INTERNATIONAL JOURNAL FOR INNOVATIVE RESEARCH IN MULTIDISCIPLINARY FIELD ISSN: 2455-0620 Volume - 7, Issue - 3, Mar – 2021
Monthly, Peer-Reviewed, Refereed, Indexed Journal with IC Value: 86.87 Impact Factor: 6.719
Received Date: 15/03/2021 Acceptance Date: 30/03/2021 Publication Date: 31/03/2021

Health, Economics and a Pandemic

Siddhant J. Raghuvanshi
Symbiosis School of Banking and Finance, Symbiosis International (Deemed University), Pune, India
Gram Lavale, Taluka Mulshi, Dist. Pune Pin 412115 (Maharashtra, India)
*E-mail: siddhant.raghuvanshi.19-21@ssbf.edu.in

Abstract: *This study aims to assess and analyze the impact of healthcare spending in order to mitigate adverse economic effects during the COVID-19 Pandemic. During the first half of 2020, the loss of life and disruption of economic activity is tremendous. In economics every life, no matter how minute, has a statistical value and health economics tries to retain this value by developing the healthcare system and making it accessible. Essentially, saving a life would mean preventing the economy from losing that part of income. With that in mind, this study tries to find a correlation between the healthcare spending and fatality rate of the top 50 affected countries (in terms of COVID cases). The study analyses the significant positive correlation among the two chosen variables, suggesting that more developed healthcare infrastructure can help mitigate the catastrophic economic circumstances. Healthcare infrastructure is developed gradually and merely expending huge chunks of the budget wouldn't guarantee sufficient healthcare. For healthcare systems to be developed, dynamic changes in health budgets are required. The findings suggest a need for investment to better equip healthcare systems to safeguard the public and economy in extreme situations.*

Key Words: *Covid-19 Pandemic, Health, economic, infrastructure, fatality.*

1. INTRODUCTION : (Background Section)

A pandemic is the global outbreak of a disease. There are many historic occurrences of this phenomenon, the most recent being the COVID-19 pandemic, declared so by the World Health Organization on March 12, 2020. The last contagion threat of this magnitude last occurred in 1918, the Influenza pandemic that caused the death of about 50 million people and affected 1/3rd of the world's population. Due to the COVID-19 cases and deaths which are growing rapidly and definite, it will leave an impact globally which is difficult to measure accurately because of the uncertainties surrounding the crisis . More disturbing than these estimates are the public health impacts that the global population fears. A virus uses its host to survive and spread, and attacking the virus without harming the host still remains a challenge to modern healthcare. The Global mortality rate of COVID-19 was estimated 3.4% on March 3rd 2020 by WHO . However, The COVID-19 virus has a high transmission rate due to it being able to survive in different environments and being airborne to a certain extent. Governments across the globe are in quagmire to reduce the Reproductive number for exponential growth. R defines the average number of people that get infected by an infected person. The aim in such a scenario is to reduce this number to 1 or below 1. In Figure 1, the exponential growth in cases of United States in comparison to United Kingdom and Germany are shown. Early reaction to the pandemic in the initial 20 days to curb the contagion has defined which way the graph moves forward.

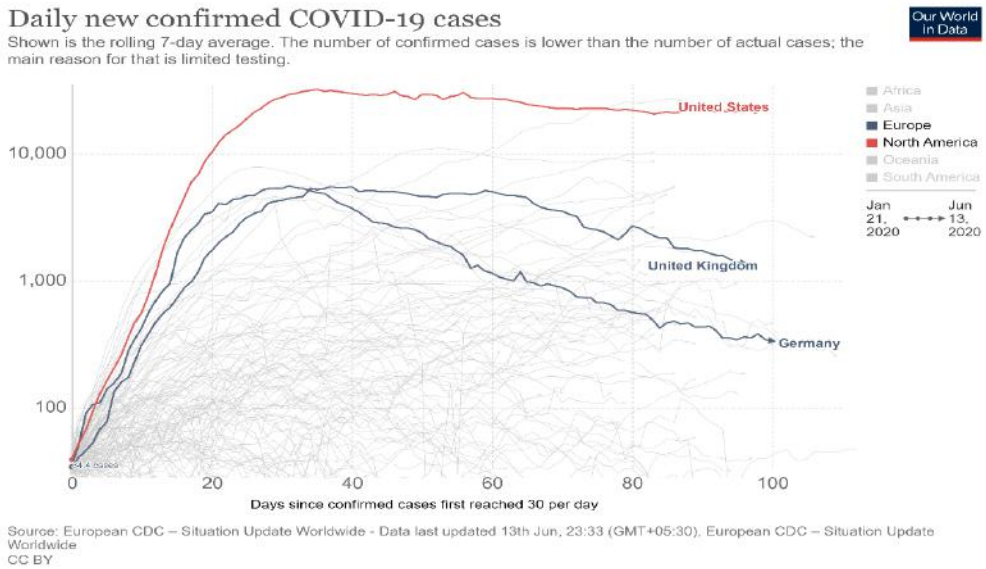

Fig 1. Graph Showing growth in COVID-19 cases in Europe and North America

Exponential growth is a small interval over which the quantity doubles. For example, consider a pandemic that doubles daily. If one person is infected today, two are infected tomorrow, four the day after. A week later, 128. Three days after that, 1,024 are infected. A growth in COVID-19 cases at this rapid rate will overwhelm the capacity of the healthcare system and cause inadequacy of beds to admit the infected patients. It is necessary to flatten this curve of growth, in order to contain the virus with available healthcare infrastructure. (Hwang, A. 2020)

