

HEALTH AND INDUSTRIALISATION: EXPLORING THE ROLE OF PUBLIC-PRIVATE PARTNERSHIPS IN BUILDING COMPETITIVE HEALTH-INDUSTRY COMPLEXES IN SOUTHERN AFRICA

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Health and Industrialisation: Exploring the role of Public-Private Partnerships in Building Competitive Health-Industry Complexes in Southern Africa

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1.0 Introduction

It has become common knowledge that many African health markets are trapped in a vicious cycle of a perennial disconnect between supply, demand and investments. According to the PharmAccess Foundation, and corroborated by numerous other sources, as of 2019, Africa has: more than 50% of all health expenses paid out of pocket; more than 80% of the global burden of non-communicable diseases; more than 15% of the world's population; 47% of the global burden of communicable diseases; yet has less than 2% of global health expenditure (PAF, 2019). To compound this and the current burden for the health sector, the African continent will in the next few decades enter multiple transition phases that impact health security. These include demographic and disease transitions as populations age and as infectious diseases begin to be overshadowed by non-communicable diseases in addition to the impact of chronic infections on non-communicable diseases. All these changes will occur as industrial transitions and rural urban migration accelerate.

As a (semi-) public good, healthcare requires large government intervention. However, many African countries suffer from limited state capabilities and poor institutions. On the other hand, despite its important role, the private sector is often weakly regulated and highly fragmented. The current health-industry complex (by which we mean the infrastructures and capabilities in place to manufacture, supply and deliver health products to patients) may not be adequate to address these emerging challenges. Put differently, the supply of medicines through manufacturing, procurement and distribution capabilities, and their dispensing to patients in health facilities of different forms, is presently not matching demand, and will only get more constrained with the challenges ushered in by multiple transitions. In response, therefore, African countries will not only need to accelerate local production of drugs, vaccines and other health technologies to be able to cater for emerging and long-term health challenges the continent is facing and will face, but will also need new innovative business and funding models to attain and sustain competitiveness as well as social inclusion through a responsive and inclusive health industry complex. There is growing global evidence on the role and influence of public-private partnerships (PPPs) as a mechanism for availing the financing, capabilities and business models necessary for a health-industry complex that is good for socio-economic development.

This paper reports on a study which sought to explore and understand the role that PPPs could play as viable technological catch-up vehicles and investment financing mechanisms for building a competitive African health sector that is interlinked with a vibrant pharmaceutical industry complex, capable of supplying drugs, vaccines and other health products that assure health inclusion and social security. In particular, this paper draws from co-produced primary and secondary qualitative and quantitative evidence from five southern African countries, namely Botswana, Namibia, South Africa, Zambia and Zimbabwe to highlight and examine examples, opportunities, successes, failures of and lessons from PPPs in health-industry innovation and health system financing. The rest of the paper is structured as follows: **Section 2** gives an overview of the southern African the health sector and pharmaceutical context, followed by **Section 3** which explores the history and role of PPPs. **Section 4** describes the rationale, conceptual framework and methodologies underpinning the study informing this paper, while **Section 5** describes, analyses and discusses the findings from our case studies and **Section 6** presents some conclusions and recommendations.

2.0 Health in Southern Africa

The five study countries are all members of the Southern African Development Community (SADC). The SADC's Regional Indicative Strategic Development Plan (RISDP) integrates health as a priority

within the context of Social and Human Development, Poverty and Food Security¹. The region's estimated 337.1 million inhabitants (2017 estimate) face high morbidity and mortality rates, low nutrition status, poor healthcare infrastructure and services and poor living conditions as major challenges. The region has for the past three decades faced a challenging and persistent HIV/AIDS pandemic, and it is not surprising that the pandemic permeates the entire plan as an issue that influences most factors of development in the region. The SADC region accounts for one-third of all people living with HIV and AIDS worldwide; while eight SADC Member States are among those countries with the highest rates of tuberculosis; and 75% of the SADC population is at risk of contracting malaria. It is estimated that the loss of productivity attributable to tuberculosis is up to 7% of gross domestic product (GDP) for some countries, while the HIV/AIDS challenge depressed the GDP of most Sub-Saharan African countries by up to 20% in the decade 2001 to 2010 (WHO, 2013).

This trio of diseases is a major threat to sustainable development in the region. As a result, a number of protocols, declarations, plans, and programmes have been developed to combat communicable diseases, led by the Social and Human Development and Special Programmes Directorate. The SADC Protocol on Health was established in 1999, and it oversees all of these declarations and strategic frameworks on health². Article 9 of the Protocol on Health addresses communicable disease control, while Articles 10, 11, and 12 specifically concern HIV/AIDS, malaria, and tuberculosis. The Protocol on Health also covers a number of other issues critical to the preventative, diagnostic and curative functions of health delivery, among others; harmonisation of policies for disease definition, notification, and management and establishment in Member States of reference laboratories and sharing of information on diseases and epidemics.

The health care systems of the five study countries, like elsewhere in the world, are continuously in need of strengthening due to challenges embedded in or transcending the systems (Mugwagwa, Banda and Chinyadza, 2017). The countries are all facing a number of similar challenges with respect to health delivery, presenting both objective and subjective reasons for inclusion in the study informing this paper. Specific country details will be presented in the findings section, suffice to say, across the five countries, there is an inexorable reality of countries that are individually and collectively confronted by a high and rising burden of disease; communicable and non-communicable diseases as well as perinatal and maternal disorders. The national health systems are characterized by relatively low quality care in rural areas and uneven access to medicines, medical devices and health services in general.³

- **Pharmaceuticals**

With respect to pharmaceuticals, the SADC region is fully awoken to the fact that use of appropriate pharmaceuticals is central to disease treatment and prevention, and that access to affordable, safe, and quality-assured medicines is uneven in Southern Africa⁴. There are a number of challenges working singly or collectively to sustain these challenges, ranging from lack of adequate production

¹ <https://www.sadc.int/themes/health/>

² https://www.sadc.int/documents-publications/show/Protocol_on_Health1999.pdf

³Bongani M Mayosi, Alan J Flisher, Umesh G Lalloo, Freddy Sitas, Stephen M Tollman and Debbie Bradshaw. 'The burden of non-communicable diseases in South Africa' *Lancet* August 25, 2009 DOI:10.1016/S0140-6736(09)61087-4 <http://fogartyfellows.org/wp-content/uploads/2012/09/2-A.4-Non-communicable-disease-South-Africa.pdf>

⁴ <https://www.sadc.int/themes/health/pharmaceuticals/>

capabilities to meet the needs of the region, inefficient supply chains, an uncoordinated regulatory terrain, to lack of standardised legislation for pharmaceutical usage and disparate treatments for diseases.

Among the five case study countries, there is a challenge of high cost of medicines due to factors related to, among others, logistical challenges, diminishing capacities of local pharmaceutical manufacturers, leading to reliance on imported medicines, particularly for Botswana, Namibia, Zambia and Zimbabwe (Mugwagwa, 2019). South Africa has accumulated industrial capabilities (or potential) for manufacturing medicines and a wide range of medical technologies. Its pharmaceutical industry is relatively well established when compared to the other SADC countries. Zimbabwe's pharmaceutical manufacturing capabilities have shrunk considerably in the last two decades due to skills and capital flights in the backdrop of economic and political challenges (Banda, 2016?)

The SADC Pharmaceutical Programme in June 2004 and now located within the Social and Human Development and Special Programmes Directorate takes care of the usage and treatment dimensions; while the SADC Pharmaceutical Programme aims to enhance the capacities of Member States to prevent and treat diseases of major concern to public health in the region, through improving access, affordability, and effectiveness of pharmaceuticals within the region (Article 29). A Business Plan for Essential Medicines has been put in place, which covers, among others; rationalising and maximising the research and production capacity of local and regional pharmaceutical industry of generic essential medicines and African Traditional Medicines; development of mechanisms to respond to emergency pharmaceutical needs (including procurement mechanisms); and strengthening regulatory capacity, supply, and distribution of basic pharmaceutical products through ensuring a fully functional regulatory authority with an adequate enforcement infrastructure.

Innovations in the governance of the local production and distribution of medicines, diagnostics and a range of other health technologies are particularly key for ensuring full preparedness to deal with current and emerging health challenges, in turn putting the countries on the right path towards meeting Sustainable Development Goals (SDGs) in general and SDG3 on 'Good Health and Well-being' in particular. PPPs are seen as an opportunity for improving the health sector in general and the national health innovation system in particular through exploiting existing national industrial capabilities that are usually scattered across an institutional terrain comprising of R&D institutes, private large companies, local companies and SMEs (Gideon and Unterhalter, 2017).

As noted by SADC and recognised across the countries, realisation of these improvements will involve various policy and institutional reforms to enable the countries to develop, utilize and expand their industrial capabilities for public health. Convergence of national health and industrial policy regimes as well as greater integration of innovation considerations into the national health policy framework are crucial considerations. Regulatory barriers, including those pertaining to registration of pharmaceuticals, diagnostics and medical devices, will need to be removed to facilitate innovation. Institutional adjustments (reform) will entail building greater linkages between industry and health care sectors. The nexus between health and industrialization is under-studied in Africa and other most developing countries (Mackintosh et al, 2018). There is scant empirical research on how industrial change (or industrial development) can aid (transform) public health, particularly in terms of reducing the costs of local manufacturing of medicines and medical equipment. This paper particularly focuses on providing new empirical data and evidence on how PPPs can play roles in the delivery of health and industrial policies and programmes for health and well-being.

3.0 Public-Private Partnerships

Van Ham and Koppenjan (2001:598) define a PPP as "cooperation of some sort of durability between public and private actors in which they jointly develop products and services or products and share

risk, cost and resources which are connected with these products”. PPPs rose to prominence in the 1980s as a strategy to raise capital without increasing public sector debt to fund infrastructure development. During this era, governments were pressured to reduce spending and pair up with the private sector, which was assumed more efficient and better at cost management capabilities than the public sector (Gideon and Unterhalter, 2007). In the next decade, Mirafirtab (2004) asserts that the donor community promoted the agenda in the global South; at a time of relentless pressure for economic structural adjustment programmes and reduction of government spending in provision of public goods. It is therefore not surprising that critics saw this as ‘welfare pluralism’ and the shift to private funding that allowed multinational corporates a foothold in public service provision services (Birch & Siemiatycki, 2016; Standing, 2007). (Gideon and Unterhalter, 2017) frame this as ‘financialisation of the means of social reproduction in sectors such as health and education’ which shapes policy direction towards profit motives for multinational corporates without an active consideration of promoting equity and social inclusion. Consequently, there are arguments that the evidence for PPP benefits claims is not overwhelming, especially concerning poverty and inequality reduction (Romero, 2015; Trebilcock & Rosenstock, 2015; UNDESA, 2016). Some of these arguments relate to the “draining the swamp” programmes of Margaret Thatcher in the UK where between 1987 and 2006 the UK had signed 590 PPPs (Ball et al, 2002).

However, PPPs have been identified as key financing vehicles for Sustainable Development Goals (SDGs). SDG 17 focuses on the government-civil society–private sector partnerships and argues that they are ‘inclusive partnerships built upon principles and values, a shared vision, and shared goals that place people and the planet at the centre, are needed at the global, regional, national and local level.’ (UN, 2015; Gideon and Unterhalter, 2017). Literature shows that the bulk of PPPs have covered infrastructure development; roads, water reticulation, rail, energy, telecommunications and the general built environment. The various types for PPPs include the following:

Table 1: Seven types of PPPs common in infrastructure projects

Type of PPP	Mechanism of the scheme
Build-and-Transfer scheme (BT)	Private sector sources funds, build infrastructure and hands over to the public sector. The public sector pays the private sector agreed principal and interest.
Build-Operate-and-Transfer Scheme (BOT)	Private sector funds and builds infrastructure, maintains the infrastructure. It recoups the costs through agreed charges (rates, rental or user fees) for the infrastructure. On agreed dates, the infrastructure is transferred to the public sector.
Build-own-operate-and-transfer scheme (BOOT)	Private sector funds, builds, owns, operates, and then at the set time transfers the infrastructure to the public sector. Costs are recovered including returns usually with minimal public sector interference.
Build-lease-and-transfer (BLT)	Private sector funds and constructs the infrastructure and on completion leases it to the public sector in order to recoup costs. At the set time, the public sector stops paying lease and assumes ownership.
Build-transfer-and operate (BTO)	The private sector builds the infrastructure and transfers to the public sector. The private sector however operates the infrastructure on behalf

	of the public sector and the proceeds are shared as per set agreement.
Rehabilitate-operate and transfer (ROT)	Dilapidated infrastructure is handed over to the private sector to be refurbished, maintained and reconditioned. The private sector operates the infrastructure for a set time to recoup costs incurred in refurbishing the infrastructure.
Lease, develop and operate (LDO)	The private sector leases an existing facility, restores or modernises it. Thereafter the private sector operates the infrastructure for a set time to recoup costs and then transfers the infrastructure to the public sector.

Source: Dube and Chigumira (2010)

The building blocks of PPPs essentially involve the following dimensions; Finance, Design, Build, Operate, Maintain, and Deliver (Abuzaineh et al, 2018) and the combinations of PPPs in Table 1 and others not mentioned in this document emanate from a combination of these dimensions. Skelcher (2005) broadly groups PPPs into five classes: Strategic Partnering; Joint Ventures and Design-Build-Finance-Operate (DBFO); Contracting-Out and Competitive Tendering; Public Leverage; and Franchising. We do not delve into the mechanics of how these PPP operate or are organised in this paper. However, our literature review shows that the major focus of PPPs is their utility as financing mechanisms and risk, resource and benefit-sharing vehicles between governments and the private sector (Walwyn and Nkolele, 2018), hence the prevalence of civil engineering types of PPPs compared to health-complex types of PPPs that we focus on in this study. Unsurprisingly, the African Development Bank has been a major promoter of PPPs and serving as “an important backer of future PPPs” to boost investor confidence in the feasibility of PPPs on the African continent (ZEPARU, 2016). Generally, there are challenges in using the PPP approach in a number of African countries because of six key issues: non-conducive legal, regulatory and policy frameworks; unpalatable risk, poor perception of country risk; small market size; absence of deep financial markets; limited power in global trade and investment; as well as lack of skills to competently manage PPPs (ibid).

A study of public-private interactions in the health sector in South Africa found that successful private-sector involvement in technological and organizational innovations will require upgrading the skills and capacities of public-sector actors in procurement, contracting and performance management (Kula and Fryatt, 2014). New forums for stakeholder participation will also need to be created in order to include networks of policy makers, academics, care providers and civil-society groups capable of reviewing and evaluating PPPs and collaborating on learning and innovation (Kula and Fryatt, 2014). Roehrich et al. (2014) reviewed the literature on PPPs in health service provision and innovation and identified several risks of PPPs including: inappropriateness of certain PPP configurations, higher capital costs, stifling of innovation, limited competition, high transaction costs, misallocation of risks. However, there is still a lack of evidence on the impacts of PPPs and the factors contributing to success of failure (Roehrich et al., 2014), a gap among others which this study intends to contribute towards filling. Overall, there is need to understand the political economy of the health-industry complex, recognising the political and context-dependent nature of investments and interventions in these complexes and how these investments are influenced by wider socio-cultural, political-economic and scientific and technological contexts.

General framework of areas where PPPs can be active in the health-industry complex.

Our original idea of the health-industry complex covered the relationship between pharmaceutical industry and the public health sector and the synergistic relationships that can be capitalised for innovation, industry development and health security simultaneously. In this paper, we are cognisant of the arguments surrounding PPPs, and we focus on the positive that they can deliver in clearly difficult circumstances where solely public or private investment may not yield much when the funding magnitude, risks inherent and the gestation as well as policy terrain are taken into consideration. Figure 1 below presents the conceptual framework tying together the different elements of arenas of analysis.

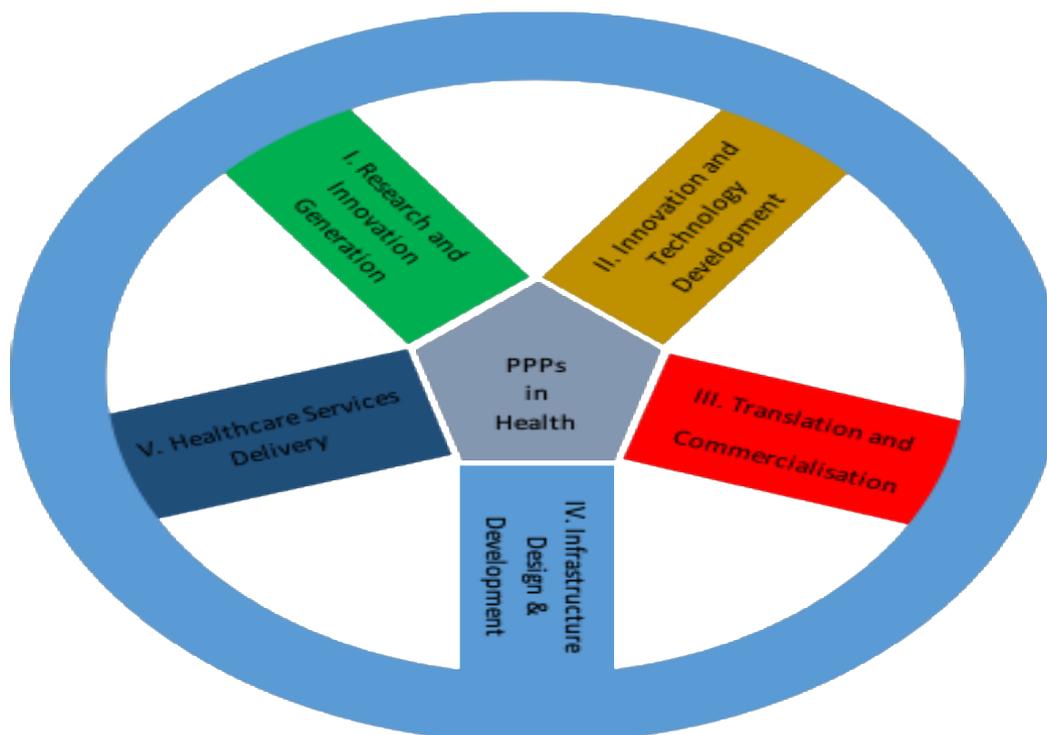


Figure 1: Conceptual framework for integration of PPPs in innovation and service delivery for the health sector.

Using this conceptual framework, the five case studies presented in this paper consider situations where ‘market failure’ can be overcome through PPPs in the health-industry complex focusing on the innovation pathways constituting the healthcare value chain.

For the purpose of our study on applicability of PPPs in the health-industry complex, we split the innovation pathway into the following stages: research and innovation generation; innovation and technology development; translation and commercialisation; infrastructure design and development and finally; healthcare services delivery. We desisted from using a linear depiction to avoid the impression that this is a linear process, as we wanted to project the iterative nature of the interaction of the various stages. In this regard, we felt the wheel and hub presentation in Figure 1 above illustrates how PPPs can be used to strengthen the various spokes constituting the innovation pathways surrounding provision of healthcare embodied in the built environment and supporting medical health technologies and the clinical and management skills required to operate health institutions and allied industries. Thus figure 1 should be read and understood in conjunction with Table 2 which shows the particular stages and activities or actions or funding streams necessary to support health systems strengthening and social inclusion.

Table 2. Range of Health-related PPPs in a health-industry complex promoting innovation and social inclusion

I. Research and Innovation Generation	II. Innovation and Technology Development	III. Translation and Commercialisation	IV. Infrastructure Design and Development	V. Healthcare Services Delivery
<p>Training in Technical Skills [Technicians & Engineers]</p> <ul style="list-style-type: none"> • Manpower development schemes - student attachment in industry – engineering, pharmacy, and other technical skills [polytechnics key link e.g. Zimbabwe] • Accounting and business management • Environmental Health 	<p>Innovation Acceleration</p> <ul style="list-style-type: none"> • Funding to support early stages of innovation • Product Development Partnerships 	<p>Technology Transfer</p> <ul style="list-style-type: none"> • Product Development Partnerships • Joint ventures 	<p>Designing</p> <ul style="list-style-type: none"> • Manufacturing, clinical and non-clinical support services infrastructure design 	<p>Primary Care</p> <ul style="list-style-type: none"> • Public health • Vaccines • Maternal and Child Health • Preventative services
<p>Post-Graduate Training and Skills Development</p> <ul style="list-style-type: none"> • Research capabilities in natural sciences key for health – e.g. pharmaceutical R&D or infectious or non-communicable diseases control. • Research training in social sciences supporting inclusion and health systems strengthening 			<p>Construction of physical infrastructure</p> <ul style="list-style-type: none"> • BOT • BOOT • DFBOT 	<p>Clinical Support Services</p> <ul style="list-style-type: none"> • Laboratory services • Imaging services • Pharmaceutical Services • Ambulatory services <p>Non-Clinical Support Services</p> <ul style="list-style-type: none"> • ICT infrastructure set up and maintenance • Food and nutrition services

<ul style="list-style-type: none"> • Clinical trial management 				<ul style="list-style-type: none"> • Laundry and Sanitation Services • Medical Waste Management
Research Grants <ul style="list-style-type: none"> • Knowledge generation funding for context specific health security challenges 	Innovation Incubation <ul style="list-style-type: none"> • Innovation hubs • Innovation test beds – “Sandbox Concept” 	Technology Scale-up <ul style="list-style-type: none"> • Institutions or innovation ecosystem supporting technology scale up 	Medical Equipment identification and acquisition <ul style="list-style-type: none"> • BOT • BOOT 	Specialised Clinical Services <ul style="list-style-type: none"> • Dialysis • Cancer Therapy • Day Surgery – e.g. Cleft lip palate surgery
Innovation Challenge Funds <ul style="list-style-type: none"> • Industry – Public joint funding of innovation to solve society challenges 			Capital Expenditure – Long Term funding of infrastructure, plant, equipment and machinery	Organisational Management <ul style="list-style-type: none"> • Management contracts to run health services

Source: Authors from interviews, literature review and AfDB (2017)

Under the research and innovation generation we cover four key functions of training in technical skills, post graduate training and skills development, provision of research grants and innovation challenge funds. This stage covers basic and applied research which leads to the second stage of innovation generation and technology development (Table 2). Innovation acceleration and innovation incubation constitute the second spoke of the hub in our conceptual framework. The third spoke covers translation and commercialisation and the key activities covered in this phase are technology transfer and technology scale up with attendant focus on joint ventures and product development partnerships; as well as an innovation ecosystem supporting technology scale up, respectively. The fourth spoke is the one most popular for traditional PPPs as it covers infrastructure design and development. Most literature has examples of these types of PPPs that cover designing and construction of for examples hospitals and other built environment for healthcare delivery or the manufacturing sector. The final spoke of the wheel is healthcare service delivery and this covers mostly technical skills deployment in both clinical and non-clinical activities as well as organisational management of infrastructure and institutions. The last two stages of the framework are operationalised in the healthcare industry as shown in Figure 2 in the built environment interacting with preventative, curative and palliative healthcare and local pharmaceutical industries are linked to healthcare services through their provision of medical health technologies (therapies and medical devices) as key components of healthcare provision.

