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PRECAUTIONS ARE BETTER THAN CURE. GUIDELINES FOR POLICY-MAKING TO COMBAT AGAINST MONKEYPOX VIRUS IN DEVELOPING COUNTRIES

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Abstract: Monkeypox is a form of zoonosis that was mostly transmitted through animals. However, in recent times research evidences several cases of secondary transfer all over the globe. Therefore, after the emergency situation was declared by the World Health Organization on the 22nd of May the probability of reemergence of the disease is much high. Therefore, there is a need to evaluate major predictors of monkeypox with reference to the developing sides of the world as the threat of an outbreak is much higher on developing sides of the world. This study has been done purposively to evaluate predictors of monkeypox with reference of Pakistan to evaluate the predictors with respect to their perceived impact numerically. SPSS has been used to reflect the importance of every predictor to support the policy formulation and improvement of precautionary measures to combat effectively the potential threat of the monkeypox virus.

Keywords: monkey pox, zoonosis, non-endemic countries, developing countries & precautionary measures

Introduction

Humanity is still suffering from the disastrous effects of COVID-19 and with all of these threats, monkeypox knocks on the door of the World Health Organization on the 22nd of May, 2022 (Okyay et al., 2022). Monkeypox belongs to the genus of virus in the pox family that also includes smallpox & cowpox etc. Monkeypox is a rear form of zoonosis initially reported back in 1958 through examining of monkeys in a laboratory. Although in the case of human beings the virus was reported initially in a 9-month-old kid from the Democratic Republic of Congo. The virus has the tendency to cause morbidity and mortality in humans and is therefore also perceived as a threat to humans though its severity is lesser than smallpox (Ogoina et al., 2019). Investigation made it clear that there are two major clades of monkeypox virus one is from North Africa and the other is from West Africa (World Health Organization, 2022). Initially, humans' monkeypox was found to be transmitted from rats & squirrels, either due to direct physical contact due to physical contact with the secretions of infected animals or due to the consumption of poorly cooked meat of African wild animals. However, secondary i.e., person-to-person transmission is also possible due to contact with secretions from infected persons, through respiratory droplets, or through a contaminated patient environment (Ogoina et al., 2019 & World Health Organization, 2022).

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From 1981 to 1986 initial research work has been made by which World Health Organization tried to understand the probability of transmission of human monkeypox from Central Africa to other parts of the world. However, most of the cases were caused due to transmission through animals; only 27% of cases reflected human-to-human transmission (Weinstein et al., 2005).

Statement of Problem & Theoretical Framework

There is no licensed anti-viral drug available for the treatment of monkeypox (Adler et al., 2022, Okyay et al., 2022 & Weinstein et al., 2005). Although the vaccine used for the treatment of smallpox is found to be effective for the treatment of the disease and it is recommended to get vaccinated between the period 4-14 days for post-exposure treatment (Weinstein et al., 2005). Studies evidence a significant increase in concern towards the outbreak of monkeypox. The primary reasons for the rise of the threat were the decrease in the level of immunity level and the discontinuation of vaccines for smallpox & for these reasons monkeypox virus is one of the top threats highlighted by the National Institute of Health (Weinstein et al., 2005).

On the other side, it is also a fact that the world is still suffering from COVID-19 & this is also one of the reasons that monkeypox is also perceived as a potentially major threat to the world. Although factors that lead to human transfer of the disease are still unclear and according to some evidence it might be caused by the co-infection of chickenpox & monkeypox. World's population and life expectancy have increased significantly which ultimately increases the percentage of sensitive people along with the higher rates of global relations & termination of vaccines for smallpox. Hence the re-emergence of monkeypox is perceived as one of the major threats by the World Health Organization (Okyay et al., 2022). Therefore, the major purpose of this study is the statistical evaluation of factors that may increase the transmission of the MPX Virus indicated by Jain et al (2022). Thus, effective to link the study with Hameleers (2021) who uses equivalency frames from equivalency framing & prospect theory so to present the situation in a new way but on the bases of logical background. Therefore, in association with the statement of the problem and theoretical framework the purpose of this study is to understand the cause of the re-emergence of monkeypox via quantitative technique.

