UTILIZATION OF DONOR FUNDING TO ACHIEVE UNIVERSAL HEALTH COVERAGE SUB-NATIONALLY.
AN EVALUATION OF DONOR FUNDING FOR THE EXPANDED PROGRAM ON IMMUNIZATION IN NIGERIA

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55th Master of Public Health/International Course in Health Development.
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Master of Public Health

By

Joan Preye Alaboson

Nigeria

Declaration:

Where other people's work has been used (either from a printed source, internet or any other source) this has been carefully acknowledged and referenced in accordance with departmental requirements.

The thesis "**UTILIZATION OF DONOR FUNDING TO ACHIEVE UNIVERSAL HEALTH COVERAGE SUB-NATIONALLY. AN EVALUATION OF DONOR FUNDING FOR THE EXPANDED PROGRAM ON IMMUNIZATION IN NIGERIA"** is my own work.

Signature: 

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List of abbreviations and acronyms

BMGF	Bill and Melinda Gates Foundation
bOPV	Bivalent Oral Polio Vaccine
CMYP	Comprehensive EPI Multi Year Plan
CRS	Creditor Reporting System
DAC	Development Assistance Committee
DHPRS	Department of Health Planning, Research and Statistics
DHS	District Health Survey
EPI	Expanded Program on Immunization
EU	European Union
FMOH	Federal Ministry of Health
HIV/AIDS	Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome
HSS	Health System Strengthening
ICC	Interagency coordination committee
IMR	Infant Mortality Rate
GAVI	The Global Vaccine Alliance
GDP	Gross Domestic Product
GF	Global Fund
GNI	Gross National Income
HDI	Human Development Index
MDG	Millennium Development Goals
NEEDS	National Economic Empowerment and Development Strategy
NHA	National Health Account
NHIS	National Health Insurance Scheme
NPHCDA	National Primary Health Care Development Agency
OASIS	Organizational Assessment for Improving and Strengthening Health Financing
ODA	Official Development Assistance
OECD	Organization for Economic Co-operation and Development
OOP	Out of Pocket Payment
OPV	Oral Polio Vaccine
PHC	Primary Health Care
PPP	Purchasing power parity
RI	Routine Immunization
SES	Socio-Economic Status
SDG	Sustainable Development Goals
SIA	Supplementary Immunization Activities
SIGI	Social Inclusions and Gender Index
SSA	Sub Saharan Africa
UHC	Universal Health Coverage
USD	United States Dollar
U5MR	Under Five Mortality Rate
WHO	World Health Organization
UNICEF	United Nations Children's Fund

Working definitions

ODA: the Organization for Economic Co-operation and Development definition is used – referring to donor government grants or loans to receiving countries as identified by the Development Assistance Committee either directly or through multilateral organizations involved in development with loans having a grant component of 25% or above (1).

Donor funding: financing from external sources to countries in need, aimed at achieving development goals (2).

Managing agencies: organizations through which ODA or donor funding in the form of grants or loans are channeled to recipient countries. These include bilateral organizations for example DFID, global health partnerships, amongst others (3).

Spending agencies: organizations that utilize ODA or donor funding to finance the implementation of development activities in recipient countries. These include multilateral organizations including the United Nations agencies, global health partnerships including GAVI, recipient country governments amongst others (3).

Investment project assistance: transfer of monetary, technical, or goods from donor countries to receiving countries, usually with an intermediary managing or spending agency (4).

DAC countries: are member countries of the Development Assistance Committee providing the greatest funding for development worldwide (5).

GAVI supported vaccines: refers to vaccines that GAVI funding is used to procure in eligible countries, which are largely new or poorly used in recipient countries (6).

SWOT analysis: an assessment of the strength or weaknesses, opportunities or threats of a course of action or program (7).

Paris declaration: an agreement in 2005 by donor and recipient countries alike towards the effectiveness of aid through improved quality donor funding (8).

Fiscal space for health: refers to governments' ability to provide resources or create budgetary allowance for the health sector, in the face of other sectors and competing needs (9).

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Abstract

Introduction
Immunization - contributing to reducing under-five mortality - has variable sub-national coverage, also lower in Northern Nigeria. GAVI funding for immunization will cease, following transition in 2022. But low evidence on country transition experiences to guide effective aid utilization exists. Donor funding for immunization and its achievement of universal health coverage sub-nationally is assessed.

Methods
A literature review on donor funding for expanded program on immunization in Nigeria, compared to Ghana and Kenya, was done. Its analysis utilized a modified Development Assistance Committee criteria framework.

Findings
Ineffective vaccination coverage sub-nationally; is associated with differences in sub-national resources, and poor health system stewardship in Nigeria. Donors fund vaccine procurement mainly, with some health system strengthening and community participation for increased effectiveness. Additionally, integrating the private sector increases efficiency in Ghana and Kenya. However weak health systems hinder successful transitioning off donor funding.

Conclusions
Ineffective government stewardship, ineffectively coordinates donors decreasing funding efficiency. Insufficient resources and poor planning sub-nationally influenced by decentralization hinders the equity and sustainability of the expanded program on immunization sub-nationally limiting universal health coverage.

Recommendations
Donors should reformulate policy for greater health systems focus, promotion of vertical equity sub-nationally, and universal health coverage. Federal government should analyze decentralization policy's effect on the immunization system informing policy reformulation, while ensuring greater community engagement in immunization.

Keywords: Nigeria, donor funding, immunization, universal health coverage

Word Count: 13181

Introduction

The concept of donor funding was conceived - following the second world war - to assist in rebuilding countries in Europe, thus contributing to their development (10). Considered a success, since the late 1950's, it has been applied to assist low income countries particularly in Africa (10), to support development - economic, demographic, and health - goals (11).

Enormous international and financial support of the millennium development goals (MDG), manifested in massive global increases – in donor aid for health – from a baseline of 5.7 billion USD to 28.1 billion USD in 1990 and 2012, respectively (1). This funding targeted HIV/AIDS, malaria, and child mortality amongst other goals, with appreciable achievements globally (1). Similarly, in Nigeria within this period, increased funding to these areas occurred with comparatively decreased interest in system wide investments (1) (12). However since 2015, a decline in donor aid for health across Africa and Nigeria, has been noted (13).

In assessing the achievement of the funding towards development goals however, under-five mortality - amongst other indicators - is used as a proxy (14). In Nigeria, though recording a downward trend in under-five mortality in the demographic and health surveys of 2013 and 2018 (15)(16), infant and under-five mortality rates in 2018 remain high at 67 and 132 (deaths per 1000 live births) respectively with wide sub-national ranges (15). This is higher than Sub-Saharan African values at 51.8 and 75.9 deaths per 1000 live births (17). Not only was the millennium development goal target 4 unmet (16), but a wide gap to achieve the sustainable development goal target 3.2 of under-five mortality below 25 deaths per 1000 live births remains to be achieved (18).

Immunization remains a cost-effective intervention to prevent deaths in under-fives attributable to vaccine- preventable diseases, worldwide (18). More so, it is a public health good (4), with capacity to influence health outcomes across international borders. In Nigeria the reductions in under-five mortality have been associated with scaling up of immunization coverage – with 80% coverage target in every local government area (14). Still in 2018, only 31.3% full immunization coverage was noted with variable inter and intra state coverage (15). The reasons for this include socio-economic, cultural and other differences sub-nationally that limit access to immunization services. This is in spite of an estimated 282 million current USD spent by external sources financing – approximately double government spending - on immunization programs in 2016 (19).

It is important to maximize all existing resources, particularly with declining donor aid for health, to rapidly achieve current sustainable development targets, including immunization. I found while working with an implementing partner on a donor funded HIV/AIDS project, that sustaining the gains of donor funded programs, requires contextual planning for sustainable adoption as I observed following exit, program gains rapidly reverted. Therefore these plans require several reformulations during the exit phase to ensure continuity.

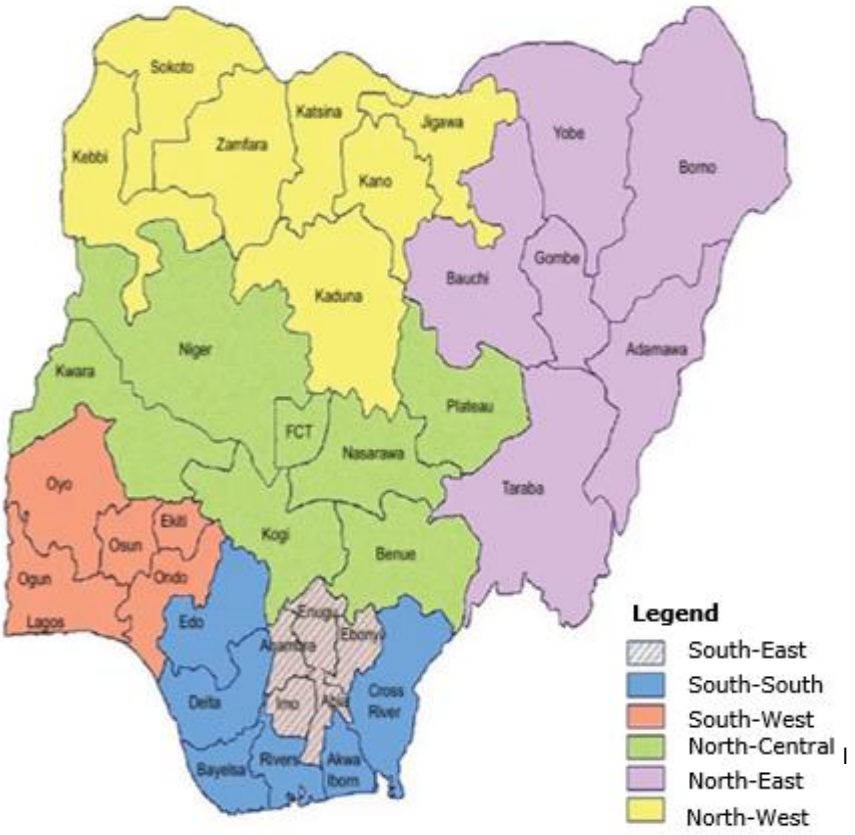
It is the aim of this study to assess donor funding for the Expanded Program on Immunization (EPI) and its achievement of universal health coverage sub-nationally in Nigeria, as well as in two comparable countries. Through a review of literature, an analysis - using a modified framework of the OASIS approach and DAC criteria - of the expanded program on immunization, will be done. Through the findings, policy makers in donor countries and institutions, and the Nigerian government will be assisted with options to better deploy resources to ensure universal health coverage, in the expanded program on immunization.

CHAPTER 1: BACKGROUND INFORMATION ON NIGERIA

1.1 Geographical and administrative profile

The Federal Republic of Nigeria (see figure 1) located in West Africa, has an area of 923,768 sq. km bordered by Chad, Niger, Benin, Cameroon and the Atlantic Ocean (20). Nigeria has a decentralized federal system (21), with a federal government, 36 federating states and a federal capital territory - grouped into six [North-West, North-Central, North-East, South-West, South-South and South-East] geo-political zones (15). The states are divided into 774 local government areas, with 374 identified ethnic groups (15).

Figure 1: Map of Nigeria showing geo-political zones (22).



1.2 Demographic profile

With an estimated population - in 2017 - over 190.6 million, Nigeria has the largest population in Africa (7) (20)(23). The total fertility rate in 2018 of 5.3 children per woman along with a low contraceptive prevalence rate of 16.6%, results in a young population - with 42.5% below 14 years. (15)(20). In this context child health interventions would continue to be relevant.

1.3 Socio-economic profile

Nigeria's current gross national income (GNI) per capita at 1960 in current US dollars (USD) has been in decline since 2016, when assigned a low middle income status by the World Bank because a GNI per capita of 2470 current USD – falling between 996 – 3895 (GNI per capita in current USD) was achieved (24). Despite this national wealth, two of every three persons lived below the poverty line in 2018 (15)(25). 70% of whom more likely lived in the North compared to the South (25). To her 2017 gross domestic product (GDP) of 375,745 million (in current) USD (26), the services and oil sectors led other sectors contributing 48.28% and 10% respectively (27). Of those employed, 90% are informally engaged – and mostly women (28). Nigeria also deals with conflict in the North-East, resulting in increased regional displacement of people (23).

The 2017 human development index (HDI) ranked Nigeria at 157 - of 189 countries - with a value of 0.532, placing her in countries with low human development (29). It is below the average Sub-Saharan Africa (SSA) development index of 0.537 (29). Adjusted for inequality, the HDI drops by 34.7% which is lower than the average loss expected in SSA at 30.8% - indicating higher subnational inequality (29). Additionally, Nigeria in 2019 is categorized as

having high gender discrimination with a value 46.8% of the composite assessment of gender equality by the social inclusions and gender index (SIGI) (30).

