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Research

Cross-border health care seeking among Somali nationals: a multi-country rapid evidence synthesis of determinants, outcome domains, economic burden and health-system implications, 2014–2026

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Abstract

Background: Somali nationals travel abroad for care that the domestic health system cannot supply, yet the scale, clinical drivers, costs and outcomes of this movement have not been synthesised. We aimed to consolidate the available evidence on outbound medical travel from Somalia to India, Türkiye, Ethiopia and Egypt, to distinguish what is measured from what is not, and to draw implications for health financing and governance.

Methods: We conducted a rapid evidence synthesis of evidence from 2014 to 2026. Sources were Indian parliamentary and ministerial series, peer-reviewed studies, country-of-origin reports, health-financing documents and consular guidance. Synthesis was narrative because heterogeneity precluded pooling. Every statement was assigned to one of three evidence tiers: directly measured, credibly inferred or unquantifiable. Movement indicators count episodes, not unique patients, and expenditure envelopes are planning scenarios, not accounts.

Results: India is the only corridor with a nationality-specific public series: 13,585 medical-purpose arrivals in 2015–2017 and 47,880 medical visas in 2019–2024 (2018 unavailable), a minimum of 61,465 episodes. Medical visas peaked at 16,411 in 2023, 4.8 times the 2019 level, and fell to 12,261 in 2024. Türkiye offers a single anchor (2,742 Somali patients in 2019); Ethiopia and Egypt lack nationality-specific series. Demand concentrates in oncology, cardiovascular and renal disease, advanced diagnostics, reproductive medicine and orthopaedics. A snowball survey of 106 medical travellers in Garowe reported a mean direct cost of US$8,543 per episode. Out-of-pocket payments met 30.8% of current health expenditure in 2023. Applying published per-patient benchmarks to Indian visas gives US$88–105 million for 2024; a four-corridor central scenario gives approximately US$219 million, about 1.8% of projected gross domestic product. No pooled morbidity, complication or mortality rate can be derived, because outbound episodes are not linked to treatment or outcome.

Conclusions: Outbound travel functions as an unregulated, privately financed parallel tertiary-care system that is substantial in scale, financially consequential and largely unmeasured in outcome. We propose a minimum outbound-referral dataset, pooled catastrophic-illness protection linked to authorised referral, facilitator licensing, bilateral referral compacts and sequenced domestic investment in oncology diagnostics, chemotherapy, dialysis and imaging.

Keywords: Somalia, Cross-border health care, Medical travel, Tertiary care, Catastrophic health expenditure, Continuity of care, Health financing, Fragile and conflict-affected settings, Universal health coverage

Background

Context and problem statement

Over the past decade, outbound medical mobility has become one of the most visible and least governed features of Somalia’s health system. The movement of patients across international borders in search of specialised treatment is not incidental. It reflects persistent structural deficits,

historical disruption and sustained socio-economic fragility, which together have eroded domestic capacity to diagnose, treat and follow up complex disease [1–3].

Since the collapse of central government in 1991, Somalia has experienced prolonged conflict, political instability and fiscal fragility. These conditions weakened public health infrastructure and produced a fragmented, largely unregulated health sector in which advanced tertiary services, including oncology, interventional and surgical cardiology, nephrology and transplantation, and complex surgery, are either unavailable or accessible only to a narrow urban stratum able to pay [3–6]. Reconstruction has proceeded mainly through private and diaspora investment. This has multiplied the number of clinics, particularly in Mogadishu, but regulatory oversight, accreditation and quality assurance have not advanced at a comparable pace [4, 7].

Somalia carries a dual burden of communicable and non-communicable disease [1, 8]. Raised blood pressure was estimated to affect 26% of adults in 2015 [8], and a recent letter describes a rising cardiovascular burden amid a scarcity of reliable prevalence data [9]. Maternal and child mortality remain among the highest in the world [10–12], and access deficits are most acute outside the principal urban centres [13]. These indicators describe deficits in primary as well as tertiary care. They establish the conditions under which international medical travel becomes, for many households, a compensatory rather than a discretionary act.

The clinical rationale for travel is consistent across the available evidence. Patients with cancer present predominantly at late stages [14]. In oncology, no radiotherapy facility is reported for Somalia in international directories, and chemotherapy is delivered in a small number of private facilities [15–17]. Every patient with a radiotherapy indication therefore requires referral abroad. A snowball survey of 106 people who had travelled abroad for treatment from Garowe, Puntland, in 2021 found that 31% cited the unavailability of the required service locally and 41% cited dissatisfaction with the quality of domestic care [18]. Patient-satisfaction research in Mogadishu's two largest public hospitals identifies provider-related determinants consistent with that assessment

[19]. Access to foreign treatment therefore appears to be driven substantially by necessity rather than preference, although the survey evidence is small and regionally specific.

The financing environment converts this clinical necessity into household financial risk. In national health accounts, out-of-pocket payments met 30.8% of current health expenditure in 2023, within a range of 31% to 47% across 2015–2023 [20]. A household survey of 2,000 households, which used non-probability sampling concentrated in the Banadir region, reported that out-of-pocket payments accounted for 44.9% of household health expenditure, that 3.5% of respondents held any form of health insurance, and that 24% of households spent more than 10% of income on health, with borrowing, asset sales and reduced essential consumption as the dominant coping responses [21]. Under such conditions the threshold for travel appears to be set less by clinical need than by liquidity, documentation and access to diaspora support: in the Garowe survey, 43% of the financing of treatment abroad came from family, diaspora or community support [18].

The consequences extend beyond expenditure. Evidence from other settings links continuity of care with better health outcomes [22]. For Somali patients treated abroad, the structured continuity that would normally follow a foreign intervention (discharge documentation, medication supply, laboratory monitoring, rehabilitation and a named follow-up clinician) is not known to be systematically provided, a gap examined in the Results. Between 2014 and 2026, Somali medical travellers have concentrated in four corridors: India, Türkiye, Ethiopia and Egypt. Destination choice is reported to be shaped by comparative cost, proximity, ease of obtaining a medical visa, cultural and religious congruence, perceived quality and the availability of advanced technology [18, 23].

The measurable scale is considerable. In India, the best-documented corridor, official records show 3,072 medical-purpose arrivals of Somali nationals in 2015, 5,549 in 2016 and 4,964 in 2017, and medical visas issued of 3,454 in 2019, 1,386 in 2020, 4,162 in 2021, 10,206 in 2022, 16,411 in 2023 and 12,261 in 2024 [24, 25]. Even allowing for definitional differences between indicators and for

repeat travel by the same patient, these figures establish a credible minimum and reveal a pronounced post-pandemic surge. What they do not capture is equally significant: no corresponding record exists of diagnosis, disease stage, treatment received, outcome or cost.

Conceptual framing

In resource-constrained and fragile settings, cross-border care seeking is frequently described as medical tourism. The term is analytically inadequate for the Somali context. Medical tourism, as conceptualised in the patient-mobility literature, denotes discretionary consumer choice exercised by patients who possess a functioning domestic alternative and elect to purchase care elsewhere on grounds of price, waiting time or amenity [26, 27]. Somali outbound travel does not satisfy this description. Patients travel to obtain diagnostics, tertiary interventions and continuity-dependent treatments that are unavailable, unaffordable or perceived as unreliable at home. The phenomenon is therefore better characterised as involuntary or compensatory patient mobility, an output of the health system rather than a market preference expressed within it [28–31].

