

Healthcare Utilization among Internally Displaced Persons in Camps and Hosting Communities after a Decade of the Yemeni Conflict

Yahia Ahmed Raja'a

yahiarajaa@yahoo.com

Sana'a University

Bushra M Jaadan

Sana'a University

Research Article

Keywords: Utilization, accessibility, contact, IDPs, Yemen

Posted Date: September 4th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-10793413/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Additional Declarations: No competing interests reported.

Abstract

Background

A decade of conflict in Yemen has severely disrupted health systems and displaced millions. We aimed to assess the healthcare utilization rates, accessibility, and service coverage among internally displaced persons (IDPs) residing in camps compared to those living within hosting communities.

Methods

This cross-sectional survey evaluated IDP families randomly selected from the host community in Taiz and IDP camps in Marib during August 2025. Data collection was guided by the Tanahashi Framework for health service coverage, assessing key dimensions including accessibility and first-contact coverage.

Findings

We surveyed 600 households from the host community in Taiz city and 385 households from camps in Marib. The mean household size was significantly larger in camps (7.45 ± 3.6 members) than in hosting communities (6.29 ± 2.2). Camps had a higher prevalence of children under 5 years (79.0% vs 54.5%) and pregnant women (20.3% vs 13.5%). Overall, 96.8% of families ($n = 953$) reported having a sick family member who required healthcare facility care over the past 6 months. Healthcare needs were high (97%), with 81% seeking formal care and 18% resorting to self-medication. Only 12 households out of 985 received free care and 56% borrowed money to pay for it. Healthcare was primarily sought for children (64.9% in camps vs 52.1% in the community).

Interpretation

Despite significant financial barriers, IDPs, especially children, maintain high healthcare utilization and reasonable access to mainstream healthcare services. Targeted financial protection and pediatric-focused interventions are urgently required to sustain health outcomes in these vulnerable populations.

Introduction

The ongoing war that broke out in Yemen in 2015 has displaced 4.5 million persons (1). The numbers and destinations of internally displaced persons (IDPs) have changed according to the development of war (2). Internal displacement took two main forms: the first to the hosting communities and the second to camps. Taiz governorate hosted the largest number (490,335 persons) within the community, whereas Marib governorate hosted the largest camps that accommodated 1,532,624 displaced persons according to 2024 statistics (3).

According to the forms and conditions of displacement; health care delivery models were adapted to provide services to IDPs. For instance, mobile clinics, outreach activities, primary health care camps (PHCs) and the community-based models were the dominant services provided to the camp residents.

These health services were primarily delivered by international and national NGOs, in coordination with local health authorities and supported by UN agencies and donors. The fixed health care delivery model, both public and private, remained central within the hosting communities (4). The healthcare needs of the millions of IDPs exerted an urgent and great stress on the routine healthcare institutions. The health care system's resilience came close to functional collapse, as large numbers of facilities were non-operational or partially operational due to unpaid salaries, disrupted supply chains, health worker shortages, damaged infrastructure, and the suspension of routine services, including primary care and referral services (5). Despite the circumstances of funding deficiencies and its unavailability most of the time, public health services like immunization programs and mother and child health continued with the support of national and international organizations (6, 7). These services are provided equally to the whole population free of charge all the times with the exception of some parts of the service like the laboratory and drug cost (7).

The most vulnerable group of IDPs are the ones most of need to healthcare such as infants, under-5 children, pregnant and lactating women, and older adults bear high burdens of malnutrition, infection, and mental health problems, intensified by poor WASH and fragmented services. Antenatal care, vaccination, adequate diets, and accessible healthcare institutions are recurrent protective factors, but are inconsistently available in most IDP settings in Yemen (8).

The utilization of health services is influenced by health-seeking behaviors. In two previous reports from Yemen, self-medication and over the counter (OTC) remain the first choices in most of the mild illnesses (9, 10). Population-based evidence from Yemen shows that health service choice is shaped by perceived illness severity, cost, and availability. Accordingly, individuals select care from public or private care depending on these factors (11). In addition to the site of displacement, where living in host communities is associated with higher physical and psychological well-being than camp residence, partly via better access and integration (12).

In several African settings, 55–75% of IDPs reported using some form of facility-based care in the previous 3 months, often for acute infections, but with heavy reliance on basic primary care and NGO-run services (13, 14, 15, 16). Many still choose self-treatment, home care/no care, informal providers, or traditional/complementary medicine (14, 16, 17, 18).

