POLITICAL FACTORS, SUSTAINABILITY AND SCALE UP OF MOBILE HEALTH PROJECTS AS EARLY WARNING SYSTEMS IN PUBLIC HEALTH SURVEILLANCE IN KENYA: A CRITICAL REVIEW

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ABSTRACT

During the devolution process in Kenya, statutory fiscal, administrative and political powers were transferred from the central government to the county governments. It's generally expected that all citizens especially those in the marginalized communities will benefit by increasing access to health care services notably during epidemics and pandemics, which negatively impact on a country's economy including health, transportation, agriculture and tourism sectors. One of the strategies for achieving this goal is through the use of mobile phone technology due to its ability to access wide geographical areas, affordability once the initial investment in the technology and technical requirements is achieved and it's cheap to maintain in terms of resources, this has led to the establishment of mHealth projects in the health sector to be applied at the point of care delivery. Sustainability of these projects has being identified as a major challenge since most mHealth projects terminate at the pilot phase. Scale up of mHealth projects can only occur after successful implementation and sustainability of the project. The analysis will focus on political factors such as leadership and governance, stakeholder management and socioeconomic and cultural factors that affect the sustainability and scale up of mHealth projects as Early Warning System in disease surveillance in Kenya.

Key Words: *political factors, sustainability, scale up, mobile health projects, early warning systems, public health surveillance, Kenya*

INTRODUCTION

Devolution and mobile Health projects in Kenya

Devolution in Kenya is enshrined in the 2010 Constitution, which resulted in the birth of 47 counties governed by elected leaders comprising of governors and county assembly members. The process entailed wide-ranging fiscal, political and administrative decentralisation and is majorly focused on the supremacy of the constitution, sovereignty of the people and public participation. Fiscal decentralisation involves the transfer of fiscal resources and revenue generating powers, political decentralisation entails devolution of decision-making powers including governance and administrative decentralisation involves the transfer of civil servants and select public functions to the counties (ICJ Kenya, 2013; Kimathi, 2017).

After the implementation of the new constitution, several elective political positions were established in the counties, in which the governor is directly elected as the executive head of the county whose mandate includes the appointing of the County Executive Council (CECs), planning and development, budgeting and expenditure, but his legislative agenda must be approved by the County Assembly which is comprised of Members of the County Assembly (MCAs), who are directly elected at the ward level and whose roles include legislation by enacting county laws to

operationalize the devolved functions, oversight role by applying checks and balances on the executive and representation role by presenting the views, opinion and proposals of the electorate to the county assembly. Counties are represented by senators in the national level, who are directly elected at the county and whose function in the second chamber of parliament called the senate, are mandated to defend the county interests by crafting bills affecting the counties.

As a reform measure the objective of decentralization of health functions is to enhance management processes, all inputs and health resources through financial, political and administrative influence (Panda et al., 2016). The devolved health care sector gives a clear distinction of operation between the national and the county governments, with the responsibilities of the two government levels in health-care distinctly defined in the fourth schedule of the 2010 constitution (Kimathi, 2017). The central government is tasked with formulation of policy, strategic planning, drafting guidelines and rendering technical assistance to sub-national governments among others, whereas the functions of sub-national governments includes resource mobilization for county health services and overseeing all health services within the County (Presidential Malaria Initiative, 2019).

Kenya's Information Communication and Technology (ICT) sector has witnessed strong growth due to the existence of a significant human resource and ICT facilities that has led to the nation's enhanced projects in Electronic Health (eHealth). In 2011 the Ministry of Health launched the first Kenya National eHealth in support of these. The aim of Kenya's e-Health policy is to ensure fair and affordable healthcare for every Kenyan to the highest achievable standards. It is rooted in the achievement of the 2030 vision, with its origins, strategies and outcomes from the execution of the 1994-2010 Kenya Health Policy Framework and executed through e-Government directorate and ICT board (Republic of Kenya, 2011).

The primary reason mobile communication appeals to the healthcare industry is that it appears to offer an alternative to the structural obstacle to connect particularly in areas without adequate and effective transport infrastructure systems. Mobile health platforms work on the idea that incorporation of mobile technologies in health-care has the ability to impact positively on health outcomes (Folaranmi, 2014). Other reason is that because of their programming, mHealth devices can also be used to gather clinical health data, distribute health information and exchange feedback information to players in the health sector, such as healthcare practitioners, researchers, patients, policy makers as well as other players in the healthcare industry. It also offers a rich source of information that will promote health sector functioning in Kenya when used (Mechael, 2014).

