

ADDRESSING THE DOUBLE BURDEN OF MALNUTRITION IN EGYPT: DO CONDITIONAL CASH TRANSFERS HAVE A ROLE?

Paper accepted for publication in the conference proceedings of the

The International Union for the Scientific Study of Population
Scientific Panel on Health Equity and Policies in the Arab World

International Seminar on
Social and Health Policies for Equity: Approaches and Strategies
London, United Kingdom, 2-4 November 2009

Report: <http://www.iussp.org/Activities/hequity/reportlondon09.pdf>

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ADDRESSING THE DUAL BURDEN OF MALNUTRITION IN EGYPT: DO CONDITIONAL CASH TRANSFERS HAVE A ROLE?

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ABSTRACT

Many developing countries are undergoing rapid socio-economic changes that impact on health and its social distribution. These changes can occur so rapidly that there is a resulting co-existence of diseases of affluence and diseases of poverty. Priority setting for nutritional programs has focused on the alleviation of undernutrition in low income settings. However, evidence shows that in many Low-and-Middle Income Countries the prevalence of obesity among women is increasing and can coexist with childhood stunting. This dual burden of poor nutrition contributes to worsening health inequity between the poor and the rich. Global and national policy makers are looking for novel programs to replace social protection mechanisms deemed inefficient. Conditional Cash Transfer (CCT) programs have emerged as an increasingly popular poverty alleviation strategy with some positive results. However, there is evidence they may have a negative impact if the complexity of transition settings is not taken into account. In this paper, we review the nutritional situation in Egypt and compare two CCT programs (Mexico and Colombia) in an attempt to identify features that would address both child undernutrition and adult overnutrition. We conclude with suggestions for design of an Egyptian CCT program that would help maximise benefit to its beneficiaries.

Introduction: The rise of obesity in Low-and-Middle Income countries

The world is witnessing a worsening global obesity epidemic with levels rising at alarming rates in Low-and-Middle Income Countries (LMIC) (J. L. Garrett and Ruel 2005). The Middle East and North Africa region has the highest rates of overweight and obesity of the developing world (FAO 2001) with implications for the global disease burden and local health service capacity (Hoffman 2001). Egypt is the largest country in the region and has one of the highest levels of female obesity (~46%), exceeding the UK and USA (Galal 2002; WHO). Alongside this high obesity level childhood manifestations of undernutrition continue to exist, sometimes coexisting at household level - a phenomenon known as the dual burden of malnutrition (Aitsi-Selmi 2008; Doak et al. 2005; J. L. Garrett and Ruel 2005).

In this paper we comment on the need for better frameworks to understand and address complex public health problems such as nutrition. We review the nutritional situation in Egypt and explore design features of Conditional Cash Transfer (CCT) programs relevant to the dual burden of malnutrition. We compare two CCT programs (Mexico and Colombia) in an attempt to identify features that might benefit child undernutrition but also adult overnutrition. We conclude with suggestions for a framework of design and analysis of an Egyptian CCT program.

The determinants of nutrition: a multiplicity of causes requires more comprehensive frameworks

A number of frameworks for understanding undernutrition have been developed including the Mosley-Chen framework (1984), the UNICEF framework (1990), and the Copenhagen Consensus (Charmarbagwal et al.). These are useful for both research and policy implementation purposes. There is no such consensus for a causal framework of obesity except to state that it is a result of energy imbalance at the individual level and beyond that acknowledge that its

causes are complex and multidimensional (Foresight 2007; NIH 2004; PAHO 2000). Consensus development is even more challenging in that obesity – a public health problem with well recognised consequences on health – has causes at the population level that sit well outside the health sphere reaching as far out as agricultural policy, transport policy and urban planning. The situation is further muddled as different disciplines seeking to understand the problem make use of different frameworks and terminology. An epidemiological or sociological framework might try to identify risk factors that are located at different levels: individual (behavioural or biological) versus social or socio-economic. More recent approaches have sought to develop multi-level models with the individual sitting at the centre of a multilayered concentric world with household, community, and politico-economic environment as the outer layers surrounding the individual (Dahlgren and Whitehead 1992). In economics, causes might be divided into immediate factors and underlying factors. Immediate factors might include food consumption, utilisation of health facilities or the poor quality of those facilities; underlying factors which affect these immediate causes would include family income and cultural factors (encompassing what economists call tastes or preferences) (Charmarbagwal et al.). Some variables may mediate between underlying and immediate causes; for example, a mother's education can affect the impact of increased food availability by favouring nutrient rich foods rather than calorie rich ones or affect the intrahousehold distribution of foods. This kind of framework overlaps greatly with those of social epidemiology.

