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REVIEW

The impact of conditional cash transfers on child health in low- and middle-income countries: a systematic review

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Abstract
Objectives The review aimed to assess the effectiveness of conditional cash transfers (CCTs) in improving child health in low- and middle-income countries.
Methods Seven electronic databases were searched for papers: MEDLINE, EMBASE, PubMed, PsychINFO, BIOSIS Previews, Academic Search Complete, and CSA Sociological Abstracts. The included studies comprised of randomised controlled trials and controlled before-and-after studies evaluating the impact of CCTs on child health. Due to the substantial heterogeneity of the studies, a narrative synthesis was conducted on the extracted data.
Results Sixteen studies predominantly from Latin American countries met the inclusion criteria. The outcomes reported by the studies in relation to CCTs' effectiveness in improving child health were reduction in morbidity risk, improvement in nutritional outcomes, health services utilisation, and immunisation coverage.
Conclusions The review suggests that to a large extent, CCTs are effective in improving child health by addressing child health determinants such as access to health care, child and maternal nutrition, morbidity risk, immunisation coverage, and household poverty in developing countries particularly middle-income countries. Of importance to both policy and practice, it appears that CCTs require effective functioning of health care systems to effectively promote child health.

Keywords Conditional cash transfers · Child health · Low- and middle-income countries · Programme theory · Systematic review

Introduction

Child health remains a major public health concern in developing countries in contemporary times (UNICEF 2009). In 2008, the median level of child mortality stood at 109 deaths per 1,000 live births in developing countries as compared with 5 per 1,000 in developed countries (World Health Organisation 2010). Aside being a key indicator of economic development, child health has a close association with educational attainments, future health outcomes, and employment opportunities (Case et al. 2005; Marmot Review Report 2010). Child health has thus attracted the attention of the international community as a number of vertical programmes (health programmes which focus on a specific demographic population, disease, or health issue, e.g. vitamin A supplementation, exclusive breastfeeding, and immunisation) are currently being implemented to help improve child health in line with the Millennium Development Goal (MDG) 4 (Ellis and Allen 2006).

It is undeniable that vertical programmes that are disease-focused and largely reflect the biomedical approach to child health promotion continue to make significant contributions to child health in terms of reducing childhood mortality in developing countries (Claeson and Waldman 2000). However, there is a growing consensus that a more holistic approach is to employ horizontal programmes that

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simultaneously address the root causes of child health (Green and South 2006). Poor child health outcomes are rooted in poverty, lack of social protection, food insecurity, and lack of access to health care and other support services (Case et al. 2005; Huerta 2006; World Health Organisation 2008). Several authors have therefore noted that improving child health should not be a sole prerogative of the health sector, contending that social policy initiatives can play a significant role in addressing child health determinants such as poverty and access to health care (Roberts 2000; Fiszbein et al. 2009).

Conditional cash transfers (CCTs) are an example of social policy interventions that holistically address the underlying and immediate causes of poor child health outcomes in developing countries. As a form of social protection, CCT programmes transfer cash to poor households (normally mothers or caregivers) on condition that such transfers are invested in the human capital development (health, nutrition, and education) of children (Shaffer 2003). The Latin Americas are the pioneers of CCTs in the 90s with the largest and iconic CCT programme being Oportunidades in Mexico, which started in 1997 and was serving over 5 million households as at 2008 (Fiszbein et al. 2009). At present, at least 24 developing countries are implementing CCTs (Fiszbein et al. 2009).

A number of studies have been conducted on CCTs' impact on child health and nutrition (Gertler 2000; Rivera et al. 2004; Barham et al. 2007; Robertson et al. 2013). However, not much has been done to synthesise this body of evidence in relation to CCTs' effectiveness in improving child health. In identifying the need for this review, a search was conducted in the Cochrane Library that has been deemed as 'the best single source of systematic reviews' (Centre for Reviews and Dissemination 2001, p.5). The results indicated that only one systematic review has been conducted on this subject (Lagarde et al. 2009). The review focused on CCTs' impact on population health rather than child health even though some effects were reported on child health. A key recommendation of this review was the need to look into the pathways of CCTs' impact on health. This systematic review is different from that of Lagarde et al. (2009) as it focuses on determining the extent to which CCTs are effective in improving child health by using the programme theory to conceptualise the pathways of CCTs effect on child health (Jackson and Waters 2005).

