

# Impact of Conditional Cash Transfer on Human Capital Investment in Sumbawanga Municipality, Tanzania

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## Abstract

The purpose of this paper was to assess the effect of Conditional Cash Transfers (CCT) on human capital development especially in access to health services and education in Sumbawanga Municipality, Tanzania. The study adopted a cross-sectional research design whereby data used were collected through household survey with a sample of 450 poor households. Data were analyzed by using Propensity Score Matching in STATA 14. The study findings show that on average conditional cash transfer programme improves human capital investment by increasing access to health services by 70 percent and increasing school attendance by 32 days in a year. Cash given was used to pay for medical care and buy school requirements for their children hence improving school attendance and the health status of members of the household. The CCT programme is crucial for human capital development for the poor households and the government and other stakeholders should work together with the CCT programme to continue to improve education and access to health services. In Tanzania, evaluation of CCT programme has been largely used descriptive statistics and OLS regressions ending with biased results. The paper applied PSM to handle biasness of research results to confirm the impact of CCT on human capital development, the approach which was not applied before.

## Keywords

Conditional Cash Transfer, Poverty, Human Capital Investment, Propensity Score Matching

## 1. Introduction

A cash transfer is social support given to poor households intentionally to in-

crease their access to services like health services and education (Owusu-Addo et al., 2018). Non-conditional and conditional cash transfers are two forms of cash transfers. Non-conditional cash transfer is cash given to poor households without any conditions and is aimed at assisting them with their basic needs (URT, 2016a). Conditional cash transfer is an intervention that assists in the form of cash to poor households with the condition of spending on health services and education of their children to improve human capital investments (Cahyadi et al., 2020; Onwuchekwa et al., 2021). Human capital investments through education and medical care are planned to increase performance and productivity in different activities (Nandi et al., 2018).

Cash transfers are used as social protection with the main objective of reducing poverty and for years now many developing countries have used cash transfers as an approach to reduce poverty. As per Daidone et al. (2019), in countries with many poor households, effective design and application of cash transfer programmes can promote poverty reduction. In Tanzania, poor households stay behind in terms of income, food quality and quantity, educational attainment and their use of health services (URT, 2019). For that reason, poverty reduction programmes are important to alleviate the effects of poverty at the household level. However, it is still questionable whether such programmes have an impact on human capital investment at the household level.

The United Nations (2019) defines poverty reduction as procedures that assist poor people in achieving adequate living standards and exercising their human rights. It includes the redistribution of opportunities, assets and incomes with the provision of social protection to poor households for economic development (Kinyondo & Pelizzo, 2018). In the interest of this study, poverty reduction was considered in human capital investments specifically in improving access to health services and education. A cash transfer has a positive impact on reducing poverty in a way that improves human capital through education and the health of poor households. Cash transfers in Tanzania reduce poverty by improving beneficiaries' health status and education outcomes by increasing children's school enrollment and attendance (Jacobus et al., 2020). Evans et al. (2019) proved that cash transfer in Tanzania managed to increase the uptake of health insurance and increase less than five-year-old clinic attendance which reduces the number of sick days of the members of the households.

Moreover, Dietrich et al. (2020) noted that other cash transfer helps to increase the child's health as they get immunized at a required time. Furthermore, Mwaita (2018) found that cash transfers contributed to households' ability to access food, health services and education. CCT improves the educational outcomes of poor households at different levels in society. According to Molina Millán et al. (2020), the study from Honduras noted that CCT has a long-term impact on human capital as it increases the beneficiary children's school enrollment in a secondary school which also gives them a great chance to attend universities. In addition, Sanchez Chico et al. (2020) argued that CCT in El Salvador helps improve schooling out-

comes as it increases school enrollment and attendance.

