Reducing the ‘Neglect’ in Neglected Tropical Diseases: A Review of the Debate surrounding the Effectiveness of Mass Deworming – A Case Study of Kenya –

Kim Brigitzer

Source: Kenya Connect (2015)
Abstract

Neglected tropical diseases are parasitic and bacterial diseases mainly prevalent in developing countries affecting people living in poverty. The World Health Organization’s human rights-based approach emphasizes the “prevention, control, elimination and eradication of neglected tropical diseases” through the use of preventative chemotherapy, such as the mass administration of deworming drugs to improve people’s health.

This research paper will take a deeper look at how WHO has been communicating NTDs to make them less ‘neglected’ and how the NTD discourse has been shaping development organizations’ action. In addition, it aims to investigate how successful mass deworming has really been in terms of the recent debate.

This study is using a combination of a discourse analysis and qualitative interviews in order to investigate how the NTD discourse and recent initiatives by international organizations have contributed to making NTDs less neglected. It deconstructs representations of the ‘Other’ – the superiority of the ‘West’ over the ‘Rest’ – in relation to the NTD discourse and its inherent power structures. Discourses are analyzed to identify power relations between governments, development organizations, pharmaceutical industries, and recipients of deworming drugs as part of Kenya’s 2013 deworming campaign.

The results showed that the NTD discourse has helped raise awareness for NTDs. NTDs and their debilitating effect on populations have been better and more widely communicated, making them less ‘neglected’. WHO and other development organizations’ actions have contributed to making NTDs more visible and have given NTDs higher priority on the global health agenda. Findings from this research study revealed that the ongoing debate has not had a negative impact on international funding. More research and development of a vaccine against NTDs is needed to find more ways to tackle these devastating diseases.

Key words: Kenya, Neglected tropical diseases, NTD discourse, mass deworming, soil-transmitted helminths, the ‘Other’, World Health Organization
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**Abbreviations**

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<tr>
<td>ComDev</td>
<td>Communication for Development</td>
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<td>FDA</td>
<td>Food and Drug Administration</td>
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<td>GSK</td>
<td>GlaxoSmithKline</td>
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<td>HFA</td>
<td>Health for All</td>
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<td>KEMRI</td>
<td>Kenya Medical Research Institute</td>
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<td>LSHTM</td>
<td>London School of Hygiene and Tropical Medicine</td>
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<td>MDA</td>
<td>Mass Drug Administration</td>
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<td>MDG</td>
<td>Millennium Development Goal</td>
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<td>NTDs</td>
<td>Neglected Tropical Diseases</td>
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<td>R&amp;D</td>
<td>Research &amp; Development</td>
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<td>SBD</td>
<td>School-based Deworming Program</td>
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<td>SDG</td>
<td>Sustainable Development Goal</td>
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<td>STH</td>
<td>Soil-Transmitted Helminths</td>
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<td>United Nations Children’s Fund</td>
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<td>WHO</td>
<td>World Health Organization</td>
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“More than 1 billion people – a sixth of the world’s population – suffer from one or more neglected tropical diseases”

– Dr. Lorenzo Savioli, Director, WHO Department of Control of NTD

1. Introduction
Neglected tropical diseases (NTDs) such as dengue, rabies, sleeping sickness, and leprosy kill approximately 534,000 people worldwide each year (WHO, 2015). These vastly prevalent parasitic and bacterial diseases are mainly existent in developing countries affecting people living in poverty. Developing countries’ lack of access to clean drinking water, sanitation, and health facilities are issues connected to poverty. The physical, psychosocial, and economic situation endorses parasitic and bacterial infections and is controlled by climatic conditions (NTDO). Neglected tropical diseases are regarded as being a problem of poor or developing countries.

“African Region bears about half of the global burden of NTDs, which have a great economic impact and contribute to maintain populations in poverty.” (WHO African Conference, 2014, p. 3).

Social marginalization and inequalities in resources are inherently linked to poverty, making the poorest, most marginalized populations of the developing world most vulnerable to NTDs. Hence, populations in Latin America, Asia, and Sub-Saharan Africa are most affected by NTDs. Resources are vital to well-being, and the lack of access to public health and public utilities may be as harmful to a person’s life chances as inadequate nutrition (Toye, 2010, p. 46).

NTDs are not just a health concern in developing countries but do have a counterpart in developed countries where they are referred to as ‘neglected infections of poverty’ since they occur outside of tropical regions (Hotez, 2008, p. 1). As a result of hot summer temperatures, travelling, immigration, and food imports, NTDs are also present in developed countries – such as the southern
United States – but have not received as much attention as in developing countries.

1.1 Relevance of the Research Topic:

These diseases have an enormous impact on people’s lives. They not only decrease people’s quality of life, but they can add to a loss of productivity and increased poverty. To better deal with global health issues, the United Nations created the World Health Organization (WHO) in 1948 with the power to pass treaties and regulations on public health that, once adopted, apply to all WHO member countries (Pinto & Upshur, 2013, p. 60). Over the past decades, international attention had been more focused on the ‘big three’ global infectious diseases – HIV/AIDS, malaria, and tuberculosis (Mantilla, 2011, p. 118). In order to address other chronically endemic tropical diseases, the United Nations adopted the Millennium Development Goals (MDGs) in 2000 aimed at attaining eight international development goals, ranging from eradicating poverty and diseases to achieving primary education and maternal health (United Nations). MDG #6 targets “HIV/AIDS, malaria, and other diseases” – such as NTDs. As the MDGs are coming to an end in 2015, a new set of ‘Sustainable Development Goals’ (SDGs) will begin to further emphasize poverty reduction, gender equality, human and economic development, in addition to focusing on food security and environment issues (Hotez & Herricks, 2015, p. 1). With these SDGs, the international community has further recognized the importance of addressing NTDs. Specifically, SDG #3 aims to “end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases” by the year 2030 (Third WHO report on NTDs, 2015, p. 13).

The topic is relevant in the field of Communication for Development as NTDs have tremendous health implications, such as blinding and disfiguring effects, and have been lacking global attention as well as adequate funding. With the implementation of the MDGs, international organizations formally recognized the significance of addressing NTDs. This collective action against the diseases aimed at achieving the MDGs provided an important milestone in the field of
Communication for Development. Putting these forgotten diseases on the global health agenda and tackling them together will foster development.

1.2 Research Aim & Objectives:

My interest in this research topic stems from a personal interest in health discussions, in particular from reading about the recent debate on deworming earlier in 2015. There is a need and potential benefit in exploring the importance of deworming in relation to improving the lives and health of the poorest populations in the world. This study will research how NTDs that have been neglected for so many years – and not only in the developing world – have been made more visible and will further explore the NTD discourse and the broader context within ‘Communication for Development’ (ComDev) literature. ‘Communication for Development’ is concerned with how communication is used to generate new knowledge and consensus in order to facilitate change (Mefalopulos, 2008, p. xi). Large institutions have made the discourse of NTDs substantial through reports and books. By effectively communicating for development, organizations have been promoting social change.

This research seeks to attain information on the epidemiology of neglected tropical diseases within the field of public health. In this study, I seek to critically examine the practices and reasons for making NTDs less neglected by using the NTD discourse as a tool to improve development organizations’ action against NTDs. A discourse analysis will be used to understand the power relations between governments, development organizations, pharmaceutical companies, and recipients of deworming drugs. This research further aims to construct, from interview data and other empirical evidence, an academically informed case study that investigates the debate about the effectiveness of mass deworming. As preventative chemotherapy – the mass administration of deworming drugs – has provided a cost-effective way of efficiently treating a large population at once, this study will have a specific focus on school-based mass deworming campaigns in Kenya for its case study. To further narrow down the scope of the research, it will specifically look at the World Health Organization’s mass deworming campaign conducted in 2013 in Kenya.
To focus on the ComDev perspective, this research will look into how the effectiveness of mass deworming has been communicated to the national and international community via WHO and Kenya’s Ministry of Health reports. This research paper will look at reports produced by WHO on its recent deworming campaigns in Kenya, as well as the 2013-2014 report and a ‘National Worm Control’ handout from Kenya’s Ministry of Health. In addition, an interview conducted with a public health specialist at WHO will provide more detail on the effectiveness of the 2013 deworming campaign.

The purpose of this research is to contribute to the existing academic research on NTDs. Research questions as well as theories discussed in the literature review contributed to determining interview questions.

1.3 Research Questions:

This research paper will investigate how recent initiatives by international organizations have contributed to tackling neglected tropical diseases to improve the health of those affected.

This research seeks to determine:

- How has WHO been communicating NTDs to make them less ‘neglected’?
- How successful has deworming really been in terms of the recent debate?
- How has the NTD discourse been shaping development organizations’ action?

1.4 Context of the Research:

1.4.1 Research Limitations

This study has been conducted within a four-month period which restricted the number of people who could be interviewed. Research is limited to NTDs and deworming and focuses on only one country (Kenya) for the case study. Due to the researcher living in Canada and time constraints, it was not feasible to conduct field research and interviews with Kenyans/recipient of the deworming drugs. This study will therefore focus on interviewees working for development organizations as well as academics working within the field to get an idea of
how the NTD discourse has shaped development organizations’ action rather than investigating how treatment has improved people’s lives.

This research will refer to statements made by interviewees for its analysis without including the personal opinion of the researcher to avoid a possible bias. Empirical data from qualitative interviews include personal opinions and are not necessarily representative of the entire organization in which they are employed. In addition to personal interviews, the study focuses on published and peer-reviewed materials. Published materials carry a risk of selective reporting bias which may have influenced the reliability of the evidence available. The findings of this research project will not be generalizable and empirical data is not representative of all deworming initiatives.

1.4.2 Research Outline
This research aims to conduct a theoretically-informed study using the mixed-method approach of qualitative interviews and discourse analysis. The degree project is structured in seven chapters. In addition to an introduction and a background on Millennium Development Goals, the first chapter introduces the concept of neglected tropical diseases. Chapter two provides some background information on NTDs and the case study. Chapter three aims to provide more information on previous research conducted in the field to better provide an overview of the topic. The literature review reveals existing topics and previous discussions. Chapter four introduces the theoretical and methodological frameworks and explains the methods used – a combination of qualitative interviews and a discourse analysis. Chapter five uses a discourse analysis to examine feedback provided during the interviews in relation to power asymmetries and the broader concepts of the NTD discourse and the ‘Other’. Chapter six provides a summary of the findings in terms of answering the research questions. Chapter seven states further research suggested as well as concluding remarks, with references and appendices thereafter.

1.4.3 Core Theories
Health is a fundamental human right and all humans should have the right to treatment of their illnesses. As maximization of health and quality of life has become almost essential throughout the twentieth century and into our own, recent efforts by international organizations aim at helping developing countries
tackle NTDs. Rather than fighting a single disease on its own, which has received limited responsiveness in the past, coining the NTD discourse within the field of public health is an expression of such collective action.

Since the majority of scholars refer to the concept of NTDs, discourse plays an important role in this research, therefore this study draws on discourse studies as they construct and interpret social reality. Foucault defines discourse as producing knowledge about a certain topic at a given historical moment and emphasizes that nothing has meaning outside discourse (Hall, 2013, p. 29). This research project will therefore refer to the social constructionist theory to show the extent to which power is utilized.

In order to establish power relations within the discourse, the study will draw on the superiority of the ‘West’ over the ‘East’ or the ‘Other’, which developed from the colonial system. Dating back to the history of colonialism and slavery, people in developing countries are seen as the ‘Other’ – subordinates of developed countries. These stereotypes still exist and can be seen in the relationship between developing and developed countries in terms of distribution of resources and medical interventions. Easterly (2007) claims that a rapid shift from colonialism to foreign aid took place as a result of “the White Man’s Burden” – the West’s notion that ‘we’ were the chosen ones to save the ‘Rest’ (p. 23). He further noted that as part of post-colonialism, the West changed the racist terminologies of ‘uncivilized’ people to ‘underdeveloped’ and called its initiative of transforming the ‘Rest’ foreign aid (ibid, p. 24). This will help explain the attitudes and differences between western countries and developing countries in how positions of power are being reinforced over the ‘Other’.

2. Background Information

2.1 Defining Neglected Tropical Diseases:

According to WHO, approximately 2 billion people worldwide are infected with soil-transmitted helminths, which includes 600 million school-age children (WHO 2015). Neglected tropical diseases are part of infectious diseases that encompass traditional parasites, such as helminths and protozoans. Roy
Anderson, a parasite ecologist, researched the nature of factors that influence host-parasite interactions (Esch, 2007, p. 204). Gerald Esch used Anderson’s work as the basis of his study on population ecology and invented the dichotomy of micro- and macroparasites, the latter referring to viruses and bacteria that multiply within the host (ibid, 2007, p. 205). Anderson and May (cited by Esch, 2007, p 208) argued in 1978 that three conditions need to be satisfied to classify an organism as parasitic – the host being utilized as a habitat, the presence of nutritional dependence, and the parasite causing ‘harm’ to its host.

It has since been well established that worms have a negative effect on children’s health, nutrition, and development. Research shows that NTDs are related to the adverse impact on both human and economic development, particularly for helminth (tapeworm) infections, schistosomiasis (trematode worm), and lymphatic filariasis (roundworm) (Hotez & Herricks, 2015, p. 1).

Infectious diseases such as HIV/AIDS, malaria, and tuberculosis have received lots of attention over the past couple of decades. These “big three” diseases, as they are referred to, are among the primary causes of death. Other infectious diseases that primarily cause disability are still widely being neglected, and until 2005, were still grouped under ‘other diseases’ under the MDGs. These neglected infectious diseases encompass 17 NTDs (see below) – some preventable and treatable – that are mainly found among the poorest populations of the world.

