

## Pareto-Criterion and Impact Evaluation of Effects of COVID-19 Pandemic on Education and Economy

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### **Abstract**

*Worse off or better effects of an event or intervention are assessed on the premise that if an event's impact is estimated, more targets should be better off than worse off, or more accurately, than the balance between total gains and total losses should be positive. The advent of COVID-19 pandemic which infected 11,635,939 people and claimed 539,026 lives, as at 8 July, 2020 produced similar oxymoron effects, these is observable as some sectors are thinking about when their loses will be recovered others are counting their gain due to increased production and sales. Apart from the fact that COVID-19 pandemic had disproportionate effects on countries and continents, education and economy sectors stand at the receiving end of all its problematic effects. As at this period, experts have begun to make projection on percentage decrease in world's economy because 0.1 percentage off global GDP was recorded due to lockdown of China economy without consideration of what happened in other countries. Additional cost of running online/remote learning is now the issue that most education stakeholders need to contend with as most teaching-learning interactions are mainly on remote/online platforms due to implementation of social distancing policy and lockdown of education and economic activities. How, where and when are the education and economic activities will be reopened remain a puzzle, therefore, it was recommended that the affected countries should weigh the lost and gain on a rational consideration that it is possible to bring back or revive nation's economy and educate children after pandemic but nothing could be done to bring back lives.*

**Keywords:** Pareto-criterion; Impact evaluation, COVID-19 pandemic, Education and Economy

### **Introduction**

Currently, the world outlook is full of indications that there is global deterioration of social well-being and lack of good health among the citizens. Social, financial and health insecurity are the predominant issues that governments and individuals need to contend with. In fact, it becomes more imperative as these issues constitute physiological need of individuals that attracts attention even when individuals seem to be unconcerned (Ojetunde, 2019). Historically, global disasters and epidemic do not have limited past, they have a long and relatively well-structured history and their recurrence has led to some milestones such as the formation of World Health Organization (WHO) and International Bank for Reconstruction and Development (IBRD) otherwise known as World Bank.

It is not an exaggeration to say that most international organizations or agencies such as International Monetary Funds (IMF), United Nation Emergency Funds (UNICEF) and so on were established as a result of either need assessment of prevailing problematic situations or as means of demystifying the solution-resistant challenges that caused global confusion such as wars, natural disasters and epidemic or pandemic diseases. This is a pointer that the current COVID-19 pandemic requires such interventions and these interventions are even more needed now than ever. Also, someone might be excused for comparing the global health status in the years before 2020 with subsequent years, but to equate mortality, morbidity and the level of health disasters in year 2020 with the previous years is an indication that such an individual is living in the past.

Before 2020, various epidemics and pandemics have been reported in history. Literature revealed that the concern of international bodies on the global health challenges began in 1851 when delegates from different countries met in Paris in an International Sanitary Conference to proffer solution to the Cholera outbreak (Independent Commission on Multilateralism, ICM, 2017). After the meeting of 1851, series of conferences were also held to combat many diseases; popular among them were yellow fever, and the bubonic plague. After some years later, specifically 1892, the International Sanitary Convention that dealt with cholera was passed (WHO, 2018). This giant stride reinforced the League of Nations on health issues and this led to the formation of World Health Organization (WHO) in 1920. As a result, after World War II, the United Nations absorbed all other health organizations into WHO.

Ever since then, rapid increase in health practices and technologies such as development of vaccine, antibiotics and diagnostics became key aspects of health sectors to combat public health risk. Despite these efforts, Epidemic and pandemic diseases such as influenza, malaria, polio, Ebola, tuberculosis, HIV/AIDS, and SARS continue to pose additional threats to public health, particularly in developing countries. In 1982, the epidemics of HIV/AIDS erupted from the United State of America but due to the concerted efforts of different stakeholders, its menace on human population has drastically subsided. In the same vein, in 2004, another epidemic disease called Severe Acute Respiratory Syndrome otherwise known as SARS stormed the area of Middle East, affected over 8,000 people and killed close to 800 infected patients. Around 2014, another epidemic disease called Ebola Virus emerged from Africa, this disease infected 28,000 people and claimed 11,300 lives. African countries are disproportionately affected by outbreaks of these diseases and the resulting crises which are often exacerbated by a lack of investment in their health infrastructure and uneven burden (ICM, 2017).