A unified approach or a widely recognised framework encompassing the complexity of obesity in a manner that would provide sufficient read-across into other disciplines has yet to emerge. Continued developments in analytical methods (such as multilevel modelling), the recognition of the importance of broader social determinants (Marmot et al. 2008) and interdisciplinary dialogue will greatly help advance research into the area.

The social distribution of obesity in Egypt: the poor are at increasing risk

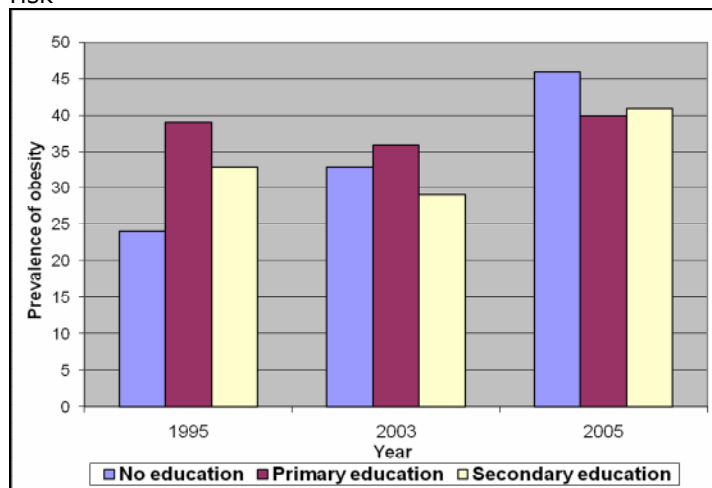
Research has shown that the rise in obesity tends to occur in a non-uniform manner in any given population, such that in the course of a country's economic development obesity affects the rich first and the poor last (J. L. Garrett and Ruel 2005; Stunkard 2000). In a low-income country, a population cross-section would show a gradient of social distribution – a social gradient - in which obesity is more common among the rich and less common among the poor (Marmot 2004). Observational data demonstrate a cross-over in risk, whereby as economic development progresses, obesity becomes less common among the rich and more common among the poor, causing a reversal of the social gradient of obesity (Monteiro et al. 2004). A review of 36 developing countries has identified the cross-over level at a GDP per capita of \$2500 (Mendez et al. 2005).

Egyptian Demographic and Health Surveys (DHS) data between 1995 to 2005 show that obesity levels have begun to rise among women of lower socio-economic status as measured by education in urban areas so that the social gradient of obesity appears to be reversing in these areas (see figure 1). (Aitsi-Selmi, in progress) The latest DHS data (DHS 2008) indicate the gradient has now reversed at national level: the prevalence of obesity in mothers who had children with secondary or higher education is 36% compared to mothers with no education among whom it is 46%. Obesity is not confined to urban areas. It is estimated that obesity now affects over 1 in 3 women (36%) in rural areas and almost 1 in 2 (45 %) in urban areas. This suggests that despite its low GDP per capita (~\$700), Egypt is in the advanced stages of transition, where economic development is fuelling health inequities by putting the poor are at increasing risk of obesity (Monteiro et al. 2004).

DHS data also show that women are more vulnerable to obesity than men. Among all adult men surveyed (15 to 59 years old), 18% were obese (less than half the prevalence among women). The prevalence of overweight and obesity was higher in men with completed secondary or higher education (59.2%) when compared with men with no education (52%). The opposite is

true for women (67.5% and 73% respectively) (DHS 2008). This creates an additional inequity which is gender based, added to the risk conferred by lower socio-economic status.

Figure 1 . Obesity prevalence among urban mothers by education and year (Egypt DHS, 1995-2005) – reversal of risk



Undernutrition

Undernutrition is almost exclusively a problem of children in Egypt. Stunting (defined as height-for-age z score less than minus 2 standard deviations of the median of the WHO reference population) was high but constant at 23% between 2000 – 2005 and by 2008 had increased to 29%. Among children that are stunted half were severely stunted (defined as height-for-age z score less than minus 3 standard deviations of the median of the WHO reference population). Children 18-23 months old had the highest levels of stunting (41%) with levels being slightly higher for boys. Wasting and underweight in the under 5 year olds were much less prevalent at 7% and 6% respectively (DHS 2008).

Possible explanations for the recent increase in childhood stunting include lower availability of animal protein (mainly poultry and eggs) due to culling enacted as a response to the spread of avian flu. As an additional consequence of this cull, cash made by many families from selling poultry has dramatically decreased reducing income available for additional food purchases by up to half for many households.

