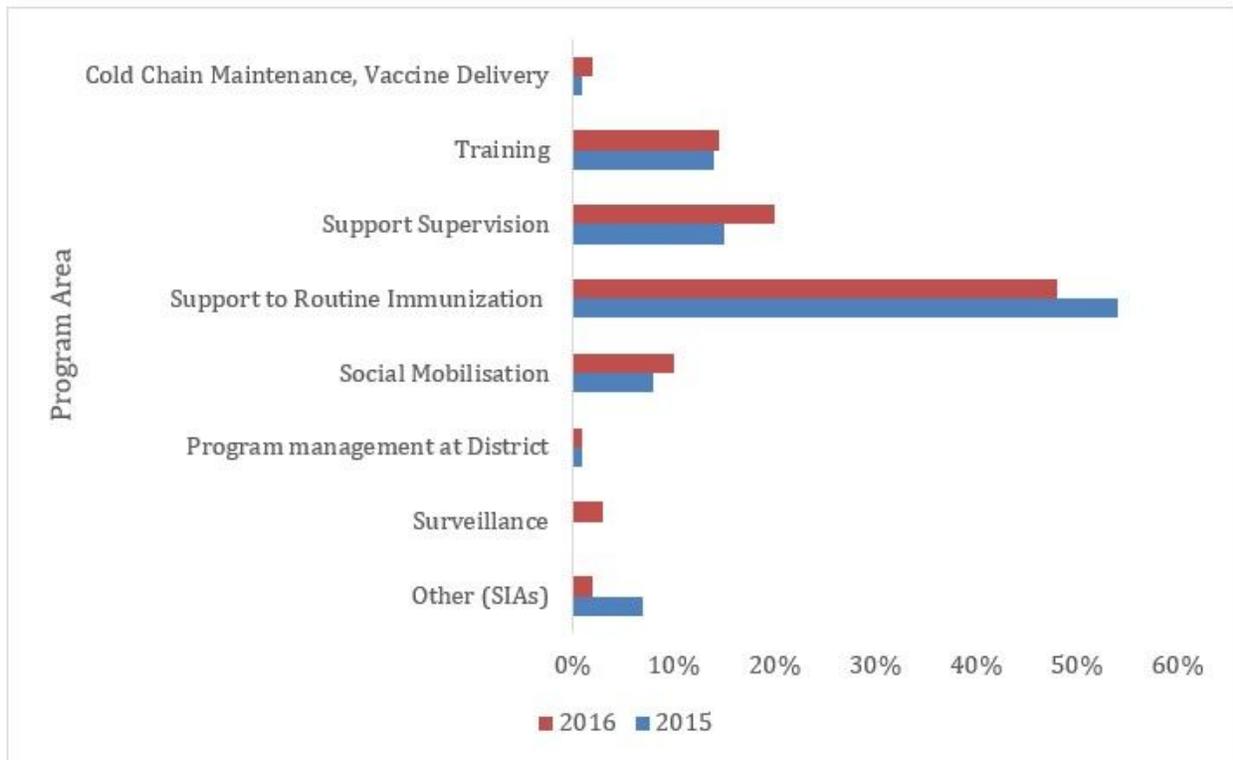


Figure 5

District Expenditure of development partner funds (by program area)

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [s1.jpg](#)