

PROJECTED BENEFITS OF THE WIC-PROPOSED REGIONAL MEDICAL CENTER OF EXCELLENCE

EXECUTIVE SUMMARY

Introduction

When commissioned, the RMCE will be an integrated six-component medical center with a broad ranging mission in the provision of health care, training, research and community outreach. It is designed to be recognized nationally and internationally and through a strategic focus on renal health and transplantation, diabetes, neuroscience, child and maternal health and existing strengths in fields such as cardiovascular disease, cancer, pediatric medicine, trauma and infectious disease, RMCE will be a veritable tool for economic and social change in Igbo land starting from its location in Ogbaku.

For the purposes of this projection, the RMCE consists of six institutes which will either be located in the same geographical area or distributed according to exigency:

- 1 **Cancer Institute:** Multidisciplinary management of all forms of cancer by different experts in Medical Oncology, Radiation Oncology and Surgery.
- 2 **Heart and Vascular Institute:** Multidisciplinary management of diseases involving the heart and vascular systems by noninvasive Cardiologists, Interventional Cardiologists, Cardiac and Vascular surgeons
- 3 **Neurologic & Neurosurgical Institute:** Multidisciplinary management of diseases of the central and peripheral nervous systems by experts in Neurology, Neurologic surgery and Physical Rehabilitation Medicine
- 4 **Women and Children Institute:** Multidisciplinary management of diseases of women and children by the different subspecialties of Obstetrics & Gynecology and Pediatrics
- 5 **Renal and Transplantation Institute:** Multidisciplinary management of diseases of the kidney including dialysis and transplantation by experts in Nephrology and Transplantation
- 6 **Spine, Orthopedics and Trauma Institute:** Multidisciplinary management of different orthopedic injuries including spine by Orthopedic and Neurologic Surgeons and Physical Rehabilitation Medicine experts

SYNOPSIS OF IMPACTS

RMCE will offer a combined employment of tens of thousands of personnel and combined annual revenues in excess of 1,000% of current revenue of Ogbaku and its environs. RMCE will be a significant economic engine within the States of Southeastern and South-South Nigeria. This projection quantifies the economic impact to be generated by the expenditures of RMCE in Igbo land which will be its immediate catchment area. When fully functional, its reputation will draw in the rest of Nigeria and Sub-Saharan Africa as well as major centers of Excellence in the US and the rest of the developed world consequently reversing medical tourism. This projection goes beyond an articulation of the economic importance of the RMCE to examine the many functional impacts to be generated in the service area and affiliated institution activities in research, training, outreach and patient care. The detailed RMCE economic impact and benefits to be generated in the geographical area of its location and operations is being conducted using the standard regional economics modeling method of input/output analysis to quantify the direct and indirect (multiplier) impacts of RMCE on Ogbaku, Imo State, Southeastern Nigeria and the rest of Nigeria. Furthermore, the projection is being made using a range of methodological techniques to assess the broader impacts in the region to be generated by the medical, educational, and research services to be provided by RMCE, also known as “functional impacts” or “forward linkage impacts”. RMCE expenditure impacts (backward linkage impacts) is being quantified using IMPLAN input/output models for the states covered starting from Ogbaku. IMPLAN is one of the most widely used and respected economic impact modeling systems worldwide.

RMCE Expenditure Impacts

RMCE Economic Impacts

The impacts of the RMCE on the economy of Ogbaku, Imo State, Southeastern and South-South Nigeria, the rest of Nigeria and sub-Saharan Africa will consist of billions of Naira in direct impact and billions in indirect and induced impacts (an output multiplier of 2.0). RMCE will generate tens of thousands direct jobs in the catchment area and double that in additional indirect and induced - multiplier effect jobs). Together, this RMCE-related workforce will receive wages and benefits expendable in the places they live and work. RMCE operations, the indirect impacts of in-area suppliers, and the induced impact of RMCE staff and supplier personal spending combine to generate overwhelming billions in state and local tax revenue as well as in federal tax revenues.