1.4 Health profile

In 2017, life expectancy at birth for males and females was 55 and 56 years respectively, with 10% probability of dying under-five (31). With over 3.9 million children unvaccinated the same year, Nigeria ranked first of 33 countries that year (32). Communicable diseases topped the highest causes of mortality – in all ages and sexes - closely followed by non-communicable diseases in 2017 (33). However, communicable diseases in addition to nutritional deficiencies - in children - mainly caused disability-adjusted life years (DALYS) per 100,000 population (in all ages and sexes) in 2017 (33).

1.5 Overview of the health system

The Nigeria health system is structured on the primary health care (PHC) approach based on the Alma Ata declaration (34). In the public sector, primary, secondary, and tertiary level of health care is provided by the local, state, and federal government, respectively; designed to involve the community at primary level (34). Additionally, formal private health providers (for profit and not for profit) – and informal traditional healers – play an important role in health service delivery (34).

Nationwide, the Federal Ministry of Health (FMOH) led by the minister of health governs the health system, through policy development, and planning - for national and state levels – (34). It oversees international health and liaises with semi-autonomous agencies on health for example National Health Insurance Scheme (NHIS) and National Primary Health Care Development Agency (NPHCDA)(34). The NPHCDA (at state level the SPHCDA), oversees PHC delivery - including the EPI - through routine and supplementary immunization activities (SIA) (34). However, inadequate, and mal-distributed health workers - favoring urban areas despite 54% of population living in rural areas – reduces access to health for those in need (15)(35).

1.6 Overview of the Expanded Programme on Immunization (EPI)

Introduced in 1978, the EPI aimed to eradicate measles, tuberculosis, polio, diphtheria, and yellow fever through routinely immunizing children under-two years (see annex 1 for immunization schedule) (36). It is coordinated by an Interagency Coordinating Committee (ICC) made up of the ministries of health at all levels, and development partners providing programmatic guidance. Donors finance procurement and operations largely; however remuneration for health workforce is funded by the government (7). The public sector provides 85% of EPI services through permanent, outreach and mobile services (7). The EPI supply chain managed centrally, distributes to geo-political zones, states, then local governments and health facilities (7).

1.7 Overview of the national expenditure on health

In Nigeria, health expenditure is financed through revenue from out of pocket payments, taxation, donor funding, mandatory and private pre-payments. Of the total health expenditure in 2016, the government spent 13%, private sector 77% - consisting of 75% out of pocket (OOP) – and external (donor funding) 10% (19). The contribution of donors approximated 285 billion naira, equivalent to almost half of the Nigerian government share in financing health highlighting their importance (37). However, both sources are overshadowed by households paying out of pocket at points of service, reflecting a need for financial protection.

1.8 Overview of the health financing function in Nigeria

In spite predominant OOPs as discussed in section 1.7, vaccines are provided free for infants (34). However, Sibeudu et al demonstrated that informal user fees and transportation costs limit households of lower socio-economic status (SES) from accessing immunization (38).

The governments' budgetary expenditure on health as a percentage of the government expenditure was 4% and 5% in 2013 and 2016 respectively (19). In 2013 this approximated 1.8 billion USD, with budgetary allocations to immunization of 3.1% - approximately 57.5 million USD (7). Also, The Basic Health Care Provision Fund (BHCPF) further aims to improve access to healthcare (39)(40), utilizing funds to increase population coverage of the NHIS and funding of essential drugs and technology in qualifying PHCs (40)

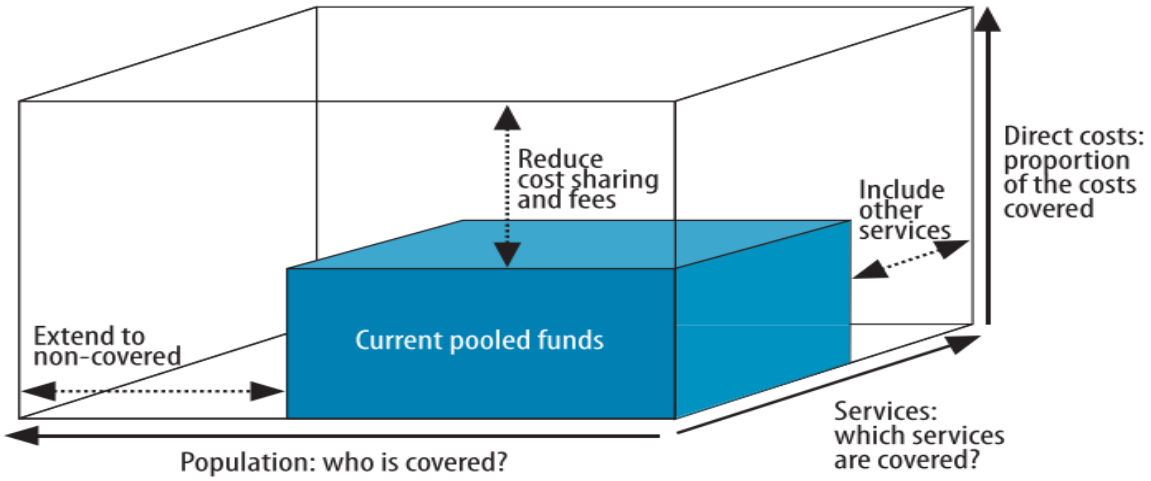
The NHIS pools health resources formally, but this is currently adopted by only two states and the federal government (41). However, insurance schemes have been shown to increase utilization of health services (42), and can influence immunization services in Nigeria. Additionally, the government of Zamfara and Kano States in Northern Nigeria – in 2009 and 2013 respectively - supported by local governments and The Global Vaccine Alliance (GAVI), set up basket funds to pool finances to support immunization (43).

The government at all levels purchase health services in the public sector (44), through global budgets and or commodity supplies, as the health financing policy of 2006 directs a split in purchasing and providing health in public agencies (45)(46). With health management organizations acting as intermediaries to purchase health services from a mix of public and private health providers (39). Nationals through OOPs or benefit packages of the NHIS access health services. A more detailed overview of the health financing function in Nigeria is provided in annex 2.

1.9 What universal health coverage is?

Universal health coverage (UHC) is a health system goal ensuring everyone accesses all needed essential and quality health services equitably, through shared risk and cost, and prepayment mechanisms (47). It is a target (3.8) of the sustainable development goals, interpreted and implemented differently amongst countries (47). Through their systems for financing health, UHC is achieved by progressively raising sufficient resources for health, in ways that reduce the financial hardship of people, and efficiently use resources (48). This is through increased pre-payment and risk pooling (48). However countries - including Nigeria - are faced with choosing between extending population coverage, increasing service inclusion and or reducing the user fees, to expand pooled funds in achieving UHC as shown in figure 2 (48). Through NHIS, and the BHCPF as mentioned previously Nigeria – increasing pooled health funds aims to achieve UHC (40)(41).

Figure 2: Moving toward UHC? The three dimension to consider – The UHC cube (48).

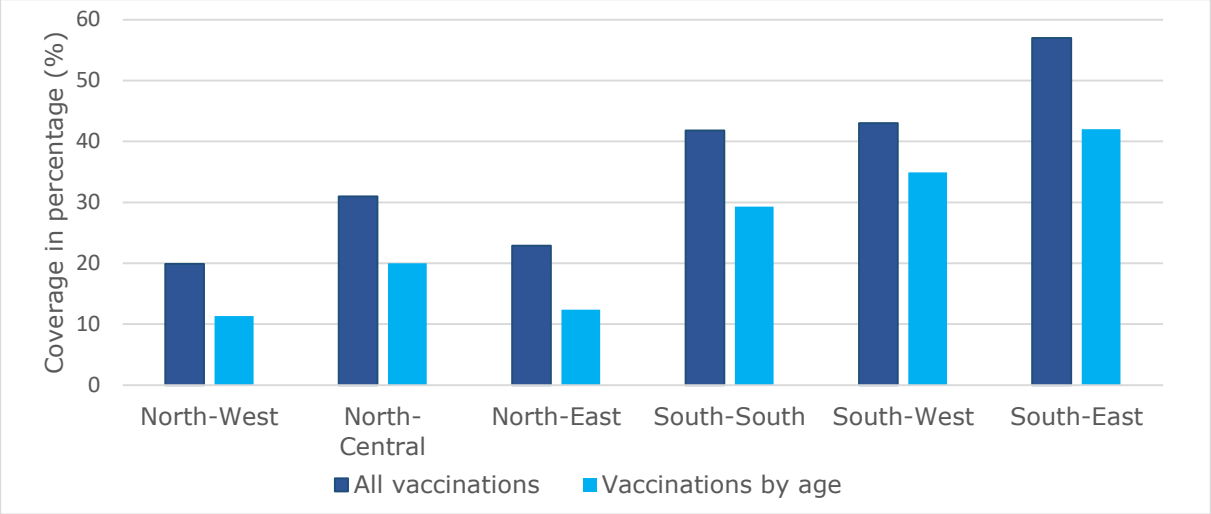


CHAPTER 2: PROBLEM STATEMENT, JUSTIFICATION, OBJECTIVES, METHODOLOGY AND LIMITATIONS

2.1 Problem statement

Although immunization is a cost-effective public health intervention (18)(49), in Nigeria its coverage has remained low. The highest immunization coverage nationwide was recorded in the early 1990s at 81.5% (7)(36). This declined to 21.4% in 2003 and gradually increased to 35.4% in 2008 (50). Nigeria also did not attain - by 2010 - universal immunization and coverage rates nationally and sub-nationally of 90% and 80% respectively, following adoption of the United Nations General Assembly Special Session targets on immunization (36)(51). In 2018, only 31.3% of children nationwide were fully vaccinated with basic vaccines; with even lower coverage for vaccinations due by age and regional disparities in coverage (Refer figure 3) (15).

Figure 3: Showing immunization coverage (full and by age) by region in Nigeria, in 2018 (15)



However immunization has been acknowledged as strategy to reduce under-five mortality (51). Consequently, in 2018 under-five mortality rates (U5MR) at 132 deaths per 1000 live births respectively was noted with wide regional ranges (15). This is significantly higher than the Sustainable Development Goal (SDG) targets 3.2 of lower than 25 deaths per 1000 live births of under-fives by 2030 (18). This is because immunization averts illness and deaths from vaccine preventable diseases, which primarily affects children under-five years (49). Inadequate funding for the EPI is recognized as a hindrance to immunization coverage globally (51), and in Nigeria (52)(53).

In 2016, 5% of total federal government spending was allocated to health (54), falling short of the Abuja declaration and commitment of African governments to spend approximately 15% of their budget on health (40). This was comparatively lower than other Sub-Saharan African country's budgetary allocation to health - with Ghana at 7%, Congo (DRC) 4% and Kenya 6% amongst others (54). To finance states inclusive of health, the federal government executes intergovernmental transfers– based on the allocation of revenue act of 2004 (55) - from the federation account receiving mainly crude oil and customs taxes. These allocations are shared on the principle of equality – where size, population density and internal – state and local government - revenue generation is condidered, only after 13% of the revenue – based on the 'Derivation Act' – is shared by the six states generating the crude oil revenue

(56). This promotes inequity, with some states - in the South - receiving more financing, as need-based allocation is less prominent.

Furthermore, as the intergovernmental transfers are unconditional, without earmarking for health or other sectors – even though 15% of the budget is recommended for health - budgetary allocation is autonomous at state level (34)(45). Consequently, different state government financing of health is variable and also inadequate, leading to health inequities at sub – national level. State governments allocate lower than 15% of their budget as well to health ranging from 2% to 15% of state budgets in Ondo in the South-West, and Bauchi in the North-East - states - respectively (41). Although states collectively generate 20% of revenue from internal taxes (41), the capacity and generation of internal revenue from state taxes varies between 196 million and 1.6 billion naira in Lagos – in the Soth-West – and Yobe – in the North-East – respectively (57). Therefore producing between states, variable fiscal space - from which fianancing for health and the EPI is derived – and health and immunization outcomes.

States in the north compared to the south - in the years 2003 to 2005 - had lower public per capita health expenditure with $9.2 and $14.31, respectively (58). This pattern is also seen when private and total health expenditure per capita is considered (58). This low priority on health further limits the implementation of programs including EPI at the sub-national level, resulting in poor program performance and high disease burdens.

Pooling through the National Health Insurance scheme (NHIS) is ineffective in providing coverage of essential health services in Nigeria. The NHIS fund contributes approximately 2% of the overall health expenditure in Nigeria (41) (54). Only covering 5% of the population (37), and lacking capacity to efficiently and effectively manage resources (59). Voluntary (private) health insurance only contributes 1% of total health expenditure and would not be further explored, as it is not relevant in this context (54).

