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OUT-OF-POCKET EXPENDITURE (OOPE) ANALYSIS OF THE EDUCATION AND HEALTH SECTORS IN BELIZE

Survey Data Analysis Report

November 2024

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Introduction

This report contains the demand-side analysis of the out-of-pocket expenditures (OoPE) study in education and health in Belize. The study aims to inform policies to promote equitable access to high-quality health and education services in Belize. Specifically, the study seeks to address the challenges posed by OoPE in these sectors, which disproportionately affect vulnerable groups, especially children. As such, this report presents a detailed demand-side analysis of household spending on health and education for children and young adults, providing insights into the key drivers and impacts of OoPE.

The analysis is based on data gathered from a nationally representative face-to-face household survey of households with children aged 0-17 years. Conducted in partnership with the University of Belize (UB), the surveys' target population is central to the research as the study examines the financial burdens families face in meeting the health and education needs of their children. The findings in this report offer a quantitative understanding of household expenditures, helping to identify the factors that contribute to these costs and their effects on service access.

The insights presented here can ultimately inform the development of policy recommendations aimed at strengthening social expenditure, improving service delivery, and enhancing access to essential services for children and other vulnerable groups. This data analysis represents a key milestone in the OoPE study, laying the groundwork for effective policy interventions that reduce financial barriers and ensure equal access to high-quality health and education services for all children in Belize.

1. Survey methodology

1.1. Sampling

To ensure national representativeness, a two-stage proportional stratified random sampling design was designed by Genesis Analytics and implemented by the Statistical Institute of Belize (SIB). The sample was stratified by district and urban/rural geographical type. The first stage involved the random selection of clusters (enumeration areas) from each stratum. In the second stage, households with children within these clusters were randomly selected using SIB's sampling frame. The target sample size was 800 households with children, in order to be representative **at the national level** (note: the sample is not designed to be representative at district level). This sample size was calculated using the MICS Sample Size Calculation tool.

Inputting key parameters[1], the sample size is found as follows:

$$n = \frac{4*r*(1-r)*deff}{(RME*r)^2 pb*AveSize*RR} = \frac{4*(0.219)*(1-0.219)*1.5}{(0.12*0.219)^2 0.52*4.1*0.8} = 774$$

With standard error is given as:

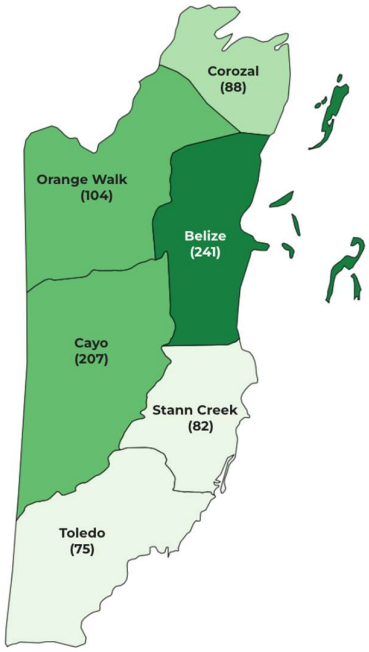
$$se = \frac{r*RME}{2} = \frac{0.219*0.12}{2} = 0.01314$$

To account for any error in data collection or outlier values found during cleaning, the calculated sample size of 774 was rounded up to 800. The sample was further distributed across 54 clusters, with ±15 households per cluster.

[1] Note that the RME, relative margin of error for 95% confidence, is given as 12% in the MICS tool and the design effect, deff, is given as 1.5.

Ultimately, the final cleaned dataset had a total of **797 complete interviews across the 54 clusters, covering all regions of the country, with an average of 14 households per cluster.** The regional, proportional distribution of the sample is demonstrated in Figure 1.

Figure 1: Sample distribution



The sample distribution is seen to cover all regions of Belize, with more populous regions being allocated a greater sample size to enhance representativeness at the national level. As such, the Belize district has the largest sample allocation, followed by Cayo district and Orange Walk. The Toledo district has the smallest sample size allocation, corresponding to the district having the lowest proportion of households with children in comparison to the other districts.

1.2. Sample limitations

Outside of strict experimental conditions, sampling can be subject to certain limitations, which will be noted in this subsection. The 2022 census data was used by SIB as the sampling frame for this study. In the field, it became apparent that the frame was subject to a number (107) of invalid residential units - which can be a result of the passing of time (people moving away, structural changes) or measurement error (incorrectly captured units) - as well as households without children (197). Randomisation was, however, retained throughout the sampling process and where invalid units were found, enumerators proceeded to the next *randomly* sampled unit in strict randomized order. As such, the data collected is expected to be subject to relatively low sampling bias.

1.3. Data collection

Face-to-face interviews were conducted using the SurveyCTO platform. The tool was developed collaboratively with UNICEF Belize and University of Belize and reviewed by a psychometrist with expertise in tool design. The tool covered key metrics, including unit costs for education and health care provision. Prior to fieldwork commencement, enumerators underwent a comprehensive 5-day training program, which included piloting the questionnaire, to ensure consistent and accurate data collection.

1.4. Quality assurance

Quality control measures were implemented throughout the study. These included GPS monitoring of enumerator locations, automated data validation checks, and real-time quality control alerts. Additionally, telephonic backchecks were conducted to verify data integrity.

2. Survey sample

This section outlines the characteristics of the survey sample. It shows how respondents were distributed across different demographic and geographic categories as well as response rates. These statistics give an overview of the sample's composition before any weighting is applied.

2.1. Response rates

Survey response rates are subject to certain elements such as dwelling validity, adult presence and consent rates. These unweighted descriptive statistics offer an overview of the survey's reach and participation levels, highlighting key factors that influenced the data collection process.

Table 1: Invalid/Valid Residential Dwelling

Dwelling	Frequency	%	Description
Invalid	107	7.90	Out of the total 1351 households surveyed, **only 107 (7.9%) did not qualify as valid residential units while 1,247(92.08%) dwellings were confirmed as households** where people resided.
Valid	1247	92.10	
Total	**1354**	**100**	

Table 2: Invalid Dwelling Reason

Reasons	Frequency	%	Description
Vacant property	44	41.12	Among the 107 invalid dwellings, **vacant properties were the main issue (41.12%)**, followed by **empty plots (26.17%).** Commercial, public, religious, and other non-residential properties accounted for 23.4%, while 8.41% were invalid for other reasons. **The "other reasons" category includes issues such as damaged structures, non-responsive households/ abandoned houses, properties under construction, and mismatched addresses.**
Empty plot of land	28	26.17	
Commercial property (e.g. shop, business)	18	16.82	
Other reason	10	9.35	
Other, non-residential, type of property	4	3.74	
Religious property (e.g. church, mosque)	2	1.87	
Public property (e.g. school, library)	1	0.93	
Total	**107**	**100.00**	

Table 3: Presence of an adult

Adult availability	Frequency	%	Description
No Adult	211	16.92	Of the 1247 valid households visited, **1036 households (83%) reported the presence of adult members.** A proportion of 211 households (17%) did not have any adults available **when we went to interview the household**. For households **without adults present during the initial visit, up to 3 attempts were made to conduct the interview when adults were available.**
Adult present	1036	83.08	
Total	**1247**	**100.00**	

Table 4: Households with children

Children	Frequency	%	Description
No Children	197	19.02	Of the households with adults visited, **839 households (81%) reported the presence of children between the ages of 0 to 17 years as members of the household.** 197 sampled households (19%) did not have any children and therefore could not participate in the study.
Children	839	80.98	
Total	**1036**	**100.00**	

Table 5: Consent

Consent	Frequency	%	Description
No (Refused to give consent)	42	5.01	Out of the 839 valid households with children and adults present, a majority of households, **(95%), provided their consent to participate in the study.** On the other hand, 42 households (5%) of those with adults present, did not give their consent to take part in the study. Households that did not give consent to participate were then excluded from the study.
Yes (Gave consent)	797	94.99	
Total	**839**	**100.00**	

3.2 Geotype (Urban/Rural)

Table 6: Geotype

Geo-type	Frequency	%	Description
Rural	462	57.97	The sample closely reflects the national rural-urban distribution, **with 57.97% of households from rural settings and 42.03% from urban areas.** This is comparable to the 2022 census data, with 54.79% of the households with children 0-17 located in rural areas
Urban	335	42.03	

Total	**797**	**100.00**	and 45.21% in urban areas.

3.3 District

Table 7: District

District	Frequency	%	Description
Belize	241	30.24	The Belize and Cayo districts constituted the largest proportion of survey respondents, while the other four districts each represented between 9% to 13% of the total respondents. This distribution reflects the sampling methodology used, where units were selected with probability proportional to population size (PPS). **As Belize and Cayo are the most populous districts, they naturally have a larger representation in the sample, ensuring that the survey reflects the population distribution across the country.**
Cayo	207	25.97	
Corozal	88	11.04	
Orange walk	104	13.05	
Stann Creek	82	10.29	
Toledo	75	9.41	
Total	**797**	**100.00**	

3.4 Household Citizenship

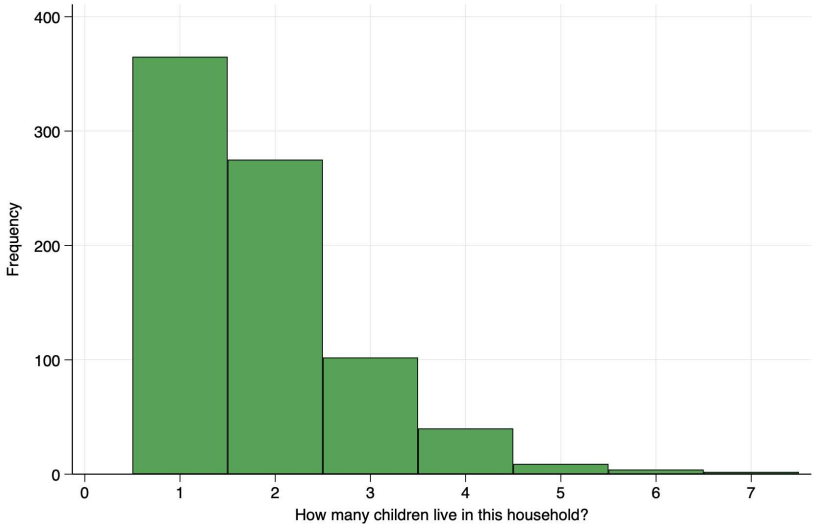
Table 8: Household Citizenship

Citizenship	Frequency	%	Description
Belize	733	91.97	**Most households interviewed were nationals from Belize**, with small percentages from neighboring countries, primarily Guatemala (4.9%), and very few from other nations.
Guatemala	39	4.89	
El Salvador	10	1.25	
Honduras	10	1.25	
Mexico	1	0.13	
USA	2	0.25	

Other	2	0.25	
Total	**797**	**100**	

3.5 Number of children

Table 9: Number of children

Description	
Most households interviewed had one or two children between 0-17 years, with fewer families having three or more children. The average (mean value) number of children per household is **1.83**.	

3. Household OoPE

This section presents the nationally representative demand-side findings on Out-of-Pocket Expenditure (OoPE) in education and health. Weighted analysis of the survey data enables us to report these nationally representative findings. The weights were supplied by the Statistical Institute of Belize (SIB) based on the prescribed sampling methodology (as outlined in section 2). Each household has therefore been assigned a weight based on the probability of selection - where households with a lower probability of selection (constituting more populous areas, such as Belize City) are assigned a larger weight in order for weighted estimates to be nationally representative. *Note: the study was designed to be nationally representative and not representative at district level (which would have necessitated a larger sample size).*

4.1. Methodology

Out-of-Pocket Expenditures (OoPE) refer to direct payments made by individuals or households for services or goods, which are not immediately reimbursed by insurance or other third-party payers. They reflect the financial burden individuals or households bear in accessing necessary or enriching services in health and education and highlight the gaps in insurance or institutional support in covering these costs.