In their mobile health deployment tracker in 2015, Groupe Speciale Mobile Association (GSMA) identified more than 400 different mHealth programmes operating mainly in Africa where majority were new pilots and rarely brought to scale, where the purpose of their development of the apps was not to integrate them into the existing health system beyond the local pilot site, but for evaluation for feasibility, usability and effectiveness and are donor funded without a long term sustainable financial framework (Kruse et al., 2019; Petersen, Jacobs & Pather, 2020).

The findings of a mapping study of eHealth and mHealth projects in Kenya carried out by Njoroge et al (2017) indicated that projects implemented in Kenya covered all eHealth strategic areas with majority n=47 (69%) of them delivered through mHealth portal. In terms of health focus, this study found that n=19 (28%) projects focused on primary care followed by HIV/AIDS n=17 (25%), then maternal and child health n=11(16%) and malaria n=8 (11%). Twenty-three projects were designed to target multiple conditions and diseases. Of these n = 19(27%) projects were used to collect and report health information within the primary care, while n=2 projects concentrated on both HIV/AIDS and either TB or malaria. The remaining n=2 projects were designed to address both HIV/AIDS and maternal and child health.

Sustainability and scale up of mobile Health Projects

The United States Agency for International Development (USAID) definition of sustainability to incorporate the aspect of the programmes ability to keep services at a scale that can bring about continued benefits even after the external donor financial, management and technical aids are brought to an end. Lapelle et al (2006) in their definition focused exclusively on the program elements to include the concept of ongoing utilisation of programmes 'outcomes versus continued community benefits. Schell et al (2013) adopted and expounded on the Lapelle definition and incorporated time element and defined sustainability as the programmes' ability to maintain its benefits overtime (Walugembe et al., 2019).

Scaling up of a health intervention involves all processes of performing the intervention on a larger scale through developing relevant policies and program expansion, especially if it was successfully tested, in order to increase the impact of the innovation on a lasting basis with the aim of benefiting more people by extending from one region to others (ExpandNet, 2010; WHO, 2016). According to Sahay &Walsham (2006) scalability or to scale up an information system implies expanding the system in scope and size, making it accessible to more users or increasing its functionality in terms of geographical location, software architecture, people, processes, and infrastructure, technical and political support.

The impact of Pandemics and Epidemics

The latest World Health Organisation (WHO) published list of priority epidemic potential diseases (2020), which require urgent research and development (R&D) attention since the causative pathogens and natural history are currently unknown, and pose great public health risk due to their epidemic potential with presence of insufficient countermeasures. These include the ongoing Corona Virus Disease 2019 (COVID-19/SARS-CoV-2) pandemic, Ebola virus disease, Marburg virus disease, Crimean-Congo Hemorrhagic Fever (CCHF), Severe Acute Respiratory Syndrome (SARS), Zika Virus, Middle East Respiratory Syndrome Corona Virus (MERS-CoV), Lassa fever, Rift Valley Fever (RVF), Nipah and Henipaviral diseases amongst many others. The other category of threats are currently endemic diseases which have the potential to spread and have

developed superbugs which are resistant to conventional antibiotics which include Malaria, Tuberculosis, HIV/AIDS, Cholera and many other emerging and remerging diseases.

According to the European Union (2020) most crucial outcome of epidemics and pandemics is human suffering and loss of lives as published by the World Bank Group's 'Pandemic Preparedness Financing' report, the estimated number of people killed by the Spanish Influenza in 1918 was more than 50 million, the SARS epidemic in 2003 killed 774, in 2012 the MERS epidemic claimed 823 lives, between 2013 to 2016 the Ebola epidemic killed 11310 people in New Guinea, Liberia and Sierra Leone, while the ongoing Ebola epidemic has killed more than 2000 people in the Democratic Republic of Congo, the 2009 H1N1 Influenza pandemic caused more than 18000 deaths with more than 32 million people having died of HIV/AIDS since the beginning of the epidemic according to WHO 2019. By 2018 approximately 1.6 million people were living with HIV in Kenya, 46 thousand new infections and 25 thousand people died from an AIDS – related illness down from 55 thousand in 2010 (UNAIDS, 2020).

Rift Valley Fever (RVF) outbreak from 1930 to 2009 is responsible for an estimated 684 cases with 155 deaths in Kenya (Pevre et al 2014), while in 2019 there were 21 confirmed RVF human cases with 11 deaths in Kenya (CDC 2019), According to WHO (2017) Kenya has been experiencing continuous large outbreaks of cholera with a cumulative total case of 17597 reported (10568 reported in 2015 and 6448 in 2016) and 550 cholera cases with 13 deaths occurring in 2020 in several counties in Kenya (MOH, 2020).