The distinction determines the policy instruments that follow. If outbound travel is treated as elective consumption, the appropriate response is restriction or taxation. If it is treated as a health-system output, the appropriate response is to address the deficits that generate it: tertiary capacity, referral governance, diagnostic infrastructure and financial protection. This paper adopts the second interpretation and uses the terms outbound medical travel and cross-border care seeking. The term medical tourism is retained only where it is critically examined or where a cited source employs it.

The analysis is organised around a push–pull framework adapted to fragile-state conditions (Fig. 1). Domestic push factors include service unavailability, constrained diagnostics, actual and perceived quality deficits, weak continuity for chronic and complex disease and limited tertiary infrastructure. Destination pull factors include perceived higher quality, shorter waiting times, clearer navigation, cultural and religious familiarity, established diaspora networks and facilitator-mediated access. In Somalia these forces are mediated by a third variable that the conventional framework under-

specifies: the financing condition. Where prepayment is negligible and out-of-pocket payment dominates, household liquidity and social capital become binding constraints and may override clinical priority in determining who travels and when [21, 32].

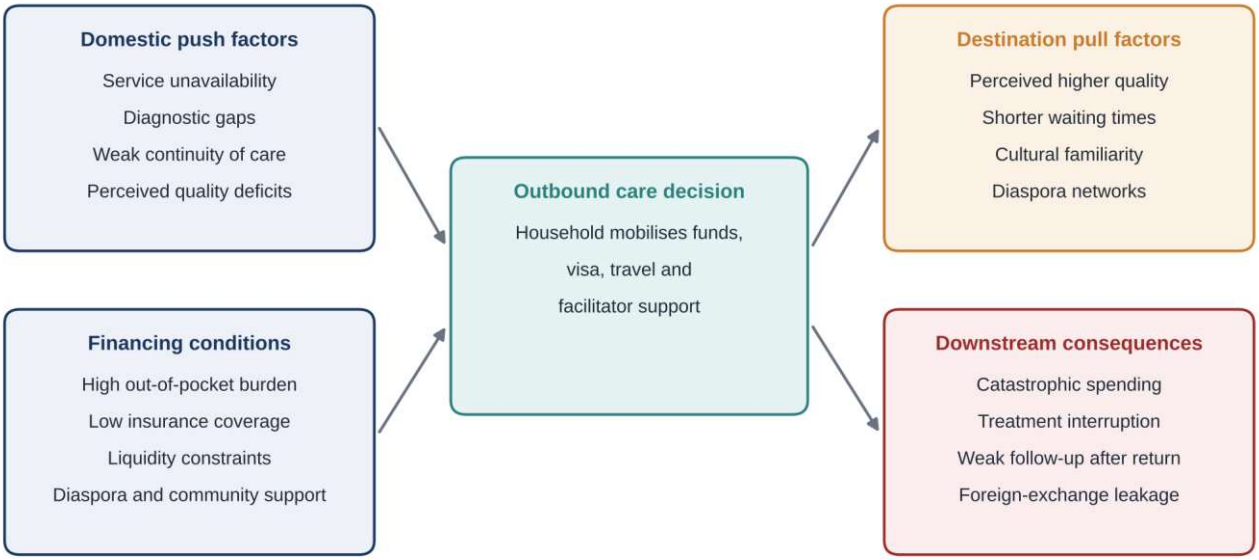


Fig. 1 Conceptual framework of Somali outbound medical travel as a health-system output. Domestic push factors and financing conditions converge on the household decision to travel; destination pull factors shape where patients go, and downstream consequences follow. Measured movement indicators capture only part of the phenomenon, and clinical outcomes remain largely unmeasurable in the absence of a Somalia-side referral registry and destination-side follow-up linkage.

Existing evidence and the knowledge gap

Four themes recur across the available literature on Somali outbound health care. First, structural deficits are the primary driver. The dominant motivation for travel is the absence of defined domestic services rather than disease as such, with the principal gaps in oncology, advanced cardiovascular intervention, renal replacement therapy and transplantation, advanced imaging and histopathology, and selected reproductive and orthopaedic services [5, 6, 14, 16, 33]. Second, financial exposure and household coping are marked: out-of-pocket expenditure remains high because risk-pooling mechanisms are minimal, and households rely on remittances, savings and

community fundraising [18, 21]. Third, destination experience extends beyond clinical quality: patient trajectories are shaped by navigational support, the conduct of intermediaries, administrative burden and follow-up after return [23, 34]. Fourth, evidence is asymmetric across corridors. India provides quantifiable nationality-specific metrics, Türkiye offers a single-year anchor, and Ethiopia and Egypt are documented mainly through qualitative and event-based reporting [23–25, 35, 36].

A substantive knowledge gap persists across all four themes. Somalia maintains no national registry of outbound medical referrals linking diagnosis, destination, financing mechanism, treatment received and subsequent outcome. Patient movement is therefore partially visible while patient outcome remains almost entirely invisible. Existing studies characterise corridor dynamics and, in part, travel volumes, but longitudinal data on morbidity, mortality, cost-effectiveness and malpractice exposure are absent. This paper consolidates reliable movement indicators, clarifies destination service patterns, estimates household and national costs, and identifies the mechanisms through which cross-border episodes fail, while stating explicitly which of these can be measured and which cannot.

Aim and objectives

The aim was to provide a policy-relevant synthesis of Somali cross-border health care seeking across India, Türkiye, Ethiopia and Egypt and to translate it into a governance and financing agenda. Table 1 sets out the five objectives, the analytical question attached to each and the corresponding output.

Table 1 Study objectives, analytical questions and analytical outputs.

Objective	Analytical question	Analytical output
1. Quantify scale	How many Somali nationals travel abroad for care, and which corridors are directly measured?	Destination volume synthesis with explicit evidence-tier classification
2. Identify clinical drivers	Which conditions and service gaps most strongly generate outbound care seeking?	Disease-profile and destination service mapping
3. Delimit outcome knowledge	What can and cannot be established regarding outcomes, morbidity, treatment failure and safety?	Outcome-domain matrix and mechanism-based interpretation
4. Estimate economic burden	What financial burden is borne by households and by the national economy?	Household cost profile, national expenditure envelope and macroeconomic leakage analysis
5. Characterise patient-level barriers	Which barriers, risks and patient-protection issues arise in destination countries?	Destination barrier matrix and derived policy implications

Methods

Study design and reporting standard

This study is a rapid evidence synthesis informed by the principles of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement and reported in an extended Introduction–Methods–Results–Discussion structure. A rapid synthesis design was selected because the relevant evidence base spans official movement statistics, peer-reviewed empirical studies, institutional and country-of-origin reports, health-financing documentation and consular guidance, rather than a uniform body of trials or registry datasets. Under these conditions a formal systematic review with meta-analysis is not feasible: the constituent sources differ in design, denominator, case definition and outcome reporting to a degree that precludes statistical pooling. The review was not prospectively registered. An internal protocol specified the search domains, inclusion and exclusion boundaries, extraction fields, evidence-tier assignment rules, appraisal criteria and the logic governing figure construction, and it was applied throughout. Narrative and comparative synthesis was the primary analytical method, with triangulation used to identify convergence and contradiction across sources.

