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ASSESSMENT OF PROACTIVE VERSUS REACTIVE SOCIAL MARKETING RESPONSES AND MEDICAL INTERVENTIONS TO EPIDEMICS AND PANDEMICS: A SYSTEMATIC LITERATURE REVIEW

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Abstract

The purpose of this paper is to analyze the first tranche of scholarly articles published on the new Coronavirus disease (COVID-19), between December 2019 to February 2020, as documented by the World Health Organization. This is with a view to undertaking a comparative of the fields of studies of those papers along the lines of medical and social sciences, so as to determine the extent of proactive and reactive social marketing involved, and directions for future research. The authors applied a systematic literature review method, in a verifiable and reproducible manner, using a qualitative research approach. The findings revealed that majority of the initial published articles on COVID-19 belong more to the medical sciences (62%) than the social sciences (28%), indicating that social science studies needs more time and voluminous data. Again, published articles focusing on social marketing or public positive behavior changes toward COVID-19 was also insignificant (12%). The articles on the medical areas of COVID-19 covered diverse areas: infection prevention and control, epidemiology case studies, medical ethics, virology, immunology, clinical care and treatment, epidemiology / epidemic response, biotechnology and pharmaceuticals. So, initial academic research in the fight against COVID-19, placed undue emphasis on the epidemiological and curative side, rather than on the social marketing (public awareness, preventive and behavior-change) side, which is what is really needed to win the war against COVID. Hence, it is recommended that for medical interventions and social marketing to contribute significantly towards epidemic and pandemic prevention and controls, proactive rather than reactive strategies have to be given serious attention. This implies having a social marketing master plan pre-epidemic and pre-pandemic, not a reactive or firebrigade approach. Again, to contribute meaningfully towards epidemic and pandemic preventions and control, social science studies should not be

narrowed down to how society behaved only, but on how society ought to behave in handling the problem, in order to elicit the desired behavior changes.

Keywords: Covid-19 Prevention, Proactive Response, Reactive Response, Medical Sciences, Social Sciences, Social Marketing.

1.1 Introduction

The entire global community is presently experiencing one of its most debilitating health crisis in the history of mankind, called Coronavirus or COVID-19. According to World Health Organisation (WHO, 2020), Coronaviruses (CoV) are a large family of viruses that cause illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV) (Burki, 2020; Chen, Wang, Li, et al., 2020). The COVID-19 or Coronavirus disease in full, is a new strain that was discovered in December 2019 and has not been previously identified in humans (Epidemiology Working Group for NCIP Epidemic Response, 2020; Bai, Wang & Zhou, 2020). Although an American reporter Brigitte Gabriel pointed that "China new about the virus as early as November 17th 2019, and they chose to cover it up rather than warn the world''**.** Hence, the new coronavirus is a respiratory virus which spreads primarily through droplets generated when an infected person coughs or sneezes, or through droplets of saliva or discharge from the nose. It is believed in medical sciences that Coronaviruses are zoonotic, that is to say, they were initially transmitted from animals to people (WHO, 2020; CDC, 2019; ECDC, 2020). This is because medical researchers found that SARS-CoV was transmitted from civet cats to human beings and MERS-CoV from dromedary camels to human beings (Chen, Guo, Pan & Zhao, 2020). There are some other strains of coronaviruses circulating in animals that have not yet infected humans (WHO, 2020). Lai, Shih, Ko, Tang & Hsueh (2020) endorse that Coronavirus is spread by human-to-human transmission via droplets or direct contact, and the infection has been estimated to have a mean incubation period of 6.4 days and a basic reproduction number of 2.24-3.58.

According to Brege and Kindström, (2019), proactiveness in business and management decisions and actions, leads to improved customers' satisfaction, because it is a key driver to the creation of sustainable customer values, which makes proactive organizations to achieve superior performance (Blocker, Flint, Myers, & Slater, 2011). Proactive response to business also gives an organization a competitive edge over others, through a superior understanding of the customers, which helps them to satisfy the customers' immediate and future needs, gotten through proactive research and analytics (Narver et al., 2004). This is true for products and services marketing, as it also true for the social marketing or promotion of social courses (Flint, Woodruff, & Gardial, 2002; Lindgreen & Wynstra, 2005), like the COVID-19 prevention (Odigbo, Eze & Odigbo, 2020). Proactive response to social marketing is particularly important in heterogeneous social environments with complex target publics or customers to satisfy (Tuominen, Rajala, & Möller, 2004; Ulaga & Eggert, 2006; Kindström, Ottosson, & Carlborg, 2018), like the promotion campaigns to control COVID-19 spread in many countries of the world (Odigbo, Eze & Odigbo, 2020).

On the contrary, reactive social marketing is a fire-brigade approach to handling issues, where the manager waits for the problem or crisis, then comes up with measures to address it. This puts a question mark on organizations' capabilities (Kindström, Ottosson, & Carlborg, 2018), and leads to the erosion of customers' confidence, and negative corporate image (Ugwuanyi & Odigbo, 2013).

Social marketing concept has been used globally to tackle various health challenges ranging from maternal and child health, risky behaviour (smoking), campaign on tuberculosis, female

genital mutilation (FGM) (Odigbo, Amadi & Bassey, 2018). It has also been used in checkmating sales of counterfeit and or adulterated products and anti-drug campaigns (Eze, Ehikwe & Odigbo, 2016). The essence of social marketing is to use a combination of marketing-mix tools to induce people to accept a social course, which may be unpalatable, but for their own good. In the case of Coronavirus, the 8Ps of social marketing-mix elements include making people all over the world to accept: the ***product*** (e.g covid-19 kits, drugs, vaccines, gloves, face masks, sanitizers, equipment's used in treatment, gifts, palliatives, healthcare personnel and care givers); the ***price*** (e.g., monetary / non-monetary sacrifices on the side of citizens of the world who are now forced to stay at home, total lockdown, efforts of governments, health personnel, caregivers, World Health Organisation, other international organisations and concerned philantropists, to prevent / control the disease and ensure affected victims are treated, business closures, job stoppages, and other deprivations on people); the ***place*** (different testing locations, hospitals, health centres, residential areas, etc.); the ***promotion*** (hand-washing, social-distancing, coronavirus test, anti-COVID-19 behaviour ethics, and cooperation with governments, law enforcement agents and healthcare personnel); ***the policy*** (e.g., right governmental regulations and laws); ***purse strings*** (sourcing for fund e.g. donations from individuals and corporate bodies); and ***partnership*** (global cooperation on the fight against COVID-19, nation's ensuring synergy with the World Health Organisation, and many more), (Odigbo, 2016).