The programme theory is a mechanism, which helps to identify the processes through which programmes are anticipated to realise their set goals (Rogers et al. 2000). Rossi et al. (2004) identify three components of the programme theory namely 1) a programme impact theory, which relates to the implicit causal pathways that connect a programme's activities to its expected outcomes; 2) a service utilisation plan, which refers to the assumptions of how and why intended beneficiaries actually use the programme; and 3) a programme's organisational plan, which relates to the implementation and operational aspects of the programme and its resources. This review focused on programme impact theory components and developed an impact pathway model to conceptualise the evidence surrounding the effectiveness of CCTs in improving child health.

Methods

Search strategy

This systematic review was guided by *Guidance for Undertaking Reviews in Health Care* from Centre for Reviews and Dissemination (2009) and *The Cochrane Handbook for Systematic Reviews of Interventions* from the Cochrane Collaboration (Higgins and Green 2008). The review identified outcomes studies (experimental, quasi-experimental, before-and-after studies) published between 2000 and 2013 in English (due to the lack of resources to translated studies published in other language) language. The inclusion criteria were that:

- The study related in full or in part to children less than 18.
- The study evaluated conditional cash transfer interventions having at least one of these components: health, nutrition, child labour, and education and was based on conditions (e.g. health care utilisation, growth monitoring, addressing child labour, and school attendance). Cash transfers not based on conditions were excluded.
- The study was conducted in a developing country as classified by World Bank.
- The main outcome reported by the study was changes in child health measured by morbidity, nutritional status, health services uptake, and immunisation coverage. At the protocol stage, childhood death was included as an outcome measure but it was later dropped since none of the studies reported on child mortality.

Seven electronic databases were searched for papers: MEDLINE, EMBASE, PubMed, PsychINFO, BIOSIS Previews, Academic Search Complete, and CSA Sociological Abstracts. After a scoping search on these databases, it was realised there was the need to categorise the search terms into exposure terms (interventions) with outcome terms (child health), subject terms (children), and context terms (developing countries) to meet the varying degree of sensitivity to the various search databases (Cattan

et al. 2005). The Boolean operators (AND, OR, and NOT), truncations, and the search filters developed by the Cochrane Collaboration were used to either broaden or narrow the search.

Study selection and data extraction

The studies were first included or excluded based on their titles or abstracts. Those studies that were found to be relevant were further passed through the draft inclusion criteria (developed at the protocol stage) to assess their suitability for inclusion which resulted in the exclusion of some papers and refinement of the inclusion criteria. Data extraction was carried out separately for each study using a standardised data extraction instrument adapted from Cochrane Effective Practice and Organisation of Care Review Group (EPOC) (2002) so as to achieve consistency and objectivity (Petticrew and Roberts 2006; Higgins and Green 2008). The data extraction instrument had the following major categories: publication details; context and description of intervention; study description; outcome measure and results; and authors' conclusions on interventions' effectiveness.

Quality assessment and data synthesis

The methodological quality of each study was critically appraised using a standardised tool slightly adapted from the Evidence for Policy and Practice Information and Coordinating Centre (EPPI-Centre 2002). The EPPI-Centre quality assessment tool for quantitative studies has been independently evaluated and judged as suitable for use in critical appraisal of papers for systematic reviews (Higgins and Green 2008). At the final stage of the quality assessment, weight of evidence (high, moderate, low) was assigned to rate the methodological quality (rigour in methods and risk of bias) of the studies. Selected studies were analysed by the authors independently to assess the quality of the study and identify possible biases within the studies reviewed. After independent analysis of articles, authors ensured reliability through series of discussions for cross-checking extracted and analysed data until consensus was built.

Due to the considerable heterogeneity of the interventions, study designs, and outcomes reported in the included studies, a meta-analysis was not practical (CRD 2009). Rather, a narrative synthesis (summarising and explaining findings in words) was conducted. The qualitative synthesis of data was done by combining studies with similarities in their interventions following the guidelines developed by Popay et al. (2006) to enhance the transparency and reproducibility of the synthesis. The narrative synthesis helped to conceptualise the findings in the light of the programme impact theory. To avoid bias in the narrative synthesis, the results of each study were reported judiciously and efforts were made to avoid inappropriate emphasis on the findings of any one particular study (Higgins and Deeks 2008).

