

Chapter 1

Poverty, Health and Livelihoods

1.1 Linking Poverty, Health and Livelihoods

Developing countries, especially those in the tropical regions of the world, are known for poverty and disease, both infectious and non-communicable diseases. People in developing countries carry on their day-to-day living amongst these two challenges, poverty and disease.

1.1.1 Non-communicable Diseases and How These Affect Impoverished Communities

With the gap between the rich and the poor widening in developing countries, those who are well-to-do have adopted a different type of lifestyle, which involves change in diet and traditional way of living. These rapid changes in lifestyle have coincided with an increase in non-communicable/non-infectious diseases (NCD) (Beran et al. 2015; Kanguru et al. 2014; Kankeu et al. 2013; Lim et al. 2014; Tolu Oni and Unwin 2015). Populations in the region are suffering from conditions which were once considered rare including cancers, diabetes, heart conditions and stroke. Diagnosis and treatment of NCD is a challenge in most developing countries as these require skills, equipment, medicines and care most of which are lacking in these regions (Elamin et al. 2015; Geissler and Leatherman 2015; Monroe et al. 1992; Vineis and Wild 2014). Even after diagnosis, treatment of some NCD can be costly requiring a change in dietary needs and long-term prophylaxis, which is costly especially for the poor population. Non-communicable diseases have further increased the strain on livelihoods and quality of life in a region already carrying the burden of infectious diseases (ID). Lack of adequate treatment in some developing countries forces people to go and seek treatment in countries where this is available. This comes with enormous expenses that only those who have the resources can afford this venture (Burniston et al. 2015; Chuma et al. 2007;

Coleman et al. 2014; Geissler and Leatherman 2015; Kanguru et al. 2014; Kankeu et al. 2013; Monroe et al. 1992).

The interaction of both ID and NCD have further complicated public health problems in developing countries (Oni and Unwin 2015). The burden of ID is enormous including the rise in emerging infectious diseases (EID). It is in this regard that this book will focus on ID. Furthermore the author has in-depth knowledge of Malawi, a developing country in south-eastern Africa; therefore some references will be made to this country in the book.

1.1.2 Infectious Diseases and Livelihoods

The livelihoods of populations in developing countries are determined by their health status and economic status which in turn determines their social status in their respective communities. Livelihood is a source of income, and loss of it could lead to poverty. Health status affects the ability of an individual to carry out their livelihood, affecting their source of income. Poor health can lead to poverty through loss of livelihood and income (Fig. 1.1), and loss of livelihood can adversely affect

