

# Public-Private Partnership: Optimising the Outcomes for Plastic Surgery in a Resource-Limited Setting at the University of Port Harcourt, (UPTH) Rivers State, Nigeria

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## Abstract:-

### ➤ *Background:*

Public Private Partnership (PPP) refers to a form of cooperation between public authorities and the world of business which aims to ensure the funding, construction, renovation, management and maintenance of an infrastructure or the provision of better services, better quality, better and better health in a relatively cost-effective manner or approach to the society.

### ➤ *Aim and Objectives:*

This paper highlights the role of PPP in optimizing outcomes for patients who require plastic surgical services.

### ➤ *Materials and Methods:*

This study was carried out to bring to light the perennial problems of the health care mixes within a period of 6 months in the Plastics and Reconstructive Surgery unit of The University of Port Harcourt Teaching Hospital. This work looked at the Public Private sector mixes in health care system using Nigeria as a case study.

### ➤ *Results:*

Cases managed at the public facility alone, cases managed at the private facility alone and the cases managed through the combined effort of both the Private and Public sector (PPP) were analyzed.

### ➤ *Conclusion:*

Public Private Partnership is key to the success and effectiveness of healthcare delivery in a resource poor setting as the PPP drives the marriage of effectiveness in administration and business prototype in the marriage of government infrastructure and large medical market with turn over into a partnership where the private component brings in the specific funding and equipment and expertise needed to make the medical business model.

**Keywords:-** Public Private Partnership, Intramural Practice, Mutual Benefit, Port-Harcourt, Nigeria.

## I. INTRODUCTION

Public Private Partnership (PPP) refers to a form of cooperation between public authorities and the world of business which aims to ensure the funding, construction, renovation, management and maintenance of an infrastructure or the provision of better services, better quality, better value (efficiency) and better health in a relatively cost-effective manner or approach to the society<sup>1</sup>. Nigeria is the most populous African country with a life expectancy rate of 48.9 years and primary healthcare makes up 88% of health facilities in Nigeria.<sup>8</sup> The majority of these center are unable to provide surgical care due to unequal distribution of equipment, doctors, and facilities, hence creating a problem in healthcare delivery.

In the year 2015, the concept of “Global surgery” was brought into the limelight by the Lancet Commission on Global Surgery. It was identified that the field of surgery has long been a marginalized area in public health a “stepchild” of some sort.<sup>2</sup> This stemmed from the erroneous beliefs of the public health community that surgery was too complex and too expensive especially when compared to other more “cost-effective” public health interventions like vaccines and treatment of infectious diseases.<sup>2</sup> Nonetheless, as epidemiological trends have begun to shift, and the burden of non-communicable diseases increase at an alarming rate, especially in low and middle-income countries, the call to integrate quality surgical and anesthesia care in the achievement of universal health coverage could not have come at a much better time than now.<sup>2,3</sup> Failure to do this will not only result in preventable death and disability for millions but has also been estimated to decrease the Gross Domestic Product of low and middle income by as much as 2% by 2030 – an unfavorable outcome for already struggling economies.<sup>2</sup>

In line with the definition of the commission, Alkire et al. examined the global access to surgical care in a country based on 4 criteria – Timeliness, Surgical capacity, safety, and affordability.<sup>4</sup> This breakdown of access to surgical care has been suggested as a guide for future studies.<sup>5</sup> They estimated that about 4.8 billion people (68% of the world's population) lacked access to quality surgical care.<sup>4</sup> This proportion was much higher when countries were categorized and examined according to income.<sup>3</sup> 99.5% of the population in low and middle-income countries lacked access to quality surgical care.<sup>5</sup> Nigeria, being a lower-middle-income country, is one of them. This paper highlights the role of PPP in optimizing outcomes for patients who require plastic surgical services. Specifically, the paper, through case presentations examines the challenges faced in plastic surgery in resource-limited centers; the benefits Public-Private Partnerships in healthcare delivery in resources-limited setting and proposes ways of optimizing this relationship.