### **Corona Virus and Advent of COVID-19**

At the moment, the pandemic of novel Coronavirus disease otherwise known as COVID-19 does not only cause alarming mortality among the infected people but also have its grip on other sectors of government apart from the health sector. The virus has spread to all the regions in the world and it has affected 6, 057, 853 people and claiming 371, 166 people as at the end of the month of May, 2020 (WHO, 2020). The peculiar characteristic of the COVID-19

pandemic is the disruption of all sectors such as the shutting down of economy, religious, education sectors and other institutions.

It should be noted that coronavirus belongs to the group of epidemic and pandemic outbreak diseases that its origin is traceable to the Middle East. The first strand of the Coronavirus to be identified around 1960 was called Middle East Respiratory Syndrome otherwise known as MARS and was termed MERS-COV. MER-COV was reported to be contracted mainly through direct contact with the intermediate host or consumption of these animals (Yin and Wunderink, 2018; Zhou, Yang, Wang, Hu, Zhang and Zhang, 2020). Besides, Yin and Wunderink (2018) reported that MERS-COV only spread and infected majority of the people in the Middle East due to its route of transmission from the intermediate host to human being. Between December 2003 and January 2004, another coronavirus also emerged in China. This coronavirus was called Severe Acute Respiratory Syndrome (SARS). It is noteworthy that due to capability of SARS to mutate rapidly under ambient condition, it was reported that SARS has two species; SARS-CoV and SARS-CoV-2 (Letko and Marzi, 2020). The report shows (or reports show) that the SARS-CoV-2 may readily transmitted, but cause less serious human infection rather than SARS-CoV (Simmons, Gosalia, Rennekamp, Reeves, Diamond and Bates, 2005). It was also reported that over 8,000 people from 29 countries were infected and, at least, 774 died worldwide as result of the SARS epidemic (James, 2020). After these series of epidemics and epidemics, the report revealed that global health sector is under-prepared to handle significant outbreak of emerging of other infectious diseases. In fact, it was reported that no country is fully prepared to handle other epidemics or pandemics like the COVID-19 (World Economic Forum; WEF, 2020).

After 16 years of SARS-CoV epidemic, specifically between December 2019 and January 2020 in the Wuhan province, China, another strand of coronavirus was reported to have also caused an easily-spread and deadly disease. This strand of coronavirus is called COVID-19 which is an acronym for coronavirus disease 2019 (Dharmendra, Risharbha and Pramod, 2020). According to Dharmenda, *et al*, the outbreak of COVID-19 swept across China rapidly and has spread to 85 countries outside of China as at 5<sup>th</sup> March, 2020. And as at the end of May, 2020, WHO (2020) reported that the number of the infected people with this novel virus was 6, 057, 853 and has claimed the lives of 371, 166 people at that period. The virus does not only challenge health sector but also put all other sectors all over the world on lockdown.

### **Pareto Criterion and Incidence of COVID-19 Pandemic**

As at 8 July, 2020, the number of confirmed cases of people affected with COVID-19 has reached 11,6635,939 while 539,026 were confirmed dead (WHO, 8 July, 2020). This shows that the number of those affected with COVID-19 is increasing while the death toll is worsened on a daily basis. Individuals and governments alike began to evaluate the impact of the COVID-19 pandemic on various sectors. Ordinarily, events or happenings are always accompanied with either worse off, unaffected or better off effects. Assessment of better off and worse off effect of events on individuals or communities are estimated using Pareto-Criterion. Pareto-criterion holds that a programme or event should make at least one person better off and nobody worse off.

Oyebanji and Ojetunde (2017) are of the opinion that the judgments of the effectiveness of social interventions or events are predicated on the notion that an effective intervention makes at least one person better off and nobody worse off. In economics, this yardstick is called the Pareto-criterion. Thus, it holds that the gains produced by a particular intervention must potentially compensate for losses with something left over. That, if the impact of an event is estimated, more targets will be better off than worse off, or more accurately, that the balance between total gains and total losses will be positive. The advent of COVID-19 pandemic has without doubt made some individuals, countries or organizations worse off, better off or unaffected. As at 8 July, 2020 web-sourced reports show that countries like Cuba and Barbados remained unaffected with COVID-19 pandemic while countries like United States of America and Brazil take the lion's share of the disaster. Also, organizations such as IT firms, health care facilities manufacturers, telecommunication, the internet or communication network providers are at the receiving end of the benefits that the advent of COVID-19 brought.