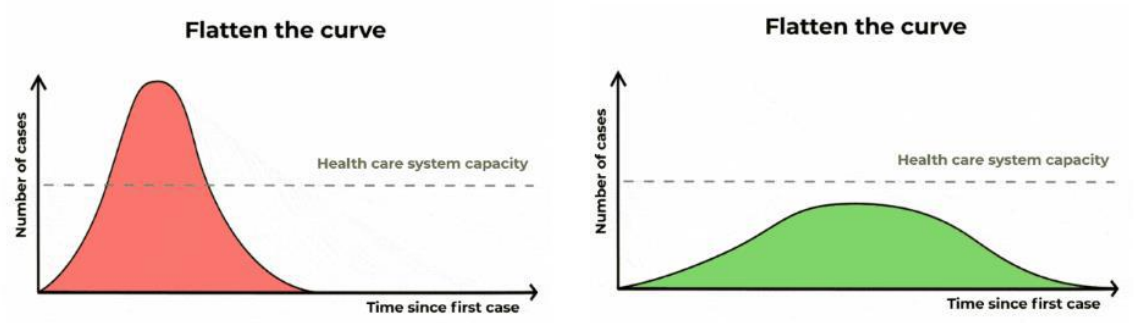

Fig:2 illustration of flatten the curve by Hwang (2020)

Governments everywhere are taking a combination of safety measures and addressing concerns that are dynamically coming with the ongoing pandemic. As the news of the virus in China spread around the world, countries started taking preventive measures like restricting flights, foreign travel, and public gathering. However, the panic mode was switched once the transmission sped up in Italy and Spain, leading to complete lockdowns across the globe. This restriction in movement outside the house sure did its bit to reduce the spread of the virus yet these lockdowns have unfolded economic and social distress.

The COVID-19 pandemic has caused a big spike of uncertainty worldwide. Uncertainties revolve around almost every aspect: the contagiousness, presence, and how deadly the virus is; the availability and distribution of antigen and antibody tests; the capability of healthcare systems to face a problem of this magnitude; the time it will take to test and prepare, effective vaccines; the size of the mortality risk; duration of the lockdowns and till when to voluntarily social distance; the economic impacts of the pandemic and policy responses; the pattern of recovery as the pandemic subsides. (Baker, Bloom, Davis & Terry, 2020)

It becomes more difficult to understand the impacts off this pandemic as an event of similar nature has not existed in history. However, the Spanish influenza over a century ago is comparable in terms of fatality but it happened in a very different economic, political, and social environment.

Lockdowns

Lockdown isn't a term that public health officials use, but it has become synonymous to a stay at home order or quarantine mandated by the government. A law like this can be unconstitutional in many parts of the world. However, in March when Italy became the new epicenter for the contagion the world started realizing how fast the virus is spreading and how unprepared we are to fight it. Finally, on March 9th Italy became the first country to enforce a lockdown as a measure to contain the spread. Moved by the examples of Iran and Italy and Spain, majority governments initiated quarantining their countries. By first week of April, more than 3.9 billion people, or more than half the world's population, had been asked or ordered to be in a lockdown by their governments for the safety of the people. The purpose of the lockdown was simple, to slowdown the spread of the novel corona virus. A lockdown of this magnitude, although crucial, is difficult to enforce. The lockdowns snowballed into a pile of challenges and costs that were difficult to be predicted in a state of panic. (Sandford A. 2020,).

Costs of lockdown

From an Economic point of view, IMF is presuming the fall in global economy to be worse than the subprime crisis a decade ago. The pandemic is being considered the worst thing to happen to economics since the great depression and the world is trying to live one day at a time and there is no way to estimate the loss that this virus will leave since there is no certain end date for the virus. The main issues revolve around panic buying, volatile markets, unemployment, work from home challenges and the way of enforcement of lockdown. Way down the pyramid, all of this ultimately affects the consumers, the worst as many uncertainties lay ahead in terms of survival.

Panic Buying:

Following the lockdowns imposed by several countries, the citizens were becoming aware of the possibility of the same happening in their country, causing them to stock on essential items. However erratic the decision of panic

buying was, it was practical. This inevitably created a loop which caused problems for supply (Macdonald, 2020). Absurd quantities of sanitizers, mask, and toilet papers were purchased causing shortage in some markets. The game theory can be applied to the shoppers here, nobody wants to hoard so much but based on the presumption that everyone else is also doing it an individual makes a decision they consider optimum.

Social issues:

The year 2020 has taken a toll on society as a whole, as the entire world sat at home with nothing while being helpless tackling the global pandemic, more underlying social problems came to light. The quarantines, lockdowns along with the huge loss of lives is worrisome and has put the world in a bleak state. Federal agencies and experts warn that a historic wave of mental-health problems is going to unfold: post-traumatic stress disorder, substance abuse, depression, and suicide (Wan, 2020). There have been reports of increase in mental health issues in parts of the world and there is a concern over how it will be dealt with once the virus passes. Following social distancing guidelines and staying at home becomes difficult when people have problems at home. Fueled by compulsory stay-at-home orders, physical distancing, economic uncertainties, and anxieties caused by the pandemic, domestic violence has increased globally. Across the world, countries have reported cases of increased domestic violence and intimate partner violence. India, which is ranked 4th in worst gender equality, is showing similar trends (Kumar, 2020).

