Relevance of Akerloff's theory of information asymmetry for the prevention and control of zoonotic infectious diseases in Sub-Saharan Africa: Perspective of Library and Information Services Provision

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ABSTRACT

This paper explores the interconnectedness of library and information services provided as a community strategy for the prevention and control of zoonotic diseases in sub-Saharan Africa. The methodology used in reviewing the literature was a systematic review. In the review, Akerloff's theory of information asymmetry was used as a lens to guide the study. Within the constructs of the theory, artificial asymmetry was found to be a major factor contributing to the situation where those that are exposed to animals are those that receive little or no information for the prevention of zoonotic diseases and their spread. That is why zoonotic diseases flourish faster among humans. For a long, researchers indicated that domesticating animals in ménage is of psychological and historical linkages that detaching individuals from this practice can present dangers to their lives or threat to their wellbeing. Unfortunately, information penetration to the public about the dangers of domesticating animals is mostly restricted to medical practitioners, epidemiologists, veterinarians, etc. neglecting social sciences, other humanities, and their contributions. This brought many zoonotic diseases literature to be confined within the milieu of healthcare professionals in books, journals, or any other scholarly contents despite calls for interdisciplinary research. This resulted in information asymmetry where the dichotomy between the haves and have-nots continues to widen exponentially, and information received by those interacting

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closely with animals and the information given by health practitioners is not sufficient to enlighten them proportionally. The study recommended that libraries could play important roles in creating awareness and providing space, relevant information resources, outreach programs, and engaging Civil Society Organizations for crowdfunding, among others for preventing the spread of zoonotic diseases in sub-Saharan Africa.
Keywords: Zoonotic Diseases, Library and Information Services, Information Asymmetry, Crowdfunding, Community-Based Organizations (CBO), Civil Society Organizations (CSO).

INTRODUCTION

Research on zoonotic diseases is alarmingly increasing thus attracting scholarly attention (Kemunto *et al.,* 2018). This is predominantly so because, zoonotic diseases are unabatedly the leading cause of death among humans (Grace, *et al.,* 2012; Jones, *et al.,* 2008). Every year, zoonotic diseases account for 2.4 billion cases annually and cause about 2.2 million deaths in humans globally (Grace, *et al.,* 2012; Taylor *et al.,* 2001). This is illustrative as of 19 February 2021, 4:18 PM CET, there have been 109, 997, 288 confirmed cases of Covid-19, including 2, 435, 145 deaths reported to the World Health Organization (WHO, 2021). In addition, there is a strong relationship between domesticating animals and the endless emerging infectious diseases among the human population (Woolhouse & Gowtage-Sequeria, 2005). To be precise, millions of households domesticate animals in their ménage per annum (Esch & Petersen, 2013). For instance, in the United States alone, there are more than 77 million dogs and over 93 million cats in households (Esch & Petersen, 2013). From 2019 to 2020, American households have more than 136.4 million pets, mainly birds, cats, dogs, horses, freshwater and saltwater fish, reptiles, and small animals (APPA, 2020). Similarly, in terms of possession of these animals, 62% of households have at least one pet, and more than half of the households possess more than one pet (APPA, 2012). Medically, to sustain the growth and development of these animals in an optimal condition, in the US alone, national pet owners used to spend $10.94 billion annually for the supplies of the pets and their drugs; and expend $14.11 billion on veterinary care once a year (APPA, 2012).

Of importance, in sub-Saharan Africa, zoonotic diseases account for a quarter of disability-adjusted life years (DALYs) (Grace *et al.,* 2012) where 75% of the emerging infectious diseases affecting humans are zoonotic (Belay *et al.,* 2017; Taylor *et al.,* 2001). Despite pets acting as a carrier of the diseases that are transmissible to humans (Pal, 2005), they have also relevant importance for the health and wellbeing of people. To

indicate the importance of these animals to households and the diseases they cause, Kemunto *et al.* (2018) reviewed 771 articles on 22 and 168 theses on 21 of the 36 zoonotic diseases. They found out that, research on zoonotic diseases multiplied logarithmically within the last 10 years. Article publications contributed 460 (60%) and theses 102 (61%). Equally, they found out that, endemic diseases were the most investigated accounting for 656 (85%) publications while 150 (89%) accounted for theses on zoonotic diseases employing epidemiological determinants using cross-sectional design with least emphasis on socio-economic factors.

Several programs and interventions have been put in place to reduce zoonotic diseases. These programs include but are not limited to one health zoonotic disease prioritization tool (Rist *et al.,* 2014), assessment of zoonotic disease burden, joint human and animal outbreak response, development of laboratory systems in public health and veterinary sectors, (Belay, 2017), among others. However, despite these programs and interventions to reduce the problem of zoonotic diseases, emerging and reemerging zoonotic diseases still exist and affect both humans and animals. The consequences of not addressing these diseases result in high morbidity and mortality rates among humans, disruption of regional and global trade, and strain public and global health workforce (Belay, 2017; World Bank, 2012), the skyrocketing price of commodities, and upsetting global economic activities (Belay, 2017). The suavity of these consequences calls for further studies to be conducted for the prevention of zoonotic diseases among the human populace from a potentially useful perspective. In line with this, many theories have been proposed for studying and preventing widespread of the deadliest zoonotic infections, but the infections continue to flourish. Unless the problem of zoonotic infections is addressed from information asymmetry of pet owners, the problem of zoonotic infections will continue. Even though studies about zoonotic diseases have focused wholly on a pragmatic approach applying only scientific, technological, etc. perspectives; unless the problem of zoonotic diseases is addressed from the information received by those interacting closely with animals and the information given by health practitioners, the problem of zoonotic diseases will continue. Afzal, (2015) referenced Akerloff, (1970) who stated that information asymmetry is a

> situation in which one party to a transaction [receives] more information than the other party" (p. 124). In other words, according to D'Cruz and Kini, (2007, p. 353), information asymmetry arises whenever there is a "disconnect between what consumers [users] can learn and how they can use what they learn, [which] results in this inability for them to truly be the drivers in their own health care decisions.