Analysis of RMCE Construction Impact

To take off, RMCE will undertake multiple large-scale construction projects to house the six institutes, staff housing, schools (Pharmacy, Dentistry, Nursing etc.) and ancillary facilities: Indeed, the development of the entire physical infrastructure. The total amount to be invested in these construction activities by RMCE will be a major seed for dramatic economic growth in the area, with emergence of new business in building, construction and supplies. This even trickles down to a multitude of petty of traders as components of the multiplier effect.

Structure of Economic Impact

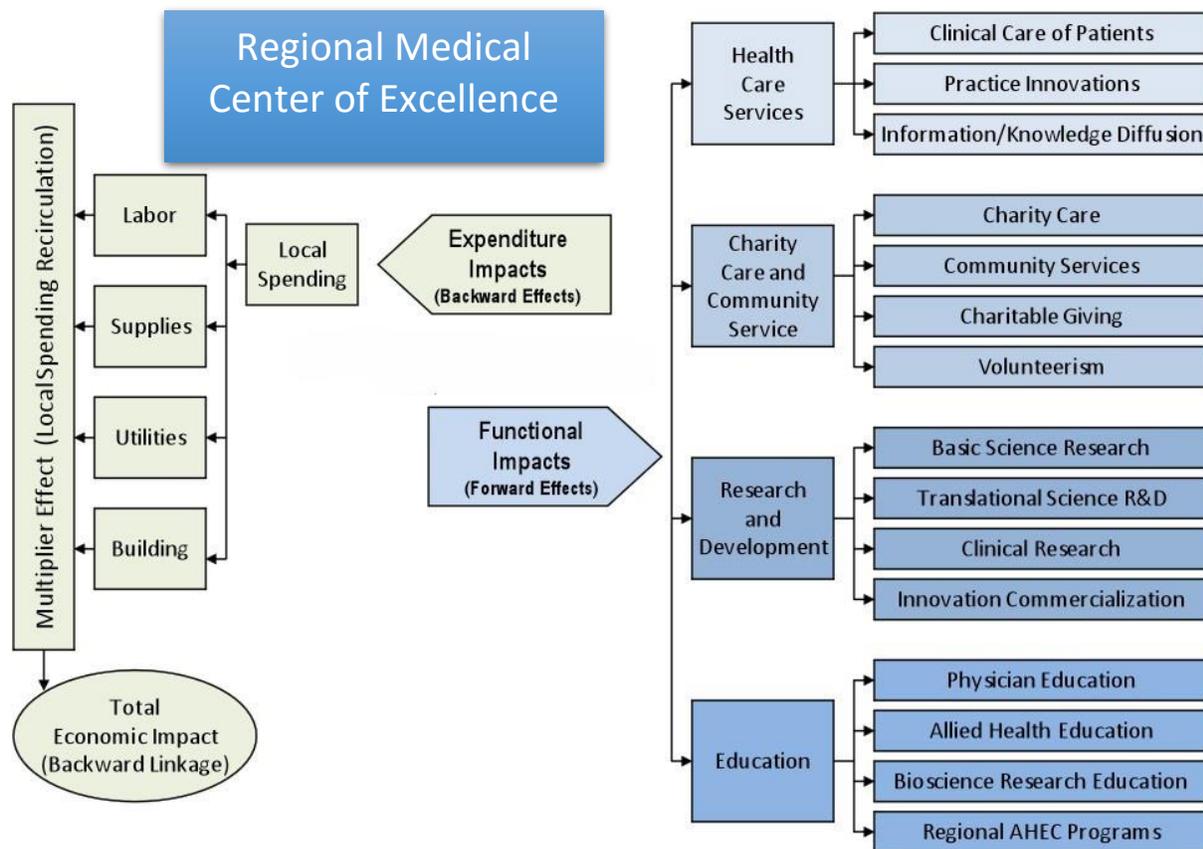
The presence and operations of RMCE will generate a broad range of positive impacts for Ogbaku, Igbo land and the entire sub Saharan Africa. Economists and economic impact analysts will generally classify these impacts into two macro categories termed “backward linkage” and “forward linkage” impacts. See Figure 1.