### **Effects of COVID-19 Pandemic on World's Economy**

From the report on Nariometrics (2020), it was disclosed by the Chief Executive Officer of Zoom, Eric Yuan that the number of users of Zoom's flagship video conferencing application surged from 200 million people on 1 April, 2020, to 300 million users on 21 April, 2020. Zoom daily users increased by 50% in 3 weeks due to the coronavirus outbreak. Forbes (March, 2020) also reported that 343,000 people globally downloaded the Zoom app with 60,000 in the U.S. alone. It may look surprising that as some companies lay-off their employees, some are using the challenging scenario as an opportunity to increase their staff strength. For instance, The Verge (2020) reported that as unemployment surged, Facebook pledged \$100 million in grants to small-scale businesses, and Amazon said it would hire 100,000 people to increase her staff strength. This was probably because the social distancing policy has necessitated most social interactions to be online as a result of prohibition of social gathering and opening of religious and educational institutions.

Also, health care facilities manufacturers are also making a wave at this period. It is not difficult to see individuals producing alcohol-based sanitizer. These sanitizers and medical equipment are in high demand due to the need to maintain hygienic environment as a preventive approach to combat the spread. Patterns of spread of COVID-19 have produced differential impact. Evaluating effect of COVID-19 could be compared to "unstandardized intervention", an evaluation terminology that is used to describe a situation where intervention varies across locations or beneficiaries or a condition whereby the administration of programme service varies with site or subjects (Ojetunde, 2019). Impact evaluation otherwise known as autopsy evaluation examines the effect of an intervention after a long period of administration. However, it has been argued that sometimes, the impact of an event could even be felt right from the process stage/segment (Oyebanji & Ojetunde, 2017). This is obvious during this period of pandemic as better off, unaffected and worse off effects of COVID-19 proved indelible on some sectors while others are unaffected or better off even before the end of the pandemic.

Despite the fact that the pandemic of COVID-19 is not yet over; individuals, organizations and countries have begun to feel the impact. Report by World Economy Forum (WEF, 2020) revealed that China's GDP growth may slow by 0.5 percentage point this year,

taking at least 0.1 percentage point off global GDP growth. This will ripple through developed and emerging markets with high dependencies on China – be that in the form of trade, tourism or investment.

### **Effects of COVID-19 Pandemic on Education Sector**

In education sector, the impact of COVID-19 pandemic is widely emphasized. Countries like China had closed her schools early enough at the onset of the pandemic in Wuhan province. Basilaia and Kvanvadze (2020) reported that the situation in general education in the United States has changed in the spring semester of 2020, when the first case of coronavirus disease (COVID-19) infection was detected in Georgia, USA. This has also led to the suspension of the learning process in Georgia from 2nd March by the recommendation of the Ministry of Education, Science, Culture and Sport of Georgia (MES 2020, the official statement of the Minister). In Africa, the first case of COVID-19 was reported on 14 February in Egypt. Most countries across the continent closed their education and religious institutions around 13th-19th March, 2020 as a result of non-medical preventive measures such as social distancing and prohibition of social gathering to contain its spread. The closed down of educational institutions particularly primary and secondary schools will not only affect the students' learning activities in the school but also parents' spending if their wards' learning is to be continued while at home. School closures in response to epidemic and pandemic situation in the past have shed light on various learning issues outside school setting. For instance, during the 1918-1919 influenza pandemic in the United States, school closures and public gathering bans were associated with lower total mortality rates and various students' learning issues (Simon, 2020).