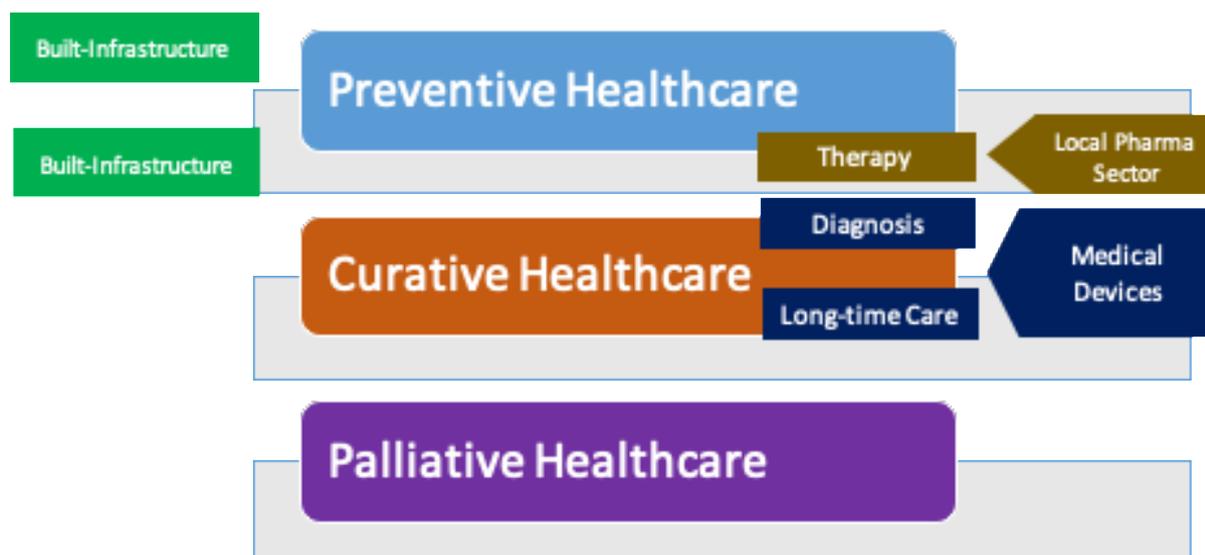


Figure 2 Potential application areas in the built environment/infrastructure and the healthcare service delivery

In our discussion of the case studies we use these frameworks as heuristic or sense making tools to understand what types of PPPs have been used in different countries and how effective they have been.

4.0 Study rationale and methodology

To date, policy and practice interventions have taken a silo approach to health and industry, ignoring the positive reinforcement from a coherent industry-health linkage consideration (Mackintosh et al, 2017). The intention of the study informing this paper was to assess the dynamics of PPPs as a viable financing mechanism for investment in the pharmaceutical sector (drugs and vaccines) that leads to better social inclusion in health (medicines access, affordability and security) through the health and industrialisation complex. For us, the study was both an assessment of the utility of PPPs and an endeavour to contribute learning to the health-industry arena in the study countries and beyond. To these ends, the methodology adopted for this study was informed by the overall focus of the study which was to unpack how health and industrialisation in Southern Africa, in the context of public-private partnerships (PPPs) will be able to address issues of "competitiveness and social inclusion" while supporting local pharmaceutical production interlinked with a mutually-supportive health-industry complex that fosters economic and social development. The underlying premise is that by purposively bringing together public and private sectors to support health and industrialisation, and deploying appropriate science, technology and innovation (STI) tools, African countries can take a long-term perspective towards solving local health security, economic development and social inclusion challenges. Achieving this entails investing in research and innovation skills, capabilities, resources (including financial and technological), knowledge, networks and evidence-based policy and practice design, implementation and refinement. A structured consideration of the complementarity of integrating public and private capabilities in delivering the benefits of a local health and industry complex speaks to the developmental and social inclusion needs of Africa, buttressed by sustainable financing and overall strengthening of health systems.

4.1 Objectives of the study

The study methodology further drew from the following objectives as set out in the terms of reference, which were to;

1. identify, analyze and share the subtle lessons behind the success or failure of health and industrialisation partnerships and collaborations between government and industry in local

production of drugs and vaccines with potential for health systems strengthening/financing that leads to better social inclusion in terms of local health security, while at the same time exposing the challenges that the partnerships faced or currently face.

2. identify and highlight key areas that foster social inclusion in local health security by focusing on (a) affordability – procurement and pricing of drugs and vaccines (b) access – distribution and supply chain management, and (c) promoting good manufacturing practice (GMP) certification, standards improvement (Bolo *et al*, 2016) and for innovative and emerging technologies priming the system for proportionate and adaptive governance of innovative technologies [new technologies coming from for example synthetic biology] and instituting anticipatory governance mechanisms.
3. (explore drivers of competitiveness – through which we will adopt and deploy the Bolo *et al* (2016) framework that splits this into (a) financing, upgrading and capacity utilisation, (b) research, innovation and skills development and (c) intellectual property rights and technology transfer
4. identify incentives, policy and regulatory frameworks that have been introduced or modified to improve (a) business environments, and (b) promote investment [including foreign direct investment - FDI] in the local sector and trade
5. map out the unique policies, processes, practices and related factors that may have led to the success or failure of public-private partnerships especially in the area of health
6. tease out lessons/action guides for the science granting councils on how to catalyse, manage and enhance knowledge exchange between academia, public and private sectors.

4.2 Key research questions and research process

In order to meet the above objectives, the study specifically sought to address the following overarching research questions which formed the basis of data collection instruments for the study:

- to what extent are PPPs prevalent in the health-industry complex, in terms of research & innovation, health system strengthening and as an innovative financing mechanism, and to what extent have they contributed to health social inclusion.
- what are the peculiar contextual realities of PPPs in health-industry complexes in Africa that need to be considered and what lessons can be learnt from other regions?
- how can governance, regulator, incentives and policy frameworks be made more anticipatory, adaptable and responsive for more effective operation of PPPs in health-industry complexes, especially for emerging innovative medical health technologies? and
- what metrics are required for effective monitoring, learning and evaluation of the role of PPPs in health system strengthening and financing?

Across the different research questions and objectives, we also analysed the role of government as an investor in, regulator and facilitator of health-industry complexes and the wider political economy. Figure 3 below shows our overall research process

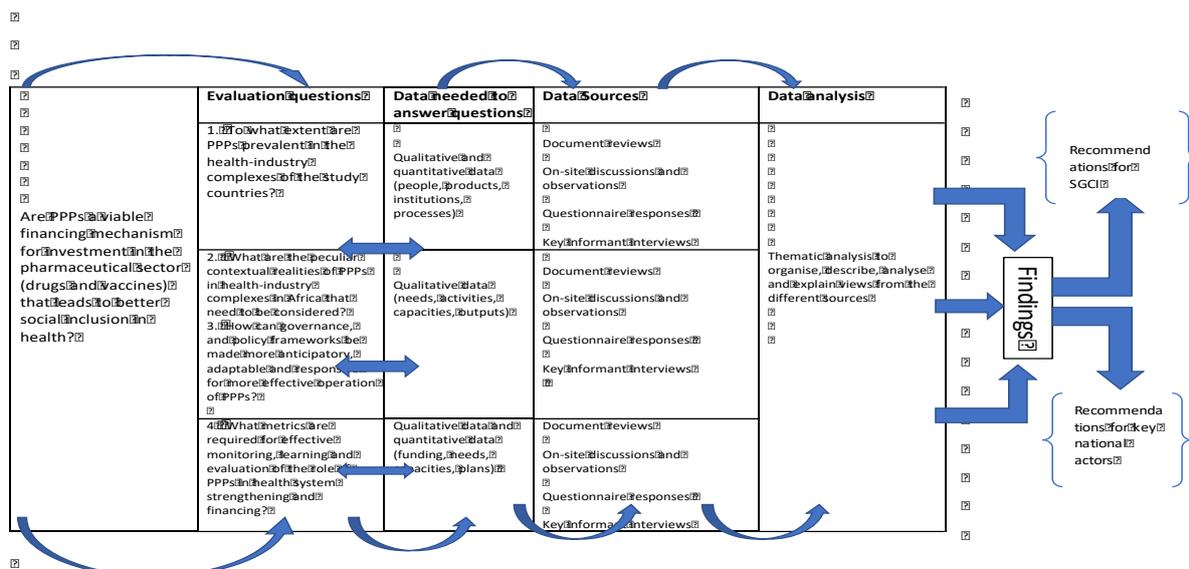


Fig 3: HISA project research process

This research adopted a case study approach, with the countries, their health and industrial sectors and specific programmes, companies or organisations serving as multiple case studies for careful analysis of the key areas of focus for the evaluation. As shown in Fig 3, data for this study was gathered using a number of complementary methods namely, document reviews, emailed questionnaires and interviews with some key respondents. Desk reviews were conducted against an evaluation checklist based on the evaluation purpose, objectives and key questions, while interviews were conducted using emailed questionnaires and/or semi-structured interview guides for different respondent categories (Annex 1) to ensure that the questions posed in the study purpose were covered in a complete and consistent manner. The research team also kept running notes of any other relevant points made by the various stakeholders during discussions or observations they made that were relevant to the study. Using the case study approach was best suited for this type of study for the deep and close in-situ investigation that we were able to obtain. Interviewees were free not to respond to any questions they felt uncomfortable with, and where feasible and desirable, anonymity was preserved. In total, we interviewed 40 key respondents, an average of 8 per country, these being drawn from the pharmaceutical industry, ministries of health & industry, health practitioners, civil society, academia and regional organisations. We also reviewed more than 50 key academic, policy and industry documents and closely studied more than 10 PPP cases across the five countries. The case studies, primary and secondary data form the basis for compilation of this commissioned paper, journal articles and a policy brief to be published.

5.0 Study Findings

5.1 Zimbabwe

Zimbabwe attained independence in 1980 and just as South Africa inherited a nation with huge social and economic inequalities that manifested in unequal access to social services and infrastructure that supported health security. The new government, as result, allocated resources to social development however, with the advent of the economic structural adjustment programmes in 1993 and subsequent land invasions in the early 2000s and political challenges; the country is currently facing severe economic and social challenges, more so in healthcare provision. Historically health provision was characterised by exclusion policies that allocated the bulk of resources to the white community. Less resources were allocated to the black community critical for industry and commerce in the urban setting; hence the unequal distribution at independence of government healthcare infrastructure in urban and peri-urban centres, compared to rural areas where the population was covered by the mission hospitals (Mhike and Makombe, 2018). This inequality dates to colonial times and the

development of health infrastructure was driven by the racist policies of the era. A respondent highlighted how the Salisbury General hospital located at what is now Parirenyatwa General Hospital catered for the blacks and white through separate systems. During the federation era (Federation of Rhodesia and Nyasaland – modern day Zambia, Zimbabwe and Malawi) general hospitals for the black communities were constructed in Harare (Harare Hospital), Bulawayo (Mpilo Hospital), Lusaka, and Blantyre (Blantyre Hospital).

At the same time and critical to the health-industry complex argument on the importance of co-location of pharmaceutical industry and healthcare provision, the Central African Pharmaceutical Services (CAPS) was established in 1953, followed by DATLABs a subsidiary of Adcock Ingram in 1955 and Pharmanova in the 1970s and Varichem and Plus 5 Pharmaceuticals in the 1980s and 2000s respectively. As will be discussed later this co-location of industry and local healthcare provision was instrumental in rapid policy and practice intervention a key public-private initiative that led to local manufacture antiretroviral drugs to combat the HIV/AIDS pandemic.

Zimbabwe has successfully completed formalised PPPs in the road, water and rail infrastructure space and one in the health space; Chitungizwa Hospital and Baines Imaging, (Table 1). Zimbabwe is however peculiar because of the long term preponderance of “un-formalised”, at times transient and transactional public private partnerships in; Innovation and Technology Development, Translation and Commercialisation and Healthcare Services Delivery, which have involved local industry, the public health system, government in general, faith based organisation, international non-governmental organisations. We will discuss this in five specific case studies of: formulation development and local manufacture of ARVs; the EU-local pharmaceutical industry drug manufacture and supply of essential medicines during the hyperinflationary era; Natpharm partnership with the pharmaceutical industry for local manufacture of essential drugs; Mission Hospitals as invisible PPPs, as described by Mhike and Makombe (2018); and the HIV/TB PPP that the Ministry of Health and Child Welfare is developing.

What has driven PPPs in Zimbabwe?

The main driver of policy shifts towards PPPs in Zimbabwe has been the incessant economic challenges. The primary PPP candidates have historically been education, health facilities, and power infrastructure and transport as well as water reticulation. This was driven by a crumbling infrastructure caused by the economic challenges of the 1990s as well as the political issues emanating from the reform in the early 2000s. The country has accumulated a huge infrastructure deficit which the World Bank (2011) estimated needs a minimum investment of \$2 billion per annum. The revenue collections have been inadequate to cover this infrastructure gap, and consequently specifically for the healthcare sector PPPs have been mooted as a possible solution. Thus spurred by this scarcity programmes such as ZimAsset recognised PPPs as a possible financing mechanism for propelling economic development (GOZ, 2013). Clinical and non-clinical services were affected by the economic downturn especially between 2008 and 2009 (Dube and Chigumira, 2010) however, during the Government of National Unity era there was improvement in services, which have since deteriorated to date. Key areas affected include infrastructure, clinical and non-clinical services, staffing and procurement of medicines and other consumables.

Our research echoes earlier studies (ibid) that hospital plant, machinery and equipment is one of the casualties of the economic downturn, and the areas most affected include diagnosis and treatment for diseases such as renal failure and cancer. Those who can afford are opting to seek medical attention in neighbouring South Africa or India. Thus similar to the 2008-9 era, the burden of care has shifted to the private health sector, and out of pocket, health expenditure has increased, as medical insurance has been rendered ineffective by the high inflationary environment.

National policies of PPP

Although PPPs projects were commissioned as far back as 1993, it took 5 years for the government consider a framework for PPPs. It was only in 2004 that the first attempt to develop a PPP framework; Public Private Partnership in Zimbabwe Policy and Guidelines (2004) commenced (Dube and Chigumira, 2010). Dube and Chigumira (2010) reported that the framework never materialised, although some modicum of PPP framework was instituted with an exemplar of BOOT through the Zimbabwe Investment Centres, which incentivises actors in a PPP with a 5-year tax moratorium, and reduced tax rates for the ensuing 5 years. There was renewed interest during the GNU in developing a comprehensive framework for PPPs and one of the identified key requirements was the creation of a clear 'policy and institutional framework for PPPs' which would signal to the private sector that government would protect investments through legal structures and support PPPs through a supportive institutional setup. The activities of the GNU led to development of the following document that would have developed policies and institutions to promote PPPs as a key contributor to infrastructural development:

- Public Private Partnership Policy of 2010,
- Public Private Partnership Guidelines 2010,
- Public Private Partnerships: Legislative Review for Zimbabwe, 2010,
- Institutional Framework, Public Private Partnerships, 2010

However, to date these documents have not yet been adopted (Table 3 below). PPPs commissioned to date have been mainly handled by the Ministry of Finance in conjunction with relevant line ministries with key legislative instruments being the Income Tax Act Chapter 23:06; Procurement Act of Zimbabwe, 1999; and recently the Joint Ventures Act (chapter 22:22) which classifies PPPs within joint ventures.

Table 3: Key legislation, programmes and policies supporting PPPs in Zimbabwe

Legislation or Policy	Mechanism
Income Tax Act Chapter 23:06	Incentivises BOOT PPPs. 5-year tax holiday plus 5 years reduced tax rate
Short Term Emergency Recovery Programme (STERP)	PPPs where private encouraged for areas such as air, rail, power generation, water and road infrastructure
STERP II	Upgrade or roads plus new infrastructure provision
Procurement Act of Zimbabwe, 1999	Provides definitions for Project Finance Initiative. Section 49 of the Procurement Act [22:14] also deals with the application of the Act to BOOT or BOT contracts
Joint Ventures Act [Chapter 22:22] The Act classifies PPPs within joint ventures.	12th of February 2016, - Joint Ventures Act [Chapter 22:22] gazetted. The Act came into force in May 27, 2016 after passage of Statutory Instrument 53 of 2016 to operationalise it. Joint Venture Act also provides for the institutions: <ul style="list-style-type: none"> • Joint Venture Unit (The Unit) • Joint Venture Committee – Secretaries of Ministry of Finance; Industry and Commerce; Transport and Infrastructure Development; Energy and Power Development; Local Government; Economic Planning; representative from the Attorney General and the Director of the Unit [ZEPARU, 2016] • Cabinet – approval of all joint ventures.

Public Private Partnership Policy of 2010	[documents prepared in 2010 but not yet adopted]
Public Private Partnership Guidelines 2010	[documents prepared in 2010 but not yet adopted]
Public Private Partnerships: Legislative Review for Zimbabwe, 2010	[documents prepared in 2010 but not yet adopted]
Institutional Framework, Public Private Partnerships, 2010	[documents prepared in 2010 but not yet adopted]

Source:

Mutandwa and Zinyama (2015) argue that Zimbabwe is not ready to embrace PPPs because the key pre-condition that acts as an investment signal and assurance to the private sector is the presence of a structured legal and political framework, which the country lacks as described earlier. Consequently, the environment is not conducive because the institutional framework has not been set up to support long-term investment which carries numerous risks (credit, commercial, currency, regulatory, political and payment) for the private investor. Given the current socio-economic and political volatility in Zimbabwe, it becomes difficult to attract capital from within and outside the country given the long gestation periods for most PPPs. Despite Mutandwa and Zinyama's (2015) argument (they focus on PPPs in water), and without a supportive PPP policy and regulatory environment, at least 14 PPPs (Table 4) have been completed or are ongoing in Zimbabwe. Suffice to say most of the PPPs are in the transport and water sector with only a single PPP falling under the health sector - the Chitungwiza – Baines Imaging case study, which was discussed in-depth in the AfDB (2017) Developing coordinated public-private partnerships and systems for financing health in Africa: Experiences from Africa and India report⁵.

Successful PPPs in Zimbabwe

Table 4: PPPs completed or ongoing in Zimbabwe in the transport, water, property and health sectors.

Sector and type PPP	Facility	Year Completed
Transport –Rail: BOT	Beitbridge-Bulawayo Railway (BBR). 350km railway line from Bulawayo the border town of Beitbridge. Reduced travel times from days to just 9hrs on this important commercial route. Critical for fuel transport from South Africa to southern parts of Zimbabwe	Construction phase lasted 18 months (record time)
Transport -Toll Bridge: BOT	New Limpopo Bridge (NLB) – awarded by the governments of Zimbabwe and South Africa. <i>* The first BOT project of this kind on the African continent</i>	Started in 1993 and completed 13 months later- Officially commissioned on 24 November 1995.
Transport- Road - BT	Newlands By-Pass (NBP): Four-lane highway bypassing Newlands Shopping Centre.	Completed

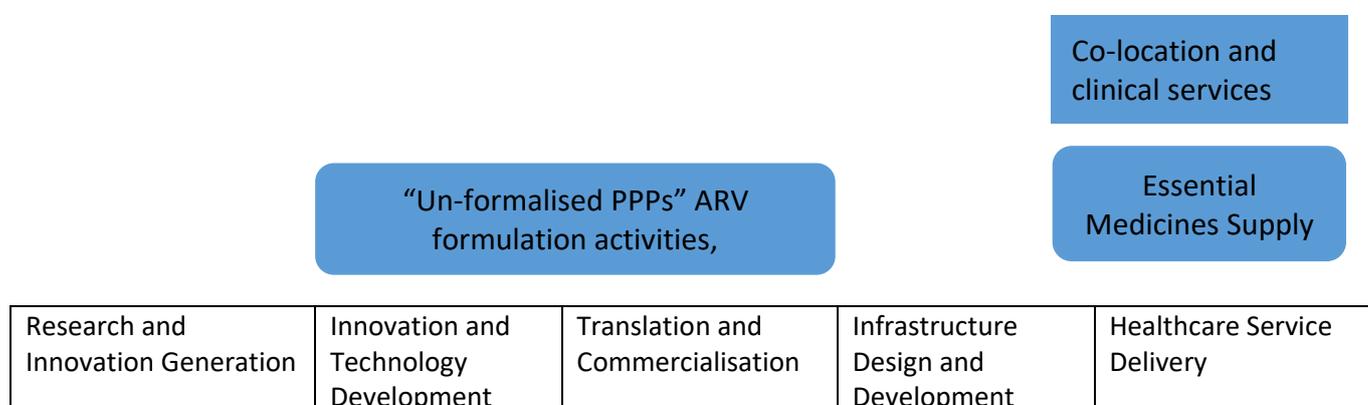
⁵ https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/WITS-AfDB_Publication.pdf accessed 15 August 2019

Transport- Road - BT	Plumtree-Harare-Mutare Road Rehabilitation of the road and construction of 9 toll gates	Completed
Transport – Road - BT	Chiremba Road Development: Development of the road by a private investor.	Completed
Water – BOT	Damafalls Development Water Augmentation Project: Bulk water supplies to Damafalls – a residential area	25 Year project
Water – BT	Donnybrook Water Augmentation Project: Bulk water supply to Ruwa – a residential and industrial area towards the east of Harare	Completed
Water – BT	Zimre Properties Water and Sewer Treatment Plant: Bulk water supply to Zimre a residential area	Completed
Water – BT	ZB Water Augmentation Project: Bulk water supply to Ruwa	Completed
Water – BOT	Muzhu Dam Rehabilitation: Bulk water supply in Chiredzi	Completed
Water – BOT	Tongaat Hulleets: Rehabilitation of Chiredzi Water Treatment Plant	Completed
Energy – BT	ZESA/Zent: Manufacture of electricity metres	Ongoing
Property – BOT	Sunway Housing Development: Servicing of residential stands in Harare	Completed
Health – ROT	Chitungwiza General Hospital: 5-year PPP with Baines Imaging Group. Rehabilitation of theatre, renal, radiology, mortuary and pharmacy.	2012-2017

Source: Dube and Chigumira (2010), ZEPARU (2016), AfDB (2017)

Using the framework described above we turn to the specific Zimbabwean cases that demonstrate transient, at times transactional and “unformalised” PPPs in the health-industry complex as well as the public-third sector terrain that impact health security and improve social inclusion in health care.

Table 5: Prevalent types of PPPs in Zimbabwe



Case 1: Government – Industry Partnership: Local manufacture of ARVs in Zimbabwe

In the 1980s, Zimbabwe through HIV/AIDS faced a huge public health challenge that threatened to overwhelm the health system. At that time, according to a local industry source, the government approached the local pharmaceutical sector and encouraged them to produce ARVs locally. The local firms approached the patent holders for ARVs and although there was initial interest, the deals fell through. Consequently, the government issued a compulsory licence to local firms on the back of pronouncement of a state of disaster for the pandemic. The local firms engaged in formulation development and by 2002, they had started producing ARVs. The table below shows how the legal and policy frameworks to support local production of ARVs emerged (Table 6)

Table 6: Legal and policy framework changes that supported local production of ARVs

Date	Legal or Policy Change	Justification
1999	<ul style="list-style-type: none"> • Introduction of the AIDS levy to raise funds to support HIV/AIDS programmes through the National Aids Council (NAC) • After dollarization in 2009, AIDS Levy annual revenues were approximately USD39 million per annum (Bhat et al, 2016) 	<p>Although much has been written about the aids levy, most literature omits the fact that this was conversion or redirection of an existing drought levy scheme that had been set up to raise funds to address effects of drought in the country.</p> <p>The AIDS levy was a product of government's inability to access Global Funding for the HIV/AIDS programme at that time⁶</p>
2002	<ul style="list-style-type: none"> • Patents Act of 1996 was amended to conform to provisions of TRIPS agreement. • Section 34 of Patents Act, Cap. 26.03, provided for compulsory licensing and Government use of drugs. • Minister could authorise use of patented invention by any Government department or third party for services of state; as explained by Section 35: Any authorisation by Minister under section 34 during a state of emergency shall include power to make, use, exercise and vend the invention for any purpose, which appears to the Minister necessary or expedient. 	<p>Public Health Threat – Government incorporated TRIPS flexibilities into Zimbabwe's domestic legislation and promoted beneficial utilization from local production.</p>
17 January 2003	<ul style="list-style-type: none"> • Through the General Notice 240 of 2002 with Official gazette published on January 17, 2003; a State of Emergency on HIV/AIDS 	<p>This allowed the state to allow local manufacturers to locally produce patented medicines for HIV/AIDS, including ARVs</p>

⁶ Interview with former Ministry of Health technocrat

	<p>from January 1, 2003 to December 31, 2005 was proclaimed.</p> <ul style="list-style-type: none"> The intention was for government to use this option to improve access to ARVs for patients in the country 	
8 April 2003	<ul style="list-style-type: none"> The Minister of Justice authorized Varichem Pharmaceuticals (Pvt) Ltd to produce ARV or HIV/AIDS related drugs, and supply 75% of its production to State owned health institutions 	Local production would augment import of generic ARVs from RSA and India.

