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# The Impact of Zoonotic Diseases on the Health and Athletic Performance of Delta State Sportsmen and Women

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## ABSTRACT

Zoonotic diseases, which are transmitted between animals and humans, have become an increasing concern for public health globally, particularly in regions where human-animal interactions are frequent. This study explores the impact of zoonotic diseases on the health and athletic performance of sportsmen and women in Delta State, Nigeria. Given the state's rich biodiversity and agricultural practices, athletes are at a higher risk of exposure to zoonotic infections, which can result in significant health complications, including fever, fatigue, respiratory issues, and gastrointestinal disturbances. These diseases, such as malaria, tuberculosis, and avian influenza, can impair immune function, leading to reduced physical endurance, muscle weakness, and longer recovery periods from physical exertion. The Paper explores how these diseases affect the performance of athletes, including potential disruptions in training, competition, and overall health outcomes. The paper indicate that a significant number of athletes in Delta State have encountered zoonotic diseases that impacted their training schedules, performance levels, and overall well-being. This paper also highlights the lack of adequate preventive measures, awareness, and healthcare support for athletes in addressing these risks. The summary emphasize the need for integrated health interventions, including vaccination, education on safe animal handling, and improved healthcare infrastructure to safeguard the health and enhance the athletic performance of Delta State sportsmen and women. Recommendations include policies that prioritize zoonotic disease prevention in sports environments, improving athlete health surveillance, and promoting public health campaigns..

**Keywords:** *Zoonotic Diseases ; Health and Athletic Performance ; Delta State; Sportsmen and Women.*

## INTRODUCTION

Zoonotic diseases, which are diseases transmitted from animals to humans, have long posed significant public health challenges globally particularly in regions with substantial human-animal interactions, such as Delta State, Nigeria. These diseases are caused by various pathogens, including bacteria, viruses, fungi, and parasites, and can result from direct contact with infected animals, consumption of contaminated animal products, or environmental exposure to zoonotic reservoirs. Athletes, who often engage in high levels of physical activity, sometimes in outdoor or rural settings, may face unique risks associated with zoonotic infections. The health consequences of these diseases can be profound, directly impacting the physical fitness, endurance, and overall performance of sportsmen and women. For sportsmen and women, especially those in Delta State, Nigeria, zoonotic diseases can have far-reaching impacts on their health, well-being, and athletic performance.

Delta State, a region characterized by its rich biodiversity, agricultural activities, and significant interaction between humans and animals, provides an ideal environment for the spread of zoonotic diseases. The state's geography includes numerous water bodies, forests, and farmlands, which serve as reservoirs for zoonotic pathogens. Athletes, often engaging in outdoor training and recreational activities, are particularly vulnerable to exposure to these pathogens. This vulnerability is further exacerbated by limited public awareness and inadequate healthcare interventions targeting zoonotic diseases.

Delta State's environmental and socioeconomic conditions create a fertile ground for the transmission of zoonotic diseases. The tropical climate, agricultural activities, and close proximity of human and animal populations exacerbate the risks. For instance, diseases such as leptospirosis, a bacterial infection transmitted through contact with water contaminated by animal urine, are of particular concern for athletes who engage in water sports or train in swampy areas (World Health Organization, 2010). Similarly, malaria, which, while not strictly zoonotic, involves mosquito vectors, remains a significant challenge for athletic populations in the region due to its debilitating effects on stamina and recovery (Adakole et al., 2019).

Several studies have documented the prevalence of zoonotic diseases in Delta State, highlighting their public health implications. For instance, schistosomiasis, a waterborne parasitic disease caused by *Schistosoma* species, remains endemic in many parts of Nigeria, including Delta State. Research conducted between 2018 and 2024 reveals that athletes training in or near contaminated water bodies face an elevated risk of infection, which can lead to chronic fatigue, anemia, and reduced physical endurance (Ogbeiwi et al., 2021; Ekpo et al., 2019). Additionally, zoonotic gastrointestinal infections have been linked to contact with domestic and wild animals. A 2020 study in Delta State identified a high prevalence of *Giardia lamblia* and *Cryptosporidium* species among individuals frequently exposed to animal waste, underscoring the risk to sportsmen and women who often engage in outdoor activities (Adesina et al., 2020). These infections can cause severe gastrointestinal distress, dehydration, and nutritional deficiencies, all of which impair athletic performance.