The Government of Tanzania established the Tanzania Social Action Fund (TASAF) in 1999 as a basic mechanism for poverty alleviation. TASAF aimed to support poor households and communities to improve their living standards by accessing services such as health, education, food, clean and safe water and being involved in other income-generating activities. TASAF has been implemented in three consecutive phases (TASAF I, TASAF II and TASAF III). The Government noted that both TASAF I and II did not do enough in alleviating poverty because the programmes did not provide adequate coverage as they concentrated only on community social development instead of the individual poor people's livelihood. Due to the incapability of TASAF I and TASAF II, some households were left in extreme poverty with poor health and education services. From that situation, poor households' children lacked access to health services and education which resulted in poor school enrollment, school attendance and increased school dropouts (URT, 2013). This has driven the Government of Tanzania to come up with TASAF III introduced in Tanzania in 2012 to reduce and break the inter-generational transmission of poverty (URT, 2013). The TASAF III has conditional cash transfers which intend to safeguard poor households from the severe consequences of poverty by empowering households to invest in human capital investment for their children (URT, 2013).

Despite evidence from research studies (Evans et al., 2019; Jacobus et al., 2020), Tanzania continues to score a high poverty rate, with 26.4 percent of people living below the national basic needs poverty line, with the Rukwa Region having the highest proportion (45.0%) (URT, 2019). Apart from the Tanzania government putting in place several strategies for poverty reduction as shown above the strategy has enabled the Government to achieve much success including increasing the coverage of education and health services. However, poor households continue to lag behind the rest of the population in terms of their educational attainment and their use of health services. Yet, despite all the efforts of the Government to reduce poverty in the country, still there was scant information about the impact of the conditional cash transfer programme on human capital investment in Sumbawanga Municipality. This study calls attention to evaluating the impact of conditional cash transfers on poor households' health and education status in Sumbawanga Municipality, Tanzania.

## 2. Research Methodology

### Study area Description

The study was conducted in Sumbawanga District in Sumbawanga Municipal Council, Rukwa. The Sumbawanga District is one of the three districts of the Rukwa Region. It is located at 7°58'0" South, 31°37'0" East in Tanzania's South-West highlands (URT, 2016b). The District borders Zambia in the South, the Songwe Region in the South-East, Lake Tanganyika in the South-West and the Nkasi District to the North (URT, 2016b). The Sumbawanga Municipal Council

is located in the Western part of Tanzania and is the administrative centre of the Rukwa Region. The Council has a dry sub-humid climate and is located at an average altitude of 1700 m above sea level. It has an average rainfall of 900 mm - 1000 mm per year with an average annual temperature of 27°C. The main economic activities of people from the Council are agriculture, business, and waged work from the Government and non-government organizations. The Council has 42 health facilities; 2 hospitals, 3 health centres and 37 dispensaries. In terms of education, the Municipality has 42 pre-primary schools, 58 primary schools, 25 secondary schools and 2 teachers' training colleges (Sumbawanga Municipal Council, 2019). The Council was selected because it was among the councils in which CCT operated and was in the region with the highest poverty level of 45%.

### Research Design and data collection

The study adopted a cross-sectional research design; the design was considered as it allowed the collection of data at one point in time (Setia, 2016; Spector, 2019). Moreover, using a cross-sectional research design assists in obtaining consistent data that makes robust conclusions and creates new assumptions that can be examined with new research (Zangirolami-Raimundo et al., 2018). In addition, the quantitative research approach was used as the approach assisted to answer the research question; since quantitative research is used to understand the relationship between the independent and dependent variables in a population (Bloomfield & Fisher, 2019).

The study used multi-stage sampling steps to obtain the needed sample population. The first step involved was the purposive selection of the Sumbawanga District; the second step was the selection of the Itwelele and Lwiche divisions; then followed by the selection of Milanzi and Katandala Wards and the last step was the selection of Milanzi and Katandala Streets. The wards have been selected due to the availability of many respondents in the area, Katandala Ward has 193 and Milanzi Ward has 459 (SMC, 2019). Simple random sampling was conducted to select the sample of 450 households for research. The method helps to obtain a good representative of the entire population and reduces bias. The sampling was conducted by having the list of respondents in the selected area then followed by assigning numbers in the pieces of paper and being put into a box that was properly mixed manually. Then, pieces were randomly picked out of the box to select the sample. The household survey was used to obtain the quantitative data used in the study.