The lockdown also caused a lot of commotion due to the cases of people stranded away from home. May it be a student, expatriate, migrant worker in a time like this want to be in the comfort of their homes. In a country like India where a big part of the workforce earns daily wages, this situation becomes extremely critical. Majority of these daily wagers are migrant workers and lost their bread as a consequence of the lockdown. Workers without the capability were forced out on the streets. Post the announcement of lockdown, cities across India saw exodus or migrant workers in large number wanting to return to their homes. They had run out of money to buy food, and were ready to walk 100s of kilometers to find shelter in their homes. Not only is the income equality gap concerning but also a fatal health hazard in a pandemic. It is a privilege to have multiple masks and sanitizer when people out there don't even have money to feed their families. Needless to say, the poorer communities will be at more risk of loss of life due to cause indirectly related to the virus.

No matter how uncertain but all of the problems stated above have been very real. The governments across the world have time and again addressed one issue at a time and made exemptions and provisions for societal woes in order to maintain smooth enforcement of lockdowns. In recent turn of events the gap between identification of a problem and its solution claims many lives and the solution seem too late or too little. The fact that each country is facing a common pandemic but also have limitations of their own, it difficult to generate specific guidelines that would work for all Lockdowns. However, the aim over the world remains of saving lives and livelihoods.

Economic Effects

By the end of 2019, people were stressed about the trade war between US and China, presidential elections in the US and the impact of Brexit on the World Economy. Predictions were made by IMF, that there will be a global economic growth of 3.4%. Corvid –19 is a new strain of Coronavirus from the SARS species which is has had an even more negative effect on our perceptions of growth. The global stock markets have reduced to US$6 trillion in value in from 24th to 28th of February due to COVID -19, the companies are more likely to lose profits on account of unsettled fears and logic. In the US while the S&P 500's largest 10 companies experienced a total loss of over $1.4 trillion in the same week the S&P faced loses more than $5trillion in wealth, despite the fact in the coming week some of these were recovered (Ozili & Arun, 2020). Due to the impact of the coronavirus the firms would decline some of the losses in wealth due to logical assessment by the firms. The impact of a pandemic disease on the economy is complex and linked to many factors. Such factors include demographic most at risk, duration of the pandemic, and speed of transmission. Many types of influenzas affect primarily the elderly and the very young; however, with past pandemics, the demographic strata most affected was the working-age population (bubonic plague [Black Plague], 1918 Influenza). (Ehlen, Mark. 2007)

It is important to highlight that the lockdowns had been implemented with leniency to essential goods and services. Hence, the goods and services that consumers are spent maximum on are classified as essentials. However, come March stock markets across the world had a huge sell off. The coronavirus has caused an abrupt stock market crash the likes of which have not been seen since Black Monday in 1987 or the market meltdowns in 2000 and 2008. (Staff, 2020). This shows that businesses that comprises majority of markets causing a market crash are the sectors that are technically as per today's definition stand 'unessential'. Sectors with complex value chains have depleted share values due to unforeseen travel and trade bans that limits them from delivering goods. Lockdown brought an abrupt pause in the businesses that required proximity and physical labor to carry on their business activities causing shareholders to lose trust in the companies' profit-making ability. This coupled with the extreme uncertainties of a pandemic led to a global sell off of securities. On the other hand, companies that had strategies to remotely run businesses

from home and companies that facilitated this work from home culture have seen their stocks rally. In an even more shocking incident on 22nd April 2020 the crude oil price per barrel was quoted negative for the first time in history this shows how uncertain market sentiments are about when things will go back to normal, if they ever do (Afp, 2020),. The International Monetary Fund (IMF) on 9 April said the coronavirus pandemic had instigated an economic downturn the likes of which the world has not experienced since the Great Depression.

The Situational Threat Report (SITREP) Index is an assessment of all available information about epidemiological, economic and social conditions related to the outbreak. On April 13, Bain raised the SITREP Index to Level 7, which suggest multi-quarter and multiple markets economic impacts are likely. A huge part of the working population faces the possibility of being laid off. A Virginia based study evaluated the impact of the pandemic on revenue losses and unemployment, (M. J. Orsi J. R. Santos) found that sectors that are majorly affected in terms of employment are ones where the reliance on workforce is high.

Thomas A.Garrett (2008) warned that Local quarantines will damage businesses in the short run. Employees would be laid off, Even Families with no contact to the virus may experience financial trouble. Some businesses could suffer as much as 50 percent loss in revenues. Others, such as health services and products, may experience boost in business. One thing is for certain lockdown are really testing the question of Lives V/s livelihoods.

Economic welfare and growth are positively r (Pritchett and Summers, 1996; Bloom and Sachs, 1998; Bhargava and et al., 2001; Cuddington et al., 1994; Cuddington and Hancock, 1994; Robalino et al., 2002a; Robalino et al., 2002b; WHO Commission on Macroeconomics and Health, 2001; Haacker, 2004) and there are a few studies of economic costs of large-scale outbreaks of infectious diseases to date: Schoenbaum (1987) is an example of an early analysis of the economic impact of influenza. Meltzer et al. (1999) examine the possible economic impact of the influenza pandemic in the US and analyzed vaccine-based interventions. At a gross attack rate (i.e. the number of people contracting the virus out of the total population) of 15-35%, the number of influenza deaths is 89 – 207 thousand, and an estimated mean total economic impact for the US economy is $73.1- $166.5 billion. Even though the potential loss of life and the possible large-scale disruption to a large number of people, many governments have failed to invest sufficiently in their health care systems, let alone public health systems in less developed countries where many infectious diseases are likely to originate. Experts warn and continue to warn that zoonotic diseases will continue to pose a threat to the lives of millions of people with potentially majorly disrupt an integrated world economy. The idea that any country can be steer clear and be independent in an integrated global economy is proven wrong by the latest outbreak of COVID-19. (Fernandes, 2020)

For the purpose of the research we will assume that each life has an economic value attached to it and in face of a pandemic like scenario where lives are lost by the 100ss, economic ramifications are expected. This paper tries to find correlation between Fatality rate COVID-19 (dependent variable) and governments spending on healthcare (independent variable). The analysis assumes high fatality as negative indicator for the economy and tries to assess if a high healthcare spending can reduce the fatality in such a scenario.

