Technology Infrastructure in Public Health System: Mediating Role of Public Trust in Government Disaster Preparedness

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Abstract
It is a natural tendency for the developing world to be unprepared for public health emergencies. Prioritizing public health systems and technological infrastructure is both costly and crucial. The goal of this study is to serve as a wake-up call to policymakers in low-income nations to make a significant change toward pandemic preparedness through innovative health investment. For the developing-country sample population, the study used a mixed-method approach. A total of 340 healthcare workers were recruited for the experiment via convenient sampling, and they were fully aware that no data would be compromised. The results reveal no major differences in pandemic threat readiness between technology infrastructure and health systems. However, although vaccination take-up attenuation dampens the study link between public trust and Covid-19 mitigation. To maintain public trust in government, it is vital to use innovative investment schemes to research global public health and upgrade health professionals and scientists. The WHO's global strategy and preparedness approach is quickly shifting toward R&D on digital infrastructure for any impending epidemics. It was also intended to increase public trust in government control of effective safety measures, immunization, and a technological deficiency that could be exploited to rescue lives if a crisis arose.
Keywords: Disaster Preparedness; Health Systems; Technology Infrastructure; Government Trust; Vaccine Uptake.
DOI: 10.7176/PPAR/12-5-03
Publication date: July 31st 2022

1. Introduction

Countries across the globe owe their citizenry, the ability to deliver Covid-19 safety-care pathways. This comes with prioritizing resources for public health systems and technology infrastructure to meet SDGs. Prioritization of the resources and investment on health depend on technology infrastructure expansion across countries against preparedness in response capacity. In light of this, comprehending the Covid-19 challenging impact in a different context of preparedness, readiness, and response will continue to be driven-by scientific driven health knowledge and technology resources (World Health Organization (WHO), 2021). In January 2020, the World Health Organization (WHO) updated report of critical preparedness of scientific knowledge on the Covid-19, how it spreads, and the public health, economic and social impacts have negatively evolved on developing countries. Most developing countries, particular interest in Africa lacks epidemiological scientific responsiveness, health investment in technology infrastructure, and public trust on government organizations. In five West African countries, all but one pandemic experience of the Ebola virus indicated some preparedness for an epidemic outbreak. Public health preparedness and response actions in terms of technology infrastructure are still a mirage in most developing countries. Given the continuous evolution of different variants emanating from SARS-CoV-2 genetic lineage and scientific mitigation expected. WHO virus evolution working group express variant concerns, comparative assessment and the degree of global public health significance: scientific public knowledge on epidemiology, effective public health communication is essential. Therefore, developing countries' health crisis preparedness is imminent for future containment of a possible epidemics.

1.1 Disaster preparedness

According to WHO assessment, the Covid-19 pandemic has not negatively affected humanity but equally depressed humanity. Healthcare system has met unique emotional and mindfulness breakthroughs; as faced by patients in different situations. Different capacity and skill hand against a crisis depends on governance public health and attitudes of the populace. The lack of preparedness refers to an unprecedented percentage in the world is handling the current crisis difference sovereign administrations. Consequently, disaster preparedness requires government to marshal strategies to meet epidemic challenges and education for a flexible responsive system (Agarwal et al., 2020). In Act, 2005 Disaster Management program has put the basic foundation for humanitarian actions into lagging technology infrastructure. Indian government applied the epidemic outlawing in its country to control the ongoing crisis. Recent studies indicate; Covid-19 allowed researchers to findings on how and where countries mitigate various natural epidemics such as floods, earthquakes, etc. In fact, epidemic control needs public health strategies under government guidance, employ innovative technologies, build up nurse capability, modern medical technologies, medical emergency strategies planning, improve hospital condition, develop information technologies. Furthermore, establish an initiative institution with a large number of people divided into different ministries with a scheme, work in a group to analyze crisis and provide solutions (Nomani et al., 2021). Countries around the world have the responsibility to resist any kind of epidemic (illness) with good technologies and healthcare structures. For example, India is one of the developing countries with a narrow supply-side, the administration tried hard to meet the challenge of the Covid-19 epidemic (Makwana, 2020). Different countries have faced various natural epidemic but preparedness need scientific knowledge, for mitigation of warning and good clinic services. For instance, the flood in Pekalongan city (Indonesia), citizens were aware because flood happened but they weren't sure about how long will it take and dangerous percentage, flood most of the assistance came from the government, stakeholders and private sector provided drugs, food, attires, etc. To help the citizen, authorities seeking to add health infrastructure by ten years' developmental project. Epidemiologists and clinicians' knowledge upgrade is essential to build on technologies (Smoro Laksmi et al., 2020). Thus, to reduce crisis impact, natural disasters required emergency know-how and technologies communication training and communication with trends. Numerous studies indicate communication leads to effective work between hospital staff to take good care of patients specifically during the disaster period. Here come the need to develop healthcare workers communications skills and technology infrastructure to ensure preparedness (Chegini et al., 2022).

