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Remittances, household health spending and care-seeking in Somalia: evidence from the Somali Integrated Household Budget Survey (SIHBS) 2022

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Abstract

Background

Somalia has almost no health insurance, and households pay for much of their care directly. It is also one of the most remittance-dependent countries in the world. Studies elsewhere show that remittances raise household health spending, but none has examined this for Somalia. This study assessed whether Somali households that receive remittances are more likely to spend on health care, spend more, and seek care when a member is ill, and whether this differs between remittances from abroad and from within Somalia.

Methods

This study analysed the nationally representative, cross-sectional Somali Integrated Household Budget Survey (SIHBS) 2022. The analysis covered 7,152 households and 1,663 members who were ill or injured in the past month. Health spending combined 12-month spending on health services and 6-month spending on medicines. Survey-weighted two-part models were fitted (logistic regression for any health spending; linear regression of log per-capita spending among spenders) and logistic regression for care-seeking, adjusted for

household demographic, health and locational characteristics. Inverse-probability weighting was used as a second estimator.

Results

About one in five households (21.7%) received remittances, and 73.4% reported some health spending. Recipient households had higher odds of any health spending (AOR 1.29, 95% CI 1.07–1.55). The association was confined to remittances from abroad (AOR 1.49, 95% CI 1.20–1.85); remittances from within Somalia showed none (AOR 0.91, 95% CI 0.68–1.23). Among spending households, recipients spent 15% more per person (ratio 1.15, 95% CI 1.02–1.30), but the difference in dollars was not significant after weighting, and the health share of the household budget did not differ. Ill members of recipient households were more likely to receive care (AOR 1.65, 95% CI 1.04–2.62) and less likely to go without care because they could not afford it (AOR 0.53, 95% CI 0.31–0.91).

Conclusions

Remittances from abroad are associated with a higher likelihood of health spending and of care-seeking in Somalia, consistent with remittances acting as informal health financing. The evidence is cross-sectional and weaker for the amount spent. Health financing policy should recognise that four in five households lack this buffer, and that protecting remittance channels also protects access to care.

Keywords: Remittances, Health expenditure, Out-of-pocket payments, Care-seeking, Health financing, Somalia, Somali Integrated Household Budget Survey

Background

Paying for health care directly at the point of use remains a leading cause of financial hardship in low- and middle-income countries [1–3]. When prepayment and insurance are

absent, households meet the cost of illness by cutting other consumption, borrowing, selling assets, or going without care [4–6]. The poorest households are the most likely to forgo treatment altogether, so low observed spending can reflect unmet need as much as good health [7]. Understanding where households find the money for care is therefore central to universal health coverage.

Somalia is an extreme case. Decades of conflict left a fragmented health system in which private, largely unregulated providers deliver much of the care and public services depend heavily on external aid [8, 9]. Coverage of essential services is among the lowest in the world [10, 11]. No national health accounts exist; available estimates place out-of-pocket payments at roughly 30–45% of current health expenditure, and health insurance is close to absent [11–13]. Over half of the population lives below the national poverty line, and poverty reaches 78% among nomadic households [14]. Two recent preprints describe the burden of health payments in Somalia, one from a calibrated simulation and one from a non-representative household survey [11, 13]. Neither examines what finances those payments.

Remittances are a plausible answer. Remittances to Somalia were estimated at about USD 1.4 billion in 2016, roughly 23% of gross domestic product and more than official development assistance [15]. The Somali diaspora has long financed relief, livelihoods and basic services [16, 17], and social connections to people who could send money shaped who survived the 2011 famine [18]. In the 2022 Somali Integrated Household Budget Survey (SIHBS), 20.7% of households reported receiving remittances in the previous 12 months [19]. Qualitative work reports that recipients often ask relatives for additional money when a household member falls ill [15].

Theory gives two reasons to expect a link between remittances and health spending. First, remittances relax the household budget constraint, and health care is a normal good. Second, in the new economics of labour migration, migration is a household strategy for managing

risk where insurance and credit markets fail, and remittances function as insurance that pays out when shocks occur [20–22]. In Andersen's behavioural model of health service use, remittances are an enabling resource that converts perceived need into actual use [23]. The two channels have different implications. Under the income channel, remittances raise routine spending. Under the insurance channel, remittances arrive because someone is ill, so illness causes remittances as well as the reverse.

