Exploring changes in primary education trends in relation to child and maternal health improvements

#WSD2015 Data Visualization Challenge Solution by Kidus Asfaw

Abstract

Many countries have significantly improved the provision of health services to new-born children and their mothers. As a result, maternal and infant mortality rates have been drastically lowered, and children increasingly immunized from diseases like measles. An interesting question arises, however, regarding the future of the generation of children whose lives have been saved by the improving conditions in their countries. How have their countries' educational systems coped with the new influx of children into primary schools? In this study, the Millennium Development Goals (MDG) dataset will be used to explore this topic particularly in the case of least developed countries (LDCs).

Problem and Motivation

It is important to analyze whether LDC educational systems are equipped to deal with a healthier and more numbered child population. By studying the trends of LDCs that have improved upon their maternal and child healthcare, we can learn how such countries have served children who are accessing more and more educational resources. The insights taken from such an analysis can shape development policy and government resource allocation into two seemingly disparate but highly interrelated sectors: healthcare and education.

Approaches

All the data used in this study was taken from the MDG Dataset made available on the United Nations MDG website. The most important variables explored are related to goals 2, 3, 4 and 5 of the MDGs. We first challenge the assumption that maternal and child healthcare have improved significantly in LDCs (e.g. by exploring maternal and infant mortality rates). Upon asserting this assumption, we ask if these countries have also improved upon their primary education goals (e.g. primary education completion rate). And finally, we perform a Singular Value Decomposition (SVD) analysis to get a general understanding of the improvement of primary education in LDCs compared to their developed counterparts.

Tools

This project relies heavily on the Python programming language and, in particular, the data analysis package for Python called pandas. This package allows users to wrangle, clean, index, aggregate, visualize, model and perform many other operations on large datasets. Other packages used include NumPy for numerical manipulations, SciPy for SVD analysis, and Matplotlib for visualizations.

Results

The results of the project reveal that the drastic improvements that many LDCs have demonstrated in their maternal and child healthcare have not encumbered their improvements in primary education. Malawi, for example, is a country that is shown to be a leader in improvements in both sectors. While this result is a very encouraging result, it leads us to further questions about how countries like Malawi have balanced the betterment of their child healthcare with the provision of quality of primary education. What lessons can be learned from the country's government policy? This is a development question that can only be answered through analyzing economic, fiscal and population data coming out of the country.