



## Editorial Commentary

## Prevention and control of COVID-19 in pastoral community through One Health Approach



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## ABSTRACT

The vast majority of its population being a pastoralist community, the Somali region in Ethiopia shares the longest border with its neighboring east African countries. These communities face a high risk for transmission of imported COVID-19 cases and remain vulnerable due to lack of access to health delivery and low utilisation of services. Valuable lessons from other countries, has placed the One Health Approach as an appropriate, feasible and applicable preventive and control measure for COVID-19. This paper discusses the epidemiological and social susceptibility of pastoral communities in the transmission of COVID-19 and the introduction of One Health Approach as an effective inter-disciplinary response and management.

## 1. Introduction

The newly emerged COVID-19 pandemic is caused by a novel Coronavirus (SARS-CoV-2) and this virus is a member of a Coronavirus sub-family called Coronaviridae. This pneumonia-like disease was first reported in December 2019 from a sea-food market in Wuhan, China as potential site of infection spreading [1] and believed to have spread from bats or animals to humans, the extant evidence postulate an extensive human-to-human transmission through airborne [2]. Hence, COVID-19 which is an infectious disease characterized by flu-like symptoms like fever, headache, fatigue, frequent cough and shortness of breath. The other clinical manifestations also include muscle ache, myalgia, sore throat, chest pain, diarrhea, nausea and vomiting [3].

Based on the WHO situational report, this infection is responsible for the morbidity of more than 20,439,814 people and 744,385 deaths globally. Across national authorities, more than 916,644 cases and 17,557 deaths have been reported in the African regions. In Ethiopia, a total of 25,136 confirmed cases and an estimated 463 deaths have been reported [4].

Despite the less number of cases reported from the region and the alternative case management, the potential spread of this outbreak in less developed countries, like Africa would pose a serious challenges to control due to the shortage of health professionals, less functional health facilities, lack of diagnostic tests kits, lack of protective equipment and overall weak health service delivery system. Moreover, these less developed countries contain large populations who exercise different lifestyles and cultures. One such situation is where these communities live in over-crowded conditions with restricted implementation of physical distancing. Apart from these challenges, the operating health facilities that exist in small numbers are already overcrowded by patients with pneumonia, malaria, Tuberculosis, acute diarrhoea and malnutrition. There would be insufficient capacity to accommodate such an epidemic as COVID-19 [5]. Moreover, citizens of these countries who

are mostly uneducated are less likely to follow the public health advice on prevention and control of the infection. Besides that, cultural and traditional barriers associated with controversial health myths and low health-seeking behaviors remain challenging in such trying times [6].

## 2. The vulnerability of pastoralist community to COVID-19

The pastoral communities contain people with high mobility due to their means of livelihood, which is largely dependent on rearing live-stock. The livestock mainly includes camels, cattle, goats and sheep. In Africa, more than 268 million people live as pastoralists or nomads. These lifestyles remain the most feasible options of livelihood for these vulnerable and under-served communities. However, some developing countries have stepped-up to curb the spread of the infection into their countries by taking different preventive measure like closing the borders and limiting the inter-country mobility of the population. As it is a matter of livelihood which depends on the extent and magnitude of the transmission.

The pastoral way of life and mode of production is extremely threatened by the newly emerging diseases and recurrent natural disasters. Having said that, these communities are vulnerable to spread of infections, malnutrition and injuries. Most of the health emergencies occur in these community due to the low utilisation of services, living in far-to-reach areas and lack of infrastructure. Moreover, due to their high mobility and frequent movements, access to health services is challenging and disease surveillance is minimum or absent. Therefore, detection of cases and response mechanisms is often delayed leading to the rapid spread of the infection. Such public health threats could exacerbate the health conditions of these population particularly in a time of drought when these communities relocate to semi-urban areas and villages in search for better life. A large pastoral community that lives in Sub-Saharan Africa, is more likely to spread the infection to the agrarian population or city dwellers due to high crowdedness in urban

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areas [5].