It was reported that working parents are more likely to miss work when schools were closed in order to take care of their children thus, incurring wage loss in many instances and negatively impacting productivity (Davis, Markel, Navarro, Well, Monto & Aiello; 2015). Localized schools closure placed burdens on academics as parents, guardians and officials redirect children to lesson/tutorial classes that are available (Wardrop, 2009). The Japan Times Online (TJTO, 2020) reported that shutting down of schools have adverse effect on students learning and the effects are disproportionate for under-privileged learners who tend to have fewer educational opportunities outside the school premises. Jordan (2020) also submitted that during close down of schools, parents often facilitates learning activities of their children at home and struggle to perform the tasks which ordinarily they may not know how to carry out. This is especially true for parents with limited education and resources.

In the course of the COVID-19 pandemic, various measures have been taken to facilitate students' learning. These measures tend to vary across nations and governments within each country. For instance, it was reported in the United States of America that some school districts offered alternative child learning options (Times, The Moscow, TTM, 2020). Also, the Governor of Maryland mandated that specific children learning services remain open for the children of emergency personnel while Washington State and California have left it to the discretion of caregiver/teachers (TTM, 2020). It was also reported by Basilaia and Kvanvadze (2020) that in Georgia, Public Broadcaster's First Channel has launched the educational project

titled - “Teleskola” (TV School). The live transmission of lessons of different subjects is broadcast through some TV channels in the U.S. The situation is similar but not the same in Africa, As UNESCO (2020) reported that Africa was the only continent where all countries have opted for a national schools' lockdown. This situation must have affected teachers, students as well as their parents and guardians.

In Africa, at the level of primary and secondary schools, different initiatives have been introduced to facilitate learning on television stations and the radio as a substitute for face-to-face interaction in the school. These were given different nomenclature such as “school at home” in Côte d'Ivoire “school on TV” in Cameroon, “learning at home” or “teachers' room” in Senegal, “school at home” in Togo and “school on-screen” in Benin republic. In Nigeria, there is no special directive from the Federal government, each state and school determined the modality of students' remote learning. For instance, Oyo state created learning platforms on radio and social media for primary and secondary categories of learners and some schools also facilitates their students' learning at their discretion.

However, differential learning opportunities have been noticed, which is an indication that online and remote learning cannot be unconnected with inequality in opportunity to learn among students most especially in Africa due to location differences. In Nigeria, while in some states (specifically Oyo and Lagos states), their teachers have started online and social media teaching-learning interaction with their students, some states in the North Eastern are still gathering momentum. Nigerian Education in Emergencies Working Group (NEiEWG, 2020) reported that international assistance and funding will be made available for the implementation of COVID19 response activities to ensure that children were able to continue their education because of proneness of the North East zone to terrorism.

Ojetunde and Akinyemi (2020) also reported that the response from higher institution stakeholders was different from the primary and secondary ones. The authors revealed that higher institutions stakeholders were not as quickly in their reaction as in other levels of education probably because teaching in higher education level could be ineffective through the traditional media such as television and the radio. As a result, some private higher institutions in Nigeria tuned to social platforms such as WhatsApp, Zoom, Google meeting and so on to ensure that they reach out to their students while those students are still within the confines of their house while most public higher institutions remained indifferent.

As a response in support of education industry, large companies in telecommunication industry such as Microsoft, Google, Zoom, and Slack freely made available some features of their products for free based on request (Basilaia & Kvavadze, 2020). At the period of intense COVID-19 pandemic lockdown, Microsoft offers anyone its premium version of Teams for free for six months and lifted existing user limits. Google also declared its enterprise video conferencing features free for the sizable number of people up to 250 participants. Zoom lifted the time limit of video calls in some countries such as china, japan, Italy, and the US by request (Rani Molla, VOX. 2020) Apart from the general problem created by the COVID-19 pandemic due to lockdown, the emerging argument was that adoption of remote learning mode by learners may generate another problem or heighten the existing problem in education Akinyemi and

Ojetunde, 2020). The authors argued that traditionally, inequality exists in education as a result of difference in socio-economic background, location, learning ability and learning support received. It was hypothesized that it is not impossible that adoption of remote learning platforms could generate additional learning inequalities due to differential self-efficacy in using learning platform by learners, availability of internet networks due to location and internet mobile data subscription among learners due to their socio-economic background.