Empirical studies using household budget surveys generally find that remittances raise health spending. In Nepal, a 1% rise in remittances was associated with a 0.099% rise in health care spending [24]. In Mexico, health care spending rose with international remittances, and households without insurance were the most responsive [25]. In Peru, remittances increased the health share of the budget even after accounting for health shocks [26]. Comparable results come from Ecuador, Guatemala, Ghana and Bangladesh, although the size of the effect and the expenditure categories affected vary [27–30]. Remittances and migration have also been linked to use of health services, including formal and maternal care [31, 32], and to child health outcomes [33, 34].

For Somalia, the existing quantitative studies stop at poverty and total consumption. A propensity score matching study of the 2018 Somali High Frequency Survey found higher consumption and lower poverty among recipient households [35]. A conference paper using SIHBS 2022 found that recipients had about 13% higher per-capita expenditure [36]. Neither examined health spending or care-seeking, and neither separated remittances from abroad from those sent within Somalia. That distinction matters, because domestic transfers are typically smaller and come from senders exposed to the same shocks as the recipients.

This study addresses that gap using SIHBS 2022. Its objectives were to (i) describe household health spending and care-seeking by remittance status; (ii) estimate the association between receiving remittances and the likelihood and level of household health spending; (iii)

estimate the association between receiving remittances and care-seeking among household members who were ill or injured; and (iv) test whether these associations differ by the source of remittances and by place of residence, displacement and poverty status.

Methods

Study design and data source

This is a secondary analysis of the Somali Integrated Household Budget Survey (SIHBS) 2022, a nationally representative cross-sectional survey conducted by the Somalia National Bureau of Statistics (SNBS) [19]. The survey used stratified multi-stage cluster sampling: three stages in urban and rural areas and two stages in nomadic areas, with 12 households interviewed in each sampled enumeration area. It covered 7,212 households in 17 regions; Middle Juba was excluded for security reasons [19, 37]. The questionnaire collected household consumption, including detailed non-food spending, a remittance module, and health information for every household member.

Study population

The household analysis included the 7,152 households with a consumption aggregate; 60 households (0.8%) without one were excluded. The care-seeking analysis included the 1,663 household members, living in 930 households, who reported an illness or injury in the month before the interview and answered the care-seeking question.

Outcome variables

Household health spending was built from two non-food modules. The 12-month module recorded spending on health services and appliances: consultations with general practitioners and specialists, dental care, laboratory tests and imaging, nursing and paramedical services, traditional healers, delivery charges, inpatient fees, and therapeutic appliances. The 6-month

module recorded spending on medicines and medical products; these amounts were doubled to give an annual figure. Health insurance premiums, reported by five households, were excluded. Three household outcomes were derived:

- **Any health spending**: annual health spending above zero.
- **Per-capita health spending**: annual health spending in US dollars divided by household size.
- **Health budget share**: health spending as a percentage of total household consumption expenditure.

For ill or injured members, the main outcome was **care-seeking**: whether the person received medical care for the illness or injury. Two secondary outcomes were receiving care from a **formal provider** (a public or private hospital, health centre or clinic, as opposed to a pharmacy or traditional practitioner) and **forgoing care for lack of money** (no care received, with "cannot afford" as the stated reason).

Exposure variables

The exposure was whether the household received any remittances of money in the 12 months before the interview. The remittance module lists up to six senders and records whether each lived in Somalia or abroad. Recipient households were classified as receiving remittances **from abroad** if any sender lived abroad, and **from Somalia only** otherwise. The total annual amount received was the sum across senders.

Covariates

Covariates were chosen from the behavioural model of health service use [23] and earlier remittance studies [24–26]. Predisposing factors were the sex, age group and education of the household head, household size, and the presence of a child under five or a member aged 65

or over. Need factors were the presence of a member with a chronic illness and of a member who was ill or injured in the past month. Contextual factors were place of residence (urban, rural, nomadic), self-reported internally displaced (IDP) status, and region. Log per-capita consumption expenditure, from the official consumption aggregate [38], was added in a second specification. The individual-level models also included the sex, age group and chronic illness status of the ill member.