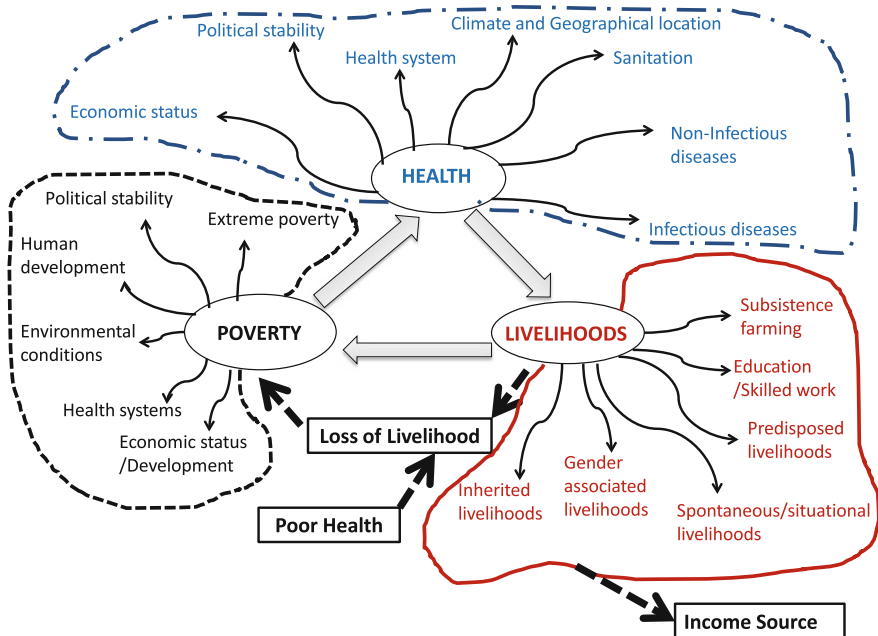


Fig. 1.1 Linking poverty health and livelihoods. Health, poverty and livelihoods are the three major factors that affect rural populations in developing countries; the determinants of poverty, health and livelihoods are indicated (black solid arrows); the dashed arrows show indicators that affect livelihoods (loss of livelihood) and health (poor health) leading to poverty

health through increased poverty. It is in the context of this potentially vicious cycle that this book takes a look at developing countries and how ID and livelihoods affect each other in poor rural communities.

In the past, efforts have been made to control many ID, but unfortunately community involvement has always been left out until the last minute, when an epidemic has hit or when there is an outbreak. Once the disease has been brought under control it is all forgotten. There is therefore need for continuity in community involvement to achieve effective control of zoonoses and infectious diseases. Raising awareness in the communities in high risk regions about disease prevention, epidemiology, and control could assist in reducing the disease burden. Involving the community in disease prevention and control strategies not only disseminates the important information regarding the disease but also a sense of ownership and responsibility. Often poor communities are treated as entities, where researchers, governments, NGOs and support organizations come and implement their ideologies without thorough engagement of communities. When these organizations leave upon completion of their projects, people go back to their usual habits and practices that put them at risk of disease. Due to poverty, poor communities are lured into projects and campaigns through handouts and other complements that are associated with their participation in the projects. This behaviour serves the interests of organizations conducting the projects to accomplish data collection or spend donor funding, but may have short-lived benefits for the communities. So how do we ensure that communities understand the risks of ID that are associated with their livelihood and lifestyle? Getting the communities involved from the beginning and helping these communities understand the diseases that surround them and the risks that their habits and livelihoods pose with regard to disease is one step towards disease prevention. Building up a knowledge base and setting up infrastructure to combat infectious disease prevention and control improves community awareness. When communities are aware of the dangers and ways of preventing them, and are included as part of the solution, it is more likely that they will be willing to participate. Imposing strategies on communities without proper disclosure shows lack of respect to their rights and traditions, and most are unwilling to participate.

1.2 Emerging Infectious Diseases (EID) and Neglected Tropical Diseases (NTD)

Between the years 1940 and 2004, over 300 emerging human ID have been reported worldwide (Jones et al. 2008). Sixty percent of these diseases are zoonotic, that is, transmitted from animals to humans mostly from wildlife; 54 % are caused by bacteria and/or rickettsiae (Jones et al. 2008).

Infectious diseases have resulted in high mortality and morbidity in developing countries (Cutler et al. 2010; Feasey et al. 2010; Hotez and Kamath 2009; Mackey

et al. 2014). Most of the affected populations live in rural areas with very minimal resources but at high risk of ID due to their surrounding and livelihoods.

Infectious diseases are caused by microorganisms that are found in the environment; these include soil, water, decomposing material, food, and body excretions such as urine and faeces from humans and animals. These microorganisms comprise of bacteria, viruses, fungi and parasites which upon entering the human body can cause disease.

Infectious diseases have always existed in the history of mankind, but with time, new ID have started to appear and on certain occasions, diseases that were once very rare are now rapidly developing. This has led to what are known as emerging diseases. According to the World Health Organization (WHO) “an emerging disease is one that has appeared in a population for the first time, or that may have existed previously but is rapidly increasing in incidence or geographic range”.

