

# The Effect of Cash Transfer on Maternal and Child Health Outcomes: A Systematic Review in Sub-Saharan Africa

Emery L Ngamasana (✉ [engamasa@uncc.edu](mailto:engamasa@uncc.edu))

University of North Carolina at Charlotte

Jessamyn Bowling

University of North Carolina at Charlotte

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## Research Article

**Keywords:** Cash Transfer, Health Outcomes, Maternal and Child Health

**Posted Date:** May 26th, 2022

**DOI:** <https://doi.org/10.21203/rs.3.rs-1655009/v1>

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# Abstract

**Background:** Evidence-based policies are critical to navigate the time post-COVID-19. Improving maternal and child health is core to any recovery strategy. Cash Transfer programs can improve maternal and child health outcomes in low- and middle-income countries. However, studies assessing the effectiveness of these programs on maternal and child health outcomes, beyond service utilization, remain inconclusive. This synthesis fills a gap in the existing literature on the effectiveness of these programs in improving mothers and children's health outcomes beyond service utilization and suggests a framework for reporting such health outcomes. We focused on Sub-Saharan Africa because of substantial operational differences between regions, and the need for maternal and child health advancement in this region.

**Methods:** This review searched PubMed Central and Google Scholar, and supplemented with a backward citation search, for studies conducted in Sub-Saharan Africa using a combination of MeSH terms and key words for the period between 2000 – 2021. The review included only studies on cash transfer programs that reported health outcomes beyond service utilization among women of reproductive age and children below 18 years old.

**Findings:** The synthesis pulled data from 17 articles conducted in 6 Sub-Saharan African countries. All studies reported health outcomes measures other than service utilization, and programs targeted women of reproductive age and children under 18 years of age. Of the 17 articles, 1 reported measures of mortality, 9 reported measures of functional status; 3 reported subjective measures of well-being, and 4 reported behavioral health outcomes. Across all categories of reported measures, evidence emerges that cash transfer programs are associated with improved health outcomes (e.g., improved infant and child survival, reduced incidence of illnesses, improved cognitive and motor development, improved general health, delayed sexual debut, lower transactional sex, etc.).

**Conclusion:** Cash Transfer programs are effective, with great potential to improve maternal and child health outcomes in Sub-Saharan African countries. However, further research is needed to address implementation challenges, which include data collection, and program management.

## Background

Populations in Low- and Middle-Income Countries (LMIC) continue to face daunting challenges. Mothers and children are the most affected by these challenges, which include a double burden of communicable and non-communicable diseases, higher infant and maternal mortality, malnutrition, etc. These challenges have been exacerbated, by the novel COVID-19 pandemic, which has dismantled the prevailing social safety nets (Busch-Hallen, Walters, Rowe, Chowdhury, & Arabi, 2020; Cash & Patel, 2020; Teachout & Zipfel, 2020). The future remains ambiguous, with vaccine access as the fault line along which economic recovery may split (IMF, 2021).

Although the full impact of the COVID-19 on maternal health and child survival remains unknown, recent studies have predicted devastating impacts. For instance, if routine healthcare is disrupted (e.g., 9.8% to

51.9% reduced coverage) and access to food is decreased (e.g., 10% increased prevalence of wasting), the resulting consequences will be devastating. Such disruptions could translate to 253,500 additional child deaths and 12,200 additional maternal deaths (Busch-Hallen et al., 2020; Headey et al., 2020; Roberton et al., 2020). These initial estimates do not account for other important aspects, such as disrupted breastfeeding practices, the duration of the pandemic, and subsequent lockdowns, and subsequent mental health issues. Hence, the need for evidence-based policies to navigate the time post-COVID-19; especially in the area of Maternal and Child Health (MCH), which should be central to any recovery strategy (Jacob et al., 2020; Modi & Hanson, 2021).

Cash Transfer (CT) programs are one of the public health interventions that policymakers and funders can rely on to improve MCH outcomes in LMICs. These programs were initially launched in Latin America (i.e., Brazil and Mexico) in the mid-90s to provide education and health to historically “excluded” populations, before being adopted in other LMICs (Turley, 2020).