Health purchasing by state government's ministries of health allocate budgets to public providers, through commodities and global budgets (60) on one hand. On the other, through the NHIS (and private health managment companies) they also purchase services from both public and private providers, utilizing capitation and fee-for service mechanisms to re-imburse providers (60). But health planning to efficiently forecast health system needs is weak (37).

In view of these health financing challenges in Nigeria, donor funding has mainly been in the form of 'investment project assistance' over the years (61). External health expenditure rose from 2% to 10% of current health expenditure, between 2006 to 2016, and now is projected to be declining (19). Currently, it is channeled through few global health funding institutions including Global Fund, and The Global Vaccine Alliance (GAVI)(37), the later prioritizing support of the EPI against vaccine preventable diseases (37).

Although co-financing of GAVI supported vaccines has enabled procurement and support of the EPI, in 2008 Nigeria transitioned from low-income to lower middle-income status – by The World Bank classification - limiting access to preferential external funding (37). Consequently, from its transition policy, at the end of the accelerated transition phase of GAVI support in 2022, vaccines procurement would be borne by the government of Nigeria or void created (37)(62). In response, a declaration of national emergency in immunization was made by the government in 2017, recognizing despite donor funding through GAVI over a 20 year period, immunization coverage remained low particularly in the North-East (37).

2.2 Justification

Although Nigeria's infant mortality rate (IMR) and U5MR as reported in the 2008, and 2013 District Health Surveys (DHS) are reducing, there wide regional variation (Refer to table 1)

(16)(14). Recent IMR and U5MR at 67 and 132 (deaths per 1000 live births) (15), mentioned previously, is higher than Sub-Saharan African values at 51.8

Table 1. Infant and under-five mortality rate (per 1000 live births) from 2008 and 2013 Nigeria District Health Surveys by region (16)

	Infant mortality rate		Under – five mortality rate	
	2008	2013	2008	2013
North- East	86	74	188	142
North - Central	77	61	150	95
North - West	86	84	196	160
South - South	80	55	136	85
South - West	55	57	93	77
South - East	93	82	147	116

and 75.9 deaths per 1000 live births (17). To achieve the SDG target 3.2 interventions to reduce measles, diarrhoea, amongst others that contribute to premature deaths in under-fives in Nigeria is needed (33). Increasing routine immunization coverage and introduction of new vaccines through strengthened primary health care, has been identified to reduce child mortality (49). Consequently, Nigeria's Comprehensive EPI Multi –Year Plan (CMYP) of 2016 -2020, targets to increase coverage of Pentavalent vaccine – which introduces Hepatitis B and Haemophilius influenzae B vaccine into the Diphtheria-Pertussis-Tetanus (DPT) vaccine - to greater than 95% in a minimum of 90% of states and local governments (7).

Additionally, introduction of Meningitis-A, Rotavirus and Human Papilloma Virus vaccines – and a switch from trivalent to bivalent oral polio vaccine (bOPV) by 2020, requires a 736% increase in total expenditure from a baseline of approximately 409 million to approximately 3.4 billion USD (7). Of this, expenditure on routine immunization would consume 75% of resources – with 38.4% spent on vaccine procurement and logistics (7).

With 2.55 billion USD secured, having the federal and state government and GAVI as mainly financing approximately 737 million and 691 million respectively, a funding gap of 57% spanning the period was projected – which only reduces to 41% if probable additional funding is considered (7). In the context of transition, the sustainability of financing the EPI taking into account sub- national variability in resource generation and income is questioned (63).

Although evidence on utilizing aid effectively to meet health goals abounds (2)(64)(65), there is low evidence exploring country transition experiences off GAVI funding to refer to. Additionally there is low information on how donor funding and subnational differences interact in the achievement of EPI objectives. This is even though regional inequalities in access - affecting supply side have been identified (53)(66). These gaps presents an opportunity to explore effectively utilizing donor funding in to attain UHC, the light of sub-national differences in Nigeria's EPI.

Therefore the overall aim of this study is to contribute tracing the obscure flow of donor funding to the EPI in Nigeria. Highlighting the effect subnational diversity has on achieving donor funding objectives on the EPI. Exploring how donor funding can accelerate national progress towards UHC. While evidence on donor financing for the EPI is drawn, a focus on GAVI is made as it is the main external financer on national EPI and also in order to compare similar countries with Nigeria.

2.3 Objectives

2.3.1 General Objective

To assess donor funding for Nigeria's EPI and its achievement of universal health coverage sub-nationally; comparing similar middle income countries, so alternate use of donor funding in achieving universal health coverage can be identified; and make recommendations on how donor funding for health can be deployed to ensure universal health coverage.

2.3.2 Specific Objectives:

1. To describe the flow of donor funding for EPI in Nigeria
2. To critically analyze the magnitude, effectiveness and efficiency of donor funding in the EPI to achieve universal health coverage sub-nationally in Nigeria.
3. To compare similar middle income countries with Nigeria, in order to identify alternative use of donor funding in the EPI to achieve universal health coverage sub-nationally.
4. To make recommendations on how donor financing for health can be deployed effectively and efficiently in the period of transition, to ensure universal health coverage sub-nationally in Nigeria.

2.4 Methodology

2.4.1 Study design

This thesis is a literature review of both published and grey literature on donor financing for the EPI in Nigeria. A desk review followed by analysis of data was done. This included the review of reports, policies and proposals published by various stakeholders to achieve universal health coverage through donor financing. Data on the flow, magnitude, effectiveness, efficiency - and other criteria – on donor funding on the EPI for UHC in Nigeria, Ghana and Kenya were researched and analyzed. These countries were chosen for a comparative analysis of the EPI because both are middle income countries, receiving GAVI support, and decentralized as Nigeria. While Ghana is transitioning off GAVI support and Kenya is not; they provided similarity and contrasting experiences in utilizing donor funding of the EPI to achieve UHC.

To enrich the study, donor funding and official development aid (ODA) – for health - was used interchangeably in relation to EPI and UHC, and literature with these themes were included. Literature in English, limited to a ten year period - although relevant older literature - in Nigeria, Ghana, Kenya was also included. Ensuring relevant findings as the landscape of donor financing has changed since 2000, while allowing the inclusion of older literature to its evolution and policies. Where the search unyielding it was widened to include Sub-Saharan Africa. Literature excluded failed to meet the above criteria or required subscriptions.

2.4.2 Search strategy

The Nigeria Federal Ministry of Health, Nigeria National Planning Commission, World Bank, World Health Organization (WHO), Global Alliance for Vaccines (GAVI), Global Fund (GF) and United Nations Children's Fund (UNICEF) websites; Google, and PubMed and Google Scholar databases, and Vrije Universiteit online library, were searched for literature and expert opinions. Snowballing was done to further identify relevant articles from literature.

2.4.3 Keywords

Keywords used in the search were used in various combinations and with Boolean operators AND and OR. These included Nigeria, donor funding, developmental assistance, health, expanded program on immunization, immunization, universal health coverage, effectiveness, efficiency, equity, priorities, GAVI, UNICEF amongst others. A detailed search strategy and keywords used is annexed (see annex 3)

2.4.4 Conceptual Framework

To achieve the study objectives, the following frameworks were identified:

2.4.4.1 The Organizational Assessment for Improving and Strengthening Health Financing (OASIS) approach

The Organizational Assessment for Improving and Strengthening Health Financing (OASIS) approach (67) analyzes comparatively, to what extent donor funding through the EPI achieves universal health coverage within Nigeria (67). It was identified because it is adaptable to any country, and evaluates the strengths and weaknesses of health financing systems, subsystems or schemes (67). Stewardship in the three health financing functions, through institutional design and organizational practice is also assessed. Thus hindrances to achieving the health financing goal of universal health coverage, and overall health system goal of improved and equitable health are identified. Additionally, it identifies improvement areas in policy aimed at enhancing health financing systems to achieve universal health coverage (67). The three health financing functions - through their objectives – are operationalized to nine performance indicators that access health financing performance in achieving universal health coverage. The limitations using this framework however is, it considers the entirety of the health financing function, whereas this study is limited to a national program and its financing through donor financing.

2.4.4.2 Development Assistance Committee (DAC) Criteria for Evaluating Development Assistance

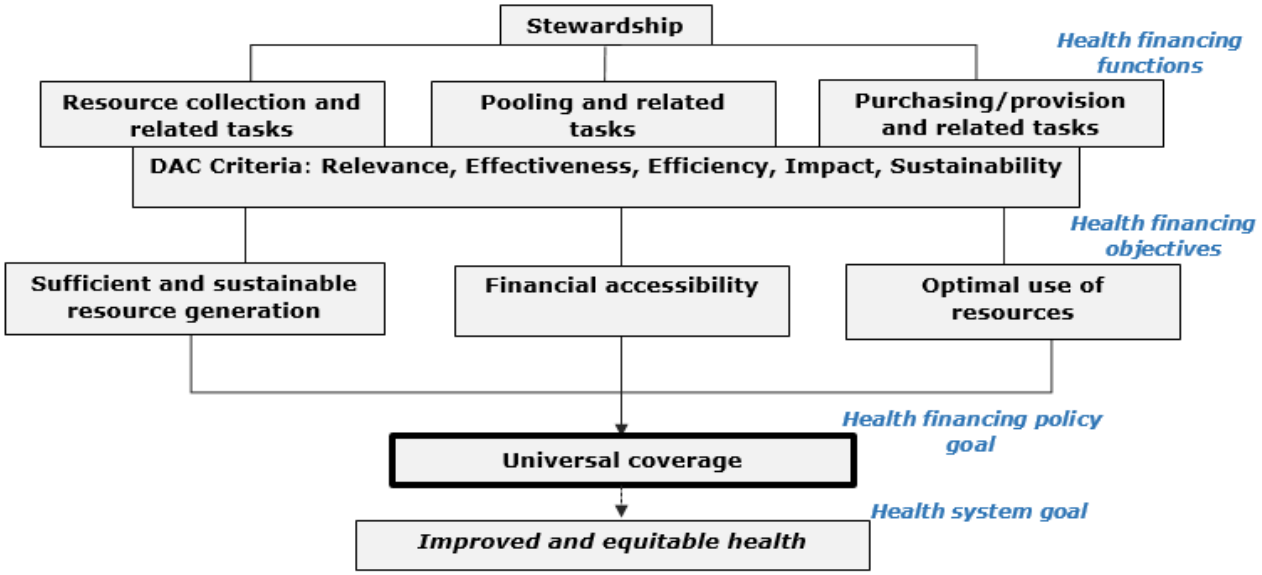
The Organization for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) Criteria for Evaluating Development Assistance (68) comparatively evaluates, to what extent donor funding achieves its objectives (69). These criteria were identified because of their clarity and flexibility to evaluate donor interventions aimed at achieving sustainable development goals based on the DAC Principles for Evaluation of Developmental Assistance (68). Thus attaining universal health coverage sub-nationally through the EPI can be analyzed. The criteria: efficiency, impact, relevance, effectiveness, and sustainability of ODA (69), is explored which can inform future direction of ODA for health.

The limitation of using this framework however is that universal health coverage is not explicitly mentioned.

2.4.4.3 Study framework: A modified OASIS analytical framework using the DAC Criteria

A merger of both frameworks - OASIS approach and DAC criteria - was done to operationalize donor financing for the EPI as a financing sub-system with the outcome of universal health coverage, while evaluating it based on its source and achievement of its objectives. The DAC criteria was introduced into the OASIS framework at the level of organizational practice and institutional design, and health financing performance indicators. This was because donor financing has multiple sources presenting unclear and differing institutional designs and organizational practices; while the performance indicators analyze performance of a broader system which donor funding is just a part of. Based on the framework – in figure 4 - the analysis for findings – in this study - progressed using the framework from stewardship to the DAC criteria. Then from the health financing objectives to the goal of universal health coverage in the context of improved and equitable health findings were discussed and conclusions made.

Figure 4: Modified OASIS analytical framework using the DAC criteria



2.5 Limitations of the study

1. Only literature in English was reviewed in the study
2. Paucity of data on donor financing for health that is officially aggregated before 2008 on the creditor reporting system (CRS) of the OECD.
3. Conflicting data on donor funding on websites, as many are forecasts. The actual disbursements may differ.
4. Many donors without the current facts – therefore study focused on GAVI as the largest contributor and managing public- private partnership, and availability of documents.
5. Government reports and documents on EPI and donor funding were limited to available electronic materials.
6. Only free articles were included.
7. Personal bias as a Nigerian, and also having worked on a HIV/AIDS donor funded programs previously.

