

# Local Knowledge of the Link between Tuberculosis and HIV-1/AIDS among the Turkana of Lodwar Township: Implications for Tuberculosis and HIV-1/AIDS Prevention

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## Abstract

This study used a broad theoretical framework encompassing an ecosystem approach to HIV-1/AIDS that partly investigated the nexus between local knowledge of tuberculosis (TB) and HIV-1/AIDS. According to the Turkana of Lodwar township, Kenya, HIV-1/AIDS and TB are largely contagious and are attributed to impersonal and natural causes. In addition, in line with biomedical knowledge, the Turkana's local knowledge emphasises a conceptual link between TB and HIV-1/AIDS. The study also demonstrates that factors of the ecosystem such as *kaada*, poverty, widow inheritance, migration and other socio-cultural practices play an influential role in the vulnerability of the Turkana to the contraction and transmission of both TB and HIV-1/AIDS. The article posits an integrated approach to the prevention of TB and HIV-1 and to the management of AIDS and TB.

## Introduction

This article is based on the outcome of a study that investigated local knowledge of, and responses to, HIV-1/AIDS among the Turkana of Lodwar township, Kenya. The study was guided by a broader critical theoretical framework that emphasizes the role of ecosystem factors in contracting

and transmitting infections. The study used local knowledge as an entry point into Turkana understanding of HIV-1/AIDS and tuberculosis (TB) and the relationship between the two. It allowed the exploration of forms of knowledge that represent the crucial mediating variables of the ecosystem and the experience of HIV-1/AIDS and TB. The ecosystem is defined here as the interrelationship between human populations and the physical, biological and socio-cultural environments. Relevant factors include social factors such as socio-cultural norms and practices, politics, economy, history, the process of production, conditions of poverty and famine, and environmental factors such as the weather, distribution of rainfall, incidence of drought, source and quality of water, and prevalence of disease vectors. The ecosystem is therefore considered the result of a “dialectical interaction of natural and socio-cultural forces” (Baer et al. 1996: 41).

Though the centrepiece of my study is local knowledge, it diverges from other anthropological studies that have been largely concerned with the rubric of ‘beliefs’ (theoretical knowledge) relating to religion, witchcraft, ancestral spirits, affliction and healing (Bibeau 1980; Yoder 1980; Young 1986; Green 1999; see, for example, studies by Turner 1967 and Pool 1994a, 1994b). As a result, the studies of local medical knowledge and techniques, and theories of illness causation, have ignored common sense and empirical pathogenic explanations, as well as the predominance of naturalistic and physiologicistic etiology (Green 1999; see also studies by Ngubane 1977; Janzen 1978; Feierman 1981; Bibeau 1980; Davis-Roberts 1981; Swantz 1990; Johnsen 1996). They instead give prominence to personalistic and/or super-naturalistic (meta-empirical) explanations of illness causation theories that revolve around witchcraft, magic, spirits and sorcery rather than empirical explanations of illness. Green (1999) has authoritatively argued for recognition of naturalistic indigenous causation theories, especially in contagious infections, rather than undue focus on witchcraft. This study indicates that the Turkana give prominence to impersonalistic and naturalistic etiology in the manner that they explain the link between HIV-1/AIDS and TB.

A biomedical link between HIV/AIDS and TB has already been established. However, the link between TB and HIV-1/AIDS in local knowledge and discourse has not been adequately researched.

In this article, local knowledge of the link between TB and HIV-1/AIDS is discussed. The nexus between the two infections is delineated through causality, symptoms and signs, treatment, ecosystem factors that influence the incidences, and their prevention. I have argued that prevention of HIV-1 and TB, and the treatment of those who are dually infected with TB and AIDS, would require an integrated approach that utilizes the positive aspects of local knowledge of both HIV-1/AIDS and TB and the nexus between them.