4.1.1 OoPE

In line with OoPE literature, we consider two measures of OoPE in health **a) average household expenditure** on health and **b) average household expenditure on health per child** and three measures of OoPE in education: **a) average household expenditure on education, b) average household expenditure on education per child at school** and **c) average household expenditure on education per child at school for each level of education (k)**. Table 10 outlines the items from the survey data used to calculate health OoPE, while table 11 outlines the same for education OoPE.

Table 10: Health Expenditure Items

Expenditure Items	Description
Consultations	Fees for doctor visits, medical advice, and professional healthcare services.
Medicines	Costs for prescription drugs and over-the-counter medications.
Treatment	Expenses for professional services related to medical procedures, therapies, and interventions.
Transport	Costs associated with traveling to and from healthcare facilities.
Food supplements	Expenses for vitamins, nutritional aids, and dietary supplements.
Accommodation	Costs for overnight stays related to medical care, such as hospital admissions.
Alternative/traditional therapies	Expenses for non-conventional medical approaches like herbal medicine, or traditional healing practices.
Emergency	Expenses for professional emergency medical services, such as ambulance transport, emergency room visits, urgent care consultations, and any immediate treatments or procedures required in critical situations.
Birth	Expenses related to prenatal care, childbirth, and postnatal care.

Solicited Gifts	Informal payments or gifts that are explicitly or implicitly requested by healthcare providers from patients or their families, often as a condition for receiving care or to expedite services.
Other health expenses	A miscellaneous category for health-related costs not captured in the previous items.

Table 11: Education Expenditure Items

Items	Description
Registration	Fees paid to enroll in school
Examination	Fees for taking exams or tests
Transport (annual)	Yearly expenses for traveling to and from school
Supplies	Expenses for general school supplies like pens, notebooks, backpacks etc
Bathroom	Fees for maintenance of school bathroom facilities
Uniform	Expenses for required school clothing and shoes
Books	Expenses for textbooks and other required reading materials
Furniture	Expenses for desks, chairs and any necessary furniture for studying.
Extracurricular	Expenses for activities outside the standard curriculum such as sports.
Special care	Expenses for additional support services, possibly for students with special needs
Food	Costs for meals consumed during school hours.
Feeding	School meal programs or canteen expenses.
Digital	Expenses for technology-related items like computers, software, or tablets
Solicited Gifts	Informal payments or gifts that are explicitly or implicitly requested by school staff from parents for schooling.
Private tuition	Expenses for additional private lessons or tutoring outside regular school hours.
Other education expenses	A category for miscellaneous education-related costs not covered by the other items.

4.1.2 OoPE Formulae

a) Household OoPE

OoPE in household i:

$$H_i = \sum_{w=1}^{k} \sum_{j=1}^{L} \underline{x}_{jw}$$

Where $\underline{x}_{jw}$ is average household expenditure on item j (j = 1, 2, ..., L) for child w (w = 1, 2, .., k)

This formula estimates the expenditure for a specific household (i). It sums up the average expenditures on various items (j=1 to L) for each child (w=1 to k) within the household. The variable ($\underline{x}_{jw}$) represents the average expenditure on item (j) for child (w)

Average household OoPE:

$$\underline{H} = N^{-1} \sum_{i=1}^{N} \quad H_i$$

Where N is the total number of households[2].

This formula estimates the average health expenditure across all households. It sums the health expenditures of all households (H_i) for (i=1) to (N) and divided by the total number of households (N).

b) Household OoPE, per child

OoPE per child in household i:

$$H_{ci} = H_i \, C_i^{-1}$$

Where C_i *is the total children in household i*

This formula estimates the expenditure per child for a specific household (i). It divides the total expenditure of the household (H_i) by the total number of children (C_i) in that household.

Average household expenditure per child:

$$\underline{H_c} = N^{-1} \sum_{i=1}^{N} \quad H_{ci}$$

This formula estimates the average health expenditure per child across all households. It sums the health expenditures per child (H_{ci}) for all households (i = 1) to (N) and then divided by the total number of households (N).

c) Household OoPE per child at school for each level of education (k)

Education expenditure per child in household i at school level k:

$$H_{kci} = H_{ki} \, C_{ki}^{-1}$$

Where C_i *is the total children enrolled in school in household i*

This formula estimates the education expenditure per child for a specific household (i) at a specific school level (k). It divides the total education expenditure of the household at that school level (E_{ki}) by the total number of children enrolled in school in that household (C_{ki}^{-1}).

Average education expenditure per child at school for school level k:

$$\underline{H_{kc}} = N_k^{-1} \sum_{i=1}^{N} \quad H_{kci}$$

Where N_k *is the total number of households with children enrolled in school level k.*

This formula estimates the average education expenditure per child across all households with children enrolled in a specific school level (k). It sums the education expenditures per child (E_{kci}) for all relevant households (i = 1) to (N_k), and then divide by the total number of these households (N_k).

[2] *In the case of education OoPE, N is the total number of households with children enrolled at school.*

4.2. OoPE Results

4.2.1. Household OoPE in Health (2023)

Table 12: Household Out of Pocket Expenditure on Health (per year)

Colors represent the magnitude of the average cost for each item. Each expenditure item was calculated only for households that used the corresponding service, resulting in differing sample sizes per category.

Item	Mean (BZ$)	Standard Error	95% Confidence Interval
Average total health OoPE across households (n=529)[3]	632.84	55.381	[521.76;743.93]
Average expenditure on consultations (n=268)	325.19	40.958	[242.92;242.92]
Average expenditure on medicines (n=432)	252.93	22.217	[208.34;297.51]
Average expenditure on hospitalization and medical treatment (n=45)	312.77	49.896	[210.39;415.15]
Average expenditure on transport (n=182)	86.04	9.420	[67.05;105.04]
Average expenditure on food supplements (n=262)	167.35	26.896	[113.27;221.43]
Average expenditure on health facility accommodation (n=21)	484.32	270.726	[-92.72;1061.36]
Average expenditure on alternative/traditional therapies (n=20)	46.30	15.820	[12.12;80.48]
Average health emergency expenditure (n=5)	316.22	162.312	[-134.44;766.87]
Average expenditure on birth costs (n=70)	618.41	120.359	[374.95;861.86]
Average expenditure on solicited gifts (n=5)	119.47	21.309	[60.31;178.64]
Average expenditure on other health expenses (not listed above) (n=17)	385.62	145.755	[68.05;703.2]

The average Belizean household with children spends about BZ$633 out-of-pocket on health. Childbirth costs, which include any expenditure incurred for the birth of a child, are the highest at around BZ$618. Hospital stays are also expensive, at about BZ$484, however the small sample size for this item could be subject to outliers. 'Other health expenses' refers to other expenses not listed that respondents mentioned. This item has a mean expense of 385.62 BZ$ and a wide 95% confidence interval of [68.05; 703.2], which represents various additional health-related costs reported by a small sample of 17 respondents. These expenses include medical tools like nebulizers (the most frequently reported item with 12 instances), diagnostic procedures such as breast X-rays and ultrasounds, and dental work including braces. The wide confidence interval and large standard error (145.76) reflect the diversity of items and their potentially varying costs, as well as the small sample size. This suggests considerable variability in these items, which may not be typical for the broader population.

A boxplot of Health Expenditure Items (overall household expenditure)

[3] *Average overall health expenditure is not necessarily equal to the sum of the average household expenditure on the sub-categories listed in the table. This is because not every household incurred all types of health expenditures - resulting in different subsample sizes for each category from which the aggregate values have been calculated.*

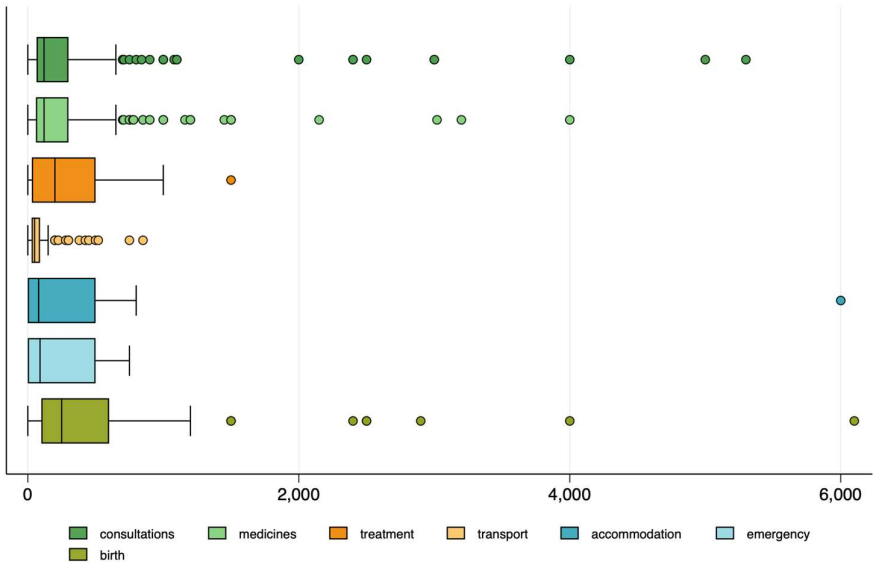


Figure 1: Boxplot of Health Expenditure Items (overall household expenditure)
The boxplot provides a more detailed overview of the distribution of key contributors to health OoPE. We see that items such as birth, accommodation, consultations and medicines are subject to some high outlying values - such as one household spending more than 6,000 BZ$ on childbirth costs.

Note: means were calculated as the average expenditure across households who indicated that they used the respective health services.

4.2.2. Household OoPE in Health per child (2023)

Table 13: Household Out-of-Pocket Expenditure on Health per child (2023) (per year)
Colors represent the magnitude of the average cost for each item. Each expenditure item was calculated only for households that used the corresponding service, resulting in differing sample sizes per category.

Item (Per Child)	Mean (BZ$)	Standard Error	95% Confidence Interval
Average total health OoPE per child across households (n=529)[4]	359.72	28.62	[302.30 ; 417.14]
Average expenditure on consultations (n=268)	189.50	20.11	[149.11 ; 229.90]
Average expenditure on medicines (n=432)	147.05	13.87	[119.22 ; 174.89]
Average expenditure on hospitalization and medical treatment (n=45)	181.34	30.72	[118.30 ; 244.37]
Average expenditure on transport (n=182)	50.17	5.24	[39.60 ; 60.73]
Average expenditure on food supplements (n=262)	100.21	14.82	[70.42 ; 130.00]

[4] *Average overall health expenditure per child is not necessarily equal to the sum of the average household expenditure on the sub-categories listed in the table. This is because not every household incurred all types of health expenditures - resulting in different subsample sizes for each category from which the aggregate values have been calculated.*

Average expenditure on health facility accommodation (n=21)	266.21	137.24	[-26.30 ; 558.72]
Average expenditure on alternative/traditional therapies (n=20)	19.29	6.64	[4.94 ; 33.64]
Average health emergency expenditure (n=5)	155.51	82.14	[-72.54 ; 383.55]
Average expenditure on birth costs (n=70)	303.98	59.07	[184.50 ; 423.46]
Average expenditure on solicited gifts (n=5)	57.61	24.94	[-11.62 ; 126.84]
Average expenditure on other health expenses (not listed above) (n=17)	193.91	68.23	[45.25 ; 342.57]

On average, **families in Belize spent BZ$ 359.72 per child** in 2023 on health-related costs, with a 95% confidence interval of [302.30;417.14]. **Consultations form a major expense, averaging BZ$ 189.50 per child, followed closely by medicines at BZ$ 147.05 per child.** Birth-related expenses are significant for those who incur them, averaging BZ$ 303.98 per child. Some categories like accommodation and emergency expenses show high variability and have limited data points, resulting in wide confidence intervals and less reliable estimates.