CT programs represent a “set of public and private policies or programs aimed at preventing, reducing and eliminating economic and social vulnerability to poverty and deprivation” (UNICEF-ESARO, 2015, p. 1). They are often implemented as a direct transfer payment of money to eligible persons and can be either conditional or unconditional. Unconditional Cash Transfer (UCT) programs provide cash to all eligible and registered beneficiaries; whereas Conditional Cash Transfer (CCT) programs require an eligible person to take a specified course of action, also known as co-responsibilities or conditionalities, to receive a benefit (Das, Do, & Özler, 2005; Garcia, Moore, & Moore, 2012). Generally, co-responsibilities include actions such as attending required medical check-ups, completing required immunizations, school attendance, adults’ attendance of education seminar covering topics such as health, family planning, nutrition, adherence to immunization, registering child birth, exclusive breastfeeding, etc. (Chakrabarti, Pan, & Singh, 2021; Garcia et al., 2012).

These programs have been widely implemented in Latin America, in Africa, and South Asia. For instance, Bolsa Familia introduced in Brazil in 2003 after merging three existing conditional and unconditional cash transfer programs, is one of the largest CCT programs in the world (Bauer, Paula, & Evans-Lacko, 2021; Neves et al., 2020). It covered over 14 million eligible households that met the eligibility criteria: households with children less than 17 years of age and/or pregnant women making less than R\$120 (USD \$68) per capita monthly. In addition to this overall payment, the Bolsa Familia program also sent monthly transfer to extremely poor families (i.e., those earning less than R\$64 or USD \$34), regardless of their composition (Soares, Ribas, & Osório, 2010).

CT programs are also common among Asian countries. For instance, in 2011 the state of Odisha in India, initiated a statewide CCT program named Mamata to improve MCH outcomes and promote health-seeking behaviors (Chakrabarti et al., 2021). Other similar programs in South Asia include the Aama (Mothers’) program in Nepal, Janani Suraksha Yojana (Safe Motherhood Scheme) and the Chiranjeevi Yojana (Scheme for Long Life) in India; the Maternal Health Voucher Scheme in Bangladesh and the Sehat (Health) Voucher Scheme in Pakistan (Jehan et al., 2012).

In Africa, major CT programs such as the Productive Safety Net Program's Direct Support (PSNP-DS) in Ethiopia and the Hunger Safety Net Program (HSNP) in Nigeria were designed to address food insecurity. Leveraging on the success of these programs, African governments and external donors, mainly the World Bank, expanded CT programs to address other challenges, including access to healthcare. Still, many CT programs are geared toward relief or development goals (Garcia et al., 2012). Examples include the Zambia's Child Grant Program (CGP) (Handa et al., 2016), the Subsidiary Reinvestment and Empowerment Program (SURE-P) in Nigeria (Okoli et al., 2014), the Manicaland program in Zimbabwe (Robertson et al., 2013), the "Santé Nutritionnelle à Assise Communautaire dans la région de Kayes" (SNACK-CAN) in Mali (Adubra et al., 2019), and many others (Onwuchekwa et al., 2021).

## Rationale for the study

Findings about the effectiveness of these programs to improve MCH outcomes, beyond service utilization, remain inconclusive (Onwuchekwa et al., 2021; Singh et al., 2021). Most evaluations of these programs tend to focus on the utilization of healthcare services by the beneficiaries and other social determinants of health, thereby overlooking specific health outcomes related to mortality, individuals' capacity to function, or the subjective sense of well-being (Parrish, 2010). The only synthesis we found examined mental health outcomes among young people under 25 years of age (Zimmerman et al., 2021). As suggested by Parrish (2010, p. 1), "positive health outcomes for people include being alive; functioning well mentally, physically and socially, and having a sense of well-being". On this account, it could be argued that service utilization is one underlying pathway through which CT programs affect health outcomes. However, no research synthesis has been done on these outcomes as the end points among women of childbearing age and children under 18 years of age. Several factors may be contributing to this gap. Many of the aforementioned studies are lacking a coherent operationalization of the concepts of maternal and child health outcomes, beyond service utilization metrics (Hunter et al., 2017; Owusu-Addo et al., 2018b; Singh et al., 2021), which creates larger heterogeneity across studies (Owusu-Addo & Cross, 2014).