Analytical framework and evidence tiers

The analysis applies the push–pull framework described in the Background, extended by an explicit financing condition. To prevent measured movement data from being conflated with modelled or interpretive material, every substantive statement was assigned to one of three evidence tiers (Fig. 2):

1. **Tier 1, directly measured.** Indicators reported in official nationality-specific series or in peer-reviewed primary studies, reported as observed values.

2. **Tier 2, credibly inferred.** Estimates derived by triangulating measured movement data with published market or cost parameters. These are labelled as scenarios or envelopes and are never reported as observed values.
3. **Tier 3, currently unquantifiable.** Outcome domains that cannot be estimated from public sources and that require registry establishment and systematic follow-up before any numerical claim can be made.

This tiering is the principal safeguard against the interpretive risk that characterises fragile-state evidence, namely the temptation to convert plausible mechanisms into spurious rates.

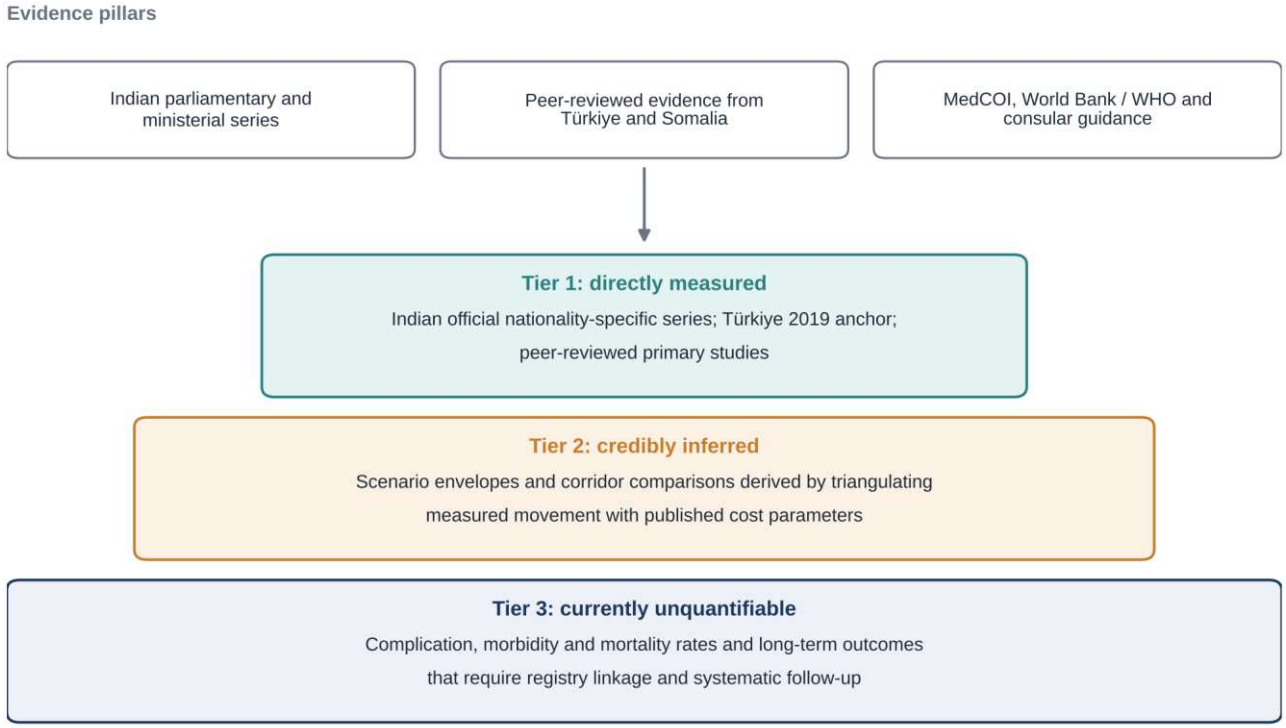


Fig. 2 Evidence architecture and validation logic used to assign evidence tiers. Three source pillars feed a three-tier classification that distinguishes directly measured indicators (Tier 1), credible inferences constructed from measured movement and published cost parameters (Tier 2) and outcome domains that cannot currently be quantified (Tier 3). MedCOI, Medical Country of Origin Information.

Data sources and search strategy

Five source pillars anchored the review. First, official Indian government series: parliamentary and ministerial annexures provided nationality-specific Somali data on medical-purpose foreign tourist arrivals (2015–2017 and 2022–2024) and on medical visas issued (2019–2024) [24, 25, 35]. Second, peer-reviewed evidence from Türkiye: a cross-sectional study of Somali patients treated in Istanbul and Ankara supplied a 2019 patient anchor derived from Ministry of Health data, together with destination-specific service-use and satisfaction patterns [23]. Third, country-of-origin documentation: successive Danish Immigration Service reports from the Medical Country of Origin Information (MedCOI) programme described service availability and care gaps in Mogadishu [5, 6]. Fourth, health-financing documentation: World Bank indicators drawn from the World Health Organization (WHO) Global Health Expenditure Database, household survey evidence, and Federal Government of Somalia and partner strategy documents [1, 2, 20, 21, 37–39]. Fifth, consular guidance: guidance issued by the Embassy of India in Addis Ababa for Somali medical-visa applicants described documentation requirements, advance-payment conditions and administrative steps along the pathway [40].

Bibliographic and general web searching was supplemented by citation chasing and by source-led retrieval from known official series. Search terms combined concepts of origin, destination, service and outcome, including “Somalia medical travel”, “Somali patients India”, “Somali patients Turkey”, “Somalia medical visa”, “Somalia cancer services”, “Somalia intensive care”, “Somalia health expenditure”, “outbound referral fragile states” and “cross-border care seeking Horn of Africa”. Reference lists of included documents were screened, and official annexures and consular guidance were retrieved directly from the issuing authorities. Searches covered 2014 to 2026, and key web-accessible official documents were re-checked against their source in October 2026.

Eligibility criteria

Eligibility was defined in the internal protocol and applied at both screening stages (Table 2).

Table 2 Eligibility criteria applied at title and abstract and at full-text screening.

Domain	Inclusion criteria	Exclusion criteria
Population	Somali nationals, Somali patient populations or Somalia-relevant cross-border referral evidence	Exclusively non-Somali populations; migration unrelated to health care
Destinations	India, Türkiye, Ethiopia and Egypt, with Somalia-side sources needed to characterise push factors	Other destinations, unless used strictly for contextual comparison
Time frame	Evidence informing 2014–2026, with the strongest quantified series for 2015–2024	Pre-2014 material, unless needed to establish baseline conditions
Evidence type	Official statistics; peer-reviewed studies; MedCOI and country-of-origin reports; multilateral and government financing documents; institutional reports; consular guidance	Opinion pieces; promotional or marketing content, except where used solely and transparently as indicative price-list sources; unverifiable claims
Outcomes and costs	Any extractable data on volumes, drivers, costs, patient barriers, outcome proxies and pathway frictions	Claims lacking a denominator, source traceability or definitional clarity

Screening and selection

Records were screened in two stages. At the first stage, titles, abstracts or executive summaries were assessed for relevance to Somali cross-border care seeking, to the four corridors and to the presence of extractable indicators. At the second stage, full texts were assessed against the criteria in Table 2. Evidence was retained where it contributed to the characterisation of drivers, pathways or barriers, even when it did not permit annual volume estimation. The most frequent grounds for exclusion at full-text assessment were exclusively non-Somali study populations, mobility unrelated to health care, destinations outside the defined scope, cosmetic and elective-tourism content outside the compensatory-mobility construct, and documents lacking extractable or verifiable data. Record counts at each screening stage are not reported, so a PRISMA flow diagram is not provided; the implications are discussed under limitations. The included sources are those listed in the References.