In 2018 there were an estimated 405 thousand deaths due to malaria in Africa with 3.5 million cases and 10700 deaths occurring every year in Kenya mostly affecting young children, pregnant women and travelers and immigrants from non-endemic parts of the world(WHO 2020; CDC 2018). In 2018 globally, a total of 1.5 million people died from Tuberculosis (TB) including 251 thousand people with HIV and 205 thousand children, 10 million cases (5.7 million men, 3.2 million women, with 1.1 million children) were diagnosed worldwide, while 484 thousand new cases of Multi Drug Resistance TB (MDR-TB) which remains a public health crisis and a health security risk were diagnosed.

Due to their unpredictability, novel or reemerging pathogens have unexpected clinical outcomes with difficult predictions and cost estimates which are limited to short term medical spending, health burden and mortality. A good example is the Zika virus whose sequel is inconsequential in terms of medical burden in normal adults but have extensive impact when it manifests in infants in terms of direct medical expenses which are cumulative during pregnancy, but also the significant direct and indirect costs that accrue during the post-natal period and throughout their life span due to the long term extensive care that they require (Smith et al., 2019).

The ongoing Covid 19 pandemic which was detected in Wuhan City, Hubei province, China when on 31 December 2019 WHO was informed of a cluster of cases of pneumonia of unknown cause, a novel coronavirus was identified as the cause of the outbreak in the samples obtained from cases and was announced on 12 January 2020 as Severe Acute Respiration Syndrome Coronavirus 2

(SARS-CoV-2) and on 11 February 2020 WHO named the syndrome caused by this novel coronavirus as COVID 19 (Corona Disease, 2019) based on best practice guidance and was declared a global pandemic on March 11 2020. Currently there are over 27 million cases diagnosed globally with more than 890 thousand deaths, Africa has over 1.3 million cases diagnosed with over 31 thousand deaths while in Kenya there are over 35 thousand confirmed cases with more than 350 deaths and counting (WHO, 2020; ECDC, 2020).

There are several channels that epidemic disease impact on a country's economy including health, transportation, agriculture and tourism sectors, which also impact on international trade and supply chains due to the interconnectedness of modern economies, These diseases present threats to modern societies as they are highly virulent and highly transmissible either locally, regionally or internationally, causing human suffering and death with wide spread negative global economic impact. This is exacerbated by globalisation with rapid international travel, climate change causing natural disasters like floods and droughts expanding the habitat of disease causing vectors, urbanisation which facilitates transmission of contagious diseases due to population congregation with rapid growth of slums with poor sanitation, lack of clean water, infrastructure and health care, conflict and wars leading to displacements and the threat of bioterrorism (Bloom et al., 2019).

Epidemics and pandemics cause multi-sector impacts where the total value loss occurs due to loss of income through labor force reduction affecting productivity, increased absenteeism either due to illness or social engineering and health measures at individual or community level aimed at interrupting transmission of the disease and the intrinsic cost of morbidity and mortality. Also due to the negative impact on agricultural and food production, trade either regional or international, tourism and travel, education sector, various market types and retail chains, oil, gas mining and natural resources together with environment and ecosystem services with the major costs incurred in health sector and virus containment measure (Smith et al., 2019).

There is need for rapid transmission of disease surveillance information especially on the onset of suspected epidemics or pandemics in real time for timely decision making to facilitate early diagnosis and containment and this call for innovative strategies such as mHealth interventions to enhance the capacity for rapid communication and transmission of necessary information by all stakeholders starting from the community to the relevant programmes at both county and national level thus scaling up appropriate responses to the populations affected and also contributes significantly to global concerted efforts to implement initiatives that first track the achievement of the United Nations Sustainable Development Goals (SDGs), which encompass the most contemporary development issues and addresses global challenges from 2016 to 2030, grounded in the principle of equity, human rights, accountability and sustainability and which is the key driver of Universal Health Care (UHC), whose objective is to ensure that both individuals and communities access quality health services without undergoing financial hardship.

Health issues are covered in the third SDG of good health and well-being which consist of 9 targets for accelerating the Millennium Development Goals (MDGs) and 4 means of implementation, as

well as promoting vision 2030 (Lee et al., 2019; Olushayo et al., 2019). Good governance is basically a political process as a result of interactions, coordination and decision making among different actors in the face of multiple views and interests, has been recognised as essential in improving health sector performance and achieving UHC.