Access to medical care is a key determinant of health service utilization. A recent study conducted among Yemeni IDPs in Aden reported predominantly negative perceptions of health-care accessibility, driven by financial constraints, inequitable service provision, and limited availability of functional facilities, all of which influence decisions on whether and where to seek care (19). In comparable displacement settings, quantitative evidence further illustrates these patterns. For example, a study among the IDPs in Nigeria found that 11.1% of them sought non facility care and 13.2% used home care or no care at all, while the majority (75.7%) used the facility-based health care for the illnesses that happened in the past month (14). A study conducted in 2018, estimated that the travel time to the nearby primary health care facility for 90.9% of the whole Yemeni population was less than 60 minutes

assuming motorized transport. Whereas 57.6% spent less than an hour when they travelled to the nearest hospital (20).

Accessibility, affordability, awareness of the illness risk, and perceived satisfaction with the quality of care represent key determinants of health service utilization among internally displaced persons (IDPs). Together, they influence not only whether care is sought but also the level and type of health services utilized across different delivery models (21). Long distances, lack of transport, few specialists, and limited clinic hours are common, especially in camps and rural resettlement areas (12, 13, 22, 23, 24).

A scoping review on IDP health notes that IDPs generally experience reduced access to services and worse outcomes than other conflict-affected groups, with financial barriers among the key drivers (25). Direct costs as major restrictive utilization of healthcare services. High out-of-pocket payments for consultations, tests, and medicines frequently lead to delayed or foregone care among IDPs in LMICs and camp settings (26). Over half of Sudanese IDPs and Somaliland IDPs reported care as unaffordable, with cost driving avoidance and low utilization (12, 22).

his study aims to investigate the utilization coverage of health services provided to IDPs both in camps and hosting community, after a decade of conflict in Marib and Taiz governorates. Beyond assessing utilization, the study seeks to examine how geographical accessibility, financial affordability, awareness of illness severity and risk, interact to shape health care seeking behavior and service use among displaced populations. The study intends also to generate evidence to inform more equitable and effective health service delivery for IDPs in conflict-affected settings.

Methods

Study Design

The study employed a cross-sectional household survey design with two stage cluster sampling using gridded population data. Two household surveys were conducted in Marib (for camp-based IDPs) and Taiz governorates (for community-hosted IDPs).

Setting and participants

This study employed a multi-stage sampling approach to ensure representative coverage of IDPs across diverse settings in Yemen. Two governorates were purposefully selected. Marib was selected to represent IDPs residing in camp settings, as it hosts the largest number of IDPs and the biggest IDP camp in Yemen. Taiz was selected to represent IDPs living within host communities, as it has the largest gathering of displaced populations. Taiz was also selected for its unique governance context, with some districts under the authority of the Sana'a-based government and others under the Aden-based government

Sample size calculation for the IDPs in camps (Marib governorate):

The largest gathering of IDPs within camps are found in Marib Governorate, with estimated 1,532,624 persons (3). The survey targeted Al Jufainah camp with 16,800 households and Assowaida camp with 2,500 households (19,300 households total). These camps are located on the outskirts of the Marib city district. These camps are recognized as the largest IDP camps in Yemen (3). Due to the clearly defined boundaries of the camp and the lack of a mixed population, geographic segmentation using Arc Pro was not required (see the annexed map number 1 of the selected households).

Household Selection Strategy

A minimum calculated sample size was 385 households. A 50% was assumed for dependent variable with 5% as a margin of error and 95% confidence interval. Out of the 384 households targeted for the survey, 87% (n = 335) households were selected from Jufainah and the other 13% (n = 50) were selected from Assowaida according to the proportion of households within the total number of households. The gate of the camp was identified as the starting point. From the starting point, enumerators used systematic random sampling to identify the starting and final household and outline a pathway, and then systematically select 385 households. They proceeded in a serpentine pattern, moving systematically from one shelter to the next in a continuous direction until the required number of 385 households was reached. The selection interval was 50 (19300 households/385 sample size) and the first shelter was randomly selected from the first 50 houses.

Sample size calculation for the IDPs hosted in communities (Taiz governorate):

Three districts in Taiz Governorate: Al Mudhaffar, Al Qahirah, and Salah were purposively selected based on two primary criteria. First, it has the largest gathering of IDPs in the governorate. Second, there are relatively safe and accessible conditions.

Household Selection Strategy

To support a structured community-based sample where displaced households are among host populations, the selected districts were geographically segmented into approximately 105 rectangular grid squares, each with an estimated area of 641 m². We used ArcPro GIS software to map that. Some peripheral squares were excluded due to their minimal area and location outside inhabited zones (see map2 in the annex). In addition, before data collection began, several grid squares in the eastern part of Salah District (right side of Map 2) were identified as operationally inaccessible due to localized conflict incidents. These squares were therefore excluded from the sampling frame prior to random selection to protect field teams and ensure safe access during household visits.