In this time of competing priorities across the world, allocation of scarce resources needs to rely on evidence-based science. Both governments, and external funders navigate resource constraints as they allocate funding. Lack of evidence on a given programmatic effort, could undermine not only funding allocation, but also any progress achieved. Hence, it is crucial to fill any gaps in the existing literature with respect to the effectiveness of CT programs and their impact on MCH outcomes, to keep these programs running, and to advocate in favor of scaling to other geographies and demographics.

Finally, some of the major barriers to the successful implementation of these programs include the lack of transparency, an endemic corruption, and lack of valid data (Wright et al., 2018). These limitations and issues represent opportunities for new areas of investigation.

## Scope of synthesis

This research synthesis focuses on the relationship between CT programs and MCH outcomes, other than service utilization. It covers studies that evaluated the effect/impact of CT programs on MCH outcomes in Sub-Saharan African countries for the period between 2000 – 2021. The focus on these countries stems from the fact that they are facing similar socioeconomic and political situations, and often share the same social norms, which are associated with populations' health behaviors (Cotterill et al., 2019; Gai Tobe et al., 2019; Harith & Mahmud, 2020; Zhang et al., 2020). The nature and scope of CT programs in Sub-Saharan African countries differ from that of other LMICs. For instance, by contrast to Latin American countries whose CT programs are solidarity-based nationwide social policies enacted by their respective Governments, CT programs in Sub-Saharan African countries are often not an expression of deliberate policy program, with clear commitment by the national or local Governments. Instead, CT programs in those countries are driven by international agencies and donors who support small-scale pilot projects (Scarlato & d'Agostino, 2016). Therefore, CT programs in this region need further evidence to continue to attract funds both from local governments, and from international donors. The chosen period reflects the time when these programs became available within the region (Owusu-Addo & Cross, 2014).

This synthesis addressed the lack of evidence on the effectiveness of CT programs to positively impact MCH outcomes, beyond service utilization-based metrics. Outcome indicators defined in this review were based on mortality, subjective health state, experiential, and psychological state, and on the ability to function. Protective behaviors that promote health were also considered.

### **Research questions**

1. To what extent CT programs can improve MCH outcomes (functional, subjective sense of well-being, experiential state, and death) in Sub-Saharan African countries?
2. What are the potential pathways through which CT programs influence MCH outcomes?

## **Methodology**

We searched PubMed Central and Google Scholar for published peer-reviewed papers from 2000–2021. This research synthesis followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) checklist (Fig. 1).

Based on the above research questions, we used a combination of Medical Subject Headings (MeSH) and keywords, incorporating Boolean operators, truncation, and field tags. Our search string was defined as followed: (("cash transfer\*" OR "cash incentive\*") AND ("maternal and child health" OR "maternal and child health outcome\*") AND "Africa".

We also conducted a backward citation search, in which we looked at the reference list on the most recent and relevant systematic review, manually searching Google Scholar for relevant studies.

### **Inclusion and exclusion criteria**

Studies were screened for eligibility and irrelevant articles were excluded based on title and abstract. Selected studies were fully reviewed for data extraction. The review included only peer-reviewed studies, whose CT programs targeted women of reproductive age (15–49 years) and children (< 18 years old) and reported health outcomes other than service utilization. Studies of interest were implemented in the Sub-Saharan African countries between 2000–2021.

Health outcomes included a measure of functional status (e.g., according to the International Classification of Functioning, Disability and Health); or a subjective sense of well-being, or mortality (survival). In addition, we included studies that reported some protective health behaviors (e.g., administration of nevirapine to prevent mother-to-child transmission of HIV).

### **Data extraction and coding**

Results from the search string in PubMed were exported in a text format file (i.e., .txt) and saved in Excel. We first screened all the titles of articles to remove duplicates and studies that were conducted outside of Sub-Saharan African region, protocol, and systematic reviews. We then screen the abstracts of the remaining articles to further exclude irrelevant studies (e.g., studies not using the specified study population, or did not report the defined health outcomes). Included articles were fully reviewed and the following data were extracted: the name of the author, the year of publication, the title of the study, the study design, the name of the intervention if provided, the country of the intervention, the outcome assessed, the method used to evaluate impact, the reported measure of effect and the 95% confidence intervals or the standard errors, and the covariates. Since all studies were RCTs, they were evaluated for their quality, using the Consolidated Standard of Reporting Trials (CONSORT) 2010 check list and a risk of bias assessment was done using the revised Cochrane risk-of-bias tool for RCTs (RoB 2).