2. NEED AND OBJECTIVE OF THE STUDY:

The study assumes that a high fatality rate has a negative impact on economic indicators, the role of government healthcare spending and Health Economics policies is to minimize the trade-off between public health and economics. To establish a correlation between the two it is found that the negative impact of adverse health scenarios can be minimized by making healthcare a priority and spending to develop healthcare infrastructure to an adequate level.

3. OBJECTIVE:

- To analyze the correlation of between government healthcare spending and Fatality rate of a Pandemic.
- To present value of human lives in economic terms to address the importance of better developed healthcare systems.
- To suggest strategic policy changes and promote a positive outlook towards health economics.

4. LITERATURE REVIEW:

Table1: Literature review on topic

Author	Title	Findings
Bradley. Condon Tapen Sinha	Global lessons from the AIDS pandemic: Economic, financial, legal and political implications Global lessons from the AIDS pandemic: Economic, financial, legal and political implications	A book that examines a global pandemic from a multidisciplinary perspective and analyses economic impact, political response and laws regarding public health. Authors explain the current scenario and

		explains importance of prevention, treatment and human rights protection as a part of pandemic strategies and an recommends changes in international economic, financial and healthcare organizations.
Jamison Pike, Tiffany Bogich Sarah Elwood Davigd C. Finnoff and Peter Daszak	Economic optimization of a global strategy to address the pandemic threat	The study concludes that globally,pandemic prevention policy need to be coordinated and implemented. The study also states that investment in reducing ill health drivers will be more cost effective for the economy than usual.
Robert J. Barro, José F. Ursúa, Joanna Weng Robert J. Barro, José F. Ursúa, Joanna Weng	The Coronavirus and the Great Influenza Pandemic: Lessons from the "Spanish Flu" for the Coronavirus's Potential Effects on Mortality and Economic Activity	The researcher estimates that the pandemic on an aerage reduced real per capita GDP by 6 percent and private consumption by 8 percent, declines comparable to those seen in the Great Recession of 2008–2009. The researchers note that "the probability that COVID-19 reaches anything close to the Great Influenza Pandemic seems remote, given advances in public health care and measures that are being taken to mitigate propagation."
(Barro, Ursúa, & Weng, 2020)	The Coronavirus and the Great Influenza Pandemic: Lessons from the "Spanish Flu" for the Coronavirus's Potential Effects on Mortality and Economic Activity	this research concluded that countries with lesser population density and provide quality health system, support and media information are likely to show low Pandemic indicators.
Maria Nicola,Zaid Alsafi Catrin Sohrabi, Ahmed Kerwan, AhmedAl-Jabir ChristosIosifidis Maliha Aghae Riaz Agha	The socio-economic implications of the coronavirus pandemic	With worries of a new recession and financial turmois, times like these call for resilient and strong leadership in healthcare, business, government and society at large. Relief measures need to be implemented and adjusted for those that may fall through the cracks.
M. J. Orsi and J. R. Santos,	Estimating Workforce-Related Economic Impact of a Pandemic on Commonwealth of Virginia	The study gives a list of industries most affected by a pandemic.
Favero, C., Ichino, A., & Rustichini, A	Restarting the Economy While Saving Lives Under Covid-19. Retrieved July 30, 2020, from	This study characterizes the policies of response to the pandemic that are efficient with compared to loss of lives and GDP loss. Policies may work and save many lives with low, as long as they differentiate by demographics. Careful safety measures may contribute to reduce fatalities.

Claudius Gros, Roser Valenti, Lukas Schneider, Kilian Valenti and Daniel Gros	Containment efficiency and control strategies for the Corona pandemic costs	This study measures the efficiency of containment policies and detailed estimates of medical, social and economic costs during the course of pandemic
Fernandes N.	Economic Effects of Coronavirus Outbreak (COVID-19) on the World Economy	This study shows the estimate costs that can be avoided through globally coordinated investment in public health worldwide.
David N. Weil	ACCOUNTING FOR THE EFFECT OF HEALTH ON ECONOMIC GROWTH	This study finds a positive correlation between Health status, workers productivity and economic growth.
Porter, E., & Tankersley, J.	Shutdown Spotlights Economic Cost of Saving Lives	it would seem crass to weigh economic losses against human lives. Yet communities still value items such as work, food and money to pay bills — and the abilito meet other needs and prevent risks.
Martin S. Eichenbaumz Sergio Rebelox Mathias Trabandt	The Macroeconomics of Epidemics	This research finds that epidemic has both aggregate demand and aggregate supply effects and that the two together lead to a big recession

5. RESEARCH METHODOLOGY:

5.1 Research Design

The research is based on secondary data of top 50 countries affected by the Covid-19 Pandemic in terms of number of infected population.

We are considering Government health spending as independent variable and covid-19 fatality as the dependent variable to find a correlation between the two.

5.2 Methodology

These two variables were converted into panel data and correlation analysis is conducted. SPSS software is used for analysis.

5.2.1 Data Source and Sample

The data of % of GDP governments spent on healthcare was collected from the latest world bank statistics of the year 2017., data for Covid-19 cases was found on World Health Organizations' website.

5.2.2 Limitations to the study

Heterogeneity between countries selected like demographics and available developed healthcare systems may hinder the accuracy of results.