Backward linkage impacts are those generated in an economy by the spending of an institution such as the RMCE and its affiliated populations (physicians, allied health professionals, staff, students, visitors, etc.). With annual total revenues currently being studied, RMCE operations will have a significant stimulus effect on the economies in which the Medical Center’s facilities and operations are located. Funds spent directly by RMCE and its related populations in the state and regional economies recirculate within these economies and generate further economic benefits through multiplier effects (Petty trading, transportation, primary schools, communal activities etc.). Also incorporated within backward linkage impacts are the revenues for government entities generated via taxes and other revenues associated with the presence and operations of RMCE and its related populations.

Forward linkage impacts, also known as functional impacts, are the critically important impacts to be generated by the mission and services of RMCE. These then are positive impacts generated through the RMCE’s provision of health care services, health and biomedical sciences research, and higher training —missions at the core of RMCE’s *raison d’être*. As will be shown in this projection, the forward linkage functional impacts of RMCE are many and widespread—having substantial impacts on Ogbaku, Imo State, the whole of Igbo land, Nigeria, sub-Saharan Africa and beyond.

Figure 1 highlights the primary components of the RMCE backward and forward linkage impacts.

Figure 1: Characterization of RMCE Economic and Social Impacts



Backward Linkage Economic Impacts

Within the catchment area, RMCE will be a major economic engine. Businesses and individuals within the area and regional economies in the service, retail, wholesale, manufacturing and other sectors will benefit from RMCE’s direct expenditures and the spending of its staff, trainees, patients and visitors. In addition, many of these expenditures are recirculated within the economy, as recipients of the first round of income re-spend a portion of this income with other businesses and individuals within the regional economy. This re-spending is termed the multiplier effect and incorporates both indirect and induced economic impacts.

The standard analytical technique for the quantification of backward linkage economic impacts is input/output analysis (I/O analysis). I/O analysis, the technique being employed for impact measurement in this projection, uses a matrix representation of an economy that quantifies the impact of spending by one sector of the economy (e.g., health care) on all other sectors, consumers, and government. We are using the MIG Inc.’s IMPLAN software and data systems for application of I/O analysis. The I/O methodology allows us to calculate the backward linkage impacts of RMCE across multiple measures, including the following:

- **Economic Output**, also known as business volume, is the total value of goods and services produced in an economy and represent the typical measure expressed as “economic impact” in a standard economic impact study.
- **Labor Income** is the total amount of income received by labor in the economy because of the presence and operations of RMCE, both directly via the Medical Center’s payroll and induced through the multiplier effect within the economy.
- **Employment** includes both direct employment at RMCE and the jobs within the economy supported by RMCE-related business volume (indirect and induced).

Forward Linkage Economic Impacts

The forward linkage, or functional, impacts of RMCE are many and varied. First and foremost, RMCE will generate health care and public health benefits for residents and visitors it serves through the provision of high quality diagnostics and advanced clinical care. The population in the region benefits from having access to the specialized knowledge, infrastructure and care provided by a modern world-class medical center.

RMCE will also be making important contributions to biomedical and health science research and will be active in research ranging from basic biological sciences to advanced translational and clinical research (the “bench to bedside” continuum). Biomedical R&D discoveries lead to new diagnostics, biomedical devices, therapeutics, and treatments, and provide the innovations that form the foundation for the commercialization of advanced technology.

R&D at RMCE will serve to expand the knowledge base in health and life sciences via the publishing of scientific discoveries, and by innovations that create unique intellectual property (IP) available for commercialization by existing industry and new start-up business enterprises.

RMCE will also be one of Nigeria’s leading providers of advanced biomedical and health science training. Plus, the institution will support post-graduate medical education of physicians and other life scientists through residencies and fellowships.