- Buruli ulcer
- Chagas disease
- Dengue and Chikungunya
- Dracunculiasis (guinea-worm disease)
- Echinococcosis
- Endemic treponematoses (Yaws)
- Foodborne trematodiases
- Human African trypanosomiasis (sleeping sickness)
- Leishmaniasis
- Leprosy (Hansen disease)
- Lymphatic filariasis
- Onchocerciasis (river blindness)
- Rabies
- Schistosomiasis
- Soil-transmitted helminthiases
- Taeniasis/Cysticercosis
- Trachoma

Source: WHO (2015)
2.1.1 Why NTDs?
During my travels, and through friends in South America, I have learned about the importance of treating NTDs by deworming. It is common in many countries with a high prevalence for worms and a lack of water sanitation systems to take deworming drugs once a year. In less industrialized countries, worms can be acquired when vegetables and fruit are washed with tap water in towns that lack water sanitation or when buying food from street vendors where parasite larvae might have contaminated the food. In the past few months, there has been an ongoing Twitter debate about the effectiveness of deworming. I found it interesting that NTDs are finally getting more attention and wanted to learn more about them. Contrary to the “big three” global infectious diseases everyone has heard of – HIV/AIDS, malaria, and tuberculosis – and that are more difficult to treat, NTDs are preventable and treatable. Soil-transmitted helminthiases (STH), or geohelminths, are also known as intestinal worms, including hookworm, pinworm, roundworm, and tapeworms, and fall under the group of NTDs recognized by WHO. The United Nations Children’s Fund (UNICEF) estimates that approximately 1.5 billion people have roundworms – accounting for the third most common human infection globally (UNICEF Report, 1998, p. 84). Five of those 17 recognized NTDs – geohelminth infection (intestinal worms), schistosomiasis (snail fever), lymphatic filariasis (elephantiasis), onchocerciasis (river blindness) and trachoma (bacterial infection of the eye) – can be successfully treated with deworming drugs. Treating other NTDs is just as important, however, the study of those NTDs is beyond the scope of this research. This research will therefore mainly focus on those five NTDs listed above and will in particular explore deworming as a treatment method.

2.1.2 Why deworming?
To improve public health, WHO’s human rights-based approach emphasizes the “prevention, control, elimination and eradication of neglected tropical diseases” through the use of preventative chemotherapy – the mass administration of deworming drugs (WHO, 2012, p. 3). The most common medicines used as part of this treatment are mebendazole and albendazole. Mass deworming is a cost-effective way to get rid of worms and is safe even for
those who are not infected (Evidence Action, 2015). Worms are associated with malnutrition, anaemia and growth impairments in children and impact economic productivity of the adult population by maintaining people in poverty. Since there has been a lot of effort over the past few years in administering school-based deworming campaigns, this study will be looking into the outcome of mass deworming initiatives as well as the ongoing debate about whether or not deworming does improve people’s health by reducing the chronic and debilitating pain they cause and increasing school attendance.

2.1.3 Why are NTDs being neglected?
Traditionally, there has been limited awareness of NTDs, partially due to a geographical prevalence of NTDs in rural centres. Many public health efforts, however, are now being conducted by policy makers in urban centres, where these diseases have been mostly eradicated and thus forgotten. In addition, NTDs do not cause major outbreaks such as Ebola and therefore have been receiving less public and media attention. When the World Health Organization, an international development organization, was first established, the initial aim was to extend health services to rural populations. At the 1978 World Health Assembly, WHO member states signed the ‘Alma Ata Declaration’ adopting the objective of ‘Health for All’ (HFA) with the aim to achieve global health, so that all people have the ability to lead a socially and economically productive life (WHO, 2015). Since endemic countries have limited resources to devote to health, WHO has been collaborating with other international aid agencies and donors in raising awareness to fight the various diseases. In recent years, international development organizations and pharmaceutical industries have shown an increased interest in making NTDs less neglected and improving the health and lives of those affected. With WHO’s policy change in 2005, the “status quo” has shifted and investment for the fight against NTDs has increased, but NTDs still have to compete with the ‘big three’ visible diseases. However, by coining the NTD discourse in 2005, WHO provided it with more power and meaning and hence more recognition and funding (Savioli, Montresor, & Gabrielli, 2011).
2.1.4 Creation of the NTD Discourse

Physical things and actions only take on meaning within the discourses about them (Foucault, cited by Hall, 1997, p. 45). That which is being said by a source endowed with authority has more meaning than statements of the marginalized (Foucault, cited by Rose, 2001, p. 158). Prior to the term ‘neglected tropical diseases’ being coined, each tropical disease was fought on its own with limited success. As part of a new strategic approach, WHO formally recognized the importance of NTDs as part of the global public health agenda. In 2005, at the WHO international workshop in Berlin, these endemic tropical diseases were formally rebranded into NTDs as part of an approach to secure strategic and technical guidance (Savioli et al., 2011). WHO Director-General Margaret Chan stated the reasons for having a catch-all term:

“When these diseases are viewed together, we gain critical mass. We get a better grip on the scale of the economic and social consequences as well as the health burdens. Arguments for giving these diseases higher priority become more powerful, more persuasive.” (M. Chan, WHO, 2007).

Since then, NTDs have received more recognition from governments, donors, pharmaceutical companies, and non-profits alike, and action to fight the disease has increased tremendously. Investments in drugs and vaccines by pharmaceutical companies have further contributed to that.

2.2 Neglected Infections of Poverty:

Neglected tropical diseases are usually associated with low income countries and tropical regions of Africa, Asia and Latin America; however, they can be found in any country with extreme poverty and a warm, tropical climate. NTDs are mainly affecting the poorest populations in the developing world. In developed countries, such as the United States, where they occur predominantly in the U.S.-Mexico borderlands, in people of color in the American South, and certain immigrant populations, they are being referred to as ‘neglected infections of poverty’ (Hotez, 2008, p. 1). In the United States, those major neglected infections encompass helminth infections, strongyloidiasis, ascariasis, toxocariasis, and cysticercosis, trichomoniasis, leptospirosis, Chagas disease, leishmaniasis, trench fever, dengue fever, cytomegalovirus (CMV), toxoplasmosis, and syphilis (ibid, 2008, p. 1).
Tropical and parasitic diseases have been brought over with immigration in the early 1900s, but since the 1930s, they are no longer endemic in the United States most likely due to urbanization and economic development. According to Hotez (2009, p. 1720), there have been no published reports of transmission of NTDs in the United States for at least three decades. However, increased globalization, migration, and trade have been encouraging the arrival of NTDs in industrialized countries, and having a tropical climate as well as hospitable demographics are contributing to them remaining (Nelson, 2014). These neglected infections of poverty are not well known to the health community. Due to this lack of knowledge about those diseases in the United States and other developed countries, people with infectious diseases of poverty and debilitating conditions are either being misdiagnosed or they do not receive adequate treatment. Hotez (cited by Nelson, 2014, p. 1) estimates that approximately 12 million Americans living in extreme poverty are infected with one or more NTDs.

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<td><strong>Disease</strong></td>
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<td>Toxocariasis</td>
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<td>Trachoma</td>
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<tr>
<td>Cystic echinococcosis</td>
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<tr>
<td>Trichinellosis</td>
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<td>Alveolar echinococcosis</td>
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Source: Hotez (2013)

2.3 Case Study:

2.3.1 Background on Kenya
This research will look at the case study of Kenya, a country where mass deworming campaigns have been administered over the past years. Kenya is situated on the eastern coast of the African continent. Kenya encountered a rapid population increase to 43 million over the past decades, with over 48% of the population being under the age of 18 (UNICEF, 2013). Due to tropical and
sub-tropical temperatures, the risk of attaining NTDs is high as the majority of the population is poor, lacking adequate footwear, sanitation, and proper water supply. WHO’s pro-poor and pro-active interventions aim to combat NTDs and contribute to achieving health-related MTDs (First WHO Report on NTDs, 2010, p. v).

2.3.2 Why Kenya?
The case study was selected among WHO’s current initiatives as one that has seen lots of engagement over recent years. Also, a very influential study conducted by Miguel and Kremer in the late 1990s was looking into the outcomes of deworming campaigns in Kenyan schools. They conducted randomized-controlled trials investigating improvements in health, nutrition, and school attendance after deworming and found positive effects of mass deworming on school attendance. Since the recent Twitter debate on deworming is based on that initial study, looking into Kenya as a case study seemed beneficial for the intent of this research project.

Deworming programs are joint efforts between development organizations and national governments. Over the past years, the Ministries of Education and Health in Kenya have been treating children as part of the national school-based deworming program. According to the national census of Kenya, the total number of school-aged children in 2008 was 10,624,380 with 82% of those attending school at the time (Kabaka & Kisia, 2011, p. 3). In 2008, a national fecal examination of 27,729 Kenyan school-aged children from 395 schools was conducted. From these tests it was estimated that approximately five million (56.8%) children were infected with intestinal parasitic worms, including soil-transmitted helminths and schistosomiasis (Kabaka & Kisia, 2011, p. 1). According to WHO guidelines, preventive chemotherapy, the mass distribution of anti-worm medicines, is applied to combat parasitic infections. Hence, 22,000 public primary schools were targeted in a nationwide school-based deworming program (WHO Regional Office for Africa, 2013, p. 1). The results below show that between 2013 and 2014, over 6 million children in Kenya had been successfully treated with deworming drugs for soil-transmitted helminths,
surpassing the national target of 5.7 million to be treated, while almost 900,000 children were treated for schistosomiasis, exceeding the goal of 600,000 children (Evidence Action, 2014).

3. Literature Review and Existing Research
Over the past months there has been considerable discussion on Twitter #wormwars on whether deworming has nutritional benefits and if, in fact, it increases school attendance. Academic papers published over the past century show advanced research within the field of NTDs. I have reviewed the original study conducted in the 1990s by Michael Kremer and Edward Miguel which
evaluated the success of deworming programs in Kenya. More articles have been written since, mainly in response to the original study. I will refer to academic peer-reviewed articles that were produced in response to the initial study on deworming and as a response to the #wormwars debate. Reference to published academic articles by experts within the field of NTDs, such as Dr. Peter Hotez, Michael Kremer, Edward Miguel, as well as to the Cochrane Review will also be made.

In addition, edited books on global health, NTDs, and infectious diseases were also relevant and reference to them was included for this study. Other sources include reports published by WHO demonstrating their progress in making NTDs less ‘neglected’. The World Health Organization has conducted school-based mass deworming programs in Kenya over the past decades, and research discloses some of those outcomes as part of a case study. The literature review will discuss the areas of Public Health, NTDs, and Communication for Development.

3.1 NTDs and Public Health:

The Universal Declaration of Human Rights of 1948 recognized health as a fundamental human right (WHO, 2015). Being healthy is not only about physical health and the absence of disease but also includes a person’s mental health and general well-being. WHO defines public health as all public or private measures to “prevent disease, promote health, and prolong life” among entire populations, not only the eradication of a particular disease (WHO, 2015). Global health combines both medical and social research on the causes and distribution of health in an international context.

NTDs are highly related to the public health discourse. Almost half of Africa’s health issues stem from infectious and parasitic diseases (WHO, 1999, cited by Miguel & Kremer, 2004, p. 160). Public health is affected by a country’s local, national, and international social-economic conditions. Developing countries lack basic health needs, such as access to clean drinking water, sanitation, and health facilities which are vital issues interrelated with poverty. The lack of fundamental freedoms and the human rights paradigm stresses the significance of inequality inherent in NTDs (Mantilla, 2011, p. 120). Governments of
developing countries are profoundly ineffective in valuing human rights by providing basic services to their people due to underlying political, economic, and social environments. Access to health systems is heavily controlled by local governments who have a person’s opportunities for health profoundly influenced by their income, education, and employment (McCracken & Phillis, 2012, p. 13).

Medicine has been transformed over the nineteenth century by biomedical advancements and has shifted to now being steered by intense capitalization and corporate profitability. In the 18th and 19th centuries, the ‘politics of life’, as Rose (2007) argues, were dominated by ‘politics of health’ – birth rates, diseases, and epidemics – while the 21st century is characterized not by eliminating pathology to protect the nation but by "our growing capacities to control, manage, engineer, reshape, and modulate the very vital capacities of human beings as living creatures" (p. 3). Global health initiatives, such as humanitarian aid programs, aim to assist those in greatest need. HIV/AIDS, malaria, and tuberculosis have, however, received the most consideration over the past decades (Mantilla, 2011, p. 118).

Considering that NTDs can have a tremendous health impact on humans, governments of developing countries need to recognize the need for alleviating human misery by tackling NTDs. Poverty and inequality structure the ‘politics of life’, and many of the world's population are given limited treatment when it comes to infectious diseases (Rose, 2007, p. 13). WHO’s director of NTD control, Dirk Engels, indicated that “Ebola has shown that when there is real urgency, something can be done (by foreign donors and pharmaceutical companies)” – “but it’s also shown that maybe we shouldn’t wait until it is urgent” (Kelland, 2015). It is important to understand that increased investments do not only contribute to freeing people trapped in poverty but also add to socioeconomic development.

3.2 NTDs and Communication for Development:

Increased funding has contributed to enhancing the health and social well-being of people in developing countries. By allocating large amounts of funding to the control of NTDs, development organizations and pharmaceutical companies are
actively working towards contributing to the MDGs and enhancing the health of the poor. The Government of Kenya and development partners have been jointly supporting the deworming initiative in Kenya. In 2009, the ‘National Deworming Program’ was launched by the Minister of Education and Minister of Public Health and Sanitation emphasizing the importance of deworming through mass media, radio stations, and parent-teacher association forums (WHO, 2013, pp. 5, 8). Policies to diminish NTDs primarily rely on the mass distribution of anthelmintic drugs to those living in endemic areas. Committed to improving global health and access to medicines in developing countries, pharma companies such as GlaxoSmithKline, Johnson & Johnson, Pfizer, and Merck have been donating millions of anthelmintic drugs to developing countries over the past years. GlaxoSmithKline (GSK), recently donated 858 million albendazole tablets to help eliminate lymphatic filariasis and control intestinal worms (GSK, 2015).