1.2 Public healthcare system

Health systems are an area that continuously works to meet the challenge and provide actionable technology infrastructure. Coronavirus is a large family of viruses that affect human beings and animals, human coronavirus causes respiratory infection, and its seriousness increase with weather coldness. The first human coronavirus case was in 1960. December 2019 in Wuhan city a new type of (SARS- MERS-COV) has appeared called Covid-19 which unprecedented virus with a quick spread from human to human through contact transmission and respiratory droplets, the virus has effect healthcare security and become a serious global problem (Fagroud et al., 2021). Whereas, China has put match effort to improve its primary healthcare services system, however, the system still meets structural challenges, motivation, and policies to provide better quality services to the much country population in the world, through financial support, eradication of non-communicable disease, neonatal disease, motivate education and qualification for the strong workforce, control village doctor's turnover, dispersed health information technology system, strengthens care delivery system, encourage good performances and control low performances to reduce sensitive disease risk (such as diabetes and hypertension), improve the system and quality measurement (Li et al., 2017). Lendsay Konkel (2020) has called recent researchers to pay attention to precision medicine significant, limited potential technologies, and better ways to deliver it to the public.

Therefore, a statement from a Distinguished Professor of Pharmaceutical Sciences and co-director of the University of California, San Francisco (UCSF) Center for Genes, Environment, and Health, has reiterated judgment of that 'In the coming 30 years some people will see the healthcare system is good and helpful, but others will see it not helpful because not all the world will be able to have innovative scientific health care services' (da Silva et al., 2021). According to Choudhury, (2016) Healthcare records and Information is important in the health system, obviously because it will help to provide the correct information at the correct time. A lot of workers in the health system did not save the Medical records properly in the system and sincerely follow the international standard guidance. Developmental Origins of Health and Disease (DOHaD) has shown the significance of individual disease records explaining. Sittig & Singh, (2020) suggested that it's important to collect Covid-19 data at the national level. During a crisis the spread of untrustworthy news, gossip, rumors, chat on social media and newspaper is superior (infodemics), here it can be seen health information play an important role. For instance, the panic of the Ebola epidemic in West Sub-Sahara Africa covered all the world. For fruitful infrastructure management, there's a need for professional nurses' teamwork, clinic items (masks, gloves, nurses' protective suits, etc.). Thus it can be seen, previous natural disasters can help nurses and front-runners to gain preparedness measurement and experience from a former epidemic before Ebola was SARS and HINI. There was a connection between healthcare players around the world for global healthcare assistance and following frontier guidance (Gunnlaugsson et al., 2019).

1.3 Technology Infrastructure and Public Health Infrastructure Policy and Practice

The Coronavirus epidemic revealed a major inconsistency in global health research policies and systems: although scientific science development, precision medicine(MP) methodologies, and infrastructure fail to adequately respond to the public health catastrophe. The production of technology and delivery of science-based solutions occurred concurrently with public sector demands, revealing and disconnect between science and innovation goals and public health demands. The betterment of technology advancement in public health is a governance and capacity issue (da Silva et al., 2021). Infrastructure is a global multi-trillion-dollar worldwide market with several potential risks (Harris et al., 2020). Additionally, a lot of African countries has poor healthcare system, a lack of sufficient financial investment in healthcare, a lack of human resources, lack of technical and policy development. Most developing countries fail to cover basic healthcare requirements (Oleribe et al., 2019). Such as Zambia, Ethiopia, etc. ("Dying in a Leadership Vacuum," 2020). The United Nations Food and Agriculture Organization has proposed that African Union member countries use humanitarian funding to strengthen social protection programs. Predictable, continuous social assistance, the benefit is provided in the form of a grant, employment, investment for health-related expenses, access to testing and treatment. Both epidemic and Covid-19 pandemics are wreaking havoc. For example, throughout the outbreak, Kenya's government has pushed teleworking. It's also a good idea to provide jobs for folks who can work from home. The effort to reform existing infrastructure finance agreements so that they cover all aspects of development plans, including healthcare shake-up and surprise (Hamilton & Maliphol, 2021).

1.4 Public trust in government for vaccine safety

Vaccination is one of the most efficient methods of illness prevention, as they said; (preventions is better than cure). In China up to date children's vaccine scandals have shattered public trust in vaccine safety. The association between media attention and perceived risks, as well as the relationship between online debate perceived risks, were totally mediated by social trust (Liu & Yang, 2021). However, a vaccine is broadly acknowledged by health authorities and the medical community as a critical strategy for delivering public health advantages infection disease avoidance (Cadeddu et al., 2021). On one hand, vaccine acceptance rest on individual trust and the belief of safety effectiveness and inoculation of vaccine, the healthcare organization, healthcare authorities, and the broader governance system (Larson et al., 2018). On the other hand, perfectly measuring vaccine reception is significant. Particularly, under present situations, any fabrication or miss-information can lead to depression and anxiety toward vaccine acceptance and debate vaccinations policies and politicizes (Sarathchandra et al., 2018). Thus it can be seen, since scientists have invented vaccines politicians must get rid of involvement due to trust, to contain community vaccination uptake. The availability of the Covid-19 vaccine doesn't mean easily can be taken (Neumann-Böhme et al., 2020). Rozek et al., (2021) has found that the impact of anti-vaccine activeness and misinformation in various counties and nations has led to vaccine hesitancy, in such a situation citizen's trust in government is important as it's the key for any public health initiative. Fundamentally, in most western countries vaccine apprehensions (vaccine hesitancy) have been likened to mistrust of politicians. in 2019 only 45% of the citizen in Organizations for Economic Cooperation and Development (OECD) countries indicated they trusted their government. Ferdinand et al., (2020) suggested some COVOD-19 vaccine policies:

(1) Provide and deliver COVID-19 immunization to citizens who are willing to uptake it for free.
(2) Establish a COVID-19 vaccine risk and safety program that is suitably funded.
(3) Encourage an equal global distribution of COVID-19 immunizations.
(4) Develop and lunch COVID-19 vaccine campaign.