The eastern lowland of Ethiopia is also a home for millions of a pastoral community where their main source of food security, nutrition, wellbeing and most importantly financial income depend on livestock. Due to climate change, these communities are facing serious food insecurity and frequent famines. They are also suffering from a wide range of health problems including infectious diseases, acute malnutrition, injuries and loss of life due to conflicts on scarce rangelands and water resources. Their sufferings are due to low awareness, poor health-seeking behavior, limited access to health services and lack of public infrastructures are the main challenges. Thus, to address the existing main knowledge gaps and identify research priorities, the World Health Organization (WHO) has initiated global research and innovation. WHO, thereby, proposed to conduct a feasibility study in the most needed and privileged far-to-reach areas for prevention and control of this epidemic [7]. Therefore, this paper aims to highlight the possible gaps, control and practical management of COVID-19 from the pastoralist perspectives in Ethiopia, as little is known about the vulnerability of these people to this infection.

### 3. Exposure to zoonotic infection

The sickness and wellbeing of human and animal are inter-linked and associated with each other. Globally, some of the outbreaks that have emerged in the last few decades reflected in a rise of infections among humans contracted to in contact from animals [8]. The pastoral community are at a higher risk of contracting zoonotic diseases for various reasons. There is no recently established evidence that reveals the acquisition of SARS-CoV from dromedary animals, yet gene isolates obtained from these viruses indicate that such animals could remain a host [9]. The risk of such zoonotic infections remains very high due to the close and direct contact of animal herders with their livestock during milking, slaughtering, assisting delivery and feeding or indirectly through consumption of the animal products. In general, a study on Middle East Respiratory Syndrome Coronavirus has identified dromedary camels which is the primary livestock for pastoral people as the main reservoir for coronaviruses [10]. Since prior evidence suggested that camels were the presumed reservoir for MERS-CoV [11], hence, possibilities of SARS-CoV evolving from animals is inevitable.

Recent evidence suggested that intensive animal husbandry and uncontrolled food consumption of animal origin could be a major contributor to the spread of the infection [9]. Moreover, the direct contact with these animal husbandry like camels by the pastoral community is accounted as a major exposure and risk factor for the viral transmission to humans [10].

Although the number of predicted cases due to the exposure to infected livestock could be less in number at the beginning and could remain asymptomatic, the risk of transmission, the predicted medical and economic catastrophe is about to evolve. As a part of the WHO coordination of global research road map, the investigation of COVID-19 from the animal sources and its route of transmission is one of the top research priority documented in WHO. To develop risk reduction and preventive strategies, particular modalities for the pastoral communities needs to be performed to increase the understandings of the transmission pathways and improve the knowledge of livestock as a reservoir of COVID-19. WHO's roadmap, it is intended to identify the association of animal species including livestock for the emergency of COVID-19 and explain the transmission pathways from an animal reservoir to possible intermediate hosts to human [7].

The transmission of the virus is through airborne spread like coughing, sneezing and droplet inhalation or contact spread like oral, nasal and through eye mucous membrane [12]. In line with the characteristics of the contagious disease, the mobility of the pastoral community places these people are most at risk of getting infected. Moreover, a huge proportion of the pastoral community is often involved in a seasonal migratory pattern in search of pasture and water.

During this population flow, the risk of transmission among distinct communities is high, making the public health measures difficult. For instance, the traditional gatherings and social connections are often observed when these migratory populations arrive in their newly sedentary areas when they are united with the formerly inhabited community in that village. Hence, the risk of transmission will remain high during such periodic festival celebrations where rural communities trade their livestock in densely populated urban markets. This shift which will increase the threat to disease exposure and transmission is not limited to the local population but also affects both human and animal from cross-border migrations.

### 4. Public health challenges of the pastoralist community

Delays in tracing, isolation and diagnoses of potential cases could lead to a dramatic increase in the transmission of cases and fatalities. Failure in early and timely management of the infection among highly mobile people can result in health damages, along with economic and social catastrophes as the disease could spread cross-border. Some of the common health challenges are indicated in the following Table 1.

### 5. One health approach for pastoralist community

One Health Approach is referred to as an efficient and effective integration of interventions from multiple sectors regionally and globally to achieve optimum health for the animal, human and environment. This comprehensively integrated approach has allocated particular health gains for the pastoralist and neglected communities. Correspondingly, the public health threat of the newly emerging diseases like COVID-19, have emphasized the importance of One Health Approach at all prevention strategies. In practice, this approach is intended to enhance the monitoring and response of both communicable and zoonotic diseases in multi-sectoral and inter-disciplinary coordination of health preventions and interventions. One of the success stories of COVID-19 control measures include the implementation of One Health Approach in Chinese animal markets where the virus is believed to have originated from [23].