Mobile Health projects as Early Warning Systems in disease surveillance

Due to the consequences of natural prolonged socio-natural processes of famine and drought called for planning ahead for unanticipated disasters leading to the evolution of EWS, which dates back to the 1980s when famine in Sudan and Ethiopia generated the need to anticipate and avert future food crisis. For social and institutional awareness and preparedness for EWS requires availability of scientific and practical information, resources both monetary and technological, but also building capacity in terms of psychological and social capital to interpret and use information according to local needs and expectations with the comprehensive understanding of the disaster.

Early warning systems are instruments which have traditionally been used to routinely communicate information on hazardous natural events such as hurricanes and volcano eruptions to vulnerable people and those at risk before it occurs to enable mitigation action to be taken or prevent the hazard from occurring. In the recent days there have been outbreaks of emerging and remerging diseases which have highlighted the urgency of putting in place EWS to prevent their spread and even curb the outbreaks.

In order to increase the efficiency and effectiveness of an EWS as a risk reduction tool, it should have the attributes of an information system designed to facilitate decision making for vulnerable and all social groups at risk at all levels of society, which include national, county, community, household and even individual level, in order to initiate actions and activities to mitigate and minimise the impact of the impending hazard or disaster which include epidemics or pandemics for this case (NAP, 2001).

The rapid evolution of mobile phone devices with their inbuilt ability for diverse digital modifications and internet connectivity, coupled with participatory disease surveillance approaches, as a component of EWS, can ensure timely reporting of unusual health occurrences, which can be revealed as a collection of symptoms appearing in time and place, in a low cost manner ensuring sustained routine monitoring of disease outbreaks with a sufficient level of specificity resulting in improvement in data collection, processing and analysis process, which has led to improving the quality of information generated for health surveillance, as a result there is better understanding of epidemiological patterns and scenarios (Leal Neto et al., 2016).

Integrated Disease Surveillance and Response (IDRS) system, is the key strategy for implementing public health surveillance in the African countries, which was launched by WHO Afro in 1998, which strengthens the countries' capacity to prevent, detect and rapidly respond to infectious diseases and other public health emergencies. This involves complementary approaches which involves active engagement of the population at risk on collecting and submitting relevant data

using diverse survey tools including mobile phone apps and hotlines among others through event based surveillance and digital surveillance. The advantage of participatory disease surveillance is that the willingness to participate and provide information by individuals facilitates a greater understanding of the disease risk factors and transmission pattern and also this provides an opportunity for the surveillance team to provide information to participants and highlight on the risks of the outbreaks leading to rapid response to the emergencies by mitigating and even everting their negative impacts (Smolinsky, 2017).

The use of mobile health and ICT technology coupled with the involvement of community health workers in public health disease surveillance in both humans and animal sectors have been piloted and reported in different countries including Kenya, Uganda, Zambia, Madagascar, China and Sri Lanka (Kallander et al 2013; Karimuribo et al 2018), while the affordability of mobile phones with the rapid advancement in the digital health technology contributed massively in delivering public health interventions through the timely identification and managing major disease outbreaks such as Ebola (Vorovchenko et al., 2017), dengue (Albinati et al., 2017) and Zika (McGough et al., 2017) and also facilitating rapid response to healthcare emergencies (Kostkova, 2018).

Some examples of disease surveillance models include the AfyaData system in Tanzania and the Participatory One Health Disease Detection (PODD) system in Thailand which both apply event based surveillance models with a One Health focus to community reporting for humans, animals and environmental health events, others platforms include Flu Near You, Influenza.Net, Vigilante, Saude na Copa, Guardian of Health etc. WHO's Early Warning Alert and Response System (EWARS) implemented in 2016 designed to improve disease outbreak detection in emergency settings such as in countries in conflict or following natural disasters. Electronic Disease Early Warning System (eDEWS) based on mobile App.TRACnet which is a web based tool for timely IDSR in Rwanda, i-sense also involved in Covid19 tracking, while Mohanty, Chughtai & Rabhi (2019) in their documentary analysis on the use of mobile Apps for epidemic surveillance and response on availability and gaps carried out a search on Google Play and the App Store and identified 26 disease surveillance Apps including 21 free of charge and 5 paid Apps, of these 17 Apps were for single disease surveillance, 7 Apps for multiple disease surveillance and 2 Apps provided information on bioterrorism agents, with intended users varying from the general public (18 Apps), health practitioners (4 Apps) and another 4 Apps for both general public and health practitioners