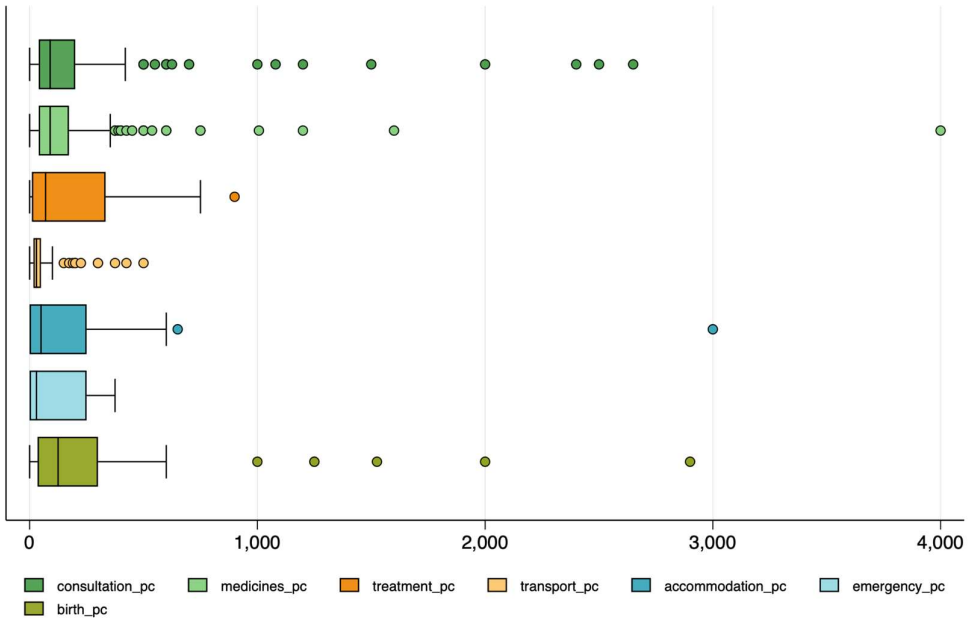


Figure 2: Boxplot of Health Expenditure Items (per child expenditure)

Similar to the boxplot for health expenditure items in terms of overall household expenditure, per child expenditure shows skewed distributions subject to outliers. Medicines in particular show a large outlier with one observation being 4,000 BZ$ for this item. On further analysis, this outlier looks plausible, as the corresponding household has a child with chronic illness who is treated at private facilities.

4.2.3. Household OoPE on Education (2023-2024)

Table 1: Household OoPE on Education (per year)

Colors represent the magnitude of the average cost for each item. Each expenditure item was calculated only for households that used the corresponding service, resulting in differing sample sizes per category.

Item	Mean (BZ$)	Standard Error	95% Confidence Interval
Average overall household OoPE on Education (n=677)[5]	2144.11	139.66	[1863.98; 2424.23]
Average household expenditure on registration (n=672)	484.10	51.59	[380.63; 587.58]
Average household expenditure on examination (n=575)	29.05	6.84	[15.33; 42.78]
Average household expenditure on transport (annual) (n=175)	2486.14	147.06	[2189.138; 2783.14]
Average household expenditure on supplies (n=490)	276.65	20.79	[235.10; 318.21]
Average household expenditure on bathroom costs (n=219)	40.54	4.47	[31.545; 49.53]
Average household expenditure on school uniforms (n=622)	248.05	13.00	[221.95; 274.15]
Average household expenditure on books (n=385)	169.73	11.85	[145.93; 193.52]
Average household expenditure on school furniture (n=217)	90.22	6.95	[76.18; 104.26]
Average household expenditure on extracurricular activities (n=212)	122.43	8.18	[105.98; 138.88]
Average household expenditure on special care (n=5)	53.55	21.46	[-6.04; 113.14]
Average household expenditure on food (179)	861.53	133.19	[593.10; 1129.95]
Average household expenditure on feeding programmes (n=24)	262.35	80.66	[89.34; 435.35]
Average household expenditure on digital education devices (n=158)	729.10	73.27	[581.33; 876.87]
Average household expenditure on Solicited Gifts (n=53)	72.34	19.11	[33.13; 111.55]
Average household expenditure on Private tuition (n=50)	620.1265	128.1581	[357.6065; 882.6466]

[5] *Average household education OoPE is not necessarily equal to the sum of the average household expenditure on the sub-categories listed in the table. This is because not every household incurred all types of education expenditures - resulting in different subsample sizes for each category from which the aggregate values have been calculated.*

Average household OoPE on other education expenses (n=15)	292.2352	220.5274	[-206.6324 ; 791.1028]

The overall average household education OoPE is BZ$2,144.11 per year. The highest OoPE category in education is **annual transport** cost at an average of BZ$2486.14 followed by food cost at BZ$861.53 and cost for digital educational items at BZ$729.10. The annual transport costs, which include any funds spent out of pocket on a child's transport to and from school (whether public or private transport), for education represent a significant expense for families in Belize.. The transport cost estimate is based on 175 respondents and was calculated using the 2023/2024 academic calendar, with daily costs multiplied by 182 school days, weekly costs by 38 weeks, and monthly costs by 10 months. To ensure accuracy, 6 outliers with annual transport costs exceeding 20,000 BZ$ were removed, resulting in a more precise estimation. The substantial nature of these transport costs suggests that they may pose a considerable financial burden for many families in Belize.' Other education expenses' refers to additional costs not specifically listed that respondents reported. This category has a mean expense of 289.82 BZ$ with a wide 95% confidence interval of [-170.95; 750.59], representing various additional education-related costs reported by a small sample of 16 respondents. The negative lower bound of the confidence interval and the large standard error (206.80) indicate substantial variability in these expenses and uncertainty in the estimate, likely due to the small sample size and diversity of items reported. The specific costs reported included class party, graduation fees, water, trips, holy communion, projects, and formal clothing for attending certain classes.

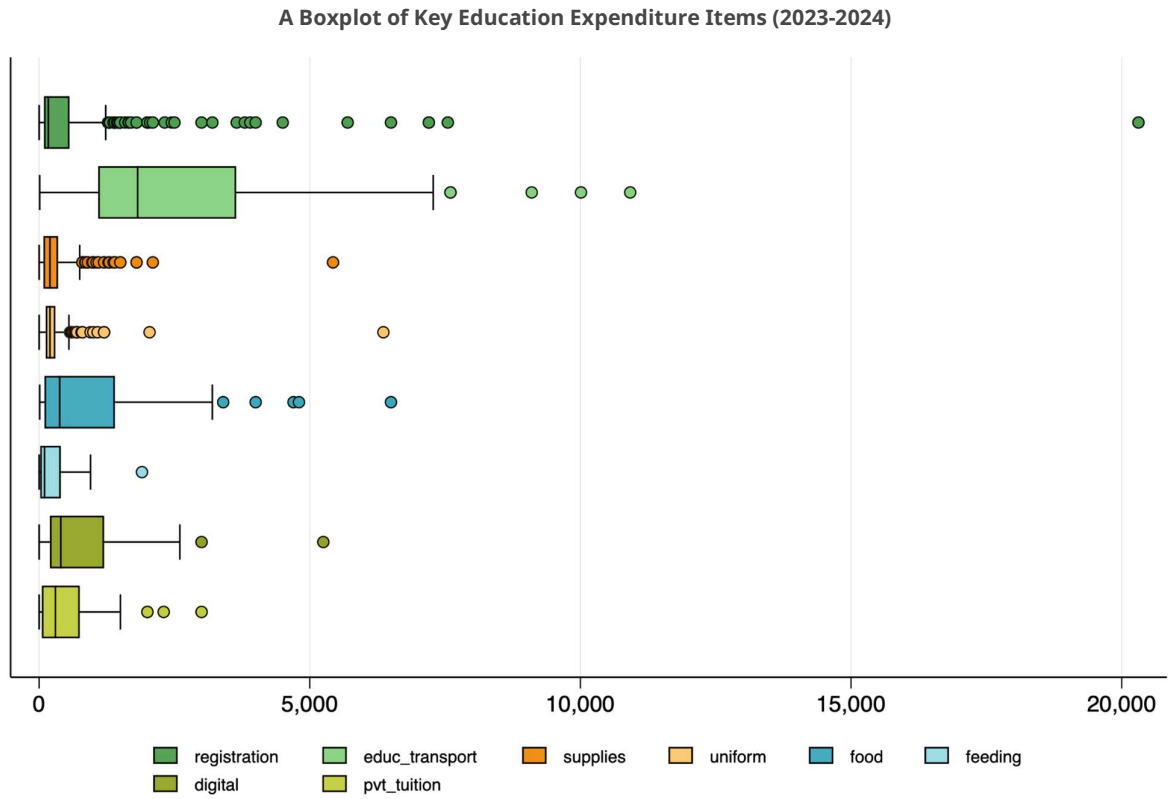


Figure 3: Boxplot of Key Education Expenditure Items (2023-2024)

Key items relating to education OoPE are shown in Figure 2. Registration was subject to one large outlier above 20,000 BZ$ (this figure was not removed from the analysis as it was deemed a plausible expense as the family was in the highest income bracket and the large expense was for higher education/university). Overall, transport, digital, food, feeding and fees display distributions subject to fewer outliers in comparison to registration, supplies and uniform. That being said, registration, supplies and uniform had 400-600 observations recorded, suggesting that the population distribution for these types of expenses is indeed subject to a degree of variation across households.

Note: means were calculated as the average expenditure across households who indicated that they used the respective education service. Digital fees were subject to one very large outlier of 30,500 BZ$, which was removed from the data.

4.2.4. Household OoPE on Education per child (2023-2024)

Table 14: Household OoPE on Education per child (2023-2024) (per year)
Colors represent the magnitude of the average cost for each item. Each expenditure item was calculated only for households that used the corresponding service, resulting in differing sample sizes per category.

Item	Mean (BZ$)	Standard Error	95% Confidence Interval
Average overall household OoPE on Education per child (n=675)[6]	1447.29	105.57	[1238.64 ; 1655.93]
Average household expenditure on registration (n=672)	318.24	30.96	[256.14 ; 380.35]
Average household expenditure on examination (n=575)	19.13	4.82	[9.46 ; 28.79]
Average household expenditure on transport (annual) (n=175)	1796.58	122.82	[1548.52 ; 2044.63]
Average household expenditure on supplies (n=490)	169.92	10.57	[148.70 ; 191.14]
Average household expenditure on bathroom costs (n=219)	26.17	2.68	[20.79 ; 31.56]
Average household expenditure on school uniforms (n=622)	160.85	7.76	[145.29 ; 176.41]
Average household expenditure on books (n=385)	107.09	7.60	[91.84 ; 122.35]
Average household expenditure on school furniture (n=217)	58.89	2.86	[53.12 ; 64.66]
Average household expenditure on extracurricular activities (n=212)	83.80	6.53	[70.66 ; 96.93]
Average household expenditure on special care (n=5)	20.51	9.47	[-5.78 ; 46.79]
Average household expenditure on food (179)	530.13	76.23	[376.49 ; 683.77]
Average household expenditure on feeding programmes (n=24)	191.25	83.16	[12.90 ; 369.60]

[6] *Average household education OoPE is not necessarily equal to the sum of the average household expenditure on the sub-categories listed in the table. This is because not every household incurred all types of education expenditures - resulting in different subsample sizes for each category from which the aggregate values have been calculated.*

Average household expenditure on digital education devices (n=156)	540.73	59.29	[421.17 ; 660.29]
Average household expenditure on Solicited Gifts (n=53)	44.49	9.21	[25.58 ; 63.39]
Average household expenditure on Private tuition (n=50)	435.36	102.64	[225.12 ; 645.60]
Average household OoPE on other education expenses (n=15)	258.96	223.44	[-246.49 ; 764.41]

On average, **families spend BZ$ 1,447.29 per child annually on education**, with a 95% confidence interval of [1238.64 ; 1655.93]. **Transport stands out as the highest expense for those who incur this cost** (note: 175 households reported incurring this cost for their children), averaging BZ$ 1,796.58 per year for those who incur this cost. Other major expenses include digital learning (BZ$ 540.73), food (BZ$ 530.13), private tuition (435.36BZ$) and registration fees (BZ$ 318.24). Some costs, like uniforms (BZ$ 160.85) and books (BZ$ 107.09), show more consistent spending patterns across families. However, categories such as special care and fees have limited data points, resulting in less reliable estimates.