All these will be geared towards influencing positive attitudes and behavioural changes amongst people in the global environment against COVID-19. Social marketing is all about change for the benefit of the society. Odigbo, Amadi and Bassey, (2018) were of the view that convincing the target audience is an essential element in every social marketing campaign. Social marketing exertions focuses on influencing behaviour that will improve health, prevent injuries, protect the environment, and contribute to the community in order to do that which is socially good to the society. (Kotler & Lee, 2011).

1.2 Corona Virus Historical Review and Global Update

An outbreak of the new Coronavirus diseases (COVID-19) was first reported in December 2019 in Wuhan, China, but spread quickly all over the thickly-populated country (CDC, 2020). The COVID-19 then spread outward from Hubei sometime after December 2019 and by February 11, 2020, 1,386 counties across all 31 provinces were affected. The epidemic curve of onset of symptoms peaked in January 23-26, then began to decline leading up to February 11. The COVID-19 epidemic has spread very quickly. It only took 30 days to expand from Hubei to the rest of Mainland China, and today, Covid-19 has spread menacingly like wild fire to all parts of the world. The coronavirus or COVID-19 as at the last count, has affected 170 countries and territories around the world and 1 international conveyance (the Diamond Princess cruise ship harbored in Yokohama, Japan), as reported by Worldometer (2020). This has prompted the World Health Organisation to declare COVID-19 as a pandemic or a global epidemic disease menace (WHO, 2020).

Even though almost all countries of the world are beset with the COVID-19 scourge, Italy is the worst hit as at 24th March, 2020, recording over 6,000 deaths, which doubles China's records of deaths. No country is spared, and many countries are coming up with novel drastic measures to checkmate the spread among their citizens. For instance, in the United Kingdom, according to the Guardian Newspaper (2020), all schools have been closed in Scotland, Wales and Northern Ireland as measures to prevent COVID-19. In the United States, President Trump compares the sacrifices needed to curb COVID-19 as akin to those made during World War II, affirming seriously that "now it is our time, we must sacrifice together. We are all in this together and we'll come through it

together. It is the invisible enemy. That's always the toughest enemy. But we're going to defeat the invisible enemy. I think we're going to do it even faster than we thought, and it will be a complete victory, a total victory" (Apnews, 2020).

In Canada, a State of Emergency has been declared in Ontario, which the Ontario's Premier, Doug Ford, said was because Covid-19 constitutes a danger of major proportions, which must be dealt with decisively without any delay (Theguardian, March 17, 2020). The government of Belgium also announced a lockdown from March 18 until April 5, saying that the citizens will only be allowed to leave their homes for essential visits to supermarkets, pharmacies, banks and in cases of emergency (Newstrust, 2020). In Austria, gatherings of more than five people are banned, and people are advised to self-isolate, while schools and shops selling non-essential goods are closed (Newstrust, 2020). Many countries have painfully imposed travel bans on other countries they shared cordial relationships, friendliness and diplomatic ties because of the COVID-19 phobia. As at March 16, 2020, more than 80 countries have imposed travel bans to curb the new coronavirus (The Economist, 2020). Other countries have shut their borders and international airports to travelers into or outside the country (New York Times, 2020; Aljazeera, 2020).

Many corporate organisations around the world including schools, biotechs have been closed up, those in the travels and tourism sub-sector being the worst hit (Traveldailynews, 2020; Jarvis, 2020), while others are battling spiritedly to discover vaccines or development safe-in-man broad-spectrum antiviral agents against COVID-19 (Andersen, Ianevski, Lysvand, et. al., 2020). According to UNESCO, over 160 countries have also closed all schools nationwide, impacting over 87% of world's student population, (UNESCO, 2020). There are fears that the world may be in for another impending global recession, of the worst kind (Havard Business Review, 2020). However, in spite of all these gory tales, the embattled citizens of the global community could turn this into a huge victory, if we give it a total fight as advised by Donald Trump (ABCnews, 2020), by heeding all the wise counsels of the World Health Organisation, concerned international organisations, medical doctors, health personnel, governments and informed individuals and organisations. Caution and enlightenment is the key to the victory.

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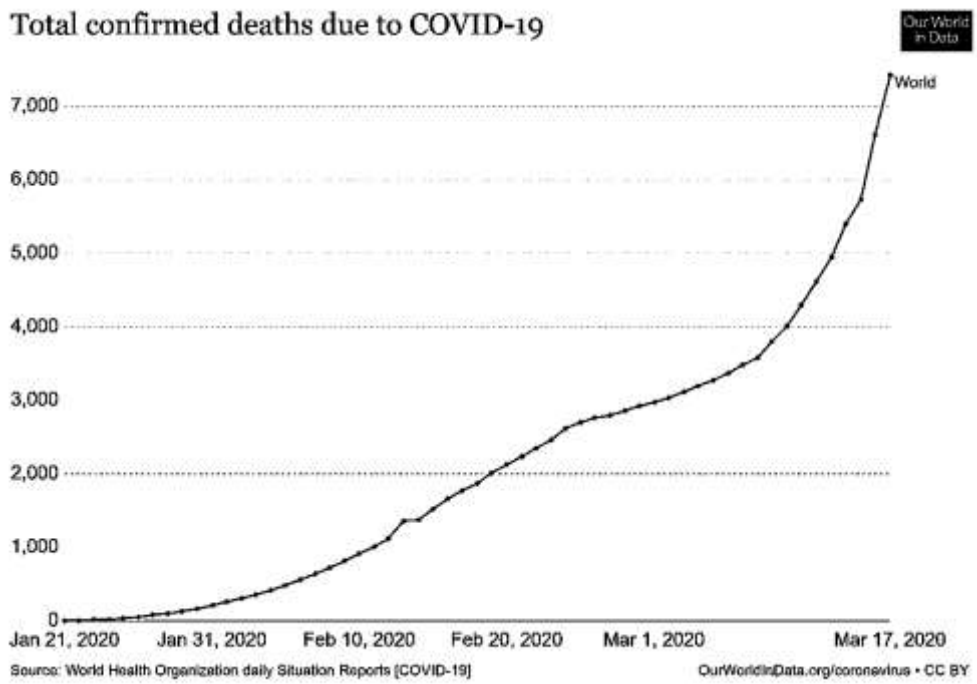

Fig. 1: Global record of deaths due to the Covid-19 as at March 17, 2020.
Source: World Health Organisation.