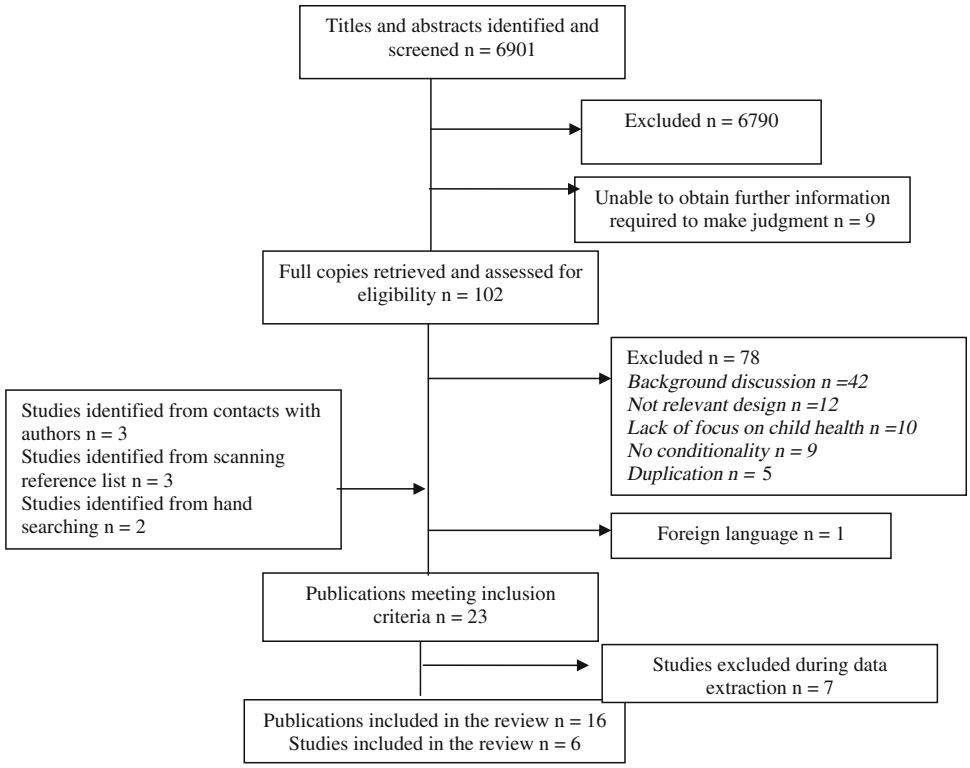
Results

Figure 1 gives an overview of the search and review process. A total of 6,901 titles were available, and abstracts were identified and screened for eligibility. Of the 6,901 papers, 6,799 were excluded as they were not relevant to the review based on their titles, abstracts, or lack of information to make judgement about them. One-hundred and two full copies of studies were obtained and examined in further detail for inclusion in the review. Of the 102 potential studies, 79 were excluded as they failed to meet the inclusion criteria. Seven papers were further excluded at the data extraction stage as the child health outcomes reported by these studies (e.g. salivary cortisol levels, aggression, and anxiety) were not of interest to this review. The remaining 16 publications which were included in the review reported data on what appeared to be 6 individual studies. One of the included studies, Barham et al. (2007), covered two separate CCTs from Mexico (Oportunidades) and Nicaragua (Red de Poteccion Social) and was treated as one study. A narrative synthesis was conducted on the 16 papers that were included in the review.

Developing a theory: how CCTs work to improve child health

All the 16 included studies reported on CCTs which had at least one of three components (health, nutrition, and education). As indicated in Fig. 2, we used the programme impact theory to hypothesise the pathways through which CCT programmes affect child health. The cash transfers may increase household income, which in turn may allow households purchase more nutritious foods and attain food security at the household level. Some CCTs condition women to attend health education workshops that may increase women's knowledge and preferences for nutritious foods and improved feeding practices (*nutrition pathway*). CCTs generally target women, and therefore, the cash transfers to women may result in women having more control over resources, women empowerment, and women's decision-making power relative to child (*women/caregivers income and control over resources pathway*). CCTs that include food supplements may have direct impact on children's nutritional status (*child dietary intake pathway*) power reduced child poverty and increased child