### **The Link between HIV-1/AIDS and TB**

The World Health Organization (WHO) estimates that there were 8.8 million new TB cases in 2005, with 7.4 million in Asia and Sub-Saharan Africa (WHO 2007). In the same year, a total of 1.6 million people died of TB, including 195,000 patients infected with HIV-1. At the end of 2001, more than 13 million people had dual HIV-1 and TB infections worldwide (WHO 2007). Even though prevalence and death rates have been falling globally for several years, the total number of new TB cases continues to rise in African, east Asian and eastern Mediterranean regions. Among the 15 countries with the highest TB incidence rates, 12 are in Africa, including Kenya. The runaway rates of TB in Sub-Saharan African countries and some parts of South East Asia (e.g., Thailand) are attributed to the HIV-1 pandemic (WHO 2007). It is estimated that HIV-1 causes about a third of TB in Sub-Saharan Africa, and, globally, TB causes 11% of the deaths from AIDS (Corbett et al. 2003). Tuberculosis has become the key opportunistic infection and first manifestation of HIV-1, and the leading cause of death among HIV-1-infected individuals in Sub-Saharan Africa (Lawn 2003; Corbett et al. 2006; Zwang et al. 2007).

While Kenya, Uganda and Tanzania have TB incidence rates of 20–49% among the HIV infected, southern African countries (South Africa, Zambia, Malawi, Zimbabwe, Botswana and Swaziland) have incidence rates of 50% and above (WHO 2007). In 2006, the Kenyan TB-case notification rate

was 325/100,000, with an estimated HIV-1 prevalence among the TB infected of 52% (Wambua 2006). Since the advent of AIDS, Kenya has witnessed an annual increase of 12–16% (Wambua 2006). It is estimated that overall, about 60% of reported TB cases in Kenya are co-infections with HIV-1 (AIDSKenya.org 2006).

There is a vicious synergistic relationship between TB and HIV-1/AIDS: co-infection with TB accelerates death from HIV-1/AIDS by adversely affecting HIV-1 progression through enhancement of HIV-1 replication; infection with HIV-1 leads to increased susceptibility to the development and transmission of active TB; and HIV-1 accelerates the progression of active TB among people with latent TB. Furthermore, the increase in dual infection leads to an increased transmission of TB in the general community.

HIV-1 has also changed the clinical course of TB, making it more difficult to diagnose and more complicated to treat. Tuberculosis develops faster in HIV-1-infected people and occurs earlier in the course of HIV-1 infection than other opportunistic infections do, and infectivity continues at all levels of CD4 cell count (UNAIDS 1997; Corbett et al. 2006). Countries with the greatest increase in active TB also have the greatest number of AIDS cases. In addition, the social groups characterized by poor social living conditions who have the largest number of HIV-1/AIDS cases also have the largest number of TB cases.

Some studies have also been carried out on the influence of HIV-1 infection on *Mycobacterium bovis* (brucellosis). HIV-related cases of *M. bovis* have been reported in France (two out of 128 cases of TB in HIV-infected patients) and in southeast England (two out of 167 HIV-seropositive cases reported between 1984 and 1992) (Dupon and Regnaud 1992 cited in Garay 1996; Yates et al. 1993). In addition, a nosocomial outbreak of multi-drug-resistant *M. bovis* TB was reported among HIV-infected patients hospitalized in a special unit in Paris (Bouvet et al. 1993). This has huge implications for pastoral populations like the Turkana, who not only live in close proximity to livestock but also rely on livestock-based dietary products which predispose them to *M. bovis* infections. Local knowledge in the Turkana indicated that *M. bovis* exists, and there is an observed increase in its prevalence. Whether this is due to HIV-1/AIDS, as there is an increase in TB prevalence as well, is currently unknown.

### Research Design and Methodology

The study was carried out among the Turkana, a pastoral population in northwestern Kenya numbering about 500,000, currently undergoing a process of diversification from nomadic pastoralism, which remains the main system of socio-economic production. The research location was set among the Turkana of Lodwar township, with a population of about 40,000 according to the 1999 Population and Housing Census. Lodwar is the administrative headquarters of Turkana District. The population of Lodwar township consists of former pastoralists who are either destitute or have diversified into other forms of livelihood, and those who still have a foothold in the nomadic production system through relatives, siblings and other family members.