1.2.1 Emerging Infectious Diseases

Emerging infectious diseases (EID) have caused a significant impact on global health (Binder et al. 1999; Morens et al. 2010). These diseases are major causes of death, disability, and social and economic disruption for millions of people (Binder et al. 1999; Morens et al. 2010). Bacteria and Rickettsia are responsible for 53.4 %, protozoa 10.7 %, fungi 6.3 % and helminths 3.3 % of the known EID (Jones et al. 2008). Despite the existence of preventive measures, many people, mostly those living in high risk areas, such as rural areas of developing countries, with minimal access to needed prevention methods and treatment, are greatly affected. The health impact and cost of ID on livelihoods in the affected regions is enormous, directly affecting households and communities. Some of the emerging infectious diseases affecting developing countries include; Ebola, HIV/AIDS and Influenza (Jones et al. 2008) (Table 1.1).

1.2.2 Infectious Diseases

Developing countries carry the huge burden of ID (Fig. 1.2). Almost all continents are affected by ID. Sub-Saharan Africa and South-East Asia have suffered a huge impact from EID caused by zoonotic pathogens from wildlife and vector-borne pathogens (Fig. 1.2). Between 1940 and 2004, over 60 % of these zoonotic EID events were caused by pathogens with a wildlife origin (Jones et al. 2008; Morens and Fauci 2012).

Home to millions of people, with a large population based in rural areas (UNDP/World Bank), tackling the issue of ID in sub-Saharan Africa and South-East Asia is of utmost importance. A rural community is typically comprised of people who depend on subsistence farming; with little income or limited income.

Table 1.1 Recent emerging and re-emerging infectious diseases (EID) in developing countries

Disease	First outbreak	Causative agent (pathogen)
Bubonic plague	Fourteenth century	Bacteria
Yellow fever	Eighteenth century	Virus
Dengue fever	1950s	Virus
Marburg haemorrhagic fever	1967	Virus
Hanta virus	1970s	Virus
Human monkeypox virus	1970	Virus
Ebola virus disease	1976	Virus
Multi-drug resistant Tuberculosis (MDR-TB)	1980s	Bacteria
HIV/AIDS	1983	Virus
Drug-resistant malaria	1990s	Parasite
Influenza A (H5N1)	1997	Virus
Nipah virus	1998	Virus
Severe Acute Respiratory Syndrome (SARS)	2002	Virus
Middle-East Respiratory Syndrome (MERS)	2012	Virus
Lassa fever	2014	Virus

Some of the emerging and re-emerging human infectious diseases that have caused disease outbreaks in developing countries in the past 30 years

These populations have their livelihood determined by their environment, social and economic factors. Rural populations usually have simple housing made from simple raw materials from their surrounding environment. Most of these populations lack resources such as clean water, schools, healthcare facilities and transport/communication facilities that are readily available in urban areas (Hartley 2004; Strasser 2003). Lack of these resources has put these populations at an even greater risk of EID.

The adverse impact of ID is most severe among poor populations, who have very few resources, lack knowledge in ID and have limited or no access to preventive tools and medications.

The recent Ebola outbreak in West Africa (2014) is evidence of the vulnerability of rural populations to EID and how lack of resources, knowledge, and poor response and management of an infectious disease can result in a major disease outbreak and a global threat. This outbreak started in one country but spread to four more countries putting the global population at risk. To prevent the spread of the disease, schools, some hospitals and public places were closed. The livelihoods and productivity of the affected countries were greatly affected.