So what are the reasons for pharmaceutical companies’ interest in battling NTDs? GSK is devoted to improving health care and to help eliminate and control NTDs in developing countries as well as enhancing the GSK image throughout the world (Addison & Lawson, 2012, p. 35). In order to sell drugs cheaper in poorer countries, GSK established a patent, a new approach to developing drugs. Generic drugs have a lower average retail price than brand name products. By altering its vision from ‘Patented’ to ‘Generic’ drugs in 2008 with the aim of achieving tangible and lasting results as part of a more holistic approach to health care, GSK made these new brand generic drugs available and accessible in developing countries (Addison & Lawson, 2012, p. 35). Rose (2007, pp. 3-4), however, argues that investing in the prospect of effective cures for all sorts of disease is driven by the desire to generate profits, neglecting the factors affecting the health and illness of the majority. He further states that pharmaceutical companies, in particular, have received a lot of criticism and have been accused of selling new drugs at inflated costs and with incorrect promises (ibid, p. 4). Pharmaceutical companies are jointly working with development organizations to fight NTDs. This research paper will examine the relationship and communication practices of pharma companies and development players.
3.3 NTDs and Existing Research:

3.3.1 NTDs and Mass Drug Administration

A complete history of NTDs and their impact on humans is beyond the scope of this research. However, within the literature on NTDs, one of the more predominant discussions revolves around Kenya’s school-based deworming programs. Especially since earlier in 2015 various media outlets reported on the critiques around a well-known randomized deworming experiment conducted at seventy-five rural Kenyan primary schools in the late 1990s. Edward Miguel and Michael Kremer had found important benefits of mass deworming on school attendance. Their research showed that the deworming program reduced the amount of worms in children and led to a 7.5 percent gain in primary school participation while even increasing school participation in communities near treatment schools; however, they were not able to find evidence for improvements in educational attainment in terms of academic test scores (Miguel & Kremer, 2004, pp. 159, 208). These positive correlations and identified cross-school externalities provided a rationale for subsidizing medical treatment for infectious diseases (ibid, 2004, p. 209). However, new evidence from the Cochrane Collaboration, a well-respected source of information for medical interventions, discredited previous research and evidence to support mass deworming in 2000. In this Cochrane Review, Dickson et al. found no evidence of mass deworming projects having a substantial effect on weight, height, haemoglobin, exam performance or mortality and therefore advised against the financing of deworming programs (McDonald, 2015; Miguel & Kremer, 2004, p. 163). The Cochrane Review, however, was limited to comparing mass administration with no treatment or placebo in randomized controlled trials.

As the Cochrane Review raised questions, the Cochrane Collaboration came up with new evidence in 2012 better distinguishing between mass and screened programs and concluding that treating children with known worm infections can improve weight gain, nevertheless, they found limited evidence of other benefits of deworming on nutrition, haemoglobin, and school performance, and limited evidence for school attendance (Taylor-Robinson, Maayan, Soares-Weiser, Donegan & Garner, 2012, p. 23). In addition, Taylor-Robinson et al. (2012,
P. 23) revealed that mass deworming is safe and effective and more cost-effective than individual screening, and they even found some evidence from randomized controlled trials that indicates that deworming does improve nutrition in *screened* infected people but the impact is too small to determine in *unscreened* populations.

So what are these discussions that have been dubbed #wormwars all about? The debate is mainly about whether the mass treatment of *all* children – including those who are not infected – is a cost-effective way for increasing school attendance. For years, experts have endorsed treating large groups at risk of infection, however, in recent months, there has been a rigorous debate on whether mass school-based deworming programs are in fact the low-cost high-impact intervention that development organizations claim it to be.

Controversy started when a group of epidemiologists at the London School of Hygiene and Tropical Medicine (LSHTM) performed a replication of the Kenya study in 2015 and encountered some errors in terms of missing data but arrived at the same fundamental conclusion. Following the same statistical strategy as in the original paper, Alexander Aiken, Calum Davey, James Hargreaves and Richard Hayes found the majority of the original conclusions – a decrease of worm infections, evidence of small nutritional improvements, and no benefits on exam results (Leach, 2015). They did, however, find calculation errors in Miguel and Kremer’s data which meant that there is a lack of evidence for an improvement of school attendance in untreated schools. Aiken et al. then went on to analyze data differently compared to Miguel and Kremer’s original study with methods commonly used by health researchers, instead of economists as in the original research, and found large amounts of missing data. Their claim that there is some evidence of a benefit on school attendance but with a high risk of bias could threaten the initial public health success story. Miguel and Kremer responded on Aiken et al.‘s publication of the re-analysis of their original study disagreeing with many of Aiken et al.’s findings by showing that the authors ignored certain time elements present in the original 2004 data (Hicks, Kremer & Miguel, 2014, p. 27).

So why is there disagreement over the evidence? Does it have to do with different researchers approaching data differently? Some of the studies
advocating deworming have been conducted by economists, while the two recent studies were both carried out by teams of epidemiologists. Studies of empirically treating infected and uninfected children are challenging when it comes to quality and outcomes. Miguel and Kremer (2004, p. 163) claim that the Cochrane Review concluded that the data does not provide sufficient evidence for educational benefits of deworming in terms of growth and cognitive performance but failed to take into account potential externalities.

3.3.2 Neglected Infections of Poverty in the United States

Apart from the discussion around the Kenyan deworming initiatives, it is also important to look into literature on ‘neglected infections of poverty’ – NTDs existing outside of developing countries. Research carried out by Dr. Peter Hotez, an internationally recognized physician-scientist and author of the acclaimed book “Forgotten People, Forgotten Diseases”, shows the importance of NTDs, or neglected infections of poverty, in the United States. Hotez is exploring the relationship between NTDs and poverty, and his findings show that neglected infections of poverty such as Chagas disease, dengue fever, and cysticercosis mainly affect impoverished and under-represented minorities in the southern United States. For the past three decades, epidemiological studies of soil-transmitted helminth infections have not been conducted in the United States, and this lack of statistics on the occurrence of NTDs is representative of their neglected status and of their effect on the poorest populations (Hotez, 2013, pp. 166, 179). Neglected infections of poverty represent some of the greatest health disparities, and Hotez is well-known for making policy recommendations for addressing this largely hidden burden of diseases in the United States.

4. Theory and Methodology

4.1 Theoretical Framework:

This section attempts to outline the theoretical framework of this research study. A critical theory examines the relationships between power, knowledge, and discourse produced within frameworks of historical and cultural struggle (Lindlof & Taylor, 2002, p. 47). Power relations are constituted by social relations of
capitalist production where certain groups are being privileged over others. Domination is most powerfully reproduced when “subordinates accept their social status as normal, necessary or inevitable” (Kinchloe & McLaren, 2000, cited by Lindlof & Taylor, 2002, p. 291). Neglected tropical diseases are ‘neglected’ diseases mainly found in developing countries. This degree project will investigate the ontology or ‘what is’ of an existing theme – neglected tropical diseases – and its epistemology – ‘the knowledge’ that we have about NTDs and the documentation of historical undertakings, such as the World Health Organization’s mass administration of deworming drugs (Hansen, Cottle, Negrin, & Newbold, 1998, p. 214). This research will work with discourse as a method for understanding the relations and power between governments, development organizations, pharmaceutical industries, and recipients of deworming drugs as part of Kenya’s 2013 deworming campaign. This study will look at communication (for development) by various players – pharma companies and development players – and will examine the motivations and conflicts between them. It will further draw upon the relevant theories of the ‘Other’ and the NTD discourse, which both have an underlying central role of power. Reference to those theories will be made throughout this research study to establish the broader areas of knowledge surrounding the topic.

The Spectacle of the ‘Other’, as Hall (2007, p. 225) calls it, seems relevant for this study due to its significance of power relations. We are stereotyping people in developing countries as being helpless, hence needing our assistance. According to Edward Said’s theory of ‘Orientalism’, political techniques of ‘othering’ promoted the difference between the West and the ‘Rest’, discursively providing western countries with the power to dominate the ‘Other’ (McEwan, 2009, p. 124). This shaped how the ‘Other’ is recognized or treated by western countries when it comes to foreign aid and medical interventions. Using the notion of the ‘Other’ helps cast light on the theme of power relations between development organizations, pharmaceutical industries, and recipients of the anthelmintics drugs and shows how development organizations and pharmaceutical companies dictate the development agenda. This power relationship is visible in texts produced by development players and is further supported by statements produced during the interviews. The empirical
materials aid in this process as they shed light on the opinions and actions of people working for development organizations and research institutions that have the authority to select treatment options for those infected with NTDs.

This study will refer to the **social constructionist approach** that uses representational systems of one’s culture to construct meaning and communicate that meaning to others (Hall, 2013, p. 13). French philosopher Michel Foucault theorized that in certain historical moments, some people had more power to speak about some subjects than others (ibid, 2013, p. 27). His concept of discourse, a group of statements that provide a language for talking about, produces the objects of our knowledge, reinforcing hierarchies of power (ibid, 2013, p. 29). The **NTD discourse** received more meaning and power when it was coined by development organizations, and by talking about it, NTDs gained more attention and received more international funding. The research aims to reveal the extent to which power is exerted over developing countries.

For the purpose of this study, I will be examining the effectiveness of mass deworming from a social perspective – in relation to underlying economic factors – and also the power relations between development organizations, pharma industries, and people in developing countries being affected by foreign aid. Interviews with health experts and professionals/communicators working for development organizations will show the different motivations and health practices of key players. In addition, this research will examine the ongoing debate about whether the mass treatment of all children is a cost-effective way for improving the health of people living in developing countries and will further discuss the underlying motivation of this controversy.

### 4.2 Methodology:

This section will discuss research methods used in this paper. This research was performed as a desktop study since the researcher lives in Canada. Due to the time constraint of the assignment, it was not possible to conduct field research. Methods used in this research project include a discourse analysis and qualitative interviews. These different but complementary methodological approaches were chosen to best demonstrate the angles and dimensions of complex processes (Hansen et al., 1998, p. 2). Material analyzed includes
WHO reports, press releases, news articles, books, website information, as well as qualitative interviews with subject experts.

4.2.1 Discourse Analysis
To gain a deeper understanding of the relation between NTDs and the adverse impact on both human and economic development, a discourse analysis was chosen due to its focus on knowledge production and power relations. Discourse shows differences of representation which reflect power relations and those promoting them. This research paper will make use of Foucauldian discourse theory which stresses that discourse is more concerned with “the effects and consequences of representation – its politics” (Hall, 1997, p. 6). In the field of social sciences, discourse has the power to “shape identities, social practices, relations between individuals, communities, and all kinds of authority” (Barker, cited by Pickering, 2008, p. 152).

To gain a greater conceptual understanding of the theme of NTDs and those affected, it will be beneficial to look into stereotypes of representations of the ‘Other’ and power relations. Power and authority play an immense role in how NTDs are being dealt with.

For primary sources, qualitative interviews – four semi-structured and two structured interviews – and original speeches by WHO members will be used to support arguments and research. For secondary sources, the main focus will be on WHO reports, press releases, news articles, and website information to demonstrate how the fight against NTDs has been addressed. In addition, a report on the African Conference of Science Journalists from the Country Office in Kenya will be used to refer to how organizations have been supporting the elimination of targeted NTDs to achieve the MDGs.

4.2.2 Semi-structured & Structured Qualitative Interviews
Qualitative interviews provide an efficient way to collect data on the subject matter and aid in the support of arguments presented in the research paper. Semi-structured interviews can be a beneficial tool for putting the interviewee at ease as it can sound more like a conversation than an interview (Robson, 2007, p. 74). Questions as well as the sequence in which they should be covered can be pre-planned, and open-ended questions provide for more informative answers. Possible findings of interviews can strengthen the research argument
This method seems appropriate for this research due to its flexible design; however, it is subject to bias as interviewees might say what the researcher wants to hear. To gain a deeper insight into the various opinions about the ongoing deworming debate, interviews with experts in the field seemed beneficial for answering my research questions as they not only display personal experiences but also provide insight into the motivations behind being for or against deworming.

**4.2.3 Reasons for the Mixed Approach**

Using a mix of qualitative interviews and a discourse analysis seems to be the most adequate approach for addressing my research questions. The objective of the discourse analysis is to connect NTDs to the wider social and cultural context to answer my research questions and gain more insight into the deeper discussion and underlying theories and concepts. Discourses of institutional power/knowledge focus on how these discourses are materialized in the form of WHO reports, relations between development organizations and pharma industries, and deworming initiatives. This method does not aim to reveal absolute truths as situations and discourses can change over time, power relations could shift, and contrasting discourse analyses by other authors might be produced. Interviews, on the other hand, allow for exploring perspectives, viewpoints, background, and motivations and can add to a deeper understanding about the topic by providing more insights into the underlying factors behind the deworming debate. Conducting semi-structured interviews via Skype is advantageous for open discussions, and follow-up questions allow for better clarification on the answers given. Drawing on the case study of Kenya can add to an understanding of how international development organizations have been controlling NTDs recently. Therefore, the mixed-method approach seemed the most beneficial in providing sufficient information to allow me to draw substantial conclusions from the empirical data.

**4.2.4 Selection of Interviewees and Questionnaire**

In order to answer the research questions of how NTDs have been communicated to make them less neglected as well as determine the reasons for and against deworming initiatives, interviewees were chosen based on their involvement and/or research within the field of NTDs. It seemed valuable to get
feedback from academics who have contributed to the field. Getting alternate views and opinions is significant in obtaining comprehensive and relevant data. The research aim was explained in the initial email to request an interview. During the interview, permission to record the conversation as well as the use of their names for my research study was received. Interviewees selected for this research study included:

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
<th>Interview conducted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jocelyn Conway</td>
<td>Coordinator Neglected Global Diseases Initiative UBC Global Health Online Network Clinical Global Health Network Vancouver, Canada</td>
<td>November 26, 2015</td>
</tr>
<tr>
<td>Calum Davey</td>
<td>Research Fellow, MSc in Epidemiology London School of Hygiene &amp; Tropical Medicine (LSHTM) London, United Kingdom</td>
<td>November 11, 2015</td>
</tr>
<tr>
<td>Dr. Timothy G. Geary</td>
<td>Professor and Director Tier I Canada Research Chair Institute of Parasitology McGill University, Canada</td>
<td>November 13, 2015</td>
</tr>
<tr>
<td>Dr. Antonio Montresor</td>
<td>Medical Officer Preventative Chemotherapy and Transmission Control (PCT) Department of Control of NTDs World Health Organization Geneva, Switzerland</td>
<td>May 18, 2015</td>
</tr>
<tr>
<td>Katherine Williams</td>
<td>Associate Deworm the World Initiative Evidence Action Washington, D.C., United States</td>
<td>December 2, 2015</td>
</tr>
<tr>
<td>Dr. Maria Yazdanbakhsh</td>
<td>Professor Head of Parasitology Leiden University Medical Center Leiden, The Netherlands</td>
<td>November 11, 2015</td>
</tr>
</tbody>
</table>

Interviews conducted were semi-structured, with the exception of two that were structured as written feedback was preferred. Five interviewees were given the same questions, while Dr. Montresor, who provided feedback specific to the case study, received questions tailored to the Kenyan deworming campaign. Due to the sixty-eighth World Health Assembly, the supreme decision-making
body of WHO, taking place in May 2015 in Geneva, resources were being tied up in preparation for this event and a structured interview was conducted due to time constraints which allowed the interviewee to answer the question on his own time. Dr. Montresor was chosen for his involvement in Kenya’s school-based deworming campaign, and even though my open-ended interview questionnaire was initially focused on the 2009 campaign, Montresor provided me with more recent information on the latest campaign held in 2013.