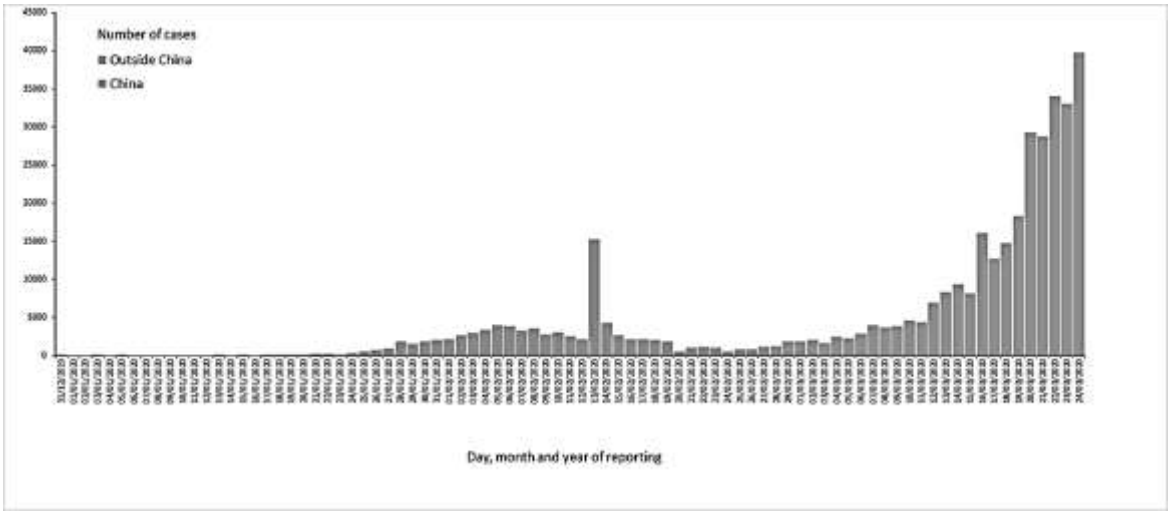

Fig. 2: Distribution of COVID-19 **cases worldwide, as of 24 March 2020.**
Source: https://www.ecdc.europa.eu/en/geographical-distribution-2019-ncov-cases

1.3 Corona Virus Symptoms and Spread

Patients with COVID-19 have had mild to severe respiratory illness with symptoms of fever, cough and shortness of breath (CDC, 2019). The virus that causes COVID-19 probably emerged from an animal source, but is now spreading from person to person. The virus is thought to spread mainly between people who are in close contact with one another (within about 6 feet) through respiratory

droplets produced when an infected person coughs or sneezes. It also may be possible that a person can get COVID-19 by touching a surface or object that has the virus on it and then touching their own mouth, nose, or possibly their eyes, but this is not thought to be the main way the virus spreads (CDC, 2020).

The World Health Organisation (WHO, 2020), also states that the most common symptoms of COVID-19 are fever, tiredness, and dry cough. Some patients may have aches and pains, nasal congestion, runny nose, sore throat or diarrhea. These symptoms are usually mild and begin gradually. Some people become infected but don't develop any symptoms and don't feel unwell. Most people (about 80%) recover from the disease without needing special treatment. Around 1 out of every 6 people who gets COVID-19 becomes seriously ill and develops difficulty breathing. Older people, and those with underlying medical problems like high blood pressure, heart problems or diabetes, are more likely to develop serious illness. People with fever, cough and difficulty breathing should seek medical attention (WHO, 2020).

1.4 Corona Virus Myths

The advent of the Covid-19 pandemic came with it, some dangerous rumours and myths all over the world regarding the lethal virus (WHO, 2020; CDC, 2019). Some people resorted to one medically worrisome and unthinkable measure or the other to safeguard themselves from Covid-19. Among those false myths and rumours were the following:

i. That COVID-19 virus is not transmittable in areas with hot and humid climates, so, people in tropical regions are immune from it.
ii. That cold weather and snow can kill the COVID-19 virus.
iii. That taking a hot bath or steam inhalation can prevent the coronavirus disease.
iv. That the new coronavirus can be transmitted through mosquito bites.
v. That hand dryers and other heat mechanisms are effective for preventing or killing the coronavirus.
vi. That ultraviolet disinfection lamps can be used to kill the coronavirus.
vii. That spraying alcohol or chlorine all over your body will kill the coronavirus.
viii. That vaccines against pneumonia can protect someone against the coronavirus.
ix. That rinsing your nose regularly with saline helps in preventing the coronavirus infection.
x. That eating garlic, ginger, lime and lemon can prevent coronavirus infection.
xi. That antibiotics are effective in preventing and treating the coronavirus.
xii. That some specific medicines could be used to prevent or treat the coronavirus.
xiii. That COVID-19 is a deliberate biological weapon from either China or the US (Foreignaffairs, 2020; Globalresearch, 2020), that accidentally leaked out.
xiv. The coronavirus can be prevented by praying.
xv. Finally, that the COVID-19 virus pandemic is a punishment from God, for sins committed especially by the rich and corrupt leaders of the world (Express, 2020; New York Times, 2020).

Reacting to most of these myths and rumours, the World Health Organisation (WHO, 2020) and the US Centre for Disease Control (CDC, 2020), gave the following answers:

