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A Systematic Review of Associated Risk Factors for Communicable Diseases

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ABSTRACT

Introduction

Communicable diseases have had negative impact for many years. They cause millions of deaths every year globally, they have raised billions of healthcare expenditures, and thus, they have consequently increased billions of economic losses at a global scale. This study focused greatly on the biological characteristics of communicable diseases and their increased socio-economic burden in the Sub-Saharan countries.

Methodology

The study relied on systematic review of literature, from different scholars, health bodies, and line ministries. The inclusion criteria was exclusively for literature that was generated in the period from 2010 to 2021. Any other literature not generated in the stated time frame was considered outside the scope of this study.

Results

The results of the study show that high population density, lack of primary hand hygiene facilities, climate change, and poverty headcount substantially increase communicable diseases. Further, the study revealed that communicable diseases increase countries' healthcare expenditures and decrease their economic growth which is a vital concern of the global economy as in the case of Covid-19 pandemic which brought the global economy on its knees.

Conclusion

Our study identified significant factors that contribute to communicable diseases and that these increase the financing of health care in developing countries while also reducing on economic growth. Understanding these drivers can inform programmatic interventions targeting reduction of communicable diseases.

Key words: Communicable disease, health care expenditure

INTRODUCTION

According to WHO (2016), mortality from communicable diseases is highest in the Sub-Saharan countries more than any other region on the globe. The proportion of all deaths due to infectious diseases is also highest in the Sub-Saharan, where more than 60% of all deaths are due to infectious or parasitic diseases (compared with only 5% in Europe). Another challenge is that, in the Sub-Sahara, the face of communicable diseases (infectious diseases) is changing in terms of magnitude, geographic scope, and the inability of science to

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provide all the answers, but also for other reasons. There are "new" diseases, most notably Ebola and COVID-19.

This study therefore, quenches the need to give urgent attention to confront the challenges of communicable diseases in the Sub-Sahara, drawing on a systematic comprehensive review of the related literature on communicable diseases. The following objectives guided the study: To define communicable diseases and state their biological characteristics; to determine the common risk factors associated with communicable diseases; and to ascertain the socio-economic impact of communicable diseases.

Biological characteristics of communicable diseases

Classification of Diseases

Eshuis (2012) indicates that diseases can be classified according to two major dimensions, namely the time course and cause. According to the time course, they are further classified as acute (characterized by a rapid onset and a short duration), and chronic disease (characterized by prolonged duration). Based on the cause, Eshuis, (2012) indicates that diseases can be broadly categorized as infectious, (caused by living parasitic organisms such as viruses, bacteria, parasitic worms, insects among others), or as noninfectious - which are caused by something other than a living parasitic organism (Eshuis, 2012).

Defining Communicable Diseases

Most of the common diseases in Africa are environmental diseases (infectious) due to infection by living organisms. These are called communicable diseases, because they spread from person to person, or sometimes from animals to people (WHO, 2014).

According to Weiss and McMichael (2014), communicable diseases are diseases that are as a result of the causative organism spreading from one person to another or from animals to people. Fletcher (2017) define communicable diseases as illnesses due to specific infectious agents or its toxic products, which arise through transmission of that agent, or its toxic products from an infected person, animal or inanimate reservoir to a susceptible host, either directly or indirectly, through an intermediate plant or animal host, vector or inanimate environment.

Communicable diseases are among the major causes of illnesses in the entire Africa especially the Sub-Sahara (WHO, 2016). These diseases affect people of all ages but more so children due to their exposure to environmental conditions that support the spread. Communicable diseases are preventable base on interventions placed on various levels of transmission of the disease (Weiss and McMichael, 2014).

Muhammad et al (2020) write that communicable diseases remain very important in developing countries because: Many of them are very common; some of them are serious and cause death and disability; some of them cause widespread out breaks of disease or epidemics; most of them are preventable by fairly simple means; poor socio-economic status of the individuals makes them vulnerable to a variety of diseases; low educational status and lack of access to modern health care service (Muhammad et al., 2020).

Communicable Diseases and Pathogens

As earlier pointed out, communicable diseases are as a result of the causative organism spreading from one person to another or from animals to people (Weiss and McMichael, 2014). These causative organism are collectively referred as Pathogens. Pathogens can be transmitted through different ways depending on the type. They can be spread through skin contact, bodily fluids, airborne particles, contact with feaces, and touching contaminated surfaces. Pathogens can cause a number of diseases that range in severity and how they're transmitted (Fletcher, 2017). The following are some of the different types of pathogens.