## **Results**

Final studies included 5 papers by the same group of authors evaluating a program implemented in Malawi, and 3 papers from the same authors for a program implemented in Kenya. Table 1 below presents results from the synthesis by type of health outcome because many studies relied on the same dataset, while investigating a diverse set of outcomes or end points (Table 1).

Almost all included studies were RCTs implemented in Sub-Saharan African countries (i.e., Malawi, Kenya, South Africa, Nigeria, Tanzania, and Zambia). Assessed outcomes included: illness in past 30 days, illness that stopped normal activities in the past 30 days, sexual debut, risky sexual behaviors (e.g., unprotected sex, multiple partners, transactional sex), depression, incidence of HIV and HSV-2, subjective sense of well-being, child survival, fetal loss, fetal death, stillborn, infant death, child anthropometric measures, prevention of mother to child HIV transmission by the administration of nevirapine, and Early Infant Diagnosis of HIV (EID), happiness, well-being, child cognitive, language and motor development, child anthropometry.

Outcomes were grouped into three main groups based on the classification suggested by (Parrish, 2010): mortality, functional status, and subjective sense of well-being. In addition, an additional category was added to account for the relevance of some protective health behaviors reported.

Table 1  
Description of reported MCH outcomes by categories of health outcomes

<b>Outcome</b>	<b>Number of articles reporting</b>
Mortality	<b>1 (5.9%)</b>
Child survival	1
Fetal loss/fetal death	1
Stillborn	1
Infant death	1
Functional status	<b>9 (52.9%)</b>
Illness in the past 30 days	3
Illness that stopped normal activities in the past 30 days	1
Cognitive, language and motor growth	1
Depression	3
Children anthropometric measures	1
Incidence of HIV, HSV-2	2
Well-being	<b>3 (17.6)</b>
Subjective well-being	2
Mother's general health	1
Happiness	1
Quality of life	1
Health-promotion behaviors	<b>4 (23.5)</b>
Prevention of mother to child HIV transmission	3
Tetanus toxoid vaccination	1
Protective sexual behaviors (e.g., condom use, etc.)	1

Of the 17 articles included in the final review, health outcomes related to individual capacities to function were reported in 9 articles, representing 52.9% of the articles included in the review. Protective behaviors

such as administration of nevirapine to prevent mother-to-child transmission of HIV, etc. were reported in 23.5% (n = 4) of the articles. Three articles out of the 17 (17.6%) reported well-being outcomes, including subjective well-being, a mother's general health, happiness, and self-reported quality of life. Only one article reported mortality or child survival outcomes.

## **Mortality**

The only article reporting mortality included outcomes on child survival, fetal death, stillborn, and infant death. The article reported a positive association between CCT programs and child survival or reduced mortality (i.e., a child who was in-utero at enrollment was alive at follow-up). In Nigeria, a CCT program was associated with substantial increases in child survival (ITT: 0.0606; std. error: 0.0098, p-value < 0.01). The increase in overall child survival was driven by a large decrease in fetal losses (29%-point decrease in the treatment group relative to the control group mean). Potential causal mechanisms included conditionalities attached to a cash payment of \$14 (i.e., if eligible pregnant women used a package of health services consisting of at least three antenatal care visits, a health facility delivery, and one postnatal visit). Provision of other essential health interventions (e.g., antenatal care, immunization, screening for childhood pneumonia, etc.) at the beginning of life, are also key mechanisms that could improve child survival (Fig. 2).

## **Functioning outcomes**

Specific outcomes included episodes of illness (reported in 3 articles), assessment of depressive symptoms (reported in 3 articles), and incidence of HIV and HSV-2 (reported in 2 articles). CT programs impacted these outcomes, mainly through school attendance (Luseno et al., 2014; Stoner et al., 2017), and also through financial and food security (Angeles et al., 2019; Kilburn, Thirumurthy, Halpern, Pettifor, & Handa, 2016).