Source: compiled from Banda (2013) with information from Osewe et al (2018) and interviews (2019)

Whilst local formulation of ARVs was under process, the government tasked the local firms to procure ARVs from India and other countries (Figure 4 – green arrows). When the local companies had reformulated the ARVs and sought regulatory approval from the Medical Control Authority of Zimbabwe (MCAZ) they started producing the drugs for the local market with some being exported.

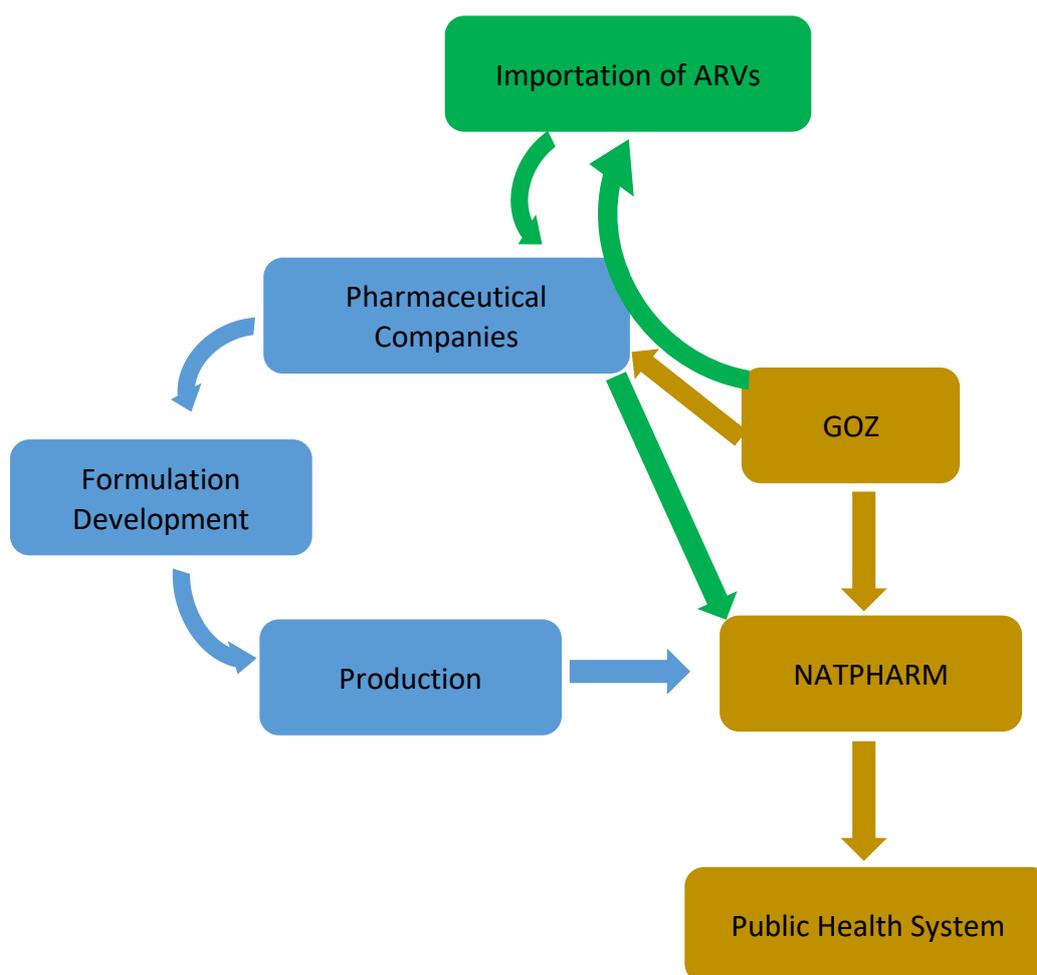


Figure 4: Public, private partners’ interaction to promote ARV manufacture technology transfer

Production of Varivar/Lamivudine commenced in July 2003 followed by Stalanev (Stavudine/Lamivudine/Nevirapine) in October 2003 and Zidovudine in March 2005 and Indinavir in 2005 (Osewe, et al, 2008). Osewe et al (2008) reported that capacity at that stage was 1.15 billion tablets and capsules and the programme benefitted from public health procurement and this saw prices of for example Varivar falling from USD 30-50 to about USD 15 per month (ibid).

This case study illustrates what we are claiming as transient, transactional PPPs that do not involve contracts but are undergirded by the social contract of assuring health security and in this case, it meant aligning industrial policy, Intellectual Property Rights, health policy as well as finance policy. We argue that current discourses on PPPs in health miss these type of “un-formalised” PPP which are needed at certain instances to solve an intractable health challenge.

Case 2: Health-Industry Complex: EU – and NATPHARM procurement of essential medicines

Table 7. Suppliers contracted to provide medicines for the EU Expanded Programme of Health.

EU Expanded Programme on Health Local Procurement of Medicines	
Supplier	Contract Value in Euros
Varichem Pharmaceuticals (Pvt) Ltd	1,987,300
CAPS Pharmaceuticals (Pvt) Ltd.	2,289,784
PCD (Wholesale Importer)	1,202,702
GHC (Importer)	1,585,464
Mission Pharma (importer)	1,049,615
SJV (Importer)	253,280
Total	8,268,145

Source: Banda (2013).

The second transient, transactional type PPP that is scarcity induced that occurred in Zimbabwe during the hyperinflationary era and into the dollarization era is exemplified by an EU funded programme that contracted local firms for procure and produce medicines for the health system that was severely under-supplied with drugs (Table 7). Of the total amount of Euro 8.3 million, Euro 4.3 million was allocated to local drug manufacturers, and in interview the respondent highlighted the need to support the local manufacturing sector as one of the key components of that particular programme which was supported by DFID and EU. This reflects the social contract nature of the PPP as illustrated in the NATPHARM example (Figure 5) where the Reserve Bank of Zimbabwe allocated foreign currency to the public health system drug procurement agency NATPHARM, which in turn paid in foreign currency directly to the supplier of raw-materials, and the local pharmaceutical firm used them to manufacture drugs and deliver to the procurement agency. NATPHARM in turn supplied the drugs to the public health system and other private sector pharmacies.

Transient and scarcity induced; and transactional based.

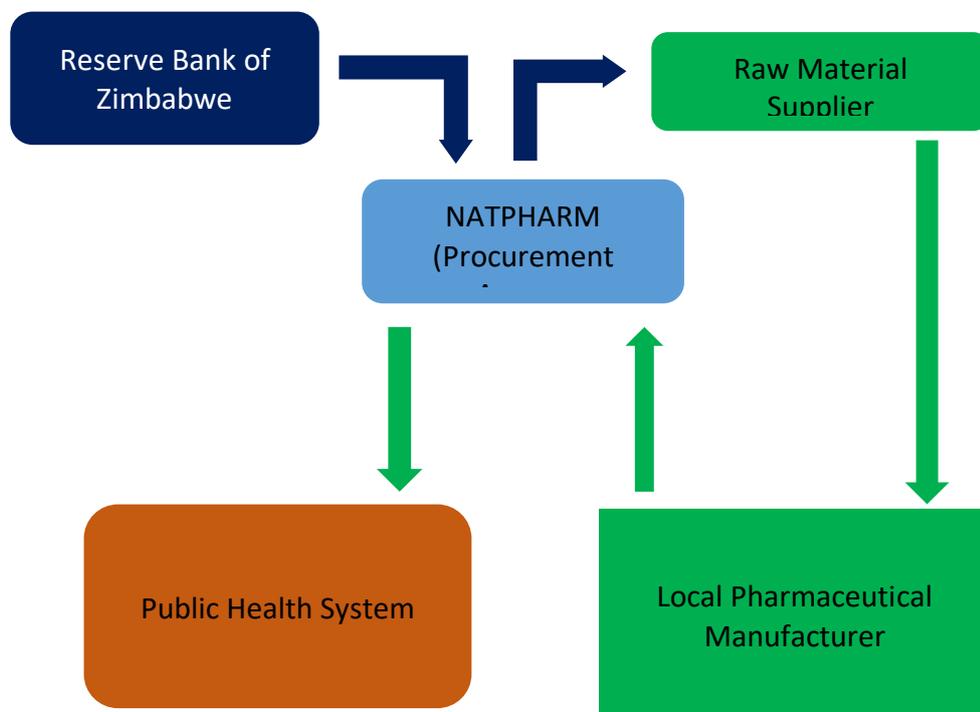


Figure 5: Natpharm strategic procurement of raw materials for local drug production

These two examples reinforce our argument about scarcity induced PPPs which are transactional and transient in nature, which have proved useful in unstable economic situations where traditional PPP which depend on traditional project financial appraisal would not be suitable. As we shall argue later there are circumstances where these types of transactional and transient PPPs can play a role not only in social inclusion of marginalised populations but also support technological capabilities preservation by allowing firms to operate in challenging economic environments. The knowledge exchange and flows are between the private sector, the public sector and the third sector exemplified by development agencies or international NGOs. What was interesting though was interviewees did not view these as PPPs as they were not fulfilling ‘the traditional characteristics of popular PPPs’.

Case 3: Mission Hospitals - invisible PPPs since colonial times

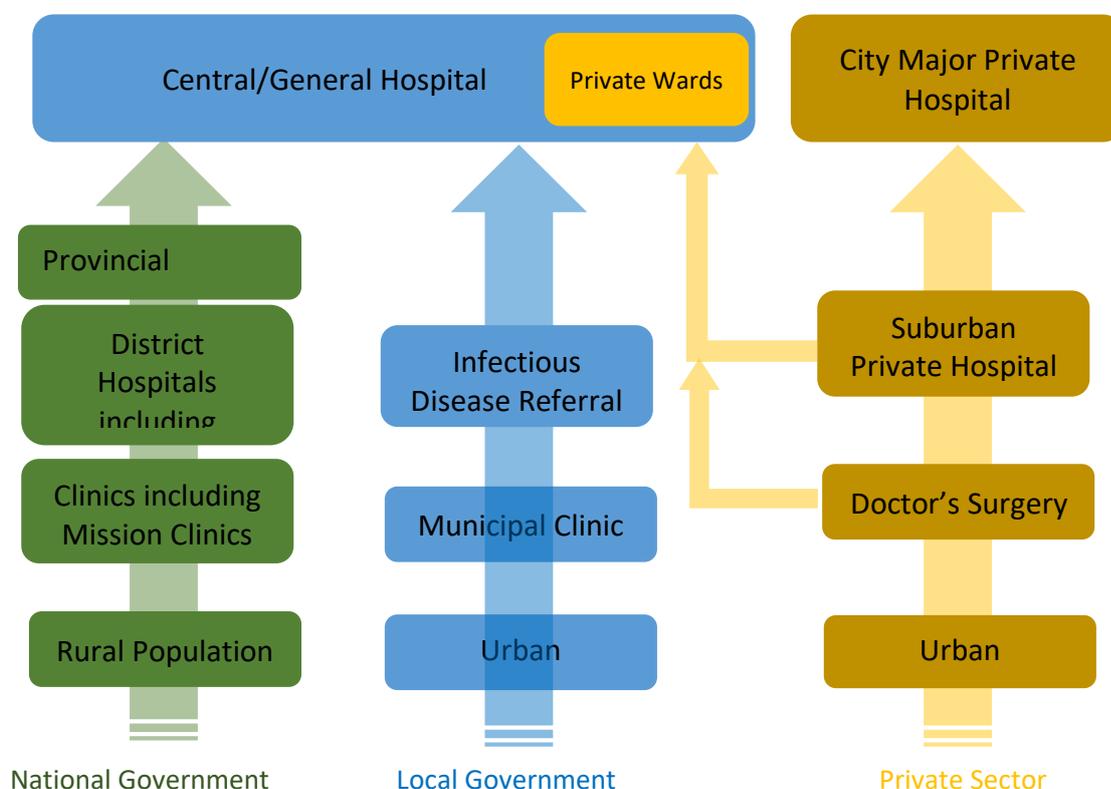
Mhike and Makombe (2018) argue that Mission and State Hospitals have been invisible PPPs since colonial times and even after independence in 1980, they continued as PPPs, with Mission Hospitals playing a critical role in social inclusion and serving patients in rural areas. Thus, from a social inclusion perspective, access to health and training of nurses and student doctors on attachment Mission Hospitals, State Hospitals, and the Ministry of Health have been “un-formalised” PPP which have been long-standing. The government through budgetary support fund Mission Hospitals and it also covers the salaries for medical professionals in these institutions.

Table 8: The number of healthcare facilities in Zimbabwe as at 2015

Zimbabwe Healthcare Facilities			
Primary Care Facilities		Referral Healthcare Facilities	
Clinics	1122	Central Hospitals	6
Polyclinics	15	Provincial Hospitals	8
Private Clinics	69	District Hospitals	44
Mission Clinics	25	Mission Hospitals	62
Council/Municipal Clinics/FHS	96	Rural Hospitals	62
Rural Health Centres	307	Private Hospitals	32
Total	1634	Total	214
Grand Total			1848

Source: ZSARA (2015)

Mission Hospitals fall under the remit of the Zimbabwe Association of Church Hospitals (ZACH); the medical arm of all churches in the country. ZACH was established in 1974 and currently has a membership of 130 hospitals and clinics⁷, contributing 68% health care delivery in rural Zimbabwe and 35% nationally. Reflecting the racialized health service delivery of colonial times, ZACH hospitals and clinics are characteristically located in remote difficult to access parts of the country and consequently their catchment covers socially excluded and poor communities. The magnitude of their contribution to healthcare is reflected in 22 of the mission hospitals being designated as District Hospitals delivering training for Primary Care Nurses, Midwives and State Registered Nurses, which supports work force development for the health sector (Table 8). In addition, Mission Hospitals work in conjunction with the Universities and Ministry of Health and Child Care by accepting medical students for training through medical and rural attachment schemes.



⁷ <http://www.zach.org.zw/about-zach/>

Figure 6. The healthcare facility set up and 4-tier referral system for urban and rural communities

The National Health Strategy for Zimbabwe (2016-2020) acknowledges the role the private sector plays in funding and delivering healthcare. Echoing Mhike and Makombe (2018) the strategy document highlights that although mission hospitals have a long history of collaborating with government; the funding through grants in real terms has declined, implying they have had to source funding elsewhere. In terms of partnering the private sector the strategy document reports that the greatest challenge is lack of “a defined public-private partnership framework within which to cooperate”. The mission hospital as unofficial PPPs (Figure 6) were a key source of social inclusion and literature shows that they serve as channels of funding from the donor community targeting healthcare provision in marginalised and remote areas. Table 9 illustrates how ZACH related clinics and hospitals have collaborated with various development partners in the provision of medicines, HIV/AIDS prevention programmes, antimicrobial resistance management programmes and other services.

Table 9: The partners that ZACH has worked with in availing healthcare services in Zimbabwe

Current Partners	Activity
CDC/PEPFAR	HIV&AIDS prevention, treatment, care services. Collection and utilization of surveillance data. Implementation of evidence based public health interventions within a network of church-related hospitals and clinics and immediate communities.
CDC/ I-TECH	Scaling up VMMC Services in Zimbabwe
Global Fund/NAC- SASA	HIV Programmes
EPN/USAID/SAIPS	Antimicrobial Resistance
Brothers Brother’s Foundation (BBF)	Equipment and Medicines
HPIC	Medicines
Action Medeor	Medicines
Restore Vision	Reading Glasses
MOHCC	Annual grant to the secretariat, Government grants to all mission hospitals and clinics, Human resources, medicines, equipment and infrastructural development.
Previous Partners	Activity
Catholic Relief Services (CRS)	Nutrition Improvement Program
DANIDA	Office Equipment and Hospital Supplies
European Commission	Training of primary counsellors (VHSSP)
EED	Institutional Funding and Vehicles
ICCO	Institutional Funding
GTZ/Royal Netherlands Embassy	Rehabilitation of Water Supply and Sanitation
OAK Foundation	Water and Sanitation Project
Mild-May International/EU	Improving the quality of life for children living with HIV and AIDS and OVCs through building and strengthening the capacity of community

	support networks to care and support such children
World Bank	Strengthening the capacity of both the Secretariat and member institutions (Governance Training)
Global Fund-HIV/TB/Malaria	Capacity Building of hospitals and districts
OXFAM Australia	Community Home Based Care and Livelihoods (Empowering PLWHIV in livelihood)

Source: ZACH Partners <http://www.zach.org.zw/partners/>

Case 4: Private Ward at Parirenyatwa Hospital – a co-location PPP to retain health skills

The most common PPP identified by all respondents in the health sector was the Parirenyatwa Private Ward Scheme that has run from pre-independence times. In this scheme designed to attract and retain specialists at the government hospital, a wing of wards designated as Private Wards. Doctors refer patients from their surgeries and clinics to the Private Wards and they are treated in the referral hospital by their doctors and physicians, who in turn also treat patients admitted in the non-private section of the hospital.

This however is not an official PPP, but an arrangement that has been in place for a long time. The doctors accept Medical Insurance and out of pocket payment for services. In the case of medical insurance if there is a shortfall, the patient pays the doctor and the hospital.

Key findings from the Zimbabwe 4 case studies and reflections on PPP literature

One of the key findings in Zimbabwe are the social function of PPP in dealing with economic challenges, and as a result the types of PPPs identified are not in line with literature as they are transient, transaction based and serve a purpose in scarcity induced situations. Thus, these PPPs show that they serve other socio-economic functions beyond those discussed in literature and practice. This is however not surprising given that most of the literature tends to focus on PPPs in infrastructure or other management based activities and not on solving critical socio-economic challenging situations for both the manufacturing sector as well as healthcare delivery sectors. We classify these as transient, transaction-based PPPs in addition to what Mhike and Makombe (2018) term invisible PPPs. Dube and Chigumira (2010) identified four key issues; financing, policy and institutional framework, risk analysis and expertise in PPPs.

- **Finance**

Finance capability is important – key funding schemes are debt and or equity and best availed through project finance. The project should be self-securing hence; the project needs to be robust and capable of paying bank the debt. Use of Special Purpose Vehicles is common in such ventures and the SPV is the contracting partner for all other players (UN ESCAP). It is usually recommended that the SPV be constituted of the sponsors and they can also include government. Availability of well-developed financial markets is one of the conditions conducive for PPPs.

- **Policy, legal and institutional framework**

Policy frameworks are important for clarifying how the PPPs function and process pathways to approval and operations, and their absence in Zimbabwe has been identified as one of the key issues that has held back PPPs. Legislation is reported in literature as acting as both insurance and assurance to investors confirming that the government will honour its obligations. The absence of a legal framework is reported to be one of the key drawbacks of accelerated use of PPPs in health. Zimbabwe

currently has no dedicated PPP law, and as discussed earlier the PPP guidelines developed in 2004 are still under review and the PPP policy of 2010 has to date not been adopted. Zinyama and Nhema (2015) argue that Zimbabwe should simplify rules, regulations and procedures to remove bottle-necks for smooth functionality of the government - achievable through policy consistency and predictability to boost confidence in investors.

Zimbabwe unlike South Africa does not have a dedicated PPP unit, and to date all PPPs are implemented by the Ministry of Finance in collaboration with relevant ministries (PPPIRC, 2017).

5.2 South Africa

South Africa attained independence in 1994 and inherited a society that had institutionalised racism, characterised by huge inequities spanning citizen rights, wealth and skills and especially in terms of access to social services Gqoli (2005). It is within this context that PPPs have been actively used in South Africa as a mechanism to address this historical inequity urgently by rapidly progressing towards equitable social service provision supported by infrastructure development targeting marginalised communities through the three government levels; national, provincial and local. In 1994 the country was divided into nine provinces; Gauteng, KwaZulu-Natal, Mpumalanga, Eastern Cape, Northern Cape, Free State, North West, Limpopo, and Western Cape; each with varying population densities.

In the latest midyear population estimates, Gauteng constitutes 25.8% (1.2 million) of the population, KwaZulu-Natal coming second at 19.2% (11.3 million), and the province with the smallest population was Northern Cape with 2.2% (1.26 million) of the population (Stats SA, 2019). Given these demographics it is not surprising that South Africa stands out in this study as the nation that has achieved more by using PPPs in health spanning infrastructure development, hospital management and joint ventures (see Table 11). Consequently, the South African government has considerable experience in health public-private interactions, however, Kula and Fryatt (2014) assert that more collaborations could result in improvement in procurement, contracting and performance management. Gqoli (2005) chronicles the genesis of policies related to PPPs; beginning with the 1997 decentralisation of budgeting by government, which led to three-year rolling spending plans and 7-year forecasts. This was followed by enactment of the 1999 Public Finance Management Act and later in 2000 the Treasury Regulation for PPPs which led to establishment of the PPP unit and finally the Municipal Finance Management Act of 2003 (see Table 9). In terms of the specific PPPs in health the AfDB (2017) report provides a more in-depth discussion detailing the specifics of the various types of health PPPs (see Table 11 for examples). In this study, we describe these PPPs in brief to give broader contexts of how they have been deployed in South Africa, however we select the BIOVAC Institute as the case study to draw lessons learnt on the role of PPPs in the health-industry complex that can impact and shape health systems strengthening.

What has driven PPPs in South Africa?

Abuzaineh et al (2018) highlight five key drivers of PPPs in healthcare: inadequate or old infrastructure in need of refurbishment or new infrastructure; financial constraints for governments to fund new infrastructure development or refurbishment; scarcity of management capabilities to improve health outcomes; better supply chain management supported by efficient procurement systems; and the need for specialist services or skills. The South African government recognised that in order to rapidly address the social imbalances that apartheid brought, PPPs were a viable option to deliver better health to especially marginalised communities. Consequently, the South African government since the early 2000s has successfully commissioned PPPs in health (see Table 10).

National policies of PPP in South Africa

The South African PPP Manual (National Treasury, nd) describes a PPP as “a contract between a public-sector institution and a private party, in which the private party assumes substantial financial, technical and operational risk in the design, financing, building and operation of a project”. All PPPs are governed under Treasury Regulation 16, and other bodies of legislation used to govern and regulate PPPs in the country include the Constitution, Municipal Finance Management Act 2003 and the Municipal Systems Act 2003 and the Public Finance Management Act 1999. Given the institutionalised inequity laws that spanned economic and social sectors the government of South

Africa devised the black economic empowerment (BEE) policies to address the historical imbalances, thus the PPP BEE policy is structured in a way that encourages broad-based and sustainable outcomes. The strategy is two pronged; institutions need to adhere to BEE policy in PPPs by selecting a transaction advisor and secondly in the selection of the private partner in the PPP (Gqoli, 2005). The BEE policy in PPPs has a scorecard which focuses on equity, management and employment, subcontracting and the local socio-economic impact (ibid).

