Editorial: **Health of nomadic pastoralists: new approaches towards equity effectiveness**

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**Nomadic pastoralists**

Nomadic pastoralists of the African Sahel, the high steppes of central Asia (including the Tibetan Plateau and Mongolia), parts of the Near and Middle East, the Arabian Peninsula and India use mobility to manage uncertainty and risk in arid and semiarid ecosystems (Scoones 1994). In these areas, livelihoods are threatened by drought, diseases, insects and war, among other calamities. Semiarid pastoral areas are estimated to constitute up to 36% of the earth’s ice-free land (Schwabe 1984). The populations of these areas engage in more or less continual movement of extended family groups with their domesticated animals, or in a semi-nomadic lifestyle alternating between a settled or permanent household and a temporary residence. These are mostly tents made of skins, felt, or palm leaf mats, occupied during the spring/summer or rainy season.

Nomadic pastoralist populations are difficult to quantify but have been estimated to involve 50–100 million persons (Omar 1992). Livestock owned by nomadic pastoralist groups is in excess of 200 million head, primarily not only comprising cattle, sheep and goats, but also yak and cattle-yak hybrids, camels, horses, donkeys and/or reindeer. In addition, dogs are owned by many pastoral nomadic groups.

A highly productive yet socially neglected population group

Nomadic pastoralists are geographically and socially marginalized, inhabiting large regions unsuitable for agriculture and infrastructural development. Human survival in communities in these environments would be virtually impossible without livestock that provides for basic needs. Various types of livestock, sheep, goats, cattle, camels, yak, donkeys and horses provide nutrition, transport, clothing, shelter, and are also the basis of wealth, traditional customs and respect. Nomadic pastoralist groups tend, not surprisingly, to be similar in many respects, being livestock-centred, seasonally mobile, well adapted to harsh terrain and extreme climates, tolerant of ill health, family/clan and social network-oriented, and independent (and suspicious) of provincial or national governments. They do, however, make a significant contribution to national gross domestic products (GDPs) by making marginal lands more productive. For example in Chad, nomadic pastoralist livestock production contributes up to 15% of the GDP for a population estimated at <6% of the total population.

However, in many countries, nomadic people lag behind settled people in education and access to public services. They are often underrepresented in governmental institutions and thus lacking political empowerment. Health and poverty initiatives at national level neglect nomadic populations because of their geographic isolation/remoteness, poor communications, logistic requirements, uncertain civil status and their perceived low priority (Cohen 2005). In return, a barrier to the use of available services is a mutual distrust between nomadic groups and governmental structures. The nomadic way of life makes access to dispensaries in villages difficult, as groups with animals have to avoid areas with crops, and visits to markets often exclude the most vulnerable – women and children. The latest World Health Organization (WHO) report on strengthening health systems, though considering most underprivileged populations, does not even mention mobile pastoralist populations (Anonymous 2004; WHO 2004). The health status of nomadic communities or populations is usually poor, and the range of infectious diseases prevalent in nomadic populations may vary with region, but tends to include similar groupings of non-zoonotic infections, e.g. tuberculosis (TB), acute respiratory and gastrointestinal (GI) infections, vaccine preventable diseases, sexually transmitted infections and some parasitic infections (Schelling et al. 2005a). In addition, several zoonotic diseases appear to occur with increased frequency.
because of the close contacts between humans and their domesticated animals (Macpherson 1995; Schelling et al. 2003; Li et al. 2005). For almost all nomadic populations, wherever they occur, three zoonoses may be considered as consistently endemic: echinococcosis, brucellosis and rabies. Other zoonotic infections may also be important, for example, trypanosomiasis and leishmaniasis in Africa, and plague in Asia.