SECTION ON STUDY FINDINGS

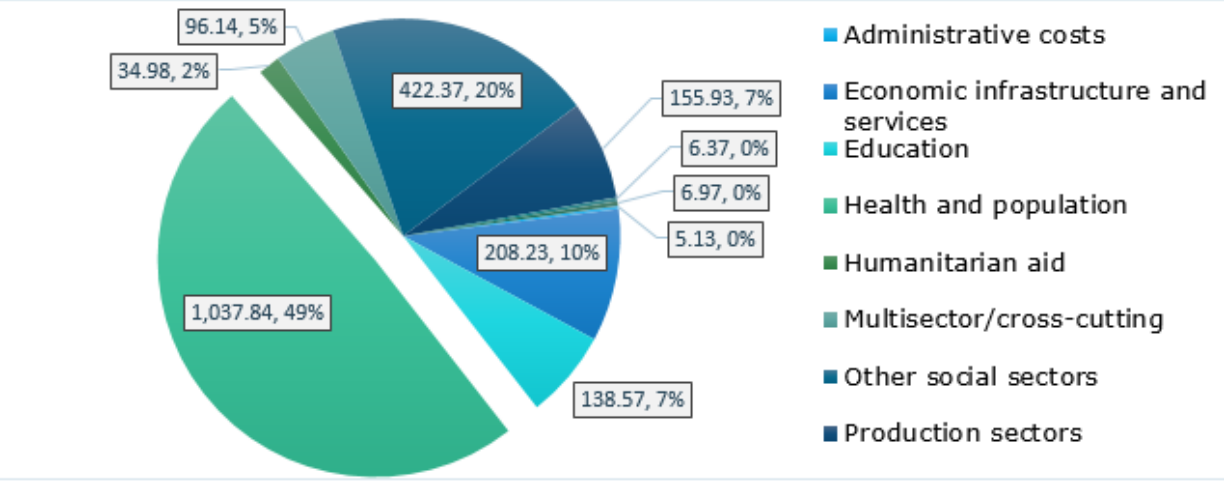
CHAPTER 3: THE FLOW OF DONOR FINANCING FOR EPI IN NIGERIA

In order to meet specific objective one, this chapter describes the flow of donor funding for the EPI in Nigeria.

Responding to increased donor funding during the MDGs, the OECD, World Bank and other partners created the AIDFLOW platform - making donor flows more accessible. They report the average ODA from all sources to Nigeria between 2011-2016 estimated 2,417.42 million USD, with multilaterals contributing 54% and DAC countries the rest (70). A greater proportion of total ODA was from the International Development Association, United States and United Kingdom contributing 69% (Refer Annex 4) (70). Increased private philanthropy (see annex 5) (13), and private-public partnerships including GAVI - ranking 8th amongst top donors - were noted (70).

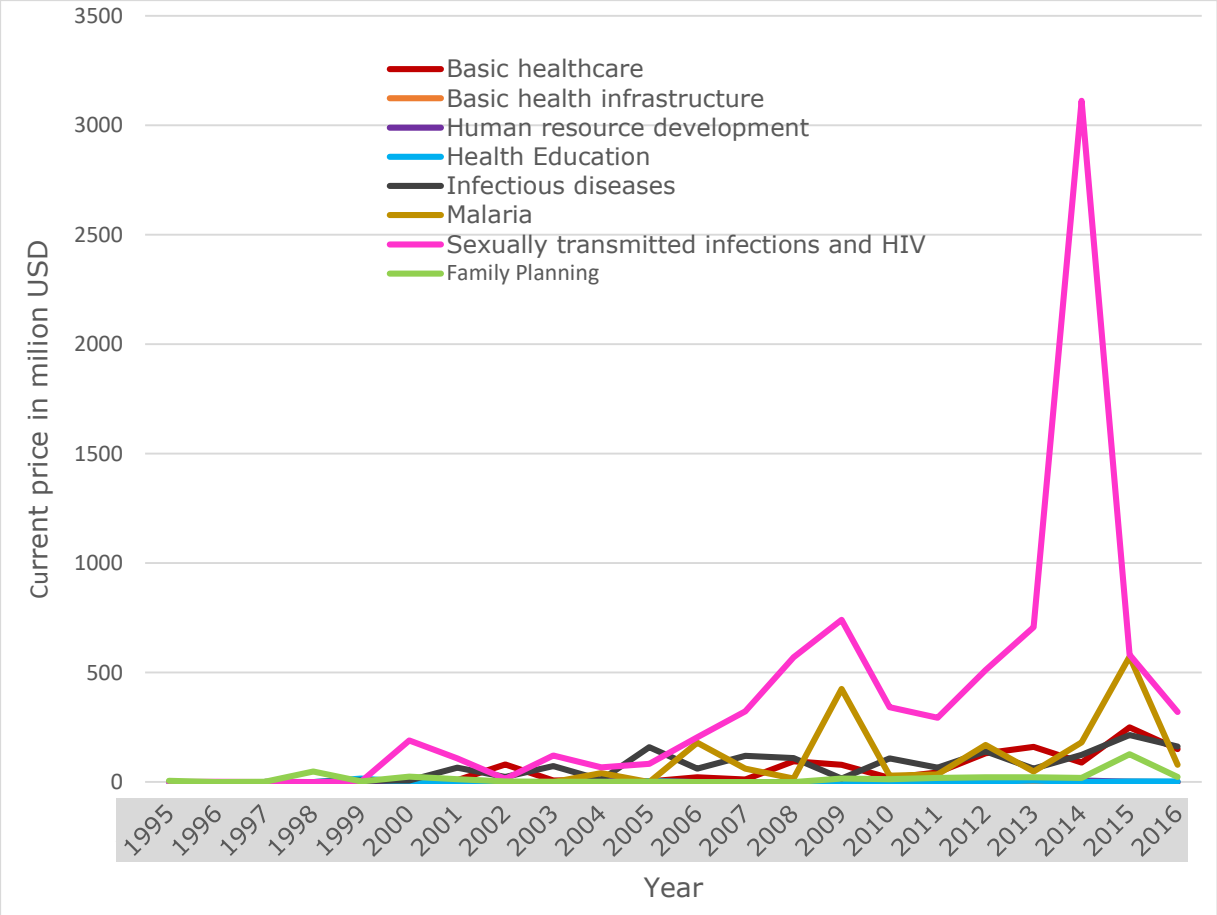
Of the total ODA to Nigeria within the aforementioned period, total commitments to health and population sector averaged 44.4% - with gross disbursements averaging 49.1% (refer figure 5) (70). Country programmable aid to health however averaged 22% in the same period (70). Reflecting a narrow flexibility of the government to utilize aid according to national priorities, through strategic planning within this period (70).

Figure 5: Average gross ODA disbursements between 2011-2016 in current million USD and percentages(%), by sector in Nigeria (70).



In identifying what health areas receive donor funding nationally, the OECD from 1995 till 2016 has tracked these allocations (12). Between 1995 and 1998 significant allocations were made to family planning. However increased volume in the early 2000s – from MDGs - with allocations mainly to HIV/AIDS, infectious disease control and basic health care - inclusive of immunization - was noted (12). Also allocations to Malaria and Tuberculosis increased from 2004 (12). In this period however, relatively less volume was allocated to health infrastructure, and human resource for health development (Refer figure 6)(12).

Figure 6: ODA for selected health commitments of official donors, of all types and channels from 1995–2016 (12).



The national health accounts (NHA) providing aggregates of national health expenditure, estimate actual health expenditure from donor sources nationally. The proportion of external health expenditure representing 10% of the current health expenditure in 2016 (19), amounted to 8 USD per capita (19). Of the total, amounting to 1451 million (current) USD, 27.4% was transferred through Nigeria's national government budgets, with the rest transferred in direct foreign transfers through managing or spending agencies (19).

CHAPTER 4: DONOR FUNDING FOR THE EXPANDED PROGRAM ON IMMUNIZATION IN NIGERIA

To meet specific objective 2, in this chapter donor funding for the EPI is examined. In the first section, its magnitude is analyzed; while in the second, an analysis using the framework described in section 2.4.4.3 is done.

4.1 Magnitude of the donor funding of EPI in Nigeria

GAVI – a partnership between the private and public sectors - financially and technically leverages resources, channeling donor funding for immunization (71). It is forecasted - between 2001 to 2023 - to co-finance the procurement of supported vaccines and activities to Nigeria, amounting to 1,285.3 million USD (72). As at July 2019, an estimated 934.9 million USD has been disbursed, with 75% allocated to vaccine procurement (72). The rest amounting to 236.6 million USD, financed operational costs, immunization services support and health system strengthening (HSS) activities (72). This funding is coordinated at federal level, and transferred to the United Nations Children's Fund (UNICEF) - mandated to provide procurement services within the immunization system in Nigeria since 2003 (7)(36). Still outside GAVI funding, other donors also fund immunization activities – channeled through UNICEF.

In 2016, UNICEF estimates 192.7 million USD was spent on immunization services in Nigeria – with 129.5 million USD from GAVI and 63.2 million USD from other donors (73). However, from the NHA, an estimated 282 million current USD was spent by external sources financing immunization programs in 2016; equivalent to double the government's expenditure (19). Although appearing conflicting, the valuation of the dollar as reported by UNICEF is not made explicit. This, and the estimation of country level expenditures in the NHA, increase the reliability of the NHA estimates for 2016.

As the 2017 immunization expenditure is not reported in the NHA, UNICEF estimates alone analyzed. A total of 189.5 million USD funded immunization in Nigeria - with 72.9 million USD channeled through regular immunization procurement services, and 116.5 million USD through GAVI (74). Donor funding for immunization is therefore decreasing, resulting from increased Nigerian national income as mentioned in section 1.3. Since government domestic financing is expected to increase.

Disaggregated sub-national data was inaccessible. However, it may be inferred from the arguments of Eboreime and Abimbola et al (66), that there is likely more focus of immunization effort in the North compared to the South Nigeria (66). With significant p-value (<0.001), compared to the south (46% in Abia) a larger percentage of people in the north (81% in Jigawa) observably lived within a five kilometers from where immunization services are received (66). Further association can be made with UNICEF outreach immunization services to hard-to-reach communities, and focus on four northern states amongst 18 unspecified others, in 2017 (74). However, the findings are extrapolated with caution, as the sample size of study - conducted in only four out of 36 states - was small.

4.2 Analysis of donor funding of EPI to achieve universal health coverage – in Nigeria - using the modified OASIS approach / DAC Criteria

4.2.1 Utilization of donor funding for EPI in Nigeria

Stewardship

The ICC chaired by the Federal Minister of Health directs EPI activities and coordinates stakeholders in Nigeria (7). The ICC's Routine Immunization Working Groups, at federal and at state levels, advise on EPI implementation nationwide (7). To achieve the MDGs, a National Economic Empowerment and Development Strategy (NEEDS) in 2004 was established (50)

(61). This included a Health Sector Reform Program aimed (amongst others) at improving stakeholder coordination, and resource management - including donor funds (50) (61).
However a SWOT analysis of the EPI in its CMYP 2016-2020 identified weak activities of the ICC at state level (7). Ineffective stewardship of the health system by the government (75), and particularly at state level are arguments by Uzochukwu et al (76) in relation to low accountability (76). Nonetheless alignment and harmonization of donor activities, is a government priority recurring through extension of NEEDS to NEEDS II in 2008 – 2013, and recently the National Action Plan for Health Security (77)(78).

Health financing functions
Resource collection
Donor expenditure as a proportion of total spending on the EPI was 30%, in 2013 (7). Of this, through grant assisted financing , GAVI financed 17% equivalent to 37.7million USD (7)(71). The Bill and Melinda Gate Foundation (BMGF) and Department for International Development financed 8% and 4% respectively, equivalent to 18.1 million USD and 7.7 million USD respectively (7). Less significant – totaling 2% of EPI expenditure - was financing by the United Nations Fund for International Partnerships and the World Health Organization (7).

Although donor funding for health has been described as unpredictable (1), the GAVI mechanism provides predictable country support (71). With this predictability, displacement of government budgetary allocations for health in general and for immunization specifically is less likely, as the flow is predominantly off budget (1)(19). According to Cernuschi, Gaglione and Bozzani (79) however, reduced capacity to mobilize resources after transitioning, hampers the sustainability of GAVI immunization support in Nigeria (79).
Donor funding when collected mainly flows through the procurement mechanisms of GAVI or UNICEF - acting as pools.

Pooling
Aggregating donor funds for vaccines through GAVI increases the purchasing volume with benefit of decreased unit cost - economies of scale - both at national and international levels (71). Furthermore, utilizing UNICEF procurement of traditional vaccines and other supplies pools funding (including donor) for EPI at federal and state government levels (7)(73). The EPI through both pools, benefits from cost reductions and savings, spread across all states.
In addition to these mechanisms, in some states donor funding may pool into basket funds for immunization, as mentioned in section 1.8. This complements funding of the RI activities in the participating states, increasing the magnitude and coverage of funding. Beneficiaries are the birth cohort of the population as identified in the CMYP 2016 - 2020 (7).

