

The Economics behind Virology

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I. THESIS

Do the negatives of Imprudent curiosity of science outweigh its benefits faced by the masses?

Is humanity at a stage beyond which no further perilous experimentation and compromise can be accepted for sustenance ?

Does our healthcare system know when to draw the line ?

With having a catastrophic pandemic prevailing since the past two years,it has made one ponder what led to such an inopportune circumstance and how it's evasion is absolutely necessary:come what may

Epidemics throughout history have led to various economical, social, political setbacks. Forget growth, it conduces the world stagnant;

So does that imply that one should suspend any risk binding intrusivity that is answered in the name of advancement?

II. HISTORY

The past is proof that the danger of man-made pandemic sparked by laboratory virus escape is not hypothetical.

Events of the yesteryears are testimonial to this hypothesis.The data presented further unravels a series of events catering to this theory.

Polio

Scientists at State University Of New York created polio, a deadly artificial virus by buying DNA pieces. The database from which the researchers took their codes was shockingly available to almost anyone. It turned out to be a virus deadlier than smallpox yet its development was owed to the ulterior motive of having their own artificially created POLIO.

H1N1

The H1N1 human influenza pandemic originated in the year 1918 causing the deaths of approximately 100 million people.The flu caused blood to penetrate into the lungs of victims. They released blood from their noses and mouths before drowning in the blood inside their lungs.

The virus returned in 2009,but it was hardly lethal;it's when Scientist Yoshihiro kawaoka took samples of the mutated strains that caused the 2009 epidemic and formulated a deadlier strain impending to the vaccine. His motive was to create the original virus to study it but many could pay for his unintentional mistake and uncalled for curiosity.

Black Death

Between 1347 and 1351, millions of Europeans were afflicted with a mysterious disease that killed over 50 million people.Today,we know this disease is the Black Death, which is caused by the Yersinia pestis bacteria.A few years ago, researchers from several schools, including the University of Tübingen in Germany and McMaster University in Canada, recreated the deadly bacteria from DNA samples extracted from the teeth of a victim who died during the plague and many researchers & scientists proved that it carried imprints of the original virus.

-Cases of Weaponizing a Deadlier Virus in Order to Combat its Old Version

During the 2002-2003 outbreak of the SARS epidemic more than 700 people were dead and it affected approximately 8,000 people in 29 countries.The second mutant of the SARS virus was led by a group of researchers headed by Dr Ralph Baric of University of North Carolina. The mutant was named SARS 2.0:created by adding some protein to the original virus.

Indeed, the deliberation was to use SARS 2.0 as a weapon to fight against the original virus SARS. Now, scientists have made it deadlier. The minds thought that by creating a deadlier virus, they could develop vaccines to combat an even more lethal SARS epidemic. However, this version of SARS 2.0 itself could be the ignition of the deadliest epidemic!

Smallpox

Smallpox is one of the most imminent examples of havoc created by laboratory escape.Originally the presence of the virus was

endemic. From 1963-78 the U.K. saw only four cases of smallpox (with no deaths). It was two cases of laboratory escape that led to the death of approximately 300 million lives. -The first identified escape was in March 1972, the assistant at the London School of Hygiene and Tropical Medicine caught the infection as part of an observation-harvesting live smallpox virus from eggs as a growing medium. -The second recognized escape was in August of 1978, a photographer working at Birmingham Medical School got infected with smallpox which ultimately led to her death, she infected her mother, who survived. Her workplace was immediately above the smallpox laboratory at Birmingham Medical School. This mishap occurred due to the faults in the ventilation and shortcomings in technique. Proving the fact even small loopholes can be a source of grave danger provoking situations.

Bird flu

Bird Flu is a similar example like others, Originally the natural bird flu could not be transmitted amongst humans easily. It is when the dutch scientist tampered with the natural bird flu with the intention to prepare for a mutated bird flu epidemic, they created a mutant that was even a deadlier version of the original strain. Ten generations later this very virus mutated and converted into an airborne disease. However, the natural bird flu wasn't originally airborne. Beyond this controversy. It became even more problematic when the dutch researchers attempted to publish the process to produce this deadly virus. Again ignorant to the fact that terrorists could use this study to create some biological weapons that could kill half the people in the world.