STATEMENT OF THE PROBLEM

One of the major attributes of mobile health intervention as an early warning system in disease surveillance is the potential to decentralize all aspects of health care by increasing access and utilisation, making it convenient especially in resource constrained settings with the potential to be modified and standardised in order to perform disease surveillance, detection, notification and prevention functions, more so in in low and middle income countries where the present disease surveillance systems is based on notifiable disease indicators as identified in health facilities and

also laboratory testing which most countries lack the capacity due to limited financial and human resources (Adeagbo et al., 2019). Despite the presence of all attributes that favour the existence of a robust mobile phone technology in Kenya, a global survey by WHO and (ITU) in 2014 indicated that most of this initiatives are weak platforms that have failed to transit to actual practice with only 9-16 percent of developing countries that have implemented eHealth projects having managed to support them for at least three years (Kenya National eHealth Policy, 2016-2030). There are no laws and regulations that back mobile health interventions around the world despite their proliferations, these include formulated policies regulating different types of interventions for particular diseases in most countries, due to lack of consultation and involvement of major stakeholders in the health ecosystem during project design for needs identification, paucity of community participation in decision making during project implementation to ensure accountability, governance and ownership who include system designers, vendors, health professionals and policy makers and even the targeted community members (Nsor-Anabiah et al., 2019). According to WHO (2017) and Mukhi et al (2018) mobile health technology can definitely contribute towards the achievement of the third goal of the SDGs by promoting healthy lives and the wellbeing of all people at all ages thus leaving no one behind as well as the UHC. But despite all the benefits and high penetration rate, mobile technology is still not commonly used for the purpose of data collection, data transmission and reporting in disease surveillance and public health generally.

OBJECTIVE OF THE STUDY

The research aims at establishing contextual political factors affecting mobile health sustainability and scale up as early warning system in disease surveillance in Kenya, as well as the factors that favor or hinder the growth of this technology within the devolved system of governments in the country, which are empowered with political powers, administrative units and fiscal resources to improve infrastructure, health and socioeconomic status of its citizens through community involvement and participation, especially in rural and marginalised areas which are most at risk of disease outbreaks and epidemics but face historical challenges in accessing quality health care.

THEORETICAL REVIEW

This theory explains the interaction of different institutions, why they are established and their social and economic relationship and the need for a regulator whose purpose is to guide and safeguard its operation. But it potent that the regulator is influenced by political and bureaucratic processes which result in market imperfections which is unanticipated by economists who fail to suggest countermeasure regulatory policies (Joskow & Noll, 1981; Posner, 1974). According to Wilson (1974), regulation concept exists for some explicit purpose which can stem from political motivation with the need to redistribute wealth or economic factors such as the need to correct market imperfections which include the abuse of monopoly power.

The purpose of regulation theory is to explain the need for government intervention in markets. It consists of three branches namely public interest theory (market failure), private interest (capture) theory and the economic regulation theory. In the theory, regulation relates to the implementation of socio-economic policy objectives through the employment of legal instruments where by an individual or organisation is compelled to comply with prescribed behaviour by means of penalties or sanctions. Public interest theory stipulates that when there are critical events such as corporate failure or the desire to promote social welfare, regulations are developed to spur the government into action. These regulation theories proceed from the assumption of full information, perfect enforcement and benevolent regulators and stipulate that the regulation of firms or other economic actors contribute to the promotion of public interest and involves the best possible allocation of scarce resources to individuals and society in general.

The neutrality of regulators can break down to the detriment of public interest and result in the failure to protect and promote the same due to bureaucratic ineptitude, deficiency in skills and resources by the regulating agency and the complexity of technical issues (Posner, 1974; Meier, 1991). This theory is relevant for this study since during the devolution process in Kenya counties were granted autonomy, with the roles of the decentralized units being clearly stipulated in the second medium term plan whose purpose was to spur economic growth, political stability and social economic development as clearly stated in the constitution and county development plans in line with the realization of UHC through the attainment of the SDGs and vision 2030.

This calls for the need to exert regulatory control through various independent bodies and commissions which offer oversight roles on decentralized institutions, which coerce different counties to comply to subscribed mode of required institutional practices and monetary systems in order to safeguard public interest from practices which can negatively impact on accountability by disproportionately benefiting from devolution at the expense of the public affecting service delivery (Kasyula, 2018).