Previous studies that discussed zoonotic diseases focused on using methodologies neglecting an approach that allows painstakingly detailed understanding of the real problem from theoretical and methodological perspectives. To begin with, research in zoonosis is quickening with no respite in its speed and at the same time remains disjointed and interdisciplinary. This makes it inflexible to keep up with new developments in the field and to make pieces of evidence available in single research that can inform practice a challenge. This conformed with Nelson and Campbell's (2017) finding that single studies lack evidence-based contextual and methodological contributions that inform policy and practice decision-making process a consequence of necessitating a shift in single studies to systematic review. To support this view, Snyder's (2019, p. 333) study found that "an effective and well-conducted review as a research method creates a firm foundation for advancing knowledge and facilitating theory development." This makes it possible to include substantive findings, theoretical and methodological contributions to a topic of interest (Hart, 2018) in a well-articulated review. More importantly, the literature review can address flaccid and worsening zoonotic diseases with a power that no single research can do. The systematic review, used in this study, despite appearing simple; encompasses epistemological and theoretical frameworks about a phenomenon of a study (Newman & Gough, 2020).

To reflect on the caption of this chapter, the following sub-headings will be emphasized:

1. Understanding zoonotic diseases and their classes
2. Library as a community
3. Why zoonotic diseases and libraries?
4. Theory of information asymmetry and information asymmetry in zoonotic diseases
5. Libraries, civil society organizations and zoonotic diseases
6. Library and information services provision and as a CBO for reducing zoonotic diseases

UNDERSTANDING ZOONOTIC DISEASES AND THEIR IMPORTANCE

There has been yearning from national and international communities to free humans from the shackles of zoonotic diseases so that the scales can fall from the human population's eyes. Unfortunately, such zoonotic diseases remain ubiquitous and available internally in or externally on the human body from head to toenail. This binary feature makes them capable of changing anatomical sites, getting access to the human body

through different ways, and thus causing different diseases. More importantly, they target people who work closely with the corresponding animals they infect. The people working with animals include veterinarians, slaughterers, farmers, researchers, pet owners, and animal feeders in companies (Al-Tayib, 2019), and those at home are in greater threat. For instance, it has been tricky enough to answer such a question as to why rats still cause diseases in humans. Despite rats have been the major cause of about ~75% of the emerging and reemerging diseases among humans (Wilke & Haas, 1999; Woolhouse *et al.,* 2005; Jones *et al.,* 2008) thus constituting 61% of all communicable diseases (Taylor *et al.,* 2001; Jones, *et al.,* 2008), still preempting their effects remain vaguely challenging. There is no wonder that zoonotic diseases are a double-aged weapon in that, they affect humans and animals, and the societies' economic activities (Pal, 2005). To begin with, zoonotic diseases are those diseases that are naturally transmissible between vertebrate animals and humans (Al-Tayib, 2019; Pal, 2005; Public Health England, 2016; WHO, 1959) or transferred from humans to animals i.e., reverse zoonosis (Kollias & Martin, n.d). In other words, they are purely sporadic diseases of vertebrate animals and man is just accidental or aberrant hosts that have no gender or age variability (Pal, 2005). Of the more than 300+ infections of humans, 178 are zoonotic (Kollias & Martin, n.d). This is the reason why the then Director of the Department of Neglected Diseases, an arm of WHO, Dirk (2014, p. 8) noted that "the time is [now] ripe to transform evidence into practical and feasible strategies scaled-up on the ground".

A report by FAO/USAID (2019), which concerned itself with enlightening the public that, global health security is a shared responsibility among nations and the international community that highlighted grey areas that border on monitoring the evolution and preventing the emergence of potentially dangerous strains of viruses, especially avian influenza strains, which are critical to averting a pandemic. The report continued to enumerate that, understanding the virulent forms of these pathogenic organisms like a virus, as well as human and animal behavior, is a vital step taken towards reducing crossover to the human population. The report capitalizes on the livestock sector growth in the African continent, which presents a critical prospect for building on lessons learned, for a more secure future. How to ensure possible penetration of information to end-users, the report did not capture that. Furthermore, the challenge of the world population projected to be 9 billion people by 2050 (Godfray *et al.,* 2010) coupled with food production predicted to be 70% sufficient for sustaining such a population (Karunasagara & Karunasagarb, 2015) raises concern over the

need for high productivity of livestock for meeting the demands of this alarming population. This is the reason why FAO/USAID, (2019) noted that

> as Africa's population grows and becomes more affluent in the next few decades, the demand for meat, milk, and eggs is expected to boom. The livestock sector will evolve in response to this growing demand and will soon become the largest contributor to the value of agricultural markets". [The report further states that], "while a growing livestock market will offer access to better nutrition and many economic opportunities, intensification will also lead to a greater risk of pathogen emergence and spread. It is important to utilize global experience in order to build a sustainable and robust livestock sector in Africa (2019, p. 23).