ECONOMIC IMPACT OF RMCE EXPENDITURES (BACKWARD LINKAGE IMPACTS)

Measuring the economic impact (backward linkage impacts) of the RMCE operations requires a detailed understanding of the operational context of its system of activities. In developing a truly reflective model of the economic impact of a RMCE and system the overall structure of the institution needs to be accounted for as these institutions operate differently than a traditional local hospital. The model must consider not only the “hospital” and “doctor” context, but also the significant levels of research activity and training activity that occur within these institutions. This functional modeling approach, while more robust, also provides additional challenges to estimating its overall economic impact.

Methodology and Modeling Inputs

The study model has already been stated. The impact analysis of the operation of RMCE quantifies the interrelationships between economic sectors in the areas analyzed. I/O data show the flow of commodities to industries from producers and institutional consumers for any given state, region or LGA. The data also show consumption activities by workers, owners of capital, and imports from outside the state or region. These trade-flows, built into the model, permit estimating the impacts of one sector on all other sectors with which it interacts. These impacts consist of three types:

Direct Impacts are, in this case, the specific impact of the health care, training, research and other related revenues of RMCE;

Indirect Impacts are the impact of purchases from local in-State, in-region and in-L suppliers related to the operation of RMCE; and

Induced Impacts are the additional economic impact of the spending of RMCE and all impacted local employees in the overall economy that can be attributed to the direct RMCE expenditures and activities.

In other words, I/O analysis models the flow of funds that originate from the direct expenditures associated with the operations of WFBMC and the ongoing ripple (multiplier) effect of these expenditures. I/O analysis represents the “gold standard” for measurement of economic impacts and is the generally accepted methodology for measuring the economic impact associated with projects, companies or of entire industries.

FUNCTIONAL IMPACTS OF RMCE

Obviously the primary purpose of RMCE will not be to generate impacts simply by spending money within the Ogbaku, Imo State and regional economies. Rather, the RMCE will exist as a discovery engine and destination institution committed to providing functional impacts—world class health care, health sciences and allied health training, biomedical

and health sciences research, intellectual property and commercialization, business start-ups, industry partnerships, and charity and community service benefits. It is these functional impacts that will make RMCE a signature institution for Igbo land.

Regional Medical Centers of Excellence are unique institutions, serving not only as providers of primary care and routine patient services, but also as centers for innovative and technically sophisticated medical and health care services and discoveries. Such centers lie at the heart of biomedical and health sciences research and associated innovations and advancements, and operate translational programs to move discoveries and innovations from “the bench to the bedside”—advancing the state of care and the practice of modern medicine. They also demonstrate a disproportionately high commitment to the provision of care for underserved and unserved populations. Furthermore, these institutions are differentiated by their commitment to medical, biological sciences and allied health sciences education and continuing education programs—assuring that states and regions have the skilled professionals required to meet their health care needs.

RMCE will provide all of these specialized medical center of excellence benefits listed under Executive Summary. RMCE’s research will be facilitated by the Medical Center making substantial investment in resources and sophisticated scientific instrumentation and infrastructure. In support of basic, translational, and clinical research, RMCE will aim to operate specialized research facilities.

Research Commercialization and Technology-Based Economic Development

Entrepreneurial Business Development, Innovation and Intellectual Property Generation

Medical Centers of Excellence like RMCE are innovation hubs—working to identify solutions to health needs and challenges. This work can often result in new technologies and innovations that are commercializable. This will certainly be the case with RMCE, where biomedical R&D will be leveraged for business and economic development in the area. (See the complete projection for details)

Medical Science Training and Workforce Development

In a modern, knowledge-driven economy the most valuable asset a state can possess is a well-trained and skilled populace and workforce. One of the acknowledged keys to success for a state or region in modern technology-based economic development is the presence of higher institutions focused on advanced training in focused disciplines of relevance to the needs of local and statewide economic clusters (and one of the central clusters of importance to Igbo economy is health and life sciences). Training and skills drive productivity and efficiency—it also has a positive return on investment for individuals and society, thereby adding additional economic benefits.