Statistical analysis

All estimates used the survey sampling weights. The public files do not include a cluster identifier, so the design was specified with region-by-residence strata and households as sampling units; variances were estimated by Taylor linearisation [39]. Characteristics were compared by remittance status using Rao–Scott chi-square tests and design-based *t*-tests.

Because 26.6% of households reported no health spending, spending was analysed with a two-part model [40, 41]. Part one was a logistic regression for any health spending, reported as adjusted odds ratios (AOR). Part two was a linear regression of log per-capita health spending among spending households; exponentiated coefficients are reported as ratios. The health budget share, a standard measure of the burden of health payments [42], was analysed by linear regression. Each model was estimated in two specifications. Specification A included all covariates except consumption. Specification B added log per-capita consumption. Consumption is partly an outcome of remittances, so specification A is the main specification and B is a conservative check.

The models were repeated with remittance source (none, Somalia only, abroad) in place of the binary exposure, with a Wald test for the difference between sources. Among recipients, outcomes were regressed on the log of the amount received. Heterogeneity was examined by

fitting the models within residence, IDP and poverty subgroups and by testing exposure-by-subgroup interactions.

Care-seeking outcomes were analysed by logistic regression at the individual level, with standard errors clustered by household. Region effects were omitted from these models because of the smaller sample.

To reduce dependence on the regression functional form, the average difference for recipient households was estimated by inverse-probability weighting [43–46]. A survey-weighted logistic model with the specification A covariates gave each household's probability of receiving remittances. Non-recipient households were reweighted by the survey weight multiplied by the odds of receipt, with weights capped at the 99th percentile. Balance was judged by standardised mean differences, with values below 0.1 taken as adequate [45].

Multicollinearity was assessed with generalised variance inflation factors. Statistical significance was set at $p < 0.05$, with no adjustment for multiple comparisons. Analyses were run in R version 4.6.1 using the survey and haven packages [39].

Ethical considerations

The study used anonymised, publicly available secondary data obtained from SNBS and involved no contact with participants. Ethical approval was therefore not required.

Results

Characteristics of households by remittance status

Of the 7,152 households, 1,563 received remittances in the previous 12 months, a weighted share of 21.7%. Applying the household weight to all 7,212 surveyed households gives 20.7%, matching the published SIHBS figure [19]. Among recipients, 1,106 households (70.8%) had at least one sender abroad and 457 received remittances from within Somalia

only. The median annual amount received was USD 720 (interquartile range 200–1,800) among the 1,400 recipients who reported an amount.

Recipient households differed from non-recipients in demographic and health characteristics but not in economic status (Table 1). They were more often headed by a woman (63.6% vs 49.2%) and by a person aged 65 or over (14.8% vs 6.0%). They more often included a member with a chronic illness (30.5% vs 18.2%) and less often a child under five (49.1% vs 62.6%). Poverty, IDP status and recent illness did not differ by remittance status. Mean per-capita consumption was also similar (USD 955 vs USD 991 a year, $p = 0.170$).

Table 1 Characteristics of households by remittance status, SIHBS 2022 ($n = 7,152$)

Characteristic	Unweighted *n*	All (%)	Non-recipients (%)	Recipients (%)	*p*-value
Sex of household head					<0.001
Male	3,408	47.7	50.8	36.4	
Female	3,744	52.3	49.2	63.6	
Age of household head (years)					<0.001
Under 35	2,440	33.4	35.7	25.0	
35–49	2,421	34.5	35.7	30.1	
50–64	1,400	19.8	18.3	25.2	
65 and over	563	7.9	6.0	14.8	
Not known	328	4.4	4.3	4.9	
Education of household head					0.004
None	4,948	68.3	69.2	65.3	
Quranic	486	7.4	7.5	7.1	
Primary	926	12.8	12.8	12.6	
Secondary or higher	792	11.5	10.5	15.0	
Household size					0.008
6 or fewer	3,806	52.3	51.3	56.1	
More than 6	3,346	47.7	48.7	43.9	
Child under 5 in household	4,311	59.7	62.6	49.1	<0.001
Member aged 65 or over	1,012	14.1	12.0	21.6	<0.001
Member with chronic illness	1,507	20.9	18.2	30.5	<0.001
Member ill or injured in past month	930	12.7	12.5	13.4	0.449

