

Health Benefits of Roadside Healthcare Services

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Abstract

Providing long distance truck drivers with adequate access to prevention, testing, and treatment services for HIV, Sexually Transmitted Infections (STIs), Tuberculosis (TB), and Malaria is suggested to be an extremely effective way to reduce the burden and the spread of these diseases. However, truck drivers need to overcome large barriers in order to obtain these services at the traditional healthcare system. To reduce these barriers, several NGOs locate healthcare facilities along the major African trucking routes. Scientific research on the impact of these facilities in terms of health outcomes is lacking. This paper investigates this issue in two steps. First, we analyze how roadside healthcare services can diminish the barriers truck drivers face to access (effective) healthcare. Next, we review scientific literature to investigate the possible health outcomes of diminishing these barriers. Our findings suggest that roadside healthcare services can have a significant health impact by decreasing treatment delay, improving treatment adherence, and decreasing disease transmission.

Keywords. roadside healthcare; truck drivers; continuous access; treatment delay; treatment adherence; primary care; Malaria; Tuberculosis; HIV

1 Introduction.

Long distance truck drivers in Sub-Saharan Africa are extremely vulnerable to several diseases, like HIV, Sexually Transmitted Infections (STIs), Tuberculosis (TB), and Malaria (Apostolopoulos & Sönmez, 2007). Their working

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environment is suggested to make them engage in high-risk sexual behaviors, which are characterized by multiple sexual partnerships and low consistent condom use (Morris & Ferguson, 2007, 2006; Nzyuko et al., 1997; Orubuloye et al., 1993). For these reasons, the prevalence rates of HIV and other STIs among the truck drivers are extremely high (Matovu & Ssebadduka, 2012; Wilson, 2005; Mbugua et al., 1995; Bwayo et al., 1994). Moreover, they seem to play a major role in the spread of HIV and other infectious diseases in Sub-Saharan Africa (Apostolopoulos & Sönmez, 2007; Morris & Ferguson, 2007, 2006; Laukamm-Josten et al., 2000; Caldwell et al., 1999; Hudson, 1996). For example, Ramjee & Gouws (2002) showed that 56% of the 310 truck drivers included in their study were HIV positive, whereas 70% of them had wives and girlfriends in rural areas and only 13% of them had used condoms at the last sexual encounter.

These facts indicate that, both from an economic perspective and from a health perspective, it is highly effective to provide truck drivers with adequate access to prevention, counseling, diagnosis, and treatment services for several diseases (Matovu & Ssebadduka, 2012; World Bank, 2008; ILO, 2005; Wilson, 2005; Ramjee & Gouws, 2002). However, the traditional healthcare facilities are generally incapable of servicing this population. Many of these facilities are located at places that cannot be accessed by truck, have insufficient parking space, and are only accessible during daytime, whereas most truck drivers only have time in the evening or at night (Gatignon & Wassenhove, 2008; Ferguson & Morris, 2007; IOM/UNAIDS, 2003; Ramjee & Gouws, 2002). In addition, truck drivers generally do not have the time to deviate from their routes to obtain health services (Ferguson & Morris, 2007; ILO, 2005).

These problems are not restricted to Sub-Saharan Africa. Truck drivers have been reported to contract and spread many (sexually transmitted) diseases and/or have poor access to the needed health services in many countries. Examples include the USA (Lichtenstein et al., 2008; Solomon et al., 2004; Stratford et al., 2000), Brazil (Malta et al., 2006; Lacerda et al., 1997), the Baltic Region (Kulis et al., 2004), India (Pandey et al., 2008; Roa et al., 1997), and China (Wong et al., 2007; Chen et al., 2006).

Several NGOs try to remove the barriers that hinder truck drivers to access healthcare. The largest among them is North Star Alliance, which built a network of 30 primary healthcare facilities, called Roadside Wellness Centers (RWCs) at busy truck stops and border crossings along the major transport corridors in Sub-Saharan Africa. These RWCs provide many truck drivers with a collection of basic health services, including condom distribution, behavior change communication (BCC), voluntary counseling and testing (VCT), and clinical services. More generally, the services are classified into five service packages: Malaria care, TB care, HIV care, STI care, and primary care.

Looking at the number of reports and scientific papers that recommend

to target healthcare interventions at truck drivers (see, e.g., Matovu & Ssebadduka (2012); World Bank (2008); ILO (2005); Wilson (2005); Ramjee & Gouws (2002)), there seems to be a general consensus that roadside healthcare services are cost-effective. Yet, to the best of our knowledge, empirical research to support this claim is lacking. Furthermore, little is known about the mechanisms that could explain the possible impact of roadside healthcare services on health outcomes.