Human cystic echinococcosis is caused by infection with the hydatid cyst or larval stage of the dog tapeworm Echinococcus granulosus. The parasite is transmitted between dogs and domestic ungulates especially sheep. After accidental ingestion of eggs, after close contact with dogs or the dog faeces-contaminated environment, hydatid cysts grow slowly (months to years) in humans, usually in the liver and/or lungs, and exert chronic pressure on tissues and organs. Morbidity increases with time, typically manifesting as hepatomegaly, jaundice and pulmonary complications, and frequently secondary proliferated disease caused by cyst rupture. The disease is difficult to treat surgically or medically. In the Turkana of north-west Kenya and Tibetan nomadic populations, ultrasound abdominal screening surveys have detected hydatid cysts in 5–19% of nomads screened, with 10–20% prevalences in the 20- to 50-year age group (Macpherson 1989; Li et al. 2005). The burden of disease due to hydatidosis (including both cystic hydatidosis and the more pathogenic alveolar echinococcosis) in one Tibetan county of Sichuan was calculated to be 0.81 disability-adjusted life years (DALYs) per person, with an additional economic loss in livestock equivalent to 1.4% per capita GDP (Budke et al. 2004, 2005).

Brucellosis is one of the world’s major zoonoses (Bchirol et al. 2001). Human brucellosis is commonly caused by exposure to infected livestock and livestock products (mostly raw milk and milk products). The clinically most important causative bacteria in humans in pastoral areas are Brucella melitensis (small ruminants) and B. abortus (cattle). In animals, brucellosis mainly affects reproduction and fertility, reduces survival of newborns and reduces milk yield. Mortality of adult animals is insignificant. Nomadic pastoralists in many areas of the world are highly vulnerable to brucellosis by their close contact during animal husbandry and by consumption of livestock products. More research is urgently needed to answer the questions: What is the burden of zoonoses and What are the determinants for their transmission? How can multi-disease control strategies (e.g. simultaneous echinococcosis and brucellosis vaccination in sheep, or Echinococcus anthelmintic dosing and rabies vaccination in dogs) be implemented in low-income countries?

New approaches to healthcare provision and zoonoses control

Delivery of health systems and initiatives to nomadic populations is difficult. This has traditionally been considered as a choice between either mobile clinics or fixed health centres placed in strategic towns. The latter approach can work well with seasonally active nomads, who will be sedentary at certain times of the year, e.g. the ‘winter pastures’ of Tibetan and Mongolian nomads. While mobile clinics may make more sense for continually moving populations such as nomadic pastoralist groups in the Sahel, though they may not be more cost-effective than fixed clinics. Even with efficient fixed or mobile clinics, significant barriers may still exist to health delivery including mistrust, low perception of health priorities by nomads, and preference for traditional medicines/treatments.

During the XVIth International Congress for Tropical Medicine and Malaria in Marseille, France (11–15 September 2005), a workshop was held on the health of nomads and zoonoses. Novel approaches to health care for nomadic pastoralists recognize the single most important resource for all nomads, their livestock (Majok & Schwabe 1996). Recent studies in Chad assessed the morbidity of nomadic pastoralists and their livestock simultaneously (Zinsstag et al. 2002; Schelling et al. 2003), revealing that the vaccination coverage of livestock exceeded vaccination coverage of children, which was almost zero. Together with national authorities and the concerned populations, pilot joint human and animal vaccination campaigns were developed to provide simultaneous health service delivery for animals and humans in two Chadian provinces. These joint campaigns have not only demonstrated the technical and organizational feasibility of conducting simultaneous vaccination, but in a first assessment also reduced costs by 15% compared with separate campaigns (Béchir et al. 2004; Schelling et al. 2005b).

These trans-sectoral approaches between animal and public health appear attractive (Zinsstag et al. 2005) but depend very much on community participation. Continuous stakeholder seminars, bringing together the concerned population, healthcare providers and authorities are part of iterative consultation and research cycles. As regards the scientific approach takes a transdisciplinary dimension, considering all available knowledge, merging academic and societal perspectives towards a health system continuously validated by its users. Moreover, the professional epidemiological perspective on morbidity (Schelling et al. 2005a) is complemented by the analysis of institutional frameworks (Fokou et al. 2004) and the patient perspective.
on health perception, meaning and behaviour (Wanzala et al. 2005).

