Tuberculosis in Nigeria: Challenges and Opportunities for Resource Allocation

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Introduction

In the modern era, Tuberculosis has largely been eradicated in advanced countries due to vaccinations, testing, and the availability of resources. However, other countries have not been able to experience the same effect, as resources are severely limited and challenge populations within these areas relative to their health and well-being. Under these conditions, it is difficult for countries to accommodate the need for resources and treatments for patients who are at risk of the disease. As a result, these countries often look to advanced nations such as the United States in order to gain their knowledge, expertise, and resources in a positive manner.

There are a number of factors that play a role in Tuberculosis cases throughout Nigeria, including poor environmental conditions, limited access to food and water in some areas, lack of access to healthcare services, and other considerations that require extensive support from other countries and agencies. Since Tuberculosis remains an important health threat for many Nigerian adults and children, a comprehensive strategy must be in place that aims to enhance the delivery of resources and care to patients at risk of developing or who already have the disease. This strategy requires the allocation of resources specifically for this process to be effective in supporting the needs of this population.

Most importantly, the financial resources and human capital available to this nation must be utilized efficiently and effectively to ensure that those with the highest level of need will obtain access to these options. The following discussion will address the public health threat of Tuberculosis in greater detail and will emphasize the importance of social factors, economic concerns, the policies and initiatives supported by the United States, resource allocation efforts, and progress made relative to the development of a strategy to reduce the risk of Tuberculosis and to improve the quality of life of this population.

Social Factors

In countries such as Nigeria, there are critical factors associated with the development of disease states across population groups, due in large part to social concerns and impoverished conditions. In order to establish an understanding of these factors, it is important to recognize environmental and health risks that impact the Nigerian people, particularly when there is limited access to the resources that are necessary to bridge these gaps effectively.  In a social context, the lack of resources contributes to a difficult social environment in many ways, particularly with the ever-increasing need to improve access to resources, and support for the children and adults who live within this nation. This also reflects the importance of understanding the social context of the country and its people in order to identify areas where improvements might be made and where resources are extremely limited.

The ability to improve access to resources to prevent Tuberculosis in Nigeria requires a continued emphasis on programs that will be established to support transportation and laboratory services to improve diagnosis and treatment (Vassall & Mustapha, 2015). In addition, an increased emphasis on infrastructure is required to strengthen the potential success of any program that has been identified (Vassall & Mustapha, 2015). It is known that "Programmatic, management and information support to all these services need to have the capacity to enable and support these investments; and ensure that funding flows and is spent in an efficient manner" (Vassall & Mustapha, 2015, p. 5). There must be a significant emphasis on supporting this population through a comprehensive strategy that will have a lasting impact on the prevention and treatment of Tuberculosis with the intent to improve quality of life and reduce mortality rates (Vassall & Mustapha, 2015). Expanding knowledge and resources will ultimately enhance these

variables and provide a higher degree of inner strength and infrastructure for the nation as a whole.

<div align="center">Economic Factors</div>

It is imperative to identify the far-reaching economic impact of Tuberculosis and to recognize the importance of the economic challenges of this issue as it affects those who are at risk of contracting the disease. This is a difficult process because there is a need to evaluate the conditions under which funding and resources are currently being allocated for Tuberculosis in Nigeria and in other African countries, given the issues that have emerged with respect to developing a framework for understanding the burden of the disease and how it impacts not only individuals, but socioeconomic groups as a whole (Zumla, George, Sharma, & Herbert, 2013). From this perspective, there must be a greater emphasis on the development of economic principles that will influence decision-making and provide support for economic allocations for treating and preventing Tuberculosis in Nigeria. As part of the United States' obligations to provide humanitarian aid and expert knowledge to other countries, an advanced economic strategy must be in place that will continue to explore the options that are available and will provide further insight regarding this process and what is expected moving forward.

The development of vaccinations that will have a significant impact on the risk of Tuberculosis in Nigeria and throughout the world is a critical step towards expanding new directives to accomplish the desired objectives in supporting improvements in this area (Kaufmann, Evans, & Hanekom, 2015). The cost of these vaccinations, however, is significant, with a cost of $2,000-$10,000 per patient in clinical trials (Kaufmann et al., 2015). As a result, it is necessary to establish a multidisciplinary effort that includes organizations from academia, industry, governments, and nonprofit organizations in order to effectively manage the burden of

vaccination research and development on a global scale (Kaufmann et al., 2015). This level of effort is likely to require a global approach to portfolio management, along with an understanding of the steps that are required to support the acceleration of clinical trials that will have a lasting impact on those in need of these treatments, using scientific knowledge and other discoveries to address these needs (Kaufmann et al., 2015).