Characteristic	Unweighted *n*	All (%)	Non-recipients (%)	Recipients (%)	*p*-value
Place of residence					0.008
Urban	4,317	61.4	61.7	60.2	
Rural	1,904	26.0	26.5	24.2	
Nomadic	931	12.6	11.8	15.6	
Internally displaced household	757	12.2	12.0	13.0	0.417
Below national poverty line	3,661	49.8	49.7	50.2	0.771

Percentages are weighted column percentages; *n* is unweighted. *p*-values are from Rao–Scott chi-square tests. Non-recipients *n* = 5,589; recipients *n* = 1,563.

Health spending and care-seeking by remittance status

Overall, 73.4% of households reported some health spending in the year. Mean spending was USD 80.2 per household and USD 15.0 per person, equal to 1.96% of household consumption. Medicines made up 43% of health spending: 70.0% of households bought medicines and 34.8% paid for health services. Among spending households, median per-capita spending was USD 6.7 (interquartile range 2.0–19.8).

All three spending outcomes were highest among households receiving remittances from abroad, while households receiving remittances from within Somalia resembled non-recipients (Table 2). Of the 1,663 ill or injured members, 65.1% received care. Among those who received care, 41.6% went mainly to a pharmacy, 25.0% to a public health centre and 17.0% to a private clinic. Among those who did not, 42.7% said they could not afford it and 33.9% said the illness was minor.

Table 2 Health spending and care-seeking by source of remittances, SIHBS 2022

Outcome	No remittances	Somalia only	Abroad
Households (unweighted *n*)	5,589	457	1,106
Any health spending (%)	71.9	73.4	80.8
Per-capita health spending (USD per year)	13.9	13.2	21.3
Health share of household budget (%)	1.76	1.77	3.01

Outcome	No remittances	Somalia only	Abroad
Ill or injured members			
Received care (%)	62.3	71.6	76.4
Received care from a formal provider (%)	36.0	42.9	41.2
Went without care, could not afford it (%)	16.2	12.4	9.2

Values are weighted. Comparing all recipients with non-recipients: any health spending 78.8% vs 71.9% ($p < 0.001$); per-capita spending USD 19.1 vs 13.9 ($p = 0.005$); budget share 2.67% vs 1.76% ($p < 0.001$); received care 75.3% vs 62.3% ($p = 0.011$). Ill or injured members: 1,301 in non-recipient and 362 in recipient households.

Remittances and household health spending

After adjustment, recipient households had 29% higher odds of any health spending (AOR 1.29, 95% CI 1.07–1.55) and, among spending households, spent 15% more per person (ratio 1.15, 95% CI 1.02–1.30) (Table 3). Adding log per-capita consumption left both estimates unchanged (AOR 1.29, 95% CI 1.07–1.55; ratio 1.16, 95% CI 1.02–1.30). Consumption itself was not associated with any spending (AOR 1.00, 95% CI 0.87–1.15) but was associated with the amount spent (ratio 1.18, 95% CI 1.07–1.29). The adjusted difference in the health budget share was not significant (0.36 percentage points, $p = 0.141$).

The strongest correlates of health spending were need and education. Households with a member ill in the past month (AOR 2.92) or with a chronic illness (AOR 1.93) were far more likely to spend, as were households whose head had any schooling. Among spenders, per-capita spending fell by 15% with each additional household member and was 19% higher in female-headed households. Residence and IDP status were not associated with either outcome once other factors were held constant. Generalised variance inflation factors were all below 1.5.