Nevertheless, encroaching of viruses have contributed towards transcendence of various studies and creation of antidotes

Since the reign of Edward Jenner, viruses have been used in vaccines. It is through tampering of viruses that medicine against polio, measles, chicken pox etc. --some of the very deadly diseases-- prevention was possible.

Experiments on modification and genetic variation of viruses can be used to make altered genomes which translate as vectors and vehicles in plants and animals. This process advocates efficient transgenic flora and Fauna.

Additionally, only through controversial analysis vaccines for hepatitis protection of the liver against human papillomavirus and cervical cancer were invented. **On the contrary, these assertions have their own demerits.**

III. ECONOMICAL ASPECTS

Economics unfolds the pathway to understand the implications of past, future, and current models of viruses-explaining their long lasting effects. Consequently, the primary consideration of the research illustrates the major factors affecting global economies and supports its arguments through historical progression witnessed in the past.

DEMERITS

3.1 Effect on Income & Employment

Epidemics cause ambiguous effects on earnings and cogent income!

While the demand for necessities rose, aggregate demand declined resulting in unemployment in retail sectors of medium and large industries.

Reduced income is also cyclically related to unemployment which correspondingly plummets demand in all productive sectors. This insinuates negative repercussions on savings and investment potential as well.

By way of example, agriculture and food industries which are based on demand of the service sector and direct consumption both got afflicted the most by this pandemic. Back in 14th century during the Black Death, variation in the role of the working class due to shift in labour bequest and decline in labour supplies added substantial evidence to this presumption

3.2 Giving Rise to Black Marketing

Black markets occupy a prominent place in the informal economic sector of the world. However, the effects of black market on the global economy are phenomenal.

Black market avails goods to people all that they need at cheaper prices or provides all that is short of supply at higher prices.

When people indulge in buying goods from black market in any above given scenario it leads to losses in domestic industries and hence to the government.

Black marketing can be seen rising on an unprecedented scale during epidemics and many reasons take the issue to a point of pressing concern they are as follows:-

1) UNDERESTIMATION OF NATIONAL INCOME

The illegal nature of black market makes it a riskier orbit of transactions. Moreover, the payments confected in black markets are completely under the absence of any authentic record making it a strenuous task for the government to identify the actual economic status of the country. Therefore, it becomes difficult for the government to plan and

implement policies for the sake of economic development.

2) DELIBERATE CREATION OF SHORTAGE

Shockingly, corruption is the major adversity to black marketing. Deliberate shortage of supply deprives people of the very needful resources that are required under desperate circumstances.

Regardless of the spike in prices, excessive demand for the goods persists.

These illegal, unlicensed firms are often small businesses involving trillions of dollars—they employ a substantial portion of the world's working class.

Take the example of Remdesivir, a covid drug which carved many savings when advised by numerous doctors, the deliberate shortage of this injection forced people to buy it from the black market at almost ten times the actual price.

3.3 Inequality based on poverty

A pandemic results in socio-psychological disturbances to the society, a situation wherein the poor are more likely to witness the burden of the pandemic than the rich. Limited access to health services, poor congested households consequently increase their risk of being infected by the contagion. The seasonal nature of their jobs has pushed so many people under the poverty line—daily wage workers being affected the most. Developing countries like India and Nigeria have been majorly hit by this trend, with approximately 12 million people being engulfed by poverty.

Limited savings and lack of access to insurance also plays a major role in disparity based treatment. For example, the economic circumstances of many rural migrants in India who were only dependent on their daily wages were forced to take their children out of school and these children were asked to work in order to make ends meet.

3.4 Impact on GDP and sectors of the economy

Covid 19 is the testimonial of the global shrink in GDP's. Economies of the world's top most countries plunged into ashes.



With India at nearly -23.9%:20 years behind in the past followed by UK, France, Italy, Canada, Germany, Japan, USA at -21.7%, -18.9%, -17.7%, -13%, -11.3%, -9.9% and -9.1% respectively.

(Source; official GDP release CEIC)

Countries are mounting record amounts of debt amidst COVID-19!!

It is evident that a pandemic can result in decline of tax receipts and a rise in expenditure hence causing fiscal burden, especially in developing and underdeveloped countries where there is a higher fiscal constraint and an urgent need for improvement in tax systems.