Fig. 1 Study selection process



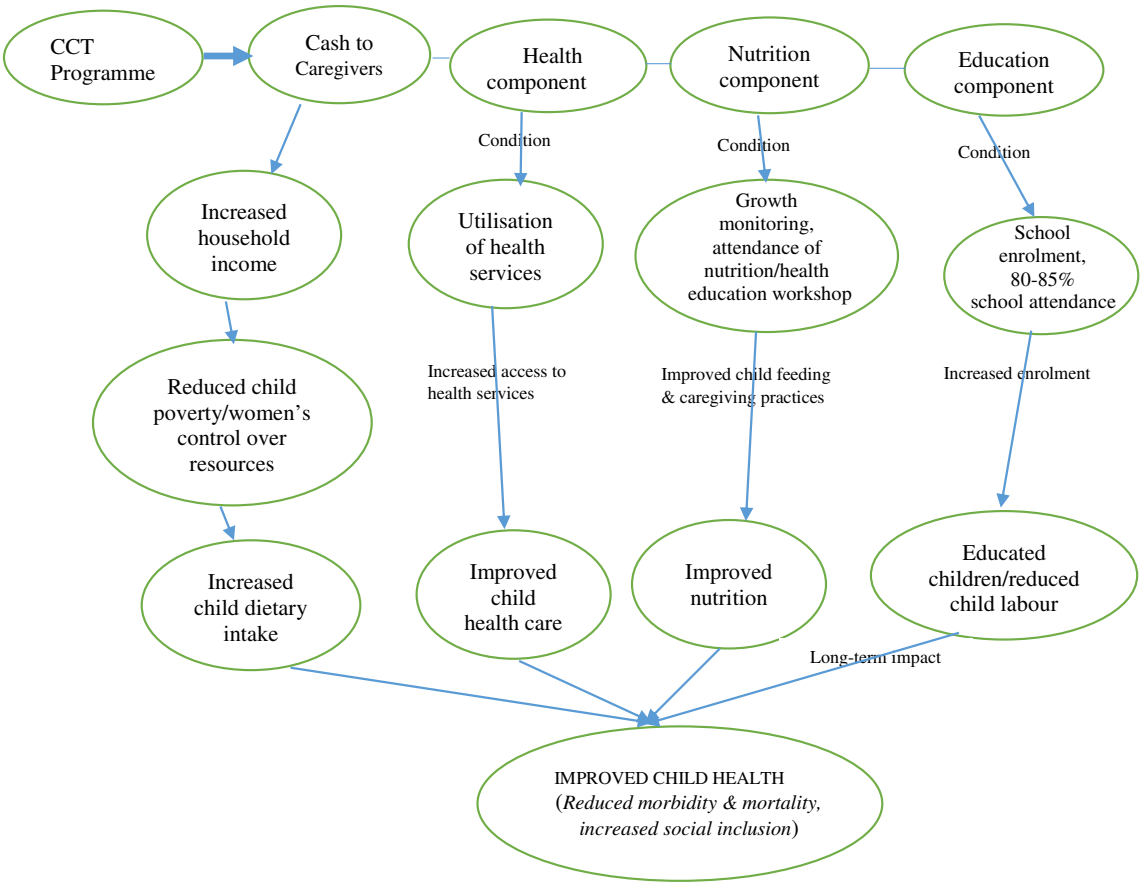


Fig. 2 Envisaged pathways of conditional cash transfer's impact on child health

dietary intake. The health component of CCTs which condition women to go for antenatal and post-natal care, and children for regular primary care visits, may increase health services utilisation and reduce child morbidity and mortality. This may however depend on the availability, quality, and capacity of the health system (*health services uptake and child health pathway*). The education component of the programme which requires that school-going children enrol and remain in school can have a long-term effect on child health (*education pathway*). Early childhood education is critical to addressing the social gradient in health particularly in tackling unemployment, poverty, and social exclusion (Marmot Review Report 2010). The education pathway is not included in this review due to the lack of evidence on these long-term outcomes.

Due to the complex nature of CCT programmes and the context under which these programmes are implemented, it is worth mentioning that the impact theory framework which formed the basis for this review is a simplification of reality.