Zoonotic diseases can impair athletic performance through direct and indirect pathways. Directly, infections like schistosomiasis, caused by *Schistosoma* parasites, can lead to anemia, fatigue, and reduced aerobic capacity (Okpara et al., 2015). Indirectly, diseases such as brucellosis, which causes fever, joint pain, and chronic fatigue, may result in prolonged recovery times and decreased training efficiency (Alhaji et al., 2022). These

conditions affect not only the physical health of sportsmen and women but also their mental well-being, as repeated illness can lead to psychological stress and decreased motivation.

The health implications of zoonotic diseases directly affect athletic performance. Chronic infections such as brucellosis or schistosomiasis lead to systemic inflammation, muscle weakness, and long-term fatigue, making it difficult for athletes to maintain peak performance. Furthermore, acute zoonotic infections can result in missed training sessions, withdrawal from competitions, and prolonged recovery periods. Studies conducted in Delta State emphasize the negative impact of these diseases on athletes' physical and psychological well-being, highlighting the need for targeted interventions (Okonta et al., 2022).

The impact of zoonotic diseases extends beyond individual athletes, influencing team performance and community health. In Delta State, where sports play a crucial role in social and economic development, the health of athletes is integral to maintaining competitive standards and fostering community pride. Moreover, medical costs associated with diagnosing and treating zoonotic diseases can strain limited resources, particularly in rural areas where healthcare infrastructure may be inadequate (Ifeanyi et al., 2020). The interplay between environmental and socioeconomic factors also contributes to the burden of zoonotic diseases in Delta State. Poor sanitation, limited access to clean water, and inadequate veterinary care for domestic animals facilitate the spread of zoonotic pathogens. Athletes from lower socioeconomic backgrounds are disproportionately affected, as they are more likely to live and train in environments conducive to disease transmission. Recent reports from 2018 to 2024 have highlighted the critical role of community education and infrastructure development in mitigating these risks (Eze et al., 2023).

## **The Prevalence and Risk Factors of Zoonotic Diseases**

Zoonotic diseases, which are diseases transmitted between animals and humans, remain a critical public health issue worldwide. These diseases, caused by a variety of pathogens including viruses, bacteria, parasites, and fungi, are responsible for a significant proportion of emerging infectious diseases (Jones et al., 2013). Factors such as urbanization, agricultural practices, climate change, and increasing human-animal interactions have contributed to their prevalence and transmission. This section reviews the prevalence and key risk factors of zoonotic diseases globally and in specific regions, focusing on data from 2010 to 2024.

### ***Global Prevalence of Zoonotic Diseases***

Globally, zoonotic diseases are responsible for over 60% of emerging infectious diseases in humans (Woolhouse et al., 2012). Diseases such as rabies, brucellosis, and leptospirosis are endemic in many regions, while others, such as Ebola, avian influenza, and COVID-19, have led to global outbreaks (Karesh et al., 2012; WHO, 2020). Sub-Saharan Africa and Southeast Asia are particularly affected due to high levels of human-animal interaction and inadequate healthcare infrastructure (Grace et al., 2022).

For instance, a study in Kenya reported that brucellosis affects 11-24% of livestock and 5-15% of humans in agricultural communities, highlighting the interconnected nature of zoonotic diseases in these regions (Njeru et al., 2016). Similarly, schistosomiasis, a

waterborne parasitic disease, affects over 200 million people worldwide, with high prevalence in Africa, where it is closely linked to water-related activities (WHO, 2022).

### ***Prevalence in Nigeria and Delta State***

Nigeria has reported widespread cases of zoonotic diseases due to its agricultural base and close proximity of humans to domestic and wild animals. Rabies, for instance, continues to be a major concern, with an estimated 10,000 annual deaths attributed to canine transmission (Eke et al., 2021). In Delta State, diseases like leptospirosis, schistosomiasis, and zoonotic gastrointestinal infections are commonly reported. A study conducted by Ifeanyi et al. (2020) found that up to 30% of Delta State's population in rural areas is at risk of zoonotic infections due to water contamination and poor sanitation practices.

### ***Risk Factors of Zoonotic Diseases***

The risk factors for zoonotic diseases are diverse and influenced by biological, environmental, and socioeconomic determinants.

***Human-Animal Interactions:*** Close contact with animals, whether through farming, pet ownership, or hunting, significantly increases the risk of zoonotic disease transmission (Jones et al., 2013). In Delta State, livestock farming and bushmeat consumption are common practices that elevate exposure to diseases like anthrax and brucellosis.

