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Gender data gaps: structural equation modeling offers an alternative to collecting more data

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Abstract

An enhanced commitment to achieving gender equality, women's rights and women's empowerment in the post-2015 development framework is important. Gender data gaps exist because gender biases have inhibited and altered data collection resulting in policy formation that has insufficiently addressed gender issues. Structural Equation Modelling (SEM) is an effective statistical tool used to estimate correlational relations using limited input data confined to a hypothetical, researcher-specified framework of relationship. This paper highlights the use of SEM to evaluate progress on gender equality and women's empowerment during the period of the first 1,000 days of life (from pregnancy through 2 years of age for infants).

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1. Introduction

The United Nations Millennium Development Goals (MDGs) are eight global targets, aimed to be achieved by 2015, with the ultimate purpose of reducing global poverty, chronic disease, and stalled development. Identified by the United Nations General Assembly in 2000, and promoted by the UN for 15 years, the MDGs focus on poverty and hunger, education, gender equality, child and maternal health, combating HIV/AIDS, protecting the environment and promoting global partnerships. The target date for achieving the MDGs is rapidly approaching, and the United Nations Entity for Gender Equality and the Empowerment of Women has called for a reaffirmation of the

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commitment to achieving gender equality, women's rights and women's empowerment in the post-2015 development framework and Sustainable Development Goals (SDGs) [1].

Since the establishment of the MDGs in 2000, progress has been made on improving the abundance of, quality of and approaches to collecting data to support policy creation as well as to track progress towards achieving the MDGs. Moving forward in the post 2015 agenda, this improved data stream needs to be evaluated and used to help establish priorities for the advancement of statistical infrastructure for gender equality [9]. This paper will identify existing data gaps on gender equality, discuss statistical models that can generate new insight, and share knowledge on new methodological approaches to address complex areas.

Gender data gaps exist because gender biases have inhibited and altered data collection (i.e., because males are predominant in many work places, surveys that collect socio-economic information targeting work places are disproportionately focused on male responses) [1]. To understand impediments to achieving gender equality, data gaps that obfuscate important trends relevant to women and young girls needs to be filled. Currently very little is understood about the lives of females and the challenges they encounter because data disaggregated by gender is limited, especially in developing countries [1]. Different methods of collecting and analyzing "big data" could potentially assist in closing existing global gender gaps. This data would make it possible to define and measure priorities to help establish policies promoting gender equality as well as to monitor progress towards achieving goals. Also, improved data collection can inform improved models (i.e., decision support tools) to help to determine the size and nature of social and economic problems and opportunities as well as the efficacy and cost-effectiveness of alternative policies [9].

There are a wide variety of questions that need to be explored. For example, how can extension offices in developing countries work with female farmers because a disproportionate fraction of males are migrating away from the smallholder farms and moving to the urban setting in search of jobs? Another example of a gender specific question could involve evaluating the most cost effective means of delivering social safety nets, including money, to women by evaluating mobile payments or traditional cash transfers. A third question is to identify how many girls are forced into child marriage when adolescent development is underway and delayed onset of initial pregnancy could be a helpful policy [1]? Good data can provide important insight into these questions and contribute to closing the gender gap in development interventions [9].

2. Methods

While improvements in data collection and an increase in the total amounts of data collected are important aspects of this problem, data without analysis is of limited utility. Therefore, an iterative process of evaluating existing data using improved statistical tools and collecting additional data would help to ensure that data collection targets information that serves as input to analyses that inform effective policy decisions. Structural Equation Modelling (SEM) has been shown to be a useful statistical tool to evaluate social, economic, and health data. SEM is a statistical technique used to estimate correlational relations using data confined to a hypothetical, researcher-specified framework of relationship.

For example, in the health field an example of a project includes the use of SEM to examine the relationship between increased sugar consumption in developing countries and the prevalence of health care providers/infrastructure that is available to provide caesareans and related care for pregnant women. In developing countries issues that are not observed in developed countries complicate the performance of caesarean section. This is because the caesarean operation is often technically more difficult to perform due to lack of resources in developing countries. Developing countries have a shortage of resources, such as sufficient, affordable, appropriate health care infrastructure and trained health care providers [3].

Research strongly suggests that the "Western diet" (i.e., high sugar and high fat) is causing people all around the globe to gain weight and to suffer from chronic, non-communicable disease (NCDs) including overweight, obese, and metabolic syndrome [4]. As developing countries replace traditional foods with modern, processed foods high in sugar, refined flour and vegetable oils, the populations of developing countries increasingly suffer from NCDs [4]. The central hypothesis to be explored through SEM is, "There is a looming public health disaster that will occur when sugar consumption increases in developing countries, and health care providers/infrastructure is unavailable to provided caesareans and related care."

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