Sample size calculation:

Based on a population size of 131,000 IDPs (See Table 1 in the annex), and using a 95% confidence level with a 5% margin of error and 50% response distribution, the calculated minimum sample size was 384 households. However, given that the household selection process is snowball sampling and clustering was expected, a design effect of 1.5 was applied to compensate for potential biases, increasing the final sample size to 576 households.

Table 1
Sampling frame Internally displaced persons within the hosting community in Taiz (3).

District	Total Population	No. of IDPs	% of Total IDPs	No. of Grid Squares Selected
Al Mudhaffar	258,337	55,700	42%	13
Al Qahirah	223,261	39,539	30%	9
Salah	229,598	35,976	27%	8
Total	711,196	131,215	100%	30

A two-stage sampling approach was implemented:

Stage 1: selection of grid squares (primary sampling units): All eligible grid squares were numbered, and 30 grid squares were randomly selected. Selection was proportional to the estimated distribution of IDPs across the three districts (Table 1). The target number of households per selected square was set at approximately 19, resulting in the overall target of 576 households.

Stage 2: Identification and recruitment of IDP households within each selected square: Because displaced households were not separately listed and were embedded within host communities, a chain-referral (snowball) method was used within each selected grid square to identify IDP households. Field teams first contacted key community informants (e.g., neighborhood leaders such as the Aaqil/Shaiikh or area supervisors) to identify an initial displaced household. Subsequent eligible households were identified through referrals from recruited households until the target number per square was reached.

To reduce over-representation of households from the same micro-location, the following operational limits were applied: No more than two households from the same building (when the building had four or more floors); and No more than two households from the same street.

Grid-square maps containing street names and neighborhood layouts were used to support field navigation. In addition, GPS coordinates were recorded for each interviewed household to document spatial coverage and minimize duplication.

Data collection:

The data collection was undertaken from August 9th to 20th, 2025. The tool was guided by Tanahashframework (21), particularly three parts of the Framework for Health Service Coverage. The three dimensions which were investigated in this paper were: availability coverage (the presence of

services), accessibility coverage (the ability of individuals to reach services) and contact coverage (the extent to which individuals seek and receive care) (16). The survey captured key domains including:

- demographics (e.g., respondent/household member age and gender and basic household composition)
- health-seeking behavior related to the most recent illness episode that required healthcare in the past 6 months among any household member (and for this episode: whether care was sought/received, type of provider/facility used, and reasons for not seeking or not receiving care)
- Tanahashi-aligned indicators of contact coverage, including reported utilization/receipt of needed care and types of services access).
- For the Tanahashi indicators of accessibility and coverage, we measured accessibility barriers (e.g., distance/travel time, transport, safety constraints, documentation-related barriers, and affordability), measures of out-of-pocket payments/affordability and perceived quality of care (e.g., satisfaction with services, waiting time, staff behavior, and facility conditions).

The tool was prepared in English and translated into Arabic, then reviewed to ensure conceptual equivalence and clarity for the local context. The survey was programmed and administered using KoBo Toolbox for digital data capture. Data collectors received standardized training covering study objectives, interviewing techniques, ethical procedures (including informed consent and confidentiality), eligibility screening, and field quality assurance. Within each selected household, the interview was conducted with an adult (≥ 18 years) household member who was most knowledgeable about household health needs and healthcare utilization; where more than one eligible respondent was available, a consistent selection rule was applied to minimize interviewer discretion. Internal consistency was assessed for eight items related to the Tanahashi dimensions, yielding acceptable reliability Cronbach's Alpha = 0.714.

To address household non-response, selected households were not replaced immediately when no eligible respondent was available at the time of the visit. Data collectors made up to two repeat visits at different times and/or on different days. If the household remained unavailable after these attempts, it was recorded as non-response and replaced by the next eligible IDP household within the same grid square, following the same eligibility criteria and field procedures.

Quality Assurance and Analysis

Prior to field deployment, enumerators received comprehensive training on the study objectives, ethical considerations, data collection procedures, and the use of digital tools for data entry. Field supervisors conducted daily briefings and random spot-checks to verify data accuracy and adherence to sampling protocols. All completed questionnaires were reviewed on the same day of collection to identify and resolve any inconsistencies or missing information. GPS coordinates and grid-based mapping were also be cross-checked to ensure spatial accuracy of the selected households. Following data collection, all responses underwent data cleaning and entered to Microsoft Excel, then imported into SPSS for statistical analysis. For the cluster survey, the complex sampling design was specified in order to

incorporate the design effect and calculate 95% confidence intervals. Descriptive statistics including proportions and their 95% confidence intervals were calculated.