Per capita healthcare spending of a particular year may give inaccurate result as health care is built gradually through continuous investments

5.2.3 Variable Description

The Government Spending data was available in terms of per capita health expenditure

The fatality rate has been calculated by number ~~of de~~aths compared to total positive case The fatality rate has been calculated by number of deaths compared to total positive case

5.2.4 Hypothesis

Null Hypothesis:

H0 – There is no correlation between the %GDP Government health spending and Covid-19 fatality rate.

Alternate hypothesis:

H1 – There exists correlation between the %GDP Government health spending and Covid-19 fatality rate.

6. FINDINGS :

Data was uploaded to SPSS software for further analysis. The correlation program was used and the results are presented in the table below.

Table1: Correlations between % expenditure and mortality			
		%Expenditure	Mortality
%Expenditure	Pearson Correlation	1	.373**
	Sig. (2-tailed)		.010
	N	48	47
Mortality	Pearson Correlation	.373**	1
	Sig. (2-tailed)	.010	
	N	47	49
**. Correlation is significant at the 0.01 level (2-tailed).			

The Test at 2 tailed significance of 0.01 level found there to be a significant correlation between the two variables. In this case we should reject the null hypothesis and accept the alternative hypothesis.

The test suggests that with growing populations size of pandemics will increase and consequently the death toll will increase too, however development of healthcare systems could lower the increase in this death toll.

It is important here to note that the test fails to establish an inverse relationship. This could be due to a number of factors.

Developed countries have already spent on their healthcare systems in the past to reach a certain level of operability, hence their further requirement of funds may not excessive

Developing countries lack the health infrastructure for a pandemic scenario, their investment maybe high but there are other internal problems.

Developing countries also lack the capacity in terms of testing hence data from these countries isn't always accurate and representative of the population.

7. DISCUSSIONS

The data establishes that a better healthcare system would consequently lead to a much better response in times of a pandemic. Healthcare spending and reserve funds are primarily established for a pandemic or war. Although tradeoffs are routinely made between health and resources in the health system, due to the issue of scarcity. Also related is the absence of consideration of the potential expense of the health effects policies sought. This refers to the consequences on families (including safety impacts) of postponing normal treatment and implementing segregation but also implicitly the wellbeing benefits that might be made with further spending at less time-consuming periods. If HE models are developed we can see cost figures per life-year, which will check the choices made. If choices are shown to be cost-effective, they are by mistake and not by design. Hatswell A. J. (2020).

7.1. Statistical value of life:

Let's call an expense of a flu pandemic with the Great Pandemic effect. About 2.8 per cent of the world 's population at the moment was 50 million deaths in 1918-19. Since then, the world population has risen more than double, a flu pandemic at this period that will require over 150 million lives to destroy 2.8 per cent of all humanity. This is an incredible amount. This may be translated into an much more astounding numerical worth by leveraging studies about how much you are able to spend to escape catastrophic safety and other hazards-economists consider this economic meaning of existence. Statistical life expectancy for a young person in the United States is valued at about $5 million. This implies that a young adult will spend around $500 for a 1/10,000 decrease in the risk of dying at each age, and $1000 for a 1/1,000 decrease in the likelihood of dying. Suppose the economic worth of living in a world with half the US per capita wealth for a average young adult will be $2.5 million. Should we instead presume that the same proportion of the people will perish in a pandemic in all nations, the overall expense of a pandemic equivalent to the magnitude of the Great Pandemic will be more than $100 trillion. A quantity of the number is unthinkable. The consequences of such a pandemic on world GDP, the economic results which are normally measured, are evidently greater in magnitude. (Becker & Posner)

For examples, if we say it's worth paying billions. Consequently, politicians use what is known as the Worth of a Value of a Statistical Life (VSL) while designing legislation to put an upper limit on how much risk government can impose to save lives. If lawmakers assign infinite economic worth to any existence, they will spare no cost (and be brazen in inflicting every inconvenience) if they actually proved so of dollars per person to stop needless deaths, no money will be left. (Conover, 2020). It's safe to say that loss of life causes economic damage but the health economics dilemma is the trade-off. How much spending is Justified to save a life or how much economy can be neglected to save lives. For this purpose Economic evaluation methods like cost benefit and cost utility analysis are carried out. Cost here means the sum of the gains lost because of the non-use of resources elsewhere. Benefits are determined from the impact a government plan has on the socioeconomic status of the population. The methods in which advantages are assessed result in a trade-off between the future impact and the practicality of measurement techniques. Cost-minimization

research includes comparing multiple approaches that have the same aim and figure out which is the best way to accomplish the same effect. (Walker, Hutubessy, & Beutels,)

Under such a situation, an significant task for epidemiologists is to help politicians agree on the key prevention goals — e.g. reducing morbidity and related mortality, preventing an outbreak surge that overwhelms healthcare systems, maintaining economic impacts at sustainable rates, and flattening the disease curve to wait for vaccine creation and production on scale. Such mitigation objectives are difficult to achieve by the same interventions, so choices are to be made about priorities.(J.W.T. Elston, C. Cartwright, P. Ndumbi, J. Wright 2017)

Reverse causality or endogeneity therefore prevents reliable research. The concept of endogeneity is the mutual selection of variables within an economic structure. Simply stated, while improved wellbeing would encourage higher wages, it is often the case that higher salaries can enable greater health, because there are more resources available for disease prevention and treatment, because citizens have exposure to better quality health products and services. It is often likely that non-observable variables that also influence both health and income create further difficulties in detecting health impacts on economic development.