This paper describes some first thoughts on these questions. First, section 2 analyzes in what ways a network of roadside healthcare facilities can diminish the barriers truck drivers currently face to access (effective) healthcare. Next, in section 3 we review scientific literature to investigate the possible health outcomes of diminishing these barriers. Finally, section 4 presents a discussion.

2 Direct Impact of Roadside Healthcare Facilities.

As explained in the introduction, there are four main barriers that hinder truck drivers to access healthcare in case that it must be obtained at a traditional healthcare facility. Placing a healthcare facility at a truck stop he visits may remove these barriers. Namely, (1) deviating from the route is not necessary any more, (2) the facility can be accessed by truck, (3) there is sufficient parking space, and (4) the facilities are open during the whole evening.

Whereas it is difficult for truck drivers to access a traditional health facilities, it is even more difficult to access these facilities *at the required moment*. As a result, truck drivers face difficulties in avoiding treatment delay, performing follow-up visits, monitoring the effectiveness of their treatment on time, and refilling their pills on time. In addition, many truck drivers rely on different healthcare providers situated in different districts and regions. This makes it hard to receive coordinated care that is based on shared information and on a shared treatment plan. Moreover, it is difficult to have a good provider-patient relationship if the provider and the truck driver rarely meet.

Again, a dense network of roadside healthcare facilities has the potential to solve these problems. First, it provides him with adequate access to healthcare *at any moment* during his trip. Second, since many truck drivers drive along the same route for years, the network enables them to build a *long-term relationship* with one or more of these providers. Last, the network of healthcare facilities ensures truck drivers *continuous and coordinated care* over time. NGOs like North Star employ an electronic health passport system, which makes data related to the truck driver's health and treatment accessible at any of the roadside healthcare facilities. This stimulates using (follow-up) services at any facility along a truck driver's route. More-

over, the facilities are linked to the local healthcare system, which ensures coordinated care in case that it must be sought elsewhere.

3 Health Impact of Roadside Healthcare Facilities.

We refer to a network of roadside healthcare facilities that provides truck drivers with a high level of access to healthcare, that enables them to receive continuous and coordinated care, and that stimulates truck drivers to build a long-term relationship with a healthcare provider as a network that provides truck drivers with *continuous access to healthcare*.

Literature suggests that these effects of continuous access result in significant health benefits. This section provides the findings of our literature review. We split up our analysis according to the classification of health services used by North Star: the effects of continuous access to primary care (section 3.1), Malaria care (section 3.2), TB care (section 3.3), and HIV care (section 3.4). Because literature about the effects of continuous access to STI care is lacking, we leave this service package out of consideration. Finally, section 3.5 reviews possible synergy effects of providing continuous access to both TB care *and* HIV care.

3.1 Health Impact of Continuous Access to Primary Care.

There is an overwhelming amount of evidence of the benefits of having adequate access to primary care. A large literature review shows that a wide range of health outcomes (e.g., all-cause mortality and self-rated health) are better in areas with more primary care physicians, that people who receive care from primary care physicians (instead of from specialist) are healthier, and that the four core features of primary care – first-contact access for each new need, long-term person-focused care, comprehensive care, and coordinated care – are associated with better health (Starfield et al., 2005). Though most of the evidence comes from developed countries, some studies suggest similar effects in developing countries. For instance, improvements in access to primary care in Costa Rica brought about a large improvements in several health outcomes (Rosero-Bixby, 2004), and a smaller distance to the nearest healthcare facility is highly related to better health service utilization, and/or improved health outcomes (O’Meara et al., 2009; Buor, 2003; Kloos, 1990; Stock, 1983; Rahaman et al., 1982).

The review by Starfield et al. (2005) suggests several mechanisms that seem to explain the health benefits of adequate access to (the core features) of primary care. We mention those that are most likely to lead to health benefits when providing African truck drivers with continuous access to primary care. First, primary care physicians seem to be very successful in

performing preventive interventions. Second, having adequate access to a primary care provider is strongly associated with the early detection and management of diseases. Last, the core features of primary care are associated with better health outcomes. For instance, primary care provides the entrance and to the rest of the system, so that it reduces or eliminates the difficulties with accessing the needed health services. In addition, it is characterized by person-focused care, which means that the provider focuses on achieving better outcomes for all aspects of the patient’s health. Finally, a long-term provider-patient relationship is associated with less treatment delay, higher levels of treatment adherence, timely preventive care, and more accurate diagnoses.