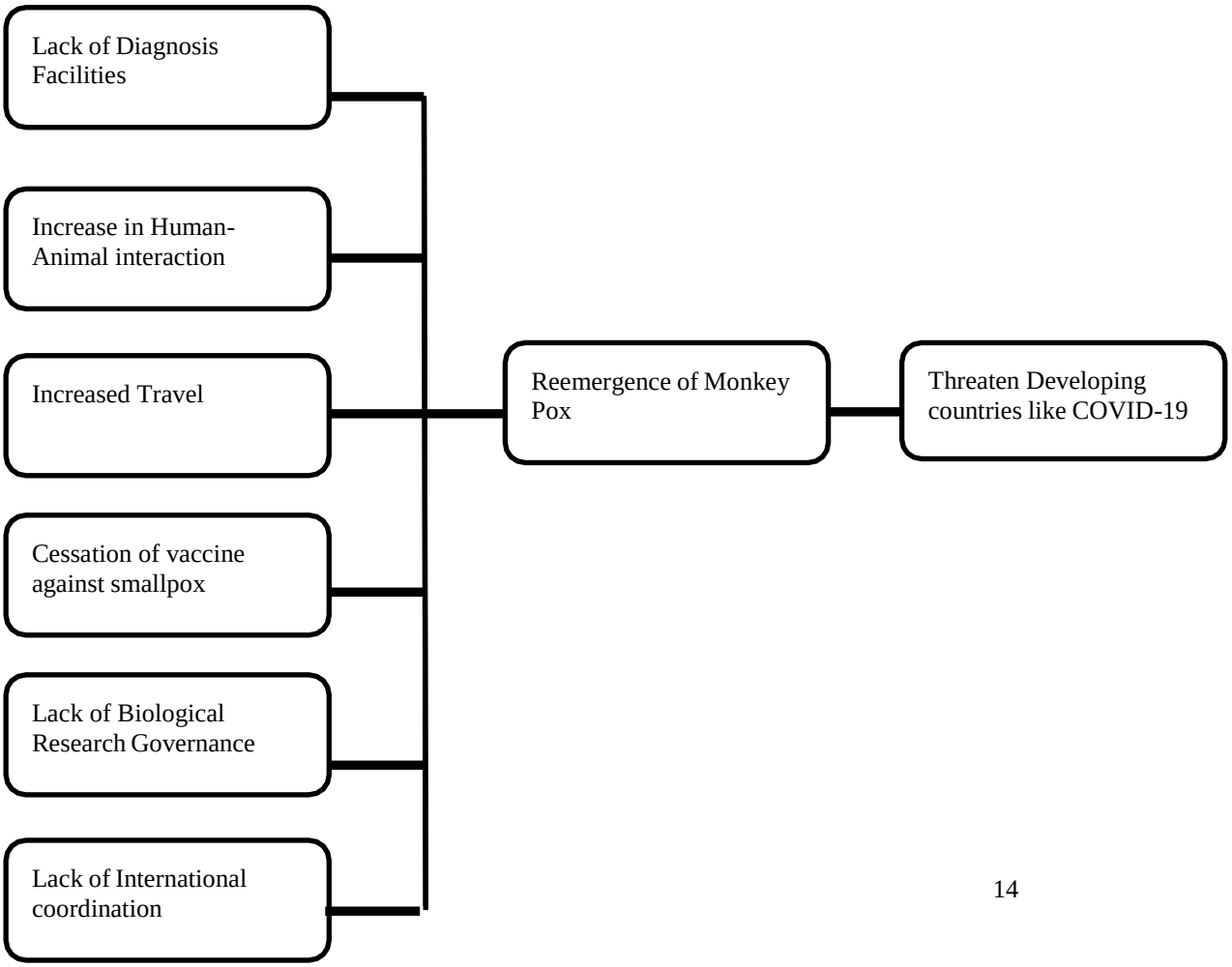
Significance of the Study

The study is pervasive and much effective for the understanding as well as policy-making associated with the outbreak or reemergence of the monkeypox virus in developing countries. In fact, it is the first one to relate the predictors of monkeypox (orthopoxvirus) with quantitative techniques. Hence legitimate to reflect that study is worthwhile not only for the students, academicians and researchers and it has a deep and thorough impact on the policy-making and precautionary measures required to handle monkeypox.

Literature Review

According to Simpson et al (2020), the first major outbreak of human monkeypox was reported in Katako-Combe, Zaire from February 1996 to February 1997 & caused 89 persons infected with the virus. However, only 27% of the reported cases had a history of contact with wild animals and major cases of contamination were from human-to-human interaction (Simpson et al., 2020).