Developing a preliminary synthesis

Study setting and evaluation design

With the exception of one study from Zimbabwe, all other studies were from Latin America. The decision to include the Zimbabwean study was based on the scope of the review which was restricted to low- and middle-income countries as defined by the World Bank. Nine studies were from Mexico (Gertler 2000; Rivera et al. 2004; Behrman and Hoddinott 2005; Barham 2005; Huerta 2006; Barham et al. 2007; Barber and Gertler 2008; Fernald et al. 2008; Leroy et al. 2008a), 4 from Nicaragua (Maluccio and Flores 2005; Barham et al. 2007; Macours et al. 2008; Barham and Maluccio 2009), 1 from Colombia (Attanasio et al. 2005), 1 from Honduras (Morris et al. 2004a), 1 from Brazil (Morris et al. 2004b), and 1 from Zimbabwe (Robertson et al. 2013). Barham et al.'s (2007) study covered two separate CCT interventions from Mexico (Oportunidades) and Nicaragua (Red de Poteccion Social). Thirteen of the 16 papers employed randomised controlled trials (cluster randomised controlled trials (C-RCT)) as the study design and the remaining three were based on controlled before-and-after study (CBA).

Characteristics of studies

Online Resource 1 gives an overview of the characteristics of the included studies. Each study was given an ID number that is used to refer to the study. The study participants comprised of pregnant women, children less than five and their mothers/caregivers, and sometimes other household members. Study 12 focused on birthweight and involved pregnant women aged between 15 and 49 years. Aside studies 10 and 13 which involved children less than 7 years, all other studies focused on children less than 5. Participant recruitment was mainly random based on the targeting techniques of each CCT intervention.

Context and description of interventions

The characteristics of the CCTs evaluated by the studies are summarised in Online Resource 2. The Mexican's CCT had its name changed from PROGRESA to Oportunidades in 2003. All the CCTs shared similar characteristics in terms of their target population who were mainly the poor and socially excluded or disadvantaged groups: pregnant women, lactating mothers, infants, and children. Even though these groups of individuals were the direct beneficiaries of the programme, all the CCT programmes were targeted at households and were normally provided at the community level with spillover effects to the larger community. The benefits package of the CCTs varied across the target groups and programmes. The targeting approaches used in the CCT programmes were either geographic targeting (selecting beneficiary municipalities based on poverty mapping or in some cases the prevalence of malnutrition) or proxy means (selecting beneficiaries at the household level using income level and household conditions as proxy indicators) or both to recruit beneficiaries.

Findings: CCTs' effectiveness in improving child health

Evidence on pathways of impact

The main child health outcomes reported by the studies were morbidity risk, improvement in nutritional outcomes, health services utilisation, and immunisation/vaccination coverage. The *cash to mothers' pathway* was reported as a cross-cutting pathway by influencing the health and nutrition pathways of impact.

Health service utilisation and child health pathway

Overall, the CCT programmes reviewed had a large impact on health service utilisation. Mexico's PROGRESA increased growth monitoring visits between 30 and 60 % for children aged 0–2 and 25–45 % for children aged 3–5 years (1). The probability of children aged 0–24 months complying with growth monitoring requirements increased by 0.228 ($p = 0.05$) in Colombia (5). In Honduras, PRAF (6) increased antenatal and well-child check-ups by 15–20 % points ($p = 0.01$) and child growth

monitoring by 15–21 % points ($p = 0.01$). Nicaragua's RPS increased the utilisation of antenatal care, regular well-child check-ups, and growth monitoring visits for children (aged 0–3) by 18, 19, and 15 % points, respectively (15).