Bacteria

Bacteria are microscopic, single-celled organisms (Seladi-Schulman, 2019). They are among the earliest known life forms on earth. There are thousands of different kinds of bacteria, and they live in every

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conceivable environment all over the world. Some are airborne and others are most prevalent in water, soil, plants, animals, and even people. Bacteria constitute approximately 38% of human pathogens and 30% of the emerging pathogens in humans (WHO, 2014). Some of the examples of bacterial infections include strep throat, urinary tract infection (UTI), tuberculosis, gonorrhea, and cellulitis (Seladi-Schulman, 2019).

Viruses

Lisk et al (2018) write that viruses are made up of a piece of genetic code, such as DNA or RNA, and protected by a coating of protein. Once infected, viruses invade host cells within body. They then use the components of the host cell to replicate, producing more viruses. Viruses cause familiar infectious diseases such as the common cold, flu and warts. They also cause severe illnesses such as HIV/AIDS, Ebola, common cold, influenza and COVID-19 (Lisk et al., 2018).

Fungi

Seladi-Schulman (2019) writes that fungi are unicellular or multi-cellular eukaryotic organisms that exist in all environments worldwide. Although most fungi are harmless to humans, some of them are capable of causing diseases under specific conditions. Fungi reproduce by releasing spores that can be picked up by direct contact or even inhaled. Fungal infections are most likely to affect the skin, nails, or lungs. Fungi can also penetrate the skin, affect your organs, and cause a body-wide systemic infection (WHO, 2016). Many skin diseases, such as ringworm and athlete's foot, are caused by fungi. Fungi can infect the lungs causing serious diseases like pneumocystis Jiroveci Pneumonia (PCP) or nervous diseases like Cryptococcal Meningitis. Some examples of common fungal infections are: vaginal yeast infections, thrush, ringworm, athlete’s foot (Seladi-Schulman, 2019).

Parasites

Parasites are organisms that behave like tiny animals, living in or on a host and feeding from or at the expense of the host. According to the CDC (2015), a parasite is an organism that lives on or in a host and gets its food from or at the expense of its host. Malaria is caused by a tiny parasite that is transmitted by a mosquito bite. Other parasites may be transmitted to humans from animal feces (CDC, 2015). Seladi-Schulman (2019) argues that though parasitic infections are more common in tropical and subtropical regions, they can occur anywhere. They can be spread several ways, including through contaminated soil, water, food, and blood, as well as through sexual contact and via insect bites. Some examples of diseases caused by parasites include: giardiasis, trichomoniasis, malaria, toxoplasmosis, and intestinal worms (Seladi-Schulman, 2019).

Prions

A prion is an infectious agent composed entirely of protein material, called PrP (short for prion protein), that can fold in multiple, structurally-distinct ways, at least one of which is transmissible to other prion proteins, leading to disease that is similar to viral infection (Seladi-Schulman, 2019)

Transmission of Communicable Diseases

Eshuis (2012) suggests that defining the means of transmission of a pathogen is important in understanding its biology and in addressing the disease it causes. Infectious organisms may be transmitted either by direct or indirect contact. Direct contact occurs when an individual comes into contact with the reservoir. Indirect contact occurs when the organism is able to withstand the harsh environment outside the host for long periods of time and still remains infective when specific opportunity arises (Eshuis, 2012).

Direct Contact

The first direct contact is referred as Person to Person: It can be physical contact with an infected person, such as through Touch (Staphylococcus), or sexual intercourse (Gonorrhea, HIV), or fecal/oral transmission (Hepatitis A), or droplets (Influenza, Tuberculosis) (Eshuis, 2012).

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue V May 2025

The second direct contact is referred to as Animal to Person: It can occur via bites from infected insects or animals capable of transmitting disease (Mosquito: Malaria, Zika Virus and Yellow Fever; Flea: Plague; Tick: Lyme disease); and handling of animal waste (Toxoplasmosis) (Eshuis, 2012).

The third direct contact is referred to as Mother to Unborn Child: Infectious disease may be transmitted to the unborn child through the placenta or during passage through the vaginal canal during the birth process e.g. HIV, Hepatitis, Herpes and Cytomegalovirus (Eshuis, 2012).

Indirect Contact

According to Eshuis (2012), indirect contact denotes contact with a contaminated surface or object (Norovirus), Food (Salmonella, Escherichia. Coli), Blood (HIV, Hepatitis B) or Water (Cholera). Travel through the air can also be categorized as indirect transmission (Tuberculosis or Measles).

