

## Economics Lessons from EBOLA Outbreak

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### Abstract

A trend called globalization, which started at the early onset of this century, has increased interdependency among international nations. This interdependency has both negative as well as positive effects. An increased air travel network has contributed significantly in global trade. Public goods such as Internet, Financial stability, commercial integration or knowledge promotion has created a new category, which is known as International public goods. Global interdependence has generated few negative effects as well. Increased international mobility has increased the risk of contagion in case of deadly diseases. We have witnessed many International Public Bad, which is symmetry to public goods, such as spread of H1N1, Influenza, in the past. A recent outbreak of EBOLA in SubSaharan Africa is a latest public bad, giving nightmares to global arena.

**Keywords:** EBOLA; Economics; Externalities; Private goods; Public bad; Public goods

### Introduction

Public goods are directly correlated with economic well-being, prosperity, and peace. Countries, mostly developed, having superior public goods in place are better off compared with others and provide welfare to their citizen.

Economic definition qualifies any good, which is non-excludable and non-rivalrous, as a public good. Non-excludability can be explained by inability to prevent non payers from enjoying the benefits of the goods. Non-rivalrous can be said in place when one person's enjoyment doesn't come from other person's expense. When a country provides public good such as defence or economic stability every citizen of that country, including those who haven't contributed in formation of public good, enjoy the benefit and no one is deprived of the public goods put in place.

Sometimes fear and not the benevolence drive the provision of the public good. Take an example of CDC- Centers for disease control and prevention, whose existence came in picture due to fear of the pandemic diseases. CDC strives hard to prevent diseases' negative spillover effects. Endemic occurs due to many scientific reasons and once it starts spreading, it almost becomes non-excludable and non-rivalrous.

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A recent outbreak of EBOLA in Sub-Saharan Africa is a latest public bad, giving nightmares to global arena [1]. Found in 1976 in Sudan, Ebola virus Disease (EVD) is member of the Zaire ebola virus species. This virus is behind largest number of EBOLA outbreaks and is the most deadly Ebola causing virus.

Research has established bats as most likely natural reservoir of EBOLA Virus (EBOV) [2]. Transmission of EBOV between natural reservoir and humans is rare thus making the traceability bit difficult. Generally, transmissions are traced back to a single case where an individual handled the carcass of gorilla, chimpanzee or duiker, which might have fed on partially eaten fruit or pulp dropped by bats.

Bush meat, meat derived from terrestrial wild animals such as apes, is very popular in Sub-Saharan Countries. Consumers and suppliers of the bush meat market might not have thought in their wildest dream that their transaction would create such a dreadful negative externality. Externalities arises whenever action of one economic agent, in this case meat seller, make bystanders worse off, in this case EVD affected people. WHO and CDC, public goods body, are taking desperate measures to contain and defeat EVD in Africa. Guinea, Liberia, and Sierra Leone where almost 14000+ people succumbed to EVD till date are trying solutions of medieval ages. Mass quarantine, border lockdown, which were last seen in some Hollywood apocalypse movies have caught human frenzy.

Sierra Leone's proposed country wide lockdown for 3 days has created huge uproar and posed [3] questions on administrations ability to tame EVD. Opponents of local governments' frantic measures are arguing that governments' lack of resources to provide essential public goods such as disease awareness, public sanitation system, functional hospitals have forced government to opt for such inhuman decisions (Figure 1).

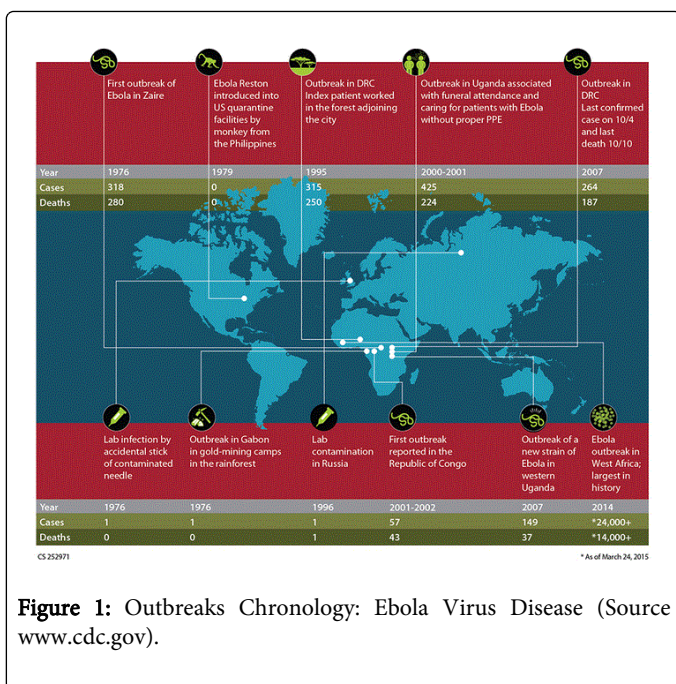


Figure 1: Outbreaks Chronology: Ebola Virus Disease (Source www.cdc.gov).