The health perspective of nomadic pastoralists is divided between traditional approaches and influences of modern medicine. For example, among nomadic pastoralists in Mauritania and Chad the biomedical concept of TB is referred to a set of different traditional concepts depending on its perceived cause. The terms ‘kouha’ or ‘soualla’ are used for TB as an inherited and incurable disease, while ‘lebroud’ or ‘Legtouga’ are considered as being caused by environmental influences or hard work and other terms refer to socially exclusive stigmatized forms. These traditional views, while containing numerous misconceptions from a modern western medical perspective, largely determine health behaviour and help seeking. Turkana nomads of Kenya recognize fluid-filled cysts (animal hydatids) in slaughtered livestock as *espespes* that are considered to be formed by the animal for water conservation, and they also fear the ‘big belly’ disease (human hydatids) as *loriwo*, but they do not connect the two, or know that dogs cause the infections. Nomadic pastoralists consult numerous traditional healers, while state health services are either absent or are not well adapted to a mobile lifestyle. Drugs are mostly purchased from ambulant dealers with often ineffective modern type of medicines. State health services are usually only consulted in advanced stages of illnesses and nomads are hardly compliant with long-term drug treatments such as for TB or hepatic echinococcosis. Lack of knowledge about health is perceived as one of the main barriers among nomadic pastoralists and health information campaigns affected better help-seeking behaviour. Currently in the Sahelian nomadic zones pastoralists have very limited or almost no access to the direct observed treatment short course (DOTS) strategy for TB. An adaptation of the DOTS strategy to nomadic pastoralists should consider, besides massive information education communication (IEC) campaigns, the presence and influence of traditional healers together with specific contacts with modern health services which should be strategically placed following the calendar of livestock transhumance. Moreover, recent approaches in Sudan, Kenya and Ethiopia (MSF TB control in the Afar region) adapt TB control centres to the nomadic pastoralist way of life by constructing traditional housing, termed the ‘Manyatta’ system (Keus et al. 2003). This approach has also been successfully used for long-term albendazole drug treatment of cystic echinococcosis in Turkana nomads (E. Zeyhle, African Medical Research Foundation). In a mid-term perspective an integrated health service should be developed including access to essential drugs, mother and child health and other programmes (Wanzala et al. 2005). Zoonoses have been largely eliminated in industrial countries with very large financial and organizational efforts focused on the animal reservoir. These are not affordable in contemporary developing countries. Yet, new trans-sectoral approaches adding the benefits for the livestock and public health sector show that brucellosis control, for example, may also become profitable in pastoral developing countries-like Mongolia (Roth et al. 2003). A quantitative model to assess economic effects of echinococcosis in Tibetan communities in north-west Sichuan Province (China), determined that the cost per DALY averted, as a result of introducing a purposeful control programme, was calculated to be US$150 if livestock production/health improvements were not included. However, by comparison the cost per DALY averted would be <US$25 for the human health sector if cost sharing was implemented between the public health and agricultural sectors (Budke et al. 2005). Future research should investigate how DOTS and antihydatid drug therapy can effectively be adapted to nomadic pastoralists, and how integrated health services can be derived under mobile circumstances in low-income countries?

Towards equity effectiveness

It seems appropriate to pay specific attention to health care for nomadic pastoralists who lead an archaic lifestyle in the age of Internet and nanotechnology, using ecosystems that could hardly be habitable or productive without livestock. But we should not forget that nomadic pastoralist systems are under tremendous pressure and for several decades have started to undergo social and economic transformation. During recent joint human and animal vaccination campaigns in Chad, nomadic women mentioned that since the vaccination campaigns they no longer experienced measles but that it remained in the settled villages. Health care for nomadic pastoralists should not only be restricted exclusively to such a specific category of people but also include the surrounding settled communities who are often as poorly served as the nomads. To reach equity effectiveness, a healthcare strategy and policy for nomadic pastoralists can only be one integrated element of national health policies with specific adaptations and decentralized decision-making (Tanner 2005), as mentioned above. Health and social service policy again should be elements of an overall framework for the sustainable use of semiarid areas. Much remains to be performed. The need to better understand nomads’ health and their demographic parameters, as well as the requirement for evidence of cost-effective interventions among nomadic pastoralists loom as large as the uncountable size of their livestock herds. Urgent questions that remain are: What are the demogra-
phic parameters of mobile populations? What are tradeoffs between environmental sustainability and enhanced social services for nomadic pastoralist systems? How can new health systems for nomadic pastoralists be scaled up as integrated part of national health policies?

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References


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