EMPIRICAL REVIEW

Governance and Leadership

The devolved government system introduced in Kenya as a result of the new constitution, enabled the transfer of power to autonomous units which are independently governed as corporate entities without the direct control of the central government, with the jurisdiction of maintaining control over mapped geographical regions and to secure resources to perform the required functions in order to combat the existing socio-economic and infrastructural challenges including healthcare services among others.

In their systematic review on decentralisation and health system performance and outcome in low and middle income countries, Dwicaksono & Fox (2018) pointed out that arguments that favoured the decentralisation of health sector included the expected empowerment of local authorities to

make decisions on their own, reduced level of bureaucracy in achieving efficiency, better matching of health services with local priorities, promoting innovations in service delivery that address local needs and enhancing stakeholder participation in decision making with members ability to advocate for the concerns of the sectors they represent through role clarity, increased competence and accountability

Through the introduction of 'local solution to local problems 'devolution enables the devolved county governments to develop and enact legislation and policies that are appropriate to the prevailing economic and social condition of the specific counties even allowing policy divergence when the need arises. There is continuous monitoring and inter-territorial comparison and competition between counties on successful development agendas which allows for continuous learning in terms of knowledge transfer more so on popular and successful policies which leads to adoption by other jurisdictions (Wagana, 2017; Mackinnon, 2015).

A lot can be learned through past experiences from different countries on devolution which depicts it as a complex process, with unpredictable reform implications and outcomes in terms of accountability and governance mechanisms with clearly defined roles, responsibilities and processes, with decision process being influenced by political, social, economic and cultural context and norms together with changing power balance by values held by different actors which may not align with the laid down formal laws and regulations.

In their research and analysis on Health system governance following devolution while comparing experiences of Kenya and Indonesia, McCollum et al (2018), concluded that not much action had been undertaken in the promotion of citizen understanding of health and their decision making role during the devolution period with a host of barriers to effective participation in both Indonesia and Kenya, as also witnessed in previous studies carried out in Tanzania and Philippines and other devolved countries where community participation in identifying priority issues in health planning at health facility level was limited despite different avenues being described in various policies but lacking in real practice due to factors such as lack of funding and tokenism.

The community as primary stakeholders can be included in rapid assessment, preparedness and m Health intervention efforts through engagement in multi-sectoral action plans and budgeting processes for purposes of allocating resources to ensure the sustainability and scale up of mHealth projects. There is a call for meaningful community participation from the start in national, county and local responses to disease outbreaks and epidemics which include mobilizing and educating the general public, especially when enforcing social engineering processes like isolation and other restrictions in order to end fear and combat stigma, play the critical role of monitoring outbreaks and the laid down responses together with holding all levels of governments and implementing agencies to account (Somse & Eba, 2020).

Shigayeva and Coker (2015) in their empirical citations on analytical approach to sustainability of communicable disease control programmes and health systems emphasised on leadership competencies as key to addressing long term vision on how to tackle the populations health

problems, develop and implement innovations that address the identified problems in the long term and provision of clarity of roles and responsibilities of all actors and stakeholders thus avoiding competing objectives. Leadership is a wide concept which incorporates central capabilities such as setting attainable organisation goals, strategic financial and organisational planning, resource mobilisation, community mobilisation, strategic use of monitoring and evaluation together with stakeholder management, which are the basic skills required to unite other aspects of sustainability.

Leadership also requires commitment, taking responsibility and ownership for actions, engaging others and handling conflict, which plays a primary role in creating an environment for continuously developing the skills for those working in an organisation. Other leadership competencies to ensure sustainability include fundraising, building trust and strategic relationships outside the organisation and political support with factors such as economic conditions, political climate, policies of funding agencies and countries history as overreaching health characteristics that influence the sustainability of health interventions (Shigayeva & Coker, 2015).

Njuguna et al (2020) in their qualitative study and documentary review on selected counties in Kenya concluded that That county health planning frameworks integrated economic, social, environmental, legal and spatial aspects of development to produce plans that meet the needs and set targets for the benefit of local community and the plans are aligned to national plans such as the Kenya Vision 2030, Medium Term Plans, the National Spatial Plan and SDGs, but the main challenges encountered during planning at the county level included political interference by legislative assemblies on priority setting and failure to embrace the relevance of health planning by the executive and political wing together with a lack of political will on MCAs engagement, lack of policies and guidelines on stakeholder engagement and health sector working groups, with disconnect between health partner support with the budget and planning office due to lack of policies and frameworks on partner coordination and engagement including the requirement for partners to disclose their resource envelope leading to poor planning due to missing and lack of full information on funding