The report did not elaborate on the issues of enlightening the public about the need to invest in livestock and guard against the possible spread of zoonotic pathogens therefrom. This implies the need for developing security agenda, policies, and sustainable solutions that can impact the sector positively. In response to this, the Global Health Security Agenda (GHSA) and Emerging Pandemic Threats (EPT) evolved that concern themselves with "building animal health capacity to prevent, detect, and respond to disease threats" (FAO/USAID, 2019, p. 2). The GHSA and EPT are rooted in Global Health Information. For long, Gilson, (2012, p. 11) noted that "Health Policy and Systems Research (HPSR) is often criticized for lacking rigor, providing a weak basis for generalization of its findings and, therefore, offering limited value for policy-makers". This is where the eminence of libraries comes up as a center for educating the populace and thus assists in providing a good atmosphere for conducting community-based studies that can inform policy formulations and program implementations.

Similarly, Gilson, (2012, p. 12) called on recognizing the importance of

> encouraging researchers to value a multidisciplinary approach; recognizing its importance in addressing the complexity of health policy, and systems challenges. [Similarly, it functions in] stimulating wider discussion about the field [particularly zoonotic diseases] and relevant research questions; demonstrating the breadth of the field in terms of study approaches, disciplinary perspectives, analytical approaches, and methods; highlighting newer or relatively little-used methods, and approaches that could be further developed (p. 12).

To augment on the above, before this development, in 2005, World Health Organization (WHO) Western Pacific Region and South-East Asia Region recognized the importance of collaboration between animal and human health sectors for ensuring sustainable and functional coalition and thus created Asia Pacific Strategy for Emerging Diseases (APSED). This is important as WHO notes that "there must be close multi-sectoral cooperation, particularly between the health and agricultural sectors at each level" for containing the spread of zoonotic diseases. Unfortunately, zoonotic diseases are still on the rise. This is probably due to neglecting the strength that libraries can offer alleviating such diseases to the barest minimum. In other words, most of the health-related investigations are centralized in hospitals neglecting an area where people use it for their leisure and intellectual maturation. In effect, despite studies on zoonotic diseases being objectively conducted to understand the microbial behavior and pattern of their pathogenicity, humans are the focal points or reservoir where the diseases flourish. Without including humans and libraries, two extreme polar points emerge.

In 2006, a work plan was developed to implement ASEP. To strengthen the applicability of this plan, WHO (2008) outlines a step-by-step action plan that could assist in developing appropriate collaborations in four key areas identified in the APSED, which include surveillance and information sharing, coordinated response, risk reduction, and collaborative research (WHO, 2008). This framework could assist regions that don't have a functional mechanism for information sharing, alert responses between the agricultural (animal) and human health sectors. This implies that this plan is more inclined to developed countries. Developing countries, need scaffolding to reach such a milestone for surveillance and information sharing. What is required for developed countries to curtail such a problem may not necessarily apply to developing countries. The most affected people as mentioned above are farmers, slaughterers, etc., and are mostly far away from urban areas. Fortunately, libraries could function in providing information and linking the people that have distal proximity and can assist these people to lessen the sufferings or understanding the pattern of growth of these pathogens. In short, in all these developments, communities should be involved.

Fortunately, each sub-Saharan African country has a population of animals of some sort. For instance, in Cameroon alone, the population of livestock is over 90 million mainly poultry (72 million), ruminants (9 million), cattle (5 million), and swine (3 million) (Animal Population of Cameroon, 2015). This means that the livelihood, wellbeing, and diseases of these animals are directly proportional to the livelihood and wellbeing or otherwise of their consumers (i.e., people). This implies

that infectious diseases that cause high morbidity and mortality, spread rapidly across national borders, and appear in an epidemic, or pandemic form, attract the attention of national, regional, or international health agencies and the populace (Kayunze *et al.,* 2012). The significance of zoonotic diseases is many, but can be narrowed to portending the livelihood and wellbeing of animals thus causing illnesses, hurting yield, and ultimately causing death, weakening the chain of sources of income for those dependent upon livestock for earning/survival, and resulting in a significant number of illnesses and death in humans (Cameroon, 2016). The endemic diseases, also called "neglected" or "lingering" zoonoses (Kayunze *et al.,* 2012), attract less attention despite causing significant socio-economic consequences (Maudlin *et al.,* 2009).

Similarly, emerging or reemerging diseases of humans and animals cause epidemic or even pandemic infections (World Bank, 2010). An emerging disease is the one "that is newly recognized or newly evolved, or that has occurred previously but shows an increase in incidence or expansion in a geographical, host or vector range" (FAO/OIE/WHO, 2004; Kayunze *et al.,* 2012). Most human diseases (60%) and human emerging infectious diseases (75%) are naturally zoonotic (Kayunze *et al.,* 2012). For emerging diseases, they encompass Ebola, Influenza, Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS), Bovine Spongiform Encephalitis (BSE), Nipah virus, etc. While neglected diseases include anthrax, bovine tuberculosis, brucellosis, cysticercosis, neurocysticercosis, cystic echinococcosis, rabies, etc. (Kayunze *et al.,* 2012). In other words, there are zoonotic diseases caused by viruses, bacteria, fungi, parasites, etc. This means that the scope of zoonotic diseases is very wide and the eunomy applicable to the developed countries for treating pets should also be appropriately used in developing countries. However, poverty with all its indicators persistently increases in developing countries. This is the reason why WHO (2014) capitalized on prioritizing key ingredients to tackle neglected zoonotic diseases (NZDs) through research, integrated control, and community-based approaches.