The prevalence of HIV-1/AIDS in the township of Lodwar is more than 11.4%, whereas the national average is 5.9% (UNAIDS 2006; Wakabi 2007). This study found there are many factors that facilitate the rapid transmission and contraction of HIV-1/AIDS and other sexually transmitted infections in Lodwar township. The factors can be divided into broad categories such as those that encourage unprotected sex, those that encourage mobility, factors of social organization that encourage risky sex, and factors related to deficient healthcare and socio-economic factors. More specifically, factors that encourage unprotected sexual contact include *kaada* (a local alcohol brewed and sold in the villages and markets), video and disco halls, emerging sexual behaviour and practices, and poverty-accentuated commercial sex work. Factors of mobility that encourage the pursuit of casual sexual partnerships encompass migration and travel, refugees, urbanization, truck drivers who transport goods over long distances, the movement of military personnel, and banditry. Factors of social organization that encourage risky sex or open sexual networks include polygamy, widow inheritance and gender inequality. In addition, factors related to deficient healthcare also influence

the transmission and contraction of HIV-1; these include iatrogenic factors (unsafe medical practices and unsafe blood for transfusion), poor sexual health and the prevalence of sexually transmitted infections, and the low use of condoms. Finally, socio-economic factors, specifically the social conditions of living epitomized by poverty, play a role in the transmission and contraction of HIV-1.

Nonetheless, the response to the growing epidemic is deficient and the district continues to conjure up images of traditional and conservative pastoralists who are not exposed to modern influences, and thus their vulnerability to HIV-1 is increased. Moreover, there is a lack of research on pastoralists and HIV-1/AIDS in Africa, and only a few systematic studies have been carried out (Coast 2002, 2006; May 2003; May and McCabe, 2004). My study is the first to be carried out among the Turkana on knowledge of not only HIV-1/AIDS but also TB. Statistics from Lodwar District Hospital and the household survey indicate that TB is among the top five illnesses in Turkana, with evidence of an increase over the last 5 years.

This research was conducted from December 2000 to December 2001, with a further field visit in March 2007. The qualitative data were collected from two sets of samples. In one, a total of 20 randomly sampled adult informants, including 10 men and 10 women of various ages from Kanamkemer, Nakwamekwi, California and Napet villages, were interviewed. In the other, 26 patients with TB, some of whom were co-infected with HIV-1/AIDS, were sampled. Of these, 13 patients of various ages (nine men and four women) were interviewed at the TB Manyatta. (The TB Manyatta is in a separate compound adjacent to the main District Hospital and provides accommodation for Turkana with TB who are from outside Lodwar; they are on directly observed therapy.) All were suffering from pulmonary TB. Their prognoses were variable, as some were seriously ill while others were on the road to recovery. In addition, 13 patients (nine women and four men) were interviewed in the isolation wards. They had similar prognoses to those in the TB Manyatta.

Data were collected through semi-structured and fully structured interviews consisting of open-ended and closed structured questionnaires with the aim of gathering information on local knowledge of TB and HIV-1/AIDS. Those infected were interviewed to gather their experiential knowledge of TB and/or HIV-1/AIDS. The experiential knowledge is far from being theoretical, for it refers to personal experiences with the infections. The response rate was 100%, as those sampled were all interviewed.

Additional data came from one focus group discussion, whose composition was gender sensitive, having an equal number of men and women who were members of the community healthcare committees in Kanamkemer and California villages. The focus group session yielded invaluable insights that not only complemented other research methods, but also enabled me to unearth some of the information that I was not able to obtain via normal interviewing and participant observation. It also brought forth the nuances and contradictions in the Turkana's understanding of TB and HIV-1/AIDS, later allowing me to triangulate the results with other data from other research methods to enhance the validity of my findings.