Table 3 Two-part model of household health spending, SIHBS 2022 (specification A)

Variable	Any health spending: AOR (95% CI)	*p*	Per-capita spending among spenders: ratio (95% CI)	*p*
Receives remittances (ref: no)	1.29 (1.07–1.55)	0.008	1.15 (1.02–1.30)	0.023
Female head (ref: male)	1.02 (0.87–1.20)	0.793	1.19 (1.06–1.33)	0.002
Age of head (ref: under 35)				
35–49	0.93 (0.77–1.12)	0.447	1.04 (0.91–1.19)	0.568
50–64	1.00 (0.79–1.25)	0.968	1.07 (0.91–1.24)	0.419
65 and over	0.77 (0.50–1.17)	0.215	0.86 (0.65–1.14)	0.304
Not known	0.72 (0.51–1.02)	0.062	1.07 (0.78–1.46)	0.692
Education of head (ref: none)				
Quranic	1.61 (1.16–2.22)	0.004	0.85 (0.69–1.05)	0.130
Primary	2.53 (1.94–3.30)	<0.001	1.31 (1.13–1.53)	<0.001
Secondary or higher	1.88 (1.44–2.46)	<0.001	1.49 (1.26–1.77)	<0.001
Household size (per member)	1.00 (0.97–1.03)	0.920	0.85 (0.84–0.87)	<0.001
Child under 5	0.89 (0.76–1.04)	0.133	1.03 (0.92–1.16)	0.570
Member aged 65 or over	0.92 (0.67–1.28)	0.626	1.04 (0.84–1.27)	0.734
Member with chronic illness	1.93 (1.57–2.37)	<0.001	1.64 (1.44–1.87)	<0.001
Member ill or injured in past month	2.92 (2.21–3.84)	<0.001	1.61 (1.39–1.86)	<0.001
Residence (ref: urban)				
Rural	0.96 (0.81–1.13)	0.609	1.04 (0.92–1.17)	0.526
Nomadic	1.08 (0.86–1.36)	0.510	0.95 (0.81–1.13)	0.583
Internally displaced	0.90 (0.70–1.15)	0.399	0.98 (0.84–1.13)	0.763
Households (*n*)	7,152		5,213	

AOR, adjusted odds ratio from survey-weighted logistic regression. Ratio, exponentiated coefficient from survey-weighted linear regression of log per-capita health spending among households with any spending. Both models also include region fixed effects.

Source and amount of remittances

The association was confined to remittances from abroad (Table 4). Households receiving remittances from abroad had 49% higher odds of any health spending and, among spenders, spent 24% more per person. Households receiving remittances only from within Somalia did not differ from non-recipients on either outcome. The difference between the two sources was significant for both outcomes ($p = 0.005$ and $p = 0.019$).

Among recipients, larger amounts were associated with more health spending. A 1% higher amount received was associated with 0.14% higher per-capita health spending among spenders (95% CI 0.06–0.22, $p < 0.001$), and the odds of any spending also rose with the amount (AOR 1.20 per log unit, 95% CI 1.03–1.39).

Table 4 Health spending by source of remittances (specification A)

Source of remittances	Any health spending: AOR (95% CI)	*p*	Per-capita spending among spenders: ratio (95% CI)	*p*
None (reference)	1.00		1.00	
Somalia only	0.91 (0.68–1.23)	0.547	0.93 (0.75–1.15)	0.527
Abroad	1.49 (1.20–1.85)	<0.001	1.24 (1.08–1.41)	0.002

Adjusted for all covariates in Table 3 and region fixed effects.

Differences across population groups

Estimates were positive in every subgroup but were individually significant mainly in the larger groups (Table 5). Formal interaction tests showed no difference in the association by residence ($p = 0.842$ for any spending; $p = 0.261$ for the amount) or by poverty status ($p = 0.711$; $p = 0.734$). The one significant interaction was for IDP households, among whom recipients who spent on health spent 73% more per person than non-recipients (interaction $p = 0.028$).

Table 5 Association between receiving remittances and health spending within population groups (specification A)

Group	Households (*n*)	Any health spending: AOR (95% CI)	*p*	Per-capita spending among spenders: ratio (95% CI)	*p*
Urban	4,317	1.34 (1.06–1.70)	0.014	1.23 (1.05–1.43)	0.009
Rural	1,904	1.20 (0.83–1.73)	0.336	1.08 (0.86–1.35)	0.502
Nomadic	931	1.05 (0.60–	0.869	1.02 (0.73–	0.907

Group	Households (*n*)	Any health spending: AOR (95% CI)	*p*	Per-capita spending among spenders: ratio (95% CI)	*p*
		1.85)		1.43)	
IDP	757	1.41 (0.81–2.46)	0.222	1.73 (1.25–2.41)	0.001
Non-IDP	6,395	1.28 (1.05–1.56)	0.015	1.10 (0.97–1.25)	0.146
Poor	3,661	1.23 (0.95–1.60)	0.118	1.15 (0.97–1.35)	0.099
Non-poor	3,491	1.31 (1.00–1.73)	0.048	1.15 (0.97–1.37)	0.116

Each row is a separate model. The IDP model omits region fixed effects because of sample size.