Immunisation coverage We found five studies reporting evidence that the programme's condition that required children to attend growth monitoring impacted on child health and increased immunisation coverage. Nicaragua's *Atención a Crisis* impacted positively on child health as there was a probability that older children benefiting from the programme would receive vitamin A or iron (0.086, $p = 0.01$), de-worming medication (0.066, $p = 0.01$), or had a growth check-up (0.056, $p = 0.01$) (13). These were self-reported measures of growth check-ups and were double-checked using a vaccination-health record card. In Honduras, immunisation started early among children benefiting from the programme as the programme was associated with a 6.9 % increase in the coverage of the first dose of DPT vaccine among children (6). On-time vaccination coverage was also found to have increased from 68 to 77 % in 2000 to 87 to 97 % in 2002 among PRAF children (6). After 6 months of implementation, the Mexican's CCT (Oportunidades) BCG coverage rates increased from 88 to 92 % ($p = 0.05$) and MCV coverage for on-time vaccination increased from 92 to 96 % ($p = 0.03$) (11). Five months of Nicaragua's RPS was associated with an increase in on-time vaccinations for OPV3 coverage from 76 to 96 % ($p = 0.13$) and an increase in fully vaccinated children from 54 to 84 % ($p = 0.20$) (11). After 6 months of PROGRESA, TB immunisation coverage among children aged 12–23 months increased from 88 to 92 % ($p = 0.01$) (14). This difference was however attributed to a decrease in coverage in control group, and the difference was no more significant after the control children recovered from the drop 12 months after baseline. There was an increase in measles vaccination during the first 6 months from 92 to 96 % ($p = 0.03$). In low coverage communities, measles vaccination increased from 75 to 92 % ($p = 0.03$) after 12 months of programme implementation. In Brazil, Morris et al. (2004b) (10) reported that RPS had no significant impact on vaccination coverage. Robertson et al. (2013) (16) reported that the Zimbabwean programme had no significant effect on vaccination coverage (1.8 % increase). In addition, for three CCTs (in Mexico, Colombia, and Honduras), there was no evidence of an increase in vaccination coverage for children above 2 years.

Morbidity risk reduction Four studies (1, 5, 9, and 15) reported on CCTs' impact on the prevalence of disease among children. Mexico's PROGRESA reduced illness rate by 12 % ($p = 0.01$) among children less than 5 in beneficiary communities (1). There was however no impact on children aged 6–17 relative to the control communities. Huerta (2006) (9) found that after 1 year of PROGRESA, the odds of being ill with diarrhoea among children less than 5 in treatment community were 32 % lower than those from control community and 2 years of PROGRESA had a positive effect on acute respiratory infections (ARI) among children aged 24–59 months (odds of 0.62:1). In Colombia, mixed findings about CCTs' impact on diarrhoea were reported (5). Whilst the programme reduced the probability of reporting diarrhoea symptoms by about 0.10 for children less than 48 months living in rural areas ($p = 0.05$), this was not so about older children. Similarly, study 15 reported that Nicaragua's RPS did not improve haemoglobin levels or lower rates of anaemia in children less than 5.

Nutrition pathway

Ten studies (1–5, 7, 10, 12, 13, and 15) reported on how four CCT programmes impacted on child nutrition through *women income and control over resources and child dietary intake pathways*. The Mexican programme improved children's nutritional status. Leroy et al. (2008a) (3) found that children aged 6–24 months in intervention group at baseline grew 1.5 cm ($p = 0.05$) more than children in comparison group. They also gained 0.76 kg ($p = 0.01$) or 0.47 weight-for-height Z-scores ($p = 0.05$) than their peers not benefiting from Oportunidades. Behrman and Hoddinott (2005) (4) found that children aged 12–36 months benefiting from PROGRESA grew by over 1 cm than non-beneficiary children representing an increase of about one-sixth in mean growth per year for children aged 12–36 months and a lower probability of stunting. The effect was, however, larger for children from poorer communities whose mothers were functionally literate. Rivera et al. (2004) (2) compared a group that had benefited from PROGRESA for 2 years against a 'cross-over' group that had benefited from the programme for 1 year. After the 2 years of PROGRESA, height for age for children younger than 6 months (at baseline 1998) in poor families was greater by 1.1 cm ($p = 0.046$) than those in cross-over group. No difference was found for children aged 6–12 months. There was a high mean haemoglobin level in intervention group (11.12 g/dL; 95 % CI 10.9–11.3 g/dL) after 1 year of PROGRESA as against cross-over intervention group (10.75 g/L; 95 %CI 10.5–11.0 g/dL) ($p = 0.01$) in 1999. The difference was no more significant in 2000 ($p = 0.26$). Anaemia was also higher in cross-over intervention group (54.9 %) than in the intervention group (44.3 %) ($p = 0.03$) in 1999. Fernald et al. (2008) (7) further reported that doubling the cash

transfers to mothers was associated with higher height-for-age Z-score (β 0.20, 95 % CI 0.09–0.30; $p = 0.0001$), lower prevalence of stunting (−0.10, −0.16 to −0.05; $p = 0.0001$), and lower prevalence of being overweight (−0.08, −0.13 to −0.03; $p = 0.001$). The authors found that mothers' purchasing power increased spending on the average 70 % of cash transfer on quality food for their children.