Utilize and expand the utilization of existing system, structure, and partnership of supervision, and make available of needed recourses to ensure rightfully of COVID-19 serum, supply, and supper visions.

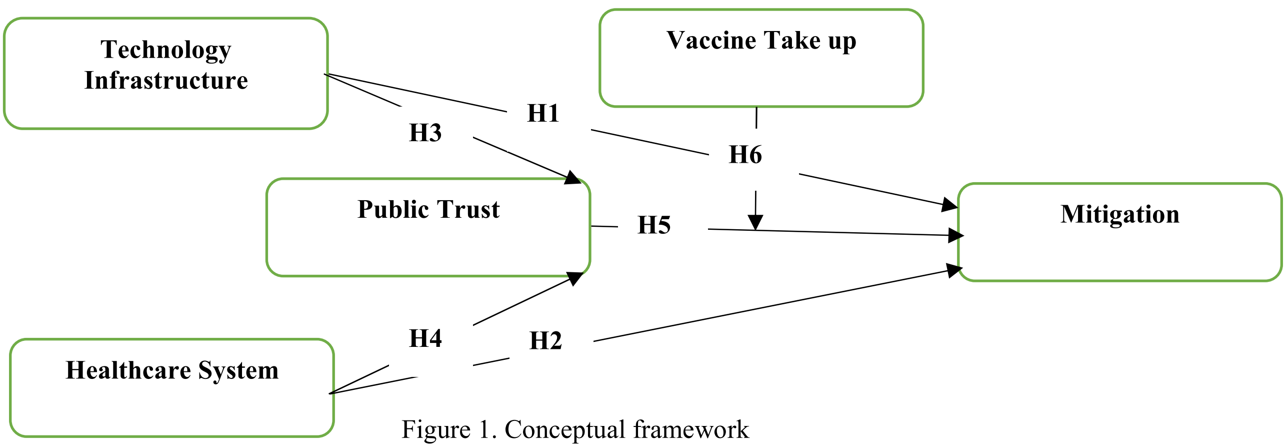

Figure 1. Conceptual framework

Table 1. Variables and Hypotheses defined

Variables	Explanation	Reference
Technology Infrastructure	The knowledge resource and facilities are needed to support the health sector within an institution.	(Cimino & Braun, 2021).
Healthcare system	Effective obtainability of medical care, quality of public treatment assistances afforded, to push up countries development.	(Bulatnikov & Constantin, 2021).
Public trust	Indicate vaccine information, value, improvement, and transparency for building public trust. Uncertainty about the COVID-19 vaccination can rise vaccine apprehension and skepticism. Philippine Government front-runners vaccinated themselves with unproved and unregulated vaccines as a strategy to get back population trust.	(Ramkissoon, 2021). (Mendoza et al., 2021).
Vaccine safety	COVID-19 vaccine safety and effectiveness it's the responsibility of policymakers and healthcare representatives.	(Ramkissoon, 2021).
Disaster preparedness	The capacity of the public health system to fast respond to any medical crisis, tolerate science to take a front seat, and the government behind.	(Gibson et al., 2012).
Hypotheses development		
H1: Preparedness/mitigation has a negative effect on technology infrastructure for developing countries		
H2: Enhancing the health system has a positive effect on citizen's trust in government.		
H3: Technology infrastructure has a positive effect on the public trust of government.		
H4: Healthcare system has a positive effect on the public trust in government.		
H5: Public trust mediates between technology infrastructure and the health system to ensure preparedness.		
H6: Vaccines take up moderates between public trust in government and mitigation.		

2. Methods and Materials

2.1Data and settings

The study will employ a mixed-method (qualitative and quantitative method) for the sample population of developing countries (Nigeria, Ghana, Sudan, China, Egypt and Ethiopia). Research on mixed methods is the collection and analysis of quantitative and qualitative data, specifically, the analysis of this data or findings in order to answer a series of research hypotheses in Table 1. Using a deductive approach, the qualitative approach strives to collect diverse perspectives, concentrating on group discussions. Qualitative techniques aim to gather numerical data to quantify interesting phenomena and extrapolate findings to a broader population(Wu et al., 2019). A convenient sampling technique is appropriate for this concept developed in Figure 1 due to lagging socioeconomic factors among developing countries. A total of 340 students were recruited for the investigation through convenient sampling, and they were fully aware assured no compromise of data. Participants were given questionnaires on variables within 5-minute response feedback. With the study target participants been healthcare workers, and administrators to impact public policy decision of the study and future disaster preparedness initiatives.