<center>U.S. Global Policies and Initiatives</center>

The United States possesses a significant responsibility to contribute to the treatment, prevention, and hopeful eradication of Tuberculosis throughout the world. This requires their continuous input and focus so that they are prepared to effectively manage the challenges associated with the disease, the cost of providing care, and the risk of high mortality in areas where the disease is not under control. Therefore, it is necessary to recognize the value of these contributions in supporting the needs of populations who have limited resources in managing disease states.

The U.S. government established a globally funded program to facilitate control of the disease through the U.S. Agency for International Development (USAID), which continues its emphasis on creating programs and directing funding towards managing the disease more effectively (Kaiser Family Foundation, 2015). Recently, the government established its Tuberculosis strategy for 2015-2019, which supports the following objectives: "treatment of 13 million new sputum-smear positive TB cases, maintaining treatment success rates of 90% for individuals with drug-susceptible TB, diagnosing and initiating treatment of 360,000 new MDR cases of TB, providing antiretroviral therapy to 100% of the people diagnosed with HIV and active TB, and a 25% reduction in TB incidence" (Kaiser Family Foundation, 2015). The continued growth and development of programs at the government level is essential in directing

the appropriate funding and other resources, such as manpower, that will have a significant

impact on populations with the greatest level of need relative to the disease (Kaiser Family

Foundation, 2015).

USAID continues to serve as the primary funding organization for Tuberculosis efforts,

while also supporting the work of the Federal Tuberculosis Task Force, which organizes these

directives (Kaiser Family Foundation, 2015). Funding for these programs is allocated from

USAID, with $191 million allocated for FY 2016, which is a decrease from the funding provided

in prior years (Kaiser Family Foundation, 2016).  From this perspective, there is a high demand

for knowledge, expertise, and funding from the United States for programs in many different

countries, including Nigeria, due to the risks associated with the spread of Tuberculosis across

different population groups; therefore, it is necessary for organizations to be proactive in their

efforts to produce effective outcomes and support in meeting the demands of the populations

with the greatest level of need. A comprehensive strategy is necessary to support programs on a

global scale that will have a significant impact on population groups and which will develop

strategies to improve outreach, prevention, and treatment that will continue to improve for the

foreseeable future.

In addition to the United States government, several other organizations have made it

their mission to prevent the spread of Tuberculosis throughout the world. The World Health

Organization (WHO) is a global entity with a significant emphasis on infectious diseases and a

strategy that is designed to support the end of the disease (2016). The primary objective of the

WHO is as follows: "Everyone with TB should have access to the innovative tools and services

they need for rapid diagnosis, treatment and care. This is a matter of social justice, fundamental

to our goal of universal health coverage" (The World Health Organization, 2016). Therefore, the

WHO is a critical stakeholder in the continued growth and expansion of programs that are designed to have a significant impact on Tuberculosis research, management, prevention, education, and treatment efforts where the need is greatest so that persons living in these areas are not at risk of developing the disease under any conditions, regardless of need or the surrounding environment (The World Health Organization, 2016).

<div align="center">Resource Allocation</div>

From a global perspective, there is a critical need to explore the dimensions of resource allocation so that those who require these resources are prepared to improve the quality of life of populations throughout the world. It is necessary to emphasize the importance of shaping a dynamic whereby resources are provided specifically for the treatment and prevention of Tuberculosis in areas of need, while also considering how this process might influence outcomes for these populations over the long term. Strategies must be cost-effective and provide a basis for improving vaccination rates and the prevention of drug resistance in many areas (D'Ambrosio et al., 2014). At the global level, Tuberculosis preparedness requires an approach that will be comprehensive in nature and which will have the greatest impact on populations with the greatest level of need; therefore, it is important for resource allocation to be appropriate and to recognize the needs of populations in an ever-changing environmental landscape.

Resource allocation must also include the development of other programs to support the fight against Tuberculosis, including the use of genomic datasets to conduct research and develop vaccinations and other therapies with the goal of reducing the risk of disease (Lew et al., 2013). The use of genomic datasets is a significant component of modern research principles; therefore, these efforts must be examined in the context of their ability to meet the expectations of scientists in order to promote cost effectiveness and time management with respect to the use

of these datasets (Lew et al., 2013). These efforts will support the development of programs that will have a significant impact on research related to the disease moving forward.