Ethical approval

s were obtained from the ethics committees of Ministry of Health in Aden (No GAIR/00/24/25). In addition to an institutional Ethical Clearance Certificate from Al Nasser University in Sana'a (NU-RECM23012).

Results

The survey covered 985 households which were visited in August 2025, with a response rate of 100%. Female informants constituted 65.6% and the males were 34.4%. The findings show that families in the camps have a high proportion of children under 5 and pregnant women as presented in Table 2.

Table 2
Household characteristics of IDPs in camps and hosting community.

Characteristic		Marib camps		Taiz community		*P-value
		(No = 385)		(no = 600)		
		No	%	No	%	
Presence of pregnant women	Yes	78	20.3	81	13.5	0.003
	No	307	79.7	519	86.5	
Presence of at least 1 child below 5yrs	Yes	304	79.0	327	54.5	< 0.001
	No	81	21.0	273	45.5	
Presence of elderly person > 60 yrs.	Yes	125	32.5	126	21.0	0.001
	No	260	67.5	474	79.0	
Presence of disabled person	Yes	68	17.7	65	10.8	0.003
	No	317	82.3	535	89.2	

Chi Square test*.

A secondary level public hospital and a health center are available in the camps of Marib. While, all levels of public healthcare facilities are available in Taiz city. Other healthcare facilities including hospitals and referral hospitals are available in both the cities of Marib and Taiz. Polyclinics and private hospitals are also available in the two cities.

The mean distance to the nearest public health facility was around 500 meters and around 1 kilometer to the nearest hospital as reported by the informant. Travelling method to the health facilities, was either

walking by 31.2% of the camp residents vs. 16.3% in the community and was around 29 minutes. The remaining percentage used motorized travelling. Most of the IDPs in Taiz community 83.7% (502/600) used motorized travelling. Significantly, more than the people in the camps of Marib 68.8% (265/385) with a P-value of < 0.001 and an odds ratio of 2.3 and confidence interval ranging from 1.7 to 3.1 (Table 3).

Table 3

Reported distance and travelling time to the health facility by the IDPs in the camps and within the community, Yemen.

Travel	Type of IDPS	No.	Mean $\pm$ Std. Dev.	t-test (P-value)
Distance in kms to the nearest health unit or medical center.	Camp	385	0.51 $\pm$ 1.0	0.27
	Within community	600	0.50 $\pm$ 0.45	(0.787)
Distance in kms to the nearest hospital	Camp	385	0.93 $\pm$ 1.1	3.29
	Within community	600	0.73 $\pm$ 0.56	(0.001)
Travel	Type of IDPS	No.	Median Min.-max.	MannWhit. (P-value)
Time in minutes to the nearest health unit or medical center.	Camp	385	15 (1-480)	139996
	Within community	600	20 (5-300)	(< 0.001)
Time in minutes to the nearest hospital	Camp	385	30 (5-480)	107367
	Within community	600	30 (5-360)	(0.055)

As for income, 52.7% (203 out of 385 family head) living in the camps obtained their income from employment (monthly wages mainly from public job) followed by freelance work (26.8%), whereas daily wages (40.7%) and freelance work (39.2%) are the main income source in the community. Only 1.2% of IDPs (12/985) got free medical care; Six households (1%) in the camps and another 6 in the community (1.6%). The others who did not get free medical care (n = 973), paid mainly for hospital examination fees. Borrowing was the highest (56.1%) source of payment as shown in Table 4.

Table 4
Paid health care services, completely/partially, by the IDPs in camps and community, Yemen.

Paid services*	Camp		Community	
	No.	Percent	No.	Percent
Hospital consultation fees	155	40.9	180	30.3
Health center services	71	18.7	221	37.2
Medication payment	110	29.0	110	18.5
Laboratory payment	30	7.9	39	6.6
Diagnostic costs (X-rays, ultrasound,..)	11	2.9	37	6.4
Surgery costs	2	0.5	7	1.2
Coverage of paid service**				
Borrowing	170	44.9	376	63.3
Personally paid	183	48.3	133	22.4
Aids and assistants	7	1.8	61	10.3
Savings	18	4.7	20	3.4
Other sources	1	0.3	4	0.7

*Chi square test = 52. $P < 0.001$. **Chi square = 90.5, $p < 0.001$.

The cascade of health seeking and utilization during the past six months prior to the interview went as follows: An illness complaint or healthcare use within the family, was reported by 96.8% (953/985)

and of those individuals, 97.1% (925/953) sought healthcare. Of the health care seekers, 81.2% (751/925) utilized health care facility and the remaining 18.8% (174/751) medicated themselves directly.

The most utilized healthcare services by the 751 users were the child healthcare and the non-communicable diseases as shown in Table 4.