Stunting in the under-5s does not appear to show any strong socio-economic distribution. Rural and urban prevalence are 27.1% and 29.9% respectively. The prevalence was 30% among children of mothers with no education and 28% among children of women with secondary or higher education (DHS 2008).

The dual burden of malnutrition

The rising levels of obesity coexisting with relatively high levels of stunting in Egypt increase the likelihood that these two manifestations of malnutrition will coexist not only at national or regional level but also at household level. In 2005, the prevalence of households where mothers that were overweight or obese had a stunted under-5 child (known as dual burden households) was estimated at 13%; and 62.3% of stunted children under 5 years old lived with an overweight or obese mother (Aitsi-Selmi 2008).

This phenomenon is not unique to Egypt and has been reported in several other LMICs including China, Brazil and Russia (Doak et al. 2005). It indicates the phenomenon may be linked to rapid changes in economic development and the associated nutrition transition - essentially increasing sedentarism and an increased availability of food. Possible explanations for the dual burden household include intra-household distributional differences; but also poor diet quality whereby an increased consumption of energy-dense, nutrient-poor foods might manifest as obesity in mothers whilst causing stunting in children (J. L. Garrett and Ruel 2005).

Current strategies to address the dual burden of malnutrition in Egypt

It is recognised that obesity is a major challenge in richer countries where undernutrition is all but a historical phenomenon, but in many LMICs nutrition strategies tend to focus on undernutrition rather than obesity. There are national programs (e.g. the Egyptian food subsidy system and the flour fortification program) and international programs (WFP and UNICEF food programs) to address undernutrition in Egypt, but there is currently no national

nutrition policy to address obesity. There is to our knowledge no program combining efforts to address both under- and overnutrition.

However, current strategies may not be appropriate for a dual burden setting. Not only do they fail to address the growing problem of obesity but they may make it worse. In Egypt, the food subsidy system favours high-energy density foods (Galal 2002) and has been linked to increased obesity by lowering the direct costs of becoming obese (Asfaw 2007).

It is important that future programs incorporate the risk of obesity but also prevent any negative unintended consequence that would worsen health and human capital among those they intend to benefit. This is particularly relevant in the case of new programs such as CCT programs as they currently increase household income without any consideration of local conditions and consumption patterns that might affect obesity. With growing interest from policy-makers in CCT programs to improve health, it is imperative to understand the implications of income supplementation, particularly in countries where both under- and overnutrition coexist amongst their target populations.

The emergence of Conditional Cash Transfer programs to address poverty: intended benefits and unintended harms on nutrition

CCT programs are an increasingly popular social mechanism to address poverty particularly in LMICs. They focus primarily on children (and their mothers) to reduce both short-term vulnerability and the long-term intergenerational transmission of poverty by improving human capital (J. Maluccio 2004). They provide monetary transfers to poor households conditional upon their compliance with program requirements that are typically related to preventive health visits, school enrolment and attendance, and sometimes activities to promote improvements in maternal and child health (J. Hoddinott, Skoufias, E. 2003).

Cash in the short term is intended to serve the immediate needs of the families, especially to increase their purchasing power for food in order to improve their nutritional status. In the long-term, the program requirements for child education and health target the poverty mechanisms thought to cause or

contribute to the cycle of poverty. Children are encouraged to attend school (instead of working or otherwise supporting the family) thereby increasing their future earning potential.

Program requirements aimed at increasing health service use target mainly causes of childhood mortality and morbidity, attempting to improve the health status of the children (and often also mothers) in order to allow them to use their full potential in future academic and professional activities. It is thought that by linking the cash transfers to investments in human capital through the conditionality component of the CCT programs, there is a reduction in out-of-pocket expenditures and opportunity costs (e.g. the lost labour contribution of children attending school) which eases constraints on household investment in children's human capital but also encourages such an investment (J. Hoddinott, Skoufias, E. 2003; J. Maluccio, Flores, R 2005).

Whilst CCT programs are not designed to address nutrition specifically many programs aim to improve child nutrition through a number of routes: by providing financial resources to mothers; by providing food supplements directly to children; and by providing new knowledge to mothers. The rationale behind the gender based cash transfer is a belief that a greater share of household resources is expended on child health and nutrition when resources are directed at mothers than when they are directed at fathers. (J. Hoddinott and Haddad 1995). In turn, mothers become primarily responsible for fulfilling the conditionalities set out by the CCT program, including attending education or awareness sessions if offered, and are assumed to bear the responsibility of implementing new knowledge within the household. Table 1 summarises the health and nutrition conditions of a few of the CCT programs.