Other countries that reported human money pox are the USA in 2003 in which 47 people were diagnosed with the disease. Although only 2 out of 47 people were found to be infected due to human-to-human transfer of the virus. In 2017 Nigeria was affected severely due to the outbreak of human monkeypox where at least 176 cases of human monkeypox were confirmed till September 2019. Similarly, in 2018 the virus was transmitted to UK and Israel although Israel did not report any secondary transmission of human monkeypox in comparison to the UK where several human-to-human cases were reported till 2019. The secondary transfer in the UK proves that there are chances of human-to-human transfer of the virus even on developed sides of the world as it was the first occasion when monkeypox was transmitted through a secondary source outside Africa (Simpson et al., 2020). Recently the UK also evidences the three monkeypox cases in May 2021 and among this one that traveled to the UK from Nigeria, which reflects the role of transportation in the transmission of viruses, zoonosis, and other forms of diseases from one side of the world to other (Okyay et al., 2022). However, there is a severe lacking of understanding related to the ecological, zoonotic, epidemiologic, clinical, and public health aspects of monkeypox (Afshar et al., 2022). Though lessons learned from COVID-19 might be found effective for combating the outbreak of monkeypox and addressing of issue must be a high priority in order to avoid other pandemics like COVID-19. The study also elaborated on a list of factors that may foster the outbreak of the monkeypox (MPX) virus (Jain, Lansiaux, Simanis, 2022). Regular vaccination of smallpox leads to a significant increase in immunity levels & has an efficacy rate of 80-95% therefore it is recommended to have vaccination after every 10 years (Grant, Nguyen & Breban, 2020). However, the study by Weinstein et al. (2005), indicated that the discontinuation of vaccines for smallpox is creating a significant threat to the outbreak of orthodox virus diseases specially monkeypox. A similar has been mentioned by Jain et al (2022).



Lack of Diagnostic facilities

There are several papulovesicular and vesiculopustular eruptions which may cause by infections or syndromes & have a high resemblance with human monkeypox (Breman, 2000). Although with the increase in the spread of the disease there is a severe need to increase diagnostic facilities. The need is significant in fact in developed countries like the UK (Reuter, 2022, August 11). The conditions are more severe on developing sides of the world as Pakistan does not have any facility for the detection of the monkeypox virus (Mansoor et al., 2022 & Najeeb & Huda, 2022). Therefore, in case of an emergency government needs to take the assistance of foreign services for the detection of the monkeypox virus (Majeed, 2022, May 28).

Increased in Animal-Human Interaction

Eltvedt Christianses and Poulsen (2020) indicated that one of the reasons for the outbreak of the monkeypox virus is the increase in human and animal interaction. The transmission can easily be made due to human contact with the viral host through blood, body fluid, or inoculation through mucocutaneous lesions (Jamil et al., 2022). Studies in the 1900s indicated that squirrels might also be the potential host of the monkeypox virus. On the other side studies from Africa indicated that species of monkey, dormice & Gambian poached rats may also transmit the virus of monkeypox to humans. Last but not least the dog that was kept with rodents imported from Africa resulted in the monkeypox outbreak in the USA back in 2003 (Deshmukh et al., 2022). Furthermore, the study of Reynolds et al (2019) indicated that evidence from natural experiments, surveys, and laboratory experiments suggested that the orthopox virus has been carried by a variety of animals and they also have a high capability to transmit the virus to humans.

Cessation of Vaccination against Smallpox: Vaughan et al (2018) also indicated that those who have been lured with the advantage of monkeypox vaccination are termed secure and protected against the spread of the monkeypox virus. On the other side latest study by Martínez et al (2022) reflected that the impact of the smallpox vaccine as a control measure against the monkeypox virus is still under debate. The study elaborated that though the vaccine was discontinued in Spain in the 1980s the vaccination status of most of the cases was unknown. Similar sort of findings came from other studies that the smallpox vaccine was an efficient protective method but only for elderly people (Memariani & Memariani, 2022)

Increased Travel

Research also evidences the spread of the Human Monkey Pox virus outside the African continent on various previous occasions in 2003 the virus was spread in the USA, in 2018 the virus was spread in UK & Israel, and in 2019 the virus spread in Singapore (Eltvedt et al., 2020). In fact, the disease has no geographical borders, especially with the increase in the rate of traveling and globalization. The recent spread of monkeypox in non-endemic countries also indicated the same as recent studies indicated that more than 10,000 cases of the virus are diagnosed all over the world. Thus, legitimate to believe that viruses can be spread easily among humans. Therefore, mentioning the need for global surveillance in order to control the spread of disease (Adegboye, 2022).

Lack of Biological Research Governance

In most countries, research activities are now under-taken by highly controlled institutional activity. The increase in the control mechanism is the association of research with social causes and its supplement with national funding. In developed countries like the UK, the main purpose of research governance is to enhance ethical & social quality with special consideration towards health and social care (Shaw, Boynton & Greenhalgh, 2005). Although, in this post-COVID, more vigilant world, understanding the biology and ecology of the poxvirus family matters even more than in the past (Xiang & White, 2022). However, lacking facilities e.g., lack of surveillance & poor laboratory services along with mass gatherings and the presence of asymptomatic individuals are creating severe hindrances in the estimation of monkeypox cases effectively. Therefore, the reasons for the outbreak of the virus in non-endemic areas are still under research (Tambo & Al-Nazawi, 2022).