i. That regardless of climate, you should adopt protective measures if you live in, or travel to an area reporting COVID-19 (WHO, 2020). This translates to all countries of the world, because no country is spared now (Worldometer, 2020).
ii. There is no reason to believe that cold weather can kill the new coronavirus or other diseases, because the normal human body temperature remains around 36.5°C to 37°C, regardless of the external temperature or weather (WHO, 2020). The implication of this is that even if the weather is cold or COVID-19 hates cold weather, the virus will get the warmth when it gets into your body, so, needless to believe the fad.
iii. Taking a hot bath will not prevent you from catching COVID-19, because your normal body temperature remains around 36.5°C to 37°C, regardless of the temperature of your bath or shower. Besides, taking a hot bath with extremely hot water can be harmful, as it can burn your body (WHO, 2020).
iv. That to date there has been no information nor evidence to suggest that the new coronavirus could be transmitted by mosquitoes (WHO, 2020).
v. That hand dryers are not effective in killing the coronavirus (WHO, 2020).
vi. That ultraviolet (UV) disinfection lamps should not be used to sterilize hands or other areas of skin as UV radiation can cause skin irritation (WHO, 2020).
vii. That even though thermal scanners may detect people with fever or a higher than normal body temperature, because of infection with the new coronavirus. However, they cannot detect people who are infected but are not yet sick with fever, because it takes between 2 and 10 days before people who are infected with COVID-19 become sick and develop a fever (WHO, 2020).
viii. That spraying alcohol or chlorine all over your body will not kill viruses that have already entered your body. Spraying such substances can be harmful to clothes or mucous membranes (i.e. eyes, mouth). However, both alcohol and chlorine can be useful to disinfect surfaces, but they need to be used under appropriate recommendations (WHO, 2020).
ix. That vaccines against pneumonia, such as pneumococcal vaccine and Haemophilus influenza type B (Hib) vaccine, do not provide protection against the new coronavirus. This is because the virus is so new and different that vaccine has been developed for it yet, however, researchers are trying hard to produce a vaccine against the virus.
x. That there is no evidence that regularly rinsing the nose with saline has protected people from infection with coronavirus. There is some limited evidence that regularly rinsing nose with saline can help people recover more quickly from the common cold. However, regularly rinsing the nose has not been shown to prevent respiratory infections.
xi. That garlic is a healthy food that may have some antimicrobial properties. However, there is no medical evidence that eating garlic has protected people from the new coronavirus (WHO, 2020). The implication of this is that even though the eating of garlic, ginger, lime and lemon may be quite good to your health, do not hinge your hope seriously on them for the prevention of coronavirus.
xii. That people of all ages can be infected by coronavirus, however, older people, and people with pre-existing medical conditions (such as asthma, diabetes, heart disease) appear to be more vulnerable to becoming severely ill with the virus (WHO, 2020).
xiii. That antibiotics do not work against viruses, only bacteria, and since the COVID-19 is a virus, antibiotics should not be used as a means of prevention or treatment. However, if

you are hospitalized for the virus, you may receive antibiotics because bacterial co-infection is possible (WHO, 2020).

xiv. That to date, there is no specific medicine recommended to prevent or treat the new coronavirus (2019-nCoV). However, some specific treatments are under investigation, and will be tested through clinical trials, and this is receiving accelerated attention from the World Health Organisation, other concerned governments, individuals and international organisations (WHO, 2020).

The claims that COVID-19 is a punishment from God was also debunked by many credible authorities including men of God (Punchnewspaper, 2020). With the foregoing in mind, the first research questions for this study is, therefore, stated as follows:

RQ1: Are studies on Coronavirus focused more on its medical solution or public enlightenment on the pandemic?

1.5 Corona Virus Myths amongst the Poor and Rural Populace

Among the poor and rural populace, especially in Africa, spread also the following myths:

i. That Coronavirus is a big man's disease and, does not afflict the poor.
ii. That Coronavirus is meant only for city dwellers and, does not concern rural people.
iii. That Coronavirus afflicts only people who have travelled outside the country.
iv. That Coronavirus can be prevented or cured by plant-based medications.
v. That Coronavirus can be prevented or cured by gulping palm wine or other alcohols.
vi. That Coronavirus can be prevented or cured by hot water bathe.
vii. That Coronavirus can be prevented or cured by steam water inhalation.
viii. That Coronavirus is a demonic attack, only curable through prayers.
ix. That Coronavirus is an end-to-the world sign.
x. That Coronavirus can be prevented or cured by consuming chloroquine.

All these claims reportedly had dire health consequences for the people, because it gave them false hope to go off-guard and, become easy prey for the COVID-19.

1.6 Social Marketing and COVID-19

Kotler and Zaltman (2011) defined social marketing as the design, implementation and control of programs calculated to influence the acceptability of social ideas and involving considerations of product designing, pricing, communication, distribution and marketing research. According to Martinez (2018), social marketing is the application of commercial marketing, principles and techniques to effect positive behavior changes on a target populace, in order to enhance their physical, social and economic well-being. This implies the use of ideas and techniques of commercial marketing in order to change or improve negative social behaviors. Social marketing experts, (Hastings & McDermott, 2006). Therefore, social marketing tools are used to change the attitudes, awareness and behavior of the populace (Kotler & Zaltman, 1971). In social marketing people are encouraged to adopt a specific, beneficial social behavior (Kotler & Roberto, 1981; Ricordeau, 2003).

Odigbo, Okonkwo and Ekemezie (2017) posited that social marketing has been successfully used in the health areas to achieved desired behavior changes for managing HIV/AIDS spread amongst the Nigerian populace. Oti, Eze and Odigbo (2016), also advised that social marketing campaigns has been used as a tool for reducing the financial costs of negative health habits amongst

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Nigerians. Seetharam, Priya, Somu, and Varun (2014) observed that social marketing has been used to improve maternal and child health, leading to increased patronage of health care centers, reduced complicated deliveries, improved newborn cares, and increased vaccination with consequent decline in maternal and infant mortality rate. The implication of all these, is that social marketing could also be used for effective public enlightenment on the dangers of the Coronavirus, the preventive measures against it, the proper things to do when contracted, the dos and don'ts over it, and the truths regarding the myths and rumours, as it has done in other health-related matters in the past (Odigbo, Eze & Bassey, 2016). This raises the second research question:

RQ2: Is the level of social marketing promotions on the Coronavirus pandemic in published articles significant?

1.7 Methodology

A Boolean search of studies related to terms of social marketing undertaken from December 2019 when the new coronavirus disease (nCov) was first reported to February 2020 when it was declared a pandemic by the World Health Organisation (WHO, 2020), was reviewed mainly from the existing published literature on Coronavirus as documented by the World Health Organisation from Web of Science, Scopus and the Social Science Citation Index collections. In doing this, a five-steps secondary data research process as shown in figure 3, was adopted (Denyer & Tranfield, 2009; Casimir and Tobi, 2011; Meglio and Risberg, 2011), of studies related to Coronavirus.