There is substantial evidence that, at least in the short term, CCT programs improve nutritional outcomes for children early in life (L. Fernald, Gertler, P, Neufeld, L. 2008a). Improvement in newborn weight, height-for-age, anaemia and stunting have been reported in Columbia, Mexico and Nicaragua's CCT programs. These outcomes are thought to be the result in part of increased use of preventive services mandated by program participation, improvements in health supply as well as increased health knowledge and improved health

practices (Lagarde 2007). There is also evidence that CCT programs reduce levels of childhood obesity through improved diet.

Table 1: Overview of health conditions in selected CCT programs

Country	Children attend preventive appointments	Children immunization	Children food supplements	Attend health education sessions	Women attend ANC
Mexico	X	X	X	X	X
Nicaragua	X	X	X	X	
Colombia	X	X		X	
Honduras	X	X			X
Brazil	X	X		X	X
Turkey	X	X			X

Source: Lagarde, Haines, Palmer (2007)

None of the programs target adult nutritional outcomes, although anthropometry and household consumption patterns are recorded. A recent analysis of data from the Mexican CCT program Oportunidades showed that there was a small but statistically significant reduction in adult Body Mass Index (BMI) for program beneficiaries (Fernald et al. 2008b). However, the cash component of the program was associated with higher body mass index in adults within households receiving higher cumulative cash transfers over time. It was not possible for the authors of these studies to explore these findings further nor assess the role of diet in these findings due to lack of detailed data (Fernald et al. 2008a).

There is a body of evidence showing a detrimental effect of increased income on diet. Longitudinal analyses of income elasticity in China found that rapid income growth adversely affected dietary quality, but also that the effect was greater among the poor among whom increased income was used to purchase greater quantities of energy-dense foods (Du et al. 2004; Guo et al. 2000). Understanding the effects of income growth among low income populations could mitigate potential negative unintended consequences of CCT programs and prevent the substitution of one health problem for another.

It is difficult to reliably assess the impact of CCT programs on adult obesity levels due to the relatively short follow-up times of the current programs, an analysis of the effect of cash transfers on food expenditure may give an indication of the long-term impact of CCT programs. Diet has a well established role in the causal pathway of obesity, alongside physical activity.

Disentangling the effects of CCT program components on nutrition

As an intervention CCT programs can be divided into three main components: 1) the cash or resource transfer (resources might include nutritional supplements), 2) the knowledge transfer, and 3) the conditionality (requirements for school attendance, health service use, etc) - the latter being their distinguishing feature. Disaggregating the effect of the different components is difficult (Gaarder 2009). The fact that some of the outcomes influence each other makes it even more so. For health utilisation outcomes it is accepted that they are the result of a 'synergy' between the different program components (Lagarde 2007). Recently, a greater recognition of the importance of supply-side factors such as the quality of services and the importance of multisectoral collaboration in program delivery has come about (Garrett et al. 2009).

Current evaluations of CCT programs only compare program participation with non-participation, or alternatively the difference between pre- and post-program participation indicators. Understanding the pathways by which CCT programs could be operating may guide policy makers who are faced with the challenge of designing the most appropriate and cost-effective interventions (Fernald et al 2008a).

Here we describe the impact and compare the designs of two of the Latin American CCT programs. We attempt to tease out the effect of the CCT program components on nutrition focusing particularly on explaining the differences in household diet composition. We compare one of the most well established and evaluated CCT programs (Mexico's Oportunidades) with the only CCT program where a significant deterioration in diet was reported and for which data were

available (Colombia's Familias en Acción - FA). In FA, there was a significant increase in fat consumption at household level.

Nutritional impact of the Mexican and Colombian CCT programs

Changes in adult and child nutritional outcomes, food expenditures and consumption patterns of the CCT programs in Mexico and Colombia are summarised in Table 2. Both programs had a positive impact on child nutritional indicators, mainly as a reduction of stunting. The overall effect appears to have been larger in the Mexican CCT.

In terms of adult nutritional outcomes, BMI was not available so it is not possible to compare the two programs. As an indication of the possible impact of CCTs, the Mexican CCT showed a reduction in BMI among adult participants at 3.5-5 years compared to newly enrolled participants (Fernald 2008a). However, as mentioned above, an accumulation of cash among beneficiaries of the Mexican CCT was associated with increased BMI whereby families that received greater amounts of cash as a result of longer enrolment time or having a greater number of child beneficiaries in the household were at higher risk of increased BMI (Fernald 2008b). The investigators speculate over three possible mechanisms to explain this cash effect on BMI: 1) that as families come out of poverty they will spend extra cash on foods that might lead to obesity; 2) that adults make healthier decisions for their children than they do for themselves; 3) that healthy foods and beverages may not be easily available in rural and impoverished areas where the CCT is rolled out. An analysis of differences between families with different levels of accumulated cash in the two programs would have been illuminating but it was not possible at this time.