Lack of International Coordination

There is a need for better communication between personnel associated with health management departments for a better understanding of viruses and their hosts in the form of humans and animals. The improvement of coordination will result in a better understanding of the impact that monkeypox might create on animals as well as human beings, the coordination will also be fruitful for an improved understanding of the mechanism for the animal-to-human transfer of the virus & will also foster cross border communication to mitigate the risk of spread of the virus through the development of effective precautions and strategies (Durski et al., 2018)

Research Methodology

Most of the studies related to outbreaks of monkeypox are related to the analysis of patients that are suffering from the virus. For e.g., Mauldin et al. (2022) and Weinstein et al (2022), etc., most of the studies are either qualitative or based on some form of experimentation or observation to analyze the reasons for the reemergence or exportation of the virus. However, there is a need for thorough surveillance of the spread of the monkeypox virus as there is a probability that the virus may extend to geographic boundaries and become the next big threat after COVID-19. Therefore, there is a need to assess those factors that may result in the spread of the virus as precautions might become efficient in creating a hindrance against the spread of the monkeypox virus (Zhang, Zhang & Wang, 2022). On the other hand, there is also a question mark on the reliability and authenticity of models and experiments related to the analysis of monkeypox (Brainard & Hunter, 2020). Therefore, there is a legitimate need to understand how the virus may transmit or what the major reasons for the reemergence of monkeypox. The understanding may be especially fruitful for non-endemic countries and may provide a shield against of the transmission of viruses (Quarleri, Delpino & Galvan, 2022). Hence the assessment method based on primary data collection through distributing closed-ended questionnaires on five points Likert scale by Wongu et al (2020) has been used for the collection of data. Hence on the bases of the above-mentioned details, the study focuses on epistemology as the research philosophy due to its association with knowledge building as indicated by Saunders Lewis and Thornhill (2007). Epistemology is referred as the philosophy of knowledge and also an efficient philosophical way to address multi-disciplinary research (Boon & Van Baalen, 2019). Although the study is working on a defined set of variables therefore rather than qualitative techniques the focus of this study is on quantitative techniques.

Hence, the philosophical stance associated with the study is post-positivism. That has the ability to link with qualitative as well as quantitative techniques (Žukauskas et al., 2018). The research strategy is a survey (Saunders et al., 2007), the unit of analysis is individual (Sekaran & Bougie, 2016) and the time horizon is cross-sectional (Saunders et al., 2007 & Sekaran & Bougie, 2016)

Sampling & Software Application

The analysis of the study is based on the use of SMART-PLS which has been used for the analysis of quantitative studies that have lower sample sizes or population that is not distributed normally (Chin, 1998). The software is suited best for any study that does not have a normally distributed population or has a lesser sample size (Hair et al., 2017). Hence with these indications, this study has been based on data collection from physicians that also hold substantial administrative experience in the form of RMO, administrator or in charge, etc. A similar sort of sampling was preferred by Dash and Sahoo (2021) for E-Consultation Services amid COVID-19. Similarly, Lucas et al (2022) also use non-probability sampling in order to assess the risks associated with the spread of Ebola and Monkeypox. Therefore, the sample size is not large and based on quota sampling which is the best alternative to probability sampling (Yang & Banamah, 2014). The sample size for the study is 100 but as compared to the mentioned studies this one is conducted in the developing side of the world where data collection from physicians is not easy. Therefore using Shackman (2013) it is effective to use a sample size ranging from 51 for statistical testing through PLS.

Research Instrument

This study uses a questionnaire as used by Alshahrani et al (2022) for the assessment of awareness regarding monkeypox infection from the general public of Saudi Arabia. However, the questionnaire of Alshahrani et al (2022) was based on a dichotomous scale and reflects frequencies for responses but this study uses a Likert scale as used by Harapan et al (2020) & Wogu et al (2020). The use of the Likert scale is also related to the purpose of the study to analyze the reemergence of the monkeypox virus and its ability to threaten developing sides of the world. However, to develop the questionnaire the indicators were based on Alshahrani et al (2022); Huhn et al (2005); Riccò et al (2022) and Temsah et al (2022)

Statistical Testing

The study is not one of the initial ones due to its inclination toward social sciences and quantitative analysis but is also backed by mediation analysis. Hence the statistical technique used for the purpose of the inferential analysis is structural equation modeling (SEM). This is consistent with Gunzler et al (2013) for causality and temporal ordering and therefore using SEM is appropriate for mediation analysis. Similar findings have also been given by Andrev et al (2009) that the use of SEM through SMART-PLS is the most effective tool for the analysis of mediation impact.

Figure 1 is indicating outer loading for each indicator (element) included in the research model and for most of the indicators the value is more than 0.708 which coincides with the requirement of value given by Hair, Sarstedt, Ringle & Mena (2012).