Key Education Expenditure Items (expenditure per school going child)

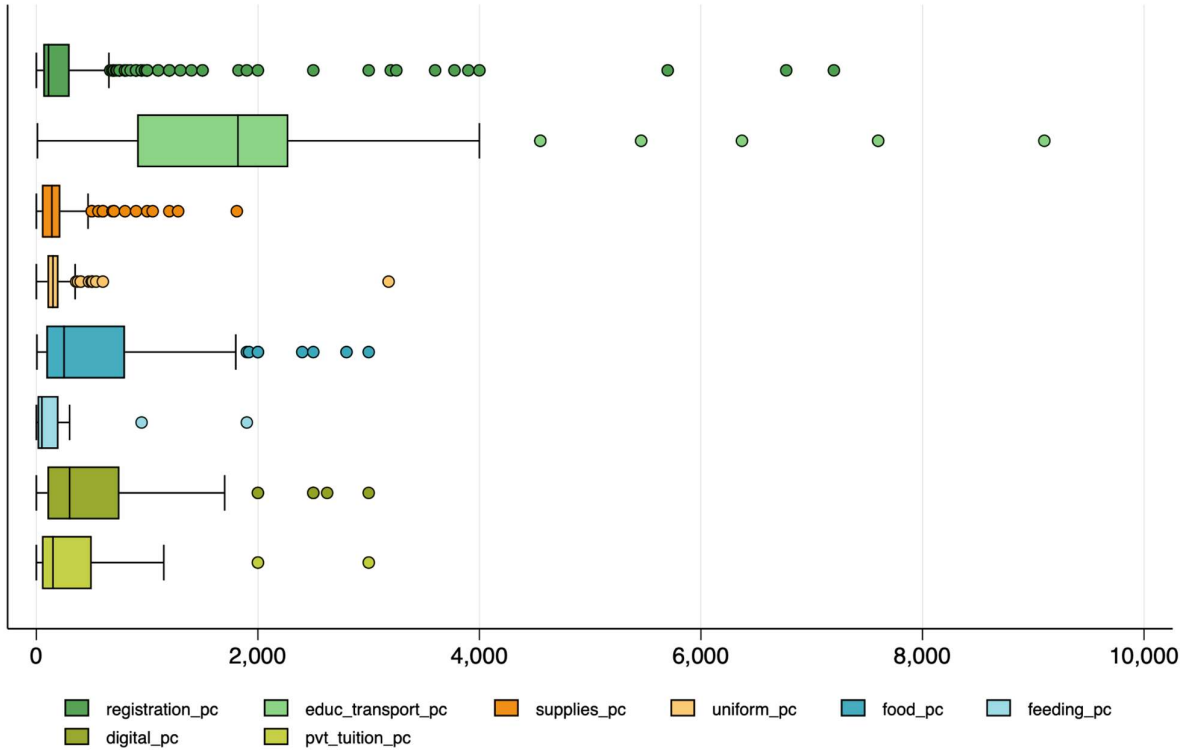


Figure 4: Boxplot of Key Education Expenditure Items ((expenditure per school going child)

The per child expenditure measure of education OoPE is subject to less severe outliers than the overall household expenditure on key education items. That being said, certain items such as transport and registration show some significant outlying values. *Supplies* originally showed one significant outlier above 6,000 BZ$ and, because the nature of this household did not seem to correspond to this type of expense, this value was treated as an error and changed to a missing value in order to not severely skew the analysis for the item.

4.2.5. Education OoPE per child (Primary school level) (2023-2024)

Table 15: Education OoPE per child (Primary school level) (per year)

Colors represent the magnitude of the average cost for each item. Each expenditure item was calculated only for households that used the corresponding service, resulting in differing sample sizes per category.

Item (Per Child)	Mean (BZ$)	Standard Error	95% Confidence Interval
Average household OoPE on Education per child (n=507)[7]	1046.87	79.82	[886.77 ; 1206.98]
Average household expenditure on registration (n=505)	142.82	25.19	[92.29 ; 193.35]
Average household expenditure on examination (n=443)	17.09	5.85	[5.36 ; 28.82]
Average household expenditure on transport (annual) (n=92)	1932.06	154.66	[1618.70 ; 2245.43]
Average household expenditure on supplies (n=384)	187.70	23.96	[139.62 ; 235.79]
Average household expenditure on bathroom costs (n=174)	28.87	3.28	[22.25 ; 35.48]
Average household expenditure on school uniforms (n=471)	151.03	8.70	[133.57 ; 168.49]
Average household expenditure on books (n=257)	82.32	5.52	[71.22 ; 93.42]
Average household expenditure on school furniture (n=172)	62.70	3.26	[56.11 ; 69.30]
Average household expenditure on extracurricular activities (n=168)	78.96	7.98	[62.89 ; 95.04]
Average household expenditure on special care (n=3)	17.74	8.84	[-20.30 ; 55.78]
Average household expenditure on food (n=98)	531.68	90.06	[349.36 ; 714.00]
Average household expenditure on feeding programmes (n=21)	209.89	97.66	[-1.10 ; 420.87]
Average household expenditure on digital education devices (n=82)	363.64	64.38	[232.81 ; 494.47]
Average household expenditure on Solicited Gifts (n=34)	55.05	13.35	[27.38 ; 82.73]

[7] *Average household education OoPE is not necessarily equal to the sum of the average household expenditure on the sub-categories listed in the table. This is because not every household incurred all types of education expenditures - resulting in different subsample sizes for each category from which the aggregate values have been calculated.*

Average household expenditure on Private tuition (n=10)	49.38	15.95	[11.65 ; 87.10]

Primary education in Belize involves diverse expenses, **averaging BZ$ 1,046.87 annually per primary school level child. Transportation is the highest cost at BZ$ 1,932.06 per primary school level child, though this applies to fewer students.** Other significant expenses include food (BZ$ 531.68), digital learning (BZ$ 363.64), and supplies (BZ$ 187.70). Uniform and book costs are more consistent across families, while expenses like special care and 'other education expenses' have limited data, making their estimates less reliable.

4.2.6. Education OoPE per child (Secondary school level) (2023-2024)

Table 16: Education OoPE per child (Secondary school level) (per year)

Colors represent the magnitude of the average cost for each item. Each expenditure item was calculated only for households that used the corresponding service, resulting in differing sample sizes per category.

Item (Per child)	Mean (BZ$)	Standard Error	95% Confidence Interval
Average household OoPE on Education per child (n=208)[8]	2630.64	188.67	[2251.69 ; 3009.59]
Average household expenditure on registration (n=202)	693.93	58.84	[575.73 ; 812.12]
Average household expenditure on examination (n=173)	23.73	4.38	[14.92 ; 32.55]
Average household expenditure on transport (annual) (n=81)	2139.95	172.00	[1790.01 ; 2489.89]
Average household expenditure on supplies (n=121)	245.54	26.97	[191.19 ; 299.88]
Average household expenditure on bathroom costs (n=39)	27.91	5.06	[17.49 ; 38.33]
Average household expenditure on school uniforms (n=183)	208.36	9.57	[189.12 ; 227.59]
Average household expenditure on books (n=123)	203.64	18.55	[166.13 ; 241.15]
Average household expenditure on school furniture (n=35)	65.53	5.80	[53.47 ; 77.59]
Average household expenditure on extracurricular activities (n=59)	87.88	9.28	[68.75 ; 107.00]
Average household expenditure on special care (n=2)	52.76	49.85	[-580.61 ; 686.13]
Average household expenditure on food (n=86)	747.26	124.31	[494.90 ; 999.62]
Average household expenditure on feeding programmes (n=2)	360.00	240.00	[-2689.49 ; 3409.49]
Average household expenditure on digital education devices (n=77)	853.95	89.27	[672.33 ; 1035.57]
Average household expenditure on Solicited Gifts (n=14)	39.59	11.53	[13.90 ; 65.29]

[8] *Average household education OoPE is not necessarily equal to the sum of the average household expenditure on the sub-categories listed in the table. This is because not every household incurred all types of education expenditures - resulting in different subsample sizes for each category from which the aggregate values have been calculated.*

Average household expenditure on Private tuition (n=15)	502.36	147.60	[180.76 ; 823.96]
Average household OoPE on other Education expenses per child (n=3)[9]	1091.95	1020.54	[-3299.08 ; 5482.97]
There is a complex landscape of educational expenses for secondary school students in Belize**.** With an **average annual out-of-pocket cost of BZ$ 2,630.64 per secondary school child** in families. **Transport** emerges as the most substantial burden at an average of BZ$ 2,139.95 per secondary school child. Other major expenses include digital learning resources, and food. While some categories like uniforms and extracurricular activities show consistent costs across the population, others such as special care and feeding have limited but diverse data points, leading to wider confidence intervals and less reliable estimates. **Secondary school in Belize costs families about BZ$ 2,631 per child each year, which is more than twice the BZ$ 1,047 for primary school. In both cases, transportation is the biggest expense.**			

4.3 Child-level analysis of OoPE

In addition to the OoPE analysis conducted at household level, we further examine the findings at the child-level to examine sex-disaggregated differences in out-of-pocket expenses for children. The findings in this section are not nationally representative, as the survey was designed at the household level. However, the randomization process used to deliver the survey combined with a large sample size of children (n=1,469) allows us to conduct inferential analyses to identify statistically significant relationships at child-level.

4.3.1 Health OoPE (Child-level)

In this subsection we present the overall health out-of-pocket expenditure disaggregated by sex and examine this relationship for statistical significance. Additionally, we present the sub-components of overall health OoPE where the disaggregated differences were statistically significant with a combined sample size of at least 50 data points[10]. To control for confounding factors, we further performed a multiple regression analysis on the significant health expenses in relation to child sex, controlling for district, urban or rural location as well as the child's age.

Item (Child-level)	Sex	Mean	Standard Error	Significance
Health OoPE	Female (n=384)	444.11	44.17	The difference observed between sexes was slightly statistically significant at the 10% level. However, under multiple regression controlling for sex, district and child's age, this overall difference was not identified as significant based on child's sex.
	Male (n=421)	357.02	34.75	
Birth	Female (n=31)	949.03	239.83	

[9] *Average household education OoPE is not necessarily equal to the sum of the average household expenditure on the sub-categories listed in the table. This is because not every household incurred all types of education expenditures - resulting in different subsample sizes for each category from which the aggregate values have been calculated.*

[10] *Sub-categories with sample sizes less than 50 are not reported here to ensure findings reported meet a minimum threshold for statistical robustness.*

	Male (n=41)	304.44	75.71	Statistically significant difference at the 1% level. Under multiple regression controlling for sex, district and child's age, this category was also significant at the 1% level.

Overall, statistical significance between the sexes with regards to health expenditure appears to be marginal. That being said, birth costs are an important area for further research.

4.3.2 Education OoPE (Child-level)

Similar to the prior subsection, we present the overall education out-of-pocket expenditure disaggregated by child sex and further present sub-components of education OoPE that show statistical significance and meet a minimum sample size threshold of n=50. To control for confounding factors, we further performed a multiple regression analysis on the significant health expenses in relation to child sex, controlling for district, urban or rural location as well as the child's age.