Purchasing/ provision
Donors largely purchase EPI vaccines through UNICEF, however new or underused vaccines are supported by GAVI (7). Other funding goes to SIAs - as the government bears the larger responsibility for routine immunization (RI) (7). Nonetheless, GAVI contributed to RI supply chain strengthening in 2014, as did the BMGF in 2013 supporting Oral Polio Vaccine purchases (52).

Provider payments mechanisms are not emphasized on the EPI however, purchasing utilizes global budgets for PHC inclusive of immunization and non-vaccine expenditure (46). However donors operating off budget parallel systems, reportedly undermine the overall EPI and PHC delivery. This Ophori et al (36) argues, results from diverging interests between donors and government (36).

4.2.2 Assessment of donor funding for EPI in Nigeria using the DAC criteria
Relevance
GAVI's funding of CMYP commitments eligible (and subsequent) years (62), formulated with the participation of stakeholders and development partners enables harmonization of

priorities (7). Although individual donor priorities may differ, the alliance presents a united front in funding immunization in Nigeria.
GAVI's funding strategy, and the CMYP 2016 – 2020, targets the entire birth cohort as at 2013 – of seven million children - for full immunization coverage (7)(80). Furthermore, GAVI aims to reduce gender, and other barriers to accessing immunization - outlined in its Gender Policy, and Health System and Immunization Strengthening Support Framework (81)(82). This lines up with Nigeria's - equity promoting - Health Policy (34). The CMYP 2016- 2020 specifically addresses equity to increase RI coverage between socio-economic classes, although addressing gender barriers are not explicit (7). Therefore, through GAVI's focus on and advocacy for gender and other forms of equity, the targeted population has a greater opportunity to be reached.

The 1999 Nigeria EPI policy directs strengthening of the immunization system, control of vaccine preventable diseases, and improvement of immunization services (36). However its design and operations affects implementation, and achievement of these goals. For example it was noted in the 2018 report on the effect of the Measles campaigns on the immunization system (83), that the 2017/2018 campaign's design was adapted from WHO guidelines on campaigns (83). An observed reduction of children having received no dose of measles vaccine from 45% to 11.2% before and after the campaign respectively, was noted (83).

With inception of GAVI funding in 2001 (84), many states recorded insufficient vaccine supplies, associated with only 61% of the approved vaccine budget released as argued by Ophori et al (36). Untimely budget approvals and or release of funds in 2003, also argued by Ophori et al (36), necessitated inception of the UNICEF procurement contract (36). But funding shortage for vaccine distribution between states, local governments, and health facilities, in 16 out of 21 states were noted in 2012 (36). GAVI funds then were reprogrammed to address logistic activities between 2013 to 2014, along with strengthened state contingency planning (7). Resultantly, no stock outs were recorded in 2014 at national level with 80% stock sufficiency in all local government areas, and increased functional cold chain equipment at 89%, from 8% levels in 2010 (7). As mentioned in section 4.1, although a large proportion of funding secures vaccines (72), the returns on investment depends on the functioning on the entire health system.

RI is managed by states and their local governments, incorporated into PHC delivery at public health facilities (36). States have had disparities in EPI performance and outcomes compared to national results. Immunization coverage rates as reported in the previous national district health surveys (NDHS) of 2003 to 2013, revealed lower values for the north compared to the south and national values (7). This disparity persists in the 2018 NDHS with 57% coverage in the South-East compared to 20% coverage in the North–East (15). Although potentially recall bias of interviewed mothers exists, the persistent trend raises questions of these inequalities causing barriers. Although low demand, from ignorance and negative beliefs have been identified, low morale and poor attitude of health workers also contribute (85). In some states basket funds are established (52); while three others have contracted the private sector to complement immunization provision as a response(7). Engaging the private sector remains an opportunity to harness by the EPI.

Furthermore, funding targeted strengthening integrated PHC delivery (84). Delays in approvals and funds transfer hampered HSS activities in 2014 (84). But according to the annual progress report of 2014, qualitative DHIS 2 reporting increased from 41.2% in 2013 to 58.7% in 2014, affecting antenatal care coverage data, and directly benefitting EPI data validation (84). Through this, further reporting on disaggregated data, would highlight intervention areas to promote equity. Also, training on data management for lower cadre staff, followed the Pentavalent Vaccine Post-Introduction Evaluation that identified low quality data management as causing reporting inconsistencies (7). However, other donors invest in HSS including EU Sign, and Global Funds (84), so there is difficulty in singling out the effect of GAVI and other donor EPI funding.

Effectiveness
Assessing the extent to which objectives of GAVI funding achieves its goals is evaluated by this criteria. GAVI's 2016-2020 goals, to increase equitable and sustainable immunization within a strengthened health system while influencing the immunization market (80), directly address the funding objectives for the EPI in 2016 (84).

However, the NDHS 2018, reported disparities in vaccination coverage - of all vaccines - between urban and rural of 44% and 23% respectively (15). With less than 30% of health workers distributed in rural areas, a potential threat to effective immunization delivery including advocacy and communication exists (7). To address this, some states in the 2017/2018 measles vaccination campaign strategically recruited retirees to participate (83). While increased accountability of fund disbursements at local government level, kept stakeholders motivated to deliver services (83). These contributed to effective delivery of immunization, since - as mentioned in section 4.2.1 - donor funds also target SIA's.

Eboreime Abimbola and Bozzani (66) argue that resource allocations can produce observed disparities (66). Therefore the EPI objective of increased budgetary allocation to immunization (84), directly addresses staff remuneration which government finances (7). The implementation of the BHCPF also bundles several strategies to improve rural retention (86) and equity in immunization delivery.

The emphasis on HSS to drive effective immunization delivery, reflects in seven of 13, 2016 GAVI funding objectives (84). In addition to HSS targets mentioned in the assessment of funding relevance, according to Uzochukwu, Chukwuogo and Onwujekwe (52) achieving polio eradication without negative impacts on RI, is influenced by the degree its of integration within the RI program (52).

In Nigeria, ward development committees are shown to impact health positively (7). Funding in 2016, targeted community participation through supporting ward development committee meetings (84). Similarly, the measles vaccination campaign of 2017/2018 utilized increased participation of community and opinion leaders – to account for state differences (83). Achievement of objectives will require community – which is an often forgotten part of the health system.

With the introduction of the Pentavalent Conjugate Vaccine in 2014, less than 1% of a targeted 4.3 million children received the first dose (84). Subsequently a 113% coverage of target was achieved (84). Attesting that target groups potentially are reached, with persistence and action. This is in spite of disparities in coverage between the North and South (83). Ethnicity, lower educational status of mothers, delivery at home , an low SES contribute to these differences (25)(66)(83). Therefore, sub-national differences contribute to achievement of aid objectives and variable outcomes.

Efficiency
Immunization is as a cost-effective strategy in vaccine preventable disease control (36). In countries receiving its support, GAVI projects 18 USD cost savings for every 1 USD invested in vaccination (87). This is in savings in health and loss of productivity costs (87).
Although vaccines are provided free, Sibeudu Uzochukwu and Onwujekwe (38) argue user fees in private hospitals and long waiting times deter utilization of RI services by clients of lower SES (38). Although a small cross-sectional study, potentially limited by low representativeness, it was found statistically significant that compared to the highest SES, people in the lowest SES were 0.5 times likely to utilize RI services with waiting time greater than 60 minutes (38).

Furthermore, in accessing the procurement process – for which GAVI funds predominantly - Cernushi Gaglione and Bozzani (79) argue that untimely funding, low procurement capacity and support systems in GAVI transitioning countries limit access to timely supplies (36)(79), for RI at federal and state levels (36), as well as on SIA's (83). These result in delayed immunization delivery (52).

Active program monitoring for improved management efficiency is promoted through learning, from data monitoring informing improvement proposals (84). Additionally, annual assessments informing improvement plans at all levels of implementation are carried out and reported annually (83)(84).

These processes in the EPI and funding design create better efficiency in delivery nationwide. However, the aforementioned health system inefficiencies affect the overall performance and impact of the funding.

Impact

Since donor funding for the EPI - regardless of the individual source - complements government funding, there is difficulty isolating individual source effects on morbidity and mortality from vaccine preventable diseases, and infant mortality. Also immunization is often bundled with other health promotion activities, as the entry point for contact with health system (77).

Nonetheless, Morakinyo and Fagbamigbe (14) argue that between 1990 and 2015, reductions in neonatal, infant and – to a lesser degree – under-five mortality was observed (14). Notably, infant mortality rates reduced by 57% to 69 deaths per 1000 live births in 2015 (14). With the increased donor funding for health including GAVI funding described in section 3 during this time an association may be made.

Active funding for HSS has led to intended improved data management, logistics and cold chain supplies, and strengthened PHC through integrated disease management training for health workers (84). But other donors, for instance the European Union (EU) investing in capacity building and trainings, invest in HSS (52) (84). However, according the 2011 report identifying barriers along with solutions for RI in Nigeria (53), financial incentives on polio eradication activities demotivated staff from RI activities, reducing effectiveness (53). Even though a perceived improvement of RI services was documented resulting from the 2017/2018 measles vaccination campaign report (83).

But with GAVI funding, a misaligned federal budget and program cycle results in funds released in the second half of the year, resulting in stock outs in the first half (85). In view of transition, increased accountability for timely funding is required. The establishment of the Public Health Fund and National Immunization Financing Task Force and proposed Immunization Financing Trust Fund are unintended consequences of the financing arrangement (6). Set up to cover costs sustainably, they potentially impact of the funding's goal.

Sustainability

Donor funding is finite, and intended for eventual adoption by sustained domestic budget lines for immunization activities - to prevent gaps at exit (2)(4)(79). According to Uzochukwu, Chukwuogo and Onwujekwe (52), at the termination of the EU Prime funding in 2009, a funding gap remained without clear plans for coverage by the benefitting states (52). In Nigeria, a recurrent budget line and potential increase of immunization budget by 201% in 2020 is required (6)(7).

GAVI funding, through its co-financing policy based on the country's ability to pay, is modelled to promote continuity after exit (88). Cernushi, Gaglione and Bozani's (79) however argue that over 70% of transitioning countries are hindered by communication, supply chain and

vaccine procurement problems (79). Similar findings have been noted in Nigeria (7)(85). Furthermore, on SIA's, the same health workers delivering RI services render services on campaigns days in addition to other PHC services and RI. This resulted in days of no activities during the 2017/2018 measles vaccination campaign in some locations (83). By this current design, either suffers neglect and threatened continuity.

The national strategy for social mobilization and communication (50), can generate demand through socio-cultural support for immunization (50). This is critical to sustainability in light of the 2003 immunization boycott in Northern Nigeria (36).

CHAPTER 5: COMPARISON OF GHANA AND KENYA, DONOR FUNDING OF EPI TO ACHIEVE UNIVERSAL HEALTH COVERAGE USING THE MODIFIED OASIS APPROACH/DAC CRITERIA FRAMEWORK

To meet specific objective 3, in this chapter an analysis of donor funding for the EPI in Ghana and Kenya, in the first and second sections respectively is done using the framework described in section 2.4.4.3. The EPI in both countries is comparable with that in Nigeria along with disparities in sub-national coverage, with successful introduction of new vaccines in the EPI schedule (89)(90).

5.1 Ghana

5.1.1 Utilization of donor funding for EPI in Ghana

Stewardship

The ICC in Ghana provides stewardship in the EPI (90). In addition to similar technical and coordinating role with its counterpart in Nigeria, it advocates for increased resource mobilization for immunization – linked to the introduction of new vaccines since 2012 (90).

Health financing functions

Resource collection

Donor financing for the EPI, flows on budget through the medium term expenditure framework or off budget (90). Similarly GAVI co-finances vaccine procurement (71), while the WHO and UNICEF increase equity and coverage through outreach to hard-to-reach areas (90). At regional level however, donors may fund immunization where gaps exists (90).

In 2016, two million (current) USD equivalent to less that 1% of the current health expenditure was spent on immunization from external sources (91). Compared to domestic spending representing 4% of the current health expenditure (91), donor financing is a less relevant sources of immunization funds. Domestic government spending for the EPI is similarly channeled through UNICEF for vaccine procurement, but has been declining (90).

Pooling

Immunization is not a benefit package financed through insurance pools in Ghana (4). However the central government's procurement for all regions, and also through UNICEF ensures benefits from savings through economies of scale in purchasing (71)(90)**.**
Beneficiaries are the birth cohort of the population - identified in the CMYP (90)(92).