The above-mentioned empirical methods rely on market-based variables of the economic effect of disease and accident, and thus only provisional assessments of the maximum effects of disease or injury on economic wellbeing are feasible. Nordhaus (2005, p. 374) claims, to illustrate, that according to traditional national income measure, "an economy in which people have a per capita income of $20,000 with lives that are nasty, brutish, and short would be ranked as equivalent to one with the same per capita income and lives that are healthy, civilized, and long (…) the key point is that the same annual income with a long and healthy life has a higher living standard than that income with a short and diseased life". Health-related improvement is the main activity area neglected if the impact of disease is measured only in terms of GDP.

(WHO GUIDE TO IDENTIFYING THE ECONOMIC CONSEQUENCES OF DISEASE AND INJURY)

For majority of health care workers world-wide, the Covid 19 pandemic is their first experiencing population-based care. In the past, infectious disease outbreaks, epidemics, and pandemics were rare and resulting exclusively by natural disasters, and war. In the early 1900s.as the human population has grown, the spread of these diseases increased through unsustainable urbanization, biodiversity loss, and climate change. moreover, they are accelerated by an increasing number of populations suffering from chronic deficiencies in food, water, and energy. The World Health Organization (WHO) and their International Health Regulation (IHR) Treaty, organized to manage population-based diseases such as Influenza, re (SARS), H1N1, (MERS), HIV, and Ebola, have failed to meet expectations. partly, this is due to influence from powerful political donors, which has become most evident in the current COVID-19 pandemic. The global citizens will no longer tolerate an ineffectual and passive international response system, nor tolerate the selfish political interference that authoritarian regimes and others have power over the WHO. In the current scenario both the WHO with its IHR Treaty have the potential to be the most effective mechanisms for pandemic response and risk reduction world-wide. Healthcare workers and health decision-makers need to speak up and advocate for a stronger treaty, a return of the WHO's singular global authority, and support coordinated population-based management. Burkle F. M. (2020)

Pandemics threaten global health and economies and are increasing in numbers. Globally coordinated strategies to tackle pandemics, similar to current strategies that deal with climate change, are adaptive, meaning they attempt to reduce the impact of a pathogen after it has been exposed.

(Pike, Bogich, Elwood, Finnoff, & Daszak, 2014) use real options economic modeling of current globally coordinated strategies for pandemic prevention and show that they would be optimally implemented within 27 years to reduce the annual rise of infectious disease events by 50% at a one-time cost of approximately $343.7 billion. They then analyzed World Bank data on multilateral “One Health” pandemic mitigation programs and found that, because most pandemics have animal origins, mitigation is more cost-effective than business-as-usual adaptation programs, and saves the economy between $344.0.7 billion and $360.3 billion over the next 100 years if implemented today. (Pike, Bogich, Elwood, Finnoff, & Daszak, 2014)

Global cooperation is necessary especially in the sphere of healthcare and economic development. All countries need to participate proactively. Too much loss is already generated if we act once the disease has taken hold in many other countries and close borders once a pandemic has started. Poverty does kill poor people, but COVID-19 shows that if diseases reach community transmission phase in poor countries due to high population density, poor quality public health and interaction with wild animals, these diseases kill people of any socioeconomic group in a society. There needs to be a considerable increase in the investment in public health and development in the developed countries and even more so in the developing countries. Studies in the past indicate the possible cost saving through global cooperative investment in public health globally. These critical policy interventions have existed for decades, yet politicians choose

to avoid the scientific evidences on the role of public health in improving the life quality and as a driver of economic development. (Fernandes, 2020)

It is important to allocate large additional investments to the health care sector. The Government could immediately allocate additional resources for: staffing in the healthcare sector, purchase of equipment that maybe needed, mobilizing resources to rapidly expand healthcare capacity, and direct researchers and industries in the health field. Government packages could do more in this context, financial incentives and exemptions from some regulations would be necessary in a time of emergency. There needs to be a war like strategy in the health sector right now. (Baker, Bloom, Davis & Terry, 2020)

However, because of time value of money without continual funding, investments gradually start depreciating them temporary. Moreover, if these resources were already deployed globally before the Pandemic began, they may have been accessible faster.

This is a dilemma for health economists: whether to pump a sudden cash flows for preventions techniques or ignore the temporary risk and not making budgetary changes, the latter might have short comings. A global fund, formed exclusively to produce a network of frontline workers and to support costs of maintenance to avoid an overburdened healthcare system. This approach is in sync with aims of WHO's GOARN (Global Outbreak Alert and Response Network). A simple technique to mitigate the pandemic threat may be a better-funded GOARN with commitment of donor funding that cannot be significantly reduce in times of severe need like a pandemic or recession.(T. Allen, KA. Murray, et al)

The Covid-19 led public health crisis was an opportunity many governments identified early to make dynamic changes in their public health sector. Countries like the UK and Spain reformed their health care systems, and fixed other inadequate in public infrastructure. Some governments also used the crisis a to fix the economic system and the financial system with the help of stimulus packages to safeguard their economies from adverse impact. (Ozili & Arun, 2020)

This in light of the current pandemic scenario suggest that funding for global healthcare in countries with high risk of pandemic emergence are urgently required for better prevention and response to the threat (Global Health Security Agenda 2018).

There needs to be capital investment in order to provide safe and accessible treatment during and in-between crisis, especially in developing countries where healthcare systems may not be well developed.

Guidelines should be clear and suggest that the optimum use of such funds should serve for global insurance against emerging infectious diseases. Here, initial investments should be used in strengthening healthcare infrastructure coupled with continued investment to face a healthcare crisis, if so happens (T. Allen, KA. Murray, **et al)**

8. FUTURE IMPLICATIONS:

The findings and discussions of this study show evidence that there is still inadequate research to link health and economics together to accurately measure their interrelation. The endogeneity of variables of these two fields cause these inaccuracies. Furthermore, certain variables such as the literacy of the population to understand the implications of certain policies would prove difficult to measure. It plays a major role in the effective implementation of whatever policy formulated by any government.