Evidence emerged across these studies that CCT were associated with improved health outcomes. For instance, participants who received treatment (cash payment) reported reduced likelihood of illness episodes in the past 30 days (e.g., OR: 0.67; 95% C.I.: 0.44–0.90), reduced likelihood of reporting difficulties to perform normal activities due to illness (e.g., OR: 0.58; 95% C.I.: 0.40–0.82). Lack of CCT was associated with higher school dropouts, which in turn were associated with higher risk of HIV (HR: 2.97; 95% C.I.: 1.62–5.45) and HSV-2 (HR: 2.47; 95% C.I.: 1.46–4.14). UCT were associated with lower likelihood of reporting the presence of depressive symptoms (coef.: -2.05; std. error: 0.475; p-value: < 0.001).

## **Well-being**

Three studies reported outcome measures related to participants' well-being. Those included: subjective sense of well-being, general health, happiness, and self-reported quality of life. For instance, Kilburn, Handa, Angeles, Tsoka, and Mvula (2018) found that UCT programs were associated with improved quality of life (e.g.: coef.: 3.18, p-value < 0.05). In addition, other studies reported positive effects of UCT

on a few subjective outcomes such as self-reported overall satisfaction with life (e.g., Intention to Treat (ITT): 0.673, p-value < 0.001), my child enjoys life (ITT.: 0.169 p-value < 0.001), I feel positive about my child's future (ITT.: 0.202, p-value < 0.001).

## **Behavioral and protective interventions**

Although the main focus of the study was to synthesize the existing literature with respect to the three outcome categories suggested by Parrish (2010, p. 1), we expanded the review to accommodate protective behavior promoting health. These outcomes are important given their protective nature and the risk associated with the lack thereof. The present review captured protected sex, tetanus toxoid vaccination, and health visits for nevirapine intake to prevent mother-to-child transmission of HIV infection. Studies reported a positive effect of CCT programs on the incidence of HIV and other sexually transmitted infections (STIs) through behavioral mechanisms such as condoms use, reduced number of sexual partners, reduced incidence of transactional sex, administration of nevirapine to prevent mother-to-child transmission of HIV infection. Another study looked at reception of tetanus toxoid vaccination during the perinatal period. The study showed that CCT programs was associated with increased likelihood of receiving the vaccine and therefore of being protected against maternal and neonatal tetanus (OR for those who received C300: 3.362; 95% C.C.: 2.595–4.354; and for those who received C800: 7.575; 95% C.I.: 5.648–10.160).

## **Discussion**

This review synthesizes evidence on the impact of CT programs on MCH outcomes other than service utilization, in Sub-Saharan African countries. Although initially designed to address nutritional needs in Latin American countries (Shei, 2013), CT programs have gained momentum around the world, including among African countries.

A lack of evidence on the effectiveness of CT programs to address MCH outcomes other than service utilization persists. This synthesis provides evidence that CT programs effectively improve MCH outcomes beyond service utilization. For instance, the study found that CCT programs are effective in averting fetal and infant deaths and improving child survival. This synthesis suggested that the conditionalities attached to most of the CCT programs also represent pathways through which CT programs influence health outcomes (Chakrabarti et al., 2021; Garcia et al., 2012). The review showed that CCT programs are most effective in improving child survival, functional health statuses, and promoting healthy behaviors, whereas UCT are mainly used to affect measures of well-being. This finding carries significant policy implications for future interventions. The conditionalities attached to some CT programs are important reinforcing mechanisms that could promote performance of healthy behaviors, whereas unconditional cash transfer could target the most deprived segment of the population to improve their wellbeing, through the provision of social support (e.g., financial security, food, etc.).

For instance, the provision of essential healthcare interventions (e.g., screening for anemia, prophylactic antibiotics for cesarean section, exclusive breastfeeding, case management of diarrhea, or childhood

pneumonia, etc.) to deprived populations early on in life is one mechanism through which CCT programs impact children survival. Consistent with the literature on life course perspective (Norris, Lakeb, & Draper, 2019; Sousa et al., 2018) every year, an estimated 6.54 million children die under the age of 5 and that the child's risk of death is the highest during the first 28 days of life (Lassi et al., 2014; UNICEF, 2015). However, financial constraints (e.g., fees for healthcare services, transportation, payment of medicines, etc.) and cultural beliefs remain significant barriers to healthcare access in most of these countries (Bright et al., 2017; Geleto et al., 2018). Hence, providing financial incentives to encourage women and their children to benefit from those interventions during critical moments (e.g., gestational period, post-delivery and during early childhood) has a significant impact on their survival and functional experiences. However, performance of this behavior could be modified by lack of motivation, and other cognitive factors. Therefore, attaching conditionality to such programs can contribute to improving adherence to promoted behaviors.