2.2 Measurements

Based on the studies of various countries (Preparedness/mitigation) against a capacity of technology infrastructure, healthcare systems, public trust on inoculation (Syan et al., 2021; Bui et al., 2022; Wang et al., 2021). This study assessment adopted questionnaires to explore public perception on public trust and vaccines take-up. i.e. "how safe do you trust the ongoing vaccination;" "how comfortable you are to take vaccine;" "Does your trust in government affects intention to vaccinate," "Did you get enough education to take-up vaccine," were using 5-point Likert scale to ascertain the degree of agreement and disagreement (1-5). Also, public trust in government and health personnel was found to have affected people's intention to inoculate. A 5-point Likert scale (e.g., "very high" to "very low" on infection risk and severity, "very important" to "very unimportant" on vaccination importance) was used to assess each item. Significantly, assessment of technology infrastructure and healthcare systems necessitated a lack of public trust to take up vaccines. Therefore, assessment of technology infrastructure and healthcare system example; "does your country have good public health force department and R&D"; "data information systems and facilities"; "agencies to respond to public health needs and "; were adopted (2030, 2022). In addition, the assessment of the health care system's quality, effectiveness, or efficiency is constructed as the sum, or weighted sum, of selected features (Bem et al., 2014). Examples; "health status, responsiveness, and finance" were adopted as vital scheme measures of quality of health system attributes. This methodology has been proposed and reported by the World Health Organization in 2000 (Tandon et al., 2002). Evaluation of the quality healthcare system using the WHO scales. The various key factors in figure 2 adopted the construction of ranking the effectiveness against equity and quality. The relationship between the health infrastructure and healthcare system inputs diagrammed employed for the purposes of COVID-19 mitigation main evaluating aspect (Bem et al., 2014).

3. Data Results and Analysis

Performing the analysis, sorting out the missing value, and data invalidation. The results showed that the value of the missing data is random (χ^2 = 24,092.86, df = 23,838, Sig. = 0.115) (Little, 1988), and the algorithm of Expectation-Maximization (EM) was run to handle the data invalidation. In terms of univariate normality, all independent variables' skewness and kurtosis were within an acceptable range of -0.997 ~ 0.021 for the skewness and 0.979 ~ 0.971 for the kurtosis, implying that univariate normality is valid. We also ensured that the reliability test was within the acceptable threshold before conducting the hypotheses testing in the model. Cook's distance (CD) method was used to analyze multivariate normality. Overall, the CDi happens to be less than 1 (Hidalgo et al., 2018; Stevens, 1984), indicating that none of the outliers will be classified as problematic.

Also, the usage of SmartPLS 3.0 to conduct the partial-least squares structural equation modeling (PLS-SEM) procedure (Hair et al., 2012). In conducting the confirmatory factor analysis (CFA), the PLS algorithm was implored to precisely evaluate the sequence of factor loadings of all the constructs and exclude items that have a weak contribution to interpreting the construct validity. The partial least squares method appears to be the most effective statistical technique for determining the significant factors influencing public acceptance of nuclear power development in the conceptual model (Hair et al., 2013). The model was evaluated in Table 2 and analyzed by developing predictor variables ratings for all the constructs in the model involving mitigation, vaccine take-up, public trust, healthcare systems, and technology infrastructure.

Finally, the relationship connected in Figure 1 was analyzed to demonstrate each hypotheses relationships and relevance to build a concept. Based on the factor analysis conducted as shown in table 2, the internal consistency, composite reliability, convergent, and discriminant validity were all tested and confirmed to verify the structure of the research framework empirically. Furthermore, the outer loadings of constructs were optimized using the PLSmart iterative approach, which resulted in modifications thus factor loadings below 0.7 (Choi & Noh, 2020; Ho et al., 2017). Following the development of metric scoring of the latent variables, we examined the significance and evaluation of zero-correlation from SPSS as well as hypothesis and their relationship in the model. This was done by finding the regression coefficients to measure the significance level (P-value) with the support of 5000 bootstrap samples. The various correlation indicated suggest that the issue of multicollinearity has been clarified because the values are within the threshold of less than 8.5 of the HTMT ratio(Ab Hamid et al., 2017; Ali et al., 2016). The Heterotrait-Monotrait ratio of correlations was used to test the discriminant validity Table 2. All outcome values fell below 0.85, indicating constructs' discriminant validity has been defeated. The correlation of Table 2 also indicated a good inter-relationship between vaccine take-up and healthcare system with negative r^2 = -.2900**. Mitigation and public trust correlated negatively significant as well as technology infrastructure (r^2 = -.165**; -.406**) respectively (Cohen, 2013).