LIBRARY AS A COMMUNITY

The survival of every community depends largely on its effective utilization of information resources which is possible through community information services (CIS) carried out by many governmental, NGOs, etc. (Majumder, 2016). Libraries still risk irrelevance in today's technology-driven environment, and for them to regain their rebranded status, they must fundamentally change themselves both tangibly and ideologically not only adapt to technological changes (McLeay, 2016). This

means that libraries should be flexible and thus, always in transition as new technology evolves so also does how the service they should provide. This is the reason why McLeay, (2016) argued that, for rebranding to be a reality, librarians must "stop thinking of ourselves as the experts on what our communities' public library needs are and [to] view our communities as the experts and ourselves as their facilitators" (p. 22). It is only then that libraries can function in providing different types of information, which help in daily problem-solving skills or raising the quality of life of people and their survival. Unfortunately, most libraries use to design their plans according to the library service planning neglecting community-led service planning (i.e., zoonotic diseases). In line with this, Williment (2009) observed that a community-practitioner-based approach is highly important in designing a library for full participation and patronage of community members from across diverse backgrounds. In the study, Williment (2009) was able to discern inclusiveness and exclusiveness in the use of the libraries in Canada due largely to gender, sexual orientation, social class, race, etc. In effect, most library staff believed that the libraries were all-inclusive whereas the community studied proved otherwise. In other words, public libraries ensure rightful access to ideas, knowledge, and entertainment available in books, and other information resources (Majumder, 2016) for meeting the needs and demands of potential or active users. Of particular significance, the study showed that survey or library statistical methods, traditional service provision, cannot measure what they are supposed to measure, and the only acceptable way to deal with services provided for all is by integrating all community members (not a small fraction of the entire community) in the planning process (Williment, 2009).

To support this assertion, Majumder (2016) cited Fleetwood (n,d) who noted that:

> community information is considered to be that information required by members of the public (or these acting on their behalf) to make effective use of the resources potentially available to them in the communities in which they live. Such information may be needed to help solve problems in the fields of housing, disability, household finance, marriage, employment, and so on (p. 798).

Furthermore, Majumder (2016) referenced Library Association (1980) which observed that

> community information services are those, which assist individuals and groups with daily problem solving and with participation in the

> democratic process. The services concentrate on the needs of those who do not have ready access to other sources of assistance on the most important problems that people have to face, problems to do with their homes, their jobs, and their rights (p. 799).

To cut it short, according to IFLA/UNESCO Guidelines (2001), libraries should be able to provide services *inter alia* as community information services, user education including support for literacy programs, programming, and events, etc. Libraries tend to put more emphasis on how to grab technology neglecting to consider the information needs of the community they serve. Libraries could perform excellently in many ways should they stick to the ideals of their formations, to serve their respective communities. In support of this, McLeay (2016) argued that:

> The library does not need to 'become' solely a technology hub, a free service provider, or an information center. It can be, as it always has been, all three of those things, and more, tailored to the needs of its community, simply by shifting focus outward and following a community-led service model (p. 25).

In addition, community development is a relative term that suits perfectly the situations and circumstances surrounding a community under study. Community development revolves around improving quality of life, building community networks, empowering individuals. From the library's perspective, community development garners support from the community members so that they can understand what the community needs from the library for improving their quality of life (Abu *et al.,* 2011). Alternatively, community development spans around providing access to current resources and technology, going beyond simple consultations or support processes to expanding towards meaningful and inclusive collaborations thereby building stronger relationships and partnerships within the community (Abu *et al.,* 2011). This means that, by so doing, the library can understand the information needs of the community and contribute immensely to the future of the community. In the context of this review from the foregoing, it can be said that creating awareness for zoonotic diseases falls under user education where support for literacy programs concerning the health of individuals and the community at large, are important against contracting the diseases. Townhall meetings, seminars, workshops, etc. on zoonotic diseases can be organized so that community becomes fully aware of the routes of transmission of diseases, how to tackle the transmission routes, how to treat if infected, and so on.

WHY ZOONOTIC DISEASES AND LIBRARIES?

Despite this question indicating the parallelism or rather opposite concepts, in this section, it will be shown how these two supposedly non-homologous concepts relate. Library as an organism increases in size. It harbors prints and non-print resources and people are using such resources for meeting their information needs. As they encounter the information resources, they may have contaminated hands or bodies with some pathogens. This means that, as information resources circulate among users, there is every tendency to share pathogens as well. That is why the library refers to a universally constructed concept, which serves as a national, economic, and social development resource (Abu, 2014). This is against the decades-old notion about libraries as a mere assemblage of shelves; they are typical of social and cultural institutions that persistently provide resources for the betterment of the communities (Buschman & Leckie, 2007). In addition, they play a role of inclusiveness offering distinctive media and professional guidance for information searching (Kjekstad, 2004). To capture the relevance of libraries in contemporary societies, Abu, (2014) cited Bundy (2003, p. 8) who noted that libraries have the following good qualities:

> 1) Libraries inform citizens, 2) libraries break down boundaries, 3) libraries level the playing fields, 4) libraries value the individual, 5) libraries nourish creativity, 6) libraries open kids' minds, 7) libraries return high dividends, 8) libraries build communities, 9) libraries make families friendlier, 10) libraries offend everyone, 11) libraries offer sanctuary and, 12) libraries preserve the past (Bundy 2003a, p. 8).