Remittances and care-seeking

Ill or injured members of recipient households had 65% higher odds of receiving care (Table 6). They also had about half the odds of going without care because they could not afford it. Receiving remittances was not associated with using a formal provider. Adding log per-capita consumption changed these estimates little (care-seeking AOR 1.63, 95% CI 1.02–2.59; forgone care AOR 0.55, 95% CI 0.32–0.94). By source, the association with care-seeking was significant for remittances from abroad (AOR 1.78, 95% CI 1.03–3.09) and not for remittances from within Somalia (AOR 1.30, 95% CI 0.69–2.46).

Care-seeking was also higher for members of female-headed households and of households whose head had secondary or higher education, and lower for members with a chronic illness. Rural residents were less likely to use a formal provider.

Table 6 Care-seeking among household members ill or injured in the past month (*n* = 1,663)

Variable	Received care: AOR (95% CI)	*p*	Formal provider: AOR (95% CI)	*p*	Went without, could not afford: AOR (95% CI)	*p*
Household receives	1.65	0.035	1.21	0.321	0.53	0.022

Variable	Received care: AOR (95% CI)	*p*	Formal provider: AOR (95% CI)	*p*	Went without, could not afford: AOR (95% CI)	*p*
remittances	(1.04–2.62)		(0.83–1.78)		(0.31–0.91)	
Member has chronic illness	0.57 (0.36–0.91)	0.019	1.29 (0.81–2.04)	0.281	1.86 (1.09–3.19)	0.023
Female household head	1.98 (1.40–2.82)	<0.001	1.16 (0.82–1.66)	0.402	0.86 (0.55–1.34)	0.503
Head has secondary or higher education (ref: none)	2.92 (1.68–5.06)	<0.001	1.34 (0.79–2.27)	0.284	0.33 (0.14–0.78)	0.012
Rural (ref: urban)	0.78 (0.53–1.16)	0.227	0.54 (0.39–0.76)	<0.001	0.98 (0.60–1.60)	0.943
Nomadic (ref: urban)	0.68 (0.43–1.06)	0.092	0.96 (0.60–1.53)	0.857	1.10 (0.55–2.22)	0.786
Internally displaced	1.21 (0.66–2.24)	0.536	1.50 (0.83–2.70)	0.179	0.47 (0.22–1.02)	0.057

Survey-weighted logistic regression with standard errors clustered by household. Models also adjust for the member's sex and age group, other categories of the head's education, and household size.

Inverse-probability weighting

Before weighting, recipient and non-recipient households differed most in the head's age (standardised mean difference 0.40), sex (0.30) and chronic illness in the household (0.29). After weighting, all standardised differences were below 0.07. The reweighted comparison group had an effective sample size of 2,253 households.

The weighted comparisons agreed with the regression results for the likelihood of spending and for care-seeking, but not for the amount spent in dollars (Table 7).

Table 7 Weighted differences between recipient households and reweighted non-recipient households

Outcome	Comparison group	Difference (95% CI)	*p*
Any health spending (percentage points)	74.9%	+3.9 (0.8 to 6.9)	0.013
Per-capita health spending (USD per year)	17.4	+1.6 (−2.7 to 6.0)	0.460
Per-capita health spending, top 1% capped (USD)	14.7	+2.1 (−0.1 to 4.3)	0.059
Health budget share (percentage points)	2.30%	+0.37 (−0.24 to 0.99)	0.235
Log per-capita spending among spenders	–	+0.14 (0.01 to 0.28)	0.037
Ill members: received care (percentage points)	62.4%	+12.9 (2.5 to 23.3)	0.016
Ill members: formal provider (percentage points)	39.0%	+2.5 (−7.7 to 12.7)	0.627
Ill members: went without, could not afford (percentage points)	18.0%	−8.0 (−13.9 to −2.1)	0.008

In summary, regression and weighting agreed that recipient households were more likely to spend on health and that their ill members were more likely to receive care. The evidence for a difference in the amount spent was weaker.