Table 2. Reliability and Validity

Constructs	Outer Loadings	Cronbach's Alpha	Composite Reliability	(AVE)
Healthcare System	0.920	0.926	0.947	0.817
	0.917			
	0.909			
	0.869			
Mitigation	0.792	0.797	0.866	0.618
	0.820			
	0.784			
	0.747			
Public Trust	0.841	0.926	0.942	0.729
	0.872			
	0.865			
	0.879			
	0.831			
	0.834			
Technology Infrastructure	0.887	0.934	0.946	0.746
	0.897			
	0.904			
	0.852			
	0.864			
	0.771			
Vaccine Take-Up	0.846	0.960	0.967	0.832
	0.930			
	0.944			
	0.910			
	0.924			
	0.915			

Table 3. Zero-correlation and HTMT ratio of the study

Constructs	Skew	1	2	3	4	5
Vaccine Take-Up	-0.411	**0.912**				
Public Trust	-0.328	-.165**	**0.854**			
Mitigation	-0.186	.303**	-.406**	**0.886**		
Technology Infrastructure		.205**	0.053	-0.043	**0.864**	
Healthcare system		0.098	0.071	0.051	-.290**	**0.904**

**. Correlation is significant at the 0.01 level (2-tailed)

Heterotrait-Monotrait Ratio (HTMT)

Constructs	HS	Mitigation	Moderation	PT	TI	Vaccine
Healthcare system						
Mitigation	0.140					
Moderating Effect 1	0.146	0.091				
Public Trust	0.090	0.574	0.095			
Technology Infrastructure	0.313	0.216	0.072	0.125		
Vaccine Take-Up	0.102	0.300	0.057	0.183	0.218	

In addition, Table 2 shows healthcare system is negatively correlated with public trust as well as mitigation of the public health emergency. Nonetheless, the healthcare system is negligible to vaccine take-up but positively correlated with public trust and mitigation. This study found a good negative effect of pairwise correlation value index of HTMT discriminant validity in Table 3. Highlighted are the values of the variance indicated that can explain variance in the construct. Discriminant validity value obtained from the square root of AVE value (S. et al., 2018). The diagonal values bolded are the square root of AVE while other values are the correlation between the respective constructs from SPSS (Leguina, 2015; Awang et al., 2017). Discriminant validity employed will ensure a constructed measure is empirically unique and represents phenomena of interest that other measures in a structural equation model do not capture (Henseler et al., 2014). Table 3 HTMT is the correlations of indicators across variables measuring different phenomena. This phenomenon allows the determination of HTMT, even in raw data availability, but the correlation matrix is acceptable (Henseler et al., 2014).

Table 4. Path coefficient for Tested Hypotheses Results

Hypotheses	**β**	**Mean (M)**	**Std Dev**	**t-values**	**p-values**	**Inference**
Healthcare System -> Mitigation	-0.075	-0.079	0.054	1.394	0.163	**Not accepted**
Healthcare System -> Public Trust	0.090	0.092	0.067	1.339	0.181	**Not accepted**
Moderating -> Mitigation	0.119	0.12	0.043	2.773	0.006	**Accepted**
Public Trust -> Mitigation	-0.492	-0.495	0.04	12.399	0.005	**Accepted**
Public Trust -> Vaccine Take-Up	-0.187	-0.189	0.05	3.739	0.005	**Accepted**
Technology Infrastructure -> Mitigation	0.158	0.158	0.045	3.479	0.001	**Accepted**
Technology Infrastructure -> Public Trust	0.043	0.045	0.073	0.592	0.554	**Not accepted**
Technology Infrastructure -> Vaccine Take-Up	0.228	0.231	0.047	4.868	0.005	**Accepted**
Vaccine Take-Up -> Mitigation	0.152	0.152	0.049	3.114	0.002	**Accepted**

Note: **$p < 0.005$= significant

Table 4 path coefficient represented indicated tested hypotheses proposed in the study. The study found technology infrastructure and preparedness (mitigation) ($\beta = 0.158$, $t = 3.479$, $p < .001$**) is confirmed. Hypothesis 2 of healthcare system and preparedness (mitigation) ($\beta = -0.075$, $t = 1.394$, $p < .163$) is not accepted. Also, hypotheses 4 and 5; technology infrastructure and public trust ($\beta = 0.043$, $t = 0.592$, $p < .554$) likewise, healthcare system and public trust ($\beta = 0.090$, $t = 1.339$, $p < .181$) not confirmed. Public trust and mitigation ($\beta = -0.492$, $t = 12.399$, $p < .005$**) and vaccine take-up with mitigation ($\beta = 0.152$, $t = 3.114$, $p < .002$**) both confirmed. In the same vein, public trust and vaccine take-up ($\beta = -0.187$, $t = 3.739$, $p < .005$**) is confirmed. the likely statistically significance has been established between public trust and mitigation ($\beta = -0.492$, $t =12.399$, $p < .005$**) mediated.

The mediation of using Hayes's micro-condition and by the mediation condition (Baron, R. M., & Kenny, 1986) the independent variability against the predictors showing significant as well as the mediating variables. Table 5 shows no significant relationship between technology infrastructure and healthcare facilities all constants remained significant. In this instance, full mediation is established due to no significance between all the independent variables against the predictor but public trust association with mitigation remained significant (Baron, R. M., & Kenny, 1986). Also, the indirect effects of the path weight values were reduced significantly, to qualify the mediation role of the independent variables.