4.2.5 Researcher/Interviewee Relationship
Four of the interviews were semi-structured and conducted via Skype varying between 25 and 45 minutes. Two of the interviews were structured and conducted via email where the interviewee provided written feedback either due to a personal preference and/or time issues. The semi-structured interviews were steered by my questions, and the order of questions asked was adjusted accordingly based on where the conversation went. I had no control over the answers, but depending on the feedback received, I was able to provide adequate follow-up questions for further information and clarification. The Skype conversation provided grounds for a professional relationship between the interviewee and myself.

4.3 Ethical Issues:
It is important to consider ethics when doing research. One ethical issue I encountered is the need to obtain participants' informed consent. It is essential to inform the participants about who is conducting the study as well as their anticipated time commitment (Rudestam & Newton, 2007, p. 278). When selecting and emailing interviewees to participate in the research study, I ensured gaining their informed consent.

A second issue involves the researcher's responsibility to avoid discriminatory or oppressive language and materials (ibid, 2007, p. 282). It is also substantial to remain unbiased when analysing the findings. The Discourse Analysis focuses explicitly on statements and arguments made by key informants to create a discussion in relation to written materials without including the personal opinion of the researcher to avoid a possible bias.
5. Analysis

5.1 Introduction:

For the purpose of this study, five interviewees were chosen who have been conducting field work and/or academic research on NTDs. Some have been selected as a result of the researcher reading their articles or contributions to NTDs while others have been referred to by other experts within the field. One additional interviewee was chosen for his involvement in the 2013 Kenya deworming campaign and for his medical expertise. They all seem to have a mutual objective – working towards improving the lives of those with NTDs. In order to get a wider perspective and opinions on NTDs and deworming, interviewees were selected from different organizations working in different countries but all within the field of NTDs. Feedback aims at representing different viewpoints about the deworming debate. The number of interviewees appears to be appropriate for the scope of this research and allows for insight into NTDs and action that has been taken by development organizations as well as research institutions. Feedback shows similarities as well as differences on the topic, which will be discussed in a critical discourse analysis.

5.2 Discourse Analysis:

5.2.1 How has WHO been communicating NTDs to make them less ‘neglected’?

NTDs are not emerging diseases but rather part of a large number of ‘neglected’ diseases that have been plaguing humans since biblical times (Mantilla, 2011, p. 121). Power produces knowledge because it is located in powerful institutions and claims absolute truth (Foucault, cited by Rose, 2001, p. 137). Large institutions have the resources to make discourses more substantial. When WHO officially recognized the importance of NTDs as part of its global health agenda in 2005, they formally rebranded ‘communicable diseases’ into NTDs (Savioli et al., 2011). Coining the discourse provided NTDs with more power and meaning and therefore more recognition and funding. By grouping the most significant 17 tropical diseases into a unified something – NTDs – WHO provided the NTD discourse with its status (First WHO Report on NTDs, 2010, pp. ii, 2).
“Health-focused NGOs and health, and academic research organizations have advocated for more funding, more treatments and more research. Public private partnerships like the London Declaration have provided a much added focus; and \textit{collective for action}.” (J. Convoy, personal communication, November 26, 2015).

Collective efforts by international organizations, governments, and pharmaceutical companies have contributed to taking the ‘\textit{neglect}’ out of NTDs and making them more visible. In October 2014, Dr. Custodia Mandlhate, WHO Country Representative in Kenya, has been addressing the African Conference of Science Journalists on the important issue of NTDs:

“Why NTDs? This is because for many years the diseases have been \textit{neglected} by government policy makers, the donor community and even the victims themselves do not consider NTDs as life-threatening as other high-profile diseases. However, there is increasing global attention to NTDs, new energy is moving policies and resolutions at global and continental levels and we are seeing donors providing funds for NTDs interventions and capacity improvement.” (WHO African Conference, 2014, pp. 2-3).

Due to their low priority and restriction to mainly tropical and subtropical regions, neglected tropical diseases have been regarded as ‘neglected’ for many years. ‘Neglect’ or the extreme social isolation of the disease occurs as a result of global inequality coupled with geographic isolation (Mantilla, 2011, p. 121). With an increased global attention, institutions and policy makers are ensuring the concrete need for prevention, screening, and treatment of NTDs in developing countries is getting addressed.

“[…] it’s been really driven by the Gates Foundation, and they have brought a great deal of attention to the issue and that has amplified their efforts. So I think that the situation today compared to twenty years ago is hugely different.” (T. Geary, personal communication, November 13, 2015).

The above statement shows that development organizations have been positively addressing NTDs over the past years; however, not everyone is convinced NTDs have been receiving the attention they should be getting.

“I’m sure they are less neglected than they used to be, but I’m not totally convinced that they are. […] there are these diseases that just don’t affect people in high income settings and then get completely, or almost completely side-lined […] as far as research is concerned in epidemiology. […] there’s probably still work to be done […] to improve that there’s the
funding to make those diseases go away.” (C. Davey, personal communication, November 11, 2015).

NTDs tend to primarily threaten people in poorer regions – marginalized populations – unlike the ‘big three’ that do also affect the rich and those living in high-income cities or countries.

“I don’t know why […] it’s not getting attention. I mean in the area I work in mostly is in HIV, and in America now, HIV is […] being associated with relatively well-off people […]. It’s now a disease which has actually a quite surprisingly high prevalence in the United States compared with other countries like Canada and Europe, with predominately among poor people, drug users, and […] black African American populations.” (C. Davey, personal communication, November 11, 2015).

As Davey points out, the socioeconomic status of people plays a significant role. While HIV/AIDS is affecting different societal classes, from poor to well-off people in developing as well as developed countries, neglected tropical diseases and neglected infections of poverty mainly affect marginalized and impoverished populations. Celebrities that have contracted HIV/AIDS have contributed to that disease’s awareness and increased media attention in recent years, but NTDs are still lacking that attention.

It has been estimated that approximately 40 million of the world’s poorest populations are infected with HIV/AIDS while around 960 million people being exposed to NTDs might be infected with these tropical diseases (Mantilla, 2011, p. 122). It was not until recently that NTDs received more acknowledgement on the global health agenda with the implementation of the SDGs to explicitly “end the epidemics of AIDS, tuberculosis, malaria, and neglected tropical diseases” (Third WHO report on NTDs, 2015, p. 13). Until then, NTDs were not visibly emphasized as an international priority encompassed in the United Nations’ Millennium Development Goals. This might explain why NTDs or neglected infections of poverty have also not received much attention in the United States. Since the 1910-15 Rockefeller Sanitary Commission hookworm eradication campaign in the American South (Bleakley, 2007, p. 74), this largely hidden burden of diseases of the poor has not received much interest in high-income countries.

“[…] most people think that they don’t exist. […] It’s probably because they think, they’re convinced we’re a developed country, we will not have any
neglected diseases.” (Dr. M. Yazdanbakhsh, personal communication, November 11, 2015).

No new surveys have been conducted for neglected infections, such as soil-transmitted helminths since the 1980s, Hotez (2008, p. 3) claims. There is an underlying power relation visible in that governments of high-income countries declared these ‘big three’ diseases more important than NTDs. This might explain why neglected infections of poverty are not well known to the public health community in the United States and other developed countries. Contrary to conventional belief, NTDs can be found in any country or region with extreme poverty and high economic burdens. Hotez’ research has been contributing to neglected infections of poverty receiving more attention in the United States over the past decades.

“There has been an increased awareness in the US because of the work of Dr. Peter Hotez over the past few years. And, of course, they are receiving less attention than developing countries because of the burden of disease is far greater there. The impact of improving people's lives is far greater there and it has been ignored far longer.” (J. Convoy, personal communication, November 26, 2015).

The first-ever National Summit on Neglected Infections of Poverty held in 2009 brought together key leaders in public health, public policy, and government to raise awareness, and identified actions for addressing neglected tropical infections of poverty in the United States (Hotez, Stillwaggon, McDonald, Todman, & DiGrazia, 2010).

International policy changes have contributed to NTDs receiving more emphasis. In 2001, the World Health Assembly endorsed the regular treatment of high-risk groups, particularly school-age children, with the goal of attaining regular administration of chemotherapy to at least 75 percent of all school-age children (WHA, 2001). At the Global Partner’s Meeting on NTDs in 2007, WHO Director-General, Dr. Margaret Chan, declared in her opening speech that the meeting “marks a turning point in the long and notorious history of some of humanity’s oldest diseases.” (Chan, 2007). Addressing development agencies, foundations, and implementing agencies, Chan acknowledged that their “sustained support is a sign of our shared concern and our solidarity in matters of health. The burden imposed by these diseases, measured in terms of human misery alone, is unacceptable. We are committed to take action.” (ibid, 2007).
WHO’s announcement shows assertions of truth in its statement to help the underprivileged, featuring the use of ‘our’ and ‘we’ aimed at informing those in developed countries and gaining their responsiveness to take action. Chan is producing a relationship between ‘us’ – development agencies, foundations, and implementing agencies – and ‘them’ – those represented who are suffering from NTDs. The NTD paradigm shift has helped raise awareness and mobilize resources for disease control interventions. Implemented treatment interventions are now reaching those in need, ensuring NTDs are gaining wider recognition. Evidence to support these mass deworming campaigns has recently been critiqued by media outlets and triggered a widespread debate in 2015, questioning the original policy conclusions.

5.2.2 How successful has deworming really been in terms of the recent debate?
One would think that it would be beneficial to treat populations with deworming drugs in areas where intestinal worms have been found to be an issue. This idea had long been supported by WHO and other development organizations, especially since Miguel and Kremer’s study from the 1990s found an improvement in health and reduced absenteeism from schools after subsequent deworming campaigns (Miguel & Kremer, 2004, p. 159). However, a recent report on deworming published by the Cochrane Review in July 2015 generated much discussion and controversy by concluding that mass deworming in regions with high infection rates does, on average, not improve nutrition, haemoglobin, cognition, school performance, or survival of the children (Taylor-Robinson, Maayan, Soares-Weiser, Donegan, & Garner, 2015, p. 3).

But why is this debate so significant? There is a potential risk of losing funding for deworming programs if proven ineffective. School-based deworming programs are considered a cost-effective way to improve children’s health and have been implemented by governments as a ‘best buy for development’ (Evidence Action, 2015).

“Well, I think in a way it may be a little too soon to tell what if any impact that will have. I know that with our organization we have not seen a reduction in funding for deworming, but, you know, of course it’s a possibility […]. So yeah, it’ll be interesting to see in the next couple of years if there is any shift but right now, we’ve definitely not felt that at all.” (K. Williams, personal communication, December 2, 2015).
In ‘The Politics of Life Itself’, Rose (2007) claims that “new drugs can help return a person to the world and enable him to take responsibility for his life” (p. 98). Pharmaceutical companies and donors are committed to drug donations to fight NTDs in developing countries. This is in alignment with the human rights approach that everyone should have the right to health. Development institutions, such as WHO, produced an apparently truthful account of NTDs and of the effects international interventions, such as Kenya’s deworming campaign, had on Africa’s population. Large pharmaceutical companies deploy anthelmintics in ways that facilitate deworming campaigns with the intention to restructure the health system in developing countries. Pharma industries and subsequent donations have amplified access to high-quality anthelmintic drugs free of charge to millions of people (First WHO Report on NTDs, 2010, p. viii). Eight million donated tablets were given to primary school children between the ages of 5 to 14 years by their teachers during the 2013 campaign, successfully treating a total of 6.4 million children (Dr. A. Montresor, personal communication, May 18, 2015). Based on Montresor’s statement, deworming campaigns have been successful.

“We have several studies that measured the improvement after deworming; we assume that without worms the children improve their health.” (Dr. A. Montresor, personal communication, May 18, 2015).

Paradoxically, WHO’s mass deworming campaign reiterates representations of people in developing countries as being the ‘Other’ – helpless victims –, reinforcing the depiction of large institutions and pharmaceutical companies – ‘we’ – as saving lives. These politics, as Rose (2007, p. 3) argues, are focused on the vital lives of those who are being governed. International institutions are using a ‘top-down’ approach – making decisions for those being treated. Deworming programs originate in developed countries but may not always be in the best interest of populations in the developing world.

The recent debate has been particularly on the matter of whether mass treatment of all children is justified. As the deworming drugs are considered very safe with no side effects for the uninfected, WHO does not endorse individual screening (Evidence Action, 2015). This is also partially a cost-factor. “Fecal investigation cost[s] approximately 100 times the cost of the tablets.”
(Dr. A. Montresor, personal communication, May 18, 2015). It is cheaper to treat than it is to screen, and money that would otherwise be spent on screening can go towards more medication and hence towards a larger number of people to be treated. Again, this is revealing evidence of power asymmetries. Individual medical screening costs are significantly higher than treating all people, which contributed to WHO's decision to conduct mass deworming campaigns in high NTD prevalence areas regardless of an existing infection. It can be safely administered even to those without a pre-existing worm infection (Evidence Action, 2015). Efforts to mass-deworm whole communities has intensified and is regarded as having a rapid positive impact. Only additional research could provide further data on any long-term health implications of the prolonged use of mass deworming drugs.

“There is a substantial body that regards evidence of high quality that shows benefits of deworming. [...] a brief from the Jameel Poverty Action Lab or J-PAL [...] explains why deworming is considered best buy in development, it talks about the intent that kids who are dewormed have higher attendance rates in school, they have less malnutrition and anaemia plus extended growth, often have shown improved immunity against other infections that are common in childhood when their bodies aren't fighting against the worm infections. [...] some studies have suggested improved academic performance although that's not quite as strong. And then there’s also some evidence of longer term impacts like increased economic productivity, higher earnings, more hours worked in adults who were dewormed as kids.” (K. Williams, personal communication, December 2, 2015).