In Colombia, the programme resulted in a 0.069 decrease in the probability of children less than 24 months being chronically undernourished ($p = 0.05$) as well as a 0.578 kg increase in the weight of newborns due to the intervention ($p = 0.05$) (5). The authors further found that cash given to the mothers resulted in increased dietary intake of protein and vegetables among children aged 24–60 months. The Nicaraguan programme resulted in a decline in stunting from 39 to 36 % and a reduction in the prevalence of underweight among children less than 5 from 13 to 9 % (15). The programme, however, did not impact on wasting among children less than 5. Macours et al. (2008) (13) also found that Nicaragua's *Atención a Crisis* had a statistically significant impact on the intake of milk, meat, and eggs among older children ($p = 0.01$). There was however no effect on child anthropometric measures, or on the birth weight of recently born children (less than 5 months). The Brazilian CCT, Bolsa Alimentação, evaluated had no impact on height-for-age measures and a negative effect on weight for children less than 7 years of age (10).

Study quality assessment

The criteria developed by EPPI-Centre (2002) were adapted to assess the methodological quality (rigour in methods and level of bias) of the studies (see Online Resource 3). In total, nine studies (1–3, 6–8, 10, 15, 16) had a high methodological quality (minor limitations—risk of bias unlikely to seriously alter results), four studies (9, 11, 13, 14) were of moderate quality (low risk of bias—raises some concerns about the results), and three studies (4, 5, 12) were of low quality (high risk of bias which weakens the confidence in the results). Studies were assigned an overall rating of low, moderate, and high based on the outcome of the quality assessment. Articles were not excluded due to a low-quality rating but this was considered with analysing effectiveness.

Discussion

CCTs effectiveness in improving child health

The results from six conditional cash transfer programmes reviewed suggest that, to a large extent, CCTs are effective in improving child health by addressing child health determinants such as nutrition, morbidity risk, access to health care, immunisation coverage, and increased household income.

Evidence on pathways of impact

Aside the Brazilian CCT, four CCTs (from Mexico, Colombia, Honduras, and Nicaragua) evaluated by the included studies impacted positively on nutritional outcomes for children less than five in areas such as height, weight and stunting, and high intake of animal protein. The nutrition pathway was also found to improve child health by improving mother's knowledge on nutritional practices (via attendance of nutrition workshops) and dietary intake for children. This is consistent with Escalante-Izeta et al.'s (2008) finding that mothers' knowledge plays an important role in sustaining the impact of the nutritional component of CCTs on child health. Fernald et al. (2008) (7) specifically focused on the cash to mothers pathway of impact and found that doubling the cash transfers to households resulted in improved nutritional outcomes for children. A limitation to this study however was the failure to control endogeneity of the transfers (i.e. whether the cash transfer was associated with the behaviour change of spending on children's nutrition). Not withstanding this, the evidence linking the impact of the cash pathway to improving child nutrition was compelling.

Barber and Gertler (2008) (12) found that PROGRESA from Mexico was effective in improving the nutritional status of pregnant women, thus resulting in improved child health via high birthweight and a reduction in low birthweight of PROGRESA mothers. These findings of the review are consistent with the argument of the *Lancet Series on Maternal and Child Under nutrition* that targeted nutritional interventions which focus on pregnant women and children at an early stage could significantly improve child health by reducing malnutrition and disease burden by 25 % in the short term (Bhutta et al. 2008). Behrman and Hoddinott (2005) (4) concluded that CCTs' effectiveness in improving and sustaining child health via improved nutrition is contingent on mothers' education level and knowledge about nutritional practices. This is in support of similar studies that have concluded that educated mothers and/or mothers with adequate knowledge about nutrition tend to feed their children more with nutritious food than their peers (Currie and Moretti 2003; Bassett 2008).

Notwithstanding the positive effects that CCTs may have on child health through improved nutrition, there may be some unintended negative effects as reported by study 10 where the Brazilian CCT (Bolsa Alimentação) had a negative effect on child nutrition (reduction in children's weight). Earlier work by Olinto et al. (2003) showed that Bolsa Alimentação increased the quantity of nutritious

foods in beneficiary households. Morris et al. (2004b) (10) therefore noted that the negative effect of the programme might have resulted from an incentive effect, that is, mothers might have misconstrued the conditions of the programme and intentionally kept their children underweight so as to continue benefiting from the programme.