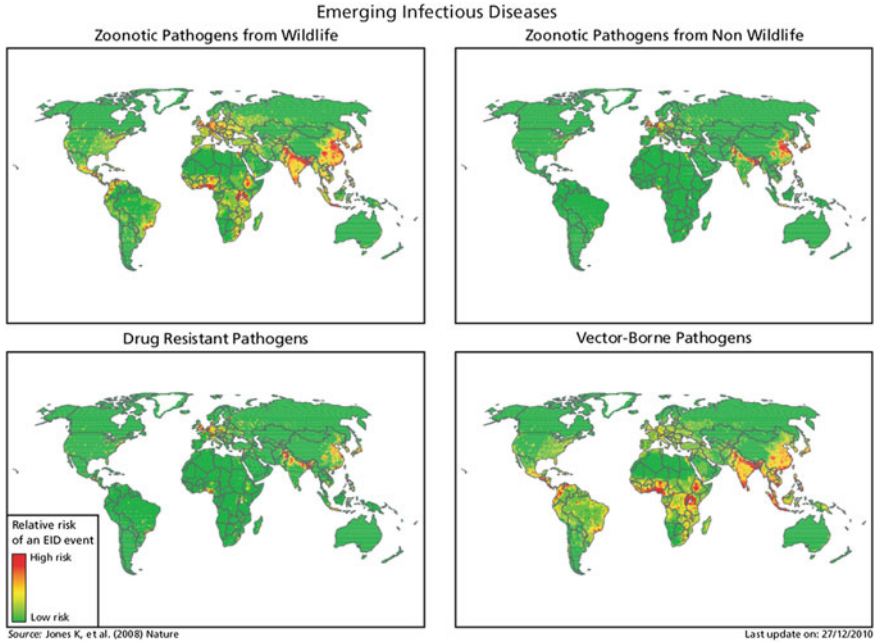


Fig. 1.2 Emerging infectious diseases. A global map showing the relative risk of EID events worldwide, all the continents except Australia contain regions where there is high, medium and low risk of zoonotic diseases from wildlife, with South-East Asia, sub-Saharan Africa and South America having pockets of high risk in regions where there are tropical rain forests; A similar pattern is observed with vector-borne diseases; Parts of Asia, Europe and North America are at risk of zoonotic diseases from non-wildlife; Drug resistant pathogens have emerged with high risk in South-East Asia, and Europe with pockets in sub-Saharan Africa and the Americas

Chronic ID such as HIV/AIDS and tuberculosis have affected productivity and sustainability of rural communities and their livelihoods. People infected with one infectious disease become more susceptible to other ID (Farmer 2013; O'Connor et al. 2006; Shaw et al. 2009). For example, people living with HIV/AIDS are more likely to become ill from tuberculosis or malaria, pneumonia, diarrhoea or any other opportunistic infection.

With nearly 15 million people dying each year due to ID, most of them living in developing countries, there is need to find solutions to prevent and tackle ID in these communities (Finnegan et al. 2004; Miller and Sentz 2006). With availability of the necessary interventions and resources, ID are preventable and some of them treatable (Brenzel et al. 2006; Miller and Sentz 2006). With children particularly vulnerable to ID, there is need to find solutions to prevent child mortality from occurring especially from preventable and treatable causes. Pneumonia, diarrhoea and malaria are the leading causes of mortality among children under 5 years of age.

1.2.3 Neglected Tropical Diseases

Affecting more than 1 billion of the world's population, NTD are a group of ID that are endemic in the poorest regions of the world. Because these diseases affect the poorest and marginalized populations, they are neglected by the rest of the world and as a result, the poor suffer debilitating effects and die from these diseases. WHO has prioritized 17 NTD which are endemic in 149 countries (WHO|World Health Organization, n.d.) (Table 1.2).

Table 1.2 Neglected tropical diseases

Disease	Causative agent	Number of cases per year	Population affected	Country/region affected as of 2013
Buruli ulcer	Mycobacterium ulcerans	6000	Children under 15 years of age	15–33 countries
Leprosy (hansen Disease)	Mycobacterium leprae	189,018 cases in 2013	All ages	115 countries with endemicity in Angola, Brazil, Central African Republic, India, Madagascar, Nepal, Tanzania and previously the Democratic Republic of Congo and Mozambique
Trachoma	Chlamydia trachomatis	At least 2.2 million people	All ages but common in pre-school children	53 countries, Africa, Asia, Central and South America, Australia and Middle East
Yaws	Treponema pallidum, T. pertenu	Approximately 460,000 cases	Mostly children under 15 years of age (75 %)	Poor communities in humid tropical regions of Africa, Asia, Latin America and Western Pacific
Cysticercosis/ Taeniasis	Taenia solium, T. saginata	50 million cases of epilepsy worldwide linked to neurocystercosis	All ages	Worldwide
			All ages	