Item (Per child)	Sex	Mean	Standard Error	Significance
Education OoPE	Female (n=512)	1475.73	97.60	The difference observed between sexes was not statistically significant.
	Male (n=538)	1452.37	80.68	
Private Tuition	Female (n=24)	763.0	189.83	Slightly statistically significant difference at the 10% level. Under multiple regression controlling for sex, district and child's age, this category was not identified as significant.
	Male (n=34)	382.84	97.21	
Digital	Female (n=96)	1062.70	316.03	Slightly statistically significant difference at the 10% level. Under multiple regression controlling for sex, district and child's age, this category was also significant at the 10% level. This finding is marginally significant, meaning that caution should be exercised in using the finding for policymaking without further research to triangulate the data.
	Male (n=93)	500.46	53.97	
Uniform	Female (n=468)	148.43	4.17	Statistically significant difference at the 5% level. Under multiple regression controlling for sex, district and child's age, this category was also significant at the 5% level. The findings show a robust significant relationship, whereby male children are more likely to have higher OoPE in this category.
	Male (n=482)	181.34	13.36	

4. OoPE drivers

The analysis now moves towards considering those items that may be contributing to OoPE in both health and education, **where we will be using health OoPE per child and education OoPE per school going child as our measure of OoPE for the majority of this section[11].** For each variable where we believe that there may be an influence on OoPE, we have run an appropriate statistical test in order to determine whether there is a *statistically significant* relationship between the variable and OoPE. Statistical tests used in this subsection include the independent sample t-test, analysis of variance (ANOVA) and regression. The t-test allows us to test whether the mean between two categories is significantly different. ANOVA is especially appropriate in cases of variables with more than two response categories, allowing us to identify whether these multiple categories are significantly different from each other. Finally, regression enables us to isolate any significant correlations between variables, which can further control for additional covariates as a way to move toward identifying any causal linkages.

5.1. Summary of OoPE drivers

Table 17: Summary of *statistically significant* drivers

Driver	Details
Geotype (Urban/Rural)	Average OoPE in education per child is higher in urban areas while health OoPE per child is higher in rural areas.
District	• Relative to other districts, Belize has higher education OoPE per school going child. • For health, significant differences between Belize and Orange Walk as well as Belize and Cayo are observed, with Belize having relatively lower health OoPE.
Household income	Health and education OoPEs generally increase as income increases.
Chronic illness	Households that have children who suffer from chronic conditions tend to have higher health OoPE.
Health facility accessibility	Those who had to have treatment outside of their district of residence tend to have higher health OoPE.
Facility type	• Households using private facilities exclusively tend to have the highest health OoPE per child. • Similarly, households with all school going children enrolled in private education had significantly higher education OoPE

Table 18: *Potential* drivers lacking statistical significance, requiring further research

Driver	Details

[11] Using OoPE *per child* allows us to control for natural variation caused by some households having more children, which would in turn contribute to higher levels of overall OoPE.

Migration status	The sample size of citizens from other countries was too small to determine a significant relationship.
Special needs	No significant difference in OoPE observed between households with a special needs child versus households without a special needs child.
Health insurance	There was no significant difference observed between health OoPE for privately insured households versus households without private health insurance. We believe this finding could be due to having a relatively small sample size of privately insured households (n=40).

5.2. General (health and education) OoPE drivers

Table 19: Geographical area type (Urban/Rural)

Geographical area type (Urban/Rural)
The average OoPE in education per child is higher in urban areas while health OoPE per child is higher in rural areas. An independent sample t-test was used to assess whether these differences observed between urban and rural locations are significant. The test findings indicate that the differences are significant for both health and education OoPE per child (at the 5% level).

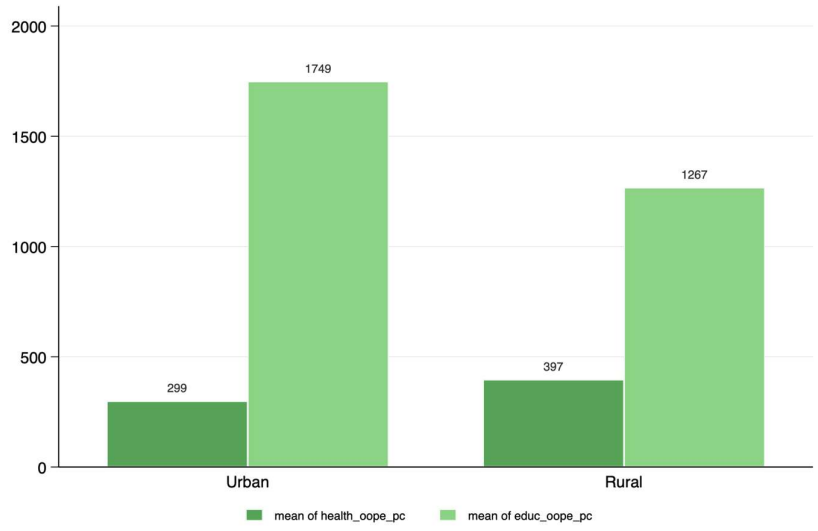


Figure 5: Geographical area type (Urban/Rural)

Table 20: A weighted analysis of OoPE across districts

A weighted analysis of OoPE across districts

A weighted analysis of OoPE per child across districts indicates that there are differences in average OoPE between the regions.

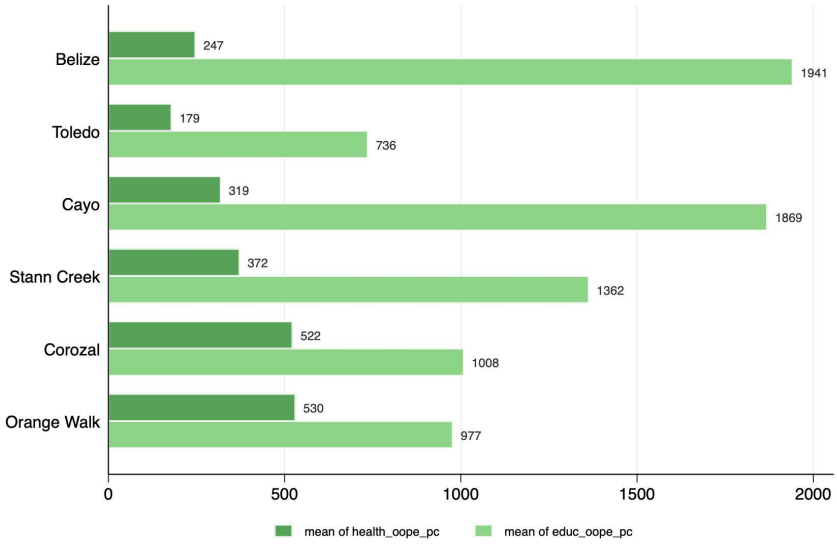


Figure 6: A weighted analysis of OoPE across districts

For education expenditure per child, ANOVA shows statistically significant differences between the districts. In general, the Belize district is seen to have significantly higher education OoPE per school going child. ANOVA for health OoPE shows significant differences between Belize and Orange Walk as well as Belize and Cayo - where the Belize district is found to have significantly lower levels of health OoPE. A significant difference was additionally observed between Toledo and Orange Walk, with Toledo having significantly lower health OoPE than Orange Walk.

Table 21: Migration status

Migration Status
Migration status has been identified as an area of interest for this study. Looking at the figure below, there is apparent variation in OoPE per child based on migration status.

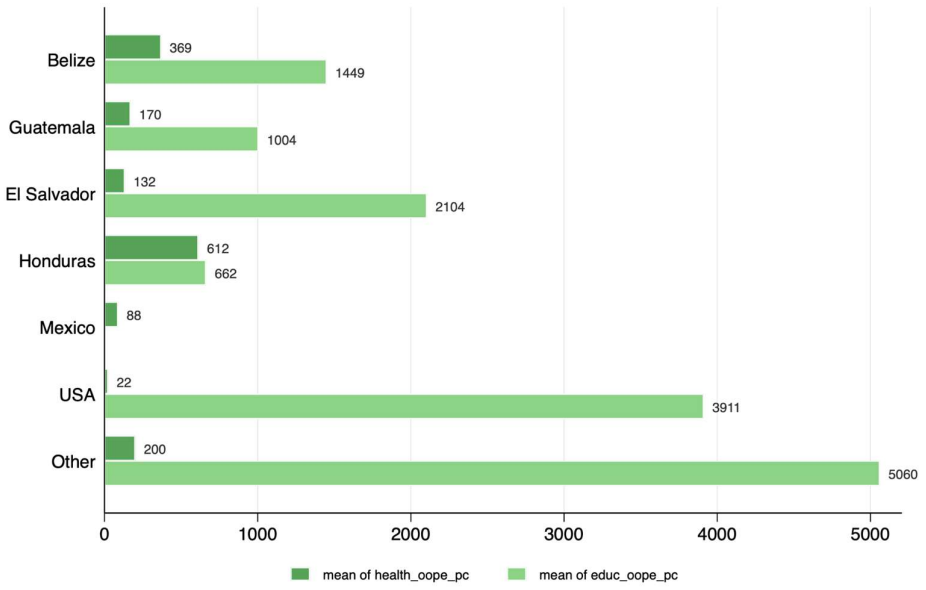


Figure 7: Migration Status

Analysis using one-way ANOVA indicates, however, that this variation is not statistically significant. This finding is likely because the respective subgroups for migration status (apart from Belizeans) are subject to very small sample sizes. Further survey research in this area will be required in order to determine if there is a *significant* relationship between migration status and OoPE.

Further analysis was conducted by forming two distinct groups: Belizeans and those who have migrated to Belize (regardless of country of origin). While some slight differences are observed between these groups, a t-test analysis revealed that these differences were not statistically significant. Additional multiple regression analysis, controlling for confounding factors (district, urban/rural, household size, income) also did not reveal any significant relationships.

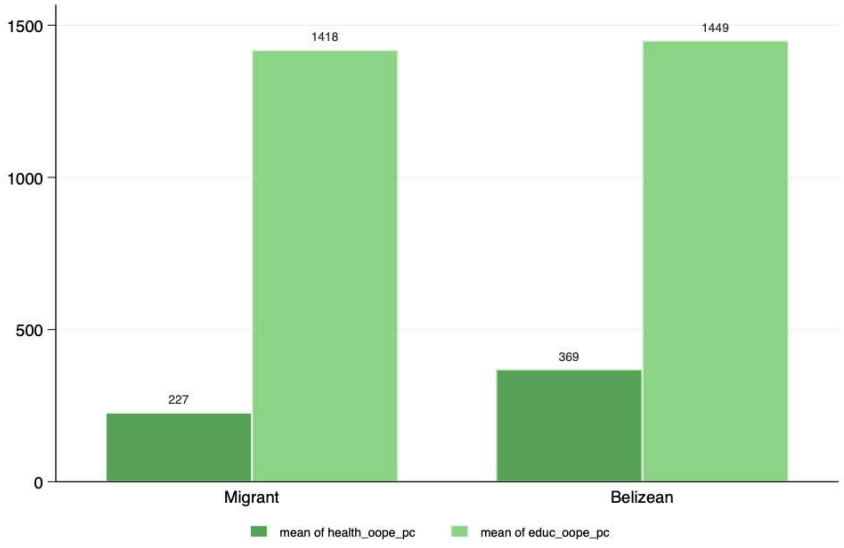


Table 22: Household income

Household income (monthly)
Households were asked about their monthly income according to the following income brackets: • 0 < 200 BZD • 200 - 599 BZD • 600 - 999 BZD • 1000 - 1399 BZD • 1400 - 2000 BZD • More than 2000 BZD The figure below shows that the highest income bracket tends to have the highest average education and health OoPE per child. Notably, the lowest income bracket (<200 BZD) shows the second highest average health OoPE per child. We see a strong linear relationship between household income bracket and education OoPE per child.