Preventative chemotherapy delivered through mass deworming provides a substantial factor for controlling NTDs by not only increasing the health of affected populations by improving nutrition and immunity, but also by contributing to economic development. However, managing our lives pharmaceutically might not always be the solution and there has been expressed concern regarding deworming campaigns.

“I just don’t think these kids should be getting pills because they all get re-infected.” (M. Yazdanbakhsh, personal communication, November 11, 2015).

In the case of Kenya, as long as we do not resolve other underlying factors that cause populations to attain neglected diseases in the first place, such as unclean water, poor sanitation, and the fact that many people lack adequate
footwear and acquire NTDs through contact with contaminated soil, taking drugs annually will not resolve the problem because of continuous re-infection.

“[…] in the West, here in the North, we eliminated hookworms by sanitation but also by some medicines, primitive medicines, and people wearing shoes and things like that […] so sanitation is the key.” (T. Geary, personal communication, November 13, 2015).

“[…] places that need deworming treatment […] or systems of sanitation are not improving on infrastructure […] and are living in homes with dirt floors […], these environments that can really facilitate re-infection, then that’s always going to be a concern. So that’s why it’s important that treatment is also in the long-term accompanied by infrastructure and sanitation improvements.” (K. Williams, personal communication, December 2, 2015).

Improving the underlying economic conditions in addition to administering mass deworming campaigns is essential for the long-term success and health of populations at risk.

“and then there’s also […] these kind of global pushes to integrate deworming with other NTD treatments and also with WASH (water, sanitation, hygiene work)” (K. Williams, personal communication, December 2, 2015).

National governments are working with development organizations to integrate programs such as WASH to improve the socio-economic environment; however, it is difficult to resolve underlying factors without the help of donors and government funding.

“[…] I really think it will be good to try and prevent the infection, so if possible, you know, develop vaccines rather than drugs against worms.” (Dr. M. Yazdanbakhsh, personal communication, November 11, 2015).

Yazdanbakhsh voiced hesitations regarding deworming due to underlying economic factors. She favoured having a vaccine as it would be more effective in the long-term and prevent re-infection. Diermer and Hotez (2008, p. 283) advocate in favour of vaccines against helminths administered at the same time as mass drug direction as these would be more beneficial than current NTDs control strategies.

Miguel and Kremer (2004, p. 208) had concluded in the initial analysis that treatment created positive health and school participation externalities for untreated students. It has been anticipated that children who have been dewormed can have an impact on those who have not been.
“Depending on the frequency, you can reduce the environmental burden of the infectious stages so you can reduce the tendency to become infective. This was the basis for doing school-children who tend to have the highest burden of the worms more or less. So the thought was, if we treat these kids, we’ll eventually lower the burden of the infectious stages in the environment to the point where we won’t have a problem.” (T. Geary, personal communication, November 13, 2015).

So how can children who have not been dewormed benefit from those who have been?

"[...] in some of the areas where school-age children were dewormed in Kenya, research showed that their younger siblings also have lower infection and later benefited from higher school attendance. So yeah, there are positive benefits on communities and on individuals in communities where people, where a large proportion of people are dewormed since, you know, that’s fewer opportunities for passing along transmission for re-infection. But at the same time, you know, those people who aren’t being dewormed also can still be kind of reservoirs for the parasites. So it works both ways.” (K. Williams, personal communication, December 2, 2015).

This disproportionate impact has been felt among treated and untreated children. Deworming externalities can be explained with the prevalent relationship between the amount of parasite eggs being shed into the environment and worm transmission in the community.

“[...] the eggs – the infective stages – can move depending on conditions for years in the soil. So what we do is lower the health impacts by these campaigns, I think that’s clear, but we are not making rapid progress towards elimination so that one day we can stop.” (T. Geary, personal communication, November 13, 2015).

Evidence suggests that mass deworming campaigns benefit children with worm infections by positively reducing the large burden of worms which is most apparent in the large number of people treated. Since 2009, school-based deworming initiatives have reached over 95 million children (Duflo & Karlan, 2015).

“[...] in the U.S., the removal of hookworm in the south had benefits in the long run with improved sanitation. [...] deworming campaigns have not been all that intensive. If you give the drugs frequently and to the whole population, you get benefits. Re-infection is very common, so going in once a year what that does is reduce the incidence of severe burdens, of very high burdens – it does not reduce the total incidence all that much. [...] treatment would probably have to be community-wide, not school based.” (T. Geary, personal communication, November 13, 2015).
To improve the lives of those living in developing countries, the focus needs to be on sustainable development and health practices to ensure that communities can maintain their own health through their own resources without a dependency on foreign funding. In order to ensure success, community participation is of particular importance.

Mass deworming is said to be safe and effective in treating all children, even those not infected. At the same time, it seems economically feasible to treat large numbers of at-risk populations. Frequent drug administration in the treatment of populations with worm infections could, however, lead to drug resistance. The possibility of becoming resistant to the medicine has generated a debate among the public health community.

“The question of resistance is something that everybody worries about. I’m not sure whether we have solid evidence whether there is resistance development. You know, some people like to say, yeah, there is a lot of resistance, I’m not sure. I’d like to say that [...] it’s better to develop a vaccine than to give drugs, so if I could see [...] developing this resistance against these drugs then I would really see it, but I’m not sure there’s solid evidence.” (Dr. M. Yazdanbakhsh, personal communication, November 11, 2015).

As Yazdanbakhsh points out, becoming resistant to the drugs administered in mass deworming initiatives is of concern. Again power relations show that ‘we’ are making the decisions of how to treat the ‘Other’. These neglected populations in developing countries, or as in the case study Kenyan school children, have little lobbying capacity. International policy makers are aware of the possibility of resistance to the drugs administered, yet there still seems to be a shortage of funding for research and development (R&D), and those being treated still lack a political voice in the decision-making process. Recently, there has been success in the development of a vaccine for the prevention of malaria. European regulators have approved the world’s first malaria vaccine for young children (GSK, 2015). Pharmaceutical funds have aided in combatting the ‘big three’ infectious diseases, and similar investments could help develop medicines and vaccines against NTDs.

“Look at Ebola. Long time, you know, they could develop, it could go so fast. Wherever there is a will, there is a way. So I’m for vaccine because kids have to be prevented from becoming infected.” (M. Yazdanbakhsh, personal communication, November 11, 2015).
Having adequate funding dedicated to research and development of a vaccine for other NTDs would be beneficial not only by reducing the risk of re-infection but also by providing a more cost-effective method in the long run.

It has been said that deworming initiatives can have positive societal effects such as increased school attendance, but they can also increase people’s health and nutrition. Soil-transmitted helminths are feeding on host tissues and blood, which results in anaemia – the loss of iron and protein – and a malabsorption of nutrients, hence weakening the nutritional status (WHO, 2012).

In terms of these direct effects, however, there is enduring controversy around the benefit of deworming initiatives.

“[…] we saw benefits in the U.S. when we got rid of hookworms, we see this in production animals, in livestock animals, all the time, so it would be naive to imagine that there wouldn’t be some effect implements. But I will say, light to moderate worm burdens are difficult to quantitate an effect on health. There are lots of anecdotal reports on health that people are feeling better when their worms are removed.” (T. Geary, personal communication, November 13, 2015).

School-based deworming can have significant impacts on health by not only lowering the burden of worms but also by reducing anaemia.

“Kids who are dewormed have lower rates of anaemia, which is a major nutrition indicator, and they have fewer deficiencies about other nutrients since the worms soaking up all the nutrition that they need. […] based on what evidence shows, yes there are positive impacts on health and nutrition.” (K. Williams, personal communication, December 2, 2015).

Although evidence suggests benefits such as improved nutrition, some experts claim that there is no sufficient data that shows the efficacy of deworming in terms of the physical development of children.

“No, we did not see, so, and I think that’s the point of many people in the Cochrane Analysis, there is just no evidence right now.” (Dr. M. Yazdanbakhsh, personal communication, November 11, 2015).

But can nutritional benefits of mass drug administrations be adequately measured without any screening or health checks prior to conducting the deworming initiative? Ongoing monitoring of children in developing countries would be essential to precisely account for the success of school-based mass deworming initiatives. However, it can be said that these deworming
interventions have been effective in providing neglected populations with better access to treatment.

5.2.3 How has the NTD discourse been shaping development organizations’ action?

Discourse is a particular knowledge about the world which shapes how the world is understood and how things are done in it (Rose, 2001, p. 136). Since the creation of the NTD discourse, neglected tropical diseases have received more attention and higher funding from donors to achieve better control and prevention. Discourses are perceived as being socially produced and concerned with a construction of difference and authority (ibid, 2001, p. 140). With discourse, meaning is defined in relation to its opposite, for example, ‘developed countries’ versus ‘developing countries’, or in this case ‘the West’ and ‘Africa’. This obvious power asymmetry in the relationship between the ‘West’ and ‘Africa’ is visible in the distribution of resources and Africa’s lack thereof. Powerful key players, such as the media, politicians, and large organizations – like the World Health Organization and pharmaceutical industries – have the power to influence discourses by deciding what is readily available.

Power asymmetries are a major factor contributing to conflicts between development organizations and pharma industries. Pharma industries produce the drugs at a low cost and distribute them free of charge to development organizations to be used to help people affected by NTDs in developing countries. But what are their motivations for doing so? Some argue that drug manufacturers are addressing unmet healthcare needs in the developing world to improve their overall business performance (Consumers International, 2007, pp. 14-15). Pharmaceutical patent protection is a hindrance for development organizations addressing the demands of public health concerns regarding supply and affordability of drugs (Rosskam & Kickbusch, 2011, p. 27). In 2000, Western governments opposed the idea to purchase generic drugs to scale up treatment, however, pharmaceutical industries argued that the price of medicines is irrelevant (GlaxoSmithKline, 2011, cited by Pinto & Upshur, 2013, pp. 140-1). Pharmaceutical industries decide what’s readily available through research and development as well as through their donations to deworming
campaigns in Kenya. For the treatment of NTDs, deworming medication is being used as it is a cost effective treatment with a market cost of approximately US$ 0.03 per dose (Dr. A. Montresor, personal communication, May 18, 2015).

“The other thing is […] economic development. So we can keep on donating those drugs and they can take it, but the next day they don't have shoes and they get re-infected. So really, what are we doing? All these drugs, pouring them in, just for people to feel good about it; for big, certain big multinationals feeling well. See, we donate so much. […] we really should re-think this.” (Dr. M. Yazdanbakhsh, personal communication, November 11, 2015).

Pharmaceutical companies such as GlaxoSmithKline have been engaging in campaigns that emphasize marketing the disease rather than the drug. They point to the misery caused by apparent symptoms with the aim to point out the disease – NTDs – and the availability of treatment – in the form of mass drug administration – to the lay person, in terms of the case study – the Kenyan people (Rose, 2007, p. 213-214). These powerful key players have been contributing to development organizations' action against NTDs by exercising their decision power over the passive recipient of the medicine, the Kenyan children, treated as part of school-based deworming campaigns. But are they really acting in the best interest of the populations at risk or do they have a market incentive? Rose (2007, p. 38) claims that major international pharmaceutical companies are piloting their experimental drugs in developing countries, with results feeding into the manufacturing of lucrative new products for the developed world, generating shareholder value. Pharmaceutical corporations 'make money' by marketing the drugs developed for the more lucrative markets. They spend millions of dollars each year developing new drugs that are most likely to provide a high return on the company's investment, prioritizing drugs for use in the industrialized world over ones for use in the Global South (Consumers International, 2007, p. 10; WHO, 2016).

“So they say, yes, we are now going to deal with neglected diseases, but when it comes to grant applications, all the money goes again to HIV/TB. Right be so, I have nothing against that; those diseases are devastating, they have to be taken care of, but don't pretend that you are going to support neglected diseases.” (M. Yazdanbakhsh, personal communication, November 11, 2015).
Pharmaceutical companies have the means to support the drugs that they deem more attractive and more profitable regardless of development organizations’ opinion. In the 1990s, WHO tried to get support from pharmaceutical companies to produce eflornithine to treat sleeping sickness. These companies were invested in manufacturing eflornithine as a beauty product but not as a cure for sleeping sickness (McNeil, 2001, cited by Pinto & Upshur, 2013, p. 145). It was not until it sparked media attention that the pharma industry agreed to produce eflornithine for treating those infected with the deadly disease in Africa.

Since the start of the nineteenth century, many medical changes took place reshaping medical perception and shifting the focus to the maintenance of a ‘healthy body’ (ibid, 2007, p. 10). Enhancing vitality and health has taken shape in advanced liberal democracies in the twenty-first century. People’s relation to health and illness has been changing, and we have become more active participants in maintaining and promoting our own health. The contemporary shift from the practice of healing to a maximization of the vital forces of the living body is part of the government of life (ibid, 2007, p. 23). This new engagement in health education and health promotion that has been prevailing in the West does not separate us much from the Global South. In the name of health, development organizations are trying to educate the developing world on NTDs and on precautionary measures that can be taken to reduce their prevalence. Kenya’s government, in collaboration with partners, has been distributing handouts to teachers on their ‘National Worm Control’ initiative because of their close contact with the community. Teachers are to educate their students about the negative effects of intestinal parasites on health and education and on the significance of deworming (WHO, 2011, p. 6). Governments and development organizations are the ones passing down their knowledge about NTDs to teachers who then inform the community. So far the developing world still remains the ‘patient’ – the passive recipient of the medicine rather than an active participant in this process – who is lacking a voice while decisions are being made for them by those in power – development organizations and pharmaceutical companies.
One might think that this power asymmetry only prevails in developing countries; however, NTDs do exist outside of tropical regions. According to Hotez (cited by Nelson, 2014, p. 2), there is little data on these diseases and an insufficient effort to establish prevalence of incidence in the United States. Eradicating these neglected infections of poverty in the United States and other developed countries will be a challenge without adequate funding and responsiveness. Their lack of attention is most likely due to their lower prevalence compared to developing countries and the belief that NTDs have were eradicated in the United States in the 1930s, hence limiting the possibility of infection.