The importance of a well-trained, skillful, and creative workforce is hard to overstate. Economists note that “the most important elements in the quest for a competitive advantage in commerce, be it at the micro, or firm, level or at the macro, or national, level, are the skills and initiative of its workforce.” In a global economic climate, where natural resources, machines, and technology are made highly mobile, and thus relatively less important, the importance of workforce education has significantly expanded. Skilled people become the only sustainable source of competitive advantage.”

Health care, life-sciences and biomedical innovation are key components of successful state economies, and medical centers of excellence play the central role in training the scientists, physicians, researchers and health professionals and technologists who drive this economic engine. Within Igbo land, health sciences, biotechnology and life sciences will represent a key cluster for focused economic development and thus RMCE represents key training and workforce development drivers for a primary economic cluster in the in Igbo state with Ogbaku as the nucleus. The six institutes of RMCE will be home to thousands of faculty (medical faculty and basic science faculty) and will provide training of medical students and graduate students in biomedical and health sciences, together with additional programs of specialized study.

The above represent only part of the multi-faceted training commitment of RMCE.

The Economic and Social Returns to RMCE Higher Training

By gaining a medical training (especially in technical and scientific disciplines such as the health sciences), an individual's knowledge and skills are enhanced, and when applied in the workplace this training enables higher levels of productivity to be achieved (in addition to other key benefits such as high levels of creativity/innovation). The increasing economic returns allocable to enhanced training may be assessed from two perspectives: (1) the private return to educational attainment received by individuals, and (2) the economic returns to society from increased education in the populace (primarily achieved through economic returns allocable to human capital productivity increases associated with education and training).

Societal Returns to Advanced Training

Economic research shows that there are societal economic gains realized through higher levels of populace training attainment, and that these gains occur through increased economic productivity allocable to knowledge and skills enhancement acquired via training.

RCME IMPACT PROSPECTS AND FUTURE DEVELOPMENTS CATCHMENT AREA

The rapid pace of advancements in medical knowledge and technologies will have profound effects on each RMCE mission areas. It is beyond the scope of this projection to investigate all the ways in which the RMCE institutes along with their biomedical science, training, and clinical practice will change and evolve into the future. It is, however, reasonable to consider the potential effect on RMCE's economic and societal impacts likely to be generated for Igbo States and Ogbaku people and its communities given expected trends at RMCE and in the health and life sciences business environment. RMCE will transform Ogbaku and the immediate environments into a top highly trained environment capable of generating high level incomes. A substantial and negotiable proportion of the work force for RMCE will be sourced from Ogbaku and its environs thereby creating a new cadre of people with enhanced and decent earning power

In Conclusion

RMCE will represent an exceptional asset for Ogbaku and Igbo States. The expenditure impacts to be generated by RMCE activities and operations will be significant, generating tens of thousands of jobs in the catchment area and over 1000 folds in economic impact (output) within the area. Igbo States will benefit not only from widespread RMCE system expenditure impacts, but also from a broad variety of functional impacts generated through RMCE health care, research, education, discovery, commercialization and community outreach missions. By independent measures, RMCE will be a high quality provider of world class and high-value clinical health care services. Furthermore, independently produced metrics will show RMCE to be a highly productive and influential Medical Center of Excellence—responsible for high level impact in science and health care research and the generation of a substantial volume of commercializable technology. RMCE will also empower the next generation of physicians, research scientists, clinicians, businesses and health care personnel through a major commitment to higher training. Among Medical Centers of Excellence of the world, RMCE will be well positioned for provide leadership in health care delivery and technology-driven 21st century economy. Ogbaku, Imo State, Igbo States, Nigeria and sub-Saharan Africa are likely to see significant further impacts and benefits from RMCE in the future.