The policies in health PPPs date back to 1994 when the South African constitution enshrined health as a human right and the government embarked on redressing the apartheid imbalance. In 1996 the state adopted privatisation policies and in 1997 cabinet approved the establishment of the PPP Inter-Departmental Task Team (IDTT) to develop a package of policy, legislative and institutional reforms that would support PPPs (see Table 10). This was followed by the adoption of a PPP strategic framework in 1999 and Public Finance Act no. 1 and in 2000 the treasury regulations for PPPs were issued which led to the establishment of the National Treasury PPP unit. In 2001 the Treasury Manual for PPPS was published and in 2003 the Municipal Finance Management Act no. 56 of 2003 was enacted and this made provision for consistent financial accountability for local authorities and also provided municipal PPPs and treasury view on feasibility.

Table 10: PPP related policies and their key drivers or rationale in South Africa.

Year	Key drivers/rationale	PPP and related policy actions
1994	Apartheid ends and the new government embarks on political and socio-economic transformation	Adoption of the new South African constitution, which enshrined health as a human right
1996	Privatisation policies start to be implemented	Official adoption of privatisation by the state
1997	Cabinet approved a PPP Inter-Departmental Task Team (IDTT) to develop a package of policy, legislative and institutional reforms that would support PPPs	PPP IDTT formed
1999	Public Finance Management Act no. 1 of 1999.	Adoption of PPP strategic framework Reduced micro budget management by Treasury National and provincial departments accountable for value-for-money decisions and delivery National Treasury maintains tight budget oversight and guidance
2000	Treasury regulations for PPPs	National Treasury PPP Unit formed - consisting of five professional staff drawn from the public and private sectors - technical assistance from the United States Agency for International Development (USAid), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) (German Aid) and the Department for International Development (DFID)

2001		Treasury Manual on PPPs published to serve as a key document for establishing PPPs in South Africa
2003	Municipal Finance Management Act no. 56 of 2003.	Consistent financial accountability system for local authorities Provides for municipal PPPs and Treasury view on feasibility

Source: Compiled from Ngwamba (2014), Gqoli (2005) and Arimoro (2018)

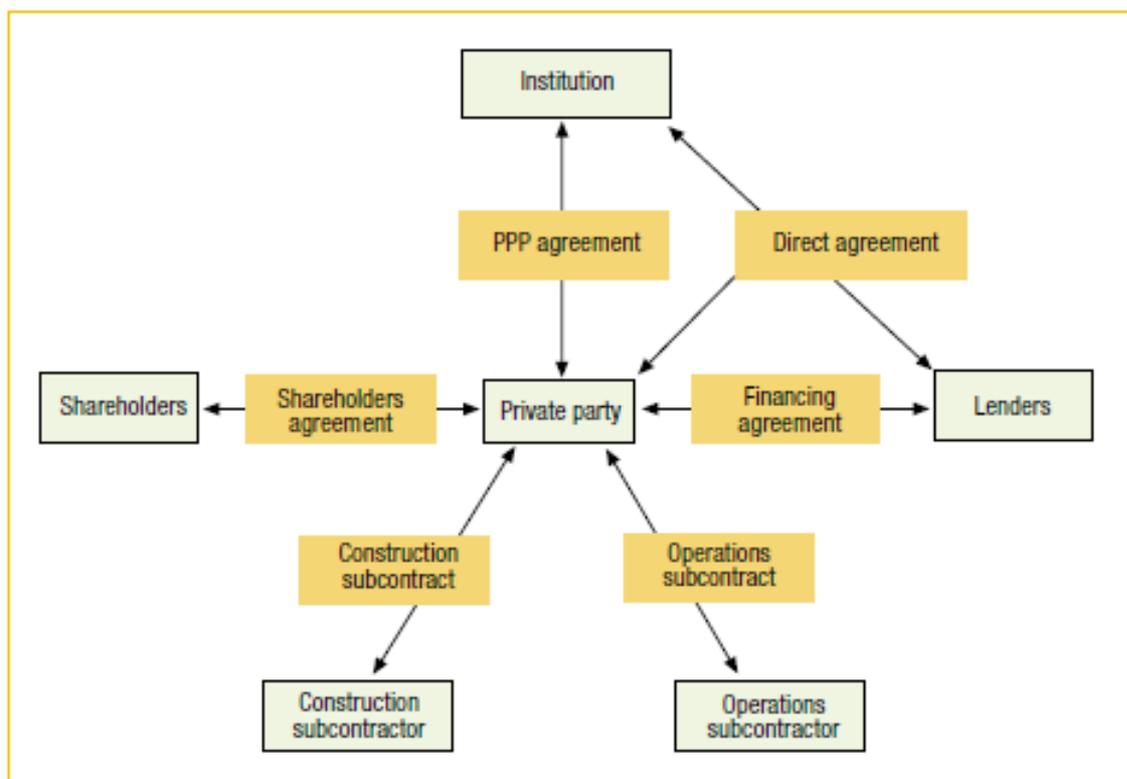
The treasury manual outlines the steps that need to be taken to execute a PPP in South Africa (see Figure 7). The project preparation stage is composed of three phases; with phase 1 covering project inception and phase 2 covering the feasibility study and the third phase focusing on procurement. The last step is the project term also covering three phases of development, delivery and exit. Figure 8 shows the various types of PPPs as laid out in the Treasury Manual, ranging from PPP agreement, Financing Agreement, Direct Agreement, Operations Sub-contracting, Shareholders Agreement as well as Construction sub-contract

Figure 7: The South African PPP Project Cycle showing pathway to approval of a PPP



Source: National Treasury (nd.) PPP Manual

Figure 8: The various forms of PPPs as enunciated in the South African PPP Manual



Source: National Treasury (nd.) South African PPP Manual

Successful Health PPPs in South Africa

Since the early 2000s, South Africa has initiated at least 11 PPPs in health (see Table 10 for examples), of which 8 have been completed. Seven of these PPPs were in five provinces with one at national level. The projects covered by the PPPs in health span asset financing mechanism, co-location, facilities management, renal care services, and concessions (AfDB, 2017). As at 2017, there were two PPPs under review; Tri-generation Chris Hani Baragwanath Hospital and Northern Cape renal dialysis. The Tri-generation Chris Hani Baragwanath Hospital PPP involved the installation of the tri-Generation plant at the hospital to reduce dependence on the national grid. The Northern Cape renal dialysis PPP involved Kimberley, Upington and Springbok renal dialysis units’ refurbishments, staffing and equipping (RSA Budget Review, 2018). For a more granular discussion of the health PPPs in South Africa (table 11) – the AfDB (2017) report covers this.

Table 11: Successful health PPPs implemented in South Africa

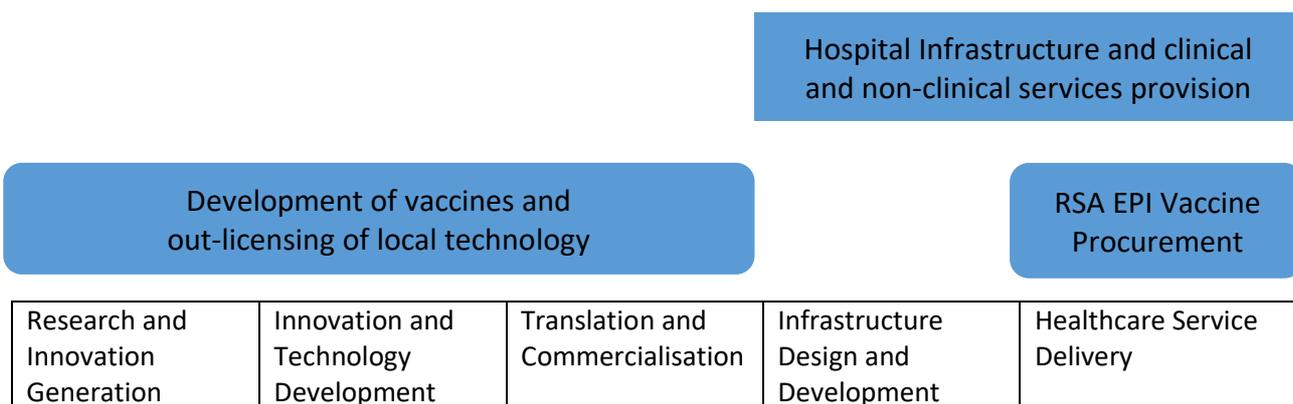
Type of PPP	Description	Government Institution	Duration	Value and Financing Mechanism	Form of Payment
Facilities Management	Rehabilitation and Lentegeur Hospital. Hospital facilities management	Western Cape Department of Health	2006-2018 [12 Years]	R334 million	Unitary payment

DFBOT	The Inkosi Albert Luthuli Central Hospital – Asset financing and maintenance and management functions	Kwazulu-Natal Department of Health	2001-2017 [15 Years]	R4.5 billion Debt: 70% Equity: 20% Govt: 20%	Unitary payment
DFBOT	Universitas and Pelanomi Hospital – co-location and clinical care management	Free State Department of Health	2002-2017 [16.5 Years]	R 81 million Equity: 100%	User charges
DFBOT	Humansdorp District Hospitals – provision of clinical and facilities management services,	Eastern Cape Department of Health	2003-2024 [20 Years]	R49 million Equity: 90% Govt: 10%	Unitary payment
	Eastern Cape: Port Alfred and Settlers – co-location		2006-2034		
DBOT	Polokwane Hospital Dialysis. Provision of specialised clinical care renal and peritoneal dialysis	Limpopo Department of Health and Social Development	2006-2016 [10 Years]	R88 million Equity: 100%	Unitary payment
DFBOT	Phalaborwa Private Hospital - concession	Limpopo Department of Health	2011-2026 [15 Years]	R90 million Equity: 100%	User charges
Equity Partnership	National State Vaccine Initiative. Project	Department of Health	2003-2010 [4 Years?]	R75 million Equity : 100%	Once off equity contribution

Source: AfDB (2017), RSA Budget Review (2018)

An analysis of the health PPPs in South Africa according to our conceptual framework span different aspects of the innovation continuum (See Table 12). Hospital infrastructure, as well as clinical and non-clinical services provision span infrastructure development (the built environment) and last mile health delivery services, whereas the Expanded Programme for Immunisation (EPI) vaccine procurement plays a dual role of healthcare delivery as well as a signal to investors that if vaccines are produced there is a market for them, however the procurement is still subject to tender procedures. Development, reformulation, local manufacture and packaging activities on the other hand span research and innovation generation, innovation and technology development as well as translation and commercialisation. We will discuss this in more detail in the Biovac Institute case study below.

PPPs are not prevalent in the pharmaceutical manufacturing sector, especially so in the small molecules sector. Although the PPP model in South Africa has worked for vaccines, in most cases it is the private model that dominates the sector. We now turn to the Biovac case study in the next section to highlight what worked well, challenges faced, the innovations that have come out of this PPP and some of the challenges that may lie ahead.

Table 12: Prevalent types of PPPs in South Africa**The BIOVAC Case Study - Historical vaccines and sera manufacturing capabilities**

The story of the Biovac Institute is intricately interwoven with the historical biological manufacturing capabilities of the South African government that pre-dates 1994, the resolve to keep vaccine technological capabilities, loss of some of these capabilities as state owned biologicals institutions were closed and how the PPP Biovac emerged from this era as a critical player in the health-industry complex. Table 13 shows that the predecessor state owned institutions that date to the 1930s and 1950s included the Johannesburg located State Vaccine Institute, and located in Johannesburg; the National Institute for Virology (NIV) and the South African Institute for Medical Research (SAIMR). These were three institutes publicly owned, connected and controlled by government. The respondents reported that the State Vaccine Institute produced BCG Vaccines, Smallpox Vaccines, Foetal calf serum and Human Growth Hormone whilst Rabies vaccines were at the time under development. The National Institute for Virology produced Yellow Fever Vaccine and Oral Polio Vaccine. The Southern African Institute for Medical Research on the other hand manufactured DTP vaccines, cholera and typhoid vaccines and anti-sera for snake, scorpion and spider. All these three institutes were closed by the early 2000s, except the State Vaccine Institute which became the Biovac Institute.

Table 13: Historical vaccines manufacturing capabilities in South Africa – pre-independence days

Location	Name of Entity	Manufacturing Capabilities	Current Status
Cape Town	State Vaccine Institute (SVI)	<ul style="list-style-type: none"> • BCG Vaccines • Smallpox Vaccines • Rabies vaccine was in development • Foetal calf serum • Human Growth Hormone 	Closed
Johannesburg	National institute for Virology	<ul style="list-style-type: none"> • Yellow Fever Vaccine • Oral Polio Vaccine 	Closed
	South African Institute for Medical Research (SAIMR)	<ul style="list-style-type: none"> • DTP vaccine • Cholera and Typhoid vaccines • Snake anti-serum • Scorpion anti-serum 	Closed

		• Spider anti-serum	
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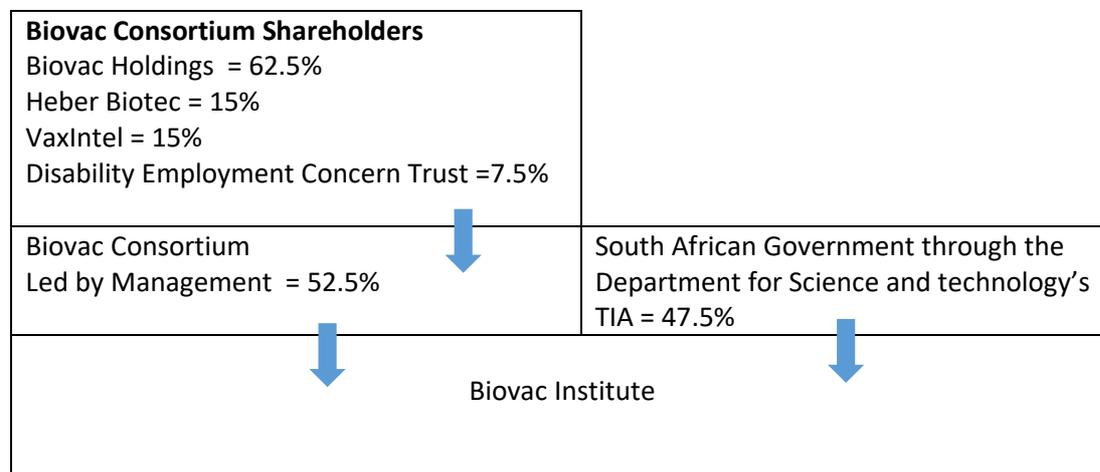
The State Vaccine Institute in Cape Town is what later became the Biovac Institute and when it was established in 2003, it carried over some staff to the new entity. The State Vaccine Institute (SVI) was a directorate within the department of health, and illustrates how the government directly invested in developing technological capabilities in local production of pharmaceuticals (biologicals) for its own consumption in the public health sector.

The products manufactured at the SVI dating back to 1984 were BCG Vaccine; a percutaneous vaccine which was the only vaccine product sold commercially out of SVI the world. The challenge however was the world was transitioning to intradermal vaccines which presented a technological and investment challenge for the SVI. Transitioning to the new mode of vaccine delivery would have called for clinical trials and at that stage there was no commitment to invest in that. The respondents highlighted that there were similar technological transitions for the other products in terms of production methods, quality assurance, ethical concerns and commercial viability. Thus, in the late 80s conversations of where to proceed were held with government department. As discussed earlier the respondent reported that it became apparent that they could not continue as per usual because they needed to improve quality. The government in the late 1980s and 1990s and after consultation with WHO, UNIDO and others a decision was made that vaccine production could not continue. They could either stop production or re-invest in production capabilities. The critical questions that needed to be addressed according to the respondent was whether re-investment would be via a private venture, a PPP or the public sector. Early in the 1990s a decision was made to form a PPP, and this was carried through into the new democratic government. However, the respondent highlighted the fact that from conception to signing it took 10 years for the Biovac Institution involving three different rounds of RFPs (request for proposals).

Biovac Institute ownership structure and reason for the PPP

The Biovac Institute according to Walwyn and Nkolele (2018) was set up in 2003 as a strategic equity partnership between with the Biovac Consortium (Pty) Ltd and Government. Biovac Consortium ownership structure included Biovac Holdings (62.5%), Heber Biotec (15%), VaxIntel (15%) and the Disability Employment Concern Trust (7.5%). Biovac Consortium then formed a partnership with the government through the Department of Science and Technology. The Biovac Consortium holds the controlling share of 52.5% whilst the government holds 47.5% of the shareholding (see Table 14 below).

Table 14: Shareholding Structure of the Biovac Institute



Source: Compiled from Walwyn and Nkolele (2018) and Morena Mokoane, CEO BIOVAC presentation at AVMI Conference Cape Town 2019.

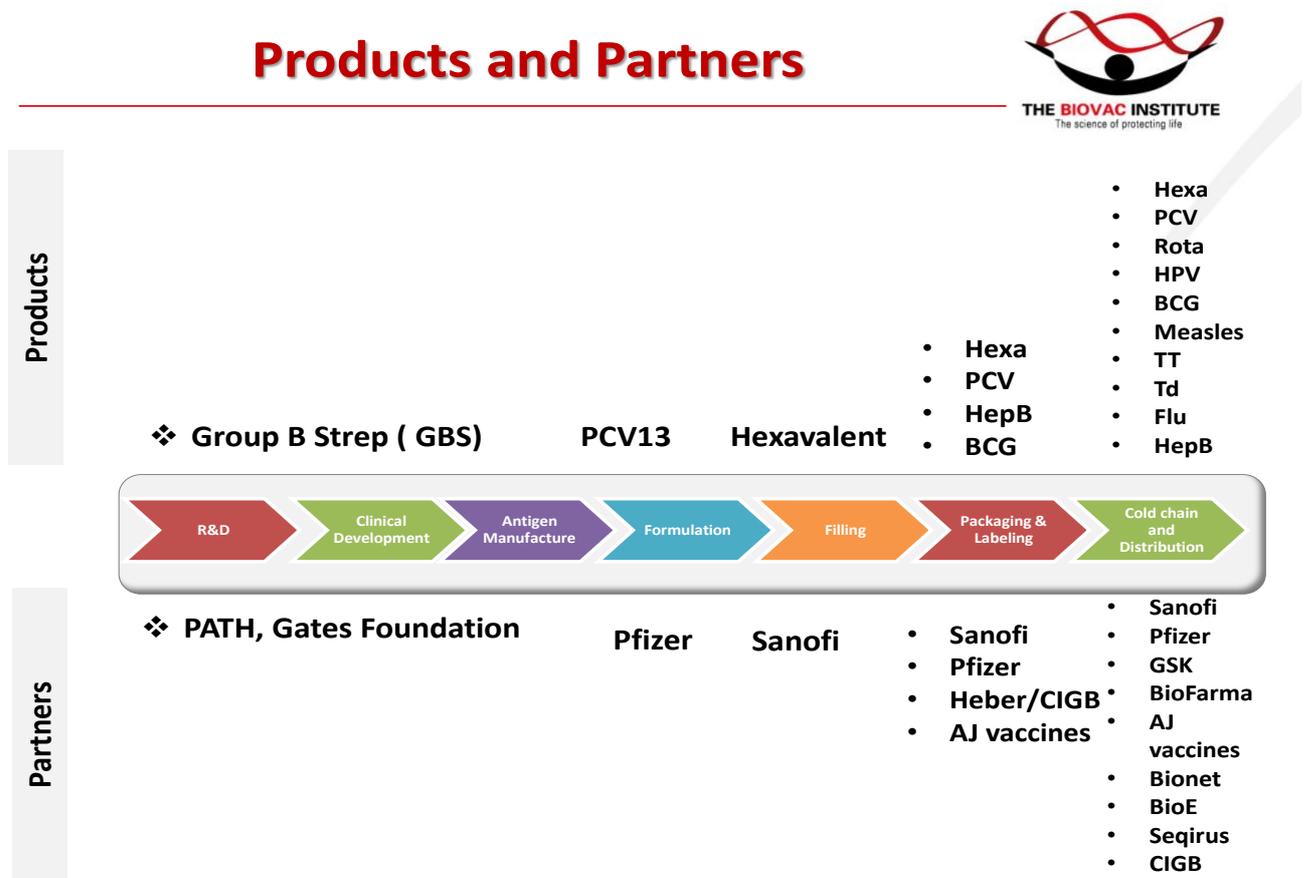
According to Walwyn and Nkolele (2018) this PPP was driven by strategic reason to maintain local vaccine security of supply via local manufacturing capabilities; as argued earlier based on the historical manufacturing capabilities of the South African state-owned institutes. Our interviews also reinforced the assertion by Walwyn and Nkolele (2018), and the agreements involved a “Supply Agreement, Shareholders Agreement, the Subscription Agreement and the Strategic Equity Partner Undertakings” covering the 2004 to 2010 period, however these were renewed in 2016 (ibid). The mandate that was given to Biovac was to establish manufacturing capacity and supply uninterrupted EPI vaccines.

Biovac technological capabilities

Respondents reported that Biovac’s capabilities are in the Bacterial platform, fermentation and conjugate vaccines. In a presentation at the AVMI-TIBA workshop (African Vaccine Manufacturing Initiative – Tackling Infections to Benefit Africa), the Biovac CEO highlighted the products under development and on the market as well as the partnerships they are collaborating with (see Figure 8). In partnership with the Gates Foundation Biovac is currently developing the Group B Strep (GBS) vaccine which is undergoing clinical trials shortly, and undergoing formulation development they are working with Pfizer on PCV13. On filling, they are collaborating with Sanofi on the hexavalent vaccine, whilst packaging Hexa, PCV, HepB and BCG in collaboration with Sanofi, Pfizer, Heber/CIGB and Aj Vaccines. For cold chain and distribution they are handling the following vaccines; Hexa, PCV, Rota, HPV, BCG, Measles, TT, Td, Flu and HepB working in collaboration with Sanofi, Pfizer, GSK, Biofarma, AJ Vaccines, Bionet, BioE, Seqirus and CIGB.

An analysis of the collaborations for Biovac as illustrated in Figure 9 shows that this health PPP is collaborating and co-innovating with leading pharmaceutical firms in the world, signifying embedding within global value chains for vaccines and activity in global vaccine innovation ecosystems. In the interviews, the respondents pointed out the importance of these collaborations in terms of technological learning and technology transfer. What is also apparent is that the further left one moves on the value chain in Figure 8, the more dominant philanthropic sources of funds become in supporting activities, whereas it is easier to strike commercial collaborations for filling, packaging and labelling and cold chain distribution. The cold chain distribution is highly active because of Biovac’s role in procuring all EPI vaccines for South Africa and also for neighbouring countries such as Namibia and Botswana. Biovac has enjoyed an exclusive agreement with the government to be the sole supplier of the EPI vaccines in RSA for all paediatric vaccine – 13 vaccines in SA.