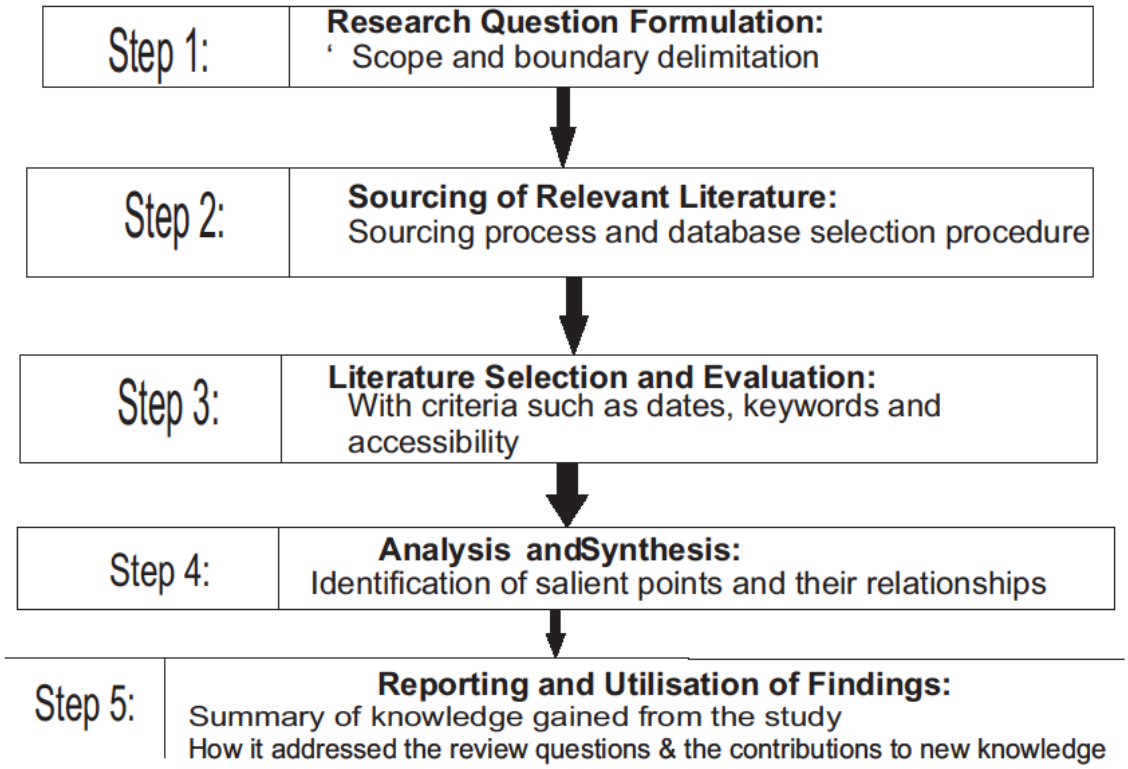

Fig. 3: Systematic review methodology. Source: Denyer, D. and Tranfield, D. (2009), "Producing a systematic review". http://www.cebma.org/wp-content/uploads/Denyer-Tranfield-Producing-a-Systematic-Review.pdf

The first step was by clearly defining the search criteria and the time period during which the works were undertaken, the specific research questions and scope of the work.

The second step was a sourcing of the relevant literature by selecting the following words or phrases that appeared in the study themes: "Coronavirus" or "COVID-19," "Social Marketing," "Health Marketing" or "Health Communication." Following the Thomson Reuter ISI Journal Citation report, the sample is limited to those journals that were recognized by the World Health Organisation as published articles so far on the subject matter (Coronavirus or COVID-19). The selected journals and the number of article(s) published by each of them are displayed on Table I.

The third stage was literature selection, evaluation and categorizing of the "articles" in those journals with regards to publication dates, keywords and accessibility. There were a total of 15 published articles on Coronavirus within the period under study (WHO, 2020). Table II presents the topics on coronavirus studied in those academic journals and their contributions in percentage terms with respect to the issues of our study. We considered two criteria when selecting the papers: first, a paper has to be peer reviewed. Second, it has to include the keywords Coronavirus and or COVID-19, to justify the validity of the literature search outcome.

The fourth stage is the data analysis and synthetization of the "articles" in those journals according to their salience and relationship to our subject matter, but, since the scope of this work is related to health and social marketing, this formed the basis of the analysis. A standardized method of structured content analysis is employed through a traceable, systematic and reproducible research process in a combined qualitative and quantitative format that complements each other (Brewerton and Millward, 2001; Seuring and Gold,2012). The fifth stage involved the summarization of the findings, the discussion of the findings with emphasis on how it addressed the research questions raised, how it contributed to knowledge and the recommendations for the way forward.

1.8 Data Presentation and Analysis

1.8.1 A Review of Published Articles' Focus Areas and Conceptual Boundaries on Corona Virus

Table1: n = 25. (95 % level of confidence).

Name of Journal	Author(s)	Article Title	Date	Area of Focus and Conceptual Boundary
Chinese Journal of Epidemiology,	Epidemiology Working Group for NCIP Epidemic Response	The epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19) in China	2020	Epidemic Response
C & EN Global Enterprise	Lisa M. Jarvis	Biotech start-ups hit by coronavirus work stoppages	2020	Biotech/ Pharmaceuticals
International Journal of Infectious Diseases	Andersen, Petter I.; Ianevski, Aleksandr; Lysvand, Hilde; Vitkauskiene, Astra; Oksenych, Valentyn;	Discovery and development of safe-in-man broad-spectrum antiviral agents	2020	Clinical care and treatment

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	BjÃ¸rÃ¥s, Magnar; Telling, Kaidi; Lutsar, Irja; Dampis, Uga; Irie, Yasuhiko; Tenson, Tanel; Kantele, Anu; Kainov, Denis E.			
Gansu Province Journal	Bai, S. L.; Wang, J. Y.; Zhou, Y. Q.; Yu, D. S.; Gao, X. M.; Li, L. L.; Yang, F.	Analysis of the first cluster of cases in a family of novel coronavirus pneumonia	2020	Case study/case series; Epidemiology
The Lancet Infectious Diseases	Burki, Talha	Outbreak of coronavirus disease	2020	Narrative review on Coronavirus
Zhonghua Yu Fang Yi Xue Za Zhi	Chen, W.; Wang, Q.; Li, Y. Q.; Yu, H. L.; Xia, Y. Y.; Zhang, M. L.; Qin, Y.; Zhang, T.; Peng, Z. B.; Zhang, R. C.; Yang, X. K.; Yin, W. W.; An, Z. J.; Wu, D.; Yin, Z. D.; Li, S.; Chen, Q. L.; Feng, L. Z.; Li, Z. J.; Feng, Z. J.	Early containment strategies and core measures for prevention and control of novel coronavirus pneumonia in China	2020	Infection prevention and control; Narrative review (Social Marketing)
Biochemical and Biophysical Research Communications	Chen, Yun; Guo, Yao; Pan, Yihang; Zhao, Zhizhuang Joe	Structure analysis of the receptor binding of 2019-nCoV	2020	Virology, immunology
Zhonghua Yu Fang Yi Xue Za Zhi	Chen, Y.; Jin, Y. L.; Zhu, L. J.; Fang, Z. M.; Wu, N.; Du, M. X.; Jiang, M. M.; Wang, J.; Yao, Y. S.	The network investigation on knowledge, attitude and practice about Novel coronavirus pneumonia of the residents in Anhui Province	2020	Case study/case series; Ethics, social science, economics; Narrative review, (Social Marketing)
Journal of the American Academy of Dermatology	Chen, Yusha; Pradhan, Sushmita; Xue, Siliang	What are we doing in the dermatology outpatient department amidst the raging of 2019-nCoV?	2020	Infection prevention and control (Social Marketing)
Nature	Cyranoski, David	When will the coronavirus outbreak peak?	2020	Epidemiology; Opinion piece
Zhonghua Jie He He Hu Xi Za Zhi	Du, B.; Qiu, H. B.; Zhan, X.; Wang, Y. S.; Kang, H. Y. J.; Li, X. Y.; Wang, F.; Sun, B.; Tong, Z. H.	Pharmacotherapeutics for the New Coronavirus Pneumonia	2020	Clinical care and treatment
Rev Clin Esp	Ena, J.; Wenzel, R. P.	A Novel Coronavirus Emerges	2020	Narrative review
Global Social Welfare	Kapiriri, Lydia; Ross, Alison	The Politics of Disease Epidemics: a Comparative Analysis of the SARS, Zika, and	2020	Ethics, social science, economics