Signs & Symptoms

Lindahl and Grace (2015) reveal that, depending on the etiology (virus, bacteria, parasite, fungi), the systems involved (respiratory, cardiovascular, central nervous system) and stage of disease (acute, chronic), the clinical manifestations of Communicable Diseases will vary widely and may be local to the site of infection (cellulitis, abscess) or systemic (most often fever). Manifestations may also develop in multiple organ systems and severe, generalized infections may have life-threatening manifestations (sepsis, septic shock).

Common Risk Factors

There are certain factors that make a person more susceptible to catching one of the communicable diseases. The following paragraphs will discuss each of the common risk factors in developing countries like Zambia.

According to Bloom and Cadarette (2019), the spread and severity of the infectious disease is influenced by many predisposing factors. Some of these are more general and apply to many infectious agents, while others are disease specific. Some predisposing factors of contracting infectious diseases can be anatomical, genetic, general and disease-specific. Climate and weather, and other environmental factors that are affected by them, can also predispose people to infectious agents. Other factors such as overall health, age, and diet are also important considerations in the prevention of spreading infectious diseases (Bloom and Cadarette, 2019).

High exposure rates

Obviously, those individuals who are around communicable disease are more at a higher risk of contracting them. For example, health care workers, nursing home aides, and preschool teachers are more likely to contract an illness because they are exposed to illnesses more often (Fletcher, 2017). Similarly, certain communicable diseases are spread by vectors, which are living organisms that carry a disease from one organism to another. A good example of a vector is the mosquito, which is known to carry malaria; so, someone living in a place with a lot of mosquitos, like Zambia, is more at risk of contracting communicable diseases.

Modifiable Risk Factors

Modifiable risk factors refer to characteristics that individuals or societies can change to reduce the risk of infectious disease and improve health outcomes. This includes Hygiene including water and sanitation, Vaccinations, Malnutrition, Food Preparation Methods, and Overcrowding (Bloom and Cadarette, 2019).

One of the modifiable risk factors is overcrowding. High Population Density provides greater opportunity for contact between infectious diseases and susceptible people which leads to higher transmission rates. In large Concentration of Population, once an epidemic starts, it spreads faster which leads to higher transmission rates (Bloom and Cadarette, 2019). According to the WHO (2014), from a purely epidemiological perspective, the provision of sufficient residential space and avoiding overcrowding are high-impact public health interventions to reduce the rate of transmission of communicable disease in developing countries.

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue V May 2025

Malnutrition is the second cited modifiable risk factor in developing countries. Malnutrition leads to lower natural immunity, which often results in increased risk of infectious disease and increased progression of disease. Nutritional Crises can Precipitate Epidemics as lower immunity often means lower vaccine efficacy, and therefore a higher susceptibility for transmission (Lefcourt et al., 2015).

Lefcourt et al (2015) show that globally, severe malnutrition is common in parts of the developing world where there is a large increase in the risk of developing active tuberculosis and other opportunistic infections, due to its damaging effects on the immune system. Along with overcrowding, poor nutrition may contribute to the strong link observed between tuberculosis and poverty (Lefcourt et al., 2015).

Levels of Preventing Communicable Diseases

Fletcher (2017) argues that the different points in the progression of a disease at which one can intervene can be classified according to three levels of prevention: primary, secondary, and tertiary.

The objectives of primary prevention are to promote health, prevent exposure, and prevent disease. Secondary prevention comes in when the situation is a little bit late to be handled (Fletcher, 2017). Secondary prevention comes in after the biological onset of disease, but before permanent damage sets in. Fletcher (2017) argues that the objective here is to stop or slow the progression of disease so as to prevent or limit permanent damage, through the early detection and treatment of disease (e.g. breast cancer (prevention of the invasive stage of the Direct Contact

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Tertiary prevention comes in after permanent damage has set in. The objective of tertiary prevention is to limit the impact of that damage. The impact can be physical, psychological, social (social stigma or avoidance by others), and financial. Rehabilitation refers to the retraining of remaining functions for maximum effectiveness, and should be seen in a very broad sense, not simply limited to the physical aspect. Thus the provision of special disability pensions would be a form of tertiary prevention (Fletcher, 2017).

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue V May 2025

The Growing Burden of Communicable diseases in developing countries

The World Health Organization (2016) indicated that developing countries are facing the double burden of communicable diseases. Developing countries are more exposed and more vulnerable due to a multitude of factors, including geographic, demographic and socio-economic factors. Non-communicable diseases like cardio-vascular diseases, cancer, diabetes, chronic obstructive pulmonary disease and mental disorders are mostly affecting developed countries with an increasing trend. In contrast, communicable diseases such as HIV/AIDS, malaria, tuberculosis, acute respiratory infections and diarrheal disease are causing high mortality rates especially in low and middle income countries. Other diseases like the so-called neglected diseases are exclusively afflicting developing countries. Adeyi et al (2011) argue that beyond the high mortality and morbidity rates caused by communicable and/or diseases in Sub-Sahan countries, these countries suffer the burden of economic losses due to care for diseases and disabilities but also as a lack of productivity. More generally, communicable diseases are impeding human development in developing countries by their negative impact on education, income and life expectancy and other health indicators. In sub-Saharan African countries, devastating consequences are already strikingly apparent in terms of life expectancy and human development index (HDI) in general (Adeyi et al., 2011).