However, based on the discussions it is clear that the trade-off between lives and economic values is disturbing, and not justifiable in the long run when there exists enough evidence that preparing to save everyone is significantly cheaper than trying to save some lives and some part of the economy. The global spending on health compared to defense or energy is optimal and unjustifiable. The Governments need reconsider their budgetary allocation that, with unprecedented times, there needs to dynamic changes in the way things work around the world. In an integrated world of 2020 the possibilities of a war are minimal whereas the bigger threats are healthcare facilities and climate change.

The old age belief of absurd quantities of military spending in the name of defense needs to be reconsidered. Upcoming issues which are rather noticeable such as climate change and the loss of life, require the same, if not more, attention and conviction as do the other areas of the economy. At this point, the ignorance of these areas and promoting military spending is not only worrisome but also rather impractical. Instead, the focus needs to be on how to be more coordinated and compassionate outlook of the future. Individual agendas need to be set aside and steps should be taken in the direction of making a healthier, safer and more sustainable world and economies for everyone.

Finland is a forerunner in this strategy of uprooting foundations of population based crisis, the country ended homelessness and provided shelter for everyone. It was not inexpensive, however the government argued that it would be more expensive to keep homeless people on the streets for an extended period of time. This is just one of many cases where eradicating the problem completely is more profitable than tackling it on an ongoing basis. This is referred to as ***Strategy 1. Eradicate.***

However, such large level crisis is highly rare and unpredictable, in some cases you can only mitigate your loss. For example, Wimbledon Tennis tournament started paying pandemic insurance premiums of around $1.5 million

annually in 2003 after the SARS outbreak. Come 2020 all sporting events were cancelled and organizers faced huge losses, whereas Wimbledon that had paid $31.7 million in premiums, received a payout of 142 million. Such an insurance, though expensive, could have huge returns. The scope of insurance could be widened with such insurance products and can boost the economy as well as help safeguard. (Insurance journal, 2020) This is referred to as ***Strategy 2. Insure.***

While some countries are facing the second wave of COVID-19 cases and others still dealing with the first one, New Zealand followed the Pandemic guidebook and successfully flattened the curve and brought down the coronavirus cases to 0. The proactive measures and effective implementations were impeccable. Moreover, when WHO declared the pandemic Healthcare Workers were given the charge of deciding national response policies. This kind of commitment and preparedness need to be adopted everywhere. *Strategy 3. Adapt*

Just like any business, whenever there exists a threat, it's better to be proactive than reactive. Yet, just like this pandemic, certain threats cannot be seen until they happen. The best course of action would be to adapt to the situation, and formulate a new, better strategy than those continued for ages. The requirement of International leadership is dire and is not satisfied with the current Organizations like WHO and UN which are largely funded by authoritative world governments, hence independence of such an organization is important.

The WHO has well defined strategies and is actively working to spread the philosophies on new age terms like universal health coverage, Health Financing, Health Budgeting and Health Taxes. However, the process of achieving such Health Systems via WHO seems slow due to lack of coordination with world government. WHO, while an international organization, lacks the power to enforce certain policies. The last call is on the respective government. The organization is rather suggestive than implementing.

It could be said that the world cannot be blind to dangers such as the COVID-19, in the hopes of no recurrence of such. Prompt action is required, whether in the form of a more authoritative health organization which would ultimately have certain degree of power of enforcement during such tragic times, or higher allocation towards healthcare infrastructure of countries unable to treat the ill. While there are two options suggested in this paper, a coordinated mix between the two suggestions could significantly prepare the world as a whole against such pandemics to happen in the future.

REFERENCES:

1. Baker, S. R., Bloom, N., Davis, S. J., & Terry, S. J. (2020). Covid-induced economic uncertainty (No. w26983).
2. Ozili, P. K., & Arun, T. (2020). Spillover of COVID-19: impact on the Global Economy. Available at *SSRN 3562570*.
3. Fernandes, N. (2020). Economic effects of coronavirus outbreak (COVID-19) on the world economy. *Available at SSRN 3557504*.
4. Becker, G., & Poner, R. (n.d.). Some Economics of Flu Pandemics-Becker. Retrieved July 28, 2020, from https://www.becker-posner-blog.com/2009/05/some-economics-of-flu-pandemics-becker.html
5. Conover, C. (2020).How Economists Calculate the Costs and Benefits of COVID-19 Lockdowns. Retrieved July 28, 2020, from https://www.forbes.com/sites/theapothecary/2020/03/27/how-economists-calculate-the-costs-and-benefits-of-covid-19-lockdowns/
6. Walker, D. G., Hutubessy, R., & Beutels, P. (2010). WHO Guide for standardisation of economic evaluations of immunization programmes. *Vaccine, 28(11), 2356-2359.*
7. Elston, J. W. T., Cartwright, C., Ndumbi, P., & Wright, J. (2017). The health impact of the 2014–15 Ebola outbreak. *Public Health*, *143*, 60-70.
8. Burkle, F. M. (2020). Political intrusions into the International Health Regulations Treaty and its impact on management of rapidly emerging zoonotic pandemics: what history tells us. *Prehospital and disaster medicine*, 1-5.
9. Porter, E., & Tankersley, J. (2020). Shutdown spotlights economic cost of saving lives. *The New York Times*.
10. Condon, B. J., & Sinha, T. (2008). *Global lessons from the AIDS pandemic: Economic, financial, legal and political implications*. Springer Science & Business Media.
11. Hatswell, A. J. (2020). Learnings for Health Economics from the Early Stages of the COVID-19 Pandemic.
12. Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A., Iosifidis, C., ... & Agha, R. (2020). The socio-economic implications of the coronavirus pandemic (COVID-19): A review. *International journal of surgery (London, England), 78*, 185.
13. (WHO GUIDE TO IDENTIFYING THE ECONOMIC CONSEQUENCES OF DISEASE AND INJURY)
14. Favero, C. A., Ichino, A., & Rustichini, A. (2020). Restarting the economy while saving lives under Covid-19.
15. Zanakis, S. H., Alvarez, C., & Li, V. (2007). Socio-economic determinants of HIV/AIDS pandemic and nations efficiencies. *European Journal of Operational Research*, *176*(3), 1811-1838.