## II. MATERIALS AND METHODS

This study was carried out to bring to light the perennial problems of the health care mixes within a period of 6 months in the Plastics and Reconstructive Surgery unit of The University of Port Harcourt Teaching Hospital. This work looked at the Public Private sector mixes in health care system using Nigeria as a case study. In analyzing the changing public private sector mixes these questions were asked and efforts were made to answer them The study was carried out at the University of Port Harcourt Teaching Hospital (UPTH), Plastic and Reconstructive Surgery Centre, UPTH (Public Facility Alone) and Life Forte Renaissance Plastic Surgery Centre, GRA Port Harcourt (Private Facility alone). Case records of patients managed at the two centers over a period of 2 years. With ethical approval, data from the patients were extracted from their case records and analyzed. Interviews of patients with challenging wounds. Findings were analyzed.

### ➤ Case Summary

Cases records of patients managed at a tertiary health facility with challenges which timely support from private plastic surgery outfits led to optimal outcomes.

Dr. M.I, a morbidly obese female with deep vein thrombosis and was admitted by the Cardio -Thoracic Unit and had thrombectomy with complete wound dehiscence as a complication. After routine dressing of the wound by the Cardio -Thoracic unit and intensive care unit, the wound deteriorated in 2 weeks and was transferred to the Plastic and Reconstructive Surgical unit. Negative Pressure Wound Therapy Device and Vacutex with Silver Stream were outsourced from a Private Plastic Surgery Facility. In 2 weeks, the wound was fit for secondary closure. The patient was discharged, Hale and Hearty.

Dr. J.S fell across a gutter and sustained an Avulsion Injury to the calf after failed dressings for a week, the Plastic and Reconstructive Surgical team was invited. Silver Stream and Silver Alginate were applied and the wound was ready for Secondary Closure which was done in a fortnight. Patient was discharged home subsequently.



Fig 1 Wound Dehiscence: Post Thrombectomy Wound Breakdown. Note Sloughs.



Fig 2 Post Use of Silver Stream and Negative Pressure Dressing. Note Healthy Granulation Tissue for Which Secondary wound Closure was Indicated.

Mr. S.E was a Port Harcourt Electricity Distribution Company (PHEDC) staff, who had high tension electrical injury and subsequently Burn wound necrosis to the right upper limb, perineum, groin and phallus. Due to unavailability of funds, the client signed against Medical Advice and presented to a Private Plastic facility in the town. Patient had live maggots crawling and was septic. Meronem was commenced and resuscitation was done, primary wound care was also done (First look Surgery). The patient also had a Second look surgery for Amputation of Necrotic Right Upper Limb, Phallus, and Lower Anterior Abdominal wall. Third look surgery was subsequently done to Refashion Stump of the right arm, Stump of Phallus and Split Thickness Skin Grafting and Double Opposing Z-Plasties at both groin flexures with the lower limbs. patient was discharged subsequently home.

### III. DISCUSSION

The collaboration between the Public and Private sector are growing by the day. Some twenty years ago, there was no form of private partnership with the government but the last ten years has witnessed a progressive growth in this partnership. A good example of this partnership is the intercontinental diagnostic center that ran equipment provision and funding for the Department of Radiology in the University of Port Harcourt Teaching Hospital from 2017 to 2023. Also, the Laboratory of LUTH is also operating on the Public Private Partnership (PPP) and its quite efficient and affordable. From our study it was revealed that a morbidly obese female with deep vein thrombosis and was admitted by the Cardio -Thoracic Unit and had thrombectomy with complete wound dehiscence as a complication. After routine dressing of the wound by the Cardio -Thoracic unit and intensive care unit, the wound deteriorated in 2 weeks and was transferred to the Plastic and Reconstructive Surgical unit, comparable result was also uncovered in a recent case control study of 265 participants which demonstrated that patients with overweight or obesity had a 3- to 5-fold greater chance of having VTE.<sup>11</sup> This could be explained by the prothrombotic state that comes with being overweight, which changes the coagulation profile and reduces fibrinolytic activity.<sup>12, 13, 14, 15</sup> In the same study, 98 (30%) and 71 (22%) patients had morbid obesity with grades II and III; obese III had the lowest death rate (6%), followed by obese II (12%). As a significant component of metabolic syndrome, obesity may also be associated with decreased levels of protein C and increased plasma levels of fibrinogen and Plasminogen Activator Inhibitor-1 (PAI-1).<sup>16,17,18</sup> Additionally, morbidly obese patients' prothrombotic characteristics include together with insulin-resistant state, which has been demonstrated to improve following medical and surgical therapy for obesity, antithrombin III deficiency might also exist.<sup>15</sup>