Table 4

The utilized healthcare services by IDPs according to residence during the past 6 months, Yemen.

Used healthcare service (multiple responses were allowed)*	Marib camps (No. = 248)		Taiz community (No. = 564)		OR (CI)	P-value
	No	%	No	%		
Child healthcare (ARI, diarrhea...etc.)	161	64.9	262	52.1	0.6 (0.4–0.8)	< 0.001
Treatment for non-communicable diseases	62	25.0	153	30.4	1.3 (0.9–1.9)	0.12
Receiving medications for chronic diseases	23	9.3	144	28.6	3.9 (2.5–6.3)	< 0.001
General consultation	79	31.9	77	15.3	0.4 (0.3–0.6)	< 0.001
Perinatal health services	55	22.2	91	18.1	0.8 (0.5–1.1)	0.18
Child and mother immunizations	62	25.0	65	12.9	0.4 (0.3–0.7)	< 0.001
Routine checkups	47	19.0	73	14.5	0.73 (0.5–1.1)	0.12
Communicable disease treatment	8	3.2	67	13.3	4.6 (2.2–9.8)	< 0.001
Accidents and injuries treatment	9	3.6	44	8.7	2.6 (1.2–5.3)	0.01
Mental health services	6	2.4	22	4.4	1.8 (0.7–4.6)	0.2

Used healthcare service (multiple responses were allowed)*	Marib camps (No. = 248)		Taiz community (No. = 564)		OR (CI)	P-value
	No	%	No	%		
Micronutrient supplementation	10	4.0	13	2.6	0.63 (0.3–1.5)	0.28
Health education services	2	0.8	15	3.0	3.8 (0.9–16.7)	0.06
Feeding center services	6	2.4	3	0.1	0.2 (0.1-1.0)	0.06

*812 health services visits among 751 respondents who sought care at a health facility either in public or private health facility (pharmacies are not included).

When IDPs were asked about where they sought treatment in the recent illness affected a family member within the household, 925 answered that they used different health care most commonly (63.9%) the public health facilities (Fig. 1).

Chi Square = 64.8, $P < 0.001$, the Other were 5/985.

Figure1. The destination to which the IDPs turned to seek healthcare in the recent illness.

Discussion

Current study revealed that IDPs residing in the camps in Marib city have higher proportions of under-five children and pregnant women than IDPs residing in the hosting community have in Taiz city. Moreover, the overcrowding in the camps is greater than in the hosting community. These findings indicate to the at high-risk communities in the camp are higher than those in the hosting community. Our finding is in line with that reported earlier in Yemen (8) and in the African settings of Somalia, Nigeria and Ethiopia (13, 14, 15) and Pakistan (6). This result implies taking this into consideration when prioritizing planning and delivering health services.

The present study revealed that IDPs residing within the host communities in Taiz find a wider range of healthcare options available to them at easier accessibility than those residing the camps in Marib. All levels of healthcare facilities are available in both settings with more abundance in Taiz community. However, it was found that displaced camp residents have a capacity to pay for the medical services than those in the host community in Taiz. One cause of this capacity might be attributed to the governorate of Marib, which is an oil and gas producing governorate which offers better opportunities for

income. This finding is in line with that reported by Cantor *et.al.* in their scoping review where they reported that in some contexts, however, non-encamped IDPs integrated in cities or villages have equal or better access to specific services (e.g., lower malaria or arboviral disease incidence where clinic access is prioritized for IDPs) (28). Ekezie *et.al.* in their systematic review reported similar finding in low- and middle-income countries (28).

The selection of a specific healthcare providing facility depends on the type of needed service, the accessibility and affordability. Our findings indicate to reasonable access in both cases. These findings are online, if not easier, with that reported by Garber *et al* in 2018, for the whole people of Yemen (8).

When we posed a question about the contact availability with healthcare facilities during the past 6 months, > 96% of the families in the two locations experienced an illness which is to be expected over this time of exposure. The purpose of choosing this wide frame of time was intentionally used to assess the contact coverage and the social and cultural acceptability of the healthcare services. In our situation, both contact and acceptability are high.

The most utilized healthcare service was the child healthcare services, followed by seeking treatment for non-communicable diseases, then receiving free medications for chronic diseases and after that attended for general consultations for variety of complaints. This pattern of utilization is common in many settings and infer consideration when planning health service providing. The IDPs in the current study sought these services mainly at public health institutions, then the private sector, after that at supported health clinics. However, a small proportion self-medicated themselves.