It is these good qualities that give libraries the edge to be present in all that involves communities and make them equal to solving individual and community problems. In other words, libraries are living organisms, whose nutrients for survival are to educate, strengthen culture, and provide information and is an everlasting agent for ensuring peace and spiritual welfare through the minds of men and women (Abu, 2014). In short, libraries are a *symbol* of the *culture* of the community for the "diffusion of knowledge and to promote serious purposes of culture and study" (Zurinski *et al.,* 2013; McCrossen, 2006, p. 176). This makes librarians view themselves as the titleholders or defenders of culture via helping community members to choose information resources of their interest in enlightenment and progress (Zurinski *et al.,* 2013). In effect, libraries serve the backbone required

for the development of the past and future information society (Fisher *et al.,* 2007). They provide access that leads to the development of individuals and the communities, in general, for promoting wellbeing and guard against information poverty (Abu, 2014). Also of importance is the issue of self-education and personal enrichment in various degrees ranging from the provision of test materials to cookbooks, to legal assistance texts to car repair manuals (Gorman, 2000, p. 82), all in trying to satisfy users' needs. Alternatively, libraries function in ensuring lifelong learning from childhood to adulthood through the provision of fiction, newspapers, periodicals, literature, concerts, movies, etc. They do so to guarantee free and open access to ideas and information that is devoid of intellectual isolationism (Zurinski *et al.,* 2013) of a given society. It is against this background that Zurinski *et al*. (2013) referenced Lankess (2012) and Oldenburg (1999) who noted that bad libraries build collections, good libraries build services, and great libraries build communities" and libraries as a "third place" respectively. To eke on these issues, libraries are good at strengthening civic engagement that encompasses "strengthening local democracy, building robust communities, and empowering people to become involved in the life of their communities in meaningful, creative, and sustained ways" (Zurinski *et al.,* 2013). Similarly, libraries are "places that statically house ideas or places where ideas are put into action" (Zurinski *et al.,* 2013; Shapiro, 2010, p. 2).

In Africa, development is a key element to continental priority and tactlessly, most governments focus on development from their perspectives ignoring to incorporate community members. As Abu (2014) reiterated that, the government approach to development lies on government action than the more participatory principles of community development. If the functions of libraries would be fully utilized, they can provide services particularly on health issues that even hospitals cannot provide. However, as studies indicated that such libraries are not fully utilized by the community members; Farabi (2008) observed the need to channelize the significant roles libraries can offer especially in terms of providing services, activities, and programs that will contribute to the local rural community development as a whole, and not just focusing on students. For instance, when there is an outbreak, there is the need for infrastructure that can cater to the patients. In this regard, infrastructural development, which supports the economic development of the region, and thus increment of quality of social and economic life, is paramount. By so doing, individuals can have "access to knowledge so that individuals, families, and communities can reach their potential" (Goulding 2008, p. 340).

Community development, which depends on the cultural context and program at hand, is a tradition that brings philosophy, methodology, theory, and practice altogether (Abu, 2014) geared towards solving societal problems thereby integrating the community into the life and progress of the nation (Selvaratnam & Tin, 2001). That is, community development is a continuous process that empowers community members to be responsible for their development. This means that community development involves a series of activities that are individualistically and collectively representative of all and sundry irrespective of status that focuses on drawing people from different backgrounds in the community cumulatively to make changes in their lives, culture, and environment that can result in a better life (Abu, 2014). Thus, this implies that, if there is an outbreak (i.e., zoonotic disease) in a community, it is the responsibility of the community members to partake in a series of activities possible in a stepwise manner that is directed towards solving such a zoonotic disease by enumerating methods that are custom to their way of life. In most cases, the government intervenes and provides the mechanism through which these activities should be conducted. As such, community development must be channelized to the development of the entire nation. That is why most governments planned, organized, and imposed activities for their communities. Before this development, community development must begin from the grass-roots level i.e., local communities (the people) must recognize the benefits attached to such an activity and geared towards self-help and mutual help thereby making them more effective (Selvaratnam & Tin, 2001). If the program fails, the local communities are blameworthy for lack of enthusiasm from their parts, not the government (Abu, 2014; Isa 2010; Samah & Aref, 2009). This required the need for (public) libraries in every community (Gorman, 2000) to capture, recapture and address the needs, programs, services, activities, etc. that match the community's development of skills and improve literacy without any latent or physical segregation (Buschman & Leckie, 2007). Through this medium, issues about infectious diseases can be discussed especially their spread directly or indirectly from one person to another, one animal to another, or from animals to persons, and *vice versa*. As captured by Kayunze *et al*. (2012) that, wild animals are reservoirs of pathogens some of which may not necessarily affect such animals due to their genetic makeup and adaptation to wild conditions, communities can be enlightened about these issues using the premises of libraries or using information resources for awareness.

Libraries will remain where they are unless the perception of the public is altered in such a way to understand the possibilities libraries hold. In other words, libraries need to integrate themselves in all ac-

tivities the communities in which they are located do and contribute to the salvaging of the incessant disasters confronting such communities. For instance, Abu (2014) argued that libraries collect, preserve and promote local culture in all diversity. She cited examples of Botswana and Australian libraries. In Botswana, for example, apart from providing conventional routinized services, libraries organized local community discussion groups where traditional songs and practices are appropriately documented in their effort to promote the local traditions of the country. Similarly, in Australia, the public libraries expanded their collections beyond book and internet connectivity to organizing children's coloring competitions. In these libraries, both verbal (i.e., recordings and CDs) and nonverbal collections (i.e., newsletters, reports, pictures, among others) that are characteristic of the local communities are provided. In Malaysia, cooking classes are designed mainly for women (and possibly, therefore the divorce rate is low in Malaysia as against our society). As it can be seen, in both Botswana and Australia, libraries and librarians are working with the skills and knowledge of the people to improve the engagement of people with libraries and integrate them into the milieu of library services. In this case, through expert and author talks, marketing of library services via media especially radio and social media, African libraries can do the same by drawing the attention of the stakeholders on extending the library services beyond the conventional ones to enlighten the public about the dangers of zoonotic diseases. By so doing, possible means of introducing traditional education measures to curtail zoonotic diseases to the barest minimum is conceivable. In other words, these are the services, the communities need and when the need arises for transforming such services, libraries should do so in a similar proportion. However, when the information resources are consulted; the person may be in asymmetry concerning the richness of information at hand. This brings about information asymmetry.