Although the values higher than 0.6 might be included in the process of research provided that the addition would not decrease the overall reliability of the variable (Wong, 2013). Hence on the bases of these criteria, the inclusion of indicators having values in the range of 0.6 or above is appropriate

Table 1: R Square (Quality Criteria)

R square

	R Square	R Square Adjusted
Reemergence of Monkey Pox	0.638	0.624
Threaten Developing countries like COVID-19	0.489	0.467

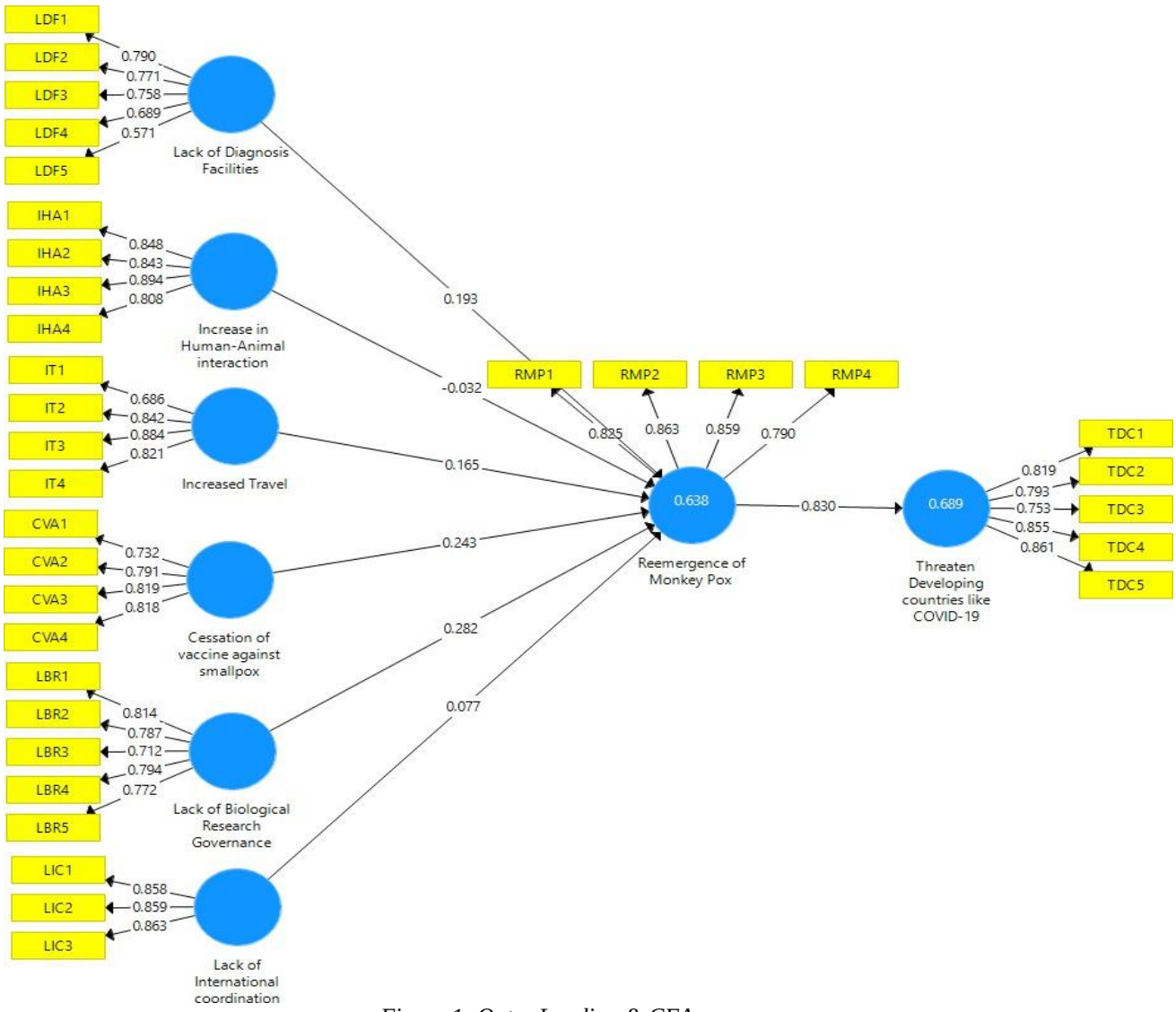


Figure 1: Outer Loading & CFA

Table 1 is indicating Predictive Accuracy through (R2), which is also known as Quality Criteria. Benitez Henseler Castillo and Schuberth (2020) indicated that the method of ordinary least squares (OLS) is used as the base of predictive accuracy for measuring variance caused by IV upon DV. The minimum value for the relationship is 0.25 while 0.5 is moderate and 0.75 is an excessive relationship (Cheah, Memon, Chuah, Ting & Ramayah, 2018). Hence on the bases of these

elaborations,' the reemergence of monkeypox falls into higher categories of moderate relationships and DV (Threaten Developing countries like COVID-19) is around the value of the moderate relationship. Therefore, the relationships are said to be effective and predict the model fit for the study.