As the number of the displacements, reached 7 times as a maximum, some of the IDPs are returning back to homes. In addition, returning is expected to increase more and more specially with the cease-fire expectations. This implies an urgent need to study the preparedness of health services in the areas coming to post-conflict phase (27). The war in Yemen has reached to the de-escalation phase as the politicians' report. The displacements did not cease, however small numbers continued displacements and substantial returns to homes had happened. Specially, where lands and houses were cleared from the mines. Accordingly, the urgent health responses declined and transition to mainstream health delivery models has become the case. Jumaan AO (2026) suggested that primary health care and specific programs, namely malnutrition and infectious diseases to be the immediate post-conflict health system priorities (27).

To conclude, people in the camp have more below five children and more pregnant mothers and crowded in homes more than those in the community. Despite the unaffordability, all IDPs use the mainstream healthcare services and have an easy access to them. In the de-escalation phase, Yemen's health system must focus on sustainability, equity, and integration of IDP health within national systems.

Limitations of study:

- Current study included IDPs residing under the legitimate government and did not include IDP communities under Ansarullah government for security reasons. The IDP numbers under AnsarruLah are considerably high numbers and may be having their specific issues of healthcare utilization. In addition, up to 3 locations in Taiz city were excluded from the sampling as these locations are at high risk and exposed to sniper activity.
- The social and cultural acceptability coverage was not investigated, as we suggested available healthcare is needed and acceptable as seen in the very high utilization rate.
- A response rate of 100% may be looked at as probable bias due to replacements of the participants. However, our data collectors returned back to unavailable participants and fulfilled this high response. In addition, IDP participants are usually keen to respond to surveys hoping to get some assistance. The efficacy coverage and barriers to utilization is tackled independently in an upcoming article.

Declarations

Ethics and consent to participate: Ethical approvals were obtained from the ethics committees of Ministry of Health in Aden (No GAIR/00/24/25). In addition to an institutional Ethical Clearance Certificate from Al Nasser University in Sana'a (NU-RECM23012).

Consent for publication: Not applicable

Availability of data: The data of this study are available from the corresponding authors upon request if reasonable.

Authors contributions: Both authors, YR and BJ, participated in al steps of the research.

Funding declaration: This research is funded by. the WHO/Alliance for Health Policy and Systems Research.

Competing interest declaration: The authors declare that they have no competing interests.

Acknowledgements

The authors highly appreciate the financial and technical assistance provided generously by the WHO/Alliance for Health Policy and Systems Research represented by Prof. A. Takian and S. Boland. The technical support offered by R. Ratnayake and A. Ismail is appreciated. Our data collectors and mapping specialist efforts is acknowledged.

References

1. International Organization for Migration (IOM). (2024). *World Migration Report 2024: Internally Displaced Persons*. Geneva: IOM. Available at: <https://worldmigrationreport.iom.int>

2. International Organization for Migration (IOM). *Yemen Displacement Tracking Matrix (DTM)*. Available from: <https://dtm.iom.int/yemen>
3. Central Statistical Organization (CSO) and OCHA. *Yemen Humanitarian Data Overview 2024*. Sana'a: CSO and OCHA; 2024.
4. Miller NP, Milsom P, Abdullah S, Alabbasi S, Elayah M, Jalloh MB, Perry HB. Implementing integrated community case management during conflict in Yemen. *Confl Health*. 2020;14(1):1–13. <https://doi.org/10.1186/s13031-020-00306-3>.
5. UNICEF. *Mobile Clinics: A Lifeline for Displaced People in Marib Governorate, Yemen*. UNICEF Yemen. 2022. Available from: <https://www.unicef.org/yemen/stories/mobile-clinics-lifeline-displaced-people-marib-governorate-yemen>
6. World Health Organization (WHO). *Protecting Essential Health Services in Yemen*. Health Cluster Report. 2020. Available from: <https://healthcluster.who.int/newsroom/news/item/07-07-2020-protecting-essential-health-services-in-yemen>
7. International Organization for Migration (IOM). *IOM Supports Vital Mass Polio Immunization Campaign in Yemen*. United Nations Yemen. 2024. Available from: <https://yemen.un.org/en/265319-iom-supports-vital-mass-polio-immunization-campaign-yemen>
8. Al-Taj MA, Al-Muntasir K. Exploring acute malnutrition, acute watery diarrhea, dietary diversity, and vaccination coverage among internally displaced children in Yemen: A cross-sectional study. *Public Health*. 2026;255:106265. <https://doi.org/10.1016/j.puhe.2026.106265>.
9. World Health Organization (WHO). *Yemen: Health System in Transition – Country Profile 2022*. Geneva: WHO; 2022.
10. Al-Ammar WA, et al. Self-Medication Practices in Yemen: A Cross-Sectional Study of Community Behavior. *J Pharm Policy Pract*. 2021;14(1):47.
11. Al-Kohafi AA, et al. Health-Seeking Behavior and Choice of Health Services in Yemen: A Population-Based Study. *East Mediterr Health J*. 2019;25(9):631–40.
12. Elobied H, Ahmed M, Ahmed A, Salih R, Ahmed S, Mahgoub A, Mohamed A, Elamin E, El-Haj A, Abd-Allah M, Ibrahim A, Mohamed Y, Shabo A. Healthcare accessibility, utilization, and quality of life among internally displaced people during the Sudan war: a cross-sectional study. *Confl Health*. 2025;19. <https://doi.org/10.1186/s13031-025-00655-3>.
13. Tahlil A, Mohamud O, Aden S, Gedi S, Osman M, Dahir G, Jimale L, Siyad A, Mohamed M. Health-seeking behavior in conflict-affected settings: a cross-sectional study of internally displaced persons in Somalia. *Confl Health*. 2025;19. <https://doi.org/10.1186/s13031-025-00718-5>.
14. Gidado S, Musa M, Ba'aba A, Okeke L, Nguku P, Hadejia I, Hassan I, Bande I, Onuoha M, Ugbenyo G, Godwin N, Usman R, Manu J, Mohammed A, Abdullahi M, Bammami M, Nuorti P, Atkins S. Factors associated with health-seeking patterns among internally displaced persons in complex humanitarian emergency, Northeast Nigeria: a cross-sectional study. *Confl Health*. 2023;17. <https://doi.org/10.1186/s13031-023-00552-7>.