Table 5. Mediation micro-process

Independent Outcome	B	M	t-value	P-value
Constant	2.6625	0.2965	8.9785	0.0001
healthcare System	0.1000	0.571	1.7517	0.0807
Technology Infrastructure	0.0799	0.0537	1.4892	0.1373
Mediating Outcome				
Constant	3.8056	0.1944	19.58	0.0005
healthcare System	0.0554	0.034	1.6273	0.1045
Public Trust	-0.2664	0.0309	1.6273	0.005
Technology Infrastructure	0.0014	0.0319	0.0435	0.953
Mediating Outcome				
Constant	3.0962	0.1927	16.0645	0.0001
healthcare System	0.0287	0.0371	0.7744	0.4392
Technology Infrastructure	-0.0199	0.0349	-0.5707	0.5686

3.1 Moderation effects of Vaccine Up-take on Mitigation

Table 4 hypothesis indicated moderated effect of (β =0.119, t = 2.773, p < .006**) is confirmed. In addition, the application of the IBM-SPSS micro-condition process (Hayes, 2017) found the results of public trust dampens the relationship between technology infrastructure/healthcare system and preparedness (mitigation) figure 2. The moderator (vaccine take-up) found smother on the low/high relationship between healthcare, technology infrastructure on the predictability.

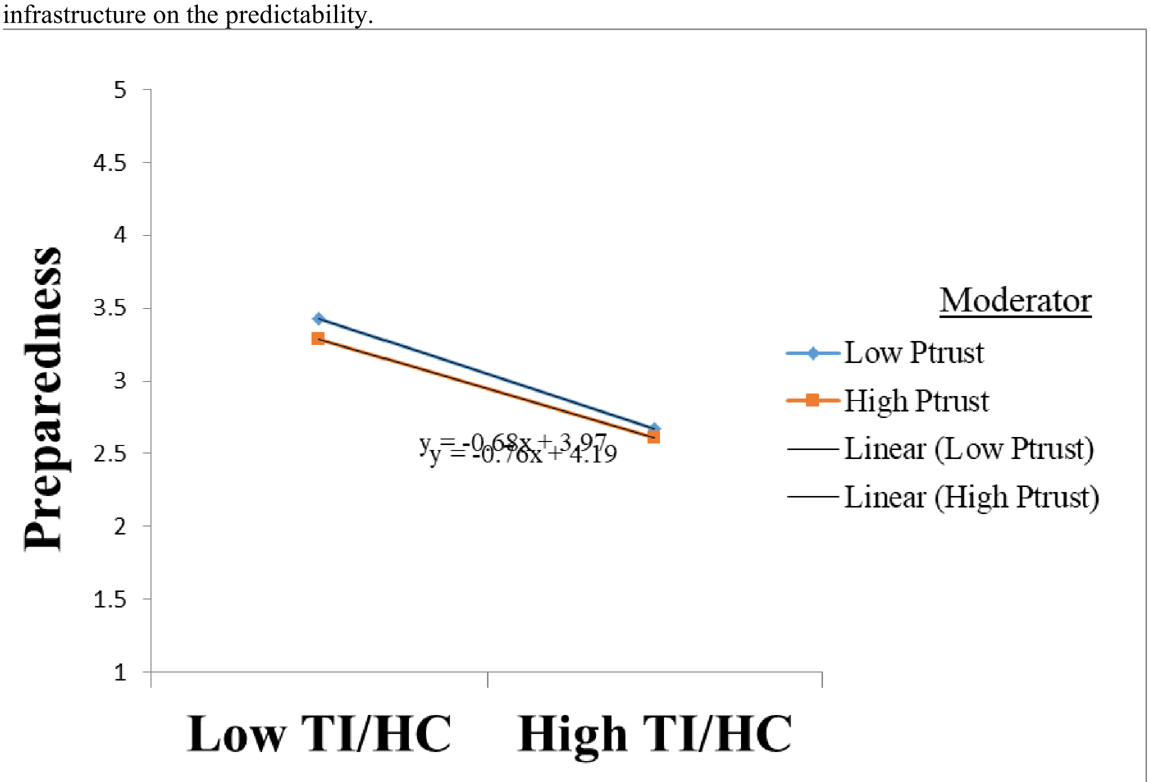

Figure 2. Public trust dampens the relationship of technology/healthcare system and preparedness (mitigation)