Table 2: Construct Reliability & Convergent Validity

Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Cessation of vaccine against smallpox	0.801	0.811	0.869	0.625
Increase in Human-Animal interaction	0.872	0.895	0.911	0.720
Increased Travel	0.825	0.850	0.884	0.658
Lack of Biological Research Governance	0.836	0.845	0.884	0.603
Lack of Diagnosis Facilities	0.774	0.797	0.842	0.519
Lack of International coordination	0.826	0.840	0.895	0.740
Reemergence of Monkey Pox	0.855	0.860	0.902	0.697
Threaten Developing countries like COVID-19	0.876	0.884	0.909	0.668

Table 2 is indicating two important aspects of descriptive statistics, i.e., construct reliability and convergent validity. Convergent validity is reflected through composite reliability and AVE (Sijtsma, 2009a). Ab Hamid et al. (2017) indicated that convergent validity is sufficiently indicated by a value of 0.5 or above. On the other side construct reliability might only be attained with all the parameters of reliability i.e., Cronbach's Alpha, Goldstein rho, and composite reliability have values of 0.7 or above and must also follow sequence CR>rho>α (Sijtsma, 2009 a, b & c). Hence in light of these parameters, the model is effective and reflects construct reliability.

Table 3 is indicating discriminant validity through the Heterotrait-Monotrait ratio and that is the most preferred method to indicate the discriminant validity Henseler, Ringle & Sarstedt, 2015). The method uses correlation among variables to reflect the difference in theoretical and statistical perspectives of variables (Cheung & Lee, 2010). The maximum value that any junction may attain to pose a difference between variables is 0.85 otherwise the variables cannot be treated as different (Hair Jr. et al., 2017). Hence in light of these parameters, the table effectively indicates discriminant validity for all the variables used as the maximum value indicated by any of the junctions is 0.847.

Table 3: Discriminant Validity

	Cessation of vaccine	Increase in Human-Animal interaction	Increased Travel	Lack of Biological Research Governance	Lack of Diagnosis Facilities	Lack of Inter. coordination	Reemergence of M-Pox	Threaten Developing countries
Cessation of vaccine against smallpox								
Increase in Human-Animal interaction	0.744							
Increased Travel	0.816	0.746						
Lack of Biological Research Governance	0.833	0.678	0.827					
Lack of Diagnosis Facilities	0.821	0.662	0.743	0.811				
Lack of International coordination	0.622	0.459	0.493	0.572	0.505			
Reemergence of Monkey Pox	0.771	0.588	0.773	0.829	0.773	0.540		
Threaten Developing countries like COVID-19	0.828	0.567	0.711	0.832	0.695	0.635	0.847	

Figure 2 & Table 4 is indicating the path coefficient in order to reflect the impact of one variable over another. The table is part of inferential statistics. The table takes the reference of t-statistics and p-values to legitimize the impact of variables so as to approve or disapprove variables. Although as per table 5 there is a lack of relationship for the increase in Human-Animal interaction and the Reemergence of monkeypox, an Increased in Travelling & Reemergence of monkeypox & Lack of International Coordination & Reemergence of monkeypox. The relationships are found to be ineffective on the bases of p-values & t-values as per the criterion indicated by Hair et al (2019).

Table 5 is used to reflect specific indirect effects that are for mediating relationships by considering Hair et al (2019). Analysis indicated that the Reemergence of monkeypox does not mediate between the increase in Human-Animal interaction & Threaten in developing countries like COVID-19. Similarly, the Reemergence of Monkeypox also does not mediate between Increased Travelling & Threatened Developing countries like COVID-19. Lastly, the Reemergence of Monkeypox also does not mediate between the Lack of International coordination & Threaten in Developing countries like COVID-19. In addition to Hair et al (2019), the implications are also based on Duarte and Amaro (2018) for p-values and Hair et al (2011) for t-values. The indications indicated that p-values must be lesser than or equal to 0.05 and t-values must be equal to or greater than 1.97.