The study used 450 poor household samples of which 171 were the treated group (CCT beneficiaries) and 279 were the control group (Non-beneficiaries). The study sample was justified by the studies of (Howarter et al., 2015; Andrillon et al., 2020) that used propensity score matching with a minimum of 200 samples and come up with efficient estimates.

### 3. Data Analysis

The collected data was coded, verified, compiled and cleaned before the analysis

using STATA 14. Descriptive and inferential statistics were utilized in the analysis, descriptive statistics tools were mean and percentage while the inferential statistics logit regression model was used. Moreover, propensity score matching was used to evaluate the impact of the programme on a household's health and education as the method used to assess the impact of the programme when participation in the programme was not randomized (Forbes & Dahabreh, 2020). The method was ideal for the objective because during poor households' identification, conditionals were involved instead of randomization procedures (URT, 2013). The propensity score matching method is used to reduce biases caused by confounding variables by assessing the effect of intervention while taking the socioeconomic characteristics of the treated and control groups into account (Benedetto et al., 2018; Johnson et al., 2018; Guo et al., 2020).

In performing propensity score matching, six steps were used. The first step was the identification of covariates. The household head's age, education, household size, marital status of the head of household, household gender, land size, main occupation, and main source of income were the covariates used. The next step was the estimation of the propensity score. The propensity score was the probability of taking treatment based on observed socioeconomic characteristics (Harris & Horst, 2016; Yasunaga, 2020). Propensity scores in this study were conditional probabilities that can influence the household to be in the conditional cash transfer programme or not.

$$b(x) = pr(D = 1 | X) \quad (1)$$

where  $b(x)$  = propensity score,  $D$  = binary dependent variable for being beneficiary ( $D=1$  if CCT beneficiary and  $D=0$  non-beneficiary), and  $V$  = observable covariates. The logit regression model was used to estimate the propensity score:

$$b(x) = \beta T + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_n X_n + \varepsilon_i \quad (2)$$

$b(x)$  = Propensity score,  $T$  = Treatment (1 = received cash, 0 = otherwise),  $\beta_0$  = Intercept of regression equation,  $\beta_i$  = Estimated regression coefficient,  $X_i$  = Observed covariates and  $\varepsilon_i$  = Error term.

The next step was the balancing which was conducted to estimate the common support. Each propensity score of the treated group was matched with one control group. Common support is the section that represents the similarity of social-economic characteristics between the two groups based on their similarities in the distribution of their propensity scores (Hotmida & Purba, 2018). The matching procedure was used to avoid comparing incomparable groups.

The other step was to select the matching algorithm. There are several matching algorithms used, such as the nearest neighbour matching algorithm, kernel matching, radius or calliper matching, stratification matching and mahalanobis metric matching (Lin, 2015; Mao & Li, 2020). The study used the nearest neighbour matching algorithm, radius matching and kernel matching as the algorithm ensures quality matching between treated and control groups.

#### **Estimating the Average Treatment Effect on Treated (ATT)**

The next step was to estimate the effect of the conditional cash transfer on the health and education of beneficiaries. Treatment effects are calculated as follows:

$$D = K(J_{1i} = 1) - K_{0i}(J_{0i} = 1) \quad (3)$$

$D$  = denotes treatment effect,  $J_{1i} = 1$  denotes the CCT beneficiaries,  $J_{0i}$  denotes non-beneficiaries,  $K_{1i}$  denotes the potential outcome of beneficiaries and  $K_{0i}$  denotes the potential outcome of non-beneficiaries. Evaluation of impact in observational studies needs counterfactuals. Therefore, to estimate the average treatment effect on treated it was calculated as follows:

$$ATT = E\left(\frac{K_{1i}}{J} = 1\right) - E\left(\frac{K_{0i}}{J} = 0\right) \quad (4)$$

ATT denotes the average treatment of the treated group,  $E(K_{1i}/J = 1)$  denotes the outcome of the treated group or beneficiary and  $E(K_{0i}/J = 0)$  denotes the outcome of the control group or non-beneficiary.