“[…] the Bleakley paper from 2004 […] describes the educational and economic impacts of deworming of the U.S. South in the 1930s. […] one of the things that is said in that paper is […] the average life span of a worm is a lot less than the average life time of a person. So for someone to be continuously infected for long periods of time, they basically need to be re-infected.” (C. Davey, personal communication, November 11, 2015).

Many of the diseases are not being recognized as such due to a lack of diagnostic tests and knowledge about their existence in industrialized countries. In addition, there is a lack of targeted funding for neglected diseases. The Global Forum on Health Research claims that “only 10 percent of resources are devoted to 90 percent of the global burden of disease, i.e., that represented by disease disproportionately occurring in developing countries” (Bell, cited by Hotez, 2008, p. 8).

“It’s very interesting that we just had a round of European clinical trial EDCTP, […] it’s a grant-giving body, and there was a grant for diagnosis of neglected diseases, and also HIV/TB, and not a single grant went to helminths. Only one went to TRIPS, one grant was granted for trypanosomiasis (sleeping sickness), but all the others were for TB.” (Dr. M. Yazdanbakhsh, personal communication, November 11, 2015).

This shows that even though neglected tropical diseases have been receiving more attention since the establishment of the NTD discourse, in comparison with other communicable diseases, they are still lacking a large proportion of funding.

“[…] so many millions get spend on deworming, but when you think about like the Global Fund and stuff spending money on malaria, tuberculosis and HIV, you know, it’s huge. And Gates Foundation, I’m not sure how much of it gets spent on neglected tropical diseases […] I’ve never got the
impression, that when you really look at it, the amounts of money that gets spend on those areas are absolutely massive. You know, these ain’t just big numbers. Like 10 million sounds like a lot but the grand scheme of say funding for HIV research is not that much.” (C. Davey, personal communication, November 11, 2015).

Discourses of institutional power and knowledge emphasize how the NTD discourse is being materialized in the form of WHO reports and deworming campaigns. The discourse also produces subject positions of WHO institutional leaders and medical doctors, pharmaceutical industries, and those being dewormed. Deciding what to use, and what not to use, in its reports and campaigns demonstrates an unequal power relationship between the producer – WHO and pharma industries – and the produced – Kenya’s population. Based on the report of Kenya’s Ministry of Health, almost 16,000 schools were targeted during a two-week period as part of the deworming campaign in Kenya’s schools in 2013 (Dr. A. Montresor, personal communication, May 18, 2015). As part of the mass drug administration, albendazole, and praziquantel in areas endemic for schistosomiasis, were given treating roundworms (ascaris lumbricoides), hookworms (ancylostoma duodenale and Necator americanus), whipworms (richuris trichiura), and schistosomes (Dr. A. Montresor, personal communication, May 18, 2015). WHO has been recommending these medicines due to their safety and minor side effects such as dizziness, stomach pain, nausea, vomiting, and fever (First WHO Report on NTDs, 2010, p. 22). The safety of the anti-worm medication albendazole, successful in treating infections caused by a variety of parasites, had been approved by the US Food and Drug Administration in June 1996 (Medicine net, 2014) while praziquantel has been effectively used in the treatment of schistosomiasis, a worm that lives in the bloodstream (MediLine, 2015). These drugs have been administered during Kenya’s school-based deworming campaign in 2013.

“In general the drug is very safe because [it] is not absorbed but kills the worms in the intestine. No side effects were reported during the campaign.” (Dr. A. Montresor, personal communication, May 18, 2015).

In general, experts are considering the drugs as safe. There have been images of kids crying during the deworming campaigns, but as one expert noted, that is due to the size of the tablets.
“[...] placebos have incidences of nausea, so the drugs that we use are quite safe. The biggest problem is probably the size of the tablets for little kids. So the companies are working on pediatric formulations to overcome that. But I think the risk is very, very low. And I think that the benefits are very, very high, so I don’t find any particular issues with these drugs.” (T. Geary, personal communication, November 13, 2015).

Empirically treating infected and uninfected children has limitations. Although deworming is considered safe for all populations treated, individuals who are malnourished or co-infected with other pathogens may react differently to deworming drugs.

“So yes, we have encountered some problems like that but [...] it’s a very small proportion of all the number of kids treated, and we also are very careful to reading up to the deworming days [...] Part of the protocol is that kids who are already ill, who aren’t feeling well that day or who have been sick that week [...] should not be treated because there can be and there have been times where kids who, like for instance in Kenya, that there’ve been [...] kids that have had malaria and had been sick and then were treated with deworming medicine and because of other pre-existing illnesses ended up dying, and so then that gets misinterpreted as a result of the deworming treatment.” (K. Williams, personal communication, December 2, 2015).

So overall, deworming drugs are being considered safe and treating worm infected populations has benefits; however, there is controversy around its effectiveness. Rose (2007, p. 50) claims that biomedicine denies the collective determinants of health and disguises the threat that biological practices discriminate against those who are considered biologically inferior.

“I think we’re filling in kids with a lot of drugs. We still don’t see in the long term much effect. So then the next question is, can you rightly say, is it safe to give all these drugs to these kids? [...] the drugs are safe, I think, all together, but whether that has some kind of effect, I’m really, I’m not sure.” (Dr. M. Yazdanbakhsh, personal communication, November 11, 2015).

So how has the NTD discourse been shaping development organizations’ action? Cultural barriers between global and local players in global health emphasize an imbalanced power dynamic, a representation of inequality and global poverty. These cultural barriers apparent in the lack of education, proper health care, clean water and adequate sanitation have added to Kenyans being ‘caught up’ in this top-down approach where developed countries have the power to make decisions about the health of populations in developing
countries. As part of Kenya’s deworming initiatives, a training cascade has been established by various government sectors and development partners that contribute the resources to the deworming program where development organizations and district-trained teams have taught divisional groups to inform and educate other members of the community on health messages to advocate for the deworming activities at all levels of society (WHO, 2013, p. 5). One-way knowledge about the mass deworming initiatives flows from global institutions to the locals – the Kenyans – via health education by teachers in the community, but not in reverse.

Institutions of power – such as WHO – have a **voice or authority** to speak on behalf of those being treated as part of deworming campaigns. According to a report by WHO (2005, p. 30), “impoverished communities cannot be expected to manage disease control on their own, *nor are their voices heard by politicians or policy-makers*. Support from both national and international levels is essential”, which clearly shows the presence of power asymmetries in WHO’s decision-making power. WHO’s actions and decision-making power are contributing to local communities not having a say in the treatment process. Global institutions are deciding on the frequency of drug administration which ranges from once to twice yearly depending on the dominant epidemiology of the targeted infections and is being administered every year “to maintain the number of worm low in each child and to avoid the negative consequences” (First WHO Report on NTDs, 2010, p. 22; Dr. A. Montresor, personal communication, May 18, 2015). To intensify control of NTDs, communities are to participate in the mass treatment campaigns administered by WHO where they do receive appropriate treatment in addition to community health information and education (WHO, 2006, p. 30). This ‘medicalization of social problems’, as Rose puts it, is visible in the therapeutic powers that doctors have over their patients, intruding into political matters that are not their concern (Rose, 2007, p. 10).

Technological advances and social media have played immense roles in development organizations’ action against NTDs. GIS mapping has assisted in the identification of geographical high prevalence areas of NTDs. The Kenya Medical Research Institute (KEMRI) carried out an extensive mapping survey of
NTD prevalence levels in Kenya identifying regions for mass deworming based of prevailing worm infections of above 50% among populations (WHO Regional Office for Africa, 2013, p. 3).

“I think the move to provide mapping of NTDs is a great improvement. Improvements in data tracking, mobile health for data collection and monitoring have been important. There has been improved awareness of the negative impact that NTDs have on the poorest populations.” (J. Convoy, personal communication, November 26, 2015).

Based on these mapping surveys, a decision by those in power was made to treat children through school-based mass deworming initiatives. This evidence-based information helps support the ‘politics of life itself’, as Rose suggests, assisting governments and development organizations in their capacity to “control, manage, engineer, reshape, and modulate” human health in Kenya (Rose, 2007, p 3). In an effort to cure diseases in developing countries, political actors are using their power to manage populations, projecting their knowledge on the ‘Other’ through the training of health workers who are amplifying the importance of deworming to the community.

Since the 2005 NTD paradigm shift, there has been an increased recognition of global health problems with respect to NTDs. This mobilization of NTDs has supported political action; however, in recent years, funding for NTDs has still been in the tens of millions of dollars compared to the billions spent on the control of the ‘big three’ diseases (Hotez, 2013, p. 195). However, global actors are placing more emphasis on research and development of NTDs. Food and Drug Administration (FDA) vouchers have been introduced as an incentive for drug companies to invest in research and development of new drugs (Mantilla, 2011, p. 124). This increased acknowledgement of NTDs has contributed to recent efforts in the prevention and control of neglected diseases. With increased awareness of the effects of NTDs on the world’s poorest populations and the latest recognition of NTDs are part of the SDGs, there is hope that the fight against NTDs will achieve a level of priority similar to those of the ‘big three’ diseases on the international health agenda.
6. Findings and Reflection

6.1 Self-Reflexivity:

The researcher often acts as the “fly on the wall: seeing and hearing without being seen or heard” (Lindlof & Taylor, 2002, p. 143). Self-reflection and awareness of subjectivity are significant in developing a healthy distance to the particular research methods used throughout the paper. The interviews produced interesting findings and were analyzed based on significant statements and their relation to its broader social contexts.

Participation in this research project was voluntary and the relationship between the researcher and the interviewees was kept professional. The email interviews proved advantageous as they prevented the need for recording and transcribing of the information presented; but on the downside, they resulted in short answers as well as a lack of clarification of the feedback provided. However, the semi-structured interviews proved beneficial in gathering more data with better clarification. Recording the conversations was favourable as it allowed for a better responsiveness to the given answers and permitted for follow-up questions for clarification rather than having to focus on capturing all the content provided during the interview. Semi-structured interviews were also helpful in establishing personal relationships with the interviewees and allowed for a respectable interaction.

With the chosen interview questions, I found that having open-ended, non-suggestive questions worked quite well. This allowed the interviewees to elaborate on their answers instead of me guiding them with my own presumptions. Five of the interviewees were asked the same interview questions referring to the same deworming debate which allowed for a comparison and proper analysis of the data gathered during the interviews. In addition, having asked the sixth interviewee specific questions on Kenya’s mass deworming initiative added to a deeper understanding of the outcome of those initiatives. All of the interviewees selected have a solid understanding of NTDs and deworming campaigns. The research might have benefited from interviewing Miguel and Kremer as well as Hotez, but none of them was available for an interview due to the time constraints of this research paper. The
findings illustrate that the empirical data obtained during the interviews was valuable in answering my research questions. The analysis considered relevant passages for addressing the research questions and placed the data in the context of the theoretical frameworks of the NTD discourse and the ‘Other’.

The discourse analysis produced essential knowledge about common institutional or political patterns by highlighting development organizations’ action and achievements in addressing NTDs and generated relevant data in terms of underlying power relations. Analysing WHO reports and secondary sources added to a deeper understanding of the topic. The systematic approach of showing the underlying power relations proved advantageous in demonstrating the ‘us’ vs. ‘them’ approach. The theoretical frameworks of the NTD discourse and the ‘Other’ clearly demonstrate the power relations of development organizations and pharmaceutical industries when it comes to addressing health issues in developing countries. Interviews with Kenyans treated as part of the 2013 school-based deworming campaign would have been beneficial for showing the power relations between development organizations and recipients of deworming drugs, however, due to the scope of this research this was not feasible. Choosing the mixed approach of an interview and a discourse analysis was favourable for this research paper as it produced diverse data that complemented each other.

6.2 Findings:

The creation of the NTD discourse in 2005 was a first step for neglected tropical diseases to receive more attention on the global health agenda. Efforts by international institutions have assisted in making NTDs more visible by educating communities about what they are and their prevalence. In comparison with the ‘big three’ infectious diseases, NTDs still receive much less funding for research and development from donor organizations. There is a general consent from interviewees that NTDs have been receiving more attention recently, making them less neglected; however, there is still more work to be done to ensure that NTDs will gain higher priority. Based on the findings, NTDs and their debilitating effects on populations have been better and more widely communicated, making them less ‘neglected’. This marks a significant
institutional approach for solving the health issues of the underprivileged. Properly addressing NTDs and mobilizing resources requires a collective approach which NTDs have been receiving as part of the Millennium Development Goals, and more recently, with the newly implemented Sustainable Development Goals that explicitly address “HIV/AIDS, tuberculosis, malaria, and neglected tropical diseases”.

While global institutions’ efforts of raising awareness of NTDs had positive results recently, neglected infections of poverty are still lacking that attentiveness in the United States. Further examination of the latter showed that the diseases have been receiving more attention mainly due to Hotez’ research and work in recent years. The 2009 National Summit on Neglected Infections of Poverty marked a milestone in raising awareness and identifying initiatives for addressing them in the United States; yet, compared to NTDs in developing countries, neglected infections of poverty are still lacking national and global awareness.

Comments provided by interviewees highlighted the underlying power asymmetries between those with authority and the disadvantaged in terms of addressing NTDs. Preventative chemotherapy as a way to combat NTDs via mass drug administration has been implemented as a cost-effective method and a best buy for development. Even with the controversy, it appears that the debate about the effectiveness of mass deworming has not yet affected government funding for deworming initiatives and is still being supported by development organizations. Despite the dissimilarity of opinion, without deworming, children would be even more infected with larger burdens of worms. Can deworming have a positive effect on school attendance and nutrition? More research and screening of individuals is needed to gain better data and more adequately compare the overall effects on children’s health.

Assertions made by interviewees have been helpful in showing the argumentative nature of the ongoing debate on the effectiveness of deworming campaigns. The empirical data assists in establishing the prevailing controversy around mass deworming and whether the treatment of all children is a cost-effective method for increasing health and school attendance. Although
considered safe for all populations treated – those infected and uninfected – there is a risk of developing resistance against the drugs. Re-infection due to unclean water, poor sanitation, and inadequate footwear is a major problem in developing countries and these underlying economic conditions need to be addressed. Having a vaccine against NTDs might help solve the issue of re-infection. Until then, mass drug administration will only help reduce the burden of NTDs but will most likely not be able to successfully eradicate the diseases.