(continued)

Table 1.2 (continued)

Disease	Causative agent	Number of cases per year	Population affected	Country/region affected as of 2013
Dracunculiasis (guinea worm disease)	Guinea worm larvae, <i>Dracunculus medinensis</i>	148 cases in 2013		4 endemic countries in Africa, Chad, Ethiopia and South Sudan as of 2014
Echinococcosis	<i>Echinococcus granulosus</i> , <i>E. multilocularis</i>	>1 million	All ages	Rural regions of endemic areas, Mediterranean region, North Africa, South and Eastern Europe, Southern tip of South America, Central Asia, and Western China
Foodborne Trematodiasis	Flat worms (Flukes), <i>Clonorchis</i> spp., <i>Opisthorchis</i> spp., <i>Fasciola</i> spp., <i>Paragonimus</i> spp	At least 40 million	All ages	70 countries in East and South East Asia, Central and South America
Lymphatic Filariasis/ Elephantiasis	<i>Wuchereria bancrofti</i> , <i>W. Brugia malayi</i> , <i>W. Brugia timori</i>	120 million	All ages	South East Asia and Africa region
Onchocerciasis (river blindness)	Filarial worm, <i>onchocerca volvulus</i>	17.7 million	All ages	37 countries in Sub-Saharan Africa
Schistosomiasis	<i>Schistosoma haematobium</i> , <i>S. guinensis</i> , <i>S. intercalatum</i> , <i>S. mansoni</i> , <i>S. japonicum</i> , <i>S. mekongi</i>	240 million	All ages	Sub-Saharan Africa
Soil transmitted helminthiasis	Round worm (<i>Ascaris lumbricoides</i>)	Millions of children	Mostly children	Tropical and sub-tropical regions
	Whip worm (<i>Trichuris trichuria</i>)			
	Hook worm (<i>Necator americanus</i> , <i>Ancylostoma duodenale</i>)			

(continued)

Table 1.2 (continued)

Disease	Causative agent	Number of cases per year	Population affected	Country/region affected as of 2013
Chagas disease	Trypanosoma cruzi	6–7 million people infected Worldwide		Mostly in Latin America
Human trypanosomiasis (African sleeping sickness)	Trypanosoma brucei gambiense	Below 10,000	All ages	Most of Sub-Saharan Africa
Leishmaniasis	Leishmania	1.3 million cases with 20,000 deaths	All ages	Highly endemic in the India sub-continent, East Africa, the Americas, the Mediterranean basin, Middle East and Central Asia
Dengue and chikungunya	Arbovirus	50–100 million infections	All ages	Endemic in 100 countries in Asia, Africa, the Pacific, the Americas and the Caribbean regions
Rabies	Lyssavirus	Tens of thousands die annually from rabies	All ages	All continents and territories except Antarctica

Seventeen NTD prioritized by WHO; the diseases, causative agent, number of people and populations affected and regions and territories where the diseases are common are shown. The NTD are common in the poorest parts of the world including sub-Saharan Africa and Asia

1.3 Recent Advances Against Infectious Diseases

Since the year 2000 many countries in sub-Saharan Africa and those affected by infectious diseases have worked towards achieving millennium development goals set up to tackle hunger, extreme poverty and deadly but treatable diseases in the next 15 years. These 15 years have now passed and some achievements have been made on the millennium development goals that were set up. The sixth Millennium Development Goal (MDG) focused on stopping and reversing the spread of ID and so far has shown some regional accomplishments, including:

- Over 90 % reduction in deaths resulting from measles in Africa and the Eastern Mediterranean between the year 2000 and 2008;
- In South-East Asia, an increase in successfully treated tuberculosis cases from 33 to 88 % between 1995 and 2007;

- A near eradication of polio and guinea worm disease and lower prevalence of several other tropical diseases over the past few decades has also been achieved (WHO|Millennium Development Goals (MDGs), n.d.).