The economic cost of care and adequate treatment for communicable diseases like HIV/AIDS, tuberculosis and malaria is beyond the capacity of most developing countries. In the main time, diseases are causing the loss of billions of dollars in terms of non-productivity, absenteeism and skill. The global disease impact has a special feature in developing countries since most of the diseases affect either children or adults in their most productive part of life. Consequently, life expectancy, education, income and all human development components are affected by communicable diseases in developing countries. The disease burden is a major problem for health public and a real global concern for the whole economic and human development (Lefcourt et al., 2015).

CONCLUSION

In conclusion, it can be argued that healthcare concerns have now become global phenomena, where countries have to come together to combat the epidemic of communicable diseases through mutual coordination, cooperation, and technology transfers. In developing countries, the spread of communicable diseases puts a burden on healthcare infrastructure in the form of high urgency of surgical instruments, including protective masks, hand sanitizers, testing swabs, and surgical gowns. The use of chemicals, fossil fuel combustion, and carbon pressure further exert pressure on different microorganisms that spread in the air which could infect people. The marginalized population is largely affected by communicable diseases, including COVID-19, HIV, Malaria, etc., as they are directly exposed to infectious diseases due to illiteracy and poverty. Furthermore, a lack of sanitation facilities will exert a greater magnitude in terms of influencing communicable diseases, which will increase healthcare expenditures across countries. It is sensible to be vigilant and keep yourself against danger rather than be casual.

REFERENCES

1. Asiedu, E., Jin, Y., and Kanyama, I. K. (2015). The impact of Communicable Diseases on foreign direct investment: Evidence from Sub- Saharan Africa. Journal of African Trade, vol. 2(1), 1-17.
2. Bloom, D. E. and Cadarette, D. (2019). “Infectious disease threats in the twenty-first century: strengthening the global response.” Frontiers in Immunology, vol. 10(549).
3. Constenla, D., Garcia, C., and Lefcourt, N. (2015). Assessing the economics of infectious diseases: Results from a systematic review of the literature and expert survey, Pharmaco-Economics, vol. 33(11), 1107–1135.
4. Eshuis, M, (2012). Communicable Diseases: A Manual for Rural Health Workers. Nairobi: African Medical and Research Association.
5. Fletcher, M. (2017). Principles and Practice of Epidemiology. Ethiopia: Addis Ababa University.
6. Howlett, P.J., Walder, A.R., Lisk, D.R., et al. (2018). Case Series of Severe Neurologic Sequel of Ebola Virus Disease during Epidemic, Sierra Leone. Emerging infectious diseases, vol 24(8).

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue V May 2025

7. Laxminarayan, R., Klein, E., Dye, C., Floyd, K., Dareley, S., Adeyi, O. (2011). Economic Benefit of Tuberculosis Control. Washington DC: The World Bank.
8. Lindahl, J.F. and Grace, D. (2015). The consequences of human actions on risks for infectious diseases: A review of Infection ecology & epidemiology. Retrieved on 29th December, 2021, from: http://www.infectionecologyandepidemiology.net/index.php/iee/article/view/30048.
9. Muhammad, K. A., Talat, I. Muhammad, A.K. (2020). Identifying the Potential Causes, Consequences, and Prevention of Communicable Diseases (Including COVID-19). BioMed Research International, vol. 13(1).
10. Seladi-Schulman, J. (2019). What You Need to Know About Pathogens and the Spread of Disease. Retrieved on 29th December, 2021 from: https://www.healthline.com/health/what-is-a-pathogen.
11. The World Health Organization (WHO) (2016). Communicable Disease Prevention, Control and Eradication. Retrieved on 29th December, 2021, from: http://www.who.int/countries/eth/areas/cds/en/.
12. Weiss, R.A. and McMichael, A. J. (2014). Health of People, Places and Planet: Reflections based on Tony McMichael's four decades of contribution to epidemiological understanding. Elsevier Health Sciences, 31(12).
13. World Health Organization (WHO) (2014). Infectious Diseases. Retrieved on 29th December, 2021, from: http://www.who.int/topics/infectious_diseases/en/.