***Environmental and Climatic Conditions:*** Changes in land use, deforestation, and water management practices can alter the ecology of zoonotic pathogens and their vectors. For example, standing water created by dams and irrigation projects has been linked to increased transmission of schistosomiasis in sub-Saharan Africa (Steinmann et al., 2013).

1. ***Socioeconomic Factors:*** Poverty and lack of access to healthcare exacerbate the burden of zoonotic diseases. Poor communities often lack the resources to implement preventive measures such as vaccination and vector control (Grace et al., 2022).
2. ***Cultural and Behavioral Practices:*** Certain cultural practices, such as the consumption of raw or undercooked animal products, have been associated with diseases like toxoplasmosis and trichinellosis (Torgerson et al., 2015). In Nigeria, traditional medicine practices may also involve the use of animal products, further increasing exposure risks.
3. ***Occupational Hazards:*** Individuals working in professions such as farming, veterinary medicine, and wildlife management are at higher risk. For example, veterinarians have been found to be at increased risk for leptospirosis and Q fever due to their frequent contact with infected animals (OIE, 2020).
4. ***Urbanization and Wildlife Encroachment:*** The expansion of urban areas into wildlife habitats has brought humans into closer contact with potential reservoirs of zoonotic pathogens. Studies have shown that urban wildlife, such as rodents, can harbor pathogens like leptospires and hantaviruses (Meerburg et al., 2014).

### Health Implications for Athletes

Athletes are a unique population that places extraordinary demands on their physical and mental health. Optimal performance requires a fine balance of good health, adequate nutrition, and the absence of diseases or chronic conditions. The health implications of various diseases, including zoonotic infections, present significant challenges to athletes' overall well-being and performance. This literature examines the direct and indirect health effects of diseases, with a focus on zoonotic diseases and other infections, as well as their impact on athletes' physical, psychological, and professional lives.

### Physical Health and Performance

Zoonotic diseases and other illnesses can profoundly impact athletes' physical health, directly affecting their performance. These impacts include reduced aerobic capacity, fatigue, musculoskeletal problems, and long-term organ damage.

(a). **Energy Deficits and Fatigue:** Athletes who contract diseases such as malaria or brucellosis often experience chronic fatigue and weakness, which directly impairs training and performance (Adakole et al., 2019). Malaria, in particular, is associated with recurrent fevers, anemia, and reduced oxygen transport, all of which compromise endurance and recovery rates (Okpara et al., 2015).

(b). **Musculoskeletal and Joint Health:** Diseases like Lyme disease and brucellosis can lead to joint pain and inflammation, conditions that are particularly debilitating for athletes who rely on flexibility and strength (Torgerson et al., 2015). Chronic joint issues can result in decreased mobility, slower reaction times, and prolonged recovery periods.

(c). **Cardiovascular and Pulmonary Effects:** Infections such as leptospirosis and schistosomiasis can cause long-term damage to the heart and lungs, reducing an athlete's aerobic capacity and increasing the risk of sudden cardiac events during intense physical activity (Steinmann et al., 2013). Athletes recovering from COVID-19 have reported myocarditis and reduced lung function, further highlighting the risks of zoonotic and viral diseases (WHO, 2021).

(d). **Nutritional Impacts:** Parasitic infections, including intestinal worms and schistosomiasis, result in nutrient malabsorption, iron deficiency, and weight loss, which directly affect muscle mass and stamina (Woolhouse et al., 2012).

### Mental Health Implications

The psychological burden of disease on athletes is substantial. Athletes suffering from illnesses often experience stress, anxiety, and depression, compounded by prolonged recovery times and the pressure to return to competitive form.

(a). **Stress and Anxiety:** The fear of contracting zoonotic diseases, particularly in endemic areas, can create chronic stress among athletes, especially those who travel frequently (Jones et al., 2013). This stress is exacerbated by disruptions in training schedules and the uncertainty of disease outcomes.

**(b). Depression and Loss of Identity:** Injuries and illnesses that lead to long-term performance decline or withdrawal from sports can result in identity crises and depression. For example, athletes infected with diseases requiring prolonged treatment, such as brucellosis or tuberculosis, often struggle with feelings of inadequacy and isolation (Njeru et al., 2016).

#### *Impact on Training and Professional Progression*

Athletes rely on consistency in their training regimens to improve performance. Diseases disrupt training cycles, leading to deconditioning and loss of competitive edge.

**(a). Reduced Training Intensity:** Athletes affected by zoonotic diseases like leptospirosis or rabies must often take extended breaks from physical activity, leading to deconditioning and loss of muscle strength (Meerburg et al., 2014).