Discussion

This study is, to the author's knowledge, the first to examine remittances and health spending in Somalia with nationally representative data. It has three main findings. First, households receiving remittances were more likely to spend on health care, and their ill members were more likely to receive care and less likely to forgo it for lack of money. Second, these associations were confined to remittances sent from abroad. Third, the evidence that recipients spend larger amounts was weak: it appeared in the regression model, but the weighted difference in dollars was not significant and the health share of the budget did not differ.

Remittances and the likelihood of obtaining care

The higher likelihood of health spending among recipients agrees with household survey evidence from Nepal, Mexico, Peru, Ecuador, Guatemala, Ghana and Bangladesh [24–30]. The care-seeking results agree with studies linking remittances and migration to greater use of health services [31, 32]. The elasticity of health spending with respect to the amount received, 0.14 among recipient households that spent, is of the same order as the 0.099 reported for Nepal [24]. The two figures are not strictly comparable, because ours is conditional on receiving remittances and on spending.

Two features of the results suggest that the association reflects more than a general income effect. Recipient and non-recipient households had similar consumption and poverty rates, and adjusting for consumption did not change the estimates. In addition, consumption was unrelated to whether a household spent on health at all. A similar pattern was reported in Peru, where remittances raised health spending beyond what their contribution to income would predict [26]. One interpretation is that remittances are a distinct, liquid source of cash that households can call on when care is needed, in line with the insurance motive in the migration literature [20–22] and with qualitative accounts from Somalia [15]. Earlier Somali studies found higher consumption among recipients [35, 36]; the similar unadjusted consumption levels in these data do not contradict those adjusted estimates, but they show that recipients are not a visibly richer group.

The pattern across outcomes points to the threshold of access, not the volume of care. Remittances were associated with whether households obtained any care and whether cost stopped them, but less clearly with how much they spent. In a setting where 42.7% of ill people who went without care cited cost, a modest and timely transfer may decide whether care is sought at all.

Remittances from abroad and from within Somalia

The contrast between sources has not been reported for Somalia before. Households receiving remittances only from within Somalia were indistinguishable from non-recipients on every outcome. Several explanations are plausible, and the data cannot separate them. Senders abroad earn in stronger economies and can usually send more. Their incomes are also not exposed to the droughts, conflict and price shocks that affect senders and recipients inside Somalia at the same time, so their support is more dependable when it is needed [18]. Finally, households with relatives abroad may differ in unmeasured ways, such as social networks or wealth before migration. Whatever the reason, the finding implies that analyses treating all remittances as one category will understate the role of international transfers and overstate that of domestic ones.

Where care is obtained

Receiving remittances was not associated with using a formal provider. Pharmacies were the main source of care for 41.6% of those treated, and medicines were bought by twice as many households as paid for services. This fits a health system in which private retail outlets are the most accessible point of care [8, 9]. Additional cash appears to buy more of the care that is available nearby, chiefly medicines, and does not by itself move people to clinics and hospitals. Rural residents were about half as likely as urban residents to use a formal provider, which points to supply and distance as the binding constraints there.

Other factors associated with health spending and care-seeking

Illness and chronic disease in the household were the strongest correlates of spending, as expected for need factors [23]. Members with a chronic illness were, however, less likely to receive care for a recent illness and nearly twice as likely to forgo it for cost. Households managing chronic disease may already have exhausted their means. Education of the

household head was strongly associated with both spending and care-seeking, consistent with its role in recognising illness and navigating services [7]. Female-headed households spent more per person and their ill members were twice as likely to receive care. Since female headship was also the strongest predictor of receiving remittances, some of these households are likely to be those of migrants' spouses.

The larger association among IDP households was the only significant interaction among six tests. It should be regarded as a hypothesis for future work, not a finding.

Implications for policy and research

The results bear on health financing in three ways. First, remittances from abroad appear to function as informal health financing for about one household in six. They are private, unevenly distributed and unrelated to need, so they cannot substitute for prepaid, pooled financing [1–3]. Second, the households without this buffer are the majority. Among their ill members, one in six went without care because of cost. Programmes that remove charges for essential services, and any future targeting of subsidies, should not assume that family networks will cover the gap. Third, disruption of remittance channels would have consequences for access to care, in addition to the effects on food security and poverty already documented [15, 18, 35].