In the developing world, millions of children in poor households are afflicted with preventable illnesses (Bryce et al. 2005). High-quality evidence from this review indicates the effectiveness of CCTs in reducing child morbidity risk (reduced probability of getting diarrhoea, anaemia, and ARI). Four studies (1, 5, 9, and 15) demonstrated that CCTs were associated with reduction in diarrhoea, anaemia, and ARI among children in Mexico and Colombia. The lack of impact on haemoglobin and anaemia in Nicaragua could be attributed to the lack of monitoring of mothers' compliance to iron supplements (to their children) at the monthly check-up services offered in clinics as observed by Maluccio and Flores (2005) (15).

The review shows a consistent evidence of CCTs' impact on health services utilisation (for growth monitoring, antenatal care, preventive check-ups for children), and immunisation and vaccination coverage for children less than five in Mexico, Colombia, Honduras, and Nicaragua. These findings are in line with a number of studies that have attested to CCTs' significant contribution to improving children's access to health care (Lagarde et al. 2009; Gaarder et al. 2010). It is widely documented that access to health care remains a major determinant of child health (Commission on Social Determinants of Health, 2008; World Health Organisation 2008). With the evidence of CCTs' positive impact on children's access to health care, however, governments, non-governmental organisations, and donor agencies concerned with improving child health in developing countries through increased access to primary health care may consider CCTs as a viable option. It must however be noted that for CCTs to increase access to primary health care for children, a well functioning and free health care system must be in place to meet the increased demand for health services that would result from CCT initiatives (Gertler and Fernald 2004; Cechini, 2009).

All the studies included in the review commented on the significant contribution of the cash component to improving child health in areas such as uptake of health services, dietary intake, and reduction in childhood poverty, which is a major determinant of child health. This supports other findings elsewhere that addressing income poverty in poor families via cash transfers holds the key to breaking intergenerational poverty and to increasing access to primary health care for the overall improvement of child health (Adato et al. 2000b; Galssman et al. 2006; Silva 2009; Marmot Review Report 2010).

Limitations

The review faced a number of methodological problems. First, the review focused on studies published in English and the possibility of missing out on other relevant studies published in other languages cannot be overruled. Although this systematic review focused on CCT interventions in developing countries, nearly all the studies (15/16) were from Latin America and this could potentially affect the generalisability of the findings to other developing countries, particularly those from Africa, due to the contextual differences among these economies (Armstrong et al. 2008). The included studies had some level of bias. Studies using C-RCT suffered from concealment of allocation, protection against contamination, and protection against detection bias whilst those using CBA design mostly suffered from the use of equivalent control sites and baseline measurements. Even though there were some methodological weaknesses in the included studies, in most cases when bias arose, the evaluators worked hard to correct them or account for confounding factors. For instance, most of the studies (13/16) made use of appropriate analysis (double-in-difference estimates and regression analysis), which mostly accounted for cluster effects/bias.

Conclusion

The review findings indicate that CCTs offer a valuable social policy instrument for the promotion of child health in developing countries particularly middle-income countries. We found evidence that to a large extent, CCTs are effective in improving child health by addressing child health determinants such as access to health care, child nutrition, morbidity risk, and household poverty. The CCT programmes included in this review have been predominantly implemented in Latin American countries (middle-income setting). Further investigation into CCTs impact on child health in low-income countries should be conducted to further strengthen the evidence base for CCT implementation in low-income country contexts. Evidence from this review suggests that the health and nutrition interventions under CCTs work best for children less than five and there is the need to tailor the interventions under these two components (health care visits and nutrition) specifically to the health needs of these children in their early developmental stages. Of importance to both policy and practice, it appears that CCTs require effective functioning of health care systems and timely implementation of the health and nutrition interventions (targeted at the developmental stage of children (0–5 years)) to effectively promote child health. In the light of the evidence reviewed, it was not clear which pathway of impact was most

effective in improving child health. It is therefore recommended that more studies be conducted to examine which specific component of CCTs (cash, health, nutrition, or education) is more effective in improving child health.

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