The synthesis also found evidence that CCT programs were associated with improved functioning capacities (e.g., lack of illness in the past 30; no report of being unable to perform usual activities because of illness, reduced depressive symptoms, and incidence of HIV and HSV-2). Across studies, there seems to be a consensus that CCT programs impact these outcomes through two underlying mechanisms, namely education (Luseno et al., 2014; Stoner et al., 2017) and financial and food security (Aubra et al., 2019; Owusu-Addo & Cross, 2014). CCT programs are used to keep young children, especially young girls in school, which reduces their likelihood of engaging in risky behaviors (e.g., transactional sex, unprotected sex, etc.). In addition, CCT programs are also used to provide financial resources to deprived populations. Thus, recipients of these grants can use the money to buy food, thereby preventing food insecurity which might compromise their functional capacities (Petersen, Brooks, Titus, Vasquez, & Batsis, 2019)

UCT programs were associated with improved emotional health (e.g., subjective sense of well-being, self-reported quality of life). UCT programs impact people's sense of well-being, by providing financial support to people, whose lives are subjected to daily concerns over the basic needs of food, shelter, clothing, etc. Given that emotions influence health directly (e.g., through the activation of the hypothalamic-pituitary-adrenal axis) and indirectly (e.g., through health behaviors), fewer episodes of stress imply improved health among participants (Berkman, Kawachi, & Glymour, 2014). For instance, a study reported that the UCT program was associated with positive feelings about children's future, and generally happiness among children in recipient households (Natali et al., 2018).

Although we found supporting evidence on the positive impact of these CT interventions on MCH outcomes, it should be underscored that one of the key issue plaguing the implementation of these programs is the lack of transparency and auditability at all levels (Jaffer et al., 2020; Wright et al., 2018). For instance, the decision on where to implement these programs (e.g., selecting a given state or province rather than others), and who should benefit from such programs cast questions on its transparency, and accountability. Quality data and information are fundamental for effective implementation and evaluation of programs (Owino, 2020). The lack thereof exposes the program to shortcomings (e.g.,

corruption, lack of transparency, and accountability), and to missed opportunities for improving its robustness. In the context of CT programs, data collection remains a very expensive and often complex operation, plumbing their effective implementation.

Hence, the need for a tamper-proof system, such as blockchain technology, that provides security, privacy, confidentiality and most important, a decentralization of data collection activities (Shahnaz, Qamar, & Khalid, 2019). The relevance of this approach in the context of Sub-Saharan African countries stems from the fact that most of these countries rely on international aid, often tied to stringent conditionalities, to implement, and sustain such programs (McShea, 2019). When the lack of transparency and accountability becomes an issue, most of the external donors become hesitant to fund the program. Hence, given the abovementioned evidence on the effectiveness of CT programs on improving MCH outcomes, it is crucial to improve the implementation of these programs to ensure current and potential stakeholders regarding the actual use of the funds and the impact thereof. Blockchain technology, through its smart contracts, could be one possible and sustainable solution.

Also, future studies should consider using a standardized framework for assessing health outcomes, such as the one proposed by Parrish (2010, p. 3). Also, the International Classification of Functioning, Disability and Health could be used to inform selection and reporting of measures of functional status.

The scope of this study was to synthesize the existing literature in a rather nascent field. Further research synthesis should expand this research to draw more statistical conclusions, not only in Sub-Saharan African countries, but across LMICs.

## **Conclusion**

We found compelling evidence that in Sub-Saharan African countries, CT programs are effective interventions with a positive impact on MCH outcomes, including survival experience, functional status, and emotional health. The quality of evidence is higher because most studies were randomized controlled trials. The underlying mechanisms through which CT programs operate have been discussed. Policymakers and funders should tailor such interventions based on the mechanisms discussed. However, more needs to be done to improve transparency in the implementation of these programs.