Thus, this approach holds supplemental importance for the pastoralist community whose main livelihood depends on livestock which is severely threatened by climate change and impacts on the environment. Considering the seriousness of COVID-19 outbreak, its public health importance is taken into account by implementing the following the

**Table 1**  
Potential challenges of prevention and control of COVID-19 in developing countries.

Challenges	key barriers	Reference
Limited public awareness	The existence of other health myths and misconceptions that are commonly practiced	[6]
Poor access to health services	Lacking information about treatment	[5]
	Accessibility to medical facilities	[13]
	High mobility and remoteness to reach	[14]
Health service delivery challenges	Practice to follow alternative and traditional medicine	[15]
	Low physical health service coverage	[16]
	Prevalence of infectious diseases like malaria, Tuberculosis, HIV and AWD	[14]
	Delay in contact tracing and low testing services	[17]
	Shortage of skilled human resource and lack of training health care practitioners	[18]
Financial constraint and poverty	Shortage of supplies and medical equipment like beds for intensive care, oxygen, ventilators, infusion pumps and drugs	[19]
	Insufficient funding and social deprivations	[20]
	Poor sanitation and hygiene	[21]
	Over-crowded conditions	[22]
	Lack of clean water	[21]

proposed prevention and control mechanisms.

## 6. Prevention and control of COVID-19 through one health approach

The emergence and development of this epidemic require effective and relevant strategic disease prevention and control measures. Recent calls have been made for the application of One Health Approach for different justified reasons. This approach attempts to mitigate and coordinate the strategies from multi-sectorial and overlapping disciplines. Several studies have suggested the application of this approach due to its comprehensive and holistic features [24,25]. Hence, it is substantially more applicable for the proposal of preventive measures on pastoral communities taking in to account the One Health research framework [26].

- (1) An improved surveillance system in domestic and livestock animals through the active engagement of pastoral health extension workers and mobile health teams with a proficient orientation on One Health Approach. This was profoundly recommended in some studies that suggested the application of One Health for enhancing COVID-19 surveillance [27].
- (2) Identifying and tracing noticeable and trade-sensitive livestock diseases by capacitating and training the frontline veterinary health workers through the establishment and strengthening of bi-sectoral surveillance platform of animal and human health by coordinating preventive mechanisms with timely reporting.
- (3) Enhanced outbreak investigation using One Health Approach and linking both pastoralist community and their livestock to satellite health sites with human and veterinary laboratory diagnosis to conduct comprehensive interventions.
- (4) Reducing risk and preventing the spread of the infection during animal trade and consumption by enhancing control measures and breaking the chain of infection transmission between livestock and between livestock-humans. This attempt could be achieved through behavioral change by introducing one-stop public awareness promotion, health education and testing to minimize the rate of the infection transmission.
- (5) Reducing and preventing human-to-human infection transmission to curb the spread of the outbreak. It includes community awareness, early diagnosis, tracing, isolation and treatment of COVID-19 patients. Ensuring the provision of PPE materials, diagnostic and treatment supplies to satellite health facilities that are close to remote villages.
- (6) The engagement of environmental health specialists and veterinary public health in disease outbreak investigation, ensuring meat safety, provision of public health education, ensuring the milk safety and hygiene and water sanitation and hygiene.

This review has presented that pastoral community are at higher risk for the rapid spread of the COVID-19 pandemic due to their life style-related factors, their social and economic vulnerabilities and the existence of the public health challenges. Given the potential impact of this new infection on pastoral community, it is substantially relevant to introduce a multi-sectoral frame work of service delivery and coordinated strategies like One Health Approach for proper preparation, response, management and mitigation of health challenges. In conclusion, this epidemic might not affect only the sedentary people, but also possibly lead to social, economic and psychological impact on the underprivileged and unserved pastoral communities.

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## Declaration of Competing Interest

The authors declare that they have no competing interests.

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