The household health status was measured by using the scale from two measures of access to health services. Two questions were considered: 1) if the household members go to health facilities, and 2) if household members join the Community Health Fund (CHF) and go to health facilities.

$$\ln\left(\frac{\hat{p}}{1-\hat{p}}\right) = H = \beta_0 + \beta_1 D + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \varepsilon_i \quad (5)$$

$\ln$  = Natural Logarithm,  $\hat{p}$  = Probability of accessing health services,  $\frac{\hat{p}}{1-\hat{p}}$  =

Probability of not accessing health services,  $H$  = Accessing health services (1 Accessing health services, 0 not accessing health services),  $D$  = Treatment (1 = received cash, 0 = otherwise),  $\beta_0$  = Intercept of the regression equation,  $\beta_1 - \beta_8$  = Estimated regression coefficient,  $X_2$  = Age,  $X_3$  = Sex,  $X_4$  = Marital status,  $X_5$  = Education level,  $X_6$  = Household size,  $X_7$  = Primary source of income,  $X_8$  = Land size,  $X_9$  = Main occupation and  $\varepsilon$  = Error term.

In the education outcome variable the number of days that students attend school per year was measured. The multiple regression model was used to measure the impact.

$$Y = \beta_0 + \beta_1 T + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \varepsilon_i \quad (6)$$

$Y$  = number of days a student attended to school,  $T$  = Treatment (1 = receiving cash, 0 = otherwise),  $\beta_0$  = Intercept of the regression equation,  $\beta_1 - \beta_8$  = Estimated regression coefficient,  $X_2$  = Age,  $X_3$  = Sex,  $X_4$  = Marital status,  $X_5$  = Education level,  $X_6$  = Household size,  $X_7$  = Main source of income,  $X_8$  = Land size,  $X_9$  = Main occupation and  $\varepsilon$  = Error term. **Table 1** below shows the description of the variables used.

### Sensitivity analysis for human capital investment

According to Rudolph and Stuart (2018), hidden biases caused by unobserved covariates in the study can lead to incorrect effect evaluations. A sensitivity

**Table 1.** Description of variables used in the study.

Variable	Variable	Nature	Variable Description
<b>Dependent variables</b>			
	Health status	Binary	Accessing health services or not accessing health services.
	Education status	Continuous	The number of days that a student attends school.
<b>Independent variables</b>			
	Age	Continuous	The number of years of household head since born.
	Sex	Categorical	Sex of household head.
	Marital status	Categorical	Marital status of the head of household.
	Education level	Categorical	The time that the head of household spent on formal education.
	Household size	Continuous	The number of members in the household.
	The main source of income	Categorical	The main source of income of the head of household.
	Land size	Continuous	Size of land owned by the head of household.
	Main occupation	Categorical	The main occupation of the head of household.

analysis was performed to check the presence of hidden bias caused by unobserved covariates between treated and control groups. The procedure was used to detect if the impact of the intervention or programme was influenced by hidden bias.

## 4. Results and Discussion

### Socio-Economic Characteristics of Respondents

**Table 2** below indicates the summary of sampled households used in the study based on their social economics characteristics. The results reveal that the majority of respondents were farmers (48%) and dominated by female-headed households (80%).

**Table 2** shows that female-headed households contributed 80 percent of the sampled households and male-headed households contributed 20 percent. In Tanzania, poverty was connected with the sex of the household head; 27.4 percent of basic needs poverty was associated with female-headed households, while 26 percent of basic needs poverty was related to male-headed households (URT, 2019). In addition, female-headed households were more considered in the programme than male-headed households. Moreover, the education level of the head of household in the study ranged from informal to primary, whereby 55 percent had a primary level of education and 44 percent had informal education. Mok and Jiang (2017) that education was the determinant of personal income and a higher level of education creates a greater chance in the labour market claimed it. Low levels of education narrow the opportunities in labour markets hence promoting poverty in the population. Furthermore, the study's respondents were involved in a variety of occupations, with 48 percent being farmers and 46 percent engaged in small businesses. It implies that the majority were

farmers, and farming was the main source of income for many households in the study area. According to [Kinuthia and Mabaya \(2017\)](#), the majority of people in Tanzania that rely on farming as the main source of income were poor.