Availability of donor funding for some of the neglected tropical ID has brought renewed interest in the research and development of new diagnostics, vaccines and drug treatments. These efforts are commendable and have led to advances in reducing the incidence of some ID. But there is still a gap between the developed world, which designs most of the preventive measures as well as the diagnostic tools for ID and the developing countries which are highly affected by these ID. This book will address how ID and rural livelihoods affect each other in developing countries.

1.4 Diseases and Livelihoods

1.4.1 *Consumption of Wild Meat and Risk of Zoonotic Diseases*

Rural livelihoods include farming, hunting, gathering and other non-farm activities such as artisan work and trading. While carrying out these livelihoods, interaction between people and animals puts the affected populations at risk of zoonotic diseases (Progress and challenges in controlling neglected zoonotic diseases 2015, WHO|Diseases, n.d., Zoonotic Diseases|One Health|CDC, n.d.). In many parts of Africa, Asia and the Pacific wild animals are part of the diet especially in the rural areas where people can still hunt and eat bush meat. Hunting is a livelihood and can be part of a tribal tradition passed on from generation to generation. Hunting brings people into close proximity with wild animals posing a high risk of contracting zoonotic diseases. For those populations where hunting is not part of their livelihood; livestock herders as well as farmers who from time to time go into the forests to find pasture and clear land for agriculture may also come into contact with wild animal habitats, putting them at risk of zoonotic diseases.

In most developing countries, wild meat is seldom tested by veterinary personnel for diseases before consumption. It is very difficult to track the source of an EID, especially if different wild animals are slaughtered and consumed on a regular basis. Without records, it is very difficult to track the actual source of possible zoonoses. The preparation and consumption of the meat also differs from place to place. Some people drink the blood of the animals, others boil it, and others yet consume the internal organs of the animals including the intestines and the stomachs. The meat, blood, intestines and other internal organs are a source of bacteria, viruses and other parasites that could result in zoonoses. This puts at risk those handling the carcass, the people using the hide, those preparing the meat as well as those that consume the meat.

Chickens, other domestic fowls and domesticated animals are usually reared using a free range system in most developing countries. The domesticated animals are released to feed in the surrounding environment. This poses a potential source

of zoonotic diseases as there is a high likelihood that these domesticated animals may come into contact with wild animals and contract infectious pathogens, which could possibly be transmitted to humans. Due to the increase in incidence of zoonotic diseases around the world, efforts have been made and are still being made to control the diseases (Morens and Fauci 2012).

Since zoonoses involve both humans and animals, efforts to control the diseases require working both with the health and veterinary sector. In as much as these two sectors have to work hand in hand, there is another very important aspect that we also have to consider in order to control these diseases—the communities involved.

With zoonoses being spread from animals to humans through meat, animal products and animal excreta from both wild and domesticated animals, it is very important to understand the livelihood of people who live in close proximity with wild and domesticated animals. These include; farmers, people who live within or in close proximity with rainforests, people working in abattoirs, cattle herders, bush hunters, park rangers, zoo keepers—the list is endless. The populations that consume the meat and meat products are equally at risk.

1.4.2 Food, Water, Sanitation and Risk of Diseases

Infections resulting from consumption of food and or water contaminated by disease causing agents such as bacteria, fungi and parasites are closely associated with livelihoods and the environment.