Further to this, I held both informal and formal conversations with the District Public Health Officer, the Turkana District AIDS and STIs Control Programme Co-ordinator, indigenous healers and biomedical practitioners at the outpatient TB Clinic, TB Manyatta and isolation wards.

The research questionnaires were administered in my presence by a bilingual research assistant who was fully trained in interviewing techniques. The questionnaires were pre-tested for validity. Data were translated from Turkana into English by the research assistant. The validity of the data was also reinforced by the fact some informants could respond in Swahili, a language I am familiar with.

The research project was approved by the University Research Ethics Board-1, Faculty of Graduate Studies and Research, McGill University. The Ministry of Education of the Government of Kenya issued a research permit. Participation of informants in the project was based on informed consent. I have maintained the anonymity and confidentiality of informants and households.

### **The Local Knowledge of the Link between TB and HIV-1/Aids**

My interest in the subject was stimulated during an interview with an indigenous healer concerning

knowledge of HIV-1/AIDS. As I was interviewing the healer, his wife, who was busy preparing the evening meal, interjected that HIV-1/AIDS is inextricably linked with TB. She likened TB and HIV-1/AIDS to two women married to one man. She indicated that many people who are HIV-1 infected hide under the umbrella of TB, as the symptoms and signs of the two infections are similar. In addition, relatives who have lost people to HIV-1/AIDS indicate that they were afflicted only with TB, which, in effect, caused their deaths. As one elder said, "Tuberculosis masks the true symptoms of AIDS. This is why in hospital...those who are HIV-1 infected are often transferred to the tuberculosis isolation wards or the TB Manyatta. *TB ndiyo ugonjwa maridadi.*" This statement means "tuberculosis is the beautiful illness," and it is made in reference to the fact that HIV-1/AIDS is more stigmatized than TB.

During a leaders' workshop in Lodwar, one participant remarked that it is popular knowledge that "Tuberculosis and HIV-1/AIDS are like brothers. When you have tuberculosis you go to the hospital and you get cured. After a short while, you go to the hospital again. The third time you go to the hospital, you do not recover, but die. This is because you are also HIV-1 infected. The chronic form of TB is HIV-1/AIDS."

A surveillance survey was conducted in the Lodwar District Hospital between February 3 and March 3, 2001, during which 12 patients (seven from the isolation wards, and five from the TB Manyatta) were tested anonymously. Eighty-five percent ( $n = 6$ ) and 20% ( $n = 1$ ) of the total number of tuberculosis patients in the isolation wards and TB Manyatta respectively were doubly infected with HIV-1. When data from the TB Manyatta and isolation wards are combined, we find that 58% of patients were doubly infected. According to this surveillance, more women (four of five) were doubly infected than men (three of seven). Of these doubly infected women, two were single, one was divorcee and one a widow. Generally, it was noted that nearly 40% of all smear-test-positive patients were also HIV-1-infected (personal communication with Clinical Officer, Chest and Skin Clinic, Lodwar District Hospital).

### Results of the Study

Of the 13 in-patients at the TB Manyatta, seven indicated that there is no link between TB and HIV-1/AIDS, while three did not know. Only three affirmed that there is a link between TB and HIV-1/AIDS. In the same vein, of the 13 TB patients interviewed in the isolation ward, nine indicated that there was no link, three indicated that there was a link, and one did not know. Of the 20 non-infected informants, 15 indicated there was no link, two did not know and three noted a link between the two infections. Those who were not infected with TB were more likely to affirm the link than those who were infected. This is due to the stigma attached to both TB and HIV-1/AIDS, with the latter being more stigmatized than the former. It emerged that it is more acceptable to acknowledge an infection with TB than with HIV-1/AIDS.