Can untreated children benefit from those who have been treated? Deworming can have an impact on those not being treated as deworming externalities can be explained through the reduced amount of eggs being shed into the environment and the subsequent decrease in worm transmission within the communities. However, there is a risk that those who have not been dewormed can re-inflect those who have been dewormed. Ongoing monitoring of children receiving school-based mass deworming medicines would be necessary to precisely account for the effectiveness of mass deworming initiatives.

The discourse analysis shows existing power relations between development organizations and pharmaceutical industries, as well as between institutions in power and the recipients of deworming drugs. The NTD discourse communicated throughout this research paper made claims of truth. Development organizations are in a position of power as they know more about NTDs than those in developing countries, leading to victimisation of those who are helpless and need treatment. The analysis suggested a clear differentiation between ‘us’ (development organizations) and ‘them’ or the ‘Other’ (those being treated). This demarcation shows a clear illustration of power relations between those in power and those being treated as part of mass deworming campaigns who are subject to the decisions of development organizations, governments, and pharmaceutical companies. The ones on the receiving end are dependent on the kind of treatment provided by those in power. Children treated as part of school-based mass deworming initiatives should be screened prior to receiving anthelminthic drugs to avoid any possible side effects that may lead to death due to already existing illnesses unrelated with soil-transmitted helminths or other diseases being treated.
The discourse analysis revealed that since the coining of the NTD discourse, NTDs have been receiving more funding. Developing nations are dependent on donors and subsequent funding to combat these debilitating diseases. The NTD discourse has helped in providing populations in the developing world with better access to treatment for NTDs while at the same time increasing public awareness of the diseases. In addition, the recognition of human suffering has contributed to more funding for research and drug development and a higher priority on the global health agenda. Having sufficient funding for research and development of new drugs and the development of a vaccine against NTDs would be necessary to find more ways to tackle these devastating diseases.

7. Conclusion
The findings showed that by coining the NTD discourse, NTDs received more recognition and power. Even the recent debate has not impacted the newly acquired importance of treating NTDs, and treatment will be further supported by development organizations. Having NTDs listed specifically as being part of the new SDGs will contribute to further reduce its 'neglected' status and add to more funding and acknowledgement by international institutions. The SDGs are evidence that there is a visible movement for change and recognition. Initiatives taken show the importance of the battle against NTDs. The discourse analysis along with qualitative interviews revealed that power relations have shaped the NTD discourse. These relations are visible between development organizations and those affected by NTDs in developing countries.

NTDs are triggered by underlying economic factors that are interrelated with poverty. Acknowledging these root causes of NTDs is significant in determining proper medical interventions for reducing the suffering of neglected populations. Many NTDs could easily be controlled or eliminated. Further research to better measure the true prevalence of these infections is needed to gain a clearer understanding of the long-term results. It must be taken into consideration that increasing cases of drug resistance in the population might have effects on the outcome of repeated treatments and that repeated infections could occur due to the living conditions present among the poor.
Investigating the public health discourse could also be explored in future research by looking into communication between developed and developing countries. Current critiques of the deworming initiatives have had little impact on international funding or government policies. This potential impact is essentially another area that might require further research. In addition, it would have been interesting to investigate mass deworming from the perspective of recipient communities which was not possible due to the scope of this study.

7.1 Concluding Remarks:
This research study is selective and the analysis is not comprehensive of the whole population. Analyzing approaches taken to combat NTDs and neglected infections of poverty are inherently critical within the field of Communication for Development. Research shows that NTDs are still not at the top of development organizations’ priority lists; however, they are steadily gaining more consideration and funding as is visible in the new SDGs. The formation of the NTD discourse helped force the world’s attention towards neglected communities and those left behind in the development process. Increased efforts in global health have been supporting the development of drugs, vaccines, and deworming initiatives. Although NTDs are still lacking funding in terms of research and access to treatment in comparison to the ‘big three’, they have been receiving increased global awareness in recent years.
8. References


Appendix 1: Interview Questions

1. There has been lots of debate around deworming on Twitter (#wormwars) lately? Have you heard of that? What’s your take on it?

2. Do you think deworming has been successful? What are the benefits?

3. What issues have you found in deworming initiatives (i.e. health concerns, side effects)?

4. How successful are deworming drugs, such as albendazole/mebendazole in deworming children and improving their health?

5. Deworming drugs provide a cost-effective way to deworm children. Do you think they are safe for all children or should children be screened before taking them?

6. What health impacts could deworming drugs have on the population in the long term after continuous use over years?

7. Would alternative, more expensive herbal products be better and safer in the long term?

8. When children who have been dewormed get re-infected, how do you think the new burden of worms negatively affects their health?

9. Children who have been dewormed can have an impact on those who have not been. To what degree can those who have NOT been dewormed benefit or be negatively impacted by those who have been dewormed?

10. Do you think deworming positively improves children’s health, nutrition, and school attendance, and if so, how?

11. How have development organizations made NTDs less ‘neglected’?

12. What kind of improvements have you seen in development organizations’ action against NTDs over the past years?

13. What do you think about the ongoing debate about deworming? Will it have a negative impact on development organizations, for example, by reducing funding for deworming?
14. Infectious diseases of poverty are present in the southern United States. What do you think are the reasons they are getting less attention in the United States than in developing countries?

15. Is there any additional information you would like to add regarding deworming?
Appendix 2: Interview Scripts
For the sake of space and user-friendliness, only relevant interview passages will be presented:

Interview 1:  Jocelyn Conway

Occupation:  Coordinator, UBC Global Health Online Network
Organisation:  Neglected Global Diseases Initiative, Canada
Date:  November 26, 2015

11. How have development organizations made NTDs less ‘neglected’?
Health-focused NGOs and health, and academic research organizations have advocated for more funding, more treatments and more research. Public private partnerships like the London Declaration have provided a much added focus; and collective for action.

12. What kind of improvements have you seen in development organizations’ action against NTDs over the past years?
I think the move to provide mapping of NTDs is a great improvement. Improvements in data tracking, mobile health for data collection and monitoring have been important. There has been improved awareness of the negative impact that NTDs have on the poorest populations.

14. Infectious diseases of poverty are present in the southern United States. What do you think are the reasons they are getting less attention in the United States than in developing countries?
There has been an increased awareness in the US because of the work of Dr. Peter Hotez over the past few years. And, of course, they are receiving less attention than developing countries because of the burden of disease is far greater there. The impact of improving people's lives is far greater there and it has been ignored far longer.
Interview 2:  Calum Davey

Occupation:  Research Fellow, MSc in Epidemiology
Organisation:  London School of Hygiene & Tropical Medicine (LSHTM), United Kingdom
Date:  November 11, 2015

7. Children who have been dewormed can have an impact on those who have not been. To what degree can those who have NOT been dewormed benefit or be negatively impacted by those who have been dewormed?

[...] the Bleakley paper from 2004 [...] describes the educational and economic impacts of deworming of the U.S. South in the 1930s. [...] one of the things that is said in that paper is [...] the average life span of a worm is a lot less than the average life time of a person. So for someone to be continuously infected for long periods of time, they basically need to be re-infected.

11. How have development organizations made NTDs less ‘neglected’?

[...] so many millions get spend on deworming, but when you think about like the Global Fund and stuff spending money on malaria, tuberculosis and HIV, you know, it’s huge. And Gates Foundation, I’m not sure how much of it gets spent on neglected tropical diseases [...] I’ve never got the impression, that when you really look at it, the amounts of money that gets spend on those areas are absolutely massive. You know, these ain’t just big numbers. Like 10 million sounds like a lot but the grand scheme of say funding for HIV research is not that much.

I’m sure they are less neglected than they used to be, but I’m not totally convinced that they are. [...] there are these diseases that just don’t affect people in high income settings and then get completely, or almost completely side-lined [...] as far as research is concerned in epidemiology. [...] there’s probably still work to be done [...] to improve that there’s the funding to make those diseases go away."
14. Infectious diseases of poverty are present in the southern United States. What do you think are the reasons they are getting less attention in the United States than in developing countries?

I don’t know why […] it’s not getting attention. I mean in the area I work in mostly is in HIV, and in America now, HIV is […] being associated with relatively well-off people […]. It’s now a disease which has actually a quite surprisingly high prevalence in the United States compared with other countries like Canada and Europe, with predominately among poor people, drug users, and […] black African American populations.
2. Do you think deworming has been successful? What are the benefits?

[...]

2. [...]

[...]

3. What issues have you found in deworming initiatives (i.e. health concerns, side effects)?

[...]

3. [...]

[...]

8. When children who have been dewormed get re-infected, how do you think the new burden of worms negatively affects their health?

[...]

8. [...]

[...]

8. [...]
9. Children who have been dewormed can have an impact on those who have not been. To what degree can those who have NOT been dewormed benefit or be negatively impacted by those who have been dewormed? Depending on the frequency, you can reduce the environmental burden of the infectious stages so you can reduce the tendency to become infective. This was the basis for doing school-children who tend to have the highest burden of the worms more or less. So the thought was, if we treat these kids, we’ll eventually lower the burden of the infectious stages in the environment to the point where we won’t have a problem.

10. Do you think deworming positively improves children’s health, nutrition, and school attendance, and if so, how?
[...] we saw benefits in the U.S. when we got rid of hookworms, we see this in production animals, in livestock animals, all the time, so it would be naive to imagine that there wouldn’t be some effect implements. But I will say, light to moderate worm burdens are difficult to quantitate an effect on health. There are lots of anecdotal reports on health that people are feeling better when their worms are removed.

12. How have development organizations made NTDs less ‘neglected’?
[...] it’s been really driven by the Gates Foundation, and they have brought a great deal of attention to the issue and that has amplified their efforts. So I think that the situation today compared to twenty years ago is hugely different.
Interview 4: Katherine Williams

Occupation: Associate, Deworm the World Initiative
Organisation: Evidence Action, United States
Date: December 2, 2015

2. Do you think deworming has been successful? What are the benefits?
There is a substantial body that regards evidence of high quality that shows benefits of deworming. […] a brief from the Jameel Poverty Action Lab or J-PAL […] explains why deworming is considered best buy in development, it talks about the intent that kids who are dewormed have higher attendance rates in school, they have less malnutrition and anaemia plus extended growth, often have shown improved immunity against other infections that are common in childhood when their bodies aren’t fighting against the worm infections. […] some studies have suggested improved academic performance although that’s not quite as strong. And then there’s also some evidence of longer term impacts like increased economic productivity, higher earnings, more hours worked in adults who were dewormed as kids.

3. What issues have you found in deworming initiatives (i.e. health concerns, side effects)?
So yes, we have encountered some problems like that but […] it’s a very small proportion of all the number of kids treated, and we also are very careful to reading up to the deworming days […] Part of the protocol is that kids who are already ill, who aren’t feeling well that day or who have been sick that week […] should not be treated because there can be and there have been times where kids who, like for instance in Kenya, that there’ve been […] kids that have had malaria and had been sick and then were treated with deworming medicine and because of other pre-existing illnesses ended up dying, and so then that gets misinterpreted as a result of the deworming treatment.
8. When children who have been dewormed get re-infected, how do you think the new burden of worms negatively affects their health?

[...] places that need deworming treatment [...] or systems of sanitation are not improving on infrastructure [...] and are living in homes with dirt floors [...], these environments that can really facilitate re-infection, then that’s always going to be a concern. So that’s why it’s important that treatment is also in the long-term accompanied by infrastructure and sanitation improvements.

9. Children who have been dewormed can have an impact on those who have not been. To what degree can those who have NOT been dewormed benefit or be negatively impacted by those who have been dewormed?

[...] in some of the areas where school-age children were dewormed in Kenya, research showed that their younger siblings also have lower infection and later benefited from higher school attendance. So yeah, there are positive benefits on communities and on individuals in communities where people, where a large proportion of people are dewormed since, you know, that’s fewer opportunities for passing along transmission for re-infection. But at the same time, you know, those people who aren’t being dewormed also can still be kind of reservoirs for the parasites. So it works both ways.

10. Do you think deworming positively improves children’s health, nutrition, and school attendance, and if so, how?

Kids who are dewormed have lower rates of anaemia, which is a major nutrition indicator, and they have fewer deficiencies about other nutrients since the worms soaking up all the nutrition that they need. [...] based on what evidence shows, yes there are positive impacts on health and nutrition.
13. What do you think about the ongoing debate about deworming? Will it have a negative impact on development organizations, for example, by reducing funding for deworming?

Well, I think in a way it maybe a little too soon to tell what if any impact that will have. I know that with our organization we have not seen a reduction in funding for deworming, but, you know, of course it’s a possibility and then there’s also, like I mentioned, also these kind of global pushes to integrate deworming with other NTD treatments and also with WASH (water, sanitation, hygiene work) […]. So yeah, it’ll be interesting to see in the next couple of years if there is any shift but right now, we’ve definitely not felt that at all.
Interview 5: Dr. Maria Yazdanbakhsh

Occupation: Professor, Head of Parasitology
Organisation: Leiden University Medical Center, The Netherlands
Date: November 11, 2015

1. There has been lots of debate around deworming on Twitter (#wormwars) lately. Have you heard of that? What’s your take on it?
Look at Ebola. Long time, you know, they could develop, it could go so fast. Wherever there is a will, there is a way. So I’m for vaccine because kids have to be prevented from becoming infected.

The other thing is [...] economic development. So we can keep on donating those drugs and they can take it, but the next day they don’t have shoes and they get re-infected. So really, what are we doing? All these drugs, pouring them in, just for people to feel good about it; for big, certain big multinationals feeling well. See, we donate so much. [...] we really should re-think this.

3. What issues have you found in deworming initiatives (i.e. health concerns, side effects)? Like nausea or the die-off effect.
I think we’re filling in kids with a lot of drugs. We still don’t see in the long term much effect. So then the next question is, can you rightly say, is it safe to give all these drugs to these kids? [...] the drugs are safe, I think, all together, but whether that has some kind of effect, I’m really, I’m not sure.