## **Declarations**

### **Ethics approval and consent to participate**

Not applicable

### **Consent for publication**

Both authors gave consent for publication of the final manuscript.

### **Availability of data and materials**

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study. However, references to the original papers are provided in appendix.

### Competing interests

The authors declare no competing interests.

### Funding

University of North Carolina at Charlotte library agreed to pay publication-related fees. There was no other funding source for the present study.

### Authors' contributions

ELN: conceptualization, data analyses, first draft

JB: conceptualization, revision of draft

### Acknowledgements

The authors express their gratitude to the University of North Carolina at Charlotte library for accepting to pay publication-related fees. The views expressed in this paper are solely those of the authors and do not reflect those of the organization they are affiliated with. Apart from publication-related funding, this work did not receive further funding.

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## Figures

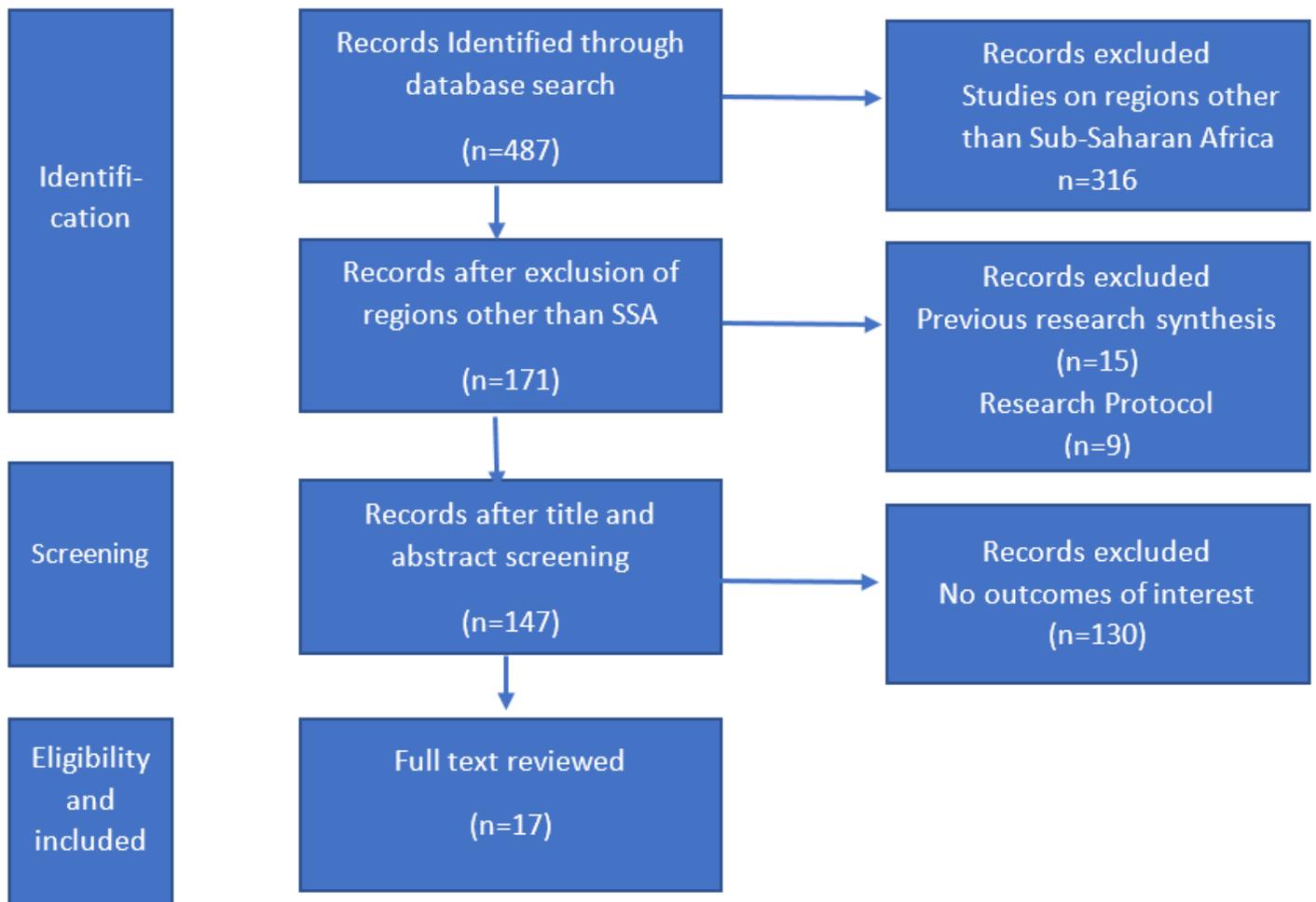


Figure 1

PRISMA flow chart for identification of studies

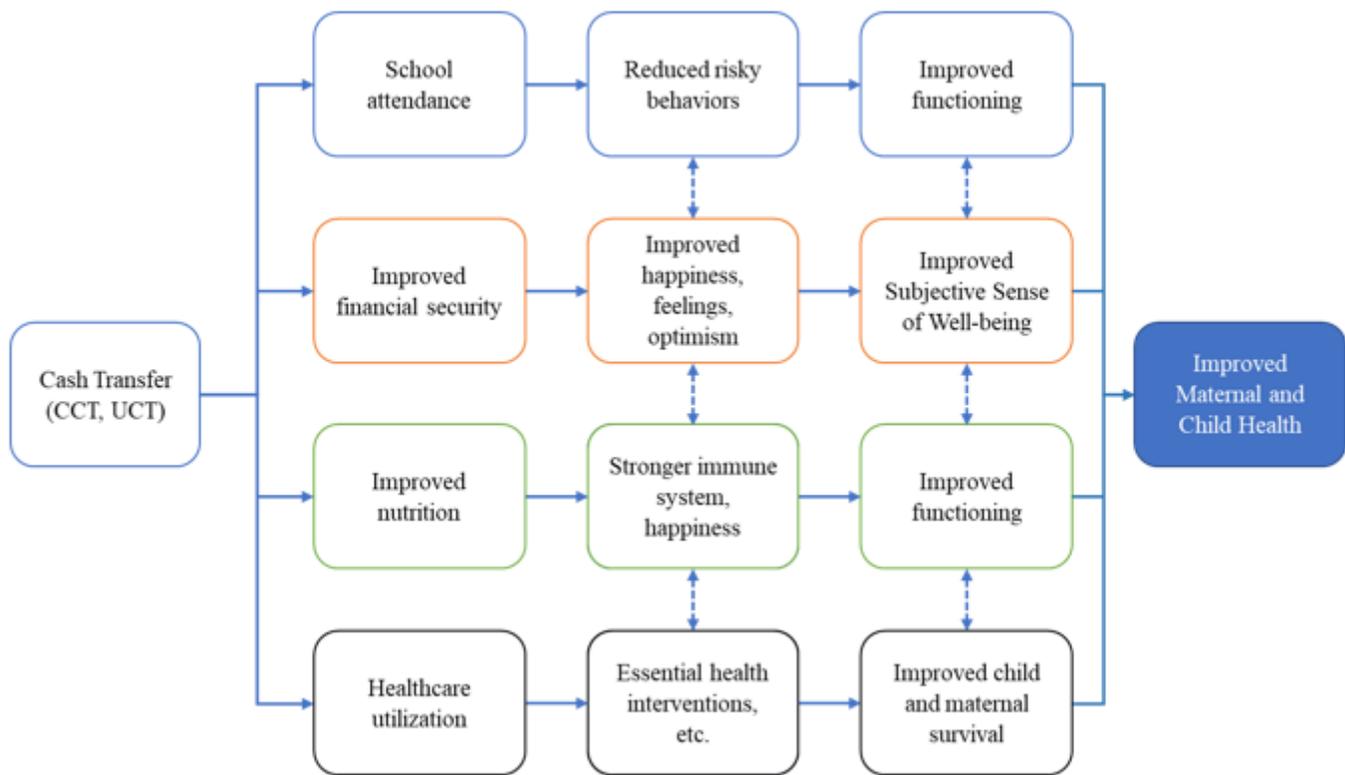


Figure 2

Pathways through which CT programs impact MCH outcomes

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