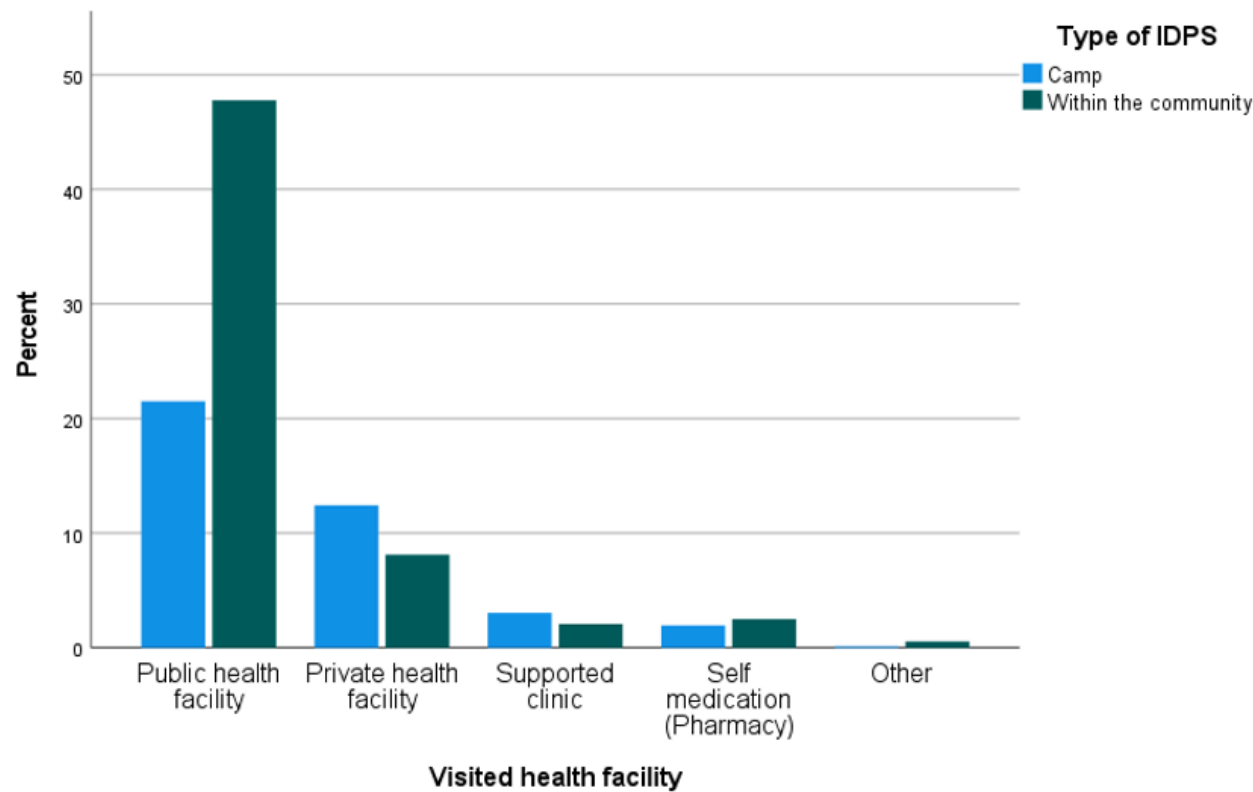
15. Abdulhamid Y, Toyeb Y, Yitbarek W. Health Services Utilization and Associated Factors among Internally Displaced Persons in South Wollo Zone, North-Eastern Ethiopia. *Int J Health Sci.* 2024;4(7):1–25.
16. Marwat M, Ronis K, Sanauddin N. Health Needs and Care Seeking Behavior of Internally Displaced Persons Living in Jalozai Camp (Khyber Pakhtunkhwa, Pakistan). *Global Social Sciences Review*; 2019.
17. Faronbi J, Akinyoola O, Faronbi G, Adegbola G, Bello C. Health needs and health seeking behaviour of Internally Displaced Persons in Dalori camp, Maiduguri, Borno State, Nigeria. *Research Journal of Health Sciences*; 2019.
18. Kazamwali M, Kisanga A, Balegamire JB, Kaningini E, Falisse J-B, Furaha G, Mapendo DM, Boeyink C. Traditional, complementary, and alternative medicine and the provision of health care to internally displaced persons in South Kivu, Democratic Republic of the Congo. *Front Hum Dyn.* 2024;6:1289169.
19. Al-Sakkaf M, Al-Serouri A, Qirbi N, et al. Perceptions of health needs and access to healthcare among internally displaced persons in Aden, Yemen: a qualitative study. *Eur J Pub Health.* 2025;35(Suppl 1):ckaf180069. 10.1093/eurpub/ckaf180.069.
20. Kent Garber C, Fox M, Abdalla A, Tatem N, Qirbi LL-B, Al-Shabi K, Ongwae K. Meredith Dyson, Kebir Hassen. Estimating access to health care in Yemen, a complex humanitarian emergency setting: a descriptive applied geospatial analysis. *Lancet Glob Health.* 2020;8:e1435–43.
21. Tanahashi T. Health service coverage and its evaluation. *Bull World Health Organ.* 1978;56(2):295–303.
22. Korse AH, Odero VO, Hassan MS, Dahir HM, Ibrahim KA. Factors Affecting Utilization of Healthcare Services Among Nasahablood and Ayah 4 Internally Displaced Persons in Hargeisa, Somaliland. *Public Health Chall.* 2025;4(4):e70140. 10.1002/puh2.70140. . PMID: 41080793; PMCID: PMC12509035.