An interviewee at the TB Manyatta indicated that there is a link between TB and HIV-1/AIDS because "When you are infected with tuberculosis, your body turns into a skeleton, and the colour of your hair changes just like somebody who is infected with HIV-1. In addition, treating tuberculosis is just as difficult as treating HIV-1/AIDS." The link between tuberculosis and HIV-1/AIDS is also demonstrated in the arena of treatment. A man on the isolation ward indicated that there is a link because "When tuberculosis and HIV-1 get into the body, they kill no matter the kind of treatment. This is why people say that tuberculosis changes to AIDS when it becomes chronic."

An HIV-1-positive man in the isolation ward concurred that though there is a link between TB and HIV-1/AIDS in terms of symptoms and signs, they differ when it comes to the efficacy of treatment, as HIV-1/AIDS has no cure. A TB/HIV-1-infected commercial sex worker indicated that there is a link because she thought that "when a doctor discovers that you have AIDS, he would tell you that you are only suffering from tuberculosis because the two illnesses have similar symptoms. In addition, in hospital, patients who are co-infected with HIV-1/AIDS are on isolation wards." Another commercial sex worker indicated that "When you have HIV-1, you will get tuberculosis," and that "If you have tuberculosis you might be HIV-1 positive."

Some informants indicated that there was no link between TB and HIV-1/AIDS as the two are different illnesses. As explained by another informant, there is no link between AIDS and TB “Because while HIV-1/AIDS is contracted and transmitted through sexual intercourse, tuberculosis is contracted through dust, water and contact with infected persons. Tuberculosis has always been there, and it affects the whole body, but after some time one would recover.” A significant proportion of the Turkana population in remote rural villages have not seen people with symptoms of HIV-1/AIDS. This is epitomized by one respondent from outside Lodwar who did not know whether there is a link between TB and HIV-1/AIDS as she was not aware of AIDS symptoms. It appears that those who had not witnessed HIV-1-infected persons, or had not been in towns where stories abound about HIV-1/AIDS, were likely to indicate that there is no link, or that they were not aware of the existence of such a link.

I have further discussed the link between TB and HIV-1/AIDS as identified by the Turkana of Lodwar township at the levels described below.

### Causality

The similarity between TB and HIV-1/AIDS is identified at the level of causality. Turkana knowledge stipulates that sharing alcohol from the same cup causes or spreads TB. The local populations, while drinking *kaada*, often share a cup. It is noted that TB and HIV-1 could be contracted or transmitted when an infected person shares alcohol with a non-infected person. Moreover, when people are drinking alcohol, they sit close to one another, thus facilitating the spread of TB through breath. Drinking alcohol is also mentioned as a cause of HIV-1 because when people of different sexes drink together, they are likely thereafter to engage in risky sexual behaviours, as alcohol impairs judgment and perception of reality. Once people are drunk (especially men), they are more likely to engage in sex with either commercial sex workers or other partners. Additionally, as the Turkana point out, “Sleeping with and/or kissing person infected with tuberculosis” would spread the infection. Sexual intercourse provides the best avenue for the spread of TB, as partners are more likely to breathe directly onto each other. In the same vein, sleeping with many sexual partners leads to the contraction of HIV-1. In sum, both TB and HIV-1/AIDS can be spread through sexual intercourse if one has sex with someone infected with either TB or HIV-1/AIDS. Nyanja speakers, like the Turkana, perceive TB and HIV-1 as being transmitted mainly through sexual intercourse and alcohol. In fact they note that young men who drink too much *kachasu* (a locally brewed alcoholic drink) get the slimming illness (Green 1999).

The sharing of non-sterilized blades, needles, toothbrushes and chewed tobacco as well as food practices common among the Turkana were all mentioned as causes of TB and HIV-1/AIDS. In addition, insects (flies and mosquitoes) are mentioned as involved in the transmission of both illnesses.