		Ebola Outbreaks		
International Journal of Antimicrobial Agents	Lai, Chih-Cheng; Shih, Tzu-Ping; Ko, Wen-Chien; Tang, Hung-Jen; Hsueh, Po-Ren	Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and corona virus disease-2019 (COVID-19): the epidemic and the challenges	2020	Clinical care and treatment; Epidemiology
Chin J Integr Med	Luo, Hui; Tang, Qiao-Ling; Shang, Ya-Xi; Liang, Shi-Bing; Yang, Ming; Robinson, Nicola; Liu, Jian-Ping	Can Chinese Medicine Be Used for Prevention of Corona Virus Disease 2019 (COVID19)? A Review of Historical Classics, Research Evidence and Current Prevention Programs	2020	Clinical care and treatment
JO - Intensive Care Medicine	Pan, Lingai; Wang, Li; Huang, Xiaobo	How to face the novel coronavirus infection during the 2019-2020 epidemic: the experience of Sichuan Provincial Peoples' Hospital	2020	Clinical care and treatment; Infection prevention and control
Pathogens and Disease	Salata, Cristiano; Calistri, Arianna; Parolin, Cristina; PalÃ¹, Giorgio	Coronaviruses: a paradigm of new emerging zoonotic diseases	2020	Narrative review; Reservoir
AAAS Journal	Service, Robert F.	Coronavirus epidemic snarls science worldwide: The disruption is enormous	2020	Ethics, social science, economics
Japanese Journal of Infectious Diseases	Shirato, Kazuya; Nao, Naganori; Katano, Harutaka; Takayama, Ikuyo; Saito, Shinji; Kato, Fumihiro; Katoh, Hiroshi; Sakata, Masafumi; Nakatsu, Yuichiro; Mori, Yoshio; Kageyama, Tsutomu; Matsuyama, Shutoku; Takeda, Makoto	Development of Genetic Diagnostic Methods for Novel Coronavirus 2019 (nCoV-2019) in Japan	2020	Clinical care and treatment; Infection prevention and control
The Lancet.com	Editorial	Challenges of coronavirus disease 2019	2020	Ethics, social science, economics
Emerg Microbes Infect	Tian, Xiaolong; Li, Cheng; Huang, Ailing; Xia, Shuai; Lu, Sicong; Shi, Zhengli; Lu, Lu; Jiang, Shibo; Yang, Zhenlin; Wu, Yanling; Ying,	Potent binding of 2019 novel coronavirus spike protein by a SARS coronavirus-specific human	2020	Virology, immunology

	Tianlei	monoclonal antibody		
The Lancet	Xiang, Yu-Tao; Li, Wen; Zhang, Qinge; Jin, Yu; Rao, Wen-Wang; Zeng, Liang-Nan; Lok, Grace K. I.; Chow, Ines H. I.; Cheung, Teris; Hall, Brian J.	Timely research papers about COVID-19 in China	2020	Ethics, social science, economics; Opinion piece
The Journal of Infectious Diseases	Yu, Ping; Zhu, Jiang; Zhang, Zhengdong; Han, Yingjun; Huang, Lihong	A familial cluster of infection associated with the 2019 novel coronavirus indicating potential person-to-person transmission during the incubation period	2020	Case study/case series; Epidemiology
Zhonghua Er Ke Za Zhi	Zeng, L. K.; Tao, X. W.; Yuan, W. H.; Wang, J.; Liu, X.; Liu, Z. S.	First case of neonate infected with novel coronavirus pneumonia in China	2020	Case study/case series
Emerg Microbes Infect	Zhang, Wei; Du, Rong-Hui; Li, Bei; Zheng, Xiao-Shuang; Yang, Xing-Lou; Hu, Ben; Wang, Yan-Yi; Xiao, Geng-Fu; Yan, Bing; Shi, Zheng-Li; Zhou, Peng	Molecular and serological investigation of 2019-nCoV infected patients: implication of multiple shedding routes	2020	Case study/case series; Infection prevention and control; Virology, immunology

From table 1, it could be seen that a total of 25 journal articles were reviewed. All the articles were from a World Health Organisation's compilation of published articles on Coronavirus from Web of Science index, Tomson Reuters and Scopus. The journal articles were classified into seven major categories. Some of the articles were multi-disciplinary and have overlapping categories. The major areas of focus and conceptual boundaries of the articles were on: epidemic response, biotech / pharmaceuticals**,** clinical care and treatment, epidemiological case study/case series, coronavirus narrative reviews, social marketing via infection prevention and controls, virology, immunology, the ethics, social science and economics of coronavirus pandemic. A summary of the number of articles and their areas of focus or categorization or conceptual boundaries is shown on table 2.

Table 2: n = 25. A summary of the number of articles and their areas of focus or categorization

S/N	**Articles Areas of Focus (Categorization)**	**Frequency**	**%**
1	Epidemiology/Epidemic Response (Medical)	4	16%
2	Biotech/ Pharmaceuticals (Para-Medical)	2	8%
3	Clinical care and treatment (Medical)	6	24%
4	Narative Reviews (Medical)	4	16%
5	Social Marketing/ Infection prevention and control	3	12%
6	Virology, immunology (Medical)	3	12%

7	Epidemiology Case Studies (Medical)	3	12%
Total =		**25**	**100%**

Addressing RQ1: Are studies on Coronavirus focused more on the medical solutions or public awareness of the pandemic?