Purchasing/ provision

Through GAVI co-financing, purchase of Pentavalent and Yellow-Fever vaccines introduced in 2012 is done (90). Traditional vaccines and immunization supplies, and remuneration of staff are borne by the government (90). GAVI also supports HSS and civil society organizations to strengthen immunization delivery and demand in hard-to-reach communities (92). This is integrated with child survival district health services with minimal involvement of the for profit private sector (90).

5.1.2 Assessment of donor funding for EPI in Ghana using the DAC criteria

Relevance

GAVI funds Ghana's CMYP objectives (62). Furthermore, through expansion of district community health services, anticipated reduction in inequities in access to immunization, further aligns with GAVIs goals (81)(82)(90). Similar to Nigeria, gender barriers are un-explicitly identified however, reporting similar sex-disaggregated DPT-3 coverage in 2014, gender barriers appears insignificant (92).

Ghana's regions provide immunization services within its districts (93), to increase coverage. However Yawson et al (93) argues that these outreach activities vary significantly between regions, with 69.8% and 32.6% outreaches in Volta and Western regions respectively (93). Targeted regional funding, can address these disparities. However through support for civil

society organizations providing community immunization services, alignment with government's strategy for strengthened district health system contributes to reducing these inequalities.

Effectiveness
The promotion of regional data generation informing regional planning supported by UNICEF (93); and supported by training by GAVI (92) identifies bottlenecks. This enables setting regional priorities to address local barriers in access and quality of immunization services rather than a broad ineffective national approach (93). However Yawson et al (93) argues that EPI training - within two years of 2014 - for a targeted 80% of health workers at facility level ranged from zero to 65% within the regions (93).

Additionally it found full immunization coverage for infants below 12 months, ranged from 65% to 91.2%, in the Western, and Upper-West regions respectively (93). The study utilizing quantitative and qualitative data to increase validity, questions effective sub-national immunization delivery. Similar patterns are observed in Nigeria.

Efficiency
Since immunization provision is delivered through the district health system, its inefficiencies affect delivery. Novignon and Nonvignon (94) through their analysis argue district health hospitals have an average efficiency score of 0.51, reflecting a 49% wastage rate (94). Rural compared to urban facilities were noted to be less wasteful (94). Le Gargasson et al equally argued the cost per delivery of immunization per facility was higher at 33% compared to 20% in urban than rural areas (95). The utilization of more expensive alternatives in urban compared to rural could be considered as driving these difference and lowering efficiency.

Efficiency rates also vary between regions particularly amongst those that use performance based financing in purchasing services – who Novignon and Nonvignon(94) further argue perform better (94). Although it incentivizes better (43), depending on its design, other programs may suffer lower performance.

Impact
Infant mortality rates over a decade dropped from 90 deaths per 1000 live births to 59 deaths per 1000 live births in 2010 (96). Although immunization contributed, DPT-3 immunization coverage rates dropped from 94% to 90% between 2011 and 2013 (96).

The reasons remain unstudied, but new vaccines were introduced in this period (96). Strengthened infrastructure, and enhanced surveillance of vaccine preventable disease have been observed to result directly from these vaccine introductions (96). However Le Gargasson et al (95) argue also that full RI costs per child – mainly from logistics and salaries - had increased to 60.3 USD from 9.7 USD along with a 300% increase in vaccine costs (95). Consequently the fiscal space for immunization has increased. In light of declining government spending on immunization mentioned in section 5.1, sustainability is questioned.

Sustainability
Ghana's CMYP 2015-2019 outlines sustainability plans to transition GAVI vaccine financing into a budget line, utilizing the 2017 - 2019 medium term expenditure framework, while committing to adequate and timely funding (96). This could addresses hindrances mentioned previously in 4.2.2 contributing to sustainability following exit (79).

Reducing waste and other improvements on efficiency would contribute to sustainability. This argument is made by Ejughemre (2), stating that at current budgetary allocations more services can be provided, by adequate policies to redistribute savings through inefficiency reduction (2).

5.2 Kenya

5.2.1 Utilization of donor funding for EPI in Kenya

Stewardship

At county and national levels, stewardship is provided through several levels of inter-governmental coordination. On one hand an agency coordinates the management of health products including vaccines – nationwide (97). On the other, operations are coordinated by a framework, covering activities of the Health sector coordinating committee supporting the ICC at county levels (89). The national government provides policy and coordination with donors, while counties coordinate stakeholders, and planning for EPI (97).

Resource generation

The medium term expenditure framework is utilized in budgeting (97) however, budget ceilings determined by the ministry of finance result in insufficient allocations not meeting needs (98). Consequently, donor funding as a percentage of total health expenditure was 30% in 2005, (98), higher than averages for Nigeria and Ghana. GAVI reportedly contributed the highest proportion of donor funding for health in 2014, 30.30 million USD representing 46% of all expenses on EPI (99).

Pooling

Pooling through the National Health Insurance Subsidy Program for the poor covers about half the population, to provide PHC services including immunization; but similar to Nigeria and Ghana, insurance pooling mechanisms do not finance immunization in Kenya (97).

Purchasing

Like Nigeria and Ghana, the cost of traditional vaccines are fully borne by the government, with GAVI co-financing supported vaccines (89). Immunization delivery is provided by the 47 counties, to their sub-counties, integrated with PHC. Unlike Nigeria however, result based financing - introduced to improve efficiency at county level - purchases services (97).

5.2.2 Assessment of donor funding for EPI in Kenya using the DAC criteria

Relevance

Kenya's CMYP is similarly supported by GAVI funding (62). Reducing inequities in immunization coverage between county's - and SES – is a priority to be addressed, in the CMYP 2015 -2019 (89), and by GAVI (81)(82).

However the budgetary ceilings mentioned in 5.2.1 result in budget gaps affecting county's immunization delivery to varying degrees (98)(99). However, the CMYP 2015 - 2019 aims to contribute to reduction of sub-national inequities through advocacy to county governments in prioritizing immunization (99). Nonetheless, the EPI introduced several new vaccines nationwide including Pentavalent, Pneumococcal Conjugate and Rotavirus Vaccines in 2002, 2011 and 2014 respectively (89).

Effectiveness

Although nationwide the average availability of vaccines in PHC centers was 85% (97), in five of the 47 counties, full vaccination coverage for infants - below 1 year - was below 50% (89). Inequitable access – particularly in hard-to-reach communities – has been associated with predominant utilization of stationary sites and not outreaches in immunization delivery (89). Additionally, low demand for immunization services linked to low inter-personal skills of staff, hindering communication has been identified (89).

An inter-agency framework, uniting stakeholders and coordinated by the government, harmonizes all partners to improve health delivery and immunization services (97). The adoption of a sector wide approach operational since 2005 through singular planning, budgeting and monitoring (97), also promotes effective donor funding for harmonized government priorities.

Efficiency
A nationwide community strategy, to identify and refer defaulters back into the EPI, improved coverage (89). Also the private sector providing immunization supply logistics between national and country warehouses, led to increased vaccines delivered and improvements in the delivery system (89). Temperature monitoring has reduced waste of vaccines; although potential efficiency gains are hindered by electricity shortages affecting over 50% of the nation (89).

Ojal et al (100) argue in their study, continuing the Pneumococcal Conjugate Vaccination at the termination of GAVI funding is cost effective for Kenya (100). Still, differing county priorities and budgets for immunization, resulting in high staff attrition, low level of surveillance training, impacts program outcomes sub-nationally (89).

Impact
The CMYP 2015 – 2019, reports increased community awareness of immunization and its importance (89). This is resulting from polio campaigns supported by stakeholders including donors (89). However, gaps in knowledge about RI services – schedule and locations - have been reported (89). This compares to findings in Nigeria, where stand-alone polio campaigns are observed to have negative impact on RI services (52).

An intended consequence of HSS by all stakeholders, is the migration from paper based reporting to the District Health Information System 2.16 improving data management in general (89)

Sustainability
As part of its sustainability plan, promoting coordination between all government levels and stakeholders is a strategy (89). Also expansion of the budget at country and national levels, is argued by Ojal et al (100) to achieve and maintain immunization coverage including that of new vaccines, shown to be cost-effective (100).

CHAPTER 6: DISCUSSION

In this chapter study findings are discussed in relation to the background, and conceptual framework, as stated in chapters 1 and 2. The sub-sections correspond to the health financing objectives and policy goal of universal health coverage - stated in the framework.

6.1 Sufficient and sustainable resource generation

In Nigeria, donor financing for the EPI has multiple sources. In 2013 GAVI, closely followed by the BMGF and Department for International Development, led donor financing of the EPI (7). With programs often implemented vertically (4), this multiplicity presents challenges for coordination between donors and the federal government, and within all levels of government. On one hand, misalignment of priorities between donors' and the federal government could result in inadequate resources for priority program activities (4). While on the other, duplication of resources for similar activities reduces funding impact (64).

Monye, Ansah and Orakwue (64) argue that coordination between donors will evolves to complementarity, where efforts through active collaboration and division of labour are complementary (64). In Kenya for instance, a sector wide-approach in health - to harmonize donor and domestic funding of the health sector is promoted (97). Nonetheless – though signatories to this approach's code of conduct- a lack of enforcement has limited its effectiveness in coordination (97).

Since donor funding complements domestic funding, and differences in fiscal space for health exists sub-nationally in Nigeria (41) (57), enhanced coordination will strategically direct funding - reducing in-sufficiency of EPI funding within states. In the case of the 2017/2018 measles vaccination campaign, subnational insufficiency was noted even with sufficient nationwide funds (83). Poor planning – considering sub-national contexts like influx of internally displaced people from conflict - resulted in inflexible budgets and shortages in some states (83).

This is a consequence of decentralization in Nigeria (21). States - and in the case of Ghana and Kenya, regions and county's respectively – deliver immunization services as part of PHC (36) (93) (97). However, management functions are carried out at federal level and disseminated to states and local government areas (7). Local managers have a limited decision space to contribute plans and other management decisions. The opposite approach is taken in Ghana where though decentralized, regional planning is done to better reflect priorities (93). Similarly, counties in Kenya constitutionally can modify national plans to attain efficiency locally (97).

Furthermore resulting from fiscal decentralization in Nigeria , variable inadequate funding for immunization across states and local government areas is noted (52)(53). This arises from the inequitable allocation formula influencing inter budgetary transfers (55)(56) and inadequate tax generation (57). In Ghana and Kenya similar variable sub-national insufficient funding is observed (89)(96). Cernushi, Gaglione and Bozzani (79) argue that only 3% of GAVI's investment address inadequate planning, budgetting or mobilization of resources for immunization in transition countries (79). So, the complementary aim of donor in relation to domestic funding is defeated, as insufficcient funding for health and the EPI results sub-nationally. Study findings show decentralization is implemented to different degrees and decision space between countries studied. Therefore, understanding the effect of decentralization on immunization system requires further study in Nigeria.

Domestic resource mobilization is key to sustaining resource generation for immunization. With declining trends of donor funding for immunization in Nigeria (73) (74), and GAVI's transition (62), development of budget lines for immunization within the medium term expenditure framework is required (4). The World Bank and GAVI (4) in their report reveal

government financing for immunization was higher in countries reporting a budget line than those without (4). However, because of autonomous budgetary allocations in Nigeria (34)(45), earmarking immunization resources should be considred to further secure sub-national resources (4). From study findings, despite immunization budget lines in Kenya, budget ceilings limit allocations and sufficiency of resources for immunization (89). Thus advocacy - to reduce competing national priorities - is equallyneeded (6).

But securing sufficient resources for immunization may require additional strategies. New innovations though the Public Health Fund and proposed Immunization Financing Trust Fund in Nigeria (6), can be financed through new taxes, donors, or more efficiency in health and on the EPI (4). But with over a third of the polulation living below the poverty line (15)(25), unless taxation is progressive or luxury, and exempting those that cannot contribute, it will unfairly task the poor – lacking support. Further tax inefficiencies and evasions in Nigeria(40), compounded by a large informal sector - presenting income stratification difficulties (28) - limit this option. Guaranteeing sufficient funding through new donors and or increased efficiency are implementable solutions.

6.2 Financial accessibility

Aggregating funds through the GAVI purchasing mechanism, guarantees cost savings from economies of scale (71). Using payments from bonds – against donor pledges - through the International Finance Facility, GAVI secures predictable upfront funding (4). Thus enabling, long term planning in country and for vaccine manufacturers, which stabilize the market (4). The UNICEF pooled procurement achieves similar results by spreading costs of larger demand to reduce prices (4)(7)(73). Pooled procurement through the Pan American Health Organization, in the Americas and Caribbean for example is also done (4).