Because the African long-distance truck drivers currently have low access to (the core features of) primary care, we believe that it is realistic to assume that these mechanisms also start to work when providing African long-distance truck drivers with continuous access to primary care along their routes, and that this brings about substantial health benefits for this population.

3.2 Health Impact of Continuous Access to Malaria Care.

The benefits of having adequate access to Malaria care are well-documented. Several studies show that patients with low access to Malaria care tend to delay seeking adequate treatment at a healthcare facility (Chuma et al., 2010; Meerman et al., 2005; Bell et al., 2005; Mller et al., 1998). Namely, the loss of productivity due to time away from work, and the availability and costs of transport are regarded as large barriers that hinder prompt access to Malaria care (Chuma et al., 2010; O’Meara et al., 2009; Meerman et al., 2005; Reilley et al., 2002). Because early and effective treatment of Malaria is crucial, this brings about immense health risks. Unsurprisingly, low access to Malaria care is associated with progression to severe disease (Al-Taiar et al., 2008; Meerman et al., 2005), and higher hospitalization (O’Meara et al., 2009).

African long-distance truck drivers need to overcome similar barriers to access Malaria care in the traditional healthcare system (no time to access healthcare and a large distance to accessible healthcare). These barriers will be reduced significantly when Malaria care is provided at healthcare facilities along the routes of the African truck drivers, which might reduce the treatment delay among truck drivers that contract Malaria as well.

3.3 Health Impact of Continuous Access to TB Care.

Providing TB patients with adequate access to the needed healthcare services brings about significant health benefits in two ways. First, a systematic review provides a large amount of evidence that low access to healthcare

leads to diagnostic and treatment delay among TB patients (Storla et al., 2008). The costs of lost income, potential job loss, and the costs of transportation appear to pose large barriers to early TB care access (Needham et al., 1998). Increased delay is strongly related to more serious illness by the time a patient presents, higher mortality, more complications, and increased risk of transmission (Gibson et al., 1998; Lawn et al., 1997; Mathur et al., 1994). Murray et al. (1990) estimates that an untreated person with TB infects others with a rate of 10 - 14 persons a year.

Second, lack of access to healthcare facilities appears to be a large barrier to adherence to TB treatment (Munro et al., 2007). Namely, TB patients have to visit the healthcare facilities often (for monitoring the treatment and/or for direct observation of treatment-taking). Low accessibility of the healthcare facility causes high (opportunity) costs of performing these visits. There is much evidence that patients consciously weigh these costs and the expected benefits of the clinic visits, and thereby of treatment adherence (Munro et al., 2007). This brings about serious health risks for the patient and for society, since adherence to TB treatment is crucial to achieving cure, decreasing the risk of transmission, and avoiding the emergence of drug resistance (Stop TB Initiative, 2010; Corbett et al., 2006).

Offering TB care at healthcare facilities along the route of a truck driver with TB minimizes the barriers that hinder (early) access to healthcare. In this way, the roadside healthcare facilities are expected to minimize treatment delay and to stimulate adherence among truck drivers. The network might also contribute to treatment adherence through the feature of delivering long-term person-focused care, which is regarded as one of the crucial elements of a successful TB treatment (Stop TB Initiative, 2010; Volmink et al., 2000).

3.4 Health Impact of Continuous Access to HIV Care.

Individuals who are infected with the HIV virus seem to benefit from adequate access to the needed health services during three phases of their life. The first is the pre-diagnosis phase, during which a lack of access to voluntary counseling and testing (VCT) services may prevent them from getting tested and diagnosed. Frequently mentioned barriers to early access to these services include the availability and the costs of transport, and inconvenient opening hours (Matovu & Makumbi, 2007; Morris & Ferguson, 2006; Asingwire, 2004). This may have serious consequences, since the early diagnosis of HIV infection is a crucial element in reducing the health risks for the individuals and for their sexual network (WHO/UNAIDS/UNICEF, 2007; Marks et al., 2006; Montaner et al., 2006).

After the diagnosis, individuals living with HIV enter the pre-ART phase, which includes regular CD4 count testing at a healthcare facility in order to determine when they are eligible for antiretroviral therapy (ART). Retaining

patients in pre-ART care and starting their treatment at the right moment increases the odds of treatment success and decreases the rate of death (Brinkhof et al., 2008). However, finishing this phase constitutes serious challenges for those who need to travel a large distance to the healthcare facility (Losina et al., 2010; Posse et al., 2008), face high transport costs (Karcher et al., 2007; Maskew et al., 2007), and/or risk losing employment by taking time off from work (Rosen & Fox, 2011).