**Table 3** on average sampled household heads were 54 years old. According to [Vera-Toscano et al. \(2020\)](#), in developing countries, poverty increases with age. Moreover, the average household size was 6 members while the highest was 12. Poverty increases with an increasing number of household members. In a household with 6 members, 10.2 percent of the members experience food poverty and 28.5 percent experience basic needs poverty ([URT, 2019](#)). Poor households in the programme were given a basic cash transfer of \$5 or TZS 20,000 ([URT, 2013](#)). It was anticipated that large household size led to the small impact

**Table 2.** Socio-economic characteristics of respondents (n = 450).

Covariate	Description	Control group (%)	Treated group (%)	Total sample (%)
Sex	Female	79	83	80
	Male	21	17	20
Number of meals	1	2	0	1
	2	88	64	79
	3	10	36	20
Education level	Informal	42	47	44
	Primary	57	52	55
	Secondary	1	1	1
Marital status	Married	56	46	52
	Single	3	4	3
	Divorced	8	9	8
	Cohabiting	3	1	2
	Widow	30	40	34
Main occupation	Farming	47	50	48
	Livestock keeping	7	6	6
	Small business	46	44	46

**Table 3.** Distribution of age, household size and land size across groups.

Covariate	Control group N = 279			Treated group N = 171			Total sample N = 450		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Age (years)	52	20	98	56	20	98	54	20	98
Household size	6	2	12	5	1	12	6	1	12
Land size (acre)	0.84	0	4	0.89	0	4	0.86	0	4



of cash given because the programme did not consider the number of household members. Poor households with fewer members benefited from basic cash transfers compared to ones with more members.

#### Propensity Score estimation

The propensity scores were strictly between 0 and 1, and there was sufficient overlap in the propensity scores between treated and control groups with a large common support region. This means that common support was satisfactory and the balance was achieved between the treated and control groups. The balancing test was conducted and the common support option was selected and the region was (0.23592335, 0.71140465). **Figure 1** shows the estimated propensity score in the common support.

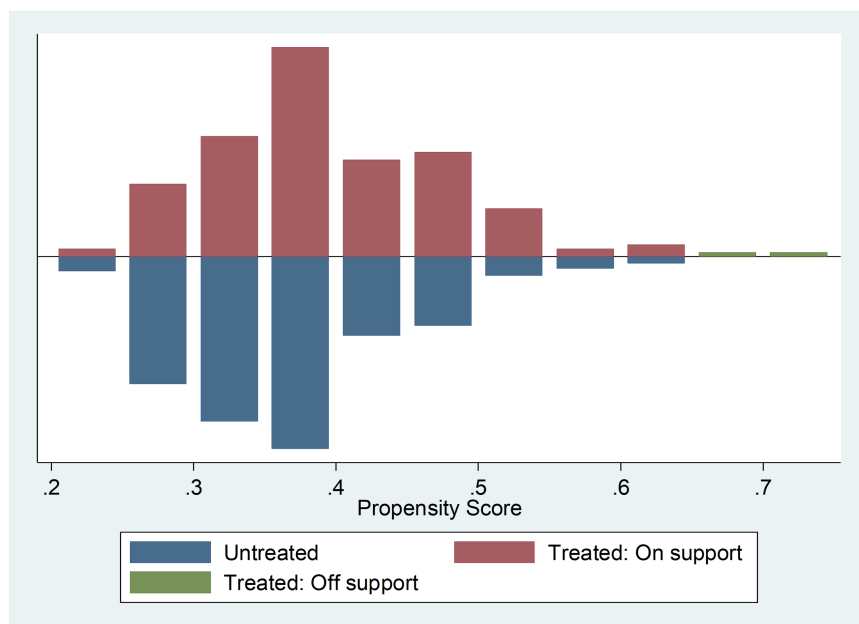
#### Covariate balancing in the control and treated groups

The balancing of control and treated groups to meet the condition of comparing matched groups to avoid selection bias is presented in **Table 4**. The two-sample t-test was used for balancing.