THEORY OF INFORMATION ASYMMETRY: THE BASIC PREMISE OF THE THEORY

As it is already captured above, Afzal (2015) referenced Akerloff, (1970) who noted that information asymmetry, is a "situation in which one party to a transaction [receives] more information than the other party" (p. 124). Alternatively, D'Cruz and Kini, (2007, p. 353) observed that, information asymmetry comes into play whenever there is a "disconnect between what consumers [users] can learn and how they can use what they learn, [which] results in this inability for them to truly be the drivers in their own health care decisions". From another perspective, information

asymmetry arises when one party lacks information about the quality of another party or when the party is concerned about another party's behavioral tendency (Stiglitz, 2000). In this way, consumers have *little influence* on their own healthcare service choices (D'Cruz & Kini, 2007) and fortunately, libraries offer services to information users just to satisfy their needs (Abu, 2014). In this sense, a rather good metaphor emerges from *having* little influence to having sufficient influence for satisfying their needs according to the information situation at hand.

BASIC CONCEPTS OF THE INFORMATION ASYMMETRY THEORY

Afzal (2015, p. 124-135) discussed extensively the concepts of the theory of information asymmetry and are as follows:

- Proximity: This indicates physical and intellectual closeness. If a person has a person has physical proximity it will lead to intellectual proximity as well and vice versa. This will enable the one who has proximity to hold more information than the one who does not have such proximity.
- Change: This means that whenever there is a change in natural or artificial matter, it creates imperfection in information humans hold for sometimes, which necessitates the acquisition of further information to quench such a thirst.
- Causal Complexities: The fact that every cause has an effect and vice versa, indicates the imperfection in understanding what causes what. Is it caused by single, multiple, or a combination of one distal and another proximal cause(s)? In other words, this indicates a dearth of quality information for understanding a given phenomenon.
- Disturbance: This occurs whenever there is the occurrence of a new event that produces new information, which renders the current distribution of information obsolete and the desire for new information.

TYPES OF INFORMATION ASYMMETRY

There are two types of information asymmetry based on human deliberate or non-deliberate actions: inherent information asymmetries, and artificial information asymmetries.

- Inherent Information Asymmetry: This is subdivided into natural-inherent and artificial-inherent information asymmetries.
  - Natural-Inherent Information Asymmetries: These asymmetries remain in the universe independent of any human interference. They are important because they further necessitate humans to deepen

exploration, thinking, and acquisition of knowledge to make sense of the world. Two things make up this type: *constant change* and *causalities*.
  - Artificial-Inherent Information Asymmetries: These arise without any deliberate effort, for example, due to informational advantage occurring to individuals because of their position, education, or experience.
- Artificial Information Asymmetries: This arises because of deliberate human effort as in politics, markets, hospitals, etc. This is possible by making information difficult for individuals on receiving ends to clearly understand the matter of interest.

MEANS OF CREATING A DISTURBANCE

- Equivocation: ambiguous information i.e., during election campaigns
- Skewness: imbalanced information i.e., negatively, or positively skewed information on a distribution
- Deficiency/Selective disclosure: incomplete information thereby the information lacks certain essential elements necessary to form a well-informed opinion about the matter.
- Hoarding: this deals with accumulating and hiding information
- Divergence: lack of agreement
- Complexity: too technical or complex information leads to asymmetry
- Excessiveness: quantitative excess in information can lead to asymmetry, which makes it difficult to use information
- Effects of asymmetry: For natural asymmetry, there are issues centered on *constant ignorance* and *constant attribution challenges*. For artificial asymmetry, there are issues like uncertainty, expectations, confusion, trust issues (i.e., lack of trust, violation of trust, etc.).

INFORMATION ASYMMETRY AND ZOONOTIC DISEASES

In this paper, artificial asymmetry is applicable where the health practitioners, because of their proximity, hold but provide little information to the public. This creates a hollow in understanding the phenomenon of interest by community members. As such, information asymmetry receives maximum attention from scholars from different perspectives such as economics (Dell'Ariccia & Mathieson, 1998; Spread, 2015; Major, 2019), medicine (Schneider, 2005), and many other fields. To reconcile what is obtainable in this literature and observable realities, information asymmetry in the medical field relates to this chapter since there is a strong relationship with zoonotic infections. For instance, in the

field of medicine, Schneider (2005) observed that information asymmetry reveals the conflicts between the physician and patient that hinder optimal treatment quality options (Schneider, 2005) thereby disrupting the physician-patient relationships. This type of conflict, according to him, may emanate from the underlying remuneration system whether the hospital uses fee-for-service, lump-sum payment, flat-rate payments, or outcome-based compensation (Schneider, 2005). To augment on this issue, the cost of healthcare is skyrocketing that is beyond the capacity of patients, and that, healthcare professionals and policymakers discuss healthcare information and strategies with little or no ideas on how to solve the problem (D'Cruz & Kini, 2007). This captured the attention of Major (2019) to concur that, the incentivization may lead to inverse relationality where "notably, efficient, high-quality healthcare units will be punished while less efficient and lower quality ones will be rewarded for their accomplishment." This opened up double asymmetric information involving the patient-physician, doctor-hospital, hospital-healthcare funding agency, and private information (Major, 2019).

This implies that information asymmetry is possible if a medical practitioner is to engage community members because of the differences and fear attached to visiting hospitals or the social construction of medical practitioners by the community members. It is there abundantly available in the literature that, the exchange of information between patients and physicians, for example, is asymmetrical with healthcare professionals receiving more information than the patients (McNeilis, 2001). In other words, while patients need information about disease -i.e., how to manage zoonotic infections- they may not be asking in such a way to facilitate the response they need (Cutilii, 2010) from medical practitioners. Similarly, medical practitioners struggle with how much information to give to patients, and some medical practitioners withhold information as a matter of course (Palmieri & Stern, 2009). However, according to Cutilli (2010), the stymied information flow between patients and providers most often arises because information seeking and giving is a complex relational process, encompassing the characteristics of the physician, patient, and the situation. Despite that information for managing health conditions is available on the internet and other sources, which means that patients can access information relevant to them, is just a theory (D'Cruz & Kini, 2007).