In Nigeria, subnational pooling utilizing basket funds in states with low resources was done (43). Extension to states affected by insurgency in the North-East (74)(83), to increase the magnitude and coverage of immunization resources are options. Additionally, variable and inadequate capacity of states to generate adequate fiscal space (40), in view of inequitable inter budgetary transfers, ensures some states receive more than what is needed producing disparities (66). Furthermore, disparities in full vaccination coverage between urban and rural of 44% and 23% respectively(15), and between states with 57% coverage in the South-East compared to 20% coverage in the North–East were found (15). Similar disparities sub-nationally were found in Ghana (93) and Kenya (98).

In Nigeria, equity between states should be addressed by acknowledging the varying sub-national socio-economic geographical and other differences, and distributing resources to groups based on need (48). Also, that all states therewith grouped receive the same resources – promoting horizontal equity - towards attaining universal health coverage. However given Nigeria's ethnic diversity (15) and potential resistance, the case for immunization can be made through child survival and results lead to discuss for wider adoption in budgetary allocations.

A community approach, can address gender and other socio-cultural barriers to immunization demand in Nigeria through ownership and financial sustainability after donor funding ends. Donor support for ward development committees and opinion leaders in Nigeria's EPI has been a strategy for community engagement (7) (84). Utilizing this in the Nigerian measles vaccination campaign of 2017/2018, was linked to positive program achievements (83). In Ghana involving civil society organizations formally reportedly effectively reaches remote communities (92). In Kenya with less emphasis on outreaches but on fixed sites (89), equity and access are limited in these remote groups, presenting an opportunity for private sector involvement.

Although the Nigeria NHIS covers approximately 5% of the population (37), immunization is not financed through insurance. However, insurance increases utilization of health services

(42). Increasing coverage through the NHIS will influence accessibility to immunization which is often bundled health promotion through primary health care (39)(77). However progressive premiums, and coverage for the poor must be attained to achieve UHC.

6.3 Optimal use of resources

Optimizing donor funding through harmonization is a priority expressed in the NEEDS - and other - policies, by the Nigeria Government aimed at improving efficiency(50)(61)(77)(78). This is because of multiple donors (7)(73), implementing unintegrated programs (4), with varying program requirements and financial channels – transaction costs – burdening the system in its fulfilment (4)(48). In response, an approach to implement PHC interventions holistically - PHC under one roof - has been advocated in Nigeria but its implementation lags (7). In Kenya, similarly, inability to enforce the sector wide approach through unified planning, budgeting and monitoring, is noted (97).

In view of reducing overall donor trends in Nigeria (discussed in section 4.1), greater efficiency ensures reduced waste to maximally utilize resources for health and immunization on the EPI (4). This will meet needs, in the light of Nigeria's high fertility and declining national GDP (15)(26). However, the predictability of GAVI funding (71), allows for longer term planning (4), contributing to its effective utilization. A commitment made - in 2005 -by countries in Paris and followed up in Accra and Busan, with varying implementation (64).

Furthermore, effective stewardship is identified as important to maintain efficient operations (48). In Nigeria ineffective government stewardship linked to the implementation of decentralization (7). At state levels, notably low accountability, and limited monitoring performance of local government staff occurred because of unclear authority (36)(76). Conversely, it was noted during the 2017/2018 Nigeria measles vaccination campaign that local government accountability in funds disbursement motivated health workers (83). Therefore, the ministry(s) of health at Federal and state level and department(s) of finance or planning at local level (34)(77), should modify policies – clearly defining roles to promote intergovernmental coordination and efficiency. For instance in Kenya, an inter-agency framework unites all government levels and stakeholders to improve healthcare delivery (97). This can be adopted after identifying bottlenecks in the Nigerian context.

Nigeria's health system delivers healthcare utilizing the PHC approach (34). This is similar in Ghana – utilizing an integrated district approach (90). Immunization activities independent of RI - delivered through PHC - negatively impacts RI, as Uzochukwu, Chukwuogo and Onwujekwe (52) posit, assessing polio eradication activities in Nigeria (52). Absence of financial incentives on the RI program (53), or the disruption of regular PHC delivery have been noted, in addion to other positive impact of increased coverage on SIAs (83). Nonetheless, HSS and increased demand for PHC are more sustainable solutions to increase coverage of immunization. Donor funding for HSS improved data management, logistics and cold chain supplies, and strengthened PHC through integrated disease management training for health workers (84). Since PHC promotes cost-efficiency through its strategies, increased focus of donor funding on HSS will reduce health system inefficiencies. Furthermore, utilizing performance based financing in Ghana (94), and Kenya, to improve efficiency (97) reportedly is associated with increased efficiency in Ghana (94). However, mixed results in affecting outcomes are noted, with more positive influence of demand as opposed to supply side interventions (4). The effect in Nigeria would require study to generate evidence on immunization. Still, identifying health system inefficiencies in Nigeria would contribute to optimizing resources.

Still, despite a significant private sector in Nigeria's health system (34), there is lack of its formal integration for PHC delivery of health prevention including EPI. Only three states have private sector contracts to complement immunization provision (7). With more people living in rural areas and health workers in urban areas (15) (35), the resultant disparities in immunization coverage (15) present an opportunity. This is explored in Kenya as the private

sector fully provides logistic services in the immunization system – with reported increased delivery and efficiency (89). However, enforcing quality through stronger regulation is required to harness greater involvement of this sector (2). By staggering private sector integration in Nigeria, efficiency gained in states with implementing, may be reinvested other.

6.4 Universal health coverage in the EPI

Progressively raising sufficient health resources for the EPI, achieves UHC. Suffcient resources raised through the complementarity of donor funding or its support for increased efficiency of the health and tax system, enables closer achievement of UHC in Nigeria (48). Through this increase, more children will be reached, costs reduced or other vaccines added to expand the EPI pool – as shown in figure 1. Its sustainability is linked to a concurrent increase in domestic resources for health and consequently, immunization.

Secondly, ensuring that funding eliminates - or reduces - financial and other hardships in accessing EPI services, also enables closer achievement of UHC in Nigeria (48). This is through greater access to funds for the EPI by more people, equitably and regardless of their ability to contribute to the pool. Access to immunization may be hindered by financial or socio-cultural barriers at individual, state and national level. Therefore, expanding EPI funds covering more people while addressing demand barriers, progresses towards UHC in Nigeria.

Finally, efficient utilization of EPI resource will accelerate Nigeria's achievement of UHC, as waste from inefficiency is saved and reprogrammed for use (48). By this means the resource pool increases to cover more people, more costs or more services (48). Maximizing outputs through redistribution of resources, planning and monitoring can thereby increase resources in a sustainable and equitable way (2). Thereby contributing towards improved equitable health outcomes.

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

In this chapter first, conclusions are made - based on the study objectives: 1) to describe the flow; 2) analyze the magnitude, effectiveness and efficiency of donor funding on the EPI to achieve UHC sub-nationally in Nigeria and 3) compare other middle income countries identifying alternate uses to promote UHC. Secondly, objective 4 will be met: making recommendations to utilize donor funding for UHC sub-nationally in Nigeria.

7.1 Conclusion

7.1.1 Objective 1: To describe the flow of donor funding to the Nigeria government in Nigeria's EPI

Nigeria's socio-economic, and the international development scene have influenced aid. Observed to oscillate, aid increases were in response to development agreements like the MDGs. Although prior to 2011 sources are limited, since its peak in 2015 donor funding for health has been on a decline. The International Development Association, United States and United Kingdom contributing a combined 69% of total ODA, led donor funding from 2011 to 2016 - focused on health and population sectors. However the spotlight of this funding was on priority diseases in the MDG era, and basic care including immunization, with low focus on infrastructure or human capital development. Nonetheless a holistic health system approach – which is the founding idea for PHC by the Alma Ata declaration - is the foundation of the Nigerian health system. Therefore, although communicable and nutritional diseases cause significant disease burden in Nigeria, a mismatch of donor priority setting in donor allocation of funding in Nigeria is questioned.

7.1.2 Objective 2: To critically analyze the magnitude, effectiveness and efficiency of donor funding in the EPI to achieve universal health coverage sub-nationally in Nigeria.

In Nigeria, GAVI funding – three-quarters of which is responsible for vaccine procurement – is the predominant donor financing mechanism for the EPI. In response to transition off GAVI funding, resulting from Nigeria's reclassification as lower middle income country by The World Bank, donor funding for immunization has been on the decline - with 192.7 and 189.5 million USD spent in 2016 and 2017 respectively.

Multiple donors fund EPI although GAVI makes the most significant contribution, however weak stewardship at national and sub-national levels in Nigeria, results in ineffective coordination. At national level, coordination amongst donors - through complementarity of efforts - reduces duplication thereby increasing the efficiency of funding for the EPI. Particularly faced with declining donor funding, optimized utilization of donor funding through coordination contributes to extending coverage of immunization needed in the light of high fertility in Nigeria, and promotion of UHC.

Donor funding, aimed to complement domestic sources in generating sufficient resources, is limited in Nigeria. This is because federal and - to varying extent – state fiscal space is low. Poor tax efficiency at all government levels and inequitable intergovernmental transfers between federal, state and local governments also contribute to this insufficiency. Since states through their local governments provide EPI services, with the current implementation of decentralization in Nigeria, sustainably generating sufficient resources to provide EPI services remains a challenge.

Additionally federal planning and low decision space at state and local government levels, results in ineffective EPI implementation, as limited incorporation of sub-national priorities to address varying socio-economic and health systems needs and inequity occurs. Variable vaccination outcomes worse in the North compared to the South Nigeria is observed. The full relationship between implementation of decentralization and the EPI in Nigeria, remains as a

question requiring further exploration. Understanding this gap in knowledge would contribute to better domestic resource generation and implementation of the EPI, along with targeted complementary donor funding to achieve sustainable, effective, and efficient EPI promoting UHC.

Nonetheless, GAVI funding is relevant as it aims to promote equity in coverage. Improving access – financial and otherwise - on the EPI in Nigeria, requires promotion of vertical equity between states in resource allocation and program design by all stakeholders to ensure UHC. Innovative funding through basket funds piloted in some states – have been used to increase domestic resources for EPI. This adopted by other states, in addition to dedicated immunization budget lines are option to ensure sufficient resources for immunization for greater population coverage sustainably.

The engagement of the community though promoted by GAVI funding, still presents as an opportunity to improve equity and access to immunization. Civil society organizations utilized in SIAs can be formally integrated as well as the private sector RI delivery. Although engaging the private sector - requiring strong regulation to maintain quality - may be more applicable in some states with additional resources, rather than others. Additionally, improving health insurance coverage would improve utilization of immunization, as a secondary benefit. While a systems approach through strengthened stewardship and primary health care would promote more efficient use of resources for EPI across Nigeria to achieve UHC.

7.1.3 Objective 3: To compare similar middle income countries with Nigeria, in order to identify alternative use of donor funding in the EPI to achieve universal health coverage sub-nationally.

Similar to Nigeria, both Kenya and Ghana deliver EPI services through district or PHC services in their Counties and Regions, respectively. Both also note sub-national variations in resource generation for the EPI and immunization coverage. However unlike Nigeria, performance based financing is employed in both countries as a strategy to improve efficiency in primary health care delivery.

In Ghana specifically, regional planning ensures local priorities are incorporated for EPI delivery thereby increasing its effectiveness in addressing local needs reaching UHC. Additionally, civil society organizations play a strong role in outreaches to hard-to-reach communities improving equity in access of the EPI.

In Kenya promotion of both intergovernmental and donor coordination through different coordination frame works along with increased decision space for planning at county and sub-county level, ensures efficient resource allocation on the EPI. Additionally, the private sector is contracted for logistics of vaccine delivery and warehousing, reportedly increasing efficiency towards UHC. However, program design with fewer outreaches limits access and equity of children utilizing immunization services in hard-to-reach areas.

7.2 Recommendations

In achieving UHC in Nigeria, the EPI should be implemented as an integral part of attaining this overall health system goal. Therefore in order to meet objective 4, recommendations on

how donor financing for health can be deployed effectively and efficiently in the period of transition, to ensure UHC sub-nationally in Nigeria, are made in this chapter. They are grouped in terms of policy, implementation and research.

7.2.1 To reformulate policies affecting the EPI in achieving UHC, the following recommendations are made:

a) **To donors:** there is urgent need to reformulate donor policy to contextualize delivery of funding for the EPI:

1. Policy accounting for the degree and effect of decentralization in program design and implementation should be adopted. This would follow the collaborative research on the effect of decentralization on funding objectives, as the data would inform analysis and reformulation of funding policy. This is because although agreements are made with the federal government, the state and local government level outcomes have differed. Low decision space at state and or local government affect contextual planning which hinders effective delivery of EPI services. The funding design can aim to promote greater vertical equity at subnational levels.