Figure 9: Biovac’s products and partner profiles as at 2019

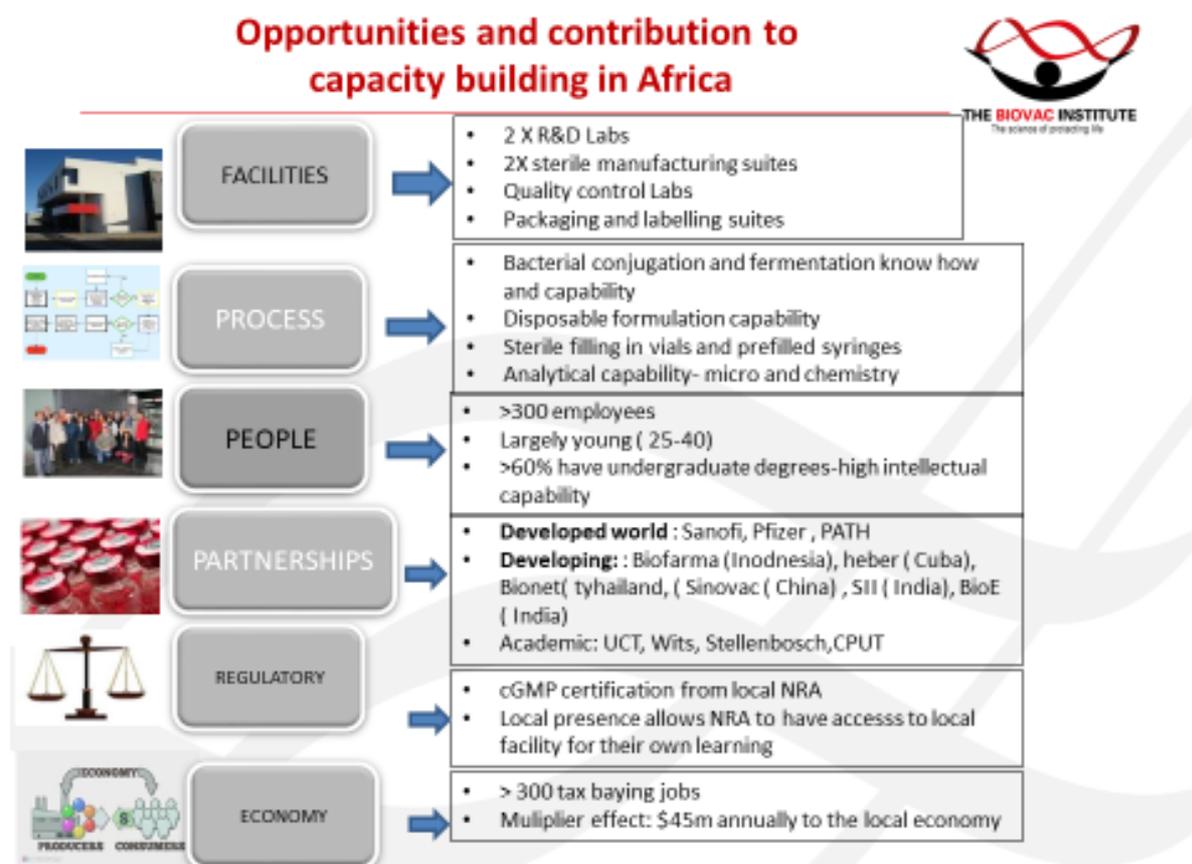


Source: Morena Mokoane, CEO BIOVAC presentation at AVMI-TIBA workshop – Cape Town, June 2019.

Biovac has also developed a vaccine for Haemophilus influenza which it has licenced out to Japan and as a result they are earning royalties for that technology. However, the respondents pointed out that it takes 12 to 15 years to place a vaccine on the market – hence the need for patient capital and assured market as an investment indicator.

Biovac currently has two research and development laboratories, two sterile manufacturing suites, quality control laboratories and packaging and labelling suites with state of the art machinery (Figure 10). In terms of technological capabilities, they are well versed with bacterial conjugation and fermentation skills, as well as sterile filling and pre-filled syringes, and analytical capabilities spanning microbiology and chemistry. Their local plant is cGMP certified by the South African regulator SAPRA and the company employs more than 300 people.

Figure 10: Facilities, processes and the partnerships that Biovac possesses



Source: Morena Mokoane, CEO BIOVAC presentation at AVMI-TIBA workshop – Cape Town, June 2019.

Innovation ecosystems surrounding vaccine development and manufacture

Biovac in South Africa closely works with the Chris Baragwanath hospital in Johannesburg where a group of clinician academics identify strains of bacteria for certain diseases and isolate the key types required to make a vaccine. Thus, the health PPP is working with the public health system, as well as academics in local universities; and given the fact that there is a private partner in the PPP this illustrates a peculiar triple helix concept. The status of PPP was reported to assist in accessing the Baragwanath hospital as well as the University collaborations. Our respondents reported that in their particular case this has been promoted by the bioeconomy strategy for the country. The bioeconomy strategy is run centrally through government via the Department of Science and Technology (DST). DST is the driver behind the bio-economy strategy and they close the circle by being both a broker and integrator linking up the PPP, local universities and hospitals, as well as other government departments/agencies. Our respondents pointed out that DST for example usually suggest that they consider collaborating with local partners including CSIR (Council for Science and Industrial Research) before they resort to partnering external organisations. The argument is that public funding is used to support basic and applied research at CSIR and actors such as Biovac concentrates on the development aspects on innovations and technologies. We found this to be a particularly interesting example of how government funding of the riskier early stages of research/innovation through CSIR, helps to de-risk this stage and passes on to the developers of proofs of concept that may need scaling up. The respondents highlighted the fact that DST does not force them to always work with local

partners in all situation. We found this strategic thrust to support local creation of innovation ecosystems a key lesson that other potential PPPs in the health could learn from.

However, our study revealed that the academia – industry collaborations can be problematic. The issues centre on challenges with scalability and transitioning technologies to industrial manufacturing and at scale. The academia-industry conceptualisation and understanding of processes, practicalities, and end goals may not always be aligned. The respondents argued that for academia the drive may be publications after success for example in model animals, whereas for industry the end goal is reproducibility and ability to scale up and manufacture at scale. The other challenges in establishing the local innovation ecosystem is driven by lack of GLP (Good Laboratory Practice) certified partners. Consequently, it becomes difficult to carry out toxicology studies because the GLP certified infrastructure does not yet exist. There are rational reasons why this is so; the market is not big enough at this stage to invest in GLP certified toxicology facilities. Consequently, the facilities that are available cater for non-clinical pre-toxicology work.

International partnerships and collaborations

Biovac collaborates and partner with organisation in the developed and developing world (Figure 10). In the developing countries, they collaborate with Biofarma in Indonesia, Heber in Cuba, Bionet in Thailand, Sinovac in China, SII as well as BioE – both in India. In the developed countries Biovac collaborates with Sanofi, Pfizer and PATH. These international collaborations indicate the global nature of innovations in vaccines and Biovac reports that they work with experts to solve particular issues for particular technologies they would be developing. These partnerships and collaborations indicate that at this juncture Biovac seems to be navigating the collaboration-competition dilemma in a way that is advantageous to them, perhaps because historically they have been the preferred procurement agent for government for EPI vaccines. However recently there was agitation in the sector when the government gave indications that vaccine procurement may be subject to open tender and there would be no preferred status for Biovac, and the press in South Africa produced reports indicating the risk of collapsing a company that was growing and contributing to technological development in the country. At the time of writing this issue has not yet been resolved.

The international collaborations also highlight that for PPPs it is not only sufficient to form a PPP with government, especially if you operate in a high-tech area; knowing who to collaborate with, crafting the collaboration agreement and acquiring the necessary technological learning through technology transfer are skills that need to be acquired.

The philanthropic funding for research and development

As described earlier Biovac is involved in research and development for the GBS vaccine with funding from the Gates Foundation. The ultimate goal is for Biovac to locally produce the vaccine API (active pharmaceutical ingredient). This is an example of a PPP- Philanthropic organisation collaboration for the purpose of developing a technology within an African country and whose application and reach can be global. The Gates Foundation funded research and development phases to manufacturing for clinical trials phase 1. The clinical trials are being run by a CRO (Clinical Research Organisation) and again illustrates a PPP-Philanthropic Organisation – CRO (Private sector) collaboration. These collaborations are testament to the complexity of partnerships that are required to bring a therapy to market, and the management agreements required at various stages. If Biovac is successful there is a possibility of proceeding with the clinical trial and market authorisation, however the challenge will be sourcing enough funding for those stages.

Regulatory issues

One of the issues brought out in the interviews was the complexity of regulating biologicals in African countries. Whilst many actors in policy and industry sectors argue that these skills are scarce, our respondents at Biovac contended otherwise; arguing that in international fora experienced regulators who interact with African regulators commend them for their expertise and as such these skills are on the continent albeit they are pockets of excellence which are not prevalent across different countries. South Africa for example because of its history of vaccine and broadly biologicals manufacture dating to the 1930s and 50s has these skills and the local regulatory agency has the capacity to certify local manufacturing sites. Our respondents also pointed to the presence of the African Vaccine Regulatory Forum (AVAREF) as evidence of the presence of these skills on the continent, and even wondered why AVAREF cannot become the continental regulator for vaccines. AVAREF is composed of 34 African countries with quality control laboratories in place, 40 countries with medical products regulation in place and 21 countries with full time regulatory personnel assessing quality and pre-clinical data⁸

However, there was a recognition that the African Union through the African Union Development Agency (AUDA)-NEPAD's AMRH programme and the journey towards the Africa Medical Agency are efforts to solve the continental regulatory needs.

How can regulation and incentives be structured in a way that supports PPPs

Our study respondents identified the following as key issues pertaining to regulation and incentives that need to be addressed

- Regulation should include robust discussions with manufacturers, academics, regulatory authorities and politicians when structuring the regulatory framework.
- There are limited resources, capabilities and skills and they need to be managed astutely. Chatham house rules and frank discussion on what needs to be prioritised and clear roles and responsibilities on who is responsible for what is important for developing roadmaps for proportionate and adaptive governance regulatory systems.
- Create a space for collaboration amongst different stakeholder.
- There is also a need to avoid regulatory ratcheting – gold plating of standards; a familiar challenge when incumbents unnecessarily raise standards as a competitive tool.
- There is a need to avoid multiple layers of regulatory oversight – mutual recognition of regulatory approval can help reduce regulatory costs to manufacturers.

Procurement

Walwyn and Nkolele (2018) point out that SA's EPI vaccine procurements requires 46 million vaccine doses and as at 2015 the value was pegged at ZAR 1.5billion, and Biovac taps into this market as the procurer for the EPI vaccines for the state. If this continues it is innovative procurement using public health financing as active industrial policy to support local industry development (Chataway et al, 2016). In the interviews, our respondents pointed to assured procurement as essential especially considering graduation from GAVI eligibility for many countries. The second factor in terms of procurement that was highlighted was the need for medical insurance to acceptance biological therapies such as MAb (monoclonal antibodies) for treatment of cancer. However, there is a dilemma that was posed as follows "if you are selling into the poor, how do you charge in a way that develops income that is ploughed back into development?" Linked to this were two things that industrialists

⁸ <https://www.afro.who.int/about-us/leadership/avaref> accessed 13 September 2019.

identified as worrisome. With respect from the roll out of proper vaccine research and development and manufacturing on the continent it was pointed out that the region does not have a coherent vaccine plan or strategy, and secondly the supportive political, market, regulation environment does not yet exist. Opportunities however exist for example in the snake anti sera in the Maghreb region – however, because players are not collaborating there is a risk of investing in the same areas whereas there could be an agreement on firms focusing on their areas of specialisation at this particular time in the vaccine sector.

Gqoli (2005) attributes the success of PPPs in South Africa to a conducive political commitment; independent judiciary; clear PPP law, process, and standard terms; the existence of a PPP Unit in a strong National Treasury, very good projects, training, communication; strategic use of black economic empowerment, strong and deep financial markets supported by a competitive private sector. However, there were still challenges faced with deal flow, public sector capacity, Municipal PPPs and some aspect of black economic empowerment

5.3 Botswana

Like many developing countries, Botswana faces challenges in the delivery of public services infrastructure including their maintenance and operational obligations. New infrastructure needs to be provided and existing infrastructure upgraded to deliver public services more effectively and extend access to services to a greater number of the population (Government of Botswana, 2019). Accordingly, the Government of Botswana is promoting the use of PPPs in developing and operating public infrastructure and related facilities. The Government of Botswana in 2000 adopted the Privatisation Policy aimed at enhancing the role of the private sector in the economy. This Policy provided for public-private partnership (PPP) as one of the methods of enabling private sector participation in the provision of public infrastructure and related services. Table 15 presents key legislation, programmes and policies supporting PPPs in Botswana.

Table 15: Key legislation, programmes and policies supporting PPPs in Botswana

Legislation or Policy	Mechanism
Adoption of the Privatisation Policy in 2000	<ul style="list-style-type: none"> Provides an optimal balance between the public and private sectors to achieve sustainable economic growth. This Policy provided for public-private partnership (PPP) as one of the methods of enabling private sector participation in the provision of public infrastructure and related services.
Adoption of the PPP Policy and Implementation Framework in 2009	<ul style="list-style-type: none"> Create a conducive environment to encourage and attract private sector investors to play a greater role in procuring and financing of infrastructure projects.
Public Procurement and Asset Disposal Act	<ul style="list-style-type: none"> The legal and regulatory framework is embodied in the Public Procurement and Asset Disposal Act for central government projects and the Local Authorities Procurement and Asset Disposal Act for local authorities' projects.
Establishment of the PPP Unit in 2016	<ul style="list-style-type: none"> To coordinate, oversee and ensure successful implementation of the PPP Policy. To provide technical assistance to sponsoring institutions throughout all the stages of the PPP process from project conceptualization to contract management, including procurement of the private sector. Support the government entities in building capacity and skills required to implement PPP projects as well as to provide

	advocacy, public awareness and sensitisation of the public and other stakeholders regarding the PPP Policy, processes and projects.
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Source: (Government of Botswana, 2019)

As shown in Table 15 above, the initiatives confirm the Government of Botswana's commitment to the involvement of the private sector in financing and managing infrastructure projects.

Public Private Partnerships form an integral component of the Government of Botswana's overall strategy for provision of public services infrastructure across all sectors. To date there are two Projects which have been developed and are notable through PPP in Botswana namely; Ombudsman and Land Tribunal Office Accommodation Project and SADC Headquarters Office Accommodation Project (Tshombe and Molokwane, 2016). The first project was a ten-year concession for provision of office accommodation for the Office of the Ombudsman and Land Tribunal, inclusive of courtrooms, offices, auditorium, cafeteria and parking. Construction was completed within schedule (16 months). The project term expired and was handed over in 2017. The second project is still on-going and is a 17 year concession project for provision of office accommodation for SADC inclusive of offices, parking, resource centre and facilities management (cleaning, security and hard facility management). Farlam (2005) argued that in cases where partnerships have been able to best deliver desired outcomes in Botswana, thorough planning, good communication, strong commitment from both parties and effective monitoring, regulation and enforcement by government was prevalent. This validates Fall et al. (2009)'s argument that successful PPPs have been part of well-designed sector reforms with clear policies and strict adherence to governments policy commitments.

Under the Government of Botswana's National Development Plan 11, development expenditure of over P100 billion was planned for the plan period 2017/18 – 2023/24 the bulk of which is to fund infrastructure projects in sectors such as water, energy, tourism, agriculture, education and health, priority being given to the maintenance of existing infrastructure. A pipeline of potential PPP projects in Botswana has been identified. These projects will go through thorough assessment to determine whether they are suitable for implementation using the PPP method. The list is tabulated in Table 16 below.

Table 16: Recent PPPs in Botswana

Ministry	Project	Description
Ministry of Basic Education	Teachers Housing	Construction of 4,000 housing units for secondary school teachers
Ministry of Lands and Water Sanitation	Glen Valley Waste Water Reuse Project	Glen Valley wastewater treatment and reuse
Ministry of Lands and Water Sanitation	Chobe-Zambezi Water Transfer Scheme	Water abstraction from Chobe-Zambezi river and pipeline
Ministry of Investment, Trade and Industry	Economic Zones Common Facilities	Construction/operation of common facilities for Economic Zones
Ministry of Health and Wellness	New Francistown District Hospital	Construction of a new district hospital and a psychiatric department in Francistown
Ministry of Health and Wellness	Construction of Level 1 primary hospitals	Construction of Level 1 primary hospitals in Werda, Sebina, Tonota, Sehitwa, Botshabelo, Shoshong and Tsetsebjwe

Ministry of Agricultural Development and Food Security	Zambezi Agro-Commercial Development	Irrigation scheme in Pandematenga
Ministry of Defence, Justice and Security	Police Headquarters Expansion	Expansion of Police Headquarters in Gaborone
Ministry of Defence, Justice and Security	SSG Workshops and Houses	Construction of SSG workshops and 150 staff houses in Francistown
Ministry of Defence, Justice and Security	Prison Headquarters	Design, construction and maintenance of BPS headquarters in Gaborone
Ministry of Defence, Justice and Security	Sepopa Prison Farm	Construction of new prison comprising of Security Wing, Farm and staff houses at Sepopa
Ministry of Defence, Justice and Security	Construction of an Offender Rehabilitation Centre Lobatse	Design, construction and maintenance of an offender rehabilitation centre in Lobatse
Ministry of Lands and Water Sanitation	Land Servicing	Provision of integrated infrastructure services to land in Kasane, Ramotswa, Mochudi and Francistown
Ministry of Environment, Natural Resources and Tourism	Gaborone Tourism Precinct	Development of meeting, conference and exhibition facilities and promotion of urban tourism
Ministry of Environment, Natural Resources and Tourism	Three Dikgosi Monument	Development of the "Three Dikgosi Monument" for urban tourism
Administration of Justice	Serowe Magistrate Court	Construction of Serowe Magistrate Court

Source: (Government of Botswana, 2019)

Health system challenges

Botswana gained its independence from Britain in 1966, has a population of around 2 250 000 and has gained upper-middle income economic status with a gross domestic product (GDP) of US\$ 17.38 billion in 2017 (CIA World Factbook, 2019). Geographically it is a landlocked country bordered by Zambia, Zimbabwe, Namibia and South Africa. The key socio-economic and health system indicators are summarised in Box 1. Health services are based on a decentralised model, with health service delivery revolving around primary healthcare system comprised of 27 health districts which encompass (district hospitals, district clinics, health posts and mobile health clinics). This is augmented by an established network of 101 health clinics with inpatient facilities, 171 outpatient clinics and 338 health posts and 844 mobile clinics (Tapera et al., 2018).

Box 1: Key socio-economic and health system indicators

Total population (2018)	2,249,104
Gross Domestic Product (GDP) US\$ Billions (2017)	17, 38
GDP per capita purchasing power parity (2017)	17, 000
Life expectancy at birth male/female (years, 2018)	61.8/68
Total expenditure on health as % of GDP (2015)	5.4

Source: <https://www.cia.gov/library/publications/the-world-factbook/geos/bc.html>

The main health challenge in Botswana is posed by HIV/AIDS with 20 percent of the adult population infected with HIV, the fourth highest prevalence globally after South Africa, Lesotho and Swaziland (UNAIDS, 2017). Furthermore, structural drivers such as poverty, domestic violence, alcohol abuse, strong gender imbalances which disadvantage women have meant that HIV has been difficult to stem. Despite these impeding factors significant successes have been recorded in the fight against HIV particularly over the last decade through government-led programming efforts in which international partners have played central roles and structural support programmes have augmented efforts to improve education and employment opportunities (Loutfi et al., 2019).

Table 17 presents a breakdown of the number of health facilities in Botswana. The main health care provider in the 27 administrative health districts is the Ministry of Health through a primary health network administered by primary and local authorities. The delivery of primary health services is through the central hospitals; Princess Marina in Gaborone and Nyagabwe in Francistown which also serve as referral centres for the remote rural areas and networks of clinics. Health services across the continuum of care (medical treatment, diagnostic investigations and drugs) are offered free to citizens, while foreigners pay subsidised costs. This health system is lauded for its efficiency and reach and is viewed by policymakers in global health as an excellent exemplar of a successful healthcare model, with 95% of the population (85 percent of whom are rural living within an eight-kilometre radius of a health centre (WHO, 2009).

Table 17: The number of healthcare facilities in Botswana in 2019.

Botswana Healthcare Facilities			
Primary Care Facilities		Referral Healthcare Facilities	
Government Clinics	277	Central Hospitals	3
Private Clinics	167	District Hospitals	14
Health Posts	338	Mission Hospitals	4
Mobile Health Posts	844	Private Hospitals	10
Total	1626	Total	31
Grand Total			1657

Source: MoH, 2019

Table 18: Examples of Health PPPs in Botswana

Research and Innovation Generation	Translation and Commercialisation	Infrastructure Design and Development	Healthcare Service Delivery
<p>Botswana Harvard AIDS partnership</p> <p>Partners: Botswana Government and Harvard University</p> <p>Projects: HIV Vaccine research</p>	<p>Botswana University of Maryland School of Medicine Health Initiative (MUMMHI) partnership</p> <p>Partners: Botswana government and the University of Maryland</p> <p>Projects: Partnership for Advanced Clinical Education (Knowledge translation)</p> <p>Ongoing</p>	<p>BOTUSA project (Botswana Ministry of Health, the US centre for disease control and the Global AIDS programme)</p> <p>Projects: Prevention of Mother to child transmission programme (PMTCT) now integrated into national HIV programme.</p>	<p><u>Drug access:</u></p> <p>CHAI and government pricing and negotiation of HIV, malaria and tuberculosis drugs</p> <p>ACHAP and Merck (donation of Crixivan and Stocrin) to initiate the national HIV treatment programme in the early 2000 - 2009.</p>
		<p>The African Comprehensive HIV/AIDS partnerships (ACHAP)</p> <p>Partners: Government, Bill and Melinda Gates and Merck Foundation</p> <p>Projects: Building of Health Facilities HIV programme support and delivery</p> <p>Ongoing.</p>	<p><u>Mission Hospitals</u></p> <p>Bamalathe Lutheran Hospital (Ramotswa – since 1933)</p> <p>Deborah Retief Memorial (Motshudi – since 1927), Kanye Adventist Hospital (Kanye – since 1922)</p> <p>Scottish Livingstone Hospital (Molepolole – since 1934)</p>
			<p>CHAI in discount pricing and supply of diagnostics (mainly HIV, tuberculosis, malaria screening and treatment monitoring)</p>
			<p>Health systems strengthening</p> <p>CHAI as a technical implementing partner</p> <p>direct support to ministry of health:</p> <ul style="list-style-type: none"> Support cross-cutting system strengthening

			<ul style="list-style-type: none"> • Accelerate uptake and adoption of new technologies • National laboratory systems strengthening
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Research and Innovation: Botswana-Harvard AIDS Institute Partnership (BHP)

Areas Covered by Partnership	Partners Involved	Primary Purpose of Partnership
Collaborative research and training	Private-Non-Profit Organisation, Academia and Government of Botswana	Providing research and training in areas such as virology, molecular biology, immunology, genetics, epidemiology, as well as social and behavioural issues relevant to the AIDS epidemic in Botswana and southern Africa.

Developed by authors with data from interviews and Botswanaharvardpartnership.org (2019)

With a fully-outfitted research laboratory and training centre, the BHP is one of Africa's leading scientific institutions. Besides the Botswana government, Harvard University and the University of Botswana, the BHP has other partners who include the DFID and Wellcome Trust from the UK, EDCTP and three universities from South Africa. This partnership, established in 1996, reflects growth and expansion designed to keep a partnership appropriate and relevant for the health, economic and societal challenges it seeks to develop. At the governance level, the BHP was incorporated as a limited liability corporation under Botswana law in 2007 in order to become an autonomous legal, administrative, and financial institution.

Manufacturing: Botswana Vaccine Institute

Areas Covered by Partnership	Partners Involved	Primary Purpose of Partnership
Research into and manufacture of vaccines for livestock	Private Livestock Pharma Company (Meriel – Sanofi) and Government of Botswana	To research on, manufacture and supply livestock vaccines to ensure Botswana's animals and animal products are free from diseases

Developed by authors with data from bvi-bw.com and interviews (2019)

BVI was established in 1979 as an autonomous and totally self-financing company wholly owned by the Government of Botswana (GoB), before later establishing and forging a strong technical cooperation with Merial (the animal health division of Sanofi). BVI's original mandate was to produce vaccines to provide biological safeguards to ensure Botswana's livestock industry freedom against foot and mouth disease (FMD). The mandate has however since expanded to include other livestock vaccines including Foot and Mouth Disease vaccines-FMD, Contagious Bovine Pleuropneumonia Vaccine -CBPP, Peste des Petits Ruminants Vaccine-PPR, Anthrax vaccine and Quarter Evil/Blackquater vaccine.