**Table 4** demonstrates the mean/proportional of covariates and the condition was satisfied at p-value 0.05. It was indicated that most of the variables were balanced between the treated and control groups, which means that the comparisons were conducted on comparable groups as 75 percent of the social-economic characteristics were insignificant at p-value 0.05. This suggests that there was no statistical difference between the treated and control groups.

#### Impact of conditional cash transfer on access to health services

**Table 5** depicts the access to health services; from the nearest neighbour matching on average, the programme improves the access to health services by 65 percent at  $p < 0.01$ . In the radius and kernel matching, the programme on average improves health access services by 71 percent and 73 percent, respectively



**Figure 1.** Estimated propensity score in the common support region.

**Table 4.** Balancing of covariate of control and treated group

Variable	Control group 279 Mean/Proportional	Treated group 171 Mean/Proportional	P-Value
Age	52.279	56.116	0.007
Sex	1.788	1.830	0.278
Marital Status	2.512	2.847	0.060
Education level	2.261	2.432	0.235
Household size	5.716	5.596	0.524
Main occupation	1.992	1.935	0.544
Main income	1.100	1.198	0.045
Land size	0.849	0.894	0.655

**Table 5.** Impact of conditional cash transfer on access to health services.

Outcome variable	Model Specification					
	Nearest neighbor		Radius Matching		Kernel Matching	
	ATT	P	ATT	P	ATT	P
Access to health services	0.650	0.0005***	0.716	0.001***	0.733	0.001***
Observations						
CCT beneficiary		169		148		171
Non CCT beneficiary		279		279		275

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

at  $p < 0.01$ . The effect was highly significant at 1 percent level of significance. On average the programme improves access to health services by 70 percent. Access to cash from CCT has ensured access to health care via joining the Community Health Fund (CHF).

**Table 5** shows the increase in access to health services by poor household members. The increased access to health services was due to health conditions and the ability of a beneficiary to join a community health fund using the cash provided by the programme. The programme facilitates improving investments in human capital by improving poor households' health status as they can uptake health services all the time whenever they need them. The results were in line with the studies of Mwaita (2018) and Evans et al. (2019) which proved that cash transfers in Tanzania assist in increasing the uptake of health insurance and increasing under five-year-old clinic attendance which reduces the number of sick days of the members of the household. Moreover, Dietrich et al. (2020) noted that among other things the importance of cash transfer helps to increase child health. Furthermore, improvement in access to health services allows poor households' children to get timely clinic attendance when they are sick which improves their health status in Tanzania (Adhvaryu & Nyshadham, 2015). Having

the ability to access health services improved the health status of the family members in the study area as the cash given helped them to afford bills for health services.

#### Impact of conditional cash transfer on education

**Table 6** displays that from the nearest neighbour matching on average the programme improves the school attendance of students by 33 days at  $p < 0.01$  and the effect was highly at a 1 percent level of significance. In the radius and kernel matching the programme improves school attendance by 31 and 30 days respectively at  $p < 0.01$ , the effect was highly at a 1 percent level of significance. The students from beneficiary households attend school more than non-beneficiary household students on an average of 32 days.

**Table 6** shows that students from beneficiary households attend school more than non-beneficiary household students on an average of 32 days. Most poor households in Tanzania have children who fail to get opportunities for a better education due to financial constraints (URT, 2013). Although nowadays, education in both primary and secondary schools is free still poor households fail to manage to buy school needs like uniforms, books, shoes and other school bills for their children which constrain them to attend school even if they are ready to start school. This implies that poor households still need assistance to support the education of their children. Findings from **Table 6** show that the CCT programme has improved school attendance of beneficiaries' children in the study area as the cash given is used to buy school requirements.