Data extraction and management

Data were extracted against the source document using a standardised template covering five domains: volume indicators (year, destination, indicator type and unit of observation); clinical drivers and service gaps; outcome proxies (for example cancer stage, satisfaction and reported error or waiting time); economic variables (procedure costs, household financing mechanisms, out-of-

pocket expenditure, catastrophic-spending markers and macroeconomic outflows); and pathway frictions (documentation, integrity controls, advance-payment protocols, reliance on intermediaries and risks to continuity after return). Extracted values were retained in their original units and definitions before any harmonisation.

Appraisal of source credibility

No single risk-of-bias instrument applies to an evidence base that combines official statistics, peer-reviewed literature, country-of-origin reporting and grey literature. Sources were therefore appraised against four criteria applied uniformly: provenance (official, secondary or anecdotal); definitional clarity (for example, arrivals versus visas issued, and how "medical traveller" was operationalised); temporal specificity (year coverage and missing periods); and replicability (whether tables, annexures and citations are traceable by a third party). Sources meeting fewer criteria were retained only for contextual or indicative material, and their status is stated wherever they are used.

Synthesis, harmonisation and estimation

Five mechanisms were applied to reconcile definitional discrepancies. Movement indicators were standardised as episodes (arrivals or visas issued) rather than unique individuals. Every analytical statement was labelled measured, inferred or unquantified according to the tier rules. Years and destinations lacking complete records were handled by scenario-based extrapolation, with measured series given priority and scenario points identified as such. Cost estimates used published lower-bound benchmarks where available, with uncertainty expressed as ranges. Where rates could not be computed, interpretation proceeded through consistently evidenced failure mechanisms (late presentation, diagnostic imprecision, financing delay, intermediary dependence and post-return discontinuity) rather than numerical inference.

National expenditure envelopes were constructed by multiplying measured or scenario episode counts by per-patient expenditure parameters. For India, the parameter range was US$7,143–8,571

per international patient, derived from published medical-value-travel market figures [41, 42] and applied to Indian visa counts. For the four-corridor scenario, the total episode counts in Table 11 are planning values in which Indian (and, for 2019, Türkiye) components are measured and the remainder is an author-specified scenario; the expenditure column implies a near-constant unit cost of about US$8,650 per episode. The derivation of each value is itemised in Additional file 1. These products are planning envelopes, not audited national accounts, and are reported with that qualification throughout.

Ethical considerations

The study used only publicly available documents and previously published materials. No patient-level identifiers were accessed, no interviews were conducted and no intervention was undertaken, so formal human-subjects ethics review was not required. Ethical caution was nevertheless exercised in interpretation: evidence from fragile settings is susceptible to overstatement, and the absence of registry data creates an incentive to assert rates that cannot be substantiated. The paper accordingly declines to construct morbidity ratios, complication rates or malpractice frequencies that the evidence cannot support.

Use of artificial intelligence

A large language model-based assistant (Claude, Anthropic) was used during manuscript preparation for language editing, restructuring to the journal's format, cross-checking of numerical values against the cited source documents and recalculation of derived quantities. The assistant did not select the research question, design the analytical framework or evidence-tiering protocol, or determine the interpretations and conclusions. The authors checked all outputs and take full responsibility for the content, and no language model is listed as an author.

Results

The synthesis is organised in five phases: measurement architecture and destination volumes; destination-specific service demand and disease profiles; outcome domains and failure mechanisms; economic burden at household and national level; and patient-level barriers in destination countries.

Measurement architecture across corridors

The central structural finding concerns measurement asymmetry. Only one of the four principal corridors is directly measurable. India is quantified through official nationality-specific series. Türkiye is partially measurable through a single annual anchor. Ethiopia and Egypt are substantively important, with recurrent demand signals, but remain weakly quantified in publicly accessible nationality-specific series. The asymmetry is not a peripheral technical limitation: it determines what can be purchased strategically, what can be negotiated bilaterally and what can be audited. Table 3 summarises the measurement status of each corridor.

Table 3 Corridor measurement status and data gaps, 2014–2026.

Corridor	Directly measured evidence (Tier 1)	Principal data gaps
Somalia to India	Official nationality-specific series: medical-purpose arrivals 2015–2017 and 2022–2024; medical visas issued 2019–2024	2014 and 2018 absent from accessible official tables; 2025–2026 require scenario projection
Somalia to Türkiye	Single 2019 anchor: 2742 Somali patients, 0.4% of total inbound medical-travel volume, derived from Ministry of Health data	No publicly accessible Somalia-specific annual series for 2014–2018 or 2020–2026
Somalia to Ethiopia	Documented presence and qualitative pathway evidence	No robust Somalia-specific annual public series
Somalia to Egypt	Documented presence, qualitative pathway evidence and an event-based demand signal (2024 medical convoy)	No robust Somalia-specific annual public series

Tier 1, directly measured evidence.

The India corridor: official series and post-pandemic dynamics

India is the most systematically quantified destination. Parliamentary annexures and ministerial tables document medical-purpose foreign tourist arrivals of Somali nationals for 2015–2017 and 2022–2024 and medical visas issued for 2019–2024 [24, 25, 35]. Both indicators count discrete travel episodes rather than unique individuals. Table 4 presents the full series.

Table 4 India corridor: official nationality-specific indicators for Somali medical travel, 2015–2024.

Year	Medical visas issued	Medical-purpose foreign tourist arrivals
2015	Not reported	3072
2016	Not reported	5549
2017	Not reported	4964
2018	Not available	Not available
2019	3454	Not reported
2020	1386	Not reported
2021	4162	Not reported
2022	10206	1006
2023	16411	15947
2024	12261	11717
Subtotal used in this paper	47880 (2019–2024)	13585 (2015–2017)
Minimum captured volume	61465 episodes (arrivals 2015–2017 plus visas 2019–2024; 2018 excluded)	

All values are Tier 1 and denote movement episodes, not unique individuals. Arrivals and visas issued are distinct indicators and are not directly interoperable; arrivals for 2022–2024 are shown for comparison and are not added to the minimum captured volume, to avoid double counting. Sources: [24, 25, 35].

Cumulatively, the minimum captured volume across 2015–2017 and 2019–2024 is 61,465 episodes (13,585 arrivals plus 47,880 visas), excluding the unresolved 2018 gap. The series shows a pronounced post-pandemic surge concentrated in 2022–2024. Visas issued fell by 60% between 2019 and 2020, then rose 2.5-fold between 2021 and 2022 and a further 61% between 2022 and 2023. The 2023 peak of 16,411 visas was 4.8 times the 2019 level (3,454) and 3.9 times the 2021 level. Visas fell by 25% to 12,261 in 2024, which remained 3.6 times the 2019 level.

Medical-purpose arrivals reported by the Ministry of Tourism for 2023 (15,947) and 2024 (11,717) were within 5% of the visas issued in those years, which lends mutual support to both indicators. In 2022, however, reported arrivals (1,006) were about one-tenth of visas issued (10,206). The published tables do not explain this divergence, so the 2022 arrival figure is treated with caution. Somali nationals accounted for 2.4% (2023) and 1.8% (2024) of all medical-purpose foreign tourist arrivals in India (659,356 and 644,387 respectively) [35].