A typical case was seen during the Ebola Virus in Liberia due to the prodigious rise in public health expenditure. The decline in revenue was one of the most recurring outcomes to curfews and quarantines. This vicious circle of a pandemic and its repercussions continues even though the intensity of the infection subsides with time the society is left to bear the long term damage that comes along with it. For instance, the lockdown enforcements and the voluntary social distancing during COVE have had a critical effect on the service, travel, tourism, catering and leisure sector.

A recent reflection on IATA (The International Transportation Association) revealed that the aviation industry's expected passenger revenue loss is a hefty amount of \$13 billion. Furthermore, manufacturing industries got negatively affected. There was a loss of demand accompanied by excessive supply. The changing consumer attitudes and the lack of operation are the reasons for stagnation in the economy. Talking about the agricultural sector, there has been an overall loss in the agro based industry, their main consumption targets hotels and restaurants were

completely shut hence creating the situation of excess supply & no demand forced them to reduce their prices.

3.5 Deficit, Borrowings, Debt trap, Disinvestment

-Owing to the stagnation of the economy, people were pushed under huge debt traps. There were numerous cases wherein the revenue expenditure was surpassing revenue receipts by huge margins. Facing this situation people were forced to borrow funds at exorbitant interest rates: the twofold effect was loss of collateral and forfeit of assets. Additionally, disinvestment in the economy became a common problem, consider the example of gold. A report said there was a huge surge in the number of people selling their jewellery to tide over the pandemic crunch. This trend was fueled by mounting expenses such as electricity bills, school fees, house rents and hospitalisation bills. Orbiting the same radius, stands medical debt and the grave issue of the truncated extent of insurance coverage especially in lower income countries. For instance in India, only around 10% of the population is covered through health financing schemes. The irony is that this ten percent of population comprises the strata of people who can actually afford the medical services, the majority remains unscathed of any kind of resources.

MERITS

3.6 Shift to A Digital Economy

-The digital switch of the economy has aided the process of creating a transparent system of transactions. Besides, businesses and consumers increasingly adapted the digital interface providing and purchasing more goods online, raising e-commerce's share of global retail trade from 14% in 2019 to approximately 17% in 2020. Also, Majority of the dealings started to take place online during the lockdowns. This shift has been so convenient that even routinely items like groceries and milk are being called for through delivery apps. In addition to this the 'work from home' culture has spared the dreadful hours spent on commuting from place to place, thus enabling a higher productivity level.

3.7 Advancement in Medical Technology

The aggravated development of means and tools to counter the wildfire-like spread of the virus, has enabled the creation of several innovations in the medical field.

Actually, the very first vaccine was invented as a protection aid against the smallpox epidemic.

Indeed, meddling with viruses has led to invention of several vaccines mainly for the purpose of

combating the epidemics but it has also supplemented prevention from mutated versions of the viruses: SARS COV-1, hepatitis-B are recent cases.

Take the example of the covid emergency ventilator, designed only within three days. "It's simple and robust and specifically designed to work against covid virus in a contagious environment", said Dr. Rhys Thomas from Glangwili Hospital in Carmarthen. The machine supplies purified air to the patient, also cleans the room of viral particles.

Secondly, the growth of genetic vaccines have been fueled by covid-19, the 94% efficacy of the mRNA vaccines outperformed health official's highest expectations. Additionally, genetic vaccines are another gain; DNA and mRNA vaccines are highly effective as compared to the traditional vaccines which take months, if not years to develop. These Gene based vaccines are likely to result in precise and effective immune response.

In conclusion, any sought of research done in the medical field ends up being the building block for a major breakthrough.

IV. SOCIAL ASPECTS

4.1 Mental Health

In contemporary times, mental health has compromised the sanity of many. It is evident that the situation seems to worsen with the pandemic crushing humanity and isolating individuals

This has been the chain reaction throughout history. The thought of being exposed to diseases that can consume anyone we may be closely or remotely associated with terrifies humans.

Uncertainty, sense of loss of control, financial stress, interpersonal stains are undoubtedly the pathogenic agents in burgeoning hardships for everyone.

In fact, the consequences of not addressing mental health conditions extend to adulthood, impairing all nations human resources.