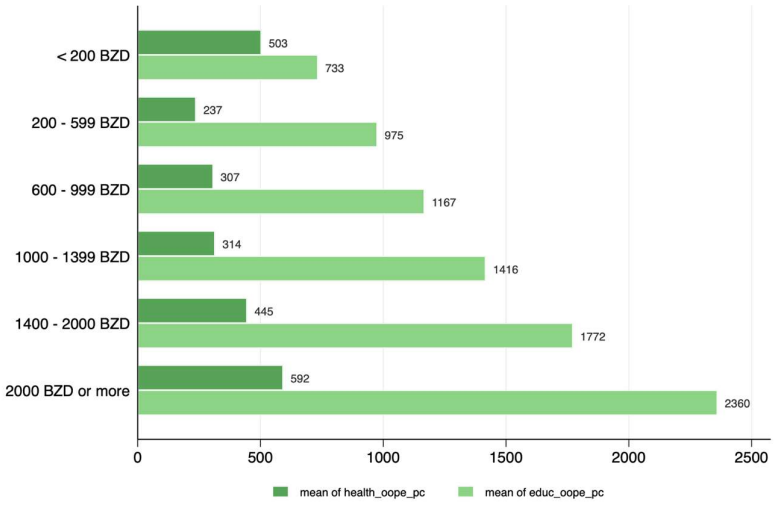


Figure 8: Household income

The ANOVA shows the difference in education OoPE per child is significantly different across income brackets. The ANOVA for health OoPE per child only indicates a significant difference between the highest income bracket and the middle income brackets (excluding < 200 BZD). Health OoPE was not deemed significantly different between the *< 200 BZD* bracket and the *2000 BZD or more* income bracket (note: this finding should be treated with some caution as the < 200 BZD income bracket only had a small sample size of 16 households).

Table 22: Catastrophic OoPE

Catastrophic OoPE (OoPE/Household Income)
We next examine the notion of catastrophic OoPE, whereby we consider OoPE relative to the household income. In order to do this, monthly household income data was annualized and estimated according to the median value of each income category. We compared the annualized income against both annual health and education OoPE.

Catastrophic Health OoPE

- Health OoPE/Household Income >= 10%: 12% of households formed part of this category.
- Health OoPE/Household Income >= 25%: 4% of households formed part of this category.

Catastrophic Education OoPE

- Education OoPE/Household Income >= 10%: 51% of households formed part of this category.
- Education OoPE/Household Income >= 25%: 25% of households formed part of this category.
- Education OoPE/Household Income >= 50%: 8% of households formed part of this category.

In general households seem to spend relatively more of their income on education OoPE, with an estimated 8% of households spending 50% or more of their annual income on education OoPE.

5.3. Health OoPE drivers

Table 23: Children with chronic illness

Chronic Illness	Mean	Standard Error	N
Proportion of households with at least one child with a chronic illness	0.16	0.0194552	797
Proportion of households where all children have a chronic illness	0.05	.0113189	797
Health OoPE per child for households where all children have a chronic illness (BZ$)	774.8253	181.2057	39
Health OoPE per child for households with at least one child with a chronic illness (BZ$)	547.06	83.25523	108
Health OoPE per child for households with no children with a chronic illness (BZ$)	311.19	24.47212	421

16% of households with children in Belize have at least one child with a chronic illness. The small standard error (0.0194552) relative to the average indicates this estimate is precise. Significance of the relationship between chronic illness and OoPE is further confirmed using an independent sample t-test.

Figure 9 outlines chronic illness for the households visited. Asthma was found as the most frequently reported type of chronic illness, followed by allergies. Other chronic conditions such as diabetes, sickle cell and cancer were less common.

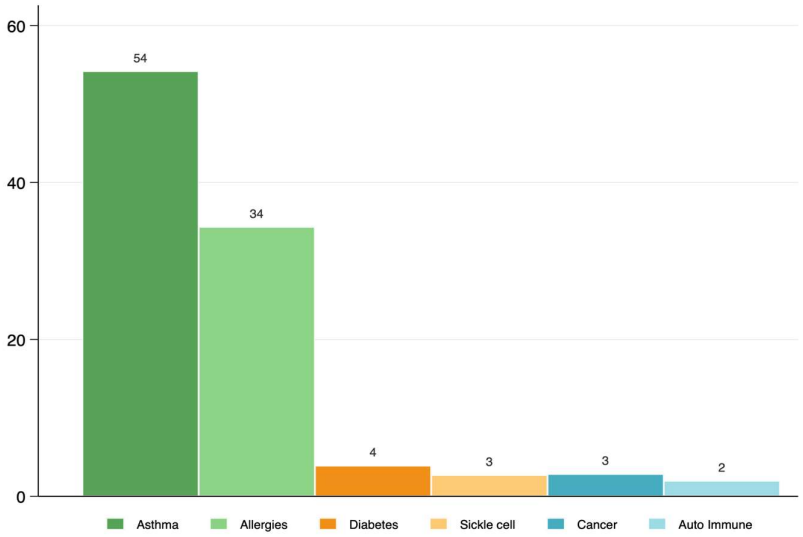


Figure 9: Distribution of chronic illnesses per household, by the type of chronic illness

Table 23: Health insurance

Health insurance	Mean	Standard Error	N
Health OoPE per child for households with private health insurance (BZ$)	468.11	107.98	40
Health OoPE per child for households without private health insurance (BZ$)	351.71	30.20	489
Most households in Belize do not have private health insurance (n=489). For those with private health insurance (n=40), health OoPE per child was higher than those without insurance. The t-test between these mean outcomes revealed that this difference, however, was not statistically significant. To further test for confounding factors a multiple regression was run (controlling for income, district, urban/rural) but results remained insignificant. We believe this is because the sample size for privately insured households was relatively small.			

Table 24: Health services outside home district

Accessibility of health facilities	Mean	Standard Error	N
Proportion of households who needed health services outside the home district	0.09	0.0115716	797
Health OoPE per child for households who had to use health services outside the home district (BZ$)	810.52	122.6127	59
Health OoPE per child for households who did not use health services outside the home district (BZ$)	301.01	30.75985	470

The proportion of households with children who had to use health services outside the home district is approximately 0.09, with a 95% confidence interval ranging from 0.06 to 0.11. Those who had to have treatment outside of their district of residence tend to have higher health OoPE that is statistically significant, confirmed by an independent sample t-test.

Table 25: Type of health facility

Type of health facility	Mean Health OoPE per child (BZ$)	SE	N
Private clinic or hospital only	670.7123	83.96545	151
Public clinic or hospital only	234.289	27.31339	207
Traditional healer only	70.9732	23.62177	4
No facility only	126.3415	31.25503	26

The type of health facility mainly used by households is also a significant determinant of health OoPE per child. It was found that some households use different types of facilities between their different children - where some households might send one child to a private facility but another child to a traditional healer. In order to assess the OoPE differences between the facility types, we looked at households that reported that they send all of their children to the same type of facility (private/public/traditional/no facility). As can be expected, households who only use private facilities for their children tend to have the highest OoPE per child. This finding is confirmed using a t-test for statistical significance, which shows that households using private facilities exclusively tend to have the highest health OoPE per child.

5.4. Education OoPE drivers

Table 26: Facility type

Facility type	Mean Education OoPE per child (BZ$)	SE	N
Private education only	2174.529	296.5798	112
Public education only	1252.658	95.93479	455
Church education only	1210.128	261.7746	45

Similar to the type of health facility, the type of education institution that a child attend is expected to have an impact on education OoPE. We looked at the difference in mean education OoPE per school going child for households with children only enrolled in private education, households with children only enrolled in public school and households with all children only enrolled in church school. As can be expected, households with all school going children enrolled in private education had significantly higher education OoPE in comparison to those not enrolled in private school (with statistical significance confirmed at the 1% level confirmed by an independent sample t-test).

Table 27: Scholarship

Scholarship

Whether a household has at least one child with a scholarship or education subsidy can be expected to impact education OoPE. The results provide evidence that is, however, contrary to what may be expected: households with at least one child with subsidized education tend to have higher education OoPE per child than households with no subsidized children. This is found to be statistically significant at the 5% level.

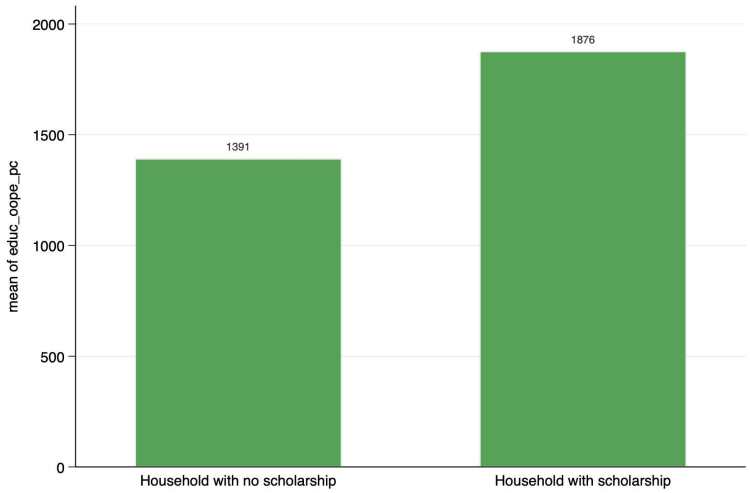


Figure 10: Scholarship

This finding may however be subject to confounding factors, e.g., subsidized households may send their children to more expensive facilities or live in more expensive regions. These types of confounding factors will be dealt with more comprehensively in the next section of the analysis: Multiple Linear Regression.

Table 28: Children with special needs

Child needs	Mean	Standard Error	N
Proportion of households with at least one special needs child.	0.09	.0134613	797
Education OoPE per child for households with at least one special needs child (BZ$)	1411.851	205.5929	59
Education OoPE per child for households with no special needs children (BZ$)	1450.755	105.6367	616

Children with special needs may require additional educational support, which may in turn result in more education OoPE. We examine this by looking at households with at least one special needs child (this need could be learning, psychiatric, physical or another type of special need noted by the primary caregiver). While a slight difference in the mean OoPE is noted between households with at least one special needs child versus households with no special needs children, an independent sample t-test shows that this difference is not statistically significant.

5. Multiple regression analysis

The various drivers of OoPE analyzed in the previous subsection have provided insight into whether there are significant statistical differences in OoPE for different segments of the population. These findings indicate which groups are facing a higher burden of OoPE and are useful for policy making. In addition to these findings, we now move towards controlling for confounding factors in order to make more comments on *causality.* For instance, the Cayo district may have higher education OoPE, but this could also be due to having more private schools and household income being relatively higher on average than in other districts. As such, we need to control for certain factors in order to isolate the effect of a given determinant and make targeted inferences. We can do this using multiple linear regression.

6.1. Health OoPE: Multiple linear regression

We begin by considering the ***average health OoPE per household*** as the outcome variable of interest. This continuous general measure of OoPE can be used to measure significant determinants of health OoPE while controlling for other factors.

Table 29: Health OoPE: Weighted multiple linear regression

Covariates	Coef.	[95% Conf Interval]		Significance
Urban Area	-218.41	-365.33	-71.49	***
Children	279.45	165.98	392.92	***
Corozal District	384.09	64.85	703.33	**
Stann Creek District	257.05	101.61	412.49	***
Chronic illness	204.21	-63.23	471.65	
Health away (Health services in a different district)	640.05	157.54	1122.56	**
Private health	621.6	335.14	908.05	***
Average child age	-29.36	-52.44	-6.28	**
R-squared	**0.24**	**Obs**	**472**	
F-test	**4.31**	**Prob > F**	**0.00**	
***** p<.01, ** p<.05, * p<.1**				
Notes: Household income bracket and highest level of education of primary caregiver have been controlled for. All districts have been controlled for (with Belize as the reference category) and only district findings with statistical significance have been reported. Survey weights have been applied.				

Table 29 shows the weighted multiple regression for health OoPE. These results show highly significant relationships (p<.01) associated with the following factors:

- Urban Area: households located in urban areas tend to have significantly lower (-218 BZ$) health OoPE than their rural counterparts, having controlled for all factors such as household income, district, number of children, use of private facilities, children with chronic illnesses, age and education level of the primary caregiver.
- Children: as can be expected, households with more children have significantly higher health OoPE (279.45 BZ$) for each additional child in the home, having controlled for the other factors.
- Stann Creek: relative to the Belize district, households in Stann Creek tend to have 257 BZ$ (on average) higher health OoPE, controlling for other factors.
- Private health: another expected result, households using private health facilities exclusively tend to have higher (622 BZ$) health OoPE.

These significant findings indicate that policy responses targeted to rural areas and Stann Creek will be highly beneficial to overall health OoPE. Improving conditions in public health facilities would contribute to reducing the need to use private facilities and also greatly lower such expenditure.