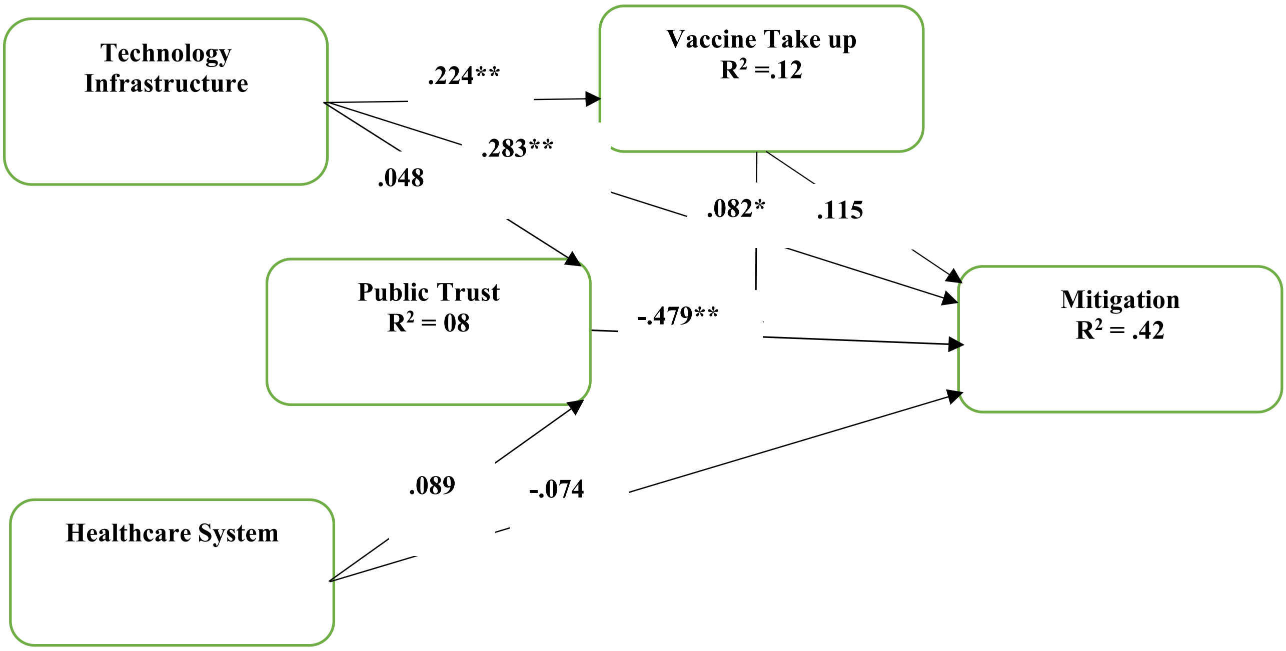

Figure 3. path coefficient of the conceptual model

4. Discussion and Limitation

The objective of this study is to determine the level of preparedness of developing countries during the crisis of the COVID-19 pandemic. TA a result, the question lingered on the country's epidemiological context and the government's preparedness in terms of health systems and technology infrastructure, which negatively affects citizenry trust. Developing countries have a negative effect on health systems and insignificant public trust for vaccine take-up according to these study hypotheses 2 and 4. Developing countries were unable to ensure rapid surveillance and containment of transmission trends as a prerequisite to the stage-by-stage mobility of the world's population because of setbacks in technology infrastructure. The connectivity between the health system and technology development as positive trends during pandemic preparedness is essential (Hanvoravongchai et al., 2010). Addressing health inequities and completing health system projects; prioritizing equity between individuals and communities for vaccinations, tests, and treatment. Governments of developing economies must widen their post-COVID-19 plans to improve health systems and technology infrastructure. Ensuring equitable health systemic developmental infrastructure in all communities (rural and urban) will pave the way for primary healthcare. Consistent with this phenomenon is the healthier world-building public trust in government and health systems with equity and determinants (WHO, 2021).

The study showed significant determination when it came to public trust and mitigation. African countries, and, for that matter, developing countries with limited access to cutting-edge technologies, and/or R&D approaches to address previously intractable problems. As part of developing human resources in the health sector. Governments should invest in capacity development of scientists, technicians, health professionals, and management of frontier science and technology to meet public trust. COVID-19 ICUs adapted to the local circumstances of hospitalized COVID-19 ill patients are a necessity and a recommendation for public health systems. Management of these critical COVID-19 septic shocks, therefore, aligned to international standards, puts developing countries behind as such public trust is uncorrelated with health systems and technology infrastructure. Public trust in government responsiveness, responsibilities, and measures to ensure the health and safety of citizens, underscores the significance of preparedness. This study confirmed the proposed hypothesis. There is a consistent correlation between trust in government organizations, fatigue, and future anxiety regarding mitigation of Covid-19 risk. Government decisions in mitigating pandemic among G7 countries (Vardavas et al., 2021; Scandurra et al., 2021). Across developing countries, public attitudes towards government trust against Covid-19 measures are substantial. Public compliance with mitigation measures of public health regulations is one factor, but public confidence in existing health systems is another.

Our study also found that technology infrastructure and vaccine take-up was significant. This analysis revealed that public trust in government precautions depended on technology infrastructure availability, and information predictability of such technology to influence attitudes towards inoculation. Technological infrastructure development in developing countries can be justified as having a negative effect on vaccine take-up. Conceivably, the belief in the Covid-19 conspiracy theory also negatively affected public trust in government, negatively affecting vaccine uptake-up attitudes and behaviors (Scandurra et al., 2021). A number of factors contribute to mitigation problems, including government trust in vaccines, ethnicity/cultural influences on vaccine willingness, and public confidence in government public health education. Public acceptance of vaccinations is closely related to trust in public health and belief in technology infrastructure (Wong et al., 2021). According to the study, a lack of technological infrastructure undermined Covid-19 mitigation in developing economies, resulting in a lack of trust in the government and stakeholders. Therefore, technology infrastructure and public trust were not significant.