At another level, TB is seen as the “cause” of HIV-1/AIDS. As one 30-year-old female healer put it, “When you are re-infected several times with tuberculosis, the result is death. After this, people would say that you are infected with HIV-1/AIDS.” A 28-year-old female said, “When a person infected with tuberculosis is not treated, people believe that the illness becomes chronic and changes to HIV-1/AIDS.” In local knowledge, frequent re-infection with tuberculosis would lead to a change in diagnosis to HIV-1/AIDS.

### Symptoms and Signs

The female informant who originally drew my attention to the nexus between TB and HIV-1/AIDS indicated that “Tuberculosis is a brother of HIV-1/AIDS because of similar symptoms and signs. In addition, a tuberculosis-infected person who is not cured would die just like those infected with HIV-1/AIDS. In addition, a person who is HIV-1 infected will definitely have tuberculosis. Tuberculosis is like one man married to two wives. It is the same way that, when one man is married to two wives, if he has an infectious illness he will transmit it to [both] wives.”

The link between TB and HIV-1/AIDS is based on the similarity of their signs and symptoms.

This is made more apparent because TB frequently infects those with HIV-1/AIDS. The Turkana mentioned various symptoms and signs that are shared between HIV-1/AIDS and TB. Loss of weight is constantly mentioned as both a symptom of HIV-1/AIDS and TB. Most patients with TB who were admitted to the Lodwar District's isolation wards and the TB Manyatta were visibly thin. Similarly, according to some Nyanja speakers, tuberculosis, or *icifuba*, is a symptom of AIDS, or it might only appear to be so because of the symptom of weight loss (Green 1999).

Persistent cough is also mentioned as a symptom of TB or HIV-1/AIDS. Other symptoms and signs shared by TB and HIV-1/AIDS are white teeth, loss of appetite, loss of hair, red lips, lethargy, dry body, skin rashes, continuous vomiting, high body temperature, perennial diarrhoea and the appearance of the wounds on the body.

### Treatment

In the hospital, patients suffering from both HIV-1/AIDS and TB are cared for together on the same wards. Overall, informants indicated that though TB can be treated, HIV-1/AIDS is still without a cure. However, two out of 26 respondents said that AIDS can also be cured, just like TB. During the course of this research, debate in Nairobi about antiretroviral therapy was frequently highlighted by the press. The Free Access to AIDS Drugs campaign led a significant number of people to believe that HIV-1/AIDS could be cured.

### Knowledge of the Factors of the Ecosystem That Influence the Occurrence of HIV-1/AIDS and TB

According to the Turkana, various cultural and social factors influence contraction and transmission of TB and HIV-1/AIDS. As both infections are contagious, it was indicated that inheriting a widow whose husband had died of TB, HIV-1/AIDS or both could lead to one's contracting the particular infection. An additional risk factor is the practice of polygamy, which leads to the spread of either infection to all wives if the husband or one of the wives is infected with either HIV-1/AIDS or TB. Besides polygamy, other multiple sexual relationships predispose both men and women to the risk of contraction and transmission of HIV-1 or TB.

It was noted that dancing at disco halls or indigenous dance gatherings with someone infected with TB or HIV-1/AIDS increases the risk of contracting either infection. A person with TB would transmit the infection through breathing and/or sneezing while in close contact with others at the dance hall. In addition, disco halls and indigenous dance gatherings facilitate risky sexual behaviours. It was pointed out that drinking *kaada* in a group composed of both men and women increases the risk of their engaging in sexual intercourse. All informants, ranging from commercial sex workers to TB patients, noted that TB has a connection to *kaada*, an emerging problem among urban Turkana. Most informants noted that *kaada* has become the *shamba* and *ngombe ya waturkana* (*kaada* is seen as the equivalent of land and livestock for the settled and stockless Turkana). Informants noted that the consumption of *kaada* has led to the high incidence and transmission of many illnesses, including HIV-1/AIDS and TB.