For any health sector reform to occur including implementing mHealth projects that are sustainable and scalable, there is need for behaviour modification within counties and individuals which is normally resisted as a natural reaction to change as it disrupts the established power structures, may require a change in policy which will lead to a redistribution of resources and responsibilities which calls for a lot of advocacy and lobbying, consensus building, conflict management and power bargaining amongst all interested parties in the county government including members of budget and oversight committees in the legislature, formal and informal policy advisors for political leaders, affected organisations and interest groups, political appointees in charge of the implementing agencies, and both powerful and powerless beneficiaries of the mHealth projects making it inevitably a wholly political process (Power et al., 2019).

Hunter (2016) in his analysis on the conflict between public health and politics highlighted factors such as the advocacy of intervention by public health officials which will prevent morbidity,

disability and demonstrate a positive outcome on mortality and improvement of health status and resulting quality of life but are likely not to assess the broader economic and social impacts of the interventions, with public health, the approaches are usually complex and multistage and can't be reduced to straight forward solution with few decision makers having the tools to assess the health impact of decisions they make on a wide range of public policies. Whereas in politics there is the incorporation of complex set of economic, ideological and personal factors, with tradeoffs across competing values and influences, with the strong incentive to incorporate business and other perspectives in their decision making and also respond to evidence on economic impact, relationships, maintaining coalition beyond an immediate issue and other factors in addition to public health evidence which may not be objective or scientific.

Another important factor that differentiates public health from politics is the difference in time horizon to achieve a set objective or target, public health agencies and advocates normally have continuity that transcends a single leader, with many interventions taking years or even generations to achieve maximum results whereas elected officials typically favour tangible short term, visible outcome overlaying the groundwork for gains that might be realised after their term of office. It's more imperative in situations where elected officials need to make tradeoffs with non-health issues where the use of their political capital and public resources might achieve short term gains.

It adds value for mHealth projects and applications to be owned by the government especially the county government in the devolution era as witnessed in Ghana and Nigeria who address issues of maternal and neonatal health by use of mobile phones, this entails collaboration between the relevant health ministers, health officials, mobile providers, medical personnel, technologists and financiers, who can coordinate and agree on incentive structures, public and private investments and the deployment of commercially viable solutions which will ensure sustainable mHealth interventions in the long run (Kallander et al., 2013).

Stakeholder Management

Project management process involves planning and controlling activities though it has shifted away from these and relationship management is the concept being advocated together with valuing people and working relationships. This calls for the willingness and ability of all stakeholders to commit to disease control efforts, have a clear and long term vision for disease control efforts, gain political and financial support, build programmes credibility, build trust and engage with stakeholders, mobilise resources and implementation efforts while taking ownership of reforms and innovations (Shigayeva & Coker, 2015; Meng & Boyd, 2017).

According to PMI (2016) one of the component of stakeholders' management is relationship management which is critical especially in health care projects success (Eskerod & Vaagaasa, 2014). Larson & Gray (2011) stated that a stakeholder is any person or organisation who is involved in the project's activities or who is affected by the project in any way whether positively or negatively. Generally, some misalignment, lack of or inadequate community involvement has

occurred throughout priority setting in the health sector, planning and budgeting, since technical planning, allocation of funds and even setting of policy as one of the goals of decentralization is to address the challenges faced in health sector planning and budgeting through accountability, efficiency and promotion of community participation (Tsofa et al., 2017).

There is great potential to improve health service delivery by employing mHealth in low and middle income countries through the formation of partnership between governments, technologists, non-governmental organizations, academia, and industry through leveraging the growing presence of cell phones across different populations, there is tangible evidence that suggests that mHealth can be used to provide expanded and improved healthcare services to people and communities, whilst seeking to improve healthcare systems but the challenge is getting the projects past the pilot phase to national scalable project with the full engagement of local governing units, health workers and the target community (Kallander et al., 2013).

There is need for a multi-disciplinary team when using a participatory approach during designing, testing, evaluation and redesigning of the entire project cycle, since all activities involved in identifying stakeholders analysing their expectations and impact on the project together with all the strategies applied to facilitate their involvement in decision making and execution of the project constitute the process of stakeholder management (PMI, 2016).

