Extended Abstract: The International Context of the Double Burden of Child Malnutrition

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Description of the topic to be studied: This paper explores a new nutritional crisis that is emerging affecting children under five years of age – the Double Burden of Child Malnutrition (DBCM). The DBCM affects children at both the population level and the individual level. At the population level, the DBCM occurs in countries that have a high proportion of children experiencing two different forms of malnutrition: <u>stunting</u> (a lower height than expected given the age of the child) and <u>overweight</u> (a greater weight than expected given the height of the child). At the individual level, the DBCM refers to children that are simultaneously shown to be both stunted and overweight (stunting-overweightness). The population burden of stunted-overweight individuals can be explored by looking at the prevalence of these individuals under-five across countries.

Theoretical focus

1. The Nutrition Transition

In order to understand how this double burden of child malnutrition that has been highlighted emerged, the theory of the nutrition transition (NT) is highlighted which models the nutritional changes of populations. The changes are related to changes in the overarching political, economic and social factors context of the population.

The NT represents the consecutive movement of populations through three stages termed 'receding famine', 'degenerative disease', and 'behavioural change' (Popkin & Gordon-Larson 2004). In the first stage, <u>receding famine</u>, a typical diet composed of plant–based foods, combined with high physical activity associated with the production of those foods, can lead to a sustained negative energy balance in an individual and consequent stunting. In the second stage, <u>degenerative disease</u>, more food products come from animal source, resulting in a higher intake of animal fat (Delgado 2003). There is also an increased consumption of sugar and processed foods. It is in this stage that sustained overnutrition can lead to a positive energy balance and resulting overweightness. In the third stage <u>behavioural change</u> occurs, leading to an increased consumption of whole grain, fruits, vegetables and foods low in saturated fats.

There are evident parallels between the nutrition transition and the epidemiologic transition which maps the long-term shifts in mortality and disease patterns within populations occur, as infectious diseases are displaced by man-made diseases including nutrition related non communicable diseases as the main causes of death.

As mentioned, the nutrition transition is conceptualised to occur alongside social and economic developments within a population, which was defined by Omran as the *'modernisation complex'* (1971: 527). Specific macro factors involved in the 'socio-economic development' or 'modernisation complex' of a population said to fuel, parallel and be resultant of the nutrition transition include urbanisation, changing economic environments and globalisation.

2. The Altered Nutrition Transition

The nutrition transition described in the previous slide can be referred to as the traditional model – a consecutive transition through the three, discrete stages. It is this transition that occurred previously in high-income populations such as Japan.

This nutrition transition, however, is not the transition occurring in populations experiencing a double burden of malnutrition. The nutrition transition these low and middle income countries are experiencing actually represents a merging of these previously discrete stages, where there is a rapid onset of overweightness within a population prior to the departure of undernutrition.

This can result in different compositions of nutritional problems for different age groups within the populations; however it is such altered transitions that lead to the double burden of child malnutrition that is of interest to this paper.

In these populations with a double burden of child malnutrition, stunting and overweightness both affect the under-five population and in addition there are increasing levels of adult obesity and nutrition related non communicable diseases. The limited research that exists on this phenomenon highlighted that the populations of China, Egypt and Mexico as exhibiting this trajectory.

3. Drivers of the Altered Nutrition Transition

As with the traditional trajectory, it is the overarching political, economic and socioeconomic context that is argued to fuel the altered nutrition transition. In particular the literature has highlighted the importance of urbanisation, changing economic environments and globalisation for the altered trajectory.

The changing socioeconomic context can impact directly and indirectly upon population nutrition through complex pathways including the impact upon a populations food system and thus the diet abvailable for the population. In addition for example, improved economic circumstances can lead to greater investment in health and education systems, improving the health care behaviours of parents as well as the socioeconomic status of households which can improve the nutrition provided to children under-five.

In addition, it is the rapidity of changes in the socioeconomic context that is considered to be particularly important to the development of a double burden of child malnutrition, by creating this altered trajectory where the stages of the nutrition transition overlap.

Data and Research Methods: The overall design of this research was a cross-country comparison of the prevalence of stunted-overweight individuals in low and middle income countries that are undergoing the nutrition transition. In order to explore the prevalence of stunted-overweight under-fives and the factors associated with the prevalence in low and middle income countries data from the Demographic and Health Surveys and macro data on countries' socioeconomic, demographic and health situation from international databases including the World Bank DataCatalog was used.

In order to explore factors associated with the DBCM linear regression models were run. The dependent variable, the prevalence of stunted-overweight under-fives was created from anthropometric indices from the Demographic and Health Surveys. The anthropometric indices were created utilising the WHO 2006 Growth Standards that reflect how a child 'should' grow and categorise individuals as 'stunted' or 'overweight' (in this case) based upon the deviation from such healthy growth patterns. In order to ensure the analysis was both relevant and comparable a five year time period, 2004 to 2009 was utilised. 43 countries has demographic and health surveys providing the required information for the time period, giving 43 cases. Based upon the literature review, Economic, socioeconomic, population demographic, population health, health expenditure, globalisation, population nutrition independent variables were utilised, the main source of which was the World Bank DataCatalog although other sources were also utilised. The literature highlighted that the pace of socioeconomic changes could be extremely important for the development of a DBCM, thus percentage change variables from the 1980s to 2000s for the variables (e.g. percentage change in GNI per capita (current US$ PPP) was utilised.

The regression models were run utilising backwards stepwise selection, with variables remaining in the model if their p-value was less than 0.2. The rationale behind this was that this is exploratory research and this would enable the required initial examination of the explanatory pattern of the DBCM.

Findings: Based upon the DHS data, the prevalence of stunted-overweight individuals under-five in the 43 countries is presented below, ranging from about 0.4% in Bangladesh to 10% of under-fives in Egypt.
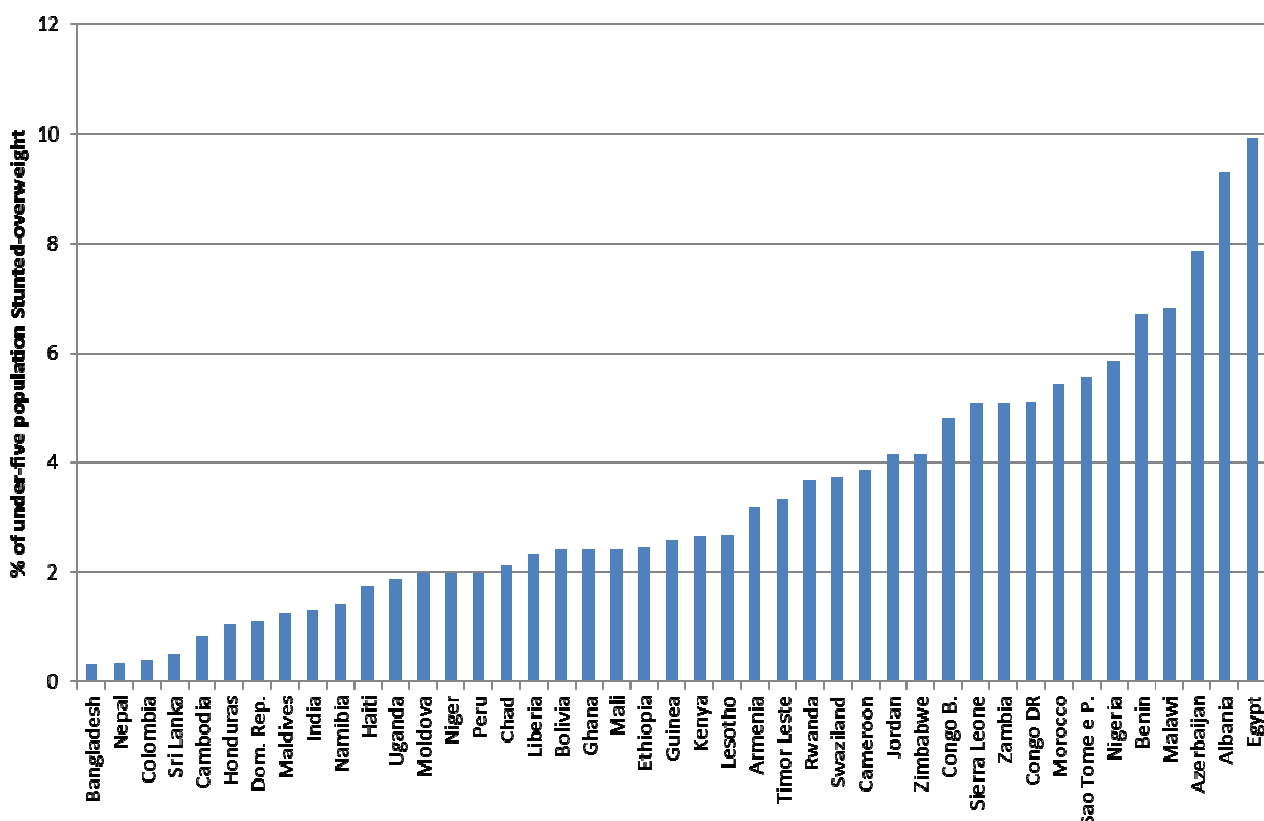
The preliminary result have shown that the lower the change in female participation and calories per capita from the 1980s to the 1990s, the lower the prevalence of stunted-overweight individuals, which coincides with the literature indicating the importance of a rapid pace of change for the development of a double burden of chid malnutrition. TA greater number of internet users is associated with a greater prevalence of stunted-overweight individuals, which highlights the association of increased communicative or 'social' globalisation with the double burden of child malnutrition. A higher percentage of overweight females is associated with the increased prevalence of stunted-overweight under-fives reinforcing the typology of the double burden of child malnutrition, being associated with adult overnutrition.

This analysis is currently being extended in order to incorporate a greater sample size by utilising the UNICEF Multiple Indicator Cluster Surveys, as well as anthropometric indices for other time periods for the countries. The latter improvement will thus result in 'year of survey' being incorporated into the model as an explanatory variable. In addition, a variable for inequality will be incorporated, as well as the use of 'interest' variables instead of percentage change variables to explore the DBCM.