Pharmaceutical industry

Currently there is no pharmaceutical production capacity in Botswana, mainly due to the small size of the market. There are, however, companies engaged in the importation and packaging of bulk drugs. Currently there are two pharmaceutical companies that are engaged in the importation of bulk drugs for packaging and distribution in the country, with plans to manufacture. The Ministries of Health and Wellness & Trade and Industry recognise that the health sector of Botswana is awash with opportunities. The best prospects highlight the provision of construction, medical technology and surgical equipment, the supply of drugs and commodities, and supportive healthcare services for treatment of HIV/AIDS and related infections. Opportunities for partnership also exist in investment in the training of health personnel in the country, particularly in areas such as commodity planning and forecasting, as well as logistics and supply chain (www.moh.gov.bw & www.mti.gov.bw).

A defining feature of the PPP model in Botswana is that despite the country bearing the fourth highest prevalence of HIV/AIDS Globally, Universal Health Coverage (UHC) goals are increasingly a tangible proposition, where the primary healthcare model for public health delivery is dominated by the public sector. At the same time, one useful indicator of health system improvement is the advancement towards the UNAIDS 90-90-90 targets, of which 91 percent of HIV positive people are aware of their status, 83 percent are on ARV treatment and 81 percent of those on treatment are virally suppressed (UNAIDS, 2019). Underpinning some of these successes are PPP arrangements directly or indirectly funded through the United States' Presidential Emergency Fund For HIV/AIDS (PEPFAR), Bill and Melinda Gates Foundation or the Global Fund for HIV/AIDS, TB and Malaria.

What is clearly evident is that PPPs in Botswana are visible in a range of configurations across health system strengthening, innovation and development, translation and commercialisation, infrastructure design and development and healthcare service provision. Whilst the remarkable strides in HIV have leveraged significantly on the PPP model to unlock the transformative capacity of private sector capital for broader health systems strengthening, it is important to discern vital lessons from this context. Among the key observations noted are the issues of ownership arrangements and governance which must be understood in greater detail. For example, whilst Botswana has successfully unleashed private finance, the partnerships between government, profit and non-profit sectors have tended to remain locked in silos (vertical or issue-focused). In that sense donor priorities have tended to be imposed over national priorities, even though the Botswana government has, uniquely, for an African country, maintained a long-term orientation on broader national health system and policy imperatives (Caines and Lush, 2004).

Relatedly, there have been significant re-alignments and shifts in the composition and orientation of PPPs over the last 15 years reflecting emerging and current health system needs. For example, in the early 2000s, Botswana emerged as the first sub-Saharan country to implement the prevention of mother to child transmission (PMTCT) initiative through the BOTUSA project involving (Botswana Ministry of Health, the US Centre for Disease control and the Global AIDS programme) focusing on

community development. Following programme success, with significant reduction in vertical transmission of HIV, the ministry of health has taken this project over and integrated it into routine health system programme delivery. Latterly the focus has shifted to knowledge translation (BUMMI partnerships) and workforce development see table XXX, with ongoing research and development projects in HIV vaccine development (Botswana Harvard Partnership) (Druce et al., 2004).

The PPP model in Botswana is unsurprisingly characterised by extreme heterogeneity: for instance in health systems provision, on one end of the spectrum are drug access PPPs involving the provision, discount pricing on a range of drugs by international pharmaceutical companies such as Merck and GSK in the donation of and discounting arrangements of essential HIV drugs. For example, Merck donated Stocrin® and Crixivan® which served as critical drivers in aiding the government to launch its antiretroviral (ARV) programme. At the other end of the spectrum are mission hospitals at the front-end of care, these include Bamalethe Lutheran Hospital in Ramotswa, Scottish Livingstone Hospital in Molepolole (table XX). Noteworthy, these rely on the ministry of health for logistical support (supply chain and procurement) through the central medical stores for pharmaceutical and diagnostic supplies. Meanwhile, a vital feature of the PPP model in Botswana is the central medical stores which uses a robust IT based monitoring system for national drug and diagnostics supply and management. This system was developed in partnership with ACHAP which had a central role in securing and designing the storage space for ARV drugs (Caines and Lush, 2004). Bilateral support from the Merck/Gates partnership played a key role in the formation of ACHAP. Through the ACHAP arrangement bridging finance was provided to set HIV/AIDS programmes into motion. This raises a key point both empirically and conceptually regarding PPPs, that in some instances there is need to look beyond existing PPPs, to explore a wider range of both benefits and risks from those PPPs, including direct ones and collateral ones that arise from the catalytic role that the partnerships play. Continuous appraisal of partnerships is therefore important, to unpack their contributions and relevance and to explore cheaper alternatives of doing what the partnerships are doing.

5.4 Namibia

Public–private partnerships in Namibia are one feature of the growing economic landscape since independence was declared in 1990. However, Opawole (2018) argued that the adoption of PPPs is relatively new in Namibia, and empirical evidence relating to its application is scanty. This argument resonates with Kaiyamo et al. (2014) who pointed out that while PPPs are not new in Namibia, the pace at which they are implemented, particularly in the health sector leaves much to be desired. It was in this backdrop that subsequently that the Ministry of Health and Social Services (MoHSS) devised a PPP framework⁹ and invited the private sector to participate, but the response has been dismal (MoHSS, 2013).

The World Bank supports Namibia in a Country Partnership Strategy (CPS) to achieve its Fourth National Development Plan that centralises development of state capacity and the private sector. The dedicated Development Bank of Namibia on the other hand provides funding for infrastructural projects completed by local or state-owned enterprises together with private companies, including direct loans for PPP enterprises (Commonwealth Governance, 2019). Table 19 below presents key legislation, programmes and policies supporting PPPs in Namibia.

Table 19: Key legislation, programmes and policies supporting PPPs in Namibia

Legislation or Policy	Mechanism
Namibia Public Private Partnership Policy (NPPPP) of 2012	<ul style="list-style-type: none"> Namibia has had a non-binding policy as its framework for PPPs since 2012
Public Private Partnership Act, No. 4 of 2017 ¹⁰	<ul style="list-style-type: none"> Was signed into law on 9 July 2017 Provides a legal framework for public-private partnership (PPP) projects. Establishes a PPP committee, whose functions would include providing transaction approvals for proposed PPP projects, developing best practice guidelines for PPPs, advising the Minister of Finance on matters related to PPP projects, overseeing the functioning of the PPP unit and (in consultation with the Attorney General) providing clarification on matters of interpretation under the Act. Regulates PPP projects through the stages of initiation, preparation, procurement, conclusion of the PPP agreement and its implementation. This Act applies to the initiation, preparation, procurement, management and implementation of public private partnership projects.
Public Private Partnership Regulations	<ul style="list-style-type: none"> Regulations made in terms of Public Private Partnership Act 4 of 2017 section 40(1) Came into force on date of publication: 18 December 2018

⁹ The MoHSS (2013) describes PPP as a government service or private business venture, which is funded and operated through a partnership of government and one or more private sector companies. From the health sector perspective, PPP is a means to bring together a set of actors for the common goal of improving the health care of a population based on the mutually agreed roles and principles

¹⁰ Namibia PPP Act is available at https://laws.parliament.na/cms_documents/public-private-partnership-8fcac0c39f.pdf. Accessed on 19 September 2019.

Government Notice 353 of 2018 ¹¹	<ul style="list-style-type: none"> • Cover PPP initiation: unsolicited proposals, appointment of project officer and appointment of transaction advisor • Cover feasibility assessment: Management of contingent liabilities and revenue sharing or revenue support mechanisms • Provides PPP project procurement and implementation mechanisms
National Development Plan 5 (NDP5)	<ul style="list-style-type: none"> • Published shortly before implementation of the Act on 31 May 2017 • Serves as Namibia's blueprint for national development between 2017 and 2022. •

Source: Public Private Partnership Act, No. 4 of 2017, Macdonald (2018).

The implementation of the Public Private Partnership Act, No. 4 of 2017, coupled with the above recent developments (among others), indicate a significant shift in the last few years to achieve some of Namibia's infrastructure development goals through a binding set of legislative provisions aimed at the government deriving efficiencies (including value for money) from the involvement of the private sector (MacDonald, 2018).

Inkumbi (2019) noted that governance mechanisms for PPPs are evidently thriving in Namibia, however there is room to further develop the field of enterprise, particularly with regard to revenue streams for projects, which entail more than the initial capital projects. The Namibian government has recently received funding from the African Development Bank for the Institutional Strengthening for Public-Private Partnerships project to, among other things, provide capacity building, technical assistance and advisory services to assist the Namibian Government in operating its PPP framework (MacDonald, 2018). A key focus of this project is to fund technical assistance for pilot projects in an attempt to address one of the key challenges faced by African governments procuring projects under burgeoning PPP laws or frameworks: the limited expertise on the part of contracting authorities and limited knowledge regarding best practices (ibid).

However, Inkumbi (2019) argues that one of the core aspects that challenges the concept of PPPs is the idea that the state should be the sole provider of services that are traditionally considered to be public services. By accepting that certain capital projects and services can be developed and rendered by the private sector, public sector resources can be directed elsewhere. Examples of this at work can be found in private education, and private medical facilities in Namibia.

As indicated in Table 19 above, the projects identified in the National Development Plan 5 (NDP5) will require estimated funding of NA\$164 billion which, according to a ministerial statement on the NDP5 implementation plan, will be funded from several sources, one of which is private-sector funding through PPPs (specifically for land servicing and infrastructure construction, such as water, roads, sewers and electricity).

Since independence, private finance has been injected into telecoms, power and port expenditure, while large investments in mining, smelting and refining infrastructure have mostly been funded by multinationals. According the Commonwealth Governance (2019), examples of public-private participation are limited, but include energy projects, mining, desalination, mobile telecommunications and the Targeted Intervention Programme for Employment and Economic

¹¹ Namibia PPPs Government Regulations available at https://laws.parliament.na/cms_documents/public-private-partnership-act-4-of-2017---regulations-2018-353-c96b676b6f.pdf. Accessed on 19 September 2019.

Growth (Tipeeg). The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) has funded more than NAD3 million on public–private partnerships in Namibia with three current private partners – NamPost Savings Bank, Pupkewitz Megabuild and BFS Nampro Fund Manager. Namibia has little in the way of dedicated public–private partnership policy framework, something the Government has pledged to address. Development achieved via public–private partnerships is in line with Namibia’s Vision 2030 to raise the living standards of the Namibian people to those of the developed world by 2030.

MacDonald (2018) highlighted that, utilizing the funding procured under the Institutional Strengthening for Public-Private Partnerships project, the Ministry of Finance is in the early stages of procuring transaction advisory services for a PPP for the redevelopment of an office building for the Ministry of Justice. If implemented, this would be the first PPP project to be successfully procured under this new legislation. Inkumbi (2019) pointed out that in Namibia public-private partnerships will progressively play a vital role in closing the development gaps. The author further argued that when managed effectively, PPPs not only provide much needed new sources of capital, but also bring significant discipline to project selections, construction, and procedures. Table 20 presents some of the PPPs projects in the construction sector prior to the new legislation.

Table 20: Some of the PPPs projects completed or on-going in Namibia in different sectors.

SECTOR/ MAIN DIVISION	PROJECT NAME	NDP 5 GOALS:	DESIRED OUTCOME/ PROJECT DESCRIPTION	STRATEGIES	STARTING & CONCLUDING DATES
Administration	State Security Infrastructure	Promote Good Governance through Effective Institutions	By 2022, Namibia continue to be safe, secure, and peaceful and upholding the rule of law.	Strengthen National Security and Territorial Integrity	Starting date: 01-APR-2014 Concluding date: 31-MAR-2025
Construction	Construction of Dobe Border Post	Promote Good Governance through Effective Institutions	The objective of this project is to construct staff accommodations at Dobe Border Post, The beneficiaries will be immigration officials based at Dobe Border Post. The main components are: Construction 16 flats, 2 houses and Services.	Integrated immigration management and civil registration systems	Starting date: 01-APR-2014 Concluding date: 31-MAR-2019
Construction	Construction of Forensic Laboratory in Windhoek	Promote Good Governance through Effective Institutions	To construct a proper Forensic Laboratory with essential facilities. The beneficiaries are: Police members and the public while the project components include: Feasibility study, Documentation, design and construction of the laboratory.	Improve Crime Prevention	Starting date: 01-APR-2014 Concluding date: 31-MAR-2019

Education, Arts and Culture	Construction and renovation of educational physical Facilities	Build Capable & Healthy Human Resources	To build a new primary school in order to accommodate 800 learners from Ehangano. The beneficiaries are: learners and teachers and the public at large.	Build Capable & Healthy Human Resources	Starting date: 01-APR-2011 Concluding date: 31-MAR-2022
Health and Social Services	Construction and upgrading of Primary Health Care Clinics Nationwide	Build Capable & Healthy Human Resources	To construct and upgrade Primary Health Care Clinics nationwide to improve service delivery, reduce mortality and morbidity through the principles of primary health care services. The components are: construction of newly approved PHC clinics and staff accommodation, upgrading of existing PHC clinics & staff accommodation as well as construction of prefabricated housing units.	Accelerate health infrastructure development and resource management (equipment, physical building, maintenance , pharmaceutical and finance)	Starting date: 01-APR-1995 Concluding date: 31-MAR-2021
Health and Social Services	Upgrading of Opuwo District Hospital	Build Capable & Healthy Human Resources	By 2022, Namibia's Health Adjusted Life Expectancy (HALE) has improved from 58 to 67.5 years.	Accelerate health infrastructure development and resource management (equipment, physical building, maintenance , pharmaceutical and finance)	Starting date: 01-APR-2010 Concluding date: 31-MAR-2021
Health and Social Services	Otjiwarongo Referral Hospital	Build Capable & Healthy Human Resources	General refurbishment of the facility, to upgrade the general wards (male & female) and staff accommodation. The project will improve access to health services for the community of Otjiwarongo as well as for the general population of the Otjozondjupa region.	Accelerate health infrastructure development and resource management (equipment, physical building, maintenance ,	Starting date: 01-MAR-2010 Concluding date: 31-MAR-2021

				pharmaceutical and finance)	
Mines and Energy	National Airborne Geophysical Surveys (NAGS)	Achieve Inclusive, Equitable & Sustainable Economic Growth	By 2022, Namibia has an integrated mining industry value chain doubling the share of valued added mining exports from 2015.	Establish mining value chain activities	Starting date: 01-APR-2001 Concluding date: 31-MAR-2022
Rural and Urban Development	Construction of Services Infrastructure in Onayena	Build Capable & Healthy Human Resources	Construction of services infrastructure (water, sewer, electricity and roads) in Onayena in order to provide households with basic services. The Project will improve and lead to the effective and efficiency of public service delivery.	Develop public-private partnerships to provide land servicing	Starting date: 1-APR-2014 Concluding date: 31-MAR-2021
Rural and Urban Development	Construction of Services Infrastructure in Lusese	Build Capable & Healthy Human Resources	To construct services infrastructure (sewer, electricity, roads and water) in Lusese. The main components are planning, surveying, feasibility study, design and documentation and construction. The beneficiaries are the residents of Lusese and the public at large.	Develop public-private partnerships to provide land servicing	Starting date: 1-APR-2017 Concluding date: 31-MAR-2021
Rural and Urban Development	Construction of Services Infrastructure in Otuzemba (Opuwo) - Phase 3	Build Capable & Healthy Human Resources	The project objective is to construct services infrastructure (water, sewerage, roads and electricity) in Opuwo in order to connect households to municipal services to have access to basic services. The main components are: planning, surveying design, documentation and construction. The main beneficiaries of the projects are residents of Opuwo and the public at large.	Develop public-private partnerships to provide land servicing	Starting date: 1-APR-2017 Concluding date: 31-MAR-2021
Rural and Urban Development	Construction of Services Infrastructure	Build Capable & Healthy	The Main objective of this project is to provide basic public infrastructure to the	Develop public-private	Starting date: 1-APR-2010

	e in Okahao (Phase 3)	Human Resources	town. This will highly benefit the residents of Okahao town, since they will have access to the services such as clean water, proper roads, proper sewer and water reticulation as well as electricity. However, this will make it possible for NDP5 goals to be achieved. The main component of this project will be documentation, designing and implementation.	partnerships to provide land servicing	Concluding date: 31-MAR-2021
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Source: Opawole (2018), Republic of Namibia (2018)

The MoTI (2019) stated that PPP projects such as those listed in Table XX above serve as an engine for achieving the social and economic objectives of the Government of Namibia, such as employment creation, pro-poor development, inequality reduction, development of Small and Medium Enterprises and in particular the Transformation Economic and Social Empowerment Framework (TESEF). The execution of the PPPs projects is done by responsible institutions and the success of the implementation of the projects is highly dependent on the commitments of the executing institutions. To underscore the importance of commitment, the Government of Namibia, has “called upon all partners that are directly and indirectly involved in the implementation of the projects to redouble their efforts and ensure that the prioritized programmes and projects are finalized on time to allow for other important programmes and projects to be implemented in the years to come” (Republic of Namibia, 2018).

Health sector landscape and PPPs

With respect to the health sector, at Independence in 1990, Namibia inherited a fragmented health system based on racial segregation. The health systems’ financial, physical and human resources were ill-distributed geographically, by level and type of service provision resulting in a concentration of infrastructure and services in the urban areas. This created inequalities in the access of health care services. These services were more of a curative nature and were managed by the Second Tier Authorities that were running parallel programmes. The PPP Act seeks to address some of this imbalance. Namibia is situated in South West Africa and is bordered by Angola, Botswana, South Africa, Zambia Zimbabwe. Data from 2016 show a population of around 2.5 million people. According to Ministry of Health data in 2018, Namibia had 343 hospitals and clinics, as well as 1,150 smaller service points (MoHSS, 2019). Although saddled with one of the highest burdens of HIV/AIDS, over the last 15 years significant strides have been made in the fight against the pandemic through government-led programmes supported by international partners, multilateral support from the Global Fund for HIV, WHO and bilateral funding from the United States (USAID) and the United Kingdom’s Department for International Development (DFID), amongst others. Data from 2016, show that Namibia is well on track to reaching the UNAIDS 90-90-90 goal by 2020. 70 percent of the population had been tested for HIV of the HIV positive, 67 percent of adults and 90 percent of children are receiving antiretroviral (ARV) treatment (references). It must be acknowledged that in 2003, Namibia had one of the highest global incidences of HIV, and current statistics bear testament to the significant success achieved by the mainly vertical programmes in the resolution of a host of

challenges, including drugs access, circumventing market deficiencies, bypassing health system bottlenecks and improving treatment access and cost-efficiency.

Box 2: Summary - key socio-economic and health system indicators

Total population (2018)	2,533,224
Gross Domestic Product (GDP) US \$ billions (2017)	13.24
GDP per capita purchasing power parity US\$ (2017)	11,200
Life expectancy at birth male/female (years, 2018)	62.7/66.2
Total expenditure on health as % of GDP (2014)	8.9

Source: CIA World Factbook (2019): <https://www.cia.gov/library/publications/the-world-factbook/geos/wa.html>

Despite having one of the highest burdens of HIV globally, and a high prevalence of HIV associated opportunistic diseases, notably tuberculosis, Namibia has made significant advancements in implementing policies that directly address these challenges through enabling health service provision across the continuum of care; in prevention, testing, treatment and monitoring. A key feature of Namibia's efforts in the global fight against HIV is that the government has contributed up to 65 % of the requirements for these multiple programmes, in a classic example of state-led health development, unique only to a few African countries (African Health Observatory, 2019). This approach appears to be particularly effective in setting the tone for the establishment of health-orientated PPPs through structural cooperation strategies involving key partners such as PEPFAR, USAID and the Global Fund for HIV/AIDS (MoHSS, 2019).

Namibia's healthcare provision is based on a four-tier system comprising of healthcare posts/outreach points, clinics and health centres, district hospitals and referral hospitals complemented by a sizable private sector and faith-based/mission hospitals (see table XX). Noteworthily, whilst Namibia has a well-developed private health care provision in the urban regions of Oshana, Kavango, Erongo and Khoma, it is however not fully deployed to improve access of services to the mainly rural population, which is sparsely distributed across the country's vast land area of 823, 290 square metres (Pareko et al., 2018). In this background, the key priorities identified for improvement by the government include:

- Service delivery redesign – primary health care provision
- Service coverage and reach (particularly for maternal and child health), ambulance, dental, and laboratory services, technical and clinical capacity
- Addressing infrastructural constraints, information technology, supply chain design and management
- Technology sustainability and future-proofing
- Organisation and coordination of health service providers
- Incentivising innovation – innovative health financing
- Integration of services across disease areas

Some of these priorities inform the structuring and delivery of PPPs in other sectors of the economy as presented in Table 20, and those in the health sector, shown in Table 21 below:

Table 21: Examples of PPPs In Namibia

Research and Innovation Generation	Translation and Commercialisation	Infrastructure Design and Development	Healthcare Service Delivery
<p>Equip Health and Ministry of Health</p> <p>Project: Experimental clinical trial pre-exposure prophylaxis (PrEP) using Gilead's Truvada</p> <p>Status: Ongoing</p>	<p>Knowledge translation; Idaho State University, University of Namibia, Ministry of Health, Collaborative Focus: Pharmacy and Medicine and Health Science</p>	<p>ACHAP and Ministry of Health. Infrastructural development of clinics and HIV health-facilities</p>	<p>Drug access PPPs ARVs</p> <p>Pharmaccess</p> <p>CHAI – discount pricing arrangements and access for diagnostics and drugs (HIV, TB, and malaria. Example: CHAI and CEPHEID arrangement for point-of-care diagnostic markers (Gene-Expert devices)</p>
<p>International Training and Education Centre for Health (I-TECH) University of Washington and Ministry of Health</p> <p>Project: HIV Preventive services for adolescent girls using PrEP.</p> <p>New molecular diagnostic technologies and electronic health (Funded by PEPFAR)</p>	<p>Namibia Institute of Pathology (NIP)(established through a parliamentary act in 1999). Commercialisation of provision of Laboratory services. Government and</p>		<p>Diagnostics access and screening services Pharmaccess, MOHSS, NABCOA and Namibia Institute of Pathology</p> <p>Health Systems Strengthening: CHAI: Laboratory systems and supply chain management</p> <p>Technical partner for cross-cutting system strengthening.</p>
			<p>Mr Sister mobile health clinics (from 2010) operationally run by Pharmaccess (supported by Heineken Africa Foundation, Ministry of Health and Social Services, Namibia</p>

			Medical Care, Health Insurance Fund, USAID
			Private and Mission hospitals
			Specific programmes: Demand creation and provision of Voluntary medical male circumcision (VMMC) Partners: MoHCC (for oversight) 32 Private clinics USAID -funder

Informed by international health objectives, a defining feature of these embryonic partnerships is that though driven by foreign policy goals and developmental cooperation, they take into consideration NPPP Policy provisions, emphasising equality between partners. In these efforts, the focus has been on maximising human resources and skills, meeting health and developmental needs, improving local capacity and reducing dependency by promoting Namibia’s advancement of its own developmental agenda. There however, was some inertia in take-off, as exemplified by the sluggish enactment of the PPP act, discussed earlier. Meanwhile, below, we give further details on some of the PPPs presented in Table 21 above.

Access to Finance: PharmAccess Foundation Namibia (PAFN)

Areas Covered by Partnership	Partners Involved	Primary Purpose of Partnership
Service delivery, quality improvement, infrastructure upgrade	Private (Communication) Technology Companies, Non-Profit Org (PAFN) & Academia (NUST) Government of Namibia	Improving access to basic health care services through more effective and inclusive healthcare finance

Developed by authors with data from interviews and MoHSS (2019):

In 2010, PAFN launched the Mister Sister Mobile Health Service, a unique PPP arrangement that leverages both governmental and private sector resources to cover the cost of service delivery and has played a vital role in upgrading health infrastructure and the quality of services delivered to rural populations in Namibia.