Thus, in the light of these parameters of Duarte and Amaro (2018); Hair et al (2011) and Hair et al (2019) the relationships reflected in table 4 and table 5 are effective and legitimized

Table 4: Path Coefficient

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Cessation of vaccine against smallpox -> Reemergence of Monkey Pox	0.243	0.228	0.106	2.292	0.022
Increase in Human-Animal interaction -> Reemergence of Monkey Pox	-0.032	-0.029	0.069	0.460	0.646
Increased Travel -> Reemergence of Monkey Pox	0.165	0.158	0.112	1.471	0.142
Lack of Biological Research Governance -> Reemergence of Monkey Pox	0.282	0.290	0.087	3.232	0.001
Lack of Diagnosis Facilities -> Reemergence of Monkey Pox	0.193	0.206	0.081	2.375	0.018
Lack of International coordination -> Reemergence of Monkey Pox	0.077	0.080	0.059	1.310	0.191
Reemergence of Monkey Pox -> Threaten Developing countries like COVID-19	0.830	0.831	0.027	30.325	0.000

Table 5: Specific Indirect Effects

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Cessation of vaccine against smallpox -> Reemergence of Monkey Pox -> Threaten Developing countries like COVID-19	0.202	0.190	0.089	2.255	0.025
Increase in Human-Animal interaction -> Reemergence of Monkey Pox -> Threaten Developing countries like COVID-19	-0.026	-0.024	0.057	0.460	0.646
Increased Travel -> Reemergence of Monkey Pox -> Threaten Developing countries like COVID-19	0.137	0.131	0.093	1.478	0.140
Lack of Biological Research Governance -> Reemergence of Monkey Pox -> Threaten Developing countries like COVID-19	0.234	0.242	0.074	3.156	0.002
Lack of Diagnosis Facilities -> Reemergence of Monkey Pox -> Threaten Developing countries like COVID-19	0.160	0.171	0.067	2.388	0.017
Lack of International coordination -> Reemergence of Monkey Pox -> Threaten Developing countries like COVID-19	0.064	0.066	0.049	1.313	0.190