2. Policy change to adopt greater health systems focus should be adopted. Although some funding for an integrated PHC approach, for example through data strengthening, is made other building blocks of the health system should be considered for inclusion. For instance the support for DHIS 2 can be scaled up to increase the quantitative evidence of contextual differences in coverage, in Nigeria. This will enable targeted interventions to these differences, thus promoting sustainability of the EPI - in line with the current objective of GAVI funding for example. This is best considered in promoting complementarity between donors, and coordination with the government in aligning with the focus of the government of Nigeria.

b) **To Federal Government**: there is urgent need of the federal government to identify bottlenecks and reformulate policies affecting the EPI. This will make clear, thus limiting ambiguous interpretation, the implementation of EPI at all levels of government:

1. A national conference to review the identified bottlenecks to RI delivery, and follow up of recommendations made in the 2011 report of the analysis of RI in Nigeria by Stokes-Prindle C, Wonodi C, Aina M, Oni G, Olukowi T, Pate MA, et al should be done. This should involve policy makers, federal, state, and local government EPI officials, health workers, donors, non-governmental organizations, religious leaders, and community representatives, ministry of health and finance representatives, researchers and parliamentarians. With participation of all stakeholders, a multi-sectorial perspective to inform reformulation and implementation of current policy will be achieved.

2. An analysis of decentralization policy is needed generally, and its effect on the EPI program specifically. For instance analyzing the strength of stewardship and adequacy of resources at state level for EPI. This will relate how decentralization was developed and formulated to how it has or failed to achieve its intended goals to bring governance and public services closer to the people on the EPI. The decision space at state and local government levels will be characterized to complement, data from the research of decentralization and the situational analysis, both of which should be conducted first. Context specific recommendations for reformulation of decentralization policy can then be made.

3. Parliamentarians in the national assembly should adopt secure - through earmarking - innovative budget lines for EPI. The Immunization Financing Trust Fund should therefore be adopted to complement other financing for EPI anticipated through the BHCPF – which should also be fully operationalized. Funds for the Immunization Financing Trust Fund should be earmarked to ensure its use in the EPI when transferred to different levels of government.

This will increase population coverage of EPI services, particularly in states where internal revenue generation is low or conflict is a barrier.

7.2.2 To improve implementation of the EPI to achieve increased immunization coverage and achievement of UHC, the following recommendations are made:

a) **To donors:**

Donors towards the EPI should implement commitments to the Paris declaration in aid effectiveness through complementarity in donor funding for the EPI. With GAVI alliance greater achievement of effectiveness and efficiency is achieved by this partnership through a defined singular objective and implementation. Complementarity will synergize donor efforts, and reduce duplication to increase sufficiently funds for the EPI.

b) **To State Government(s):**

1. Formal integration of the private sector is an immediate change in implementation of the EPI that can improve coverage to hard-to-reach and conflict areas in Nigeria. Not-for-profits can be utilized to improve service delivery in conflict areas while for-profit organizations can be engaged to increase efficiency. This requires concurrent regulatory frameworks to ensure quality is maintained. Implementation however might be staggered to specific states with capacity for the added responsibility for regulation, or target specific areas in EPI system. Efficiency savings can then be reinvested to other states, while lessons learnt can inform further efficiency and scaling up to other states.

2. Community participation should evolve from more than just ward development committee engagement to fora yielding the voice of all. Ownership and sustainability can be generated on the demand for the services to increase coverage. Also responsiveness to equity issues raised is easier promoted. Civil society can lead this with participation of government to increase accountability to the population.

c) **To Federal Government:**

1. Coordination within all arms of the government through the implementation of The PHC under one roof, and adoption of a sector wide approach between donors; is important to harmonize all resources. Resources can be more efficiently utilized this way in promotion of UHC.

7.3.3 Regarding research to inform policy and implementation of the EPI to achieve UHC, the following recommendations are made

Mixed methods research on the effect of decentralization on the EPI. First this should be a collaborative effort between donors and government.

- The qualitative research will identity EPI implementation challenges relating to decentralization at state and local government level. This can bring to fore the effect of the allocation formula and derivation act in fiscal decentralization and raising sufficient resources. While decision space at state and local government level and its effect on planning, budgeting and other functions on the EPI can be studied. These will better give understanding to findings from the results of the quantitative study.

- The quantitative research can evaluate the financing efficiency of EPI at different levels of government. Insight into inefficiency in the EPI associated with decentralization can there be yielded.

This research is linked to further recommendations, informing donor and federal government policy reformulations affecting the EPI to achieve UHC.

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ANNEX

Annex 1: Nigeria national immunization schedule with vaccines and administration for children and women (* immunization for child-bearing women) (7)

Vaccine name	Target population	Vaccine Classification	1st dose	2nd dose	3rd dose	4th dose
BCG	Birth	Traditional	Birth			
Oral Polio Vaccine	Birth	Traditional	Birth	6 weeks	10 weeks	
Hep-B	Birth	Underused	Birth			
Pentavalent Vaccine (DPT-HepB-Hib)	Infants surviving the birth cohort	Underused	6 weeks	10 weeks	14 weeks	
Vitamin A	Infants surviving the birth cohort	Underused	6 months			
Yellow Fever	Infants surviving the birth cohort	Traditional	9 months			
Measles	Surviving infants	Traditional	9 months			

Annex 2: Health financing function in Nigeria

Annex 2.1 Stewardship in health financing in Nigeria

The FMOH governs the health system (101); collaborating with donors along with the National Planning Commission to promote aid alignment and harmonization (34) (77). At state and local government levels –the respective ministry(s) or department(s) of finance or planning play this role (77).

Annex 2.2 Revenue collection

Funding for the health sector is generated from a combination of financing sources.

Out of Pocket Payments (OOP): Although OOPs are the largest health expenditure in Nigeria (discussed in section 1.7), the national health policy directs vaccines provided free for infants (34). However, Sibeudu et al demonstrated that informal user fees and transportation costs limit households of lower socio-economic status from accessing immunization (38).
General Government Budgetary Expenditure: The governments' budgetary expenditure on health as a percentage of the government expenditure in 2013 and 2014 at 4% respectively, increased to 5% in years 2015 and 2016 (19). Of the budgetary allocation to health in 2013 - approximately 1.8 billion USD – budgetary allocations to immunization was 57.5 million USD – approximately 3.1% (7).

Since taxes are the main source of government revenue, which Awosusi et al (40) argues it is inefficiently collected and evaded (40); this low fiscal space may explain low allocations to health. However, government budgetary allocations to health are not exclusively related to government revenue but also on other competing national priorities. and additionally as

argued by Doherty et al (9) low absorptive capacity to utilize released revenue at the FMOH (9) (41).

Basic Health Care Provision Fund (BHCPF): This fund – operationalized in 2018 - aims to improve access to healthcare (39)(40). Contributions comprise 1% of federally generated taxes along with counterpart funding from donors – currently the Global Financing Facility - and benefiting states and local governments (40).

50% of allocations increase demand through increased services in the basic benefit package and population covered by the NHIS; while 45% finances supply side capital projects including essential drugs for qualifying PHCs (40)(41). The rest funds emergency preparedness and responses (41). Its assessment in the 2018 fiscal year revealed off-target performances mainly in accountability (102) (76). Its implications on the EPI will require further study.

External: Total donor funding on health in Nigeria grew from 8% in 2012, peaked at 12% in 2014, has declined to 10% of the current health expenditure in 2016 (19). Shaw et al argues that donor funding in Nigeria appears largely off the government's budget although utilized at the local government level (103). This funded infectious and parasitic diseases (including HIV/AIDS, Tuberculosis and Malaria) reproductive health, non-communicable diseases (19), and the EPI (7).

Annex 2.3 Revenue pooling

Three pooling mechanisms redistribute financial risks in accessing health in Nigeria

Intergovernmental Monetary Transfers: In implementing fiscal decentralization (21), taxes generated by the federal government is allocated to the federal, state and local governments by means of the formula (Federal -48.5%, state – 24%, and local government – 20%) for sharing revenue (37). Although this aims at redistributing resources (including those for health) between these levels, mainly recurrent expenditure is financed (41). In particular, human resources for health – affecting access to health care on the supply side.

National Health Insurance Scheme (NHIS): The NHIS was established in 1999 to reduce catastrophic out-of-pocket health spending and improve health care access (42). It implements: the Formal Sector, Urban Self-Employed and Rural Community, Social Health Insurance Programs (39). The Formal Sector Social Health Insurance program channels premiums from the formal public and private sector to health management organizations that contract with public or private providers in purchasing health care (39) (41). Both the Urban Self-Employed and Rural Community Social Health Insurance Programs, utilize monthly contributions at a flat rate from voluntary participants (39). But whereas in the former participants select pre-established plans with designated health benefits, the later more flexibly allows selection of benefit packages following assessments of need (39).

Only two states have formally adopted the NHIS (41). Additional coverage of the informal sector, through a community based insurance program, is low (104). Furthermore Aregbeshola and Khan (28) argue that women – 97.9% of women of reproductive age - were not covered with any form of health insurance (28). Insurance schemes have been shown to increase utilization of health services (42), and can influence the uptake of immunization services in Nigeria

Basket Funds: Basket funds channel resources for a specific purpose (43). The government of Zamfara and Kano States in Northern Nigeria – in 2009 and 2013 respectively - supported by local governments and The Global Vaccine Alliance (GAVI), set up this mechanism to support immunization (43).

Annex 2.4 Purchasing/ provision of services

The federal, state and local governments utilize pooled funds to purchase health services in the public sector at tertiary, secondary and primary care levels, respectively (44). This is through global budgets and or commodity supplies, as the health financing policy of 2006 directs a split in purchasing and providing health in public agencies (45)(46). However through the NHIS pool, health management organizations act as intermediaries to purchase health services from a mix of public and private health providers (39). Nationals access health services either through OOP, or the benefit packages of the NHIS.

Annex 3: Detailed search strategy with table highlighting keywords used and application of Boolean Operators.

Primary search strategy

1. The keywords below were used in the search, and combination and or synonym clusters along with the use of Boolean Operators, in table below.

	Boolean Operator **AND** in multiple combinations was used							
Boolean operator **OR** was used in multiple combinations	Donor	Aid	Expanded Program on Immunization	Stewardship	Health	Nigeria	Policies	Universal health coverage
	External	Funding	Immunization	governance	Health care	North Nigeria	priorities	coverage
	Official development assistance	financing	Vaccination	Resource collection		South Nigeria		
	Project assistance		Supplementary Immunization Activities	Tax (taxes)		Sub-Saharan Africa		
	OECD			Purchasing		Countries		
	CRS			Allocation		Kenya		
	DAC			Provision		Kenya county		
	BMGF			Provider payment mechanisms		Ghana		
	GAVI			Contracting		Ghana Regions		
	UNICEF			Pooling				

	WHO			NHIS				
				Insurance				
				BHCPF				
				Basket funds				
				Relevance				
				suitability				
				Effectiveness				
				Accessibility				
				Equity				
				Efficiency				
				Cost effectiveness				
				Cost analysis				
				Sustainability				
				Impact				
				Consequences				
				History				
				Colonial				
				Independence				
				Post-independence				
				Outcome				

				Results				
				Optimal				
				Flow				
				Magnitude				
				health system strengthening				

2. Secondary search strategy

Snowballing was done from literature to identify other relevant data

Annex 4: Table showing top 15 donors as a source of average total ODA to Nigeria from 2011-2016 by disbursements in current million USD (70)**.**

Donor Name	**Disbursement**
International Development Association	604.48
United States	481.19
United Kingdom	353.38
Global Fund	170.87
Bill & Melinda Gates Foundation	134.11
European Union Institutions	121.88
African Development Bank	91.18
Global Alliance for Vaccines	79.33
African Development Fund	64.56
International Finance Corporation	60.87
United Nations Children's Fund	49.11
Japan	41.86
Germany	33.98
France	31.06
Canada	26.24
United Nations Development Programme	10.85
Norway	9.98
International Fund for Agricultural Development	8.45
United Nation Population Fund	6.78

Annex 5: Table showing private funding for development, as reported by the Creditor Reporting System. Table shows official development assistance commitments – of all types, from all channels and of total DAC countries for the total health sector in (constant 2017) USD in millions (13)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Private Donors Total	..	34.378	27.842	44.229	85.241	47.368	101.541	163.379	69.831	117.867
Bill & Melinda Gates Foundation	..	34.378	27.842	44.229	85.241	46.968	101.541	163.379	69.831	102.794
Children's Investment Fund Foundation	..	..	..	..	..	..	..	..	..	14.167
Conrad N. Hilton Foundation	..	..	..	..	..	0.399	0.000	0.000	..	0.380
John D. & Catherine T. MacArthur Foundation		..	..	..	..	..	..	..	..	0.526