Ceremonies and traditional practices also contribute to HIV-1/AIDS and/or TB transmission and are recognized as such. Most ceremonies involve rituals that incorporate drinking blood or alcohol from one cup, passed from one elder to another in order of seniority. These ceremonies are: *asapan*, an initiation ceremony for boys involves sharing of milk or blood from one cup; *nagkot na akunta* – the drinking of blood during a marriage ceremony; and *agurum*, the reconciliation ritual incorporates drinking of milk from a shared cup. Chewing food for babies or for old, toothless men and women is traditional practice. Spitting saliva or water directly on the faces of both children and adults by parents or healers as a sign of blessing is common practice in Turkana. Moreover, during naming ceremonies, a person the child is named after is expected to spit into its mouth. According to informants, spitting of water and/or saliva from the mouth could lead to the transmission of TB or HIV-1 infections. The Turkana are also known to share chewed tobacco, toothbrushes and blades

during healing, shaving and body decoration (tattooing), all of which put them at risk of contracting and transmitting the two infections.

Local knowledge indicates that travelling together in the same vehicle might predispose one to TB if one of the passengers is infected. In the same vein, if the vehicle one is travelling in is involved in an accident where bleeding occurs, someone infected with HIV-1 might transmit the virus to other passengers. Informants also noted that non-Turkana immigrants have brought TB and HIV-1/AIDS into townships. These infections are further spread into the villages by Turkana migrants.

Poverty and malnutrition lead to vulnerability to infections including HIV-1/AIDS and TB. In addition, droughts that cause protein-calorie malnutrition, social dislocation, loss of livestock, the raping of women during livestock raids, and migration are factors in transmitting and contracting both TB and HIV-1/AIDS. It was also indicated that lack of medical facilities necessitating sharing needles and delays in accessing medical care, further influencing the prevalence of the two infections in Turkana.

Informants indicated that a nomadic and semi-nomadic pattern of life predisposes the population to contracting TB and HIV-1/AIDS. In the course of moving from place to place, one might encounter a person who is infected with TB or HIV-1. The infected person would transmit the disease to many people in other places, through migration. On the other hand, when people settle they have larger sexual networks, thus increasing their vulnerability to contracting and transmitting HIV-1. Further, overcrowding occasioned by settlements would create ideal social conditions for transmission of TB and HIV-1/AIDS.

### **Prevention of TB and HIV-1/AIDS**

Modes of preventing both TB and HIV-1/AIDS were seen as similar in several ways. Improving both personal and environmental hygiene was frequently mentioned as a means of preventing the spread of TB and HIV-1/AIDS, by not sharing utensils, toothbrushes, blades and chewed tobacco, and by using safe and sterilized medical facilities. Provision of free testing and prompt treatment of TB/HIV-1/AIDS patients were frequently mentioned by informants as ways of containing the spread of the two maladies.

Prevention through educating the masses about TB and HIV-1/AIDS was also frequently mentioned. Educating people through churches, schools and *barazas* – gatherings led by chiefs, District Officers, the District Commissioner and politicians – was also recommended.

### **Implications of the Conceptual Link between TB and HIV-1/AIDS for Control and Prevention of TB and HIV-1/AIDS**

As demonstrated by local knowledge among the Turkana of Lodwar township, TB and HIV-1/AIDS are inextricably linked. As discussed above, biomedical science has also shown a strong nexus between TB and HIV-1/AIDS. Making the association between TB and HIV-1/AIDS is not confined to Turkana alone. In fact, residents, healers, patients and members of the general population of Nyanja speakers of southern Africa demonstrated the same (Green 1999). This association adds stigma and social rejection to an already unfortunate condition. In Turkana, before the advent of the AIDS pandemic, there was no significant stigma attached to TB. However, HIV-1/AIDS is highly stigmatized. It is socially acceptable for one to suffer from TB but not HIV-1/AIDS. As a consequence, another factor has emerged: those who have chronic TB with symptoms such as loss of weight are simply labelled as suffering from HIV-1/AIDS. The increased stigmatization of TB will hamper its control and management, as those who have the disease will simply not reveal it. Continued failure to incorporate TB and sexually transmitted infection (STI) clinics and district AIDS and STI control programs into integrated programs to control TB and HIV-1/AIDS will drive both underground.