Trematodes: Diseases can be a result of consumption of food contaminated by certain stages of the disease causing pathogen. Larval stages of the trematodes develop in the human body where the adult worms emerge. Transmission of flatworms or trematodes has been associated with human behaviour patterns such as food preparation. In regions where consumption of raw fish, crustaceans and/or plants is part of their diet, the disease is sustained and can spread within the community (WHO|Foodborne trematode infections, n.d.).

Schistosomiasis: Another trematode infection associated with contaminated water is Schistosomiasis, which is prevalent in poor communities of tropical and sub-tropical countries. People who spend a lot of time in water for example fishermen, women carrying out their daily chores, and people (especially children) swimming in contaminated water are at risk of catching the disease. The *cercariae* stage of the parasite is free swimming, therefore it can penetrate through the skin and develop into mature stages in the human host. This is one example where a livelihood can put individuals at risk of ID. Schistosomiasis affects millions in endemic regions (WHO|Schistosomiasis, n.d.).

Roundworms: The lack of basic sanitary facilities such as toilets has led to practices such as open defecation. Roundworm eggs are passed out through faeces of infected individuals. This results in the soil being contaminated by the eggs which can then be transmitted to other people who come into contact with the contaminated soil (WHO|Soil-transmitted helminths, n.d.).

Sleeping sickness: In Africa, people living in rural areas in close proximity to tsetse flies are at risk of human sleeping sickness, a disease caused by a parasite that is carried by tsetse flies of the genus *Glossina*. The parasite is introduced into humans after a bite from the flies. People come into contact with the flies as they carry out their livelihoods such as farming, herding animals and hunting. Since the rural populations depend on these livelihoods to raise income, they are continually at risk of the disease. Sleeping sickness can also be transmitted from mother to child in pregnant women as the parasite can cross the placenta (CDC—African Trypanosomiasis—Biology, n.d., WHO|Trypanosomiasis, human African (sleeping sickness), n.d.; Simarro et al. 2011).

1.4.3 Steps in Community Involvement

Step 1: Surveillance

Understanding the livelihoods, habits and the traditions of communities can help to address important health problems. This understanding can be achieved through open discussions with the community and surveillance of their surroundings, including surveillance of food sources and sanitation facilities and inspection of slaughter areas for both wild and domesticated animals. A mechanism for testing meat for diseases before it is consumed can reduce human infections—but few rural communities have such facilities.

Step 2: Background knowledge

Knowledge and understanding of a community's history can assist in designing strategies for disease control for that community. This includes understanding the origins of their food processing and storage habits. Background knowledge can also be used as a primary screening process for possible sources of ID that can be perpetuated through their livelihoods and the methods of food processing used in the community and or village

Step 3: Sanitation

Poor sanitation is a major source of infections. Understanding the sanitary procedures of a community can help in designing strategies to prevent NTD and EID. Sanitation here includes disposal of waste, animal remains, proximity of people to their livestock, management of livestock and exposure to animal excreta, cleanliness of their surroundings, availability of safe water, toilets and appropriate waste disposal methods. Proper training in sanitation, food and water handling, waste management, handling of animal carcasses and meat, proper disposal of animal waste and management of slaughter houses is needed. It is significant to stress why these strategies are being put forward and how they will benefit the families and communities.

Early community involvement provides the required knowledge to prevent EID. Teaching the community the signs to look for with regard to potential ID can be the first step to disease prevention and control.

From these three steps outlined above, community involvement even before the onslaught of and informing the community prior to the outbreak of diseases and offering the necessary training and advice to avoid the spread of the diseases is critical. Community leaders are an important link between health/veterinary experts and the entire community. Understanding hierarchies within the communities is one strategy in communicating with communities, especially in rural areas.

1.4.4 Success Stories on Community Involvement

1.4.4.1 The HIV/AIDS Story

HIV/AIDS-related stigma and discrimination is described as prejudice, negative attitudes, abuse and maltreatment directed at people living with HIV and AIDS (Mahajan et al. 2008).