Access to services: Namdeb hospital in Oranjemund and Rosh Pinah

Areas Covered by Partnership	Partners Involved	Primary Purpose of Partnership

Service delivery, quality improvement, infrastructure upgrade	Private Mining Companies (Orangemud and Rosh Pinah) and Government of Namibia through Ministry of Health and Social Services	Health service for company workers and community members
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Developed by authors with data from interviews, SHOPS (2012) and MoHSS (2019):

Oranjemund is a “company town” located in the restricted diamond area, which is off limits to those without the proper permit. To serve its workers in this isolated location, Namdeb operates its own hospital and clinic. MoHSS runs a primary care clinic in the town for those not employed or insured by Namdeb. When patients cannot be treated by the nurses at the public clinic, they are referred to the Namdeb hospital, and MoHSS pays for their care under a negotiated agreement (SHOPS, 2012)¹².

The partnership at Rosh Pinah is an attempt to give public patients access to mine-operated medical facilities. The fully equipped outpatient clinic founded by the two mines at Rosh Pinah has two physicians and a full range of support personnel. It also has basic diagnostic equipment (X-ray, ultrasound) that is not available at the nurse-staffed public clinic. An agreement between the regional MoHSS and the private clinic was facilitated by PharmAccess Foundation and Boston University. The rapidly expanding uranium mine at Rosh Pinah offers a similar opportunity for partnership.

From the data on PPPs for health in Namibia that this study managed to consolidate, a number of observations stand out. Firstly, as the governance terrain takes shape, questions still remain concerning co-location arrangements and the most feasible mechanism for private sector engagement in Namibia. Relatedly, there is symmetric division of power in projects relying on external donors mainly (PEPFAR funded HIV programmes), which is part of a broader narrative on the patchiness of information regarding the contractual mechanisms underpinning PPP relationships and lack of clarity of the precise structure for engagement between the government and international donors. Further, while opportunities for innovative private sector finance in the design, building, and financing of large infrastructural projects are highlighted as a key driver for PPPs, they are as yet not clearly articulated or visible. Development and implementation of partnerships need competencies and dedicated resources. Meanwhile, the government is taking a leading role in leveraging the catalytic role of PPPs, through for example, leading infrastructural projects and seeking to repurpose (integrate) vertical driven programmes in the long-term (MoHSS, 2014). In addition, despite a small domestic market and capabilities for local pharmaceutical production, government policy has created preferential market access for local producers such as Fabupharm (producers of creams, ointments and syrups) and Comex, condom producers for the local and sub-regional market (MoHSS, 2019).

¹² SHOPS Project. 2012. Namibia Private Health Sector Assessment. Brief. Bethesda, MD: Strengthening Health Outcomes through the Private Health Sector Project, Abt Associates

5.5 Zambia.

Zambia is a lower-middle income country, with a population of nearly 18 million in 2019, having gained its independence from Britain in 1964. Although Zambia has grown in economic status since gaining its independence in 1964, and currently boasts a GDP of USD 27.0 Billion with a 6.0% annual growth due to an increase in mining and industrial activities, disproportionate income levels are observable between the rural and urban population with poverty levels in rural areas at 70% compared with between 20 and 30 percent in urban areas which include Lusaka the capital city, Kitwe, Ndola and Livingstone (World Bank, 2019).

Given the changing economic, social and political environment, coupled with globalisation and budget constraints, public-private partnerships (PPPs) have become unavoidable and indeed desirable in many countries worldwide (School of Built & Natural Environment, 2011). PPPs are now commonly used to accelerate economic growth, development and infrastructure delivery and to achieve quality service delivery and good governance (ibid). Zambia, like many other developing countries whose Gross Domestic Product (GDP) and Per Capital Income (PCI) cannot sufficiently support the required social and economic development is not an exception. Zambia has embraced PPPs as a project delivery method (Ngoma et al., 2014) and has engaged in different forms of PPPs in the transport, construction, health and energy sectors among others (ZDA, 2014).

Mukela (2010) stated that in 2004, the government of Zambia recognised the need to provide infrastructure and other public services through PPPs. Although various forms of PPPs had been implemented previously, there was no structured legal policy framework at the national level. According to the Zambia Development Agency (2014), the Zambian Government acknowledged that the use of PPP¹³ tools and techniques to finance infrastructure development could enhance public service delivery. As such, in December 2008 the Government approved a Policy Framework for the implementation of PPPs in Zambia. Following the Policy pronouncement by Government, Parliament in August 2009, passed the *PPP Act No. 14 of 2009*, which aims to promote and facilitate the implementation of privately financed public infrastructure projects in Zambia. The PPP Act, therefore, provided for the establishment of the PPP Unit as a directorate under the Ministry of Finance and National Planning (MOFNP). All PPPs henceforth are initiated and implemented under the PPP Policy and Act of 2009. The Act was developed and enacted into law in order to put into effect the need to use PPPs as strategic tools and means of complimenting Government efforts to mitigate the limited resources towards economic programmes (Government of the Republic of Zambia, 2009). Thus, the Government's vision on PPPs is:

"To have well developed and maintained quality socio-economic infrastructure and related services that enhance the Zambian people's livelihood and effectively contribute to national development through PPP frameworks and initiatives" PPP Policy and Act (2009, p. 5)¹⁴.

¹³ From the Zambian perspective, a PPP is defined as an arrangement between public and private sectors with clear agreement on shared objectives for the delivery of public infrastructure and/or public service by private sector that otherwise would have been provided through traditional public sector procurement (PPP Policy and the Act of 2009).

¹⁴ https://ppp.worldbank.org/public-private-partnership/sites/ppp.worldbank.org/files/ppp_testdumb/documents/zambia_ppp_act_2009.pdf accessed 17 September 2019

Implementation challenges for PPPs in Zambia

Zambia has been facing serious funding constraints in implementing projects backed by public finances (Muleya and Zulu, 2009). ZDA (2014) argue that the major constraints being faced in the implementation of PPPs in Zambia are mainly related to factors affecting the supply side of PPP projects, resulting in obstacles to mobilize private sector resources. These constraints include the following:

- *Political Champions required in driving the PPPs agenda.* ZDA (2014) highlighted that Political Champions are necessary to marshal the support of stakeholders in the implementation of the PPP projects. In Zambia, key ministries that would be in a better position to play the Political Champion's role include the Ministry of Finance, Ministry of Commerce, Trade and Industry, and the Ministry of Transport, Works, Supply and Communications. ZDA argue further that unless the requirement of these Political Champions is recognised and addressed, even the technical staff in ministries, departments, agencies, and local government will not move at a speed adequate enough to implement the PPPs in Zambia.
- *Lack of capacity in Government to undertake PPP projects.* ZDA (2014) reviewed the PPP implementation process in Zambia and argued that there is limited capacity in Government to implement PPP projects. The complex and long-term nature of most PPP projects demand skills and understanding beyond that of traditional contract management or administration. However, the Cabinet's approval to subsume and institutionalize the PPP Unit functions into the Zambia Development Agency in November 2013, addressed this challenge to a greater extent and the ZDA now play a critical role in coordinating PPP projects between various key players and Contracting Authorities in Zambia.
- *Political-bureaucratic constraints and risks.* Ngoma et al. (2014) argue that in the Zambian PPP Act, political risks, such as the discontinuation of concessions, tax increases, inappropriate tariff implementation and increases, and enforcement of new government policies do not appear to have been addressed. While the Act stipulates the administrative procurement procedure, it does not provide specific project strategies and expected results from the PPP process.
- *Financial constraints.* Muleya and Zulu (2009)'s study on delivering infrastructure development using PPPs in Zambia argue that the Zambian PPP Act of 2009 does not provide any financial measures to address such constraints and risks. Although the act provides clauses prescribing the criteria for evaluating financial and commercial proposals, it lacks direction on appropriate PPP finance structures to ensure revenue risk reduction and user affordability of possible charges.
- ZDA (2014) highlighted that *lack of clear guidelines and regulations* to guide contracting authorities and the private sector in the implementation of PPPs as one of the major constraints. ZDA's argument was based on the fact that since the enactment of the PPP Act of 2009, no regulations have been produced to clarify and guide the public and private parties in respect of those provisions that require regulations.

While literature has shown some major challenges faced in the implementation of PPPs in Zambia, it is worth noting that PPPs provide innovative ways of improving the delivery of socio-economic services to the citizenry (ZDA, 2014). A study by Nshimbi and Vinya (2014) on impacts of public-private partnership on local livelihoods and natural resource dynamics: perceptions from Eastern Zambia suggest that PPPs, if well-structured, have the potential to address both livelihoods and enterprise needs with an ultimate benefit of promoting both sustainable livelihoods and natural resources

management in tropical Africa. Table 22 presents key legislation and policies supporting PPPs in Zambia.

Table 22: Key legislation and policies supporting PPPs in Zambia

Legislation or Policy	Mechanism
The ZDA ACT No. 11 of 2006	<ul style="list-style-type: none"> • Established the Zambia Development Agency whose mandate is to facilitate investment by providing effective and comprehensive business services facilitation, micro, small and medium enterprise development, business development and aftercare services as well as market information in order to promote Zambian exports. The Act is currently undergoing revision to align it with the current trends in investment promotion.
The PPP policy of 2008	<ul style="list-style-type: none"> • A strategic document that clearly outlines the country's strategic objectives in terms of PPPs and includes, among others, the implementation framework
PPP Act of 2009	<ul style="list-style-type: none"> • Provides for the participation of the private sector in the provision of social sector services and the development and operations of public infrastructure; • An Act to promote and facilitate the implementation of privately financed infrastructure projects and effective delivery of social services by enhancing transparency, fairness and long-term sustainability and removing undesirable restrictions on private sector participation in the provision of social sector services and the development and operation of public infrastructure; • Establishes a Public-Private Partnership Unit and provides for its functions; establish the public-private partnership Council and provide for its function; • Provides for public-private partnership for the construction and operation of new infrastructure facilities and systems and the maintenance, rehabilitation, modernisation, expansion and operations of existing infrastructure facilities and systems and the provision of social sector services; • Develops general principles of transparency and fairness in the award of contracts by public authorities through the establishment of specific procedures for the award of infrastructure projects and facilities and provision of social sector services and rules governing public-private inception, procurement, contracting and management of public-private partnerships; • Provides for the implementation of public-private partnership agreements between contracting authorities and concessionaires; and provides for matters connected with, or incidental to, the forgoing

Source: (Government of the Republic of Zambia, 2009; PPP Policy and Act of 2009, p. 79)

As shown in Table 22, the PPP policy of 2008 is backed by the PPP Act No. 14 of 2009 and both the PPP Policy and Act provide an enabling environment for various PPPs to be initiated, developed and implemented using a number of variants such as Concessions, Lease, Management, Service contracts among others (Government of the Republic of Zambia, 2009).

Priority Areas in PPP Infrastructure Investment in Zambia

Table 23 identifies priority areas for infrastructure investment in Zambia. The government has been looking at private partners to fund the identified projects (ZDA, 2014). The Government retains a significant role in the partnerships as the main purchaser of services or the main enabler of the projects.

Table 23: PPP projects completed or on-going in Zambia in the transport, agriculture, energy and health sectors.

Sector and type of PPP	Facility/Project summary
Transport – rail	Chingola-Solwezi-Lumwana-Jimbe railway line: Expansion of the existing 604km railway line to link with Chingola through Solwezi to the border town of Jimbe to enhance the transportation of freight and passenger traffic and other products using Lobito Bay port in Angola
Transport – rail	Kazungula-Livingstone railway spur: The development of approximately 193 kilometre stretch of railway line from Livingstone District, Southern Province, (which will run parallel to the border with Zimbabwe, Botswana and Namibia) to Sesheke District, Western Province, and will connect to the existing Zambia Railways Limited Railway line in Livingstone which in turn connects to TAZARA in Kapiri Mposhi, Central Province.
Transport – rail	Kafue Lions den: Linking the Zambia Railway line from Kafue (Zambia) to Ziwa (Zimbabwe) (341km) the way to the Beira Port as the shortest route to the port of Baira in Mozambique.
Transport	Njanji commuter
Transport – rail	Nseluka-Mpulungu railway spur: The development of approximately 190 kilometre stretch of railway line from Mpulungu to Nseluka (within the Northern Province of Zambia) connecting to the TAZARA. This will provided easy transport to three Districts of the ten in Northern Province i.e. Mungwi, Mbala and Mpulungu Districts
Transport	Solwezi via Kasempa-Kaoma-Mongu to Katima Mulilo
Transport – rail	TAZARA Nseluka – Mpulungu port: The railway lines involves linking Mpulungu Port to TAZARA line at Nseluka (170km) to facilitate the imports and exports from the Great Lakes region to the sea ports on the Indian Ocean
Transport – rail	Mchinji/Chipata railway: Extension of the existing railway line to TAZARA by 406km- The railway line involves linking the Chipata–Mchinji line through Petauke District to the port of Nacala in Mozambique.
Agriculture	Development of Kalumwanga Farming block
Agriculture	Development of Luena Farming blocks
Energy	Development of Kabompo mini-hydro
Energy	Development of Kalungwishi mini-hydro
Energy	Development of Mombututu mini-hydro

Health	An Ultra-modern Center of Excellence Hospital in Lusaka
Health	Three diagnostic health facilities in Lusaka, Livingstone and on the Copperbelt

Source: ZDA, (2014)

Health System Overview

Healthcare service delivery in Zambia is centred on state and non-state actors, which encompass non-governmental organisations (NGOs) such as Medicines San Frontières and the Clinton Health Access Initiative (CHAI) amongst others complementing faith-based organisations which mainly run what have often been termed ‘mission’ health facilities (Caines and Lush, 2004). Health service provision is based on a decentralised health delivery model that is government-led as shown in table 24 (ministry of health contributes to 81 percent) of health facilities and 19 percent of the health facilities are private (of which six percent are mission type). Public health sector provision is categorised at three main levels: tertiary or specialist hospitals (level 3), provincial care (level 2) and district level care in (level 1 hospitals).

Box 3: Summary – socio-economic and health system indicators

Total population (2019)	18, 012, 770
Gross Domestic Product (GDP) US\$ billions (2017)	25, 71
GDP per capita purchasing power parity US\$ (2017)	4,000
Life expectancy at birth male/female (years, 2018)	51.4/54.7
Total expenditure on health as % of GDP (2019)	9.0

Sources: CIA World Fact Book (2019) <https://www.cia.gov/library/publications/the-world-factbook/geos/za.html> and WHO 2019 <https://www.who.int/countries/zmb/en/>

Since 2000, the Zambian government has spear-headed pro-poor policies and initiatives to address central systemic issues such as inequity, lack of access to basic health care, and a high infectious disease burden particularly that of HIV, tuberculosis and malaria whilst assuring protection against financial risk (Phiri and Ataguba, 2014). Notably, government has indicated plans to implement the National Insurance Act of 2018 in 2019 (Zambia Budget Report, 2019). These efforts at driving health inclusion have however been hamstrung in the past by a range of challenges including contraction in health-sector funding, an increasing poverty gap, inequality, and poor distribution of resources in rural areas (Hellowell, 2013; Aantjes et al., 2014). Cumulatively these factors not only adversely impact the healthcare system but also reflect the extent to which they are in the first instance intrinsically attached to broader economic, social security and health policies (Fleischman and Peck, 2016). Yet despite significant improvements government funding has not reached the target threshold for health funding (fifteen percent) specified in the Abuja declaration¹⁵. Ministry of health figures show that in 2015, health spending constituted only around five percent of the total health budget. A recent study

¹⁵ Head of States from the African Union met in 2001 and pledged to allocate at least 15% of their annual budget to drive health sector service delivery and improvement (WHO, 2010).

by Chitah et al., (2018) offers vital insights into the range and scale of current and emerging systemic issues faced by the health sector.

These authors show that despite years of sustained health reform efforts, the government's vision of 'equity of access to quality health services' has not been realised, and worse still, this is unlikely to be achieved soon. These researchers conclude by advocating for 'minimal risk protection' through the adjustment of 'supply and demand' as an avenue of enhancing both equity and health care access. Such perspectives create a distinct impression that highlights 'equity of access' as the 'Achilles heel' against efforts to attain hard targets such as the health-related sustainable development goal (SDG) 3 which aims at reducing infectious diseases and non-communicable diseases by 2030.

Zambia's large geographical area must be recognised as the first impediment against equitable access to health services. The varied terrain and the relatively sparsely distributed population mean that the subsequent organisation of settlements poses significant logistical challenges from the perspectives of transportation and the referral networks linking the various healthcare centres. This means that basic health facilities may not necessarily be within easy reach for the population, particularly for rural dwellers of whom only 46 percent live within five kilometres of a health facility (Zambia Statistical Office, 2011). These access-related issues are exacerbated by the underlying issue of a fragmented health system, in which human resources skills are in short supply, funding is chronically inadequate, and infrastructure is relatively weak, factors which cumulatively generate contexts of risk and uncertainty for citizens (WHO Cooperation Strategy: Zambia, 2013).

Table 24: Types and providers of health facilities in Zambia (2015).

Health Facilities (Provider)	Total	Percentages (%) of Health Facilities
Ministry of Health (MoH)	1 590	81
Mission	116	6
Private	250	13
Grand Total	1956	100 %
Health Facilities (Type)		
Level 3 Hospitals (Tertiary/Specialist)	6	<1
Level 2 Hospitals (Provincial)	19	<1
Level 1 Hospitals (District)	84	4
Rural Health Centres	1131	58
Urban Health Centres	409	21
Health Posts	307	16
Grand Total	1956	100 %

Source: Ministry of Health Zambia (2015)

The need for PPPs in Health

As highlighted in the previous section, the public health system of Zambia, faces significant capacity and resource limitations to address health service related challenges on its own. Zambia has embraced partnerships since independence in 1964 through which private health care providers identify profitable undertakings and government provides regulation to guide their operations in the interest of the Zambian people. Through partnerships, private companies donate resources as part of their Corporate Social Responsibility. The Church in Zambia (Catholic and Protestant) provides health services on behalf of the Zambian government. In return, the government offers support to Church health hospitals and clinics.

Frequency, distribution and contextual realities of health PPPs in Zambia

Table 25 presents the examples of the PPP initiatives identified through interviews and a review of the available literature across the dimensions of; research and innovation generation, innovation and technology development, translation and commercialisation, infrastructure design and development, and health care service delivery. The PPP mode most visible and extensively reported in the literature on health systems, is on healthcare service delivery, particularly across the different components of the healthcare continuum including drug access, diagnostic access, and transportation.

Table 25: Examples of health system PPP initiatives in Zambia

Research and Innovation Generation	Translation and Commercialisation	Infrastructure Design and Development	Healthcare Service Delivery
Global Alliance for Vaccines initiative (GAVI) Partnership with Ministry of Health (Zambia has accessed GAVI funding to drive the roll out of the pneumococcal vaccine Zambia is 10 th country to introduce measles second dose vaccine Through innovative finance mechanisms access to affordable vaccines (GAVI, 2019)	Knowledge Translation Platform: Zambia Forum for Health Research (ZAMFOR) funded by Canada's International Development Resource Centre (IDRC), fully fledged NGO in 2012.	Construction of Supply chain and distribution regional hubs in Chipata, Mpika, Mansa, and Choma. Medical Stores Limited (supported by Global Fund, USAID and European Union).	Drugs access PPPs e.g. HIV/AIDS Boehringer Ingelheim Viramune donation GSK, Merck Malaria (2001 -2011) WHO/Novartis public purchase agreement HIV drugs, malaria and tuberculosis drugs access and pricing arrangements (Clinton Health Access Initiative (CHAI))
			HIV, TB, malaria, diagnostic access (CHAI) Health system
			Mission Hospitals (36) Majority are located in rural and hard to reach areas
			Social enterprises: Riders for Health (Transportation)

Source: authors from interviews and MoH, 2019

Details on selected Examples of Zambian Health PPPs

Broadly, health PPPs in Zambia have been initiated for a number of reasons, including, **complementarity** - filling critical but commercially viable gaps (e.g. Medical Diagnostic Laboratories and Air Ambulances) for those who can afford; **providing value addition services** (Specialized health

care); **Supporting health services** (E.g. commercial banks and others); or **Expanding or building facilities** e.g. Multi-nationals- eg such as Copper Mines companies.

Training and health delivery: Churches Health Association of Zambia (CHAZ)

Areas Covered by Partnership	Partners Involved	Primary Purpose of Partnership
Training, diagnostics, preventative, curative and palliative services	Private-Non-Profit Organisation (CHAZ) and Government of Zambia	Providing access to health services in the rural and hard to reach area for the people of Zambia

Source: Interviews and MoH (Zambia), 2019

The Church is the second largest provider of health services in Zambia with an estimated coverage of over 50% in rural areas and about 30% nationally. The CHAZ was formed in 1970 and is currently an interdenominational umbrella organisation of more than 150 churches from all the 10 Provinces of Zambia. It runs 36 Hospitals, including 9 Nurse Training Schools, more than 80 rural health centres and more than 30 Community Based Programmes on Health Services Coverage. Registered members of CHAZ operate on a Not-for-Profit basis and within the national health policy framework. CHAZ has held Principal Recipient (PR) Status for more than 15 years for the Global Fund Mechanism in Zambia for all the 3 disease components: HIV/AIDS (including ART), Malaria & TB, managing multi-million dollar grants in the process and complementing government’s efforts in health service delivery.

Training and R&D - Zambart

Areas Covered by Partnership	Partners Involved	Primary Purpose of Partnership
Training, research and development, diagnostics, preventative, curative and palliative services	Private-Non-Profit Organisations (Funders, WHO and CBOs), Academia - local and international (LSHTM and UNZA) and Government of Zambia	Healthcare research, managerial, scientific and technical capacity building to reduce the public health burden of HIV/AIDS and TB

Source: Interviews and Zambart.Org (2019)

Zambart is a Zambian research organisation established in 2004 from a research collaboration between the School of Medicine University of Zambia and the London School of Hygiene and Tropical Medicine (LSHTM) that spans over 20 years. From the initial studies of the impact of HIV on the clinical presentation and outcome of Tuberculosis, the scope and partnership of the research have expanded widely. Zambart actively partners with the Zambian government through direct collaboration in healthcare research, and works closely with other research organizations and academic institutions within Africa, and worldwide to help innovatively reduce the public-health burden caused by the dual epidemics in resource-limited communities in Zambia and beyond.

The prevailing view in global health frames Zambia as a preferred site for PPPs is based on its perception as a relatively stable environment for health and development efforts, despite sustained pressures from such factors as inequality, widening gap between the rural and urban population and broader national economy issues such as inconsistent exports (Fleischman and Peck (2016). The Zambian government has introduced a range of health policies that have driven improvements across

various components of health delivery, including prevention, diagnosis and treatment programmes, with successful partnerships established with international partners which include pharmaceutical giants such as Merck, organisations such as the Clinton Health Access Initiative (CHAI), and faith based organisations which have an established footprint of delivering health through hospitals and clinics over the last century.

However, the health policies and initiatives have mainly targeted high profile and diseases such as HIV/AIDS, tuberculosis and malaria on account of their high prevalence, and in alignment with donor preferences. Even then, there have also been concerted efforts at integration and harmonisation of initiatives, programmes, even though this has not been reflected in the financing practices and mechanisms. Thus, the evidence and experience of the PPP model in Zambia paints a conflicting picture that reflects some of the predominant practical challenges faced by the Zambian government in re-orienting health policies, structures and service provision towards a system that can simultaneously address infectious and non-communicable diseases (Aantjes, 2014).