Slightly less statistically significant but notable findings include:

- Health away ($p < .05$): households with health requirements that necessitated leaving their home district had on average, 640 BZ$ higher health OoPE.
- Average age of children ($p < .05$): for every year that the average age of children in the household increases, health OoPE decreases by 29 BZ$.

These findings speak to the need for accessible facilities close to people's homes. Younger children are also seen to be more expensive on average, which suggests potential opportunities to help families with young children to manage costs.

6.2. Education OoPE: Multiple linear regression

Similar to that of health OoPE, the key drivers observed in the previous subsection will now be applied in the multiple regression context in order to control for confounding factors. We begin by considering general household education OoPE, with results presented in Table 30.

Table 30: Education OoPE: Weighted multiple linear regression

Education OoPE: Weighted multiple linear regression				
Covariates	**Coef.**	**[95% Conf Interval]**		**Significance**
Number of Children	501.31	295.18	707.44	***
Corozal District	-1265.67	-1982.24	-549.09	***
Orange Walk District	-1370.76	-1912.39	-829.12	***
Stann Creek District	-501.39	-891.56	-111.21	**
Primary (CG)	827.5	114.79	1540.21	**
Secondary (CG)	1410.1	572.74	2247.46	***
Vocational (CG)	1688.87	689.99	2687.74	***

Higher (CG)	2880.72	1717.18	4044.26	***
Household monthly income: 600 - 999 BZD	825.07	115.84	1534.3	**
Household monthly income: 1000 - 1399 BZD	1021.02	298.87	1743.17	***
Household monthly income: 1400 - 2000 BZD	1418.15	478.54	2357.77	***
Household monthly income: 2000 BZD or more	1792.26	847.95	2736.57	***
R-squared	0.31	Obs	602	
F-test	18.63	Prob > F	0.00	
*** p<.01, ** p<.05, * p<.1				

Notes: Household income bracket and average age of children and age of primary caregiver have been controlled for. All districts have been controlled for (with Belize as the reference category) and only district findings with statistical significance have been reported. The reference category for caregiver education level (CG) is preschool. Urban location, scholarship and private education were controlled for but were not found to be statistically significant. Survey weights have been applied.

Table 30 indicates several significant influences on household education OoPE, having controlled for other variables. The results show highly significant relationships (p<.01) associated with the following determinants:

- Children: As can be expected, households with more children have significantly higher education OoPE (501.31 BZ$) for each additional child in the home, having controlled for the other factors.
- Districts:
    - Corozal: Households in Corozal tend to have lower education OoPE (1,265.67 BZ$) compared to the reference district (Belize), controlling for other factors.
    - Orange Walk: Households in Orange Walk tend to have lower education OoPE (1,370.76BZ$) compared to the reference district (Belize), controlling for other factors.
- Caregiver's education level: The more educated the primary caregiver, the higher the family's education spending
    - Secondary (CG): Primary caregivers with secondary education as their highest level of education tend to have higher education OoPE (1,410.1 BZ$) for their children, compared to caregivers with preschool education, controlling for other factors.
    - Vocational (CG): Primary caregivers with vocational education tend to have higher education OoPE (1,688.87 BZ$) for their children, compared to caregivers with preschool education, controlling for other factors.
    - Higher (CG): Primary caregivers with higher education (e.g., university) tend to have significantly higher education OoPE (2,880.72 BZ$) for their children, compared to caregivers with preschool education, controlling for other factors.
- Household monthly income: Higher-income families in Belize consistently spend more on their children's education

- 1000 - 1399 BZ$: Households in this income bracket tend to spend 1,021.02 BZ$ more on education compared to the lowest income group (0-200 BZ$), controlling for other factors.
- 1400 - 2000 BZ$: Households in this income bracket tend to spend 1,418.15 BZ$ more on education compared to the lowest income group (0-200 BZ$), controlling for other factors.
- Over 2000 BZ$: Households in this highest income bracket tend to spend 1,792.26 BZ$ more on education compared to the lowest income group (0-200 BZ$), controlling for other factors.

Other significant insights (p<.05) include:

- Stann Creek: Households in Stann Creek district tend to have lower education OoPE (501.39 BZ$) compared to Belize district, controlling for other factors.
- Primary (CG): Primary caregivers with primary education as their highest level tend to have higher education OoPE (827.5 BZ$) for their children, compared to caregivers with preschool education, controlling for other factors.
- 600 - 999 BZD income bracket: Households in this income bracket tend to spend 825.07 BZ$ more on education compared to the lowest income group (0-200 BZ$), controlling for other factors.

6.3. Education OoPE per child (Primary School)

In line with the literature, we next consider household education OoPE per child in primary school.

Table 31: Education OoPE per child in Primary school level : Weighted multiple linear regression

Education OoPE per child in Primary school level : Weighted multiple linear regression				
Covariate	**Coef.**	**[95% Confidence Interval]**		**Sig**
Urban Area	-310.46	-553.36	-67.57	**
Household size	-58.22	-104.51	-11.92	**
Scholarship	-281.54	-558.21	-4.86	**
Private school	613.03	191.36	1034.7	***
Corozal district	-988.04	-1367.24	-608.84	***
Orange Walk district	-1282.84	-1674.15	-891.54	***
Stann Creek district	-426.58	-832.14	-21.01	**
Toledo District	-986.24	-1372.54	-599.94	***
Caregiver's age	15.7	5.97	25.42	***
Primary (CG)	563.28	146.5	980.06	***
Secondary (CG)	701.06	260.03	1142.1	***
Vocational (CG)	980.71	151.76	1809.66	**

Higher (CG)	1412.37	708.38	2116.36	***
R-squared	0.28	Number of obs	454	
F-test	7.18	Prob > F	0.00	
*** p<.01, ** p<.05, * p<.1				
Notes: Household income bracket, household size and average age of children have been controlled for. All districts have been controlled for (with Belize as the reference category) and only district findings with statistical significance have been reported. The reference category for caregiver education level (CG) is preschool. Survey weights have been applied.				

The weighted regression analysis for OoPE per child in primary school shows critical determinants that strongly influence education expenses. The results highlight highly significant relationships (p<.01) with the following key determinants:

- Private school: As can be expected, households with children enrolled in private schools have significantly higher education OoPE (613.03 BZ$) per child in primary school, having controlled for the other factors.
- Districts
    - Corozal: Households in Corozal tend to have lower education OoPE per child in primary school (-988.04 BZ$) compared to the reference district (Belize), controlling for other factors.
    - Orange Walk: Households in Orange Walk tend to have lower education OoPE per child in primary school (1282.04 BZ$) compared to the reference district (Belize), controlling for other factors.
    - Toledo: Households in Toledo tend to have lower education OoPE per child in primary school (986.24 BZ$) compared to the reference district (Belize), controlling for other factors.
- Caregiver's age: Households with older primary caregivers tend to have higher education OoPE per child in primary school (15.7 BZ$ more for each additional year), having controlled for the other factors.
- Caregiver's education level: The more educated the primary caregiver, the higher the family's education spending
    - Primary (CG): Primary caregivers with primary education as their highest level of education tend to have higher education OoPE per child in primary school (563.28 BZ$), compared to caregivers with preschool education, controlling for other factors.
    - Secondary (CG): Primary caregivers with secondary education as their highest level of education tend to have higher education OoPE per child in primary school (701.06 BZ$), compared to caregivers with preschool education, controlling for other factors.
    - Higher (CG): Primary caregivers with higher education (e.g., university) tend to have significantly higher education OoPE per child in primary school (1412.37BZ$), compared to caregivers with preschool education, controlling other factors.

Other significant insights p<.05 include:

- Urban area: Households residing in urban areas tend to have significantly lower education OoPE (-310.46 BZ$) per child in primary school, having controlled for the other factors.

- Scholarship: Households with children receiving a scholarship in primary school have lower OoPE (-281.54 BZ$) per child in primary school, having controlled all other factors. This result is contrary to the t-test results presented earlier, where confounding factors were not controlled for. A deeper analysis on the subsample of primary school children shows that there is a significant relationship in this case only once the factors included in the multiple regression have been controlled for. This means that factors such as household income and district may have been skewing earlier results - where those who were awarded scholarships may have been in more expensive districts, resulting in higher education OoPE. Once these factors have been adjusted for, we now are able to see the **isolated effect of 'scholarship' on OoPE** and we see that, in the case of primary school, it contributed to reduced OoPE compared to individuals in the same district and same income group.
- Stann Creek: Households in Stann Creek tend to have significantly lower education OoPE (-426.58 BZ$) per child in primary school, compared to the reference district (Belize), having controlled for the other factors.
- Vocation (PC): Primary caregivers with vocational education tend to have higher education OoPE (980.71 BZ$) for their children, compared to caregivers with preschool education, controlling for other factors.

6.4. Education OoPE per child (Secondary School)

Table 30: Education OoPE per child in secondary school level

Education OoPE per child in Secondary school level : Weighted multiple linear regression				
Covariate	**Coef.**	**[95% Confidence Interval]**		**Sig**
Urban Area	-707.06	-1380.63	-33.48	**
Corozal District	-1252.91	-2448	-57.83	**
Toledo District	-1342.96	-2102.58	-583.34	***
Household monthly Income: 1400 - 2000 BZD	1733.04	128.21	3337.87	**
Household monthly income: 2000 BZD or more	2675.77	789.27	4562.27	***
Constant	1408.34	-580.61	3397.3	
R-squared	0.22	Number of obs	183	
F-test	4.76	Prob > F	0.00	
*** p<.01, ** p<.05, * p<.1				
Notes: Household income bracket and average age of children have been controlled for. Only significant income brackets have been reported (reference category: <200 BZD). All districts have been controlled for (with Belize as the reference category) and only district findings with statistical significance have been reported. Household size,				

scholarship and private schooling were controlled for but not found to be statistically significant. Survey weights have been applied.

The weighted regression analysis for OoPE per child in secondary school unveils critical determinants that strongly influence education expenses, even after controlling for various variables. The results highlight highly significant relationships (p<.01) with the Toledo district and higher household income level (2000 BZD or more):

- Toledo: Households in Toledo tend to have significantly lower education OoPE (-1342.96 BZ$) per child in secondary school, compared to the reference district (Belize), having controlled for the other factors.
- Household monthly income (2000 BZD or more): Households with a monthly income of 2000 BZD or more have significantly higher education OoPE (2675.77 BZ$) per child in secondary school, having controlled all other factors.

Other significant insights p<.05 include:

- Urban Area: Households residing in urban areas tend to have significantly lower education OoPE (-707.06 BZ$) per child in secondary school, having controlled for the other factors.
- Corozal: Households in Corozal tend to have significantly lower education OoPE (-1252.91 BZ$) per child in secondary school, compared to the reference district (Belize), having controlled for the other factors.
- Household monthly income (1400 - 2000 BZD): Households with a monthly income between 1400 and 2000 BZD have significantly higher education OoPE (1733.04 BZ$) per child in secondary school, having controlled all other factors.

6. Respondent insights

Nationally representative respondent insights were gathered throughout the survey and are presented in this section. These responses provide enrichment to the inferential analysis conducted in the previous section, as respondent perspectives offer further insight into the on-the-ground reality.

7.1 Health

Beginning with the health sector, respondents were asked about their experiences and recommendations for the sector. A key important development in the sector has been the recent removal of fees in public facilities. Respondents, however, exhibited limited awareness of the removal fee, as shown in Table 31. Only 13.55% of households reported being aware of the removal fee.

Table 31: Awareness of fee removal

Respondent awareness	Proportion of households	N households
Not aware of fee removal	86.45%	689
Aware of fee removal	13.55%	103
Most households indicated that they are unaware of the fee removal.		

Of those who reported being aware of the fee removal, respondents were asked about their experience of the removal and how it impacted their OoPE. In general, most households (65.52%) reported no impact, while some respondents indicated that there was a positive impact in terms of medical fee reduction and removal.