In their studies Sundin et al (2016) and Mangone et al. (2016) found out that it was challenging for mHealth projects to be self-sustaining and this calls for partnership and collaboration with stakeholders at different levels including local and international companies, Non-Governmental Organisations (NGOs) and the government. Strategic and technical partners who include established mobile phone network operators and technology companies who can provide technical and competences and other required resources to the project, while Lee et al. (2017) emphasises on the importance of regional collaboration with other countries operating mHealth projects as a chance to exchange experience and knowledge.

Socio-economic and Cultural Factors

Ceptureanu et al (2018) in their citations on their study on community based programme sustainability observed that Community based programmes [CBP] sustainability cannot be approached unilaterally since they rely on working in partnership with the people concerned who are able to recognise community's capabilities or resources and use them effectively to provide solutions supporting the community's goal in form of champion leaders, there is need for community acceptance and involvement by incorporating of the targeted community's needs in all aspects of CBP since they understand their problems and are better suited to use their skills and community resources to identify actual solutions to their needs, take into account local values or contribute to an early detection of potential problems before they can escalate.

Petersen et al. (2020) collected qualitative data on user acceptance of ICT for diabetes self-management in Western Cape, South Africa identified age as a great influencer on the usage of a

mHealth system and suggested the inclusion of older patients as stakeholders in the design of the mHealth application so that their needs and limitations are put into consideration to enable ease and effective use. Social support from family members and friends through face to face interaction also favoured the use of mHealth applications than seeking information from a mobile application due to anxiety and lack of experience around computer technology.

Karimuribo et al. (2017) during the development and deployment of the smart phone app. (AfyaData) observed that disease outbreaks typically erupt in communities who are key drivers of transmission and persistence of infectious diseases especially in vulnerable poor population in remote and hard to reach areas without reliable communication contributing enormously to delays in response, calling for utilisation of innovative approaches for early detection and reporting of disease events in real time without relying on the internet.

This is in relation to the health seeking behaviour of many remote poor communities who according to their African culture, their healthcare pathway starts with traditional healers and not at official health facilities, as a result most health events in the community are not captured in the official health surveillance system calling for community members to be directly and actively involved in the surveillance and detection of health events through mHealth innovations that allows for sustainable participatory strategy by all affected stakeholders in early detection of human and animal diseases at community level by empowering communities to take ownership and control over local decisions and to have a stake in maintaining the surveillance structure and practices.

Any project implemented at the community level including mHealth interventions require social cultural acceptability since they encourage diversity, through considering community's beliefs, norms, religion and cultural identity in the programme design and implementation in order to be sustainable in order to avoid the perception of undermining the socio-cultural orientation resulting in the rejection of the intervention due to lack of trust.

Other factors identified that influence mobile health adoption and sustainability by Walis et al. (2017) is access barrier due to most target population for mHealth interventions in disease surveillance live below the poverty index with limited devise and internet access whereas patients of higher socioeconomic status, well-educated with high health literacy especially from developed countries tend to use eHealth and mHealth services unlike those from low medium income countries with low socioeconomic status, with little health literacy and not competent at using mobile based technologies where a study by simple SMS reminders had a failure rate of 40 percent thus impacting on the adoption, sustainability and scale up of mHealth projects.

In their literature review and systems approach, Fanta & Pretorious (2018) identified end users attitude and acceptance of eHealth and mHealth technology ensures social sustainability through the individual's feelings about the usefulness of the system, their motivation, the user's problem solving skills, competence and confidence to use the system more so in developing countries since the end user skills in using electronic systems is lower than in developed countries. Lee, Seohyun

(2017) in the logistic regression analysis identified older age, low levels of education and wealth, living in rural area and being married or living with a partner as important socioeconomic factors associated with disparities in mHealth experience for family planning in Sub Saharan Africa.

Though Africa was the most frequent study setting while participating extensively in mobile health projects, in their article analysis Kruse et al (2019) identified lack of infrastructure, lack of equipment and technology gap as the most frequent barriers and suggested the need for developing countries to invest in their infrastructure, develop partnership with equipment providers to provide phones to the population and training on how to use them and it's imperative for developing countries to adapt to new emerging technologies in health innovations.

CONCLUSION

Mobile Health technology can definitely contribute towards the achievement of the third SDGs goal by promoting healthy lives and the wellbeing of all people at all ages thus leaving no one behind as well as the UHC and Vision 2030 objectives. But despite all the benefits and high penetration rate, mobile technology is still not commonly used for the purpose of data collection, data transmission and reporting in disease surveillance and public health generally (WHO, 2017; Mukhi et al., 2018; Pankomera & Graunan, 2018).

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