To finance such initiatives as shouldering the responsibility of enlightening the public about zoonotic diseases, libraries need to think outside box for crowdfunding opportunities. It is a known fact that libraries are not moneymaking agencies, hence the need for targeting the external funders to support their activities especially on prevention and control

of zoonotic diseases. Even in this case, there is information asymmetry between the funders and libraries. To remedy this seemingly impossible undertaking, research by Courtney *et al.* (2017) will provide not only a rich but focal investigation that would guide theory and practice in library and health information science studies. In the research, these authors investigated how multiple signaling factors and endorsements interact to influence a project's likelihood to secure a crowdfunding goal. The study involved testing dependent variables *(success)* against explanatory variables (media, past success, backer sentiment) and control variables (project goals, duration, spelling error, quick updates, and crowd comments) (Courtney *et al.,* 2017).

This type of research needs to start somewhere and the best option to start from multiple options is rewards-based crowdfunding. Rewards-based crowdfunding is the fastest (Mollick, 2014) avenue to source for funds to finance a new start-up. It involves introducing new products and services (i.e., equipping the community with information that can assist in eradicating zoonotic diseases themselves) that are not yet available in communities and where uncertainty and information asymmetry are prevalent (Belleflamme *et al.,* 2014; Courtney *et al.,* 2017). Rewards-based crowdfunding project, which usually must have a webpage, frequently should contain information about the funding goal, the timeframe for a crowdfunding campaign, comments left by the crowd of backers, updates left by the founder, and all other information that relates to the founder and backers (Courtney *et al.,* 2017). The project should not exceed two months (Mollick, 2014) and the funding goal typically fixed at more than $1 000 indicates the seriousness of the initiation and commitment of the founders, and anything less is not considered worthy of considerations by funders. Fundraising is usually carried out through online platforms in a short period (Belleflamme *et al.,* 2014) but the practicality of the project is uncertain (Courtney, Dutta, & Li, 2017). Information asymmetry arises in this sense when the founder has more information than the funder who might be concerned with the credibility of the founder to produce and deliver the product or services as promised (Courtney *et al.,* 2017: Mollick, 2014). In short, the "credibility of the founder concerns the trust that potential backers place in the founder's promise to produce and deliver a product or service as specified." (Courtney *et al.,* 2017, p. 268).

LIBRARIES, CIVIL SOCIETY ORGANIZATIONS (CSOS) AND ZOONOTIC DISEASES: THE NEED FOR PARTNERSHIP

Civil society refers to "the area outside the family, market, and state [to] encompass a spectrum of civil society actors and entities with a

wide range of purposes, structures, degrees of organization, membership, and geographical coverage." (World Economic Forum, 2013, p. 8). Alternatively, World Economic Forum, (2013) cited World Bank (2009) whose definition is broader defined civil society organization as "the wide array of non-governmental and not-for-profit organizations that have a presence in public life, expressing the interests and values of their members or others, based on ethical, cultural, political, scientific, religious or philanthropic considerations." Since before this development, civil society organizations (CSOs) have been recognized as those that are increasingly becoming influential actors in the provision of basic services in many countries centered around targeting the poor, quality of services, and sustainability (Clayton *et al.,* 2000). This is enough to suggest their relevance especially if synergized with libraries. Another factor is that the type of contracts CSOs have with governments to provide services to the extent they are constantly developing mechanisms to maintain their distinctive contributions to development (Clayton *et al.,* 2000) is also a promising avenue to achieve maximum gratification if fine-tuned to alleviate or eradicate complications of zoonotic diseases. This is because of the civil society's dynamism, vibration, and influence, which "is evolving in impactful and dynamic ways" (World Economic Forum, 2013).

Therefore, according to the Union of International Associations, (2012), the number of NGOs has increased remarkably from 6, 000 in 1990 to 50, 000 in 2006, and 65, 000 in 2013. Similarly, in China, there are more than 460, 000 registered non-profit organizations having more than 6 million employees whereas, in India, there are more than 3.3 million NGOs as of 2009. This implies that many opportunities are lingering for libraries to utilize or else, risk irrelevance in this world of competition. The synergy between CSOs and libraries is important as many CSOs function in auditing and public finance management (Ramkumar & Krafchik, n.d), examining elements of the legal environment to guard against transporting dangerous chemicals through aviation (Savic, 2005), among others. While CSOs function in stopping the transportation of dangerous substances and possibly, infected animals through aviation channels; libraries, on the other hand, can educate the communities on how to handle the embattled zoonotic infections through organizing seminars, developing community-based planning, providing resources that can assist in the informed decision-making process, to mention but few.

Medical practitioners are fully aware of these zoonotic diseases because they master the terminologies right from their secondary schools to tertiary institutions. The language of medicine is beyond the com-

prehension of the ordinary man and thus leads to many communities vulnerable to such infections. If a medical student secures admission and becomes a practicing doctor, hardly if he/she could live in rural areas. This creates havoc with regards to mastering health information by most communities because of becoming vulnerable to most infectious diseases. Many local government secretariats have conventional libraries but are mostly underutilized by the immediate communities due to a lack of involvement of librarians in health-related issues. In other words, most public libraries are without medical librarians a consequence of having a generation without fully understanding health implications and the likes. This necessitates incorporating medical librarians in libraries situated within urban and rural areas.

