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Rapid identification and deployment of low-cost measures to reduce the spread of COVID-19 in rural African settings in Zambia.

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WHAT IS THE KTA PROBLEM? AND WHO DOES IT AFFECT?

The advent of the global pandemic COVID-19 altered activities from the norm across the world. The first case of COVID-19 in Zambia was recorded on 18 March 2020. In response, the Ministry of Health supported by other organizations developed the "Zambia COVID-19 Emergency Response and Health Systems Preparedness Project". Three response plans are targeting engagement of stakeholders, environmental and social commitments, research, and innovation plans. Later, a simplified reader friendly fact sheet and brochure on COVID-19 disease control and Non-Pharmaceutical Interventions (NPI) was published as well.

NPI disease control measures in the health care facilities and at home have been promoted. On the legal front, legislation has been passed to help enforce these public health guidelines with fines and sentences attached. The key question is how effective and efficient these national guidelines are. Zambia is a multicultural country with economic and social disparities. Legislation has been passed to enforce these public health measures and guidelines with fines and sentences attached but the law enforcement is not strong and tends to leave the larger responsibility of spread prevention to individuals.

Furthermore, some enforcement measures seem to have potential to violate human rights. Hence the effects of COVID-19 and the ability to adequately follow recommended disease control measures and NPIs vary not just among people but also among community healthcare facilities. Health care systems in rural and remote areas lack the basic requirements for daily infection prevention and control such as running water and soap. COVID-19 will burden the health system. The healthcare workers in rural facilities and communities along with community health volunteers and public health officers require the appropriate Personal Protective Equipment (PPE) while educating and engaging in contact tracing.

Understanding the socio-economic and epidemiological context of the rural communities, through proper research, could address challenges around the implementation of Low-Cost Measures in these regions to mitigate the spread of Covid-19.

HOW DOES IT AFFECT THEM?

a. Workers in rural communities cannot earn their salaries by working from home. Their income comes from on-site jobs which may require travel, trading, and contact with other workers outside of their own communities which could largely increase the spread of the disease.

b. The local health care facilities that are challenged with low compliance from the population and scarcity of PPE could rely on better prevention and control measures. Low-cost innovative strategies that are looking to be more effective than current ones need the input of the local communities so that they can be effectively implemented in these areas that already suffer low resources.

c. Testing is not yet widely available which hides the real rate of infection, moreover, rural health systems lack the capacity to provide the level of care required for those in need of hospitalization.

DESCRIBE THE "K"

WHAT DO WE KNOW ABOUT IT?

a. As of to September 3rd,2020 the number of cases reported by the Zambia National Public Health Institute was 12,523 (2). The COVID-19 Emergency Response and Health Systems Preparedness Project implemented a number of NPI's such as: closures of borders, airports, schools, bars and restaurants; banning of public gatherings and church services; increased hand hygiene, social physical distancing, avoidance of unessential travel, using a face covering/mask, quarantining for 14 days after an international travel or exposure to an infected person, and practicing infection prevention and control measures especially in the health care facilities and at home. Many of these restrictions have begun to be loosened but strict regulations regarding physical distancing and the wearing of face masks continue.

b. The Sub-Saharan social and geographic arrangement of rural settings is a strong context challenging the isolation measures against Covid-19, where villages might be geographically apart from each other but are composed of a number of households with family members who interact amongst each other within their own village, this situation adds up to the high level of poverty as well as a large informal economy which prevent many from remaining in their homes; lockdowns and stringent physical distancing protocols will exact a heavy toll on livelihoods, and the potential for the disease to overwhelm under-resourced public health systems is of great concern. The history of effective public health responses to infectious diseases in low resource settings – for example, recent Ebola outbreaks – makes clear that **innovative community-based approaches**, building on networks of community workers from different sectors, nurses, and clinical officers coupled with effective community engagement are the most viable strategies in these settings.

c. The 'Community-Based Approach' must be tailored to specific settings: culturally appropriate, attentive to the gendered dimensions of health security, and compatible with local/regional social, economic, and health system structures. Although the basic practices needed to disrupt disease transmission will remain constant, its success would depend on the rapid identification, development, and deployment of low-cost, contextually specific interventions.

WHAT DO WE THINK WE DON'T KNOW?