Those at the greatest risk of developing Tuberculosis must obtain the vaccinations that are necessary to prevent the disease; however, when these vaccinations are not available, such people remain at the highest risk of and vulnerable to the disease. As a result, timely testing and diagnoses must be made by experienced healthcare providers in areas of need, including the availability of accurate testing kits and procedures for use (Frieden, Brudney, & Harries, 2014). It is likely that when diagnoses are made earlier, the response to treatment will be more effective, along with a greater opportunity to prevent the spread of the disease to other persons (Frieden et al., 2014). Furthermore, when treatments are available to patients, communication must be two-way in order to support a patient's ability to respond to treatment more effectively (Frieden et al., 2014). It is important for a comprehensive evaluation program to be in place to address any gaps within the treatment facilities that are available, while also considering how the personnel, that operate these facilities, are being educated and trained so that patients can receive optimal conditions under which to recover (Frieden et al., 2014). This process is instrumental in advancing programs in African countries, such as Nigeria, where environmental and social conditions are poor in many areas and where the risk of Tuberculosis is very high (Frieden et al., 2014).

From a global perspective, there must be a continued emphasis on allocating resources effectively and securing the funding that is required to expand efforts to develop vaccinations and new therapies that will fight the disease. This includes recognizing the risks associated with drug-resistant therapies and other limitations that researchers and medical experts have experienced in the fight against the disease. Therefore, a collaborative effort among different

organizations must be established in order to effectively manage the needs of at-risk populations, while also considering innovative practices and methods that may have an even greater impact on the disease.

Progress

It is somewhat difficult to determine what the future might hold for those who are at risk of or who have been diagnosed with Tuberculosis; therefore, continued progress must be made, one that will have a significant impact on those who are most affected by the disease in countries where there is the greatest level of need. It is believed that approximately $8 billion is necessary to provide an adequate response to Tuberculosis on an annual basis; therefore, it is necessary for organizations and governments to continue to collaborate in order to pool their resources and make a difference in the lives of those affected by the disease.

The continued emergence of drug-resistant strains of the disease is highly problematic in many areas throughout the world and requires an approach that will include the development of new therapies to combat these strains and recognize the need for "visionary political leadership" in an effort to reduce the risk of drug-resistant strains through proper funding for research and therapies to minimize these risks (Abubakar et al., 2013). This process is instrumental in supporting the efforts of scientists and medical professionals who apply their talent and expertise to minimize disease risks, with the ultimate objective to eradicate the disease in future years.

In spite of global efforts to enhance Tuberculosis prevention and treatment, the problem remains significant in Africa and continues to serve as a critical issue in Nigeria, among other nations; therefore, it is important to consider the impact of other disease states and behaviors on the risk of developing Tuberculosis (Raviglione et al., 2012). Health issues such as lung disease due to smoking, drug and alcohol abuse, and diabetes mellitus have an impact on Tuberculosis

control in many ways because these impact the vulnerabilities of some populations to contract the disease (Raviglione et al., 2012). From this perspective, it is likely that there will continue to be new challenges associated with the development of disease states and in supporting a dynamic where multidisciplinary approaches to disease management are of critical importance (Raviglione et al., 2012). This process is instrumental in shaping the response effort from the United States and other countries with the goal to reduce the number of cases of Tuberculosis moving forward (Raviglione et al., 2012). It is necessary for continued progress to be made in order to improve disease management and reduce the risk of new cases, particularly in Africa, using options such as directly observed therapy, short course (DOTS) and programs like Stop TB, both of which demonstrate the importance of evaluating the disease state and the different strains that have emerged that are resistant to traditional therapies and which impact many communities in Nigeria and beyond (Lienhardt, Glaziou, Uplekar, Lonnroth, Getahun, & Raviglione, 2012).

        Currently, it is evident that the risks of Tuberculosis in Nigeria remain significant; therefore, it is necessary to achieve the following: "global action should be based on strategies that exploit technical and operational innovations to improve TB control and promote universal health coverage and social protection mechanisms as a means to ensure access to quality care while avoiding catastrophic costs incurred by patients" (Dirlikov, Raviglione, & Scano, 2015). This perspective is critical because there must be a greater emphasis on developing programs that will have a significant impact on outcomes and on understanding how to best reduce disease risk in areas where the need is greatest, while also continuing to allocate resources effectively to optimize the progress that is made on a global scale, and particularly in the highest at-risk areas, such as Africa.

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