There is a need for vigorous health education among the Turkana population of Lodwar township to dispel the myths surrounding TB and HIV-1/AIDS. Those charged with designing programs – the public health and biomedical specialists – must incorporate local knowledge of TB and HIV-

1/AIDS into their programs. Many informants including community health workers, teachers, students and local members of the public expressed concern over the lack of education and vigorous health campaigns on either TB or HIV-1/AIDS in the district.

Increased prevalence of HIV-1/AIDS and the potential outbreak of *M. bovis* TB will have huge implications for pastoral populations like the Turkana, who not only live in close proximity to livestock but also rely on livestock-based dietary products which predispose them to *M. bovis* infections. The combination of bovine and human TB in Turkana would have catastrophic implications for both livestock production and human populations.

Due to the link between TB and HIV-1/AIDS as a result of common routes of infections and risk factors, integrated interventions designed to target both illnesses might be more efficient and cost-effective than single, disjointed programs. This study demonstrates that TB care and prevention should be a priority of HIV-1/AIDS programs, and HIV-1/AIDS prevention and care should be a priority of TB programs.

### Conclusion

The nexus between TB and HIV-1/AIDS is currently well established through biomedical and epidemiological data. This study has uncovered the Turkana's local knowledge of the link between HIV-1/AIDS and TB, clearly demonstrated through perceptions of vulnerability and shared routes of contraction and transmission such as *kaada*, poverty, migration, widow inheritance and other socio-cultural practices. In addition, HIV-1/AIDS is linked to TB in areas of symptoms and signs, causality, treatment and prevention; they are seen as brothers or as two wives married to one man. The Turkana imply that once you have HIV-1/AIDS, you cannot avoid contracting or "relating" to TB, as they are inextricably linked. As discussed earlier, biomedical science also demonstrates the link between TB and HIV-1/AIDS.

Moreover, the study demonstrates that prevalence of both HIV-1/AIDS and TB is influenced by the same factors of the ecosystem, and that they are largely contagious and attributed to impersonal and natural causes. Understanding the nexus between TB and HIV-1/AIDS by policy makers and interventionists would contribute greatly to prevention of TB and HIV-1/AIDS in communities where both are prevalent. This unified approach is justified because HIV-1 drives the TB epidemic and should be reflected in the development of joint intervention programs. The stigma among TB patients thought to be HIV-1 infected is fast developing in Turkana, with negative implications for the control of TB, because those infected would not seek medical treatment.

Continued failure to develop joint programs to control HIV-1/AIDS and TB together will drive both underground. In Turkana, there was no stigma attached to TB before the advent of the AIDS pandemic. However, HIV-1/AIDS is highly stigmatized. As discussed earlier, many people misrepresent the interconnectedness between TB and HIV-1/AIDS by labelling all HIV-1-infected people as suffering from TB. It is socially acceptable for one to suffer from TB but not HIV-1/AIDS. As a consequence, another factor has emerged: those who have chronic TB with symptoms such as emaciation, loss of weight and thin hair are simply labelled as suffering from HIV-1/AIDS. This means that TB is becoming stigmatized, as people infected with TB are perceived as HIV-1 infected as well. Likewise it is felt that many people infected with HIV-1 take cover under TB. This will mean that controlling TB will be hard, as those who have the disease will simply not reveal it.

There is a need for vigorous education among the Turkana population of Lodwar township to dispel the myths surrounding TB and HIV-1/AIDS. Health education aimed at HIV-1 prevention must also be aimed at TB. The illnesses must be pursued through a single strategy. Turkana local knowledge correctly recognizes some control and prevention strategies against TB and HIV-1 as similar. Those charged with the design of programs – public health and biomedical specialists – must incorporate this knowledge into their curative and preventative programs.

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