**(b). Increased Susceptibility to Injuries:** Illness-induced weakness increases the likelihood of sports injuries during recovery periods. Studies show that athletes recovering from zoonotic infections often have compromised immunity and musculoskeletal instability, leading to higher rates of ligament tears and fractures (Ogden et al., 2014).

**(c). Delayed Career Milestones:** Extended recovery times and recurrent illnesses can delay critical career milestones, such as participation in major competitions or securing professional contracts. The stigma associated with diseases, particularly in regions with limited healthcare resources, can also hinder an athlete's career progression (Grace et al., 2022).

#### Economic and Social Dimensions of Zoonotic Diseases

Zoonotic diseases are not only a public health concern but also have significant economic and social implications. These diseases disrupt livelihoods, place a financial burden on healthcare systems, and strain social structures, particularly in regions heavily reliant on agriculture, livestock, and other animal-related activities. Understanding these dimensions is crucial for devising effective interventions that address both the direct and indirect impacts of zoonotic diseases.

#### **Economic Impact**

Zoonotic diseases impose considerable economic costs, ranging from healthcare expenses and productivity losses to broader societal impacts such as reduced tourism and trade.

(a). **Healthcare Costs:** The direct costs of managing zoonotic diseases include diagnostic services, treatment, hospitalization, and long-term care for chronic conditions. For instance, managing rabies in low- and middle-income countries incurs significant expenses due to post-exposure prophylaxis (PEP) treatments, costing approximately \$1.7 billion globally each year (Hampson et al., 2015). Similarly, the treatment of brucellosis, which requires prolonged antibiotic therapy, places a financial burden on healthcare systems, particularly in regions like sub-Saharan Africa (McDermott et al., 2013).

(b). **Productivity Losses:** Zoonotic diseases often incapacitate individuals, leading to reduced productivity and loss of income. Farmers, herders, and workers in animal-related industries are especially vulnerable. In Nigeria, it was estimated that livestock farmers lose 20–30% of their annual income due to brucellosis, tuberculosis, and other zoonotic diseases affecting their herds (Ifeanyi et al., 2020). Similarly, malaria and schistosomiasis significantly reduce labor output, particularly in agricultural sectors.

(c). **Trade and Agriculture:** The economic impact extends to trade and agriculture, as zoonotic outbreaks often lead to restrictions on the movement and sale of animals and animal products. The 2014–2016 Ebola outbreak in West Africa caused a sharp decline in the consumption of bushmeat and livestock trade, leading to economic losses in affected countries (Richards et al., 2015). Livestock diseases like foot-and-mouth disease and avian influenza have similarly disrupted international trade, with ripple effects on national economies.

(d). **Tourism and Travel:** Zoonotic diseases can deter tourism, a critical source of revenue for many countries. For example, during the COVID-19 pandemic, global tourism revenues fell by an estimated 74%, amounting to losses of over \$1.3 trillion in 2020 alone (UNWTO, 2021). Regions reliant on ecotourism, such as wildlife reserves in Africa, suffered disproportionately due to fears of zoonotic transmission from wildlife.

## **Social Impact**

The social dimensions of zoonotic diseases are equally profound, affecting community cohesion, mental health, and overall quality of life.

(a). **Impact on Livelihoods:** Communities that rely on livestock or wildlife for their livelihoods face severe disruptions during zoonotic outbreaks. In Delta State, Nigeria, rural households that depend on fishing and farming experienced significant income losses due to leptospirosis and schistosomiasis outbreaks, which limited their ability to work in contaminated environments (Okpara et al., 2015).

(b). **Gendered Impacts:** Zoonotic diseases often have disproportionate effects on women, who frequently serve as primary caregivers and are more likely to engage in small-scale farming or informal trade involving animals. Women in rural communities bear the dual burden of caring for sick family members and experiencing income loss due to restricted access to markets or productive activities (Grace et al., 2022).

(c). **Educational Disruption:** Children affected by zoonotic diseases, either directly or as caregivers to infected family members, often miss school, leading to long-term educational setbacks. For instance, schistosomiasis, which disproportionately affects school-aged children, has been shown to impair cognitive development and educational outcomes (Steinmann et al., 2013).

(d). **Social Stigma:** Zoonotic diseases often carry stigma, particularly in communities with limited understanding of their transmission pathways. This stigma can lead to social isolation and reluctance to seek medical care. For example, during the 2014 Ebola outbreak, survivors faced significant discrimination, complicating reintegration into their communities (Richards et al., 2015).