When the market can't manage to establish an optimum situation [4], society will, at least to some extent, become aware of the shortages, and other social institutions, outside the market, will emerge to try to fix them. Developed countries have started pouring in resources to develop vaccine to fight EVD. Teams of expert doctors and nurses from international public bodies such as WHO, CDC, and MSF are fighting together on ground zero to defeat this public bad.

A section of society is accusing international bodies to be responsible for current outbreak. WHO, CDC are being blamed for being hand in glove with major pharmaceutical firms. International bodies' commitment towards provision of preventive measures such as improved sanitation system, clean water distribution system, disease control mechanism has been not much encouraging. Why world has woken up suddenly with a dire need to contain EVD? Why afflicted nations did not put their healthcare system in order and brought entire world to the edge of a pandemic? The answers lie in public goods aggregation technology [5]. Aggregation technology states that contributors' incentive determines the overall supply of a public good.

Current scenario of EVD outbreak very well depicts the supply of public goods by weakest link [6]. Where public goods are supplied by weakest link, the smallest effort or contribution fixes the effective provision level. Contributions beyond this smallest level use resources without increasing provision. As a consequence, contributors will match the smallest contribution level. With weakest link public goods, there are no incentives to free ride since the effective provision level is zero. This is the case with the risk of contagious diseases such as EVD.

Probability of an endemic outbreak, to take place, is subjective to the healthcare situation of host country. The country, such as any Sub-Saharan country, having weakest healthcare infrastructure, can easily become a focal point of infection from which the disease can spread to the rest of the world. The supply chain of this public good critically depends on its weakest point. Tremendous amount of relief provided by international public bodies and developed countries are turning less effective due to host nation's negligible contribution towards healthcare infrastructure. This is evident by lack of, labs and clinics containing bio safety level-4, which meets CDC's mandatory requirement to handle cases of EVD.

In epidemiology [7], the basic reproduction number (denoted as  $R_0$ ,  $r$  nought) of an infection can be thought of as the number of cases one case generates over the course of its infectious period, in an otherwise uninfected population. Generally, higher  $R_0$  defines higher possibility of contagion. As EBOV transmits through bodily fluids, only, it has a  $R_0$  varying between 1 and 4. As heuristic,  $1 - (1/R_0)$  percentage of people needs to be vaccinated to prevent sustained spread of epidemic. In the case of EVD, 75% of the population of afflicted country needs to be vaccinated immediately. Development of Vaccine for EVD depicts the concept of better shot public goods. In current scenario aggregate level of provision of public good (Vaccine development) is determined solely by the largest single contributor. Trial drugs such as ZMapp and TKM-EBOLA are being developed by powerful pharmaceutical firms located in USA and Canada, which have high technology and monetary fund at their disposal.

The development of successful vaccine will be preceded by human trials and mass manufacturing. It will take months for vaccine to be available on ground zero. Looking at EVD's contagious effect everyone around the globe seems to be hell-bent to tame this international public bad at any cost. Developed countries are coming forward with all the aid they can provide to assist affected countries in this difficult time. If we leave aside problems pertaining to principle and agent, we have learned a vital lesson from this calamity; it is always desirable and economical to strengthen the weakest link of the system instead of providing a big shot of remedy later on.

## References

1. Outbreak Chronology- Ebola Virus Disease.
2. Media Center- Ebola Virus disease.
3. Sierra Leone orders three-day lockdown against Ebola.
4. Arrow K (1971) The Theory of Discrimination. Industrial relations section, princeton university, USA.
5. Sandler T (1998) Global and Regional Public Goods: A Prognosis for Collective Action, Fiscal Studies 19: 221-247.
6. Jack H (1983) From weakest link to best shot: The voluntary provision of public goods 41: 371-386.
7. Fraser C, Christl A, Donnelly, Cauchemez S (2009) Pandemic Potential of a Strain of Influenza A (H1N1): Early Findings 324: 1557-1561.