4. Deworming drugs provide a cost-effective way to deworm children. Do you think they are safe for all children or should children be screened before taking them?
I just don’t think these kids should be getting pills because they all get re-infected.
5. How successful are deworming drugs, such as albendazole/mebendazole in deworming children and improving their health?
The question of resistance is something that everybody worries about. I’m not sure whether we have solid evidence whether there is resistance development. You know, some people like to say, yeah, there is a lot of resistance, I’m not sure. I’d like to say that [...] it’s better to develop a vaccine than to give drugs, so if I could see [...] developing this resistance against these drugs then I would really see it, but I’m not sure there’s solid evidence.

6. What health impacts could deworming drugs have on the population in the long term after continuous use over years?
No, we did not see, so, and I think that’s the point of many people in the Cochrane Analysis, there is just no evidence right now.

11. How have development organizations made NTDs less ‘neglected’?
It’s very interesting that we just had a round of European clinical trial EDCTP, […] it’s a grant-giving body, and there was a grant for diagnosis of neglected diseases, and also HIV/TB, and not a single grant went to helminths. Only one went to TRIPS, one grant was granted for trypanosomiasis (sleeping sickness), but all the others were for TB.

14. Infectious diseases of poverty are present in the southern United States. What do you think are the reasons they are getting less attention in the United States than in developing countries?
[…] most people think that they don’t exist. […] It’s probably because they think, they’re convinced we’re a developed country, we will not have any neglected diseases.

So they say, yes, are now going to deal with neglected diseases, but when it comes to grant applications, all the money goes again to HIV/TB. Right be so, I have nothing against that; those diseases are devastating, they have to be taken care of, but don’t pretend that you are going to support neglected diseases.
15. **Is there any additional information you would like to add regarding deworming?**

[...] I really think it will be good to try and prevent the infection, so if possible, you know, develop vaccines rather than drugs against worms.
Appendix 3: Interview Questions: Deworming Campaign in Kenya’s Schools

1. As part of the deworming campaign in Kenya’s schools in 2009 (2013), how many schools were targeted?
2. How long did the campaign run?
3. How many doses of dewormers were distributed to the children? And for how long?
4. What kind of drugs were given?
   - Albendazole
   - Mebendazole
   - Levamisole
   - Pyrantel palmoate
   - Others (please list):
5. What was the age of children treated?
6. How many children were successfully treated?
7. What kind of worms were treated?
   - Roundworms (Ascaris lumbricoides)
   - Hookworms (Ancylostoma duodenale and Necator americanus)
   - Whipworms (richuris trichiura)
   - Schistosomes
   - Others (please list):
8. How were teachers educated on the deworming procedure (Training workshops, brochures, etc.)?
9. Were social networks used as part of the communication process?
10. Deworming medication is a cost-effective treatment. What was the cost of the deworming tablets?
11. Were the children monitored? What side effects were observed in children given deworming tablets?
12. How long did it take until children were feeling an improvement in their health?
13. Was a follow-up fecal examination taken to ensure those children are now worm free?

14. Children with worm usually have a Vitamin-A deficiency as well. Were Vitamin-A supplements given with the deworming tablets?

15. How did the children’s health and nutrition improve after the deworming? Any measurable improvements?

16. Do you think the campaign was successful in achieving a better health in Kenya’s school children? How so?

17. Were follow-up deworming campaigns administered in Kenya’s schools? When and for how long?

18. Please list any other comments/additional information.
Appendix 4: Interview Script – Deworming Campaign in Kenya’s Schools

Interview 6: Dr. Antonio Montresor

Occupation: Medical Officer, Preventative Chemotherapy and Transmission Control (PCT)
Organisation: World Health Organization, Switzerland
Date: May 18, 2015

1. As part of the deworming campaign in Kenya’s schools in 2009 (2013), how many schools were targeted?
   I mention here data on the 2013 campaign based on the report of the MoH. – almost 16,000 schools.

2. How long did the campaign run?
   2 weeks

3. How many doses of dewormers were distributed to the children? And for how long?
   8 million tablets were donated to Kenya.

4. What kind of drugs were given?
   - Albendazole
   - Mebendazole
   □ Levamisole
   □ Pyrantel palmoate
   - Others (please list): Praziquantel in areas endemic for schistosomiasis

5. What was the age of children treated?
   Primary school children in principle 5-14 year of age, if older or younger children are present in the class they are also treated.
6. How many children were successfully treated?
6.4 million

7. What kind of worms were treated?
- Roundworms (Ascaris lumbricoides)
- Hookworms (Ancylostoma duodenale and Necator americanus)
- Whipworms (richuris trichiura)
- Schistosomes
- Others (please list):

10. Deworming medication is a cost-effective treatment. What was the cost of the deworming tablets?
The cost in the market is approximately 3 cents of $/dose (with 3$ is possible to buy drugs for 100 children).

11. Were the children monitored? What side effects were observed in children given deworming tablets?
In general the drug is very safe because is not absorbed but kills the worms in the intestine. No side effects were reported during the campaign.

13. Was a follow-up fecal examination taken to ensure those children are now worm free?
Not individually, do fecal investigation cost approximately 100 times the cost of the tablets, the investigation is done in a sample.

15. How did the children's health and nutrition improve after the deworming? Any measurable improvements?
We have several studies that measured the improvement after deworming. We assume that without worms the children improve their health.
17. Were follow-up deworming campaigns administered in Kenya’s schools? When and for how long?

Yes every year. This is to maintain the number of worm low in each child and to avoid the negative consequences.

COUNTRY OFFICE IN KENYA
African Conference of Science Journalists
October 12 to 16, 2014
Venue: Eastland Hotel, Nairobi

Neglected Tropical Diseases (NTDs)
8.30–10:15 am Wednesday, 15th October 2014

REMARKS
By
By: Dr Custodia MANDLHATE, WHO COUNTRY REPRESENTATIVE
Dear Chair,

The chair of Media for Environment, Science, Health and Agriculture (MESHA) Ms. Violet Otindo,

The Secretary – Mesha – Mr Daniel Aghan

The President of African and Federation of Science Journalists Mr Diran Onifade

The African media fraternity representatives

Ladies and gentlemen...

A very good morning to you all. Hamjambo

It gives me great pleasure to meet all of you from the continent and to address the African Conference of Science Journalists on a very important topic: the Neglected Tropical Diseases (NTDs). This is indeed a remarkable platform for a conversation about an important but probably little known subject: the Neglected Tropical Diseases (NTDs), from the concept, their public health relevance, the prevention, control and elimination interventions globally and in-country.

Let me use this opportunity to commend the Organizers of this Conference for creating a platform for dialogue on different issues involving policy makers, scientists and also the general public. This is indeed a great opportunity for all of us to interact with the media and discuss the situation of health, diseases and other critical issues that need to be addressed and acted upon at different levels. In very different for you, I want to say that the media fraternity is well-informed, and performing responsible information sharing, you are our trusted partners in Health Promotion leading to prevention and control of
Communicable and Non Communicable diseases and conditions, and also promotion of healthy life styles.

Ladies and gentlemen, let me take you through the definition of Neglected Tropical Diseases, to set the stage for further discussion.

Neglected tropical diseases (NTDs) are defined as a medically diverse group of infections caused by a variety of agents such as viruses, bacteria, protozoa and helminthes. There are 17 neglected tropical diseases prioritized by the World Health Organization which affect more than 1 billion people worldwide and are endemic in 149 countries globally, but more prevalent in less developed countries.

WHO classifies NTDs into two major groups –

- the Preventive chemotherapy (PC) NTDs and
- the Innovative Disease management (IDM)/case management NTDs.

The PC-NTDs are river blindness (onchocerciasis), elephantiasis (lymphatic filariasis), intestinal worms (soil transmitted helminthes), blood in urine (schistosomiasis) and blinding trachoma.

The IDM NTDs include leprosy, leishmaniasis (kala azar), dracunculiasis (guineaworm), and human african trypanosomiasis (sleeping sickness).

I am sure some of these names are familiar to you, even without classifying them as NTDs.

Why NTDs? This is because for many years the diseases have been neglected by government policy makers, the donor community and even the victims themselves do not consider NTDs as life-threatening as other high-profile diseases. However, there is increasing global attention to NTDs, new
energy is moving policies and resolutions at global and continental levels and we are seeing donors providing funds for NTDs interventions and capacity improvement. In a number of countries at-risk, populations are now increasingly recognizing that this group of diseases can reduce significantly their quality of life.

NTDs have collectively caused untold hardship and misery to millions of people globally but especially in sub-Saharan Africa. These diseases debilitate, blind or maim, and permanently curtail human potentials. They also impair childhood growth, intellectual development, and educational outcomes. They are more prevalent where there is poverty, sanitation is poor, living conditions are sub-optimal, and access to clean water supply is also lacking.

Africa Region bears about half of the global burden of NTDs, which have a great economic impact and contribute to maintain populations in poverty. Of the world’s poorest 2.7 billion people (defined as those who live on less than US$ 2.00 a day), more than 1 billion are affected by one or more neglected tropical disease, and approximately 534,000 (around half a million) deaths occur annually as a result of NTDs.

**Ladies and gentlemen**

In Kenya, many children, mothers, fathers and indeed many communities suffer from at least 9 of the 10 priority NTDs in Africa. The major neglected tropical diseases (NTDs) in the country include, **Trachoma**, **Leprosy**, **Leishmaniasis** (Kala-azar), **Lymphatic filariasis** (elephantiasis), **Schistosomiasis** (bilharziases), **Soil-transmitted helminthiasis** (STH) and **Dracunculiasis** (Guinea-Worm disease). is targeted for eradication.

**LF**, also called elephantiasis, is restricted to the coastal region, Schistosomiasis is distributed in Coastal region, Lower Eastern and Lake Victoria regions; and the STHs (round worms, especially in children) are more
widely distributed in most parts of the country except dry arid areas. Trachoma and Leishmaniasis are mainly distributed in the arid and semi-arid regions of the country.

The endemicity of these diseases overlap, whereby several NTDs occur together. For example in coastal region LF, Schistosomiasis and STHs are co-endemic in many places; elsewhere, Schistosomiasis and STHs occur together in many areas, while Trachoma and Leishmaniasis co-exist in the arid and semi-arid areas associated with nomadic livelihoods.

Guinea Worm is a diseases targeted for eradication. Kenya is among the few countries that need to accelerate efforts for GW free certification. I am pleased to note that WHO is currently working with the government to strengthen the evidence that will enable the country to receive its certification. In this respect we commend the Ministry for creating the national GW certification committee (NGWCC) which will take oversight for certifying Kenya Guinea Worm free.

I am pleased to note that reliable evaluation of the significance of NTDs for public health and economies has convinced governments, donors, the pharmaceutical industry and other agencies, including nongovernmental organizations, to invest in preventing and controlling this diverse, but connected, group of diseases. Once widely dispersed, many neglected tropical diseases are now concentrated in poor remote rural areas and also in urban slums and conflict zones. They cause blindness, disability, deformities or otherwise maim those who are affected.

The World Health Organization, (WHO) recommends five public-health, strategies for the prevention and control, of neglected tropical diseases:

- Expansion of preventive chemotherapy;
- intensified case-detection and case management;
- improved vector control:
✓ appropriate veterinary public health measures;
✓ and provision of safe water, sanitation and hygiene.

WHO has established at Global and Regional levels the Neglected Tropical Diseases (NTD) programme to support countries in their implementation of selected priority interventions.

The framework recognizes that NTD control can be achieved if three requirements are met;
- Attention and action are given to the health needs of populations affected by neglected tropical;
- Interventions to deliver treatments are integrated with other control measures; and
- Multisectoral approach, whereby all stakeholders, government, private sector and local communities work together to generate and deploy necessary resources for the control of these diseases.

Kenya's history of control NTDs, was based on single disease-specific interventions. WHO has since supported the development of Integrated NTD Master Plans in the African region. The essence of this Master Plan is to synergize planning, intervention and monitoring mechanisms for the elimination of targeted NTDs by the year 2020.

Robust national coordination mechanisms are vital for leveraging the new national, regional and global momentum to reduce the burden of Neglected Tropical Diseases (NTDs). Such mechanisms will bring together all stakeholders within a single national coordination structure to support the rapid scale up of interventions needed to control, eliminate and eradicate NTDs.

With WHO support, Kenya is among the initial countries in the region to complete this NTDs Master Plan, which clearly shows the roadmap for NTDs control in Kenya. The plan has highlighted strategies for the control
and elimination of 5 NTDs identified (Lymphatic Filariasis, Trachoma, Schistosomiasis, Leishmaniasis and soil transmitted helminthiasis (STH)).

The Ministry of Health has a Key function of coordinating all interventions aimed at controlling, eliminating, or eradicating NTDs. We note that the country has made progress in this area by launching Interagency Coordination Committee for NTD (ICC) in June this year.

Ladies and gentlemen, permit me to emphasize that it is important for Governments to lead and own the NTD programmes and country coordination mechanism.

On April 7, this year, we commemorated the World Health Day in Baringo County where the main slogan was “Small bite, big threat” which focuses on preventing vector-borne diseases. This activity provided visibility and awareness on NTDs.

Ladies and gentlemen, as I conclude I want to recognize this forum as a milestone for creating awareness on the implementation of the NTD master plan in the countries her represented. The media is a key stakeholder in health information and public information and can play a key role in NTDs control and elimination. I urge you to take greater interest in NTDs and highlight the problem in our society. Be our partners as we focus on prevention and as we support African governments to control, eliminate and eradicate the Neglected Tropical Diseases.

WHO, is committed to support National NTDs programme in coordination with stakeholders and implementation of relevant strategies to support the National and County governments eliminate targeted NTDs by 2020.

We note and commend the Ministry of Health for prioritizing NTDs in the current Health Policies and Strategies. I believe this will provide visibility and support allocation of resources to tackle NTDs problem. I also appreciate the collaboration with KEMRI, through Dr Mpoke the Director for providing
training facilities and needed technical support for NTDs mapping activities. KEMRI is also spearheading research on drugs for NTDs medicines though Drugs for Neglected Tropical Diseases initiative (DNDi). This indeed is an important collaboration in NTDs control, elimination and eradication.

I am sure we all want to see our respective countries free of NTDs. We know what works; we have no reason to fail. Together with you the media, we can achieve elimination of these neglected diseases from our communities. We all have a roll to play

I thank you for your attention