Out of the 25 published articles displayed on table 1, only 7 (28%) focused on public awareness of the Coronavirus pandemic. This to our opinion is very small, considering the urgency for public enlightenment as a tool for containing the global crisis. The articles in question, the journals and the authors are as shown on table 3.

S/N	**Table 3: n = 25. Correlation between published articles and COVID-19 pandemic public awareness (95% Confidence Level)**				
1	The Lancet Infectious Diseases	Burki, Talha	Outbreak of coronavirus disease	2019	Narrative review on Coronavirus
2	Zhonghua Yu Fang Yi Xue Za Zhi	Chen, W.; Wang, Q.; Li, Y. Q.; Yu, H. L.; Xia, Y. Y.; Zhang, M. L.; Qin, Y.; Zhang, T.; Peng, Z. B.; Zhang, R. C.; Yang, X. K.; Yin, W. W.; An, Z. J.; Wu, D.; Yin, Z. D.; Li, S.; Chen, Q. L.; Feng, L. Z.; Li, Z. J.; Feng, Z. J.	Early containment strategies and core measures for prevention and control of novel coronavirus pneumonia in China	2020	Infection prevention and control; Narrative review (Social Marketing)
3	Zhonghua Yu Fang Yi Xue Za Zhi	Chen, Y.; Jin, Y. L.; Zhu, L. J.; Fang, Z. M.; Wu, N.; Du, M. X.; Jiang, M. M.; Wang, J.; Yao, Y. S.	The network investigation on knowledge, attitude and practice about Novel coronavirus pneumonia of the residents in Anhui Province	2020	Case study/case series; Ethics, social science, economics; Narrative review, (Social Marketing)
4	Journal of the American Academy of Dermatology	Chen, Yusha; Pradhan, Sushmita; Xue, Siliang	What are we doing in the dermatology outpatient department amidst the raging of 2019-nCoV?	2020	Infection prevention and control (Social Marketing)
5	Rev Clin Esp	Ena, J.; Wenzel, R. P.	A Novel Coronavirus Emerges	2020	Narrative review
6	The Lancet	Xiang, Yu-Tao; Li, Wen; Zhang, Qinge; Jin, Yu; Rao, Wen-Wang; Zeng, Liang-Nan; Lok, Grace K. I.; Chow, Ines H. I.; Cheung, Teris; Hall, Brian J.	Timely research papers about COVID-19 in China	2020	Ethics, social science, economics; Opinion piece
7	Zhonghua Er Ke Za Zhi	Zeng, L. K.; Tao, X. W.; Yuan, W. H.; Wang, J.;	First case of neonate infected with novel	2020	Case study/case

		Liu, X.; Liu, Z. S.	coronavirus pneumonia in China		series

Addressing RQ2: Is the level of social marketing promotions on the Corona Virus pandemic in published articles significant?

Out of a total of 25 published articles displayed on table 1, only 3 (12%) really focused on social marking or public awareness campaigns directed towards positive health attitudes and behavior-changes on the Coronavirus pandemic. This again, to our opinion is very disappointing, considering the fact that the war against the Coronavirus pandemic cannot be won through medicines, but through concerted efforts at getting the public adopt the rightful health behaviours and attitudes against the problem. The articles in question, the journals and the authors are as shown on table 4.

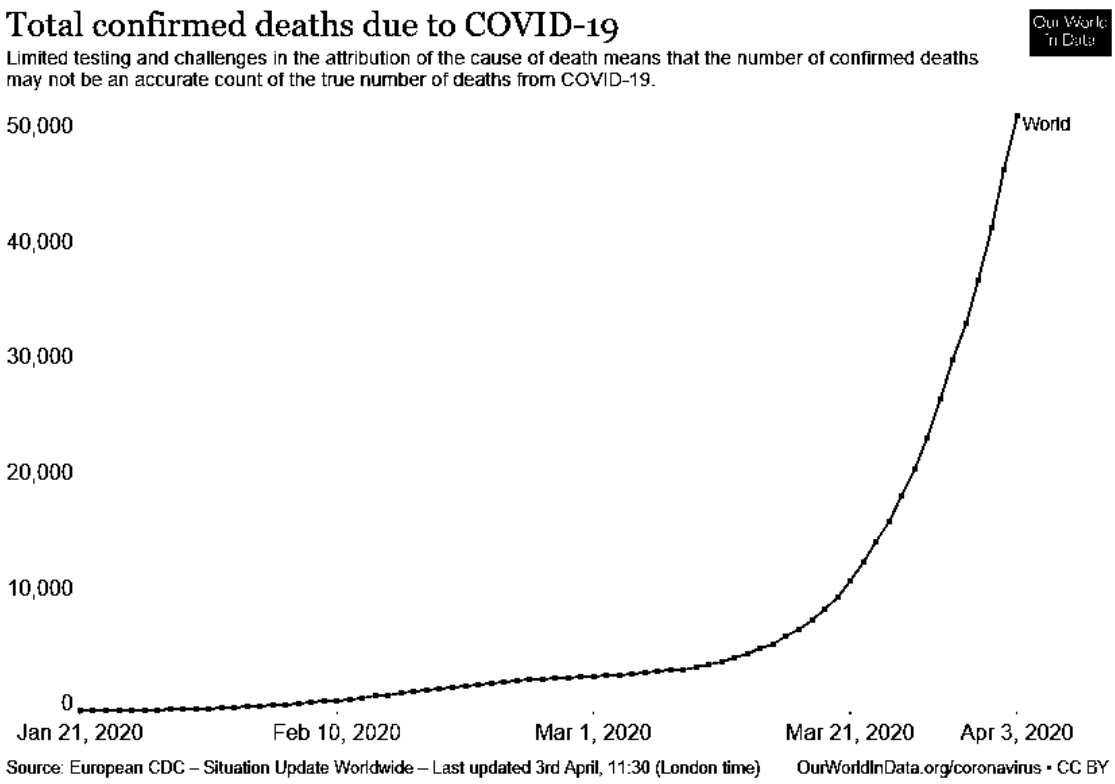
S/N	**Table 4: n = 25. Summary of number of articles and the correlations to social marketing on COVID-19 pandemic (95% Confidence Level)**				
1	Zhonghua Yu Fang Yi Xue Za Zhi	Chen, W.; Wang, Q.; Li, Y. Q.; Yu, H. L.; Xia, Y. Y.; Zhang, M. L.; Qin, Y.; Zhang, T.; Peng, Z. B.; Zhang, R. C.; Yang, X. K.; Yin, W. W.; An, Z. J.; Wu, D.; Yin, Z. D.; Li, S.; Chen, Q. L.; Feng, L. Z.; Li, Z. J.; Feng, Z. J.	Early containment strategies and core measures for prevention and control of novel coronavirus pneumonia in China	2020	Infection prevention and control; Narrative review (Social Marketing)
2	Zhonghua Yu Fang Yi Xue Za Zhi	Chen, Y.; Jin, Y. L.; Zhu, L. J.; Fang, Z. M.; Wu, N.; Du, M. X.; Jiang, M. M.; Wang, J.; Yao, Y. S.	The network investigation on knowledge, attitude and practice about Novel coronavirus pneumonia of the residents in Anhui Province	2020	Case study/case series; Ethics, social science, economics; Narrative review, (Social Marketing)
3	Journal of the American Academy of Dermatology	Chen, Yusha; Pradhan, Sushmita; Xue, Siliang	What are we doing in the dermatology outpatient department amidst the raging of 2019-nCoV?	2020	Infection prevention and control (Social Marketing)