1. What social determinants are associated with COVID -19 transmission in rural areas where new clusters of cases are appearing?
2. What are the current social and public health responses offered in rural areas that are significantly associated in reducing transmission of the COVID-19 virus?
3. What interventions have successfully been implemented in other rural areas with limited resource settings?
4. How shall we monitor and evaluate the outcomes and impacts of the interventions in these areas?

DESCRIBE THE "K"

WHAT ARE THE BIGGEST GAPS?

a. **Research based Social Policy and Public Health Responses (Social/Cultural)** High-quality evidence such as epidemiological studies are needed in order to achieve the goals of public health interventions as well as production of knowledge with a local mechanism of support; translation of knowledge that is easily understood by non-scientists stakeholders and decision makers; guidelines and Standard Operating Procedures (SOPs) to operationalize epidemic mitigation mechanisms; connection of global research networks with response partners; engagement with communities as key stakeholders, and understanding of how social and economic impacts can be mitigated.

b. **Transdisciplinary research** where generation of knowledge includes the adoption and integration of local knowledge from communities. This will allow us to both evaluate how current public health messages are being received and discovered, and what local strategies can be used to adapt public health messages more effectively.

c. **Rapid literature review of Low-Cost Measures** from other rural areas or countries that could be integrated in Rural Zambia plan to mitigate the spread of COVID-19.

d. **A historic narrative study of socioeconomic determinants** that are impacting the management of the COVID-19 pandemic.

e. A clear strategy on **Infection Prevention and Control (IPC**) measures in labor settings, including health care workers' protection strategies and PPE.

f. **Ethical considerations for research:** Articulate and translate existing ethical standards to COVID-19 issues, and the impact of restrictive public health measures such as quarantine, isolation, or cordon sanitaire.

g. **Monitoring and Evaluation Framework** of the newly implemented NPI's.

PROMISING PRACTICES

RECOMMENDATIONS

Since the Covid-19 pandemic has affected all facets of life from economic, social, cultural to even political arenas, the response should address these areas. Building on available evidence on how the public health measures have proved to assist in reducing the spread of the disease, different countries have taken their own measures based on the strength of their health system, ability to rapidly implement social distancing, and their community's needs. For Zambia rural setting, this paper makes the following recommendations:

3.1.1 Investment in Research

a. We recommend a socio-historic narrative study of socioeconomic determinants that impact management of the COVID-19 pandemic in a rural Zambian community.

b. Integrate and Deploy a Low-Cost Non-Pharmaceutical Intervention Plan to mitigate the spread of COVID-19 into the current health system. To inform this deployment, economic evaluations for two or three proposed options of the Low-Cost Measures will be conducted. The economic evaluations will be based on the cost of each measure, the benefits, the efficiency, and the effectiveness. Furthermore, comparing the outcomes of the economically evaluated options in terms of costs and benefits, deaths averted, and the quality of life years lived will form the basis of choosing one option of measures over another. The issue of sustainability of interventions will be addressed through the economic evaluations.

3.1.2 Investment in Targeted Community-Based Response Approaches

a. Social distancing with implementation of supplemental measures: The economic effects of Covid-19 are far reaching and worse for rural settings where formal employment is low with many people depending on retailing as well as selling local agricultural produce. Social distancing in the trading places may prove a challenge and so, to support the well-being of those most affected by social distancing policies, governments can consider offering 'in-kind distributions' to the vulnerable household in order for them to stay at home. This exercise can utilize public-private partnerships as well as leverage on existing distribution networks where possible, for example: via community groups and/or NGOs serving these communities or companies with wide-reaching, and granular distribution networks.

b. At Facility Level: Based on available knowledge on how to mitigate the spread of Covid-19, provision of training health workers, community health workers and other key people necessary in the prevention and early detection of the disease.

c. As a next-level prevention and control measure (mitigation), we also suggest to evaluate and consider the utilization of Mobile Health Services: The World Health Organization recognizes the use of mobile health clinics as an adequate way of providing health access to communities living in areas far from health facilities.

PROMISING PRACTICES

In Zambia, the Health Policy promises provision of health services within a 5-kilometer radius and so the lack of it encourages the implementation of mobile health clinics. These operate as a primary health center with a doctor's office and exam room, or testing facilities located inside a large truck, van or bus. Covid-19 specific services should be deliberately incorporated for the medically underserved areas to help connect patients and those at risk to care, while overcoming financial and access barriers to care. Mobile clinics bring healthcare directly to communities and have the great potential of reducing transport to health centers and the associated risk of spreading disease during travel.