The results were in line with the results of Evans et al. (2020) who proved that in Tanzania, CCT improves educational outcomes for vulnerable children as it increases school attendance. According to Mwaita (2018); Ng'ong'a (2019); Jacobus et al. (2020), cash transfers improve child education for poor households as they spend money on school requirements hence increasing the school attendance of students which directly reduces school dropouts. In addition, Kapama (2019) shows that the initiation of cash transfers in Tanzania improved poor households' children's education in school attendance and increased enrollment as it enabled children to get all their requirements. Before the programme, most of the students were not attending school due to the inability of their

**Table 6.** Impact of Conditional Cash Transfer on education.

Outcome variable	Model Specification					
	Nearest neighbor		Radius Matching		Kernel Matching	
	ATT	P	ATT	P	ATT	P
School attendance	33	0.001***	32	0.001***	30	0.001***
Observations						
CCT beneficiary	169		148		171	
Non CCT beneficiary	279		279		275	

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

families to buy school needs like uniforms and stationaries (URT, 2013). The findings of the study implied that the programme improves access to education for poor households' children as the cash provided was used to buy school needs, which were discouraging children from attending school. It is also assumed that children who will attain education today will handle family needs in the future as education increases the chances of working in labour markets. Moreover, the education obtained helps to increase the number of poor household members that know how to read and write which will help them in their daily life to understand issues in the global view.

#### Sensitivity analysis for human capital investment

A sensitivity analysis was performed to check the occurrence of hidden bias caused by unobserved covariates between the treated and control groups. The p-critical values of all outcome variables estimated at various levels of critical gamma values are significant at  $p < 0.05$ , indicating that the main covariates influencing conditional cash transfer participation and the outcome variables have been considered and changes in gamma values did not change the study conclusions. Therefore, the positive effect of conditional cash transfer on access to health services and school attendance was not affected by potential hidden bias due to unobserved covariates see [Table 7](#).

## 5. Conclusion and Recommendations

### Conclusion

The main objective of this study was to evaluate the impact of conditional cash transfers on human capital investment, especially on health and education

**Table 7.** Rosenbaum sensitivity analysis for average treatment effect on treated.

Rosenbaum bounds for School attendance (N = 450 matched pairs)			Rosenbaum bounds for access to health services (N = 450 matched pairs)		
Gamma	Sig+	Sig-	Gamma	Sig+	Sig-
1	0	0	1	0	0
2	0	0	2	0	0
3	0	0	3	0	0
4	1.1e-16	0	4	0	0
5	8.2e-14	0	5	0	0
6	8.3e-17	0	6	1.7e-14	0
7	2.3e-10	0	7	1.1e-12	0
8	2.8e-09	0	8	2.6e-11	0
9	1.9e-08	0	9	3.0e-10	0
10	9.2e-08	0	10	2.1e-09	0

\*Gamma-log odds of differential assignment due to unobserved factors; Sig+: upper bound significance level; Sig-: lower bound significance level.

among poor households in the Sumbawanga Municipality. The conditional cash transfer programme for the improvement of human capital investments proved to have a significant effect as it improved poor households' access to health services and education. Based on the findings of the study, it was clear that the conditional cash transfer programme in the Sumbawanga Municipality has a significant positive impact on improving access to health services and school attendance. The study findings revealed that after the households involved in cash transfers, there was an increase in school attendance by 32 days more than children from non-beneficiary households and the ability to access health services due to cash and health insurance increased. In the study area, poor households' health and education status improved which was the aim of the programme to improve poor households' living quality. This suggests that through improvements made by the programme to the health and education of poor households, the poverty rate in the study area will decrease as the programme continues.

### Recommendations

Therefore, based on the study findings and conclusion, it is recommended that:

1) The Government, Non-Government Organizations (NGOs) and other stakeholders should work together with the conditional cash transfer programme to continue to invest for a long term in the education and health needs of poor households to improve human capital investments in the study area.

2) The Ministry under the President's Office of Public Services Management and Good Governance through the conditional cash transfer programme should consider increasing the basic cash transfer to households with higher household size.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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