With the development of a Public Private Partnership, most daunting challenges faced by the public health sector in delivering health care services will be efficiently over hauled. Prior the introduction of PPP as the resolution model to ensuring effectiveness in the Nigerian public health delivery system, the public health sector was faced with challenges such as bureaucratic bottlenecks that hinders effective health administration, issue of funding, most especially health care budgets and projects that ensures the easy accessibility to timely and effective health services, challenges surrounding the Adequacy and maintenance of equipment that are modern and at per global standards and issues of human resource management within the public health sector. The partnership allows both sectors to draw from their strengths and augment their area of weaknesses. This promotes the effectiveness and efficiency of healthcare delivery. With evidence, centers that previously experienced limitations in resources, witnessed an improvement in the health care delivery services a result of the PPP. The area of improvement experienced by these public health centers are determined by the model or description of their partnership. The partnership improved drastically the level and rate of revenue generation in the public health sector and as well

the private sector. The limiting challenges to efficient monetary returns faced by the public health facilities will be resolved due to the effect of the private sector interventions.

In our study a patient fell across a gutter and sustained an Avulsion injury to the calf after failed dressings a week, Plastic and Reconstructive Surgical team was invited. Silver Stream and Silver Alginate were applied and the wound was ready for Secondary Closure which was done in a fortnight, the patient was discharged, Hale and Hearty. Similar research was conducted by Suliman and colleagues<sup>19</sup>, who found that avulsion injuries to the dorsum of the foot and ankle, particularly in young patients, offer challenging reconstructive issues. Typically, flaps are needed to cover exposed bones, joints, tendons, or ligaments. In the first session, debridement and flap delaying utilizing the bipediced flap elevation technique were performed. While the flaps were waiting, the raw parts were dressed. In the second session, the delayed flaps were raised to conceal any exposed ligaments, joints, or bone. Skin grafts with split thickness were applied to both the granulating raw areas and the donor site. Free, regional, and local flaps are among the flaps utilized in reconstruction. whole take and entire survival of the flaps of the skin grafts with negligible morbidity at the donor location.

There are several potential benefits of Public Private Partnerships (PPPs). One of the key benefits is that they can help to leverage the expertise and resources of both the public and private sectors, resulting in more effective and efficient delivery of services. Additionally, PPPs can help to spread the risk of projects, as well as to provide access to private sector financing. They can also promote innovation, as the private sector can bring new ideas and approaches to the table. Finally, PPPs can; help to improve accountability and transparency, as both partners are accountable to the public for the success of the project, skills transfer/capacity-patients and resources for training the health workforce, help in reduction of cost of care/services, improved access to qualitycare/services, infrastructural development/equipment.

In this present study a patient had high tension electrical injury and subsequently Burnt Wound Necrosis to the right upper limb, perineum, groin and phallus. Due to unavailability of funds, the client signed against Medical Advice and presented to a Private Plastic facility in the town. Patient had life maggots crawling and was septic. Meronem was commenced and resuscitation was done, primary wound care was also done (First look Surgery). The patient also had a Second look surgery for Amputation of Necrotic Right Upper Limb, Phallus, and Lower Anterior Abdominal wall. Third look surgery was subsequently done to Refashion Stump of the right arm, Stump of Phallus and Split Thickness Skin Grafting and Double Opposing Z-Plasties at both groin flexures with the lower limbs. patient was discharged subsequently home.



Fig 3 High Tension Electrical Burns Injury to Phallus, Groin, Upper Tigh, Lower Abdomen and Right Upper limb.

