

Approximately 1.2 million people in the world live in extreme poverty. It is an accurate observation that living in poverty causes inadequate access to healthcare ultimately leading to poor health outcomes in patients. However, how is the extent of these poor outcomes examined as different poverty levels across the world are analyzed? Tara Templin, Stanford University Department of Statistics, tackles this issue and provides insight into how we can assess the connection of poor health outcomes in different poverty thresholds.

On January 18th, Tara Templin, Annie Haakenstad (Harvard T.H. Chan School of Public Health), Abigail Chapin, and Joseph Dieleman (University of Washington), presented their abstract at the 3rd annual global health research convening at Stanford University. Templin's research focuses on addressing and demonstrating that poverty and mean national income account for the variation in health outcomes across patients. Templin accomplished this through constructing 51 different poverty series measured at different poverty thresholds, using 188 different countries. Her project was further motivated by the large inaccuracies in the POVCAL data sets given by the World Bank. It was found that 86% of the data in the POVCAL system was either inaccurate or missing. These series were then tested and analyzed in order to see which poverty threshold benefited the most relative to others. From here, we can determine how specific poverty levels in a nation relate to specific healthcare factors such as: access, treatment, and outcome.

A three step process was used for the prediction of these data sets. Upon constructing 51 different poverty series, 2,578 potential covariates are considered. These covariates are provided from the World Bank, Institute for Health Metrics and Evaluation, Freedom House, and the Quality of Government databases. From here, Bayesian model selection and the categorization of covariates was implemented. This data is then separated into three different models: multiple imputation, hierarchical mixed effects models, and

Gaussian Process Regression. A hierarchical model imposes a structure that allows for the comparison of different countries in order to show ways in which they relate. Cross validation is used in order to check the validity of these data sets and the Gaussian Model allows for the determination of the best model. These models are also tested against certain societal factors such as GDP, poverty and HIV. Testing GDP against certain factors such as GDP with the regression effect is to test the effect of poverty above and beyond terms of GDP. This data is significantly important in determining if national poverty rates are related with changes in adult and child mortality. This research is extremely useful in predicting trends in poverty levels and their connections with healthcare.

The studies published by Tara Templin are extremely beneficial in understanding the relationships between income/poverty levels and how they play out in the implementation of healthcare across the globe. Poverty is much more associated with healthcare outcomes beyond the scope of just gross domestic product. For example, getting out of extreme poverty (\$1.25/day) does not significantly improve one's health. A patient's health can only significantly improve when a patient avoids living in "extreme poverty" defined at \$5/day.

Fully addressing the issue of access to adequate healthcare is still far from complete, however progress has certainly been made. By redefining poverty levels and assessing health outcomes at this point, Templin has paved the way for a new perspective in achieving improved national health.

References

Templin, Tara. "Assessing the Relationship between National Poverty Rates and Health Outcomes." Abstract: Assessing the Relationship between National Poverty Rates and Health Outcomes (6th Biennial Conference of the American Society of Health Economists). Ashecon, n.d. Web. 04 Mar. 2017.

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