1.9 Discussion of Findings

Even though we commend the efforts of mass media and governments all over the world at promoting public awareness and mass enlightenment over the global COVID-19 scourge, the percentage of published articles directed at this is quite low (only 28%), while the remaining 72 percent centered on medical and medical-related matters. According to Seymour (2017), raising awareness should be the key plank of every public health programme, which this result negates. Social marketing health behavior change campaigns could employ online interventions or internet-

based interventions for optimal success (Cugelman, Thelwall & Dawes, 2011; Van Genugten, et al., 2016).

Fig. 4:



Statistics of global COVID-19 confirmed deaths globally as at April 3, 2020. Source: Max Roser, Hannah Ritchie and Esteban Ortiz-Ospina (2020). Coronavirus Disease (COVID-19) – Statistics and Research. https://ourworldindata.org/coronavirus#all-charts-preview

The public awareness programme should also identify and address the needs of both city and rural dwellers, accommodate literacy skills and make unequal access to resources (Seymour, 2017). This agrees with Kapiriri and Alison (2020) views that regardless of income setting, there is need to give voice to the most marginalized communities during an epidemic and also, that the experiences and narratives of those most vulnerable to an epidemic, specifically poor communities, need to be represented in literature, in order to mitigate some of the negative impact of epidemics in such vulnerable areas.

Again, that only 12 percent of published articles as at the time of this study focused on social marketing behavior-change campaigns towards the Coronavirus pandemic is worrisome, considering that this very disease has turned into a global emergency. While we commend the efforts of medical personnel all over the world, who have put their lives on the lines in trying to contain the pandemic, it is also good to recognize the fact that COVID-19 cannot be won through medications alone, but through social marketing that will engender the right attitudes and desired behavior changes amongst the global citizens. This agrees with the views of Colby et al. (2011), and Gordon, McDermott, Stead and Angus (2006), that social marketing communication strategies could be used to promote public health resources. Other authors also agree that an effective social marketing campaign in the health arena for health behavior change interventions could be championed through diverse media channels like the use of online social networks (Maher, Lewis,

Ferrar et al., 2014), mass media interventions (Grilli, Freemantle & Minozzi, 2002), social media networks (Maher, Ryan & Kernot, 2016).

1.10 Recommendations

Based on the outcome of the literature reviewed in this study, we hereby recommend as follows:

i. That experts in public relations, marketing communications, health communications, health marketing and social marketing should join the team of medical experts researching and publishing on Coronavirus now, in fighting the pandemic from the angle of mass public education and enlightenment.

ii. That most of the articles by those communications and communications-related experts should be centred around social marketing health behavior changes aimed at getting people adopt the right attitudes, dos and don'ts towards the Coronavirus.

iii. That through social marketing, those erroneously believing that the Coronavirus is a big man's disease and, does not afflict the poor, should be made to realize that they are deluding themselves, because reports from the World Health Organization and other international organizations, reveal the virus is no respecter of social status and have so far killed people of all income levels around the world.

iv. That through social marketing, those erroneously believing that the Coronavirus is meant only for city dwellers and, does not concern rural people, should be made to know that the virus thrives and harms anyone that contracts it regardless of his / her location. Social marketing campaigns must be packaged to accommodate both city dwellers, where a greater percentage of media resources are located and poor rural communities with little or no access to media resources.

v. Social marketing interventions should also be used to change the mindset of those who believe that Coronavirus afflict only people who travelled outside the country, not the poor and rural people, to understand that through social interactions, business transactions and other activities, international travelers, city dwellers and rural dwellers all mix together, hence, the likelihood of transmisions.

vi. Social marketing interventions should be used to educate those who believe that Coronavirus can be prevented or cured by plant-based medications, to seek expert advice before and confirmed evidence over history before such treatment, in line with World Health Organisation's evidence-based medicine (EBM), (WHO, 2014).

vii. Social marketing interventions should be used to enlighten those who claim that Coronavirus can be prevented or cured by drinking palmwine or other alcohols, that they stand the risk of falling into alcoholism, which negates the wise counsel of Trump (2020), that people should not let the cure they resort to, be worse than the problem itself.

viii. Social marketing campaigns should be used to change the mindset of people who assert that Coronavirus can be prevented or cured by hot water bathe or by steam water inhalation, that this has not received medical sciences' confirmation, so, any suspected victim must not resort to self-medication, but seek expert medical attention without any delay.

ix. Social marketing campaigns should be used to let people who claim that Coronavirus is a demonic attack, only curable through prayers, that they must not throw caution to the winds, but must abide by all the advertised Coronavirus preventive measures of regular

hand-washing, social distancing and many more, seek expert medical attention without any delay when symptoms of the virus appear, while still not neglecting their prayers.

x. Social marketing campaigns should be used to change the mindset of people who have been brainwashed that Coronavirus is a sign of an end-to-the world, that they should not fall prey to fear-mongers, because fear could prove a deadlier disease than the COVID-19 itself.

xi. Social marketing campaigns should also be used to enlighten those who believe Coronavirus can be prevented or cured by consuming chloroquine, that they must do so only on doctor's prescriptions and advise.

xii. Social marketing campaigns should also be used to mass market the World Health Organisation's informed positions debunking most of the myths spreading around COVID-19, as highlighted in item 1.4 of this paper.

xiii. Finally, social marketing campaigns should be used to educate citizens of the world that in this trying time, we must be our brother's keepers, even while observing social distancing. We must avoid stigmatization and ostracizations, which could kill COVID-19 sufferers even faster than the disease itself.

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