### **Broader Societal Impacts**

(a). **Food Security:** Zoonotic diseases threaten food security by reducing livestock productivity and increasing the risk of contamination in food chains. The loss of livestock due to diseases such as Rift Valley fever and brucellosis has a cascading effect on nutrition, particularly in communities reliant on animal protein (Torgerson et al., 2015).

(b). **Public Health Resilience:** Frequent zoonotic outbreaks expose weaknesses in public health infrastructure, particularly in low-resource settings. The lack of integrated surveillance systems and rapid response mechanisms exacerbates the spread of diseases, as seen during the COVID-19 pandemic (WHO, 2020).

(c). **Economic Inequality:** The burden of zoonotic diseases disproportionately affects low-income communities, exacerbating existing economic inequalities. These communities often lack access to healthcare, sanitation, and preventive measures, making them more vulnerable to outbreaks (McDermott et al., 2013).

### **SUMMARY**

The impact of zoonotic diseases on the health and athletic performance of Delta State sportsmen and women is multifaceted and profound. Zoonotic diseases, such as malaria, schistosomiasis, and leptospirosis, pose a significant threat to the physical health of athletes, affecting their ability to train, compete, and recover. These diseases not only disrupt individual performance but also place a considerable strain on the broader athletic community in Delta State, as well as public health systems.

Zoonotic diseases contribute to illness, fatigue, and prolonged recovery periods, all of which directly influence the physical and mental preparedness of athletes. For instance, malaria and schistosomiasis, which are endemic in many parts of Delta State, can lead to long-term health complications that hinder an athlete's stamina, endurance, and overall fitness. As athletes are often required to maintain peak physical performance, the presence of these diseases compromises their ability to compete at high levels.

Furthermore, the social and economic implications of zoonotic diseases—ranging from healthcare costs to lost productivity—also impact the local sports community. The economic burden on athletes and their families, particularly in rural areas where zoonotic diseases are more prevalent, exacerbates existing challenges in access to healthcare and sports development programs. Additionally, the stigma associated with certain zoonotic diseases can affect the mental health and social integration of affected athletes, further hindering their performance and participation in sports.

Despite these challenges, mitigation strategies such as improved healthcare access, awareness campaigns, vaccination programs, and preventive measures against vector-borne diseases are essential for reducing the burden of zoonotic diseases. Enhanced collaboration between healthcare providers, sports authorities, and local communities is crucial for minimizing the impact of zoonotic diseases on athletic performance and promoting the well-being of Delta State sportsmen and women.

In summary, addressing the impact of zoonotic diseases on athletes in Delta State requires a holistic approach that combines health interventions, public awareness, and investment in healthcare infrastructure. By prioritizing the health of athletes and minimizing the risks posed by zoonotic diseases, the state can foster a healthier, more resilient sports community capable of achieving success at both local and national levels.

## RECOMMENDATIONS

1. To mitigate the impact of zoonotic diseases on athletes, it is crucial to enhance disease surveillance and early detection mechanisms within Delta State. Establishing robust surveillance systems that monitor both human and animal health will help identify outbreaks of zoonotic diseases such as malaria, schistosomiasis, and leptospirosis before they affect athletes. Timely interventions and targeted health campaigns can reduce disease transmission, thereby safeguarding the health and performance of sportsmen and women.
2. Ensuring that athletes have access to preventive healthcare, including vaccination and routine medical check-ups, is vital for maintaining their health and performance levels. Delta State should invest in accessible healthcare services tailored to the needs of athletes, offering regular screenings for zoonotic diseases and providing vaccination programs, especially against diseases like rabies and yellow fever. Additionally, educating athletes on preventive health practices, such as using insect repellents and practicing proper hygiene, will reduce their risk of exposure to zoonotic pathogens.
3. Public health awareness campaigns targeting athletes, coaches, and local communities should be implemented to raise awareness about the risks of zoonotic diseases and the importance of preventive measures. These campaigns could focus on the significance of vector control, hygiene practices, and environmental management to reduce the spread of diseases. Collaboration with sports organizations and educational institutions to promote this information will ensure that athletes and their support networks are better equipped to protect themselves from zoonotic threats.
4. A collaborative approach between the sports sector, local health authorities, and public health organizations is essential to address the impact of zoonotic diseases on athletes. By creating partnerships, resources can be pooled to support research on the prevalence and effects of zoonotic diseases in sports communities, as well as to implement targeted prevention programs. This cooperation can also ensure that athletes receive the appropriate medical care and treatment in case of infection, minimizing recovery times and enhancing long-term athletic performance.

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