PPP initiatives in Zambia over the last fifteen years have been dominated by overt government efforts to engage the private sector in addressing research and development, pharmaceuticals manufacture, procurement, distributing of medical products and health service delivery amongst other avenues of health systems strengthening. Despite the significant advances achieved in establishing partnerships with the non-profit sector, it is easily observable that such success in engagement efforts were not replicated in the private sector (Caines and Lush, 2004). Several explanations have been proffered to explain the mixed outcomes of success counterbalanced by lacklustre health system impacts attributable to PPPs. Our findings, corroborated by other researchers, identifies that regarding the impact of PPPs, the underdeveloped state of Zambia's private sector explains, at least in part, the lack of engagement by local investors, and why, furthermore initiatives rarely extend or commit beyond massively dampened versions of corporate responsibility (Fleischman and Peck, 2016).

The short-term orientation of PPPs has been criticised widely. Partnerships need long-term commitment, eg the successful cases at UNZA or NISIR. The central criticism for short-term partnerships is identified as the inadvertent weakening of institutional and local capacity, on completion of donor missions. Concerns have also been raised regarding the heavy reliance on external donors, whose motivations for participation in health initiatives do not necessarily mirror the long-term sustainability and scalability goals advanced by government (Clinton and Sridhar, 2017). A clear example of such mismatches in policy and strategies, is the preference by external organisations to focus on vertical or issue-focused approaches rather than the more holistic (system-wide) programming. Whilst the rationale underpinning these preferred approaches is understandable (i.e. vertical approaches can cut across the inertia associated with horizontal/ holistic programmes) one unintended consequence of the engagement between the public sector and its international benefactors is the 'undercurrent tensions' often ignored on account of the perceived benefits to health service delivery. For example, through vertical programmes anti-retroviral drugs for HIV have been available in Zambia since the early 2000s. Through such arrangements and due to transaction and opportunity costs, verticalised procurement and distribution systems were developed for ARV drugs such as Viramune® (designed to stem the vertical transmission of HIV). Likewise, access to Fluconazole (Diflucan®) for oesophageal candidiasis was developed under similar discount arrangements, a national programme outside of the conventional procurement and distribution system. Establishment of such mechanisms, whilst clearly beneficial in greatly enhancing access to medicines, also introduced skewed market dynamics with the potential to cause system leakages (Aantjes et al, 2014). The differential pricing between donor-procured and private sector sourced medical products creates a risk of pilferage from the PPPs. In other words, this creates and sustains two different markets, and tensions between the provision of drugs, and services with separate pricing arrangements and structures for the public and private sectors. On the whole, the Zambian case

confirms that while management of the PPPs remains a challenge, rapid technological and market developments are reconfiguring user needs and demands in ways that make it increasingly impossible for single partners to keep up, e.g. the types of service delivery facilities that new populations of patients are willing to pay for are driving actors in the health sector to privatise and modernise their facilities. There is a lot of learning from the South African health system in this regard.

5.6 Overarching narratives on relevance and salience of PPPs for health in southern Africa

As we draw towards some conclusions and recommendations from this study, we take a moment to reflect on some of the broader narratives shared by respondents which encapsulate how, as Gideon and Unterhalter (2017) argued *'PPPs will be a feature of the policy landscape around development assistance for the next 15 years'*.

'Partnerships are not much of a choice in most cases because no single actor would have the capacity or reach to cover all the areas that you mentioned ... from making products to making them available to patients with different levels of treatment needs. Partnerships are a necessity; the biggest challenge though is that often there isn't sufficient time devoted to creating and deploying the best form of partnership for a given scenario. We tend to rely on generic approaches to and models of partnership which often do not take into serious consideration the realities surrounding particular health sector challenges in our countries' (Pharmaceutical Manufacturers' representative, Aug 2019)

'We are a partnership, and our mandate includes encouraging countries to enter into partnerships that are beneficial for the health sector. The starting point should not be the partnership, but the challenge that the partnership intends to solve. There must be a compelling case that without the partnership, outcomes for the partners and those they intend to serve, would be poorer' (Regional Economic Community official, Aug, 2019)

'We intend, through partnerships, to close gaps in capacity so that we can produce sufficient and appropriate quantities of medicines in good time. It is true that sometimes we do not structure the partnerships correctly, putting too much emphasis on certain parts of the value chain, and not the rest of the value chain, which may then result in bottlenecks elsewhere. Ideal partnerships should be catalytic, i.e. leading to formation of appropriate partnerships elsewhere where needed, that way ensuring that the whole complex functions well. Policy plays a crucial role in the creation of such partnerships, as well as the collective will of actors in the sector' (Pharmaceutical company representative, July 2019)

'We are there to facilitate, and yes, as much as policy does need to be instrumental in facilitating the emergence and operations of partners, as policy makers we rely to a great extent on the good will of actors in their quest for policy-led models of operation, or for the way in which policy shapes the business environment. It is not possible to be prescriptive because at the end of the day actors, especially external actors or private actors, tend to drift towards environments where they can maximise returns on their investment. This may not always be in line with our broader socio-economic development goals, but in some cases government has to be in or approve certain partnerships with the hope of more inclusive intentions as time goes on' (Government official, Namibia, Sept, 2019)

'It is good to realise and accept that partnerships do not always work, that they fail even after starting off well, and also that their purpose will come to an end. Most of our policies seem to assume that partnerships are perpetual or that they should be forced to continue to exist, or have to be adjusted so that they continue existing, even when they no longer have an

imperative to continue to exist. We need to have the boldness to discontinue certain partnerships, across all levels from the global to the local' (Government official, Zambia, July, 2019).

'How do we make existing partnerships adaptable? We cannot be forming new partnerships for every new challenge. On the other hand, existing partnerships often accumulate a lot of baggage as they carry on, so it's about getting a good balance between adjusting the old or creating a new arrangement' (Pharma wholesaler, Botswana, July, 2019)

'Among the biggest and on-going challenges that we face is the fact that we have a wide diversity of activities that define the work we do, all broadly fitting into clinical and non-clinical work. The kinds of partnership that would work in such areas are therefore different, and even for non-clinical work, our requirements as a stakeholder are different from what other stakeholders would require. For example, when it comes to construction, renovations and the like, we would need some kind of transient partnerships because of the specialisations that our final construction products require' (Health facility respondent, Zimbabwe, Aug 2019)

'The future challenge is to remain attractive as clinical research partners to private industry and to maintain a consistent level of research quality across sites so that knowhow is both transferable, shared and sustained. In addition, new technologies are entering clinical research increasingly over the next 5-10 years so it will be important that the partnerships get involved so as not to become outdated. Examples are Big Data mining efforts that could be done by pooling study information (Clinical Trials researcher, South Africa, July, 2019).

These views lay bare the conundrum that faces the role of PPPs in serving as investment vehicles and financing mechanisms for building a competitive African health sector that is interlinked with a viable pharmaceutical industry complex. Drawing from the 6-month study which sought and analysed primary and secondary evidence from five southern African countries, this paper has closed an empirical gap on health PPPs by shedding some light on the issues above and related others. The next session presents the paper's main conclusions and recommendations.

6.0 Conclusions and Recommendations

The paper has been set in the context of post-2000 period which has signified an important shift in the normative dimension of what constitutes basic health in low-and-middle-income countries, from the previous reliance on the syndromic management of disease to the current use of diagnostic and other evidence-based treatments central to the delivery of public health. In that light has emerged a greater need to understand the contextual factors vital to achieving and sustaining the delicate balance between increasing value for money and advancing public health goals in the face of an intractable set of current and emerging health system challenges (poor funding, fragmented and weak infrastructure, skills shortages), and a high burden of diseases such as HIV/AIDS, malaria, tuberculosis (TB), neglected tropical diseases (NTDs) such as trypanosomiasis and bilharzia added to which there is a growing incidence in non-communicable diseases (NCDs) such as diabetes, cardiovascular issues and cancers. Consequently, one of the most distinctive changes in the global health landscape has been the increase in the number of special organisational structures called public-private partnerships (PPPs) involving international organisations and private sector partners linked in some way with service provision, across the different components of health care; pharmaceutical production, procurement and delivery, community health, infrastructure, information technology and human resources and skills.

Despite an increase in research investigating the roles of PPPs globally and elsewhere in Africa, there is limited understanding on the distribution and make up of PPPs in Southern African countries. This paper sought empirical evidence from five countries in this region namely Botswana, Namibia, South Africa, Zambia and Zimbabwe to explore potential avenues on how health PPPs can be more broadly deployed to leverage private sector resources and expertise to drive government goals of optimising the efficiency and cost-effectiveness of the PPP model in health service delivery. Southern African countries, previously viewed as the epicentre of HIV/AIDS were viewed as an important source of insights, experiences and lessons for global health researchers and policymakers on the role of PPPs in building competitive health-industry complexes in the study countries and other LMICs.

This paper has established that while the core provision of healthcare services is primarily viewed as the responsibility of governments, policymakers increasingly recognise that in these evolving health contexts, private actors' capital and expertise are a central driver for improving both cost-efficiency and overall health system effectiveness, through enhanced access to services and the introduction of innovative technologies and service delivery modes. In the last two decades, for example, in all the study countries, the view that governments have a role in attaining and sustaining the appropriate balance between public and private sector resources both for financing and managing health services has taken centre-stage as a viable avenue for ensuring the optimal deployment of resources to advance public health goals, across the dimensions of equity, access, cost-effectiveness and quality of healthcare provision. Public private partnerships in health have thus been proffered as vital mechanisms through which governments can deploy and leverage private sector resources and expertise not only to deliver public health objectives in broad terms but to judiciously balance and maximise public and private sector strength such as accelerated decision making, strong skills base, flexible human resource practices and quick resource appropriation and also manage their functional weaknesses during the course of delivery of cost-effective, inclusive and quality health provision.

This paper has also established that across the study countries, there is no consensual definition for PPPs nor is the terminology necessarily universally applicable, as other authors have also noted. The authors were in agreement with the dominant notion underpinning PPPs which is about '*... working arrangements based on a mutual commitment (over and above that implied in any contract) between a public sector organisation with any organisation outside of the public sector (Bovard, 2004)*'. This broad conceptualisation allowed the study informing this paper to capture different configurations associated with the PPP model recognising that PPP actors cut across a range of sectors and roles including, pharmaceutical manufacturing, policy design, implementation, activism, procurement and supply chain and policy monitoring and evaluation.

While policymakers and governments must contend with the sheer complexity and uncertainty of the nature of global health challenges, especially under conditions of economic constraints and difficult geographies which are commonplace in the historically disadvantaged settings of the study countries, the key drivers for PPPs established by this study include, but are not limited to the following:

1. Partnerships are better placed to address market deficiencies, through risk sharing, across multiple stakeholders and projects, which is especially relevant in contexts of emerging technologies and innovations for whom the associated 'high technical risk' may outweigh the visible economic benefits
2. Partnerships also aid economies of scale, particularly of procurement, service provision but also research and development and manufacturing
3. PPPs are also viewed as 'system integrators' in which knowledge and ideas are leveraged across sectors, for instance across, industry, academia and government as seen in the examples of partnerships for in the areas of health financing, access to antiretroviral (ARV) drugs for HIV, and market access for diagnostics and treatments across the continuum of care for HIV, TB and Malaria

Exemplifying the above, this paper has presented and analysed various configurations of PPPs, including various partnerships with two or more partners drawn from non-governmental organisations (NGOs), donor agencies, industry, and other for-profit and non-profit enterprises, academia and social enterprises which link with governments to address specific maladies, intra-system issues, as a route to achieving better and a more responsive and resilient health system. This paper speaks broadly to the roles of PPPs in addressing global health inequity through market adjustment, connection of pharmaceutical suppliers with poor populations in low-middle income countries to drive overall health social inclusion, unpacking an array of context-specific social, economic, political, geographic, and epidemiological factors which cannot be successfully examined if the lens is not anchored on the sub-regional, regional and global political economies. The paper has thus expanded literature for the southern African region which hitherto disproportionately focused on public-private engagement in South Africa, with very little known about the other countries, outside of Zimbabwe and Mozambique, in which narratives on the health-industry complex from the perspectives of pharmaceutical manufacturing have only been recently captured (Mackintosh et al., 2016).

A number of specific conclusions and recommendations arise from this work pertaining to the key questions underpinning the study:

a) The extent to which PPPs are prevalent in the health industry complex, across health innovation, manufacturing, and innovative financing mechanisms including the ways in which these elements drive health social inclusion.

This paper has identified and analysed different examples on the distribution and make up of PPPs across different functional areas in the health sectors of the study countries. The case studies presented have showcased how the potential avenues for advancing government's efficiency in health spending, deploying and leveraging the private sector (profit and non-profit) resources and human resources and skills, the effectiveness of private and public sector engagements in the health-industry complex, can be maximised. We recommend continuous appraisal and documentation of the role and contributions of different actors to PPPs, for example, how, as evidenced in this paper, government can support local pharmaceutical production and hence the local health-industry complex through innovative procurement by assuring markets for products; how public funding of research in universities and state innovation institutes de-risks the early stages of innovation and technology development thereby supporting a richer translation pipeline. However, there is need to invest in capabilities and resources for coordination in order for the broad range of benefits from partnerships to be realised. This includes recognition, as exemplified in our cases, of the technological, geographical, social as well as formal but also informal nature of partnerships, all of which separately or collectively can be good for impact, sustainability, agility, appropriateness and inclusion.

b) The peculiar contextual realities of PPPs in the health industry particularly in those countries in which such factors remain markedly under-researched.

This study has established that PPPs in health are distinct from typical infrastructure projects for a few key reasons. Apart from the transient and predominantly philanthropy driven nature of PPPs in some of the study countries, this study also established cases where health PPPs do not fit into the conventional models of PPPs (e.g. BOT or BOOT), yet still being within the conventional reasons why PPPs are initiated, e.g. to fill gaps in supply. We have also seen in the cases some PPPs whose motivations go beyond this in their design and/or in their operations. What stands out for health PPPs is that primarily, private revenue contribution is usually low, and as a result, these projects require a large and ongoing payment from the government. In addition, the ongoing expenses of operating a hospital or other medical facility represent the vast majority of project costs, as opposed to a typical

infrastructure project in which capital expenditures (Capex) are the main cost element. Thus, there must be money and other resources for the project post-construction phase.

c) The set of factors limiting the effectiveness of governance, incentive and policy frameworks to make the health system more adaptable, and responsive to health systems strengthening initiatives and articulation of the role of innovative health technologies within and across this sphere

This paper established the existence of different mechanisms for governing and incentivising PPPs in the study countries. We established and recommend continuous recognition of the fact that Governments assume multiple roles as regulators, facilitators, funders of innovation and as well as investors in PPPs. These multiple roles could be leveraged for identification and deployment of much needed political champions for PPPs in the study countries. Further, we noted the catalytic role that PPPs play, and how they serve as sources of collateral capacities for new partnerships and for other sectors of the economy. Successful PPPs such as Biovac have shown ability to collaborate with both private and philanthropic actors in pursuing technology transfer and technological learning. The government as in the case of Biovac can, through departments such as DST, act as both brokers and integrators actively supporting the creation of an innovation ecosystem in the local production of pharmaceuticals. Such pervasive impact and potential should be harnessed for structuring incentive structures and governance mechanisms which are responsive and able to enhance the relevance and contributions of PPPs to health system strengthening.

d) Indicators/metrics that would lend themselves well for the effective monitoring and evaluation of health system strengthening and financing arising from PPPs.

We recommend that whilst the argument underpinning the need for metrics is self-evident, it is perhaps more prudent to ask how the technological, intellectual, industrial, and research-driven insights drawn from the PPP model can be effectively mobilised to tackle and meet current and future health demands through addressing the most pressing structural and functional limitations of health systems in these countries. In so doing, important contributions will be made towards nuanced context-specific narratives, rather than predominantly quantitative ideological argumentations critiquing the PPP model in health delivery. To operationalise the above, we recommend a Partnership Impact Index which SGCI and SADC could develop to offer annual awards for impactful partnerships in some of the pressing and persistent health challenge areas, eg. HIV/AIDS. This could also potentially include a proactive dimension identifying, nurturing and rewarding innovative partnerships that are helping countries to cope with NCDs. A related idea would be the development of partnership/partner relevance indexes which would be deployed to assess the relevance and salience of partnerships/partners.

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Annex 1

Study Questionnaire Health and Industrialisation in Southern Africa (HISA) Study

By
African Centre for Technology Studies (ACTS) and The SCINNOVENT Centre

Background

The Science Granting Councils Initiative (SGCI) is a five-year Initiative, which aims to strengthen the capacities of Science Granting Councils (SGCs) in sub-Saharan Africa in order to support research and evidence-based policies that will contribute to economic and social development. The objectives of this initiative are to strengthen the ability of Councils to (i) manage research; (ii) design and monitor research programs based on the use of robust science, technology and innovation (STI) indicators; (iii) support knowledge exchange with the private sector; and (iv) establish partnerships between Councils and other science system actors. The Initiative is jointly funded by the United Kingdom's Department for International Development (DFID), Canada's International Development Research Centre (IDRC), and South Africa's National Research Foundation (NRF).

Theme 3 of the SGCI focuses on strengthening partnerships between Africa's science granting councils and the private sector, with the ultimate objective to: (a) enhance knowledge exchange between academia and industry and (b) stimulate private sector investments into research and innovation. Theme 3 is being implemented by the ACTS Consortium comprising the African Centre for Technology Studies (ACTS), The Scinnovent Centre, the Science, Technology and Innovation Policy Research Organization (STIPRO) and the Association of African Universities (AAU). One of the crucial assignments for the Theme 3 of the SGCI is to commission three regional research studies critical to Public-Private Partnerships (PPPs) in Africa.

Commissioned studies

Among the key challenges that the SGCI sought to address is the entrenched mutual reluctance from academia and private sector actors in Sub-Saharan Africa (SSA) for research and innovation collaboration. Often times, the private sector actors complain that academic institutions are often too bureaucratic and inflexible in their operational procedures. They also contend that academic research in Africa is often too abstract or 'out of touch' and as a result, it increasingly fails to address commercial needs or local challenges. On the other hand, academics accuse the private sector of being too profit-focused; unstructured, institutionally weak and too small to engage in any meaningful R&D or innovation collaborations. This study falls under the "Public-Private Partnerships in Research and Innovation" strand of work, focuses on Health Systems in Southern Africa (with a special focus on the nexus systems strengthening/financing and pharmaceutical industrialization), with the following aims:

- ✓ identify, analyze and share the subtle lessons behind the success of some of partnerships and collaborations between academia and industry while at the same time exposing the challenges that face the partnerships,
- ✓ identify and highlight key areas of (a) mutual interests (b) disagreements/ "points of conflict" that either 'glued' together the partnerships or made them break apart,
- ✓ interrogate the institutional and governance architecture of the partnerships and how internal disputes that may have arisen were resolved,

- ✓ map out the unique policies, processes, practices that may have led to the success or failure of the partnerships,
- ✓ tease out lessons/action guides for the science granting councils on how to catalyze, manage and enhance knowledge exchange between the academia and the private sector

Purpose of this Questionnaire

This questionnaire seeks to gather key stakeholder views to identify context-specific insights to unpack how health and industrialisation in Southern Africa, in the context of public-private partnerships (PPPs) will be able to address issues of "competitiveness and social inclusion" while supporting local pharmaceutical production interlinked with a mutually-supportive health-industry complex that fosters economic and social development. The results of the study will be used to produce a commissioned paper, Policy Brief and peer reviewed policy-oriented journal articles, which will inform policy, debates and potentially lead to reviews and re-organization of the health-industry arena in African countries. As a key stakeholder in health, finance, industry and allied areas in the study countries and beyond, we seek your contribution to this endeavour through responding to this questionnaire. All responses will be anonymised in the analysis and project publications. You will however be included in the distribution lists for the study outputs towards the end of 2019.

1.0 Respondent details

- 1.1 Name (optional):.....
- 1.2 Organisation:.....
- 1.3 Position in organisation:.....
- 1.4 Years in position:.....

1.5 Stakeholder category:

- | | |
|---------------------------|--------------------------|
| Government/ Policymaker | <input type="checkbox"/> |
| R&D organisation | <input type="checkbox"/> |
| Academic institution | <input type="checkbox"/> |
| Funding organisation | <input type="checkbox"/> |
| Pharma company/supplier | <input type="checkbox"/> |
| Continental/global agency | <input type="checkbox"/> |
| Other (please specify) | <input type="checkbox"/> |

2.0 Considerations on peculiar contextual realities of PPPs in health-industry complexes

- What historical factors favour private-public partnerships in the country's economy, generally and with specific reference to health systems and pharmaceutical industries?
- What current factors/opportunities necessitate the need for PPPs in the health-industry complex?
- Are there any constraining factors/challenges currently and in the future?
- How can these be resolved?
- What lessons can be learnt from previous successes or failures of PPPs in the country?

3.0 Prevalence of PPPs in health-industry complexes and their role in inclusion

- Please give a few examples of successful PPPs in the national economy and reasons why they have been successful.
- Are there any specific examples of PPPs in health systems and the pharmaceutical industry? Give examples
- Where has the greatest impact of the PPPs been with respect to inclusive health care?
 - Affordable medicines, vaccines and diagnostic services
 - Widespread access to medicines, vaccines and diagnostic services
 - Timely access to medicines, vaccines and diagnostic services
 - Improved quality of medicines through GMPs
 - Other (specify)
- Where has the greatest impact of the PPPs in the health-industry complex?
 - Local research, innovation and skills development
 - Financing of services and activities
 - Local facility upgrading and capacity utilisation
 - Technology transfer and acquisition of intellectual property
 - Other (specify)

4.0 Evidence of qualitative and quantitative contribution of PPPs to improvement of healthcare access and functions in local health security

- Which examples or specific cases highlight the key roles played by PPPs in the health-industry complex?
- What is the source of corroborating evidence for this?
- What **qualitative factors** makes these examples important (e.g. sustainability of PPPs, number and type of partners involved, unique business models, geographical reach of products, goodwill and relevance to local context, corporate social responsibility etc)
- Please elaborate on some of the points raised
- What **quantitative factors** make these examples important (e.g. market share, range of products, number of employees etc)
- Please elaborate on some of the points raised.

5.0 Governance, regulatory, financing and policy frameworks for anticipative, adaptable and responsive operation of PPPs in health-industry complexes

- Who are the key actors in (a) regulation and (b) financing of health systems and pharmaceutical companies in the country?
- What changes have occurred in these roles in the last 10 years? Why?
- With respect to governance (including standards), financing and incentives for PPPs, how would you characterise (in your own words) the roles of national government, industry associations, WHO, NEPAD Agency, SADC and donors in these issues?
- Are the governance mechanisms in place conducive for both existing and new forms PPPs? Briefly explain why you say Yes or No
- Are the incentives in place conducive for existing and new forms PPPs? Briefly explain why you say Yes or No.

6.0 Monitoring, learning and evaluation of the role of PPPs in health-industry complexes

- Is there a mechanism for monitoring and evaluating the role of PPPs your country?

- Please briefly explain how this mechanism works, including roles, responsibilities and connections with the health-industry arena
- In your view, what are the key lessons **for** your country regarding the role of PPPs in health-industry complexes, health systems strengthening and financing?
- Related to the above, what are the key lessons **from** your country regarding the role of PPPs in health-industry complexes, health systems strengthening and financing?

7.0 Beyond PPPs, are there other forms of partnerships that are useful and effective?

- Can you suggest other forms of partnership or business models that could work for the health-industry complex?
- Would they be replacing or complementing PPPs? Reasons for your suggestion
- Thinking about Science Granting Councils and other key others in innovation systems, please suggest some actions that you think they should take to catalyze, manage and enhance knowledge exchange between academia, public and private sectors.
- Finally, what issues do you think have not being adequately attended to in the agendas on PPPs and health-industry complexes in Southern Africa?