Three explanations for the surge are consistent with the data and are not mutually exclusive: release of demand suppressed during the pandemic closure period; intensifying domestic tertiary-care

shortage; and accumulation of unmet clinical need among patients with chronic and progressive conditions who deferred treatment. The contraction in 2024 is compatible with exhaustion of deferred demand or with administrative tightening, or both. The revised Indian guidelines for Somali applicants are dated 7 October 2024 [40] and therefore postdate most of the year, so they cannot by themselves account for a full-year decline; other contributors cannot be assessed from the available data.

Two interpretive cautions govern the use of the series. First, arrivals and visas issued are not identical measures: a visa may be issued and not used, and an arrival may occur under another visa category, so the two segments should be read as adjacent but non-interchangeable. Second, the unit of observation is the episode. Repeat travel by the same patient, a recurring feature of oncology, dialysis and transplant follow-up, is counted more than once. The series therefore establishes a robust floor for corridor volume and an unreliable ceiling for patient numbers (Fig. 3).

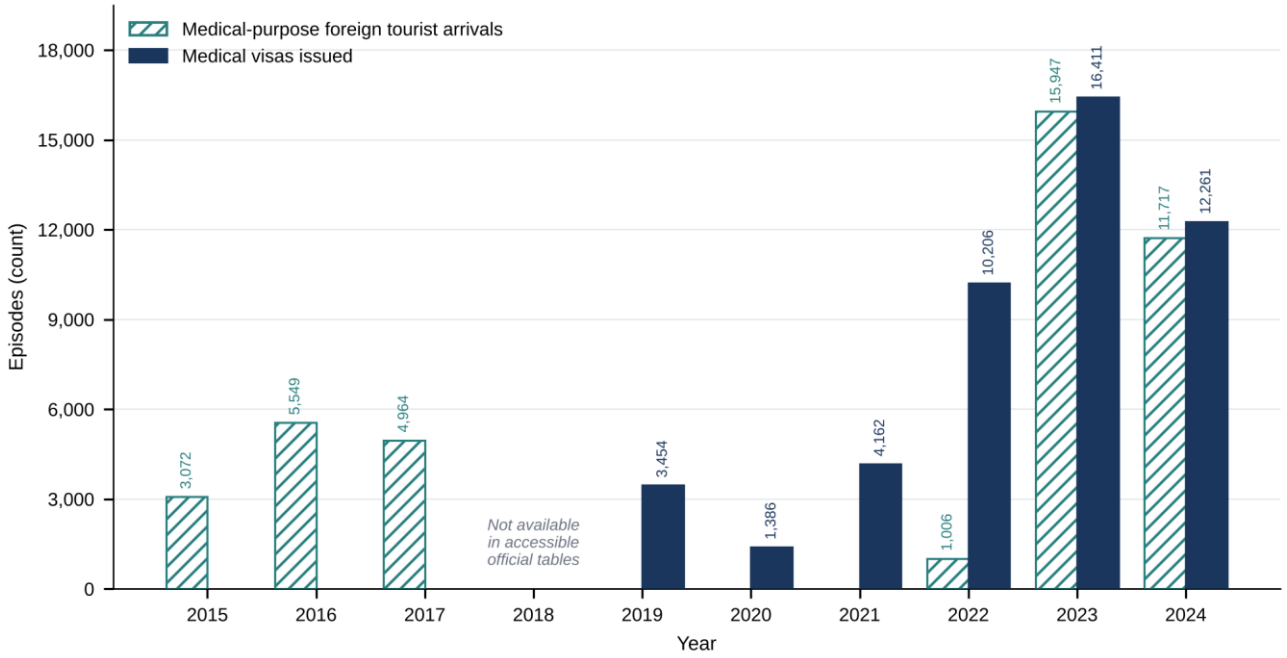


Fig. 3 India corridor: official Somali medical-travel episodes, 2015–2024. Bars show medical-purpose foreign tourist arrivals (hatched) and medical visas issued (solid) for Somali nationals. The two indicators are not interoperable and are not summed within a year. Both indicators are

unavailable for 2018, and arrivals are not reported for 2019–2021 in the sources used. Sources: references [24, 25, 35].

The Türkiye corridor: a verified anchor without a series

For Türkiye, the principal quantitative anchor is a peer-reviewed cross-sectional study of Somali patients treated in Istanbul and Ankara, which reports 2,742 Somali medical travellers in 2019, equivalent to 0.4% of Türkiye's total inbound medical-travel volume, based on Ministry of Health data [23]. The same study, whose primary survey was administered between July 2021 and May 2022, characterises the Somali patient population as predominantly male, with a mean age of approximately 35 years and a mean reported monthly income of US$921. Treatment concentrated in in-vitro fertilisation, urology and orthopaedics, most patients held no health insurance, and intermediary organisations were used extensively to arrange travel and admission [23].

No year-by-year Somali series is publicly accessible for this corridor. The absence is consequential because Türkiye is plausibly the second-largest destination by volume and is the corridor in which intermediary dependence is best documented. The national inbound health-travel series can be used only as a contextual denominator, indicating whether Somali flows are likely to have risen or fallen with the wider market (Table 5). It must not be used to impute Somali volumes, because the Somali share is observed in a single year and its stability over time is unknown.

Table 5 Türkiye: total inbound health-travel volumes, 2014–2025, used solely as a contextual denominator.

Year	Total inbound health travellers	Year	Total inbound health travellers
2014	414658	2020	435691
2015	360180	2021	729592
2016	377384	2022	1381807
2017	433292	2023	1538643
2018	551748	2024	1506442
2019	756926	2025	1398580

Figures denote all nationalities. The single observed Somali share (0.4% in 2019) cannot be assumed constant across the series. Figures for 2026 are not yet published. Evidence tier: Tier 1 for the denominator and Tier 3 for any Somali-specific annual inference. Sources: [43, 44].

The Ethiopia and Egypt corridors: demand without measurement

Ethiopia and Egypt present the inverse evidential profile: recurrent demand signals in the absence of systematic nationality-specific annual data. This quantification gap constrains comparative analysis and is itself a finding of policy significance. Ethiopia is described as a regional proximity and stabilisation corridor, particularly where overland access or shorter travel distance is decisive [45], and has pursued deliberate expansion of its own health-tourism capacity, which is likely to consolidate the corridor further [46]. Egypt combines geographical proximity with demand for cardiology, oncology and other specialist services. The scale of unmet need is illustrated by an Egyptian medical convoy to Mogadishu in September 2024, which examined 1,674 Somali patients and performed 436 surgical procedures in a single mission [36]. An episode of that magnitude, delivered by a visiting team in a compressed period, is a direct measure of latent demand for services that the domestic system does not supply.

Neither corridor can currently be quantified longitudinally. Any figure presented for Ethiopia or Egypt in this paper is therefore a Tier 2 scenario value constructed for planning purposes and reported as such.

Service demand and disease profiles

Across the evidence base, outbound demand concentrates in continuity-dependent and technology-intensive service lines. Among 106 Garowe residents who had recently travelled abroad for treatment, the most frequent complaints were musculoskeletal (17%), urinary (16%), neurological (13%), malignant (8%) and gastrointestinal (8%) conditions [18]; this is a small, non-random sample and is not a national disease profile.