16. Pike, J., Bogich, T., Elwood, S., Finnoff, D. C., & Daszak, P. (2014). Economic optimization of a global strategy to address the pandemic threat. *Proceedings of the National Academy of Sciences*, *111*(52), 18519-18523.
17. Barro, R. J., Ursúa, J. F., & Weng, J. (2020). *The coronavirus and the great influenza pandemic: Lessons from the "spanish flu" for the coronavirus's potential effects on mortality and economic activity* (No. w26866). National Bureau of Economic Research.
18. Hickok, K. (2020). What is a pandemic.
19. Hwang, A. D. (2020). Coronavirus cases are growing exponentially–here's what that means. *The Conversation. https://theconversation. com/coronavirus-cases-are-growing-exponentially-heres-what-thatmeans-135181*.
20. Ferguson, N. M. (2020). Ferguson NM, Laydon D, Nedjati-Gilani G, et al. *Impact of non-pharmaceutical interventions (NPIs) to reduce COVID19 mortality and healthcare demand*.
21. Sandford, A. (2020). Coronavirus: Half of humanity now on lockdown as 90 countries call for confinement. *Accessed on*, *17*.
22. More than 3.9 billion people, or half of the world's population, have now been asked or ordered to stay at home by their governments to prevent the spread of the deadly COVID-19 virus
23. Macdonald, J. (2020, March 26). COVID-19 and Game Theory. Retrieved June 14, 2020, from https://www.adamsmith.org/blog/covid-19-and-game-theory
24. Wan, W. (2020). The coronavirus pandemic is pushing America into a mental-health crisis. The Washington Post.
25. Kumar, A. M., Singh, B., & Mehta, S. (2020). The link between lockdown, COVID-19, and domestic violence. India Development Review.
26. Pike, J., Bogich, T., Elwood, S., Finnoff, D. C., & Daszak, P. (2014). Economic optimization of a global strategy to address the pandemic threat. *Proceedings of the National Academy of Sciences*, *111*(52), 18519-18523.
27. T. Allen, KA. Murray, et al. "The Economic Case for a Pandemic Fund." *EcoHealth*, Springer US, 1 Jan. 1970, link.springer.com/article/10.1007/s10393-018-1338-1.
28. Greenstone, M., & Nigam, V. (2020). Does social distancing matter?. *University of Chicago, Becker Friedman Institute for Economics Working Paper*, (2020-26).
29. Lizzygurdus. (2020). These stocks could get a boost from the millions working from home, traders say. Retrieved June 26, 2020, from https://www.cnbc.com/2020/04/06/coronavirus-stock-market-work-from-home-plays-zoom-stock-in-focus.html. (Accessed on June 2020).
30. Garrett, T. A. (2008). Pandemic economics: The 1918 influenza and its modern-day implications. *Federal Reserve Bank of St. Louis Review*, *90*(March/April 2008).
31. Hutt, R. (2020, March). The economic effects of COVID-19 around the world. In *World Economic Forum. Accessed* (Vol. 22).
32. The Great Lockdown: Worst Economic Downturn Since the Great Depression. (2020, April 21). Retrieved June 26, 2020, from https://blogs.imf.org/2020/04/14/the-great-lockdown-worst-economic-downturn-since-the-great-depression/
33. Afp. (2020, April 21). How can crude oil prices be negative? Retrieved June 26, 2020, from https://economictimes.indiatimes.com/markets/commodities/news/how-can-oil-prices-be-negative/articleshow/75275366.cms?from=mdr
34. https://www.worldometers.info/coronavirus/?utm_campaign=homeAdvegas1?#countries
35. Ehlen, Mark. (2007). Economic Modeling for the Analysis of Pandemic Influenza - https://www.researchgate.net/publication/263504612_Economic_Modeling_for_the_Analysis_of_Pandemic_Influenza. (Accessed on June 2020).
36. Tracking the Global Impact of the Coronavirus Outbreak. (2020). Retrieved 25 July 2020, from https://www.bain.com/insights/tracking-the-global-impact-of-the-coronavirus-outbreak-snap-chart/.
37. Orsi, M. J., & Santos, J. R. (2009). Estimating workforce-related economic impact of a pandemic on the Commonwealth of Virginia. *IEEE Transactions on Systems, Man, and Cybernetics-Part A: Systems and Humans*, *40*(2), 301-305.
38. Mgbemene, C. A., Nnaji, C. C., & Nwozor, C. (2016). Industrialization and its backlash: focus on climate change and its consequences. *Journal of Environmental Science and Technology*, *9*(4), 301-316.
39. Huertas, A., (2015). *Dear Humans: Industry Is Causing Global Warming, Not Your Activities*. [online] Union of Concerned Scientists. Henriques,M., 2020. *Will Covid-19 Have A Lasting Impact On The Environment?*. [online] Bbc.com.