Apart from the fact that remote learning has the tendency to heighten the existing inequality among learners, teachers may also feel similar impacts which in turn may have effect on students' academic achievement. Gewin (2020) observed that there is no prior training programme for teachers in some schools on how to facilitate learning on online platforms before the advent of COVID-19 pandemic. Another problem that teachers may stand at its receiving end is in a situation whereby computers and IT equipment at home with many children are in heavy demand from parents, children, and other relatives who have to work from home and where internet infrastructure or resources to facilitate online learning is at deficit (Chronicle, 2020). This may create challenges for some teachers as they need to facilitate learning on remote platforms and also cares for the learning curve of their wards.

In addition, the impacts of COVID-19 pandemic on education have uneven effects across different countries. For instance, in late January 2020, China instituted a nationwide lockdown and students learning was transited to online platforms on 17 February and by 27 April, their schools were reopened to prepare their students for college entrance exams. In United States, it was reported that schools' activities in Georgia was suspended on the 2nd March, 2020 by the recommendation of the Ministry of Education, Science, Culture and Sport of Georgia until 16th March, which was later prolonged to 1st April. On 21st March, the country announced a state of emergency for one month with restrictions (The government of Georgia, 2020). The situation in the U.S. has led to the staying at home of 592, 900 students in 2,313 schools countrywide, as there are 2086 public schools with 530100 and 227 private schools with 62800 students (Geostat 2020).

Similar to what happened in the United States, Nigeria closed down all schools at every level on 19 March, 2020 and reopened it on 6 July, 2020 for students who are in terminal classes to prepare them for "common entrance exams" particular to terminal primary class, "Basic Education Certificate Examination" for the terminal junior secondary school students and "Senior Secondary School Certificate Examination" for the terminal secondary school students. The action was reversed on 8 July, 2020 and the resumption date was postponed to year 2021 by the Federal Ministry of Education, due to the possibility of spike in number of COVID-19 infected people owing to the fact that teachers and students may be unable to implement social distancing policy and manage the situation in the classroom settings. However, some studies have shown that long period of school closures and home confinement might have negative effects on children's physical and mental health (Brazendale, K et al., 2017). Study also revealed that "the psychological effects of quarantine or home stay is wide-ranging, substantial and can be long-lasting" (Brooks, Webster, Smith, Woodland, Wessely, Greenberg, and Rubin, 2020).

Based on the afore-discussed background, inference could be made that COVID-19 pandemic does not only produced irrecoverable lost on the world's economy, it has left an indelible mark on education industry that history will never forget and posterity will remember with the wishes to never occur again.

### Conclusion

Measurement of worse off or better off effects of COVID-19 pandemic is an unbelievable oxymoron that every strictly rational individual will doubt its existence. It is noteworthy that as some sectors of government are counting their gains, others are thinking peradventure they would be able to recover the lost in the next two years. Apart from the fact that COVID-19 pandemic had disproportionate effects on countries and continents, education and economy sectors stand at receiving end of all its problematic effects. As at this period, experts have begun making projection on percentage decrease in world's economy because 0.1 percentage off global GDP was recorded due to lockdown of China's economy without consideration of happens in other countries. Also, most schools and institutions have been closed down indefinitely. Although, Pareto-Criterion holds that the gains produced by a particular event should potentially compensate for loses with something left over. That is, if an event's impact is estimated, more targets should be better off than worse off, or more accurately, than the balance between total gains and total losses should be positive. A deep reflection on this premise shows that some sectors of government gain profusely during COVID-19 pandemic, which is an indication that Pareto-Criterion is implied, but not applicable as there are irrecoverable loss of lives and some recoverable losses will take two or more years to amend, most especially in education and economic sectors.

### Suggestions

Based on the conclusion of the review, suggestion could be made that:

- i. government of the affected countries should strengthen sectors that are most productive at this period of COVID-19 pandemic and device alternative means of improving their GDP.
- ii. alternative to face-to-face classroom interaction should be embraced by stakeholders in education to facilitate learning even when there is need to close down the school.
- iii. affected countries should weigh the lost and gain on a rational consideration that is possible to bring back nation's economy and educate children after pandemic but nothing could be done to bring back lives.
- iv. multilateral agency that will be saddled with responsibilities of reconstruction and development of those countries who have been the superior victims of COVID-19 pandemic should be established by United Nations.

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