Oncology emerges as the strongest driver of high-cost referral. Oesophageal cancer was the most frequent malignancy in successive Mogadishu hospital series, accounting for 32.3% of 403 cases diagnosed in 2016–2017 [47], 21.7% of 1,306 cases diagnosed in 2017–2020 [48] and 37.2% (898 of 2,417 cases) in a six-year retrospective study covering January 2020 to July 2025 [33]. The

proportions differ by series and period and should not be pooled. Domestic limitations are categorical rather than incremental: no radiotherapy facility is reported, chemotherapy is available in only a small number of private facilities, and no national cancer registry or national cancer institute exists [15–17]. A multicentre observational study of oesophageal cancer in Mogadishu, covering patients diagnosed in 2022–2024, reports late-stage presentation dominating, with diagnostic and referral delays and limited access to definitive treatment [14]. Every patient requiring radiotherapy must, by definition, be referred abroad.

Cardiovascular and renal conditions generate travel through a related mechanism: both depend on diagnostic precision, procedural infrastructure and longitudinal management. In a retrospective registry of 1,140 patients with abnormal echocardiograms at a Mogadishu tertiary hospital (2019), hypertensive heart disease (39.8%), valvular heart disease (34.6%) and heart failure with reduced ejection fraction (30.8%) were the most frequent findings, alongside a substantial burden of rheumatic and congenital heart disease [49]. These are conditions for which valve surgery, bypass grafting and device implantation may be indicated and are not reliably available domestically [5, 6]. In nephrology, dialysis is available on a limited basis while kidney transplantation is, to our knowledge, not performed in the country [5, 6]. Surgical subspecialty capacity has expanded since the re-establishment of postgraduate surgical training in Mogadishu, but the resulting cadre remains small relative to need [50].

Destination profiles are differentiated rather than interchangeable. India is consistently associated with high-acuity tertiary intervention: oncology, cardiac surgery, renal care, complex diagnostics and transplant pathways. Türkiye shows a distinct service mix in which in-vitro fertilisation, urology and orthopaedics predominate [23]. Ethiopia functions as a proximity corridor, and Egypt combines proximity with demand for cardiology, oncology and other specialist services. Table 6 synthesises these patterns.

Table 6 Destination-specific service demand and disease profiles.

Condition or service line	Indicative domestic burden or signal	Principal destination(s)	Core reason for travel
Oncology and malignant disease	Oesophageal cancer 21.7–37.2% of recorded malignancies in hospital series; late-stage presentation; no radiotherapy capacity reported; chemotherapy limited to a small number of private centres	India, Ethiopia, Egypt	Advanced imaging, staging, chemotherapy, radiotherapy and oncological surgery
Cardiovascular disease	Raised blood pressure in 26% of adults (2015); hypertensive, valvular and rheumatic heart disease prominent in a hospital echocardiography series	India, Egypt	Coronary artery bypass grafting, valve replacement, device implantation, higher-level diagnostics
Renal disease and transplantation	Dialysis available on a limited basis; no domestic transplantation reported	India, Türkiye	Dialysis capacity constraint, transplant access, specialist nephrology
Reproductive medicine	Strong and sustained demand signal in the Türkiye evidence base	Türkiye	In-vitro fertilisation and culturally congruent fertility services
Orthopaedics, urology and neurology	Musculoskeletal (17%), urinary (16%) and neurological (13%) conditions most frequent among 106 Garowe travellers; orthopaedics and urology prominent among Somali patients in Türkiye	Türkiye, India	Arthroplasty, minimally invasive surgery, prosthetics, structured rehabilitation

Destinations are those named in the cited sources and are indicative. Sources: [8, 18, 23, 49].

Outcome domains, evidence status and failure mechanisms

Outcomes must be interpreted across the entire cross-border pathway rather than at the point of treatment alone. The available evidence does not permit calculation of a pooled mortality, complication, readmission or treatment-success rate for Somali patients treated abroad. The limitation is structural: visa and arrival statistics are movement indicators, not clinical records, and Somalia maintains no linked outbound-referral dataset capturing diagnosis, disease stage, procedure, destination facility, discharge status or follow-up after return. This review therefore distinguishes directly observed outcomes from plausible pathway mechanisms and declines to attribute domestic mortality estimates to patients treated internationally.

Four outcome domains are nevertheless policy-relevant and should be specified now, so that the instruments capable of measuring them can be designed correctly:

1. **Access and timeliness** concerns whether clinically eligible patients reach appropriate treatment before disease progression. Fundraising delay, visa processing, repeat diagnostics and fragmented referral decisions each lengthen the interval from indication to definitive care.

2. **Clinical outcomes** include peri-procedural survival, complications, symptom control, functional recovery and disease-specific response, all unmeasured at population level.
3. **Continuity outcomes** concern medication access, wound review, rehabilitation, laboratory monitoring, pathology review and specialist follow-up after return. A systematic review of patient-reported continuity found an association with at least one favourable health outcome in most included studies, although the evidence was heterogeneous [22].
4. **Patient-reported outcomes** include quality of life, functional status, comprehension of the treatment plan, confidence in follow-up arrangements and financial distress.

The principal risk identified across the evidence is the discontinuous episode of care. A technically successful intervention may deliver limited long-term benefit where the patient returns without a complete discharge summary, operative report, pathology record, medication plan, implant specification, rehabilitation protocol or a named clinician accountable for follow-up. The risk is concentrated in the conditions that generate the largest outbound volumes (oncology, renal transplantation, cardiac surgery and arthroplasty), because each requires repeated monitoring over months or years. Language barriers and dependence on intermediaries further weaken informed consent, expectation management and the transfer of clinical information [23, 34]. This mechanism is inferred from the structure of the pathway and from evidence in other settings; no Somalia-specific outcome study was identified.

Domestic severity and capacity data explain why travel is so frequently perceived as the last viable option, without themselves describing outbound outcomes. A nationwide assessment of emergency and critical-care services documents substantial capability gaps across the hospital network [51, 52], and a recent commentary proposes that families may perceive intensive care as a place of death, producing decision delay driven by mistrust and financial constraint [53]. These are domestic observations and are reported only as context for the decision to travel.

Where rates cannot be computed, interpretation proceeds through mechanism. Five failure mechanisms recur across the evidence base: terminal-stage referral following prolonged diagnostic delay; avoidable referral generated by diagnostic uncertainty or institutional mistrust; financial exhaustion producing treatment interruption mid-episode; coordination risk arising from intermediary-mediated arrangements; and continuity failure after return. Fig. 4 locates these mechanisms along the pathway, and Table 7 states the evidence status and recommended indicator for each outcome domain.