23. Mohamed A, Bocher T, Magan M, Omar A, Mutai O, Mohamoud S, Omer M. Experiences from the Field: A Qualitative Study Exploring Barriers to Maternal and Child Health Service Utilization in IDP Settings Somalia. *Int J Women's Health.* 2021;13. <https://doi.org/10.2147/ijwh.s330069>.
24. Ekezie W, Siebert P, Timmons S, Murray R, Bains M. Exploring the influence of health management processes on health outcomes among internally displaced persons (IDPs). *J Migration Health.* 2022;6. <https://doi.org/10.1016/j.jmh.2022.100124>.
25. Schokkaert E, Steel J, Van De Voorde C. Out-of-Pocket Payments and Subjective Unmet Need of Healthcare. *Appl Health Econ Health Policy.* 2017;15. <https://doi.org/10.1007/s40258-017-0331-0>.
26. Sarabu S, Bognini M, Kebede M, Ifeanyichi M, Hargest R, Friebel R. Strengthening health systems for displaced populations: A systematic review of access to surgical care in low- and middle-income countries. *Soc Sci Med.* 2025;388. <https://doi.org/10.1016/j.socscimed.2025.118705>.
27. Jumaan AO. (2026) ' Yemen Healthcare Priorities Post-Conflict' in Osman KF and Hedaya M. (Eds, 2026). *Yemen at the Cross-Roads, Crisis and Reconstruction (1st edition)*.pp.204–229.

28. Cantor D, Swartz J, Bayard R, Abbara A, Ager A, Bhutta Z, Blanchet K, Bunte D, Chukwuorji J, Daoud N, Ekezie W, Jiménez-Damary C, Jobanputra K, Makhashvili N, Rayes D, Restrepo-Espinosa M, Rodríguez-Morales A, Bukola S, Smith J. Understanding the health needs of internally displaced persons: A scoping review. *J Migration Health*. 2021;4. <https://doi.org/10.1016/j.jmh.2021.100071>.

Maps

Map 1 and 2 are available in the Supplementary Files section

Figures



Chi Square= 64.8, P<0.001, the Other were 5/985.

Figure 1

The destination to which the IDPs turned to seek healthcare in the recent illness.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Map1.jpg](#)
- [Map2..jpg](#)