Future research should use panel data or a credible source of exogenous variation, such as exchange-rate or host-country labour-market shocks [22], to test whether the association is causal. Surveys should record the timing and purpose of transfers so that insurance and income motives can be distinguished.

Strengths and limitations

The study has several strengths. SIHBS 2022 is nationally representative and includes nomadic and displaced households, which are often missing from Somali surveys. The

remittance module allowed transfers from abroad to be separated from domestic ones. Health spending was measured from itemised expenditure modules, and care-seeking from individual illness episodes. The main results were tested with a second specification and with inverse-probability weighting, and non-significant results are reported alongside significant ones.

The limitations are substantial and should guide interpretation.

- **Causality.** The data are cross-sectional. Remittances may be sent because a member is ill, and households with migrants may differ from others in unmeasured ways such as social networks, clan ties or wealth before migration [33]. The models adjust for illness in the household, but this does not rule out illness-triggered transfers or selection on unobserved characteristics. Inverse-probability weighting balances observed characteristics only. The public SIHBS files offer no credible instrument.
- **Precision.** The public files lack the cluster identifier, so households were treated as sampling units. Standard errors are probably understated. Results with *p*-values between 0.01 and 0.05, including care-seeking ($p = 0.035$) and the amount spent ($p = 0.023$), should be read with caution.
- **Measurement of health spending.** Spending was recalled over 12 months for services and 6 months for medicines, and the latter was doubled. Recall error and seasonality may affect both. Transport costs for care were not included. Infrequent, large items such as inpatient stays are likely to be under-reported.
- **Measurement of remittances.** Receipt and amounts were self-reported and may be under-reported. In-kind transfers were not captured. Of 1,563 recipient households, 163 did not report a usable amount.

- **Care-seeking sample.** Only 1,663 members reported an illness or injury in the past month, a low share that suggests under-reporting of illness. Region effects could not be included in these models, and estimates by source of remittance are imprecise.
- **Multiple comparisons.** Several outcomes and subgroups were examined without adjustment. Subgroup results are exploratory.
- **Coverage.** Middle Juba was not surveyed, and 60 households without a consumption aggregate were excluded.

Conclusions

In Somalia, households that receive remittances from abroad are more likely to spend on health care, and their members are more likely to receive care when ill and less likely to go without it because of cost. Remittances sent within Somalia show no such association. The findings are consistent with international remittances acting as informal health financing in a country with almost no insurance, but they are cross-sectional associations and the evidence on the amount spent is weak.

Based on these findings, the following are recommended.

1. **Health financing policy should not rely on family transfers.** About four in five households receive no remittances, and cost is the leading reason their ill members go without care. Expansion of free essential services and any targeting of subsidies should give priority to these households, to households with chronically ill members, and to those whose head has no schooling.
2. **Remittance channels should be treated as relevant to health.** Regulators and development partners working to keep money transfer services open and affordable should recognise access to care among the benefits at stake.

3. **Pharmacies should be brought into quality and regulatory efforts.** They are the first point of care for two in five people treated, and additional household cash is spent mainly there.

List of abbreviations

AOR: adjusted odds ratio; CI: confidence interval; IDP: internally displaced person; SIHBS: Somali Integrated Household Budget Survey; SNBS: Somalia National Bureau of Statistics; USD: United States dollar.

Declarations

Ethics approval and consent to participate

The study is a secondary analysis of anonymised data that are publicly available from SNBS. It involved no contact with human participants, so ethical approval and consent to participate were not required.

Consent for publication

Not applicable.

Clinical trial number

Not applicable.

Availability of data and materials

The SIHBS 2022 microdata are available on request from the Somali National Data Archive of SNBS: https://microdata.nbs.gov.so/index.php/catalog/59. The R code that reproduces all estimates is available from the corresponding author.

Competing interests

The author declares no competing interests.

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Author's contributions

MKA conceived the study, obtained and analysed the data, interpreted the results, and wrote and approved the final manuscript.

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