A similar investigation was conducted by Huei and Colleagues<sup>20</sup> on a 28-year-old man who was burned by electrical current while attempting to use a metal pole to chase a bird that had fallen on a high-voltage cable (11,000 V). He was wearing rubber slippers at the time of the event, and he got to the emergency room one hour after he was hurt. Upon initial inspection, he was found to have many full thickness burn wounds throughout his scalp, left upper back, bilateral forearms, palms, and both lower limbs, accounting for roughly 25% of his total burned surface area. Active mobility was restricted, touch and pressure sensations were diminished, and the capillary refilling time at the fingertips was normal. Upon presentation, his 300 cc dark crimson urine showed signs of myoglobinuria. A liquid paraffin-based bandage was used for early wound treatment. The findings of the blood test showed acute renal injury (134.6  $\mu\text{mol/L}$ ) and severe rhabdomyolysis (creatinine kinase level = 42670 U/L). Heart damage were ruled out when an ECG revealed sinus tachycardia and troponin "I" was normal. Within two hours following the damage, an emergency fasciotomy was done on both the hands and the forearms. Due to rhabdomyolysis, he finished the 24-hour Parkland regimen and was kept on forced alkaline diuresis for three days. More than 1cc/kg/hour of urine was produced, and 12 hours after the injury, his urine was clear. Five days later, his creatine kinase (CK) level dropped from 42670 U/L to 4638 U/L. From day three of his treatment, he had several debridements every three to four days. A mobility assessment indicated that he had severe impairments to his right hand and wrist, with just 10 degrees of active left-hand extension at the metacarpopharyngeal and wrist joints. The elbow motions were typical. Three to five days following an electrical injury is the best window of time, according to Mann<sup>21</sup> et al., to assess the severity of muscle damage.

There are also a number of limitations and challenges associated with PPPs. One of the main concerns is the potential for conflicts of interest, as private sector partners may prioritize their own interests over the public interest. Additionally, PPPs can be complex and time-consuming to set up, and there is a risk that they may not deliver the expected results. Finally, there is a risk that the public sector may lose control over the project, as the private sector partner may have more influence over decision-making. To address these challenges, it is important to have strong governance structures in place, as well as clear performance indices as guidelines. It is an acknowledged fact that the public health sector is not at its best and this issue aside energy problem and other related developmental issues needs to be fixed as quickly as possible. This ranges from the siting of healthcare centers far from residential areas making accessibility to health Care difficult most especially at odd hours and power supply is erratic and undependable and also due to high cost of running other alternatives to electricity supply (cost of diesel).

With an estimated Nigerian population of 2 million, healthcare becomes a big burden for the government to handle alone. At the end of the 2nd world war, Canada and several other countries introduced measures to build health care systems that will the public's health challenging needs and demands. During this time, healthcare because universally accessible and healthcare spending Accounted for an increasingly large proportion of the gross domestic product. As a result, the range of publicly health fund services increased, hospital infrastructure improved and the use of new medical technologies significantly increased the number of diseases that can be successfully treated. Changes were introduced to curtail cost and enable healthcare resources to be used more efficiently, in general, these changes have meant reduced public courage, decreased publicly funded health services an increased out of pocket payment. Although the rate of growth in the private sector was decreased in the 1980's and the 1990's, it began to exceed public sector spending in, many countries including Nigeria. There is now greater involvement in the private sector in healthcare increasingly, the public and private sectors are working conjointly to fund and deliver health care services.

The Nigerian government through the ministry of health has been on its toes to bring relief to the overwhelming burden of healthcare services in the public health care sector by varying forms of collaboration with the private sector. In many developing countries such as Nigeria, the health sector suffers from the lack of financing and human resources. There is a constraint on health sector resources; yet the demand or health services is increasing at an alarming rate. The World Health Assembly (WHA) passed a resolution in their 63rd meeting of strengthening the capacity of government to constrictively engage private sector in providing essential healthcare services. The private provision of healthcare services will lead to provision of better health services, financing health goals and ultimately improving a Nations health status if optimized. This therefore, highlights the potential for the Nigerian

government to scale up healthcare financing by leveraging private resources, innovations and expertise while working to achieve universal health covers.

#### IV. CONCLUSION

Public Private Partnership {Intramural Practice} is key to the success and effectiveness of in Healthcare Delivery in a resource poor setting as the PPP drives the marriage of effectiveness in administration and business prototype in the marriage of Government Infrastructure and large medical market with turn over into a partnership where the private component brings in the specific funding and equipment and expertise needed to make the medical business model a profit venture to run a self-providing the resources to reinvest and bring in the finance as profit needed to drive medical practice into a Business Model -bringing success and quality and prompt healthcare delivery into a resource poor setting.

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