Table 32: Perceived impact of fee removal

Respondent perceived impact	Proportion of households	N households
Positive impact: I haven't had to pay medical fees since the removal	14.57%	14
Positive impact: I have paid less medical fees since the fee removal	19.17%	18
No impact	65.52%	66
Negative impact: I have had to pay more medical fees since the fee removal	0.74%	1
Households generally (65.52%) perceived no impact from the fee removal. Some, however, indicated that there has been a positive impact in terms of paying none or lower medical fees. Note: only those households who indicated that they were aware of the fee removal were asked about the perceived impact of the removal.		

An inferential analysis of the factors associated with fee removal awareness is presented in Table 33. In general, respondents from the Belize district exhibited lower levels of awareness of the fee policy change.

Table 33: Factors associated with fee removal awareness

District (measured relative to Belize district)	Coefficient	Significance
Cayo	2.629736	***
Corozal	3.100135	***
Orange Walk	1.429135	*
Stann Creek	3.587073	***
Toledo	2.349168	**
Urban area	-.0873857	Not significant
Household monthly income: 200 - 599 BZD	-.3547465	Not significant
Household monthly income: 600 - 999 BZD	-.1489616	Not significant
Household monthly income: 1000 - 1399 BZD	.3713224	Not significant
Household monthly income: 1400 - 2000 BZD	.7641155	Not significant
Household monthly income: 2000 BZD or more	.7552835	Not significant
Primary (CG)	-.7767739	Not significant
Secondary (CG)	-1.087423	Not significant
Vocational (CG)	-2.080012	Not significant
Higher (CG)	-.4652698	Not significant

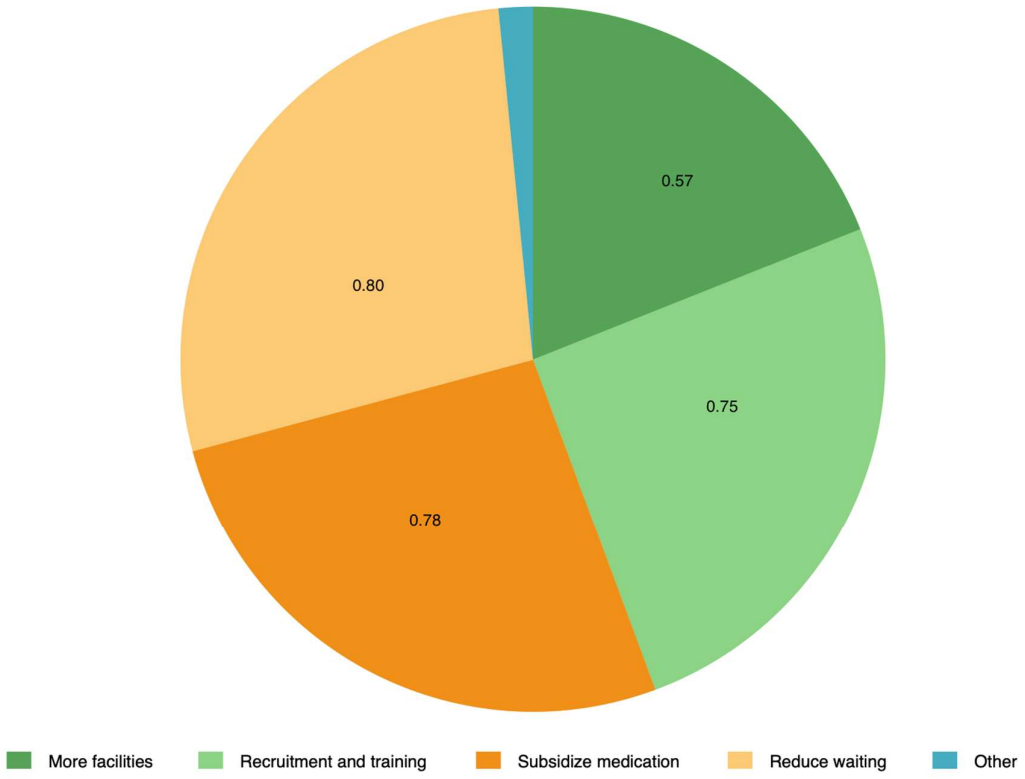
A logistic regression was run to determine whether district, geotype (urban/rural), household income and caregiver education significantly predict awareness of fee removal. Out of all the covariates, **household districts resulted in being the key significant predictor** of fee removal awareness.

District results indicated that, in comparison to Belize district, most of the other districts exhibited significantly greater awareness of the fee removal. In particular, Corozal, Stann Creek and Cayo showed statistically significantly larger instances of awareness, in comparison to the Belize district.

In addition to the fee removal change, respondents were asked to contribute any further recommendations for the health section. These recommendations are presented in Table 34.

Table 34: Recommendations for the health sector

Respondent recommendations



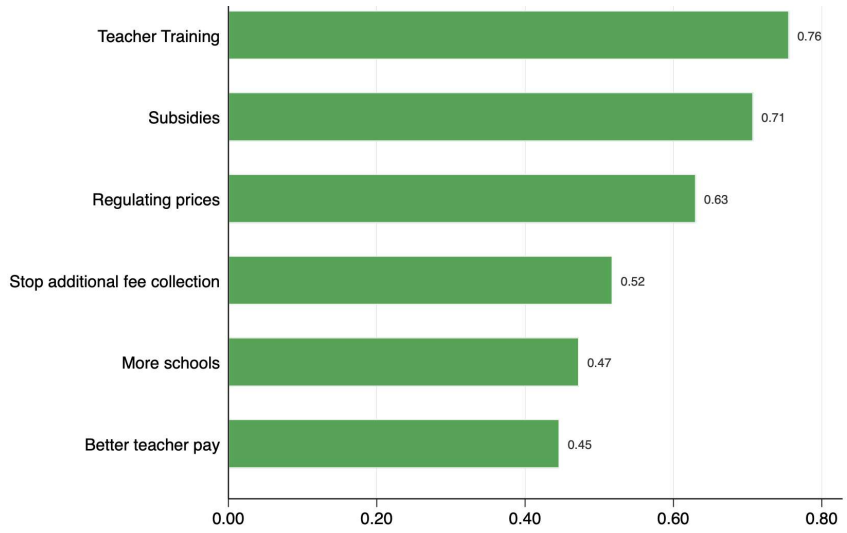
The most common recommendations provided by respondents include reduced waiting time and subsidized medication, followed by increasing recruitment and training of health professionals as well as the provision of more medical facilities. *Note: respondents were allowed to make more than one suggestion, hence the sum total amounts to more than 1.*

7.2 Education

Similar to the health sector, respondent recommendations for the education sector are presented in Table 35.

Table 35: Recommendations for the education sector

Respondent recommendations



The most common recommendations provided by respondents include more teacher training (76%), followed by increasing subsidies and regulating education prices as well as stopping additional fee collection at education facilities.

7. Limitations

The demand-side survey findings have certain limitations that should be considered when interpreting the results.

1. **Self-Reported Out-of-Pocket Expenditure (OoPE) Data:**

The primary limitation stems from the reliance on self-reported data for OoPE. Respondents may not always recall or report their education and health-related expenditures with complete accuracy. This can result in recall bias, where participants either overestimate or underestimate their expenses, potentially affecting the reliability of the findings.

2. **Demand-Side Focus:**

It is important to note that the demand-side survey is one component of the OoPE study in education and health, designed to be complemented by supply-side insights. That being said, the survey findings only consider demand-side data and do not account for supply-side factors that might influence OoPE. As such, considering the demand-side findings in isolation may provide an incomplete picture of the underlying drivers of education and health expenditures and it is therefore recommended that this report is read in conjunction with the supply-side analysis also conducted by Genesis Analytics.

3. **Limited Generalizability Over Time:**

The data collected reflects a specific point in time and may not fully account for changes in household dynamics, economic conditions, or government policies that could impact education and health expenditures in the future. As such, the findings may not be fully generalizable to different time periods.

As in all demand-side surveys, recall bias, self-reporting inaccuracies, and other potential limitations might affect certain data points captured, however the general trends, patterns, and correlations identified remain highly valuable and insightful. This is especially true given the rigorous methodology employed—including random sampling, a nationally representative survey frame, and statistical controls for confounding variables—which ensures that the broad conclusions and trends observed reflect real dynamics within Belize's education and health sectors.

8. Recommendations

9.1 Health

Addressing household out-of-pocket expenditures (OoPE) in Belize's health sector is crucial for ensuring equitable access to health services, particularly for vulnerable groups. Based on the findings of the demand-side survey, the following policy responses and interventions are recommended:

1. **Targeted Health Policies for Rural Areas and Stann Creek:**

Health policies focused on rural regions, especially areas like Stann Creek, can play a significant role in reducing OoPE for health services. These areas often face limited access to public health facilities, forcing families to rely on private providers or travel outside the district to access treatment, leading to higher personal health expenditures. By improving access to public health infrastructure and services in these regions, the need to use costlier private facilities as well as facilities outside of the district can be minimized. This would make healthcare more affordable for families, reducing the financial burden on the vulnerable populations.

2. **Strengthening Public Health Facilities and Services:**

Expanding the capacity and quality of public health facilities across the country is essential to lowering OoPE. Many families face higher healthcare costs because public facilities are either inaccessible, under-resourced, or lack necessary services, forcing them to turn to private providers. Investment in public healthcare infrastructure—such as hospitals, clinics, and primary care centers—would ensure that essential services are available close to where people live. This would decrease reliance on private healthcare providers and help lower household spending on health services, particularly for routine and preventative care.

3. **Improving Accessibility and Proximity of Health Facilities:**

The study highlights the importance of making health facilities more accessible and located closer to people's homes. Currently, many families travel long distances to access healthcare, which incurs additional costs related to transportation and time. Implementing strategies such as mobile clinics, telemedicine, and building new health centers in underserved areas can reduce these logistical barriers and bring essential services closer to families. This would be particularly beneficial in rural and remote areas, reducing costs and improving health outcomes.

4. **Support for Families with Younger Children:**

Younger children are found to be more expensive on average in terms of healthcare needs. This suggests that there are opportunities for targeted interventions to help families manage these higher costs. Policy measures such as subsidized healthcare for children under a certain age, provision of free or low-cost essential medicines, and expanded child health programs (e.g., immunization drives, nutrition programs, and well-child visits) can help alleviate the financial pressure on households with young children.

9.2 Education

To address out-of-pocket expenditures (OoPE) in education and promote equitable access to education for all children, the following policy recommendations are proposed based on the demand-side survey findings:

1. **Support for Households in Belize District:**

The data indicates that households in Belize District experience higher education OoPE compared to other districts. This suggests that the cost of accessing education is significantly higher in the region. To address this, the government should consider implementing targeted subsidies for families in high-cost districts like Belize, particularly for low- and middle-income families. Financial aid programs could further help to offset the higher costs associated with educational expenses in the areas.

2. **Promote and Strengthen Public Primary Education:**

The study highlights the significant cost difference between private and public primary school education, with private schooling contributing to much higher OoPE. To encourage greater enrollment in public schools and reduce the financial burden on families, focus on strengthening the quality of public primary education could help to reduce OoPE. This could include improving school infrastructure, enhancing teacher training, and ensuring that public schools offer high-quality resources and extracurricular activities comparable to private institutions. By making public schools more attractive and competitive, families may opt for this more affordable option, reducing their education-related expenditures.

3. **Scholarship Programs:**

Households with children receiving scholarships in primary school were found to have significantly lower OoPE. To further reduce financial burdens on families, the government and educational institutions should work to expand the availability of scholarships and financial aid programs for primary school students. These programs could target both academic achievement and financial need, ensuring that more families, especially those from low-income households, benefit from these opportunities. Public awareness campaigns can be further implemented to inform families about available scholarship options and how to apply for them.

Through targeted, data-driven interventions, policy can be tailored to communities in need. This will allow for easier access to high quality education, regardless of geographic location and school type.