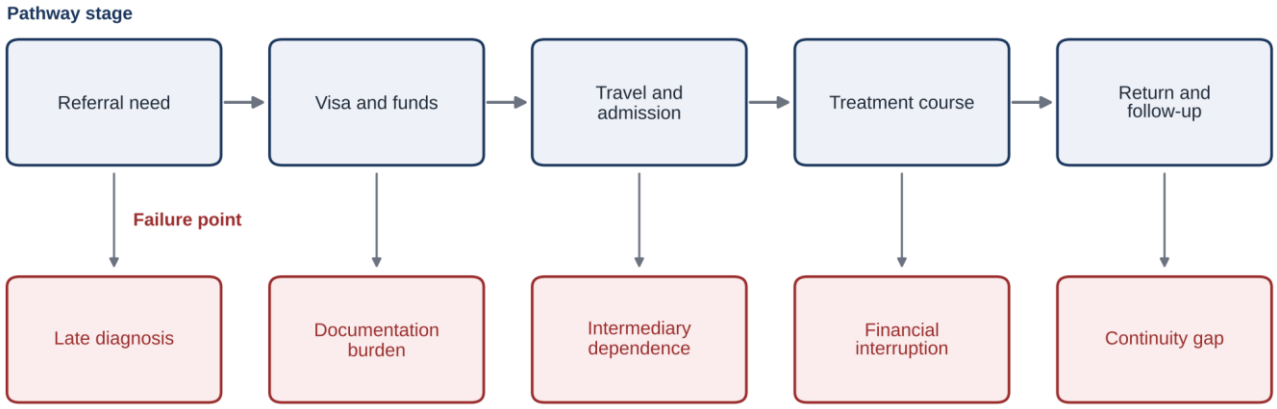


Fig. 4 Cross-border care pathway and common failure points. The sequence identifies the stages at which clinical need can be converted into avoidable harm through diagnostic delay, documentation burden, intermediary dependence, financial interruption or weak follow-up after return. The failure points are mechanisms inferred from the evidence, not measured rates.

Table 7 Outcome domains, recommended indicators, current evidence status and policy application.

Outcome domain	Recommended indicator	Current evidence status	Policy application
Access and timeliness	Referral-to-treatment interval; disease stage at arrival; visa or financing delay	Not systematically measured (Tier 3)	Identify avoidable delay and inequitable exclusion
Immediate clinical outcome	Procedure completion; discharge status; major complication; in-hospital death	Destination-side records exist but are not linked nationally (Tier 3)	Assess provider safety and referral appropriateness
Post-return continuity	Medication access; laboratory monitoring; rehabilitation; 30-, 90- and 180-day follow-up	Largely unmeasured (Tier 3)	Prevent avoidable deterioration after technically successful treatment
Patient-reported outcome	Quality of life; functional recovery; comprehension of care plan; satisfaction	Partial evidence from single-destination surveys (Tier 1, limited)	Measure benefit from the patient perspective

Outcome domain	Recommended indicator	Current evidence status	Policy application
Financial outcome	Catastrophic expenditure; debt; asset sale; treatment interruption	Cost and financing data from one small survey; catastrophic expenditure not measured for outbound care (Tier 1, indirect)	Link clinical benefit to financial protection
Pooled morbidity and mortality	Aggregate complication and mortality rates for outbound patients	Not derivable from public sources (Tier 3)	Requires registry linkage before any rate is asserted
Malpractice exposure	Complaint rate; adverse-event reporting; records-release compliance	Suggested by reported error and diagnostic concerns; not quantifiable (Tier 3)	Requires bilateral reporting arrangements and a domestic complaints mechanism

Tier 1, directly measured; Tier 3, currently unquantifiable.

Household economic burden

The economic burden of an outbound episode extends well beyond the hospital invoice. A complete episode-cost framework comprises pre-departure consultation and repeat diagnostics; passport, visa and administrative processing; treatment deposits; air or overland transport for the patient and an accompanying caregiver; accommodation and subsistence; interpreter and facilitator charges; medicines, consumables and rehabilitation; income forgone by patient and caregiver; post-return monitoring; and, in unsuccessful cases, emergency extension of stay or repatriation of remains. Table 8 sets out this framework alongside the measured cost profile, and Fig. 5 shows the reported component means.

The only primary cost data identified were collected in a survey of 106 people who had travelled abroad for treatment from Garowe, Puntland, in 2021, conducted by the Somali Institute for Research Development and Analysis (SIDRA) and recruited by snowball sampling as part of a hospital feasibility study [18]. The survey was not designed to measure the magnitude of medical travel or to capture indirect economic impacts. It reports a mean total direct cost of US$8,543 per episode (range US$380–79,390), with component means of US$5,983 for health care, US$1,995 for accommodation, US$1,291 for travel and US$398 for visa and administrative costs [18]. The component means sum to US$9,667, which exceeds the reported overall mean; they are presumably averaged over respondents who incurred each item, so they are used here to indicate the relative weight of cost categories and not as an additive decomposition. The same source records

accommodation costs reaching US$30,000 and health care costs reaching US$40,000 for individual respondents. The mean should be read as a partial direct-cost estimate from a small, non-random, regionally specific sample. It excludes indirect costs, post-return costs and the opportunity cost of depleted productive assets, and it cannot be generalised to Somalia as a whole.

Financing is socialised downward onto households and kinship networks rather than pooled nationally. Of the financing of treatment abroad in the Garowe survey, 43% came from family, diaspora or community support, 20% from current income, 17% from life savings and 5% from asset liquidation; the remaining 15% is not itemised in the summary available [18]. In the household survey of 2,000 households, only 3.5% held any health insurance [21]. The distributional implication is direct: tertiary care appears to be rationed less by clinical triage than by a household's capacity to mobilise cash quickly. The mean direct cost is equivalent to about nine months of the mean monthly income of US$921 reported by Somali patients treated in Türkiye [23], an imperfect comparator drawn from a different population. Catastrophic expenditure was not measured for outbound care in any source identified, so the proposition that costs of this magnitude are catastrophic for many households is an inference from the cost and income data.

Table 8 Household economic burden of an outbound episode: cost architecture, measured values and financing profile.

Economic layer or financing channel	Component or value	Measurement approach or interpretation
Direct medical	US$5983 mean (range 200–40000)	Reported health care cost; largest single component
Direct non-medical: accommodation	US$1995 mean (range 50–30000)	Long stays can make non-medical costs decisive for completion of treatment
Direct non-medical: travel	US$1291 mean (range 100–7990)	Cross-border mobility cost incurred before treatment commences
Direct non-medical: visa and administration	US$398 mean (range 30–1400)	Understates the broader documentation and transaction burden
Reported mean total direct cost per episode	US$8543 (range 380–79390)	Partial direct-cost estimate; component means sum to US$9667 and are not additive
Indirect costs	Not quantified	Lost earnings, business interruption, caregiver time and school absence; human-capital and time-use methods required
Post-treatment costs	Not quantified	Monitoring, complications, readmission, repeat travel and long-term medicines; requires registry linkage at 30, 90 and 180 days

Economic layer or financing channel	Component or value	Measurement approach or interpretation
Financing: family, diaspora, community	43%	Social capital functioning as informal insurance
Financing: current income	20%	Liquidity drawn from wages or business income
Financing: life savings	17%	Depletion of accumulated household reserves
Financing: asset liquidation	5%	Distress financing through sale of productive assets
Financing: other or not itemised	15% (residual)	Not itemised in the source summary used

Source: SIDRA survey of 106 medical travellers, Garowe, 2021 (snowball sample; US dollars) [18]. The 15% residual is calculated as 100% minus the four itemised channels. Costs are partial, are not nationally representative and are not adjusted for inflation.