Adequate access to health facilities benefits HIV positive individuals during their treatment as well. The efficacy of ART relies on continuous adherence, which is a serious challenge for those receiving ART. Namely, they often suffer from adverse effects, and have to deal with complicated treatment regimens and dietary restrictions. Suboptimal levels of adherence are associated with the development of drug resistance and negative treatment outcomes (Wood et al., 2003; Garca et al., 2002; Bangsberg et al., 2001, 2000; Chesney et al., 1999). Several studies show that low access to health facilities negatively affects adherence, because of the high (opportunity) costs of the frequent clinic visits (e.g., to refill the pills, and to monitor the treatment). Specifically, the costs of transportation and the opportunity costs due to lost income pose large barriers to adherence (Roura et al., 2009; Hardon et al., 2007; Maskew et al., 2007; Mills et al., 2006; Alliance, 2004; Weiser et al., 2003; Brigido et al., 2001)

The network of roadside healthcare facilities can diminish the barriers truck drivers living with HIV need to overcome during their journey from getting tested through to the start of ART, and during their life-long treatment. First, by ensuring adequate access to HIV services it might stimulate truck drivers to get tested and prevent treatment delay. In addition, the network may increase their level of adherence because it decreases the barriers to performing follow-up visits and refilling the medicines on time. Third, the network ensures coordination of care that must be sought elsewhere (like CD4 counts and viral load test). Lack of coordination is regarded as a barrier to access to ART (Posse et al., 2008; Bates et al., 2004b). The network also enables the truck drivers to build a long-term relationship with their healthcare provider(s). Such relationship appears to be a key factor in stimulating people to come forward for advice and diagnosis, and in maintaining individuals' commitment to ART (Mills et al., 2006; Bates et al., 2004b; Alliance, 2004). Last, literature suggests that, when these benefits of offering ART at healthcare facilities become evident, fear and stigma surrounding HIV/AIDS may lessen (Roura et al., 2009; Mukherjee et al., 2003). This may also take place among truck drivers who see their colleagues being treated successfully at roadside health facilities, and thereby increase the number of truck drivers who access VCT and treatment services.

3.5 Synergy Effects of Continuous Access to HIV Care and TB Care

The collaboration between TB programs and HIV programs is increasingly regarded as a crucial element in the response to both the TB and the HIV epidemic. Increased immunodeficiency in HIV infected individuals increases the risk for the progression of latent TB infection to active TB (Bates et al., 2004a; Selwyn et al., 1989). Insight in this relationship can be translated into many prevention and treatment interventions that are beneficial to TB patients and HIV patients (Maher et al., 2003). These include the early initiation of ART in co-infected patients (Abdool Karim et al., 2009b), active case finding among HIV patients (Abdool Karim et al., 2009a), the initiation of Isoniazid Preventive Therapy (IPT) in HIV positive individuals who are at risk of developing active TB (Akolo et al., 2010), and provider-initiated HIV testing among TB patients (Abdool Karim et al., 2009a). Close collaboration is also required to successfully treat patients that are co-infected with HIV and TB. Namely, the coadministration of antituberculosis treatment and antiretroviral treatment is very complex because of drug interactions and adverse effects (Tuberculosis Coalition for Technical Assistance, 2006; Maher et al., 2003).

Several studies exemplify how such close collaboration can benefit those served by each program (WHO, 2004; Burgess et al., 2001). These benefits might also be realized when offering truck drivers both HIV and TB care along their routes. Namely, the programs can be linked together by offering them at the same location and by using the electronic health passport system to ensure optimal information sharing.

4 Discussion

In this paper we argue that a network of roadside healthcare services provides truck drivers diminish the barriers truck drivers currently face to access the needed health services and to access them at the right moment. Furthermore, we explain that this network is characterized by continuous and coordinated care, and stimulates truck drivers to build a long-term relationship with a healthcare provider. Our literature review suggests that these characteristics of a network of roadside healthcare facilities lead to lower morbidity and mortality, lower treatment delay, improved treatment adherence, less drug resistance, and less transmission.

We support this hypothesis by presenting an in-depth analysis of mechanisms that could facilitate these health outcomes. The strength of our argument could be enhanced in two ways. First, the hypothesis is based on the assumption that network of roadside healthcare facilities actually provides truck drivers with continuous access to the needed health services, as suggested in section 2. Empirical research is needed to investigate the va-

lidity of this assumption. Second, in section 3 we reviewed the mechanisms that explain the relationship between continuous access and better health. It is, however, not clear whether these mechanisms can be generalized to the population we consider. Namely, empirical studies in which these mechanisms have been investigated do not specifically use mobile sample populations. Empirical research among truck drivers is needed to strengthen the argument.

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