Because of their rapid changes in their genomic constitution, probably due to antigenic drift and antigenic shift, human coronaviruses (HCoVs) isolated in clinical samples since the late 1960s (Principi *et al.,* 2010), are the major causes of infections among humans and animals (Kahn & McIntosh, 2005). Similarly, they are known to cause a lot of infections with varying severity like respiratory, enteric, hepatic, and neurologic diseases (Kahn & McIntosh, 2005). HCV (mainly HCoV229E and HCoV-OC43) was thought to cause a negligible infection among children but later found out to be the major agent responsible for the severe acute respiratory syndrome (SARS) and coronavirus infections are more severe in adults than in children (Principi *et al.,* 2010). For a long, SARS was identified and categorized as a zoonotic infection after its characterization in China from caged animals particularly palm civets and raccoon dogs (Guan *et al.,* 2003) discovered in wild animal markets. This finding raised awareness that wild animals could be the reservoir of these viruses (Principi *et al.,* 2010) a consequence of their transmission should man meet them in an unhygienic manner.

Coronavirus disease 2019 (COVID-19) infection has become pandemic and thus declared a global health hazard (WHO, 2020). For the first time in history, a novel variant of coronavirus (COVID-19) is confirmed in China (WHO, 2020), first identified in Wuhan in December 2019 (Zhao *et al.,* 2020), spreads across nations, and pungently continues to claim more lives at geometric progression globally. For instance, in less than a month, in a report released on January 28, 2019, in China alone, 4,537 cases were confirmed; 6,973 people were suspected; 976 severe cases erupted, and 106 deaths occurred (WHO, 2020). To buttress its exponential/logarithmic progression, on February 16, 2020, the virus has affected 70,548 individuals and 1,770 deaths in China and 413 infections in Japan (Gao *et al.,* 2020). Furthermore, on March 30, 2020, there were

693 224 COVID-19 patients around the world and 33 106 deaths globally (WHO, 2020).

Ruben & Farber (1990) observed that influenza viruses are highly infectious and affect humans of all ages. These viruses are mostly transmitted by aerosols usually resulting from coughing and sneezing. The most notorious of viral influenza is influenza A. It is the most common cause of viral pneumonia in adults and can result in pandemics. Influenza B virus associated with Reye's syndrome in children, pneumonitis, and croup in infants, causes epidemics. Influenza C virus causes sporadic upper respiratory infections, but not epidemic influenza.

LIBRARY AND INFORMATION SERVICES PROVIDED FOR AND AS A CBO IN REDUCING ZOONOTIC DISEASES. CREATING AWARENESS AND PROVIDING SPACE

World Health Organization observed that the total global health workforce is just 56 million (WHO, 2006) in a world with apparently 7 billion people (USAID, 2018) and by 2050, the world population would reach 9 billion (Godfray *et al.*, 2010). This implies that the global health workforce is less than 1% and presents dangers or even impossibility to cater to the emerging population. To eke on the above assertions, covid-19 has affected and continually affects many sectors of human development including social, economic, medical, political, security, to mention but a few. Perhaps that is why Bangdiwala *et al.* (2010, p. 296) reiterated that "with increased globalization and interdependence among countries, sustained health worker migration and the complex threats of rapidly spreading infectious diseases, as well as changing lifestyles, a strong health workforce is essential". This means that other avenues like libraries must be tested to augment the global health workforce for assisting the involvement of tiny medical substrate to enable participation of hyper key health workforce in educating community members about the emerging and reemerging infectious diseases.

Similarly, most communities are not aware of the existence of infectious agents i.e., bacteria, fungi, viruses, etc. They have a strong belief that diseases are not caused by microorganisms. In other words, they believe in superstitions, witchcraft, among other issues. In short, this is where the eminence of libraries comes up as a center for educating the populace about the existence of microorganisms and thus assists in providing a good atmosphere for conducting community-based investigations that can inform policy formulations and program implementations.

PROVIDING INFORMATION RESOURCES

There are several information resources in print and in non-print that can inform people about a particular disease. These information resources will educate people on how to contract a disease, how to get rid of it, how to prevent and control it. Unfortunately, most of the health-related information resources are centralized in hospitals neglecting an area where people use them for their leisure and intellectual maturation. In effect, despite researches on zoonotic diseases being objectively conducted to understand the microbial behavior and pattern of their pathogenicity, humans are the focal points or reservoir where the diseases flourish. Without including humans and libraries, two extreme polar points emerge.

OUTREACH PROGRAMS

It is well enshrined in the objectives of libraries to outreach to people when, the circumstances bordering their safety and security, are not entertained by communities. In this way, libraries can market their resources and services to neighboring communities so that good practices can be strengthened, and the bad ones corrected to meet international standards. That is, by outreaching the communities, libraries and librarians can bring out the programs at hand that can alleviate zoonotic disease spread among localities. In so doing, communities can be compared to compete to ensure that the health services taught are understood and assimilated.

CONCLUSIONS

There is no doubt that zoonotic disease continues to affect political, economic activities, social wellbeing and claim more lives innocently. People lack awareness about the possible means through which zoonotic diseases can be contracted and where to turn to prevent themselves from being infected. Those that know retain it as a matter of course and the gap between those who haves and have-nots continue to widen. This creates information asymmetry. The reviews showed elaborately why libraries must integrate into their societies and should design plans based on community needs, not following service providers' understandings. More so, crowdfunding source is very important in financing the activities of libraries. Libraries should develop websites that should capture the images and videos of the plan at hand and the probable problems to encounter if such programs are not implemented in the communities. There is a need for partnerships between CSOs and libraries for meeting the information needs of their communities.

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