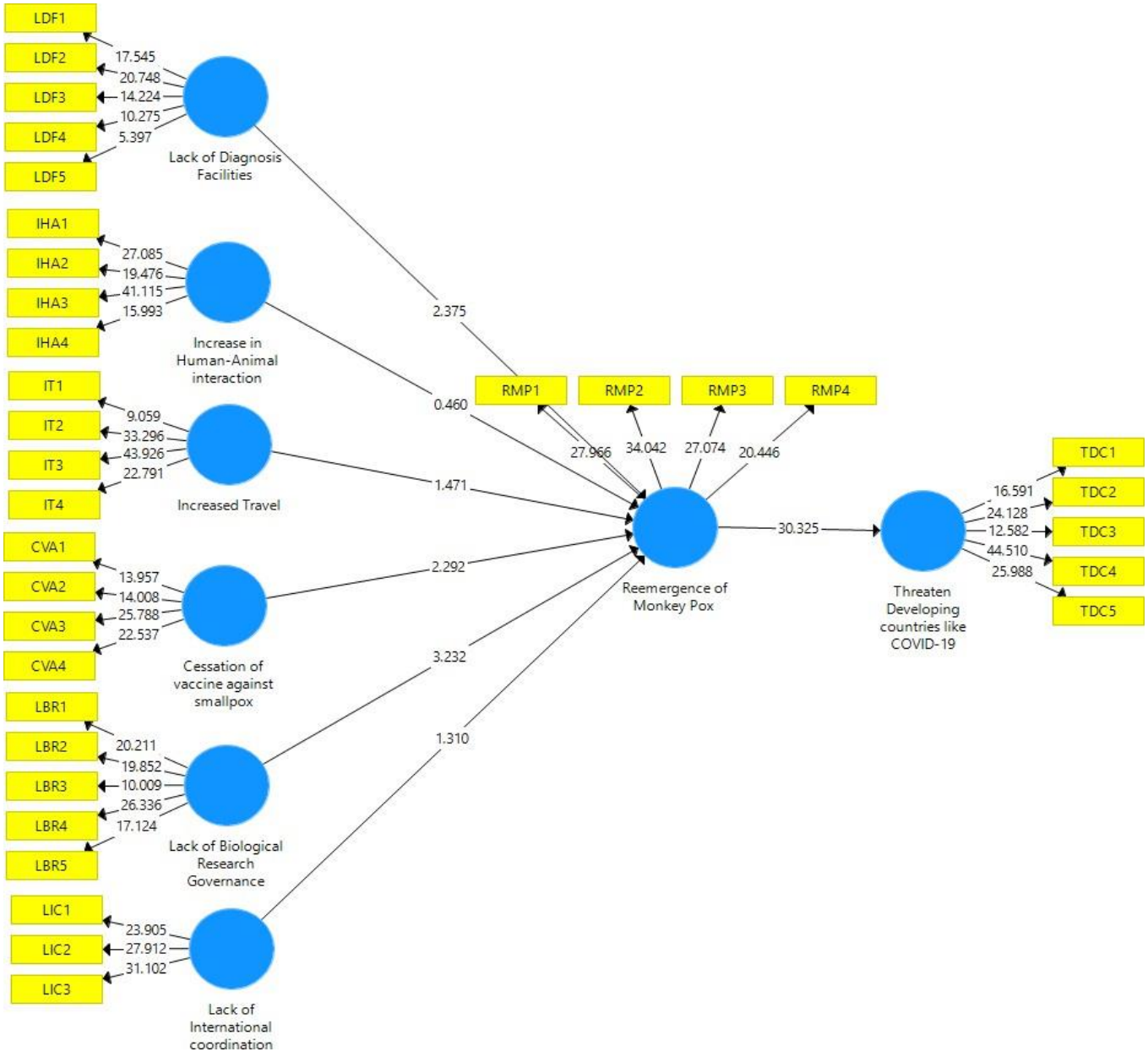


Figure 2: Path Coefficient

Conclusion & Discussions

After the detailed analysis using SMART-PLS, it has been reflected through the study that Monkeypox has the tendency to threaten developing countries during the COVID-19 pandemic. Hence the findings are clearly against initial discussions that the virus is rare in human beings and cannot threat to the globe (Ogoina et al., 2019).

Therefore, it is legitimate to consider the findings consistent with Okyay et al (2022) and the World Health Organization (2022), that believe monkeypox has the tendency to be transmitted from one human being to another and it may cause a real threat to the globe, especially the developing sides of the world after the COVID-19. However, there is still much unknown about the tendency of monkeypox to become the next pandemic (Okyay et al. 2022). Hence the use of uses equivalency

frames from equivalency framing & prospect theory by Hameleers (2021) is an effective way to understand the probability of monkeypox becoming a pandemic. Although, by applying the theory we have a limited variable inventory that needs to be tested and evaluated with respect to the non-endemic and developing sides of the world in order to validate the points mentioned by Okyay et al. (2022) and Quarleri et al (2022). Among the selected variable inventory lack of diagnostic facilities; cessation of a vaccine against monkeypox; lack of biological research governance, and lack of International coordination are found to be potent predictors of the re-emergence of money pox.

Hence the findings of the study are inclined with the indications of Mansoor et al (022); Majeed (2022, May 28), and Reuter, (2022, August 11) as the lack of diagnostic facilities are perceived as the major predictor of monkeypox. Similarly, cessation of the vaccine used to control smallpox is also an important variable that may cause an outbreak or reemergence of monkeypox as indicated by Memariani and Memariani (2022). Although according to the analysis medical and vaccinations are not only the reasons that may cause the re-emergence of monkeypox. Hence legitimate to indicate that study is also inclined and associated with Shaw et al (2005); Xiang and White (2022) and Tambo and Al-Nazawi (2022) to indicate lack of biological research governance may also be a variable that may cause the re-emergence of monkeypox. Last but not least findings also make the study consistent with Durski et al. (2018), reflecting that lack of International coordination may also result in the re-emergence of monkeypox. However, increased human-animal integration and increased travel are not perceived as the major predictor for the outbreak of monkeypox. Hence other than consistency and alignment with the prior research work there some inconsistencies also exists, especially with Eltvedt et al (2020) and Jamil et al. (2022) who postulated that human-animal interaction might also be one of the major reasons for the outbreak of monkeypox virus.

Similarly, Eltvedt et al (2020) and Adegboye (2022), also predicted that an increase in traveling may also cause the outbreak of the monkeypox virus and the findings of the quantitative analysis is also in against the indications. However, the overall findings through mediation for the re-emergence of monkeypox indicated that monkeypox may affect developing countries in a drastic manner. Findings indicated cessation of vaccines for small boxes, lack of biological research governance along with lack of international coordination as the major variables of concern. Thus, for countries like Pakistan, there is a need to focus on Najeeb and Huda (2022) that Pakistan cannot bear the burden of any further disaster. Therefore, strict surveillance is required to place a lid on the threat of the re-emergence of the monkeypox.

Needs of Future Research

The study has been conducted on perceived factors that may cause the reemergence of monkeypox and may threaten developing countries more drastically. Although the data has been only collected from medical practitioners with administrative experience working as RMO s or administrators etc & therefore further studies may consult doctors and specialists that are reputed but not working in any administrative positions. Similarly, data collection from secondary sources in order to validate the threat of the re-emergence of monkeypox in developing countries like India and Pakistan, etc may also be helpful for conducting pervasive studies.

Policy Implications

The study highlighted that cessation of vaccine for smallpox; lacks of diagnostic facilities as well as lack of biological research governance are the factors that are not mainly causing the re-emergence of monkeypox. Similarly due to the absence of these two factors monkeypox might threaten developing sides of the world just like COVID-19. Hence in the light of McColloum and Damon (2014) these findings are the answers to major questions and may assist policymakers in devising better strategies for prevention & control against the spread of the monkeypox virus.

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