ADAPTATION FOR LOW-RESOURCE SETTTINGS

a. The goal of this project is to identify, and support, the scale-up of fitting innovations in a particular context – rural Western Province, Zambia.

b. We hope to develop a model for rural context-specific mitigation strategies. Although the specific characteristics of these innovations will be determined by this local context, we argue that the approach we propose to take, and likely some of the more promising mitigation strategies developed, will be relevant to other low-resource settings throughout the region.

SYNTHESIS

The COVID-19 pandemic has shaken economic and health-care systems around the world, and Zambia in Africa is no exception. Up to September 3rd,2020 the number of cases reported by the Zambia National Public Health Institute was 12,523 including 292 deaths and 11,562 recoveries. The COVID-19 Emergency Response and Health Systems Preparedness Project includes three response plans targeting engagement of stakeholders, environmental and social commitments, and research and innovation plans. Later, a simplified reader friendly fact sheet and brochure on COVID-19 disease control and Non-Pharmaceutical Interventions (NPI) was published as well.

Despite the numerable measures provided by Health Authorities in the country, it is still difficult to implement them efficiently in some of the most vulnerable areas such as the rural settings, and this situation is evident. There has been strong promotion of Non-pharmaceutical Interventions (NPI) for the control and prevention of the spread of the disease by different entities such as the media, clinics, hospitals, government, and private organizations. But where in urban areas there is more access to water and soap to continuously wash the hands, and where people can have internet access allowing them to keep earning salary while staying at home and work remotely, these are not alternatives available for the people living in rural settings where all kinds of resources are low, water is scarce, and earnings are made of on-site jobs such as farming, fishing, retailing and others.

Health Care workers face numerous challenges when attempting to reinforce NPI measures and COVID-19 related policies due to the specific regional conditions of the rural communities. Therefore, evidence-based information from reliable research must be done to provide an educated acknowledgment of the socio-economic determinants of these communities, their behaviors, their needs, their weaknesses, and their strengths. There have been effective strategies that have been taken on other disease outbreaks such as Ebola's where innovative community-based approaches, that are tailored to specific settings and build on networks of community workers, nurses, and clinical officers coupled with effective community engagement, are, in the short run, the most viable strategies to reduce the risk of transmission in low-resource settings.

A possible overlooked tool during the COVID-19 pandemic is the Transdisciplinary Research where knowledge generation includes harnessing local knowledge from communities. This is particularly relevant now, as it will allow us to both evaluate how current public health messages around preventing the spread of COVID-19 are being received by local communities and discover what local knowledge is available that could be used to adapt public health messages increasing efficiency and providing better compliance. Transdisciplinary research not only integrates knowledge from different academic disciplines, that transcends disciplinary boundaries but also draws from non-scientific sources such as the community (Galway, Parkes, Allen & Takaro,2016). Historically and successfully, local communities have used traditional knowledge to adapt to their environments.

SYNTHESIS

An economic evaluation based on the cost of each measure, the benefits, the efficiency and the effectiveness needs to be conducted. Furthermore, comparing the outcomes of the economically evaluated options in terms of costs and benefits, deaths averted, and the quality of life-years lived, will form the basis of choosing one option of measures over another. The sustainability of these interventions will also be addressed through the economic evaluations.

Once the relevant knowledge has been produced, and an economic evaluation of the suggested measures has been acquired, the true impact will come with a strategy that would implement Low-Cost measures to mitigate the spread of COVID-19 in these rural settings. This plan would be focused on **Infection Prevention and Control (IPC)** measures that include NPIs tailored to the specific conditions of the communities; the investment in **Targeted Community-Based Response Approaches** such as the utilization of Mobile Health Services, Social Distancing Strategies and implementation of Supplemental Measures including 'in-kind distributions' to the vulnerable households to provide allowance for them to stay at home. This exercise can utilize public-private partnerships as well as leverage on existing distribution networks where possible, for example: via community groups and/or NGOs serving these communities or companies with wide-reaching granular distribution networks. And finally, developing and implementing a **Monitoring and Evaluation Framework** of the newly implemented NPI's.

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