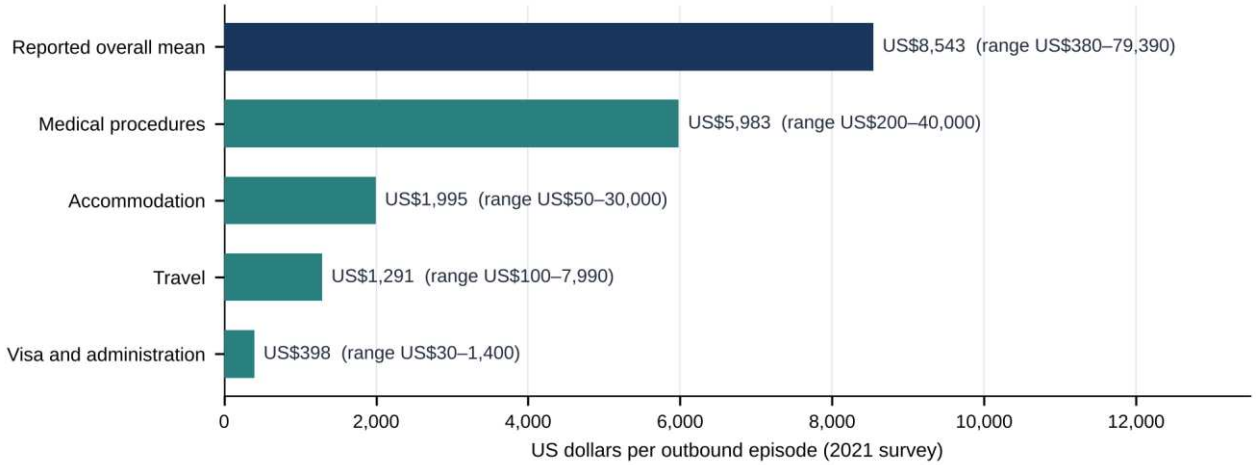


Fig. 5 Mean direct cost components of outbound episodes reported by Garowe travellers, 2021. Bars show the reported overall mean and the component means; ranges are minimum to maximum. Component means sum to more than the overall mean and are presented for relative weight only. Source: SIDRA survey of 106 medical travellers (snowball sample), Garowe, 2021 [18]. Values are US dollars.

Procedure-level cost comparison across destinations

Destination selection is in part an economic calculation performed under conditions of catastrophic risk. Table 9 presents indicative procedure cost ranges for the three corridors for which price information is publicly available, with a high-income reference point where one exists. These values come from commercial market-intelligence sources and carry low evidential weight.

Table 9 Illustrative procedure cost ranges by destination (US dollars).

Procedure	India	Türkiye	Egypt	High-income reference
Coronary artery bypass grafting	5200–8000	9000–15000+	7500–26000	~123000 (United States)
Kidney transplantation	12000–15000	18000–22000	~16000	Not comparable

Procedure	India	Türkiye	Egypt	High-income reference
Hip arthroplasty	~7000	12000+	~11300	Not comparable
In-vitro fertilisation (per cycle)	~3250	6000+	~5000	Not comparable
Dental implant	~1000	Not reported	Not reported	Not comparable
Comprehensive medical assessment	~350	500+	~250	Not comparable

Evidence tier: Tier 3. Values are indicative ranges from commercial price-list and market-intelligence sources [41, 54], presented only to illustrate relative magnitude. They are not audited prices, exclude travel, accommodation and indirect costs, and should not be used for procurement or contracting without independent verification.

The relative differentials are informative even under this caveat. The upper end of the Indian range for coronary artery bypass grafting (US$8,000) is roughly one-third of the upper end of the Egyptian range (US$26,000), and the Indian range is 4–7% of the high-income reference. This differential is consistent with the prominence of the India corridor despite its heavier administrative and logistical burden, and suggests that cost rather than proximity is an important determinant of destination for high-acuity surgery; the available data do not allow this to be tested.

National expenditure envelope and macroeconomic leakage

Somalia's health-financing baseline establishes the significance of any outbound expenditure figure. Table 10 presents the principal indicators.

Table 10 Somalia health-financing indicators.

Indicator	Value	Source basis and interpretation
Out-of-pocket share of household health expenditure	44.9%	Household survey of 2000 households; non-probability sampling concentrated in Banadir; not nationally representative [21]
Out-of-pocket share of current health expenditure (national accounts)	30.8% (2023); range 31–47% over 2015–2023	WHO Global Health Expenditure Database via World Bank [20]; yearly values 2015 to 2023: 37.5, 45.0, 39.7, 43.2, 45.0, 47.1, 41.5, 40.7, 30.8; 2024 not reported. Distinct source, method and reference period; not interchangeable with the survey estimate
Health insurance coverage	3.5%	Household survey [21]; minimal financial protection
Households with health spending above 10% of income	24%	Household survey [21]; conventional catastrophic-expenditure threshold [32, 56]

The government health allocation has remained below the 15% Abuja Declaration target and external financing dependence is high [37, 55]; precise shares were not independently verified and are not tabulated.

Two estimates of out-of-pocket burden circulate and are frequently conflated. The household-survey estimate of 44.9% and the national-accounts estimate of 30.8% for 2023 are not contradictory and are not substitutable. They differ in source, method, scope and reference period: the first measures the share of household health spending met directly by households in a surveyed

sample, and the second the share of aggregate current health expenditure met out of pocket across all financing sources, including external assistance. Analysts should state which measure they use. At macroeconomic level, the India corridor provides the strongest lower-bound evidence because it alone has nationality-specific movement counts. Applying a published medical-value-travel benchmark of approximately US$7,143–8,571 per international patient [41, 42] to the measured Somali series yields indicative expenditure envelopes of roughly US$73–87 million in 2022, US$117–141 million in 2023 and US$88–105 million in 2024. The cumulative implied expenditure to India across 2015–2017 and 2019–2024, excluding 2018, is approximately US$439–527 million. The benchmark is a market-derived average for all international patients to India, not a Somali-specific cost, and the Somali mix of conditions may differ.

Extending the estimate to all four corridors necessarily increases uncertainty, because longitudinal Somali-specific volumes are unavailable for Türkiye, Ethiopia and Egypt. The central four-corridor scenario places 2024 outbound expenditure at approximately US$219.3 million, about 1.8% of a gross domestic product projected at US$12.11 billion [37]. This is a planning scenario, not observed expenditure. Table 11 presents the selected-year envelope and separates the measured component from the scenario residual, Fig. 6 compares the scenario with the India-only range, and the derivations are itemised in Additional file 1.

Table 11 Scenario-based national outbound expenditure envelope, selected years.

Year	India episodes (measured)	Türkiye episodes (measured)	Scenario residual episodes	Total episodes	Expenditure (US$ millions)	Implied US$ per episode
2014	Not available	Not available	6305	6305	54.6	8660
2016	5549 (arrivals)	Not available	3281	8830	76.1	8618
2019	3454 (visas)	2742	3839	10035	87.1	8680
2020	1386 (visas)	Not available	3787	5173	45.0	8699
2023	16411 (visas)	Not available	13377	29788	257.2	8634
2024	12261 (visas)	Not available	13097	25358	219.3	8648
2026	Not available	Not available	25607	25607	221.4	8646

All values are Tier 2 (scenario). The scenario residual is total episodes minus the measured Indian and Türkiye components and represents author-specified planning values for Türkiye, Ethiopia, Egypt and other flows. The implied cost per episode is expenditure divided by total episodes; it is near-constant across years and close to the Garowe survey mean (US$8543) and the upper India benchmark (US$8571). Values illustrate order of magnitude and are not audited expenditure.