Different societies and cultures have shown varying levels of stigma and discrimination and these in turn have instilled fear in people being discriminated against. This fear has resulted in people running away from knowing their HIV status and not disclosing their HIV status if they know it.

Governments and non-governmental organizations are working hand in hand with most developing countries especially in sub-Saharan to raise awareness about the disease.

In the beginning it was not easy to break the cultural barriers and talk about issues concerning sexuality which are considered taboo in most of these cultures (South Africa: Who Goes to the Public Sector for Voluntary HIV/AIDS Counselling and Testing 2005). But as the disease claimed more lives and infections increased, people resorted to opening up and bringing the truth about HIV/AIDS into the open. Churches and religious leaders were at the forefront explaining the dangers of HIV/AIDS and the availability of medications that would help in prolonging lives. As these statements were made in public during funerals and public gatherings, people saw and understood the effects the disease had brought in their community, and attitudes started changing. The communities started opening up, families started opening up about their HIV status, and more people started going to clinics and hospitals for HIV testing. It has taken over two decades to reach this level of understanding. HIV/AIDS has created thousands of orphans in Africa and communities are working hard to bring awareness of the disease to both young and old. For example, in Malawi, children in primary school (between the ages of 5 and 12) and in secondary school (12–18 years of age) are taught about the dangers of HIV/AIDS and how they can contract it as well as avoid infection. In the rural areas, health personnel and social workers are working hard to raise awareness on HIV/AIDS.

But how has this awareness affected the issues of stigma and discrimination in these societies?

In South Africa the fear of stigma, lack of confidence in health workers, culture and tradition are some of the issues affecting the voluntary HIV testing (South Africa: Who Goes to the Public Sector for Voluntary HIV/AIDS Counselling and Testing 2005).

Uganda was badly hit by the pandemic but the country embarked on an extensive HIV/AIDS awareness campaign which showed remarkable results in the local society, its perception of the disease as well as stigma and discrimination (Allen and Heald 2004; Parkhurst 2002).

In Malawi, people are now more open to talk about their HIV status than two decades ago. They are open to tell their friends and family members to go for HIV testing if they suspect they have the disease. Nevertheless, there are still some people who are not aware of their HIV status. Even though they may see all the symptoms of HIV/AIDS they still refuse to be tested. Some are aware of their HIV status and choose to be promiscuous in order to spread the disease. A study in Botswana showed that stigmatizing attitudes lessened 3 years after the introduction of the national programme providing access to treatment. A reduction in stigma was also observed in Tanzania with the introduction of the antiretroviral treatment (ART) (Allen and Heald 2004).

The Secretary General of the UN, Ban Ki Moon said “Stigma remains a single most important barrier to public action. It is a main reason why too many people are afraid to see a doctor to determine whether they have the disease, or to seek treatment if so. It helps make AIDS the silent killer, because people fear social disgrace, of speaking about it, or taking easily available precautions. Stigma is a chief reason why the AIDS epidemic continues to devastate societies around the world.”

So can stigma be conquered? The answer lies with each and every one of us. To fight the HIV/AIDS pandemic, there is need to work together against stigma and discrimination.

1.5 Conclusion

Livelihoods are a source of income in most parts of the world. Infectious diseases pose a huge threat to health and livelihoods with enormous impacts on poor households and communities. Infectious diseases directly affect productivity and sustainability of livelihoods in poor rural communities with millions dying each year. Among these ID are zoonotic diseases which comprise most of the EID. Affecting both the consumers and those in close proximity with animals, there is need for collaboration between the health and veterinary sectors to prevent and control the spread of zoonotic diseases. Setting up infrastructure and develop a knowledge base within populations in developing countries regarding infectious disease control and prevention is needed to achieve long-term solutions. The risk of NTD and EID is ever present. Livelihoods expose individuals to diverse infectious disease-causing microorganisms which puts the human population at risk of these diseases.

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