Above analysis highlights the gravity of the situation and the need of the hour for mental health to be integrated as a critical repercussion of epidemics.

4.2 Lack of Supervision

Spotlighting another sociological extensive problem is--not having the acumen to understand your limitations.

As a case in point, China's research department displays no governing body. This translates into abuse of power, lack of judgement, carelessness, unfair experimentation etc.

Among others, India's healthcare also adds up to this misery since it is completely dependent on bureaucracy.

V. PROPOSED SOLUTIONS

Evaluating the above scenario: endorsed below are the anticipated solutions to reduce or resolve the intensity of the matter.

5.1 Medical Insurance Coverage

Lack of health insurance coverage especially in low income countries conduce as a concession for deteriorating healthcare affairs globally. This also creates grounds to create a deepening situation of rich- poor divide. Proper Implementation of government programmes and schemes need to be executed. Furthermore, this lowering premium rates has encouraged a larger population to get insured.

Ergo, planning and policy making is crucial to ensure effective awareness.

5.2 Formulation of Mandate Code of Conduct

The salvage of such experiments tempts the human race to continue working on such hazardous pursuits.

Therefore, to address this requirement we suggest adhesion to the protocols, concrete requisites to be taken under great consideration with respect to seeking approval from esteemed authority. Present situation suggests that even after years of invention of these deadly viruses, the origin of the discovery is camouflaged.

Equivalently, intimating the concerned authority with the potential danger chaperoned with the task is pivotal. Hence reflecting upon the fact that precautionary measures ought to be more cost effective and safe than recovery expenses.

5.3 Economic Evaluation

The goal of economic evaluation is to facilitate an effective and efficient healthcare system through accessible preventive measures, medical treatments and procedures in this course of increasing medical expenditures all across the world. Some of the potential economic evaluation benefits that can come into play into the expansion of a better health economics system is development of public reimbursement lists, establishment of proper clinical practical guidelines and enlargement of public communication platforms with prescribers.

5.4 Need for a Governing Body Over Controversial Experimentation

Carelessness and lack of supervision are the major causes of increase in vulnerability to exposure of viruses.

Countries and labs without surveillance reveal a grim picture, it is through these communities and practices that wrath has been unfurled frequently. Accordingly, governing bodies must be established in all parts of the world to avoid the ill-effects of pandemic.

VI. CONCLUSION

This research paper sparks off an intense argument addressing the burgeoning conundrum of whether provocative experiments have their own perks or shortcomings. Monetarily, health care might have witnessed exponential growth on graph but on a whole has deleterious effects historically, economically and socially.

It is evident through the history of man made viruses that the plausible goal of these experiments—in which researchers manipulate already-dangerous pathogens to develop antidotes, explain existing viruses, weaponize original viruses and monitor the natural emergence of pandemic strains -- backfired the pioneer intention. On top of that it made bioterrorism inevitable. The TREND seen in the aftermath post the escape of these potent pathogens far outweighs any potential advance.

Now analysing from a macroeconomics perspective, the effect of epidemics on economics is bi-directional. I.e there are shifts in both aggregate demand and aggregate supply trends in the economy. These dynamics occurred due to the transitioning purchasing and consumption attitudes of consumers. Such fluctuations acted as a catalyst in breeding a situation of black marketing.

Black marketing seems to erode the economic stability of many! especially the underprivileged who bear the brunt of such losses.

It becomes a guiding force for stockpiling, shortage and reduction of national income.

The umbrella of medical debts engulfs a huge mass under its ramifications, leading to reduction in assets or creating a liability both of which are unpalatable circumstances.

Economic shocks are a common consequence amidst a pandemic due to the scarcity of human resources as a consequence of rampant illness, and an overall fear stricken behavior added to the already stagnant state of the chain.

Now, considering the social tangent, it is observed detrimental impact on mental health of the individuals and the incompetence instilled in the implementation of the system and behavioural economics.

Supporting this proposition further is quoted Marc Lipsitch, an epidemiologist at Harvard School of Public Health, **“We are not saying this is going to happen, but when the potential is a pandemic, even a small chance is something you have to weigh very heavily,”**

Ultimately, all conclusions are an affidavit of the verdict that, ‘Concoction of plausible crises that rally on account of dubious experimentation and development surpasses the prosperity and welfare accrued from it’.

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