In addition, vaccination has been significant as a vital measure of Covid-19 risk mitigation. Acceptance of Covid-19 vaccines is recommended by the World Health Organization (WHO), governments, stakeholders, as a public health emergency measure of the pandemic. Other studies have identified some individual characteristics that negatively impede vaccines over time. Valckx et al., (2022) findings revealed age, gender, province, educational attainment, household size, financial circumstance, employment status, underlying medical factors, mental well-being, public trust in government and health institutions, are associated features that could hamper Covid-19 compliance with risk mitigation. The developing continent of Africa is carved out of this lagging proper health systems and technology infrastructure, demonstrated all-time in need of government approach for good public health systems. Undoubtedly, socioeconomic factors could have necessitated, however, political willingness and collective government decision-making, in respect of science technology actions can help strengthen public health systems for good healthcare in emergencies. The Ebola pandemic is unprecedented as such could have edged African continent preparedness on health systems and technology infrastructure (Moll et al., 2016). No impressive gains have come about since developing countries signed the Millennium Development Goals MDGs to improve technology infrastructure; health system development; public health projects (Borthwick & Horton, 2010). Inequalities in public health and human rights are exacerbated by Covid-19. The African sub-regions have been experiencing pressing challenges on the health system due to socio-economic challenges. To meet global health policies on science and technology operationalization, the World Health Organization proposed a framework for comprehensive health system strengthening (Ibeneme et al., 2020).

Our study also found mediation of public trust and vaccine take-up moderated the relationship between mitigation and public trust. The essentials of sound public trust in government rely on investment in health systems and technology infrastructure, acknowledging the need for emergency preparedness, health system, and social safety measures. The African continent is expected to have a population of 3 billion by 2050 (Vearey et al., 2019). Improving public health systems should be a priority and part of the global concern of the Sustainable Development Goals (SDGs). The increasing population growth needs to be aligned with health technology infrastructure to ensure public trust in government organizations. The achievement of the Sustainable Development Goals, global public health targets, and Universal Health Coverage (UHC) among developing countries is critical to ensure public trust in government.

As part of the preparedness of government across the globe, the global crises mitigation has triggered transformational across behaviors, attitudes, to induce public trust in government. Policy response to strengthen health systems during the Covid-19, the role of government preparedness is a "global-public-concerns." The global architecture in the provision of technology infrastructure through investing in health facilities is insufficient. Hence, the risk involved in lack of preparedness in any pandemic resurgence on developing countries is consequentially awful. This study realized government innovative health system development is likely to shift public trust in health systemic management. Development of the health system is long overdue per the World Health Organization (WHO) estimated financial support on primary healthcare to meet SDG targets and Universal Health Coverage (UHC) in low-middle income countries (OECD, 2020). OECD, (2020) reports from developing cooperation continually found with official development assistance (ODA) of 26 billion USD for health sector development in 2018. OECD reported that about 12% of total health development assistance is in lower-middle-income countries, and 29% for low-income countries (OECD, 2020). The Covid-19 pandemic has exposed the global unpreparedness of governments, international stakeholders, scholars, researchers, also underscores unequal access to vaccines, technologies, and health system development. Conceivably, the global crises have shown how ill-equipped approaches to tackling public health emergencies like the current pandemic.

Undoubtedly, global scientists and public health experts have warned the world of an imminent epidemic spreading virus, not forgetting SARS-2 in 2003, Ebola in 2014, and Zika virus in 2016 (Yolanda Botti-Lodovico and Pardis Sabeti, 2020). Technology and health system development can be enhanced with pandemic preparedness. The breakthrough pillars 2 identified information technology for purposes of public health response tools, citizens data capture tools, proximity sensing tools, and forecasting networking (Yolanda Botti-Lodovico and Pardis Sabeti, 2020 pp. 24). Therefore, the preparedness of any impending pandemic requires international diplomatic stakeholders, the World Health Organization (WHO), the United Nations General Assembly, not excluding governments across both developed and developing countries. Many experts recommend developing global collaboration and cooperation for any level of pandemic preparedness. Governmental cooperation on technical and technological frontiers.

5. Conclusion

In the wake of COVID-19, more pandemic preparedness was deemed necessary, along with technology infrastructure development and health system preparation. This phenomenon has resulted in many citizens not complying with vaccination requirements due to a lack of public trust in government. Although the study found some mediation in public trust, this is negligible compared to a "panic-neglect-vaccine." A plan for pandemic preparedness is crucial to preventing any resurgence of diseases in the future. To ensure public trust in government, the use of investment schemes to research global public health, upgrade health professionals and scientists is necessary. In the WHO's global strategy and preparedness plan, an emphasis is placed on rapidly advancing technology infrastructure for any upcoming epidemic. It also aimed to boost public trust in government management of effective safety measures, vaccination, and technology. These measures can be used to save lives in the event of an emergency.

Public or citizenry trust in government is considered as key to significant investment in building technology infrastructure. Developing economies were hard hit by lack of technology infrastructure leading to lack of public take-up to inoculation. The Sustainable Development Goals has been affected due to COVID-19, plugged nations into lack of science and technology preparedness in responses to the pandemic. Developing countries often lack science and technology infrastructure, as well as human resources in health professionals, networks and technologies, as well as related skills. Governments and public policy must address these challenges to improve the living conditions of society's most vulnerable, and the pandemic should be viewed as a "take-up trust" to bridge these gaps. Building higher-quality healthcare facilities as a mitigation measure will be a challenge. This includes developing sustainable science and technology infrastructure, improving government budget support for R&D against future pandemics, and establishing sustainable science and technology infrastructure.

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