Results for food expenditure per capita are available for both programs and showed an increase in overall expenditure among beneficiaries compared to controls in both the Mexican and Colombian CCT. This change was of 10.6% in Oportunidades and as high as 22.5% of the baseline expenditure for rural Colombian beneficiaries. This was accompanied by an increased consumption of high-quality foods (fruits, vegetables and animal protein) in both programs. In

the Colombian CCT program however, consumption of fats increased by 14-24% among beneficiary households. In the next two sections we seek to understand this finding and explain the difference between the two programs in the light of their design features.

Design similarities and differences

Both programs used a two stage selection process to identify potential recipients. Geographical municipalities are first identified and screened for the existence of supply institutions of education and health. National poverty measures were applied to identify the poorest households, who were then invited to participate in the program. Program impact was measured by comparing indicators at baseline and after participation, for both beneficiaries (treatment group) and non-beneficiaries (control groups) in similar locations.

In Mexico, the evaluation of the program was based on an experimental design (treatment and control group were randomly selected) and in Colombia comparison groups were selected and analysed based on econometric techniques of propensity score matching and difference-in-differences to adjust for selection bias. Both CCT programs benefited from effective monitoring and compliance of beneficiary households with conditions which included requirements on child school attendance and use of health services. The cash transfer was given to female heads of households in both programs.

Below we describe differences in the main components of the two CCT programs (Resource transfer, knowledge transfer, conditionality and how they might have had a role in dietary quality).

RESOURCE TRANSFER

Size of transfer

CCT programs are not set up to address expenditure patterns or behaviours directly and the income transfer can be spent on anything. There is no requirement that the mother spend the transfer on the children, nor on health or education specifically (Bassett 2008).

The cash transfer as a percentage of household income was larger in Colombia. In Mexico, beneficiary families on average received a transfer of approximately 20% of the average monthly expenditure, whereas families enrolled in the Colombia CCT program received almost 30% of the household's average income. In absolute US dollar values this was more than double: an average of \$20 per family per month in Mexico as compared to \$50 in Colombia.

Food consumption analyses indicate that beneficiary households in both Mexico and Colombia spent their additional food budget on fruits, vegetables and animal proteins. Yet, households in Colombia and especially those in rural areas also significantly increased their intake of fats and oils. This suggests a threshold effect: part of the cash transfer is used by beneficiaries to increase consumption of high quality foods (fruits, vegetables, cereals and animal protein), and any additional cash beyond that (either an amount or a proportion of total household income) is used for consumption of high-calorie foods such as oils and fats. Thus, household expenditure for nutrition may not be considered optimal in the Colombian CCT program where consumption of fats increased.

However, income alone cannot inform this behaviour, local food consumption preferences, food availability, as well as the knowledge transfer and program requirements must have an influence. Economic analyses of the impact of income on nutritional status show that as a single program component cash transfer is possibly quite weak (Garrett et al. 2009). In addition, micronutrient deficiencies among children and adults appear to remain even at higher income levels (Hoddinott and Bassett 2009).

Nutritional supplements for children and pregnant women

In the Mexican CCT, nutritional supplements for children (all children between age 4 and 24 months, and undernourished children between 2 and 5 years) and pregnant women were provided to beneficiary families. These supplements contained 20% of daily caloric intake and 100% of micronutrient requirements (Bassett 2008). The utilisation of such supplements was closely monitored and mothers received instructions on the usage of the formula for children. The emphasis given to nutritional needs of children and provision of

additional calories to the households may have influenced the choices parents made for the remaining food budget.

KNOWLEDGE TRANSFER AND CONDITIONALITY

Health education sessions

In Oportunidades, both female and male heads of households were required to attend sessions on health education, some of which were on nutrition. During a regular series of lectures called "pláticas", beneficiaries were encouraged to eat a more diverse diet, including more fruit, vegetables, milk and other animal products. An analysis of food consumption suggested that the impact of the CCT program on households' consumption of these foods as measured by the income effect was larger than expected (Hoddinott, & Skoufias 2003). This would indicate a possible synergy between the additional cash and education sessions.

In the Colombian CCT program, although health education sessions for female heads of households were provided, their attendance was not required as a condition for the receipt of cash transfers. As a result, the absence of synergy between knowledge transfer and increased income may have been reduced.

Adult preventive health visits

Although the main focus CCT programs is child health and nutrition, Mexico's CCT program requires both parents of a beneficiary child to receive annual preventive health visits in addition to the schedule of frequent appointments for children. Within these preventive visits, adults are screened for blood pressure, diabetes and women for cervical cancer. In this context adult beneficiaries also receive advice on nutrition and health management. The Colombian CCT program does not incorporate an adult health component thus reducing the opportunity of knowledge transfer.

In summary, it appears from this review of the Colombian and Mexican CCT programs that household expenditure on food may have been optimised

(towards greater consumption of animal protein, fruit and vegetable and away from fats and oils) through increased knowledge and skills acquired through adult health education sessions and preventive visits. This required the incorporation of both an adult health component and an attached conditionality. Arguably, child nutritional supplements may also help boost expenditure on fresh fruit and vegetable by relieving constraints on food expenditure although a larger size of transfer as a proportion of household income may overall reduce the quality of diet. The latter corroborates evidence from Oportunidades and elsewhere that demonstrates a negative cash effect after a certain threshold particularly in low income settings.

Role of external factors

We have discussed differences between two CCT programs and attempted to understand the effect of program components on food consumption. However, we acknowledge that differences in food consumption among beneficiaries may also be the result of other factors external to the program that are not taken into account here or in CCT evaluation studies. These might include food prices, access to local markets, dietary practices and cultural preferences such as those pertaining to body image and beauty. The role of external agents and socio-economic forces such as the growing processed food industry and fast-food industry, street sellers of fried foods and snacks, and the media has not been examined yet will undoubtedly play a role.

Finally, BMI is also influenced by levels of physical activity which in turn are influenced by occupation, use of motorised transport, and cultural beliefs that may restrict female mobility for example. Creating synergy between program components might involve more subtle program design. A simple example might be as follows: instead of encouraging the use of motorised transport to access services, a CCT program might compensate the beneficiaries for the opportunity cost of walking by increasing the size of the transfer whilst linking it to the benefits of 1) increased physical activity and 2) of an active role for women outside the home. Such program refinements will require

assessment within the broader ethical framework of CCT programs as well as within local contexts.

This highlights the need to develop comprehensive frameworks for both evaluation of CCT program impact on nutritional and other outcomes as well as for the problems these programs seek to address.

Which way forward: can social policies such as CCT programs improve nutrition and have a role in the prevention of obesity in Egypt?

There is good evidence for the short term effects of CCT programs on child nutrition and for financial incentives outside CCT programs on adult weight management (Volpp et al. 2008), but the effects on dietary quality and BMI are mixed and the long term benefits of these interventions are speculative.

Whilst it is difficult to assess the effects of individual components our review suggests that synergy between adult health knowledge and increased income may offset any negative consequences on diet of increased cash availability in low income settings that may otherwise occur. A focus on increasing adult knowledge may be crucial in an Egyptian CCT as educational levels are relatively low: about half the female population is estimated to have either no or incomplete primary education (DHS 2008).

A more complete review would compare the effects of cash accumulation and adjust for differences whilst exploring the effect of adult education sessions and/or health components. A framework incorporating both quantitative and qualitative methods would be enlightening.

In addition, there are external factors such as food prices that are likely to have a role. The cultural and social environment in Latin America is different to that in the Arab world. The food environment will be particularly important in Egypt where the environment is already conducive to high calorie intake and where there are high levels of poverty. Of all LMICs, Egypt is among the highest in terms of calorie intake (alongside Honduras and India). Egypt's consumption of 3,335 calories per capita per day is extraordinarily high considering its annual per capita GDP of ~\$700 (Meade and Rosen 1996). This consumption level is comparable to that of the UK. Explanations for this include the following:

- 1) The food subsidy system already favours high energy density foods;
- 2) There is an increased availability of fast food outlets and supermarkets selling fried food and processed snacks) occurring at national level through globalisation processes;
- 3) Rapid rises in Foreign Direct Investment (FDI) may increase food processing and sale of processed food. In Egypt, the overall FDI has grown from 0.5% to 13% between 2001 and 2008. The food processing industry is one of the key economic sectors in Egypt, contributing employment, and value added and export activity. Dairy product facilities represent about 10% of Egypt's food processing sector. Soft drinks are becoming increasingly popular among Egypt's dominant young population. 75% of soft drinks consumed by Egyptians are carbonated, the latter having increased by more than 15% between 1998 and 2003 (Berry 2007).
- 4) Cultural preferences for body shape favour plumpness and are likely to influence diets particularly in more traditional settings. In addition, social norms in Egypt would tend to restrict female mobility. This was observed directly in rural areas where women were confined to households thus potentially limiting their physical activity levels.

Furthermore, increased consumption of high calorie foods is not confined to an urban environment but may also occur in poorer rural environments which a CCT program might target. Price elasticities (i.e. consumption preferences) of sugar, dairy products and oil & fats are higher than those for cereals, beans and vegetables and more markedly so in rural areas than in urban areas (Dawoud 2005).

It may not come as a surprise considering the above that obesity levels are so high in Egypt, although physical activity levels would need to be taken into account for a firm conclusion to be drawn.

The above observations suggests that unless an Egyptian CCT program is carefully designed the increased cash may be spent on the 'wrong' kinds of foods thereby worsening the already significant risk of obesity present among the poor. This again highlights the importance of developing more comprehensive frameworks to both evaluate the impact of CCT programs and

also understand the problems they seek to address to improve human capital and reduce poverty.

A nutrition focused CCT program implementing a new approach?

Implementing a nutrition focused CCT program could be very relevant to Egypt as relatively high levels of stunting persist alongside growing obesity. The pace of spread of the obesity epidemic is such that it will have an immeasurable impact on health services and wellbeing of the Egyptian population. Chronic diseases are already the most important cause of mortality. It is worth noting that Egypt has higher rates of both stunting and obesity than either Mexico or Columbia (see table 3).

Table 3. Comparison of stunting and obesity rates by country.

	Year of survey	Childhood stunting (children under 5 yrs)	Female obesity (women 15-49 yrs)
Mexico	2006	16% ¹	35% ²
Colombia	2005	16% ¹	12% ²
Peru	2000 & 2006	31%	13.5%
Egypt	2005	24% ¹	46% ²

¹WHOSIS

²WHO BMI database

Our review supports the evidence that synergy is required between program components. In Egypt the adult education sessions may have added importance as levels of knowledge may be low (DHS 2008).

Peru has undertaken to design a nutrition focused CCT (JUNTOS). As with other CCT programs the focus of the Peruvian program is on children and undernutrition but it makes an advance on previous CCT programs both in its design as well as in its evaluation framework. Whilst a number of questions remain unresolved as to the best way to design a CCT program (Forde and Zeuner 2009), it is being developed as a program that recognises the need for integrated, holistic design and implementation, incentivising pathways rather than activities and engaging operational partners not just beneficiaries.

A recent review of the nutritional impact of CCT programs in Latin America has made some detailed suggestions as to how to improve childhood nutritional

outcomes including the implementation of supply-side incentive for service providers (Hoddinott and Bassett 2009). Supply side incentives could be important in Egypt where services in remote areas may be of poor quality or inaccessible.

The stated intention of JUNTOS in modifying its design and strengthening its focus on nutrition is to apply what is known on managing change and working multisectorally in order to ensure by program operating partners (Garrett et al. 2009).

This is a welcome acknowledgment that undernutrition is multisectoral. It is hoped that this kind of approach would naturally extend to the growing problem of overnutrition in Egypt particularly as the food environment is likely to have a critical role and is influenced by several factors in the economic and social spheres. This does not imply that CCT programs have to address the totality of determinants of poor nutrition merely that they should take a more comprehensive approach that focuses on systems and pathways rather than single outcomes.

This signals a possible change in philosophy regarding CCT programs and a potential shift from a discourse of conditionalities to 'coresponsibilities', where the responsibility of governments and other agencies to fulfil social obligations and deliver high-quality services is emphasised (Garrett et al. 2009). This could be crucial in Egypt where the food subsidy system is a national institution. Attempted increases to the price of bread by the Egyptian government in 2008 lead to widespread riots.

The use of mixed-methods by the research community working on CCT programs and similar social protection programs is also likely to be of benefit as the quantitative CCT program outcomes are not always easy to explain. Quantitative research found that the Brazilian CCT program had a small negative effect on children's weight gain, which was speculated to be a result of a perverse incentive, based on "anecdotal—and impossible to substantiate—reports of beneficiary mothers deliberately keeping their children malnourished to qualify for the benefits" (Adato 2008). This type of behaviour and beliefs lend

themselves well to ethnographic methods which could be used to resolve this kind of question.

Garrett (2009) summarises a systems perspective as one that considers a CCT program to be one element of an overall strategy to improve nutrition. It uses "coordinated, integrated action across multiple sectors, actors, and levels [...] a systems analysis would take into account all the components of the system that influence nutritional outcomes and determine how these components relate to one another. The analysis would also consider how the program could promote needed complementary actions. For instance, even with additional cash, mothers may not know the best practices for care and feeding, or the distance to the health care centre may still be too far." (Garrett 2009: 5)

In summary, the search for more comprehensive approaches among economists for the evaluation of CCT program impact on nutrition is not dissimilar to the approaches developed in epidemiology and sociology to understand new public health problems such as obesity. Interdisciplinary dialogue could only expand the frontiers of our knowledge and set of analytical tools to evaluate social policies and their impact further and faster.

Conclusion

The fast pace of economic development occurring in Egypt and other LMICs is likely to fuel inequities in nutrition and health with serious implications in the future. Childhood undernutrition will persist alongside a rapidly growing obesity epidemic that will be an added burden to the high levels of poverty in Egypt. Our review corroborates evidence that increased income can be detrimental to diet in low income settings and suggests that synergy between cash transfer and adult knowledge transfer may be crucial to an Egyptian CCT program. This would help counter the effects of a food environment that is conducive to high calorie consumption. CCTs can be a double edged sword but their adequacy can be improved by careful analysis of their internal mechanism in relation to wider factors such as the nutrition environment. This is will require an emphasis on multisectoral collaboration for implementation and the use of interdisciplinary methods for evaluation.

Table 3. Comparison of design and nutritional outcomes of CCT programs in Mexico (Oportunidades) and Colombia (Familias en Acción)

Program	Targeting	Transfer	Nutrition conditionalities	Effects on consumption	Child nutritional outcome	Adult nutritional outcome
Mexico: Progresa/ Oportunidades Start: 1997	Geographic targeting of localities (distance to nearest school and health facility), followed by identification of poorest households	Bi-monthly transfer appx 20% of average monthly household expenditure Monthly average USD 20	<ul style="list-style-type: none"> - Health checkups and growth monitoring for children - Adult preventive visits (include screening and control of hypertension and diabetes, community-based training on healthy lifestyles and screening for cervical cancer) - Attendance of education workshops required (women and men) - Nutritional supplements for children up to 5 years, pregnant and lactating women 	<p>1997-1999</p> <ul style="list-style-type: none"> - Mean consumption increased by 14.5% and mean per capita food expenditure by 10.6%. - Overall mean caloric intake for beneficiary compared to control households increased by 7.8% - Dietary diversity improved. - Increase in consumption of more diverse and high-nutritional foods (fruits and vegetables consumed by beneficiary households 16.7% more than control and animal products 30% more.) - Youth consumed less alcohol and more cigarette than control groups 	<p>1997-2003</p> <ul style="list-style-type: none"> - Decrease in probability of stunting in 24-72 month olds: <ul style="list-style-type: none"> girls: 29% boys: 11% - No impact on proportion of underweight children - Mean haemoglobin value increase 0.37 (g/dL) for 12 month olds (at baseline) 1 year after baseline v. control group 	<p>1997 – 2003</p> <p>Comparison of adults in CCT from 1997-98 and control group enrolling in 2003:</p> <ul style="list-style-type: none"> - Age- and sex-adjusted BMI significantly different (26.57kg/m² vs. 27.16kg/m², p<0.001) - Uncontrolled hypertension (SBP>140mmHg or DBP >90mmHg) present in 33.8% CCT beneficiaries and 34.52% in control group.
Colombia: Familias en Acción Start: 2001	Geographic targeting of poorest localities (eligible localities must have a bank and supply of health and education services), followed by identification of poorest households	Transfer appx 26% of average monthly household income Monthly average USD 50	<ul style="list-style-type: none"> - Health checkups children 0-6 years - Growth monitoring - Attendance at education workshops encouraged 	<p>2001-2003</p> <ul style="list-style-type: none"> - 20.4% (urban) and 22.5% (rural) increase in mean per capita food expenditure - Increase in overall household consumption of proteins, tubers, cereals, fruits and vegetables, fats and oils in urban areas. Proteins, cereals, fats and oil in rural areas - Difference in consumption of alcohol and tobacco (diff in diff between treatment and control) is not statistically significant in either rural or urban areas. <p>----</p> <p>2002-2003</p> <p>Household consumption increased by 19.5% in rural and 9.3% in urban areas. Share of food within household spending remained constant. Most of the increase in food consumption in all areas was in higher quality foods (animal protein) and fruits and vegetables. Meat and dairy consumption increased by 19 percent, fats by 14-24 percent (in urban and rural, respectively) and grains by 9-17 percent (in urban and rural, respectively).</p>	<p>2001-2003</p> <ul style="list-style-type: none"> - Decrease in probability of stunting 0-2 year olds: 6.9%, no impact children 2-7 years old - Probability of wasting decreased 3.4% in 3-7 year old rural children (no impact on 0-3 year old rural and any urban children) 	Not available

Sources: (Bassett October 2008), {Gaarder, 2009 #9}, (J. Maluccio 2004), (L. Fernald, Gertler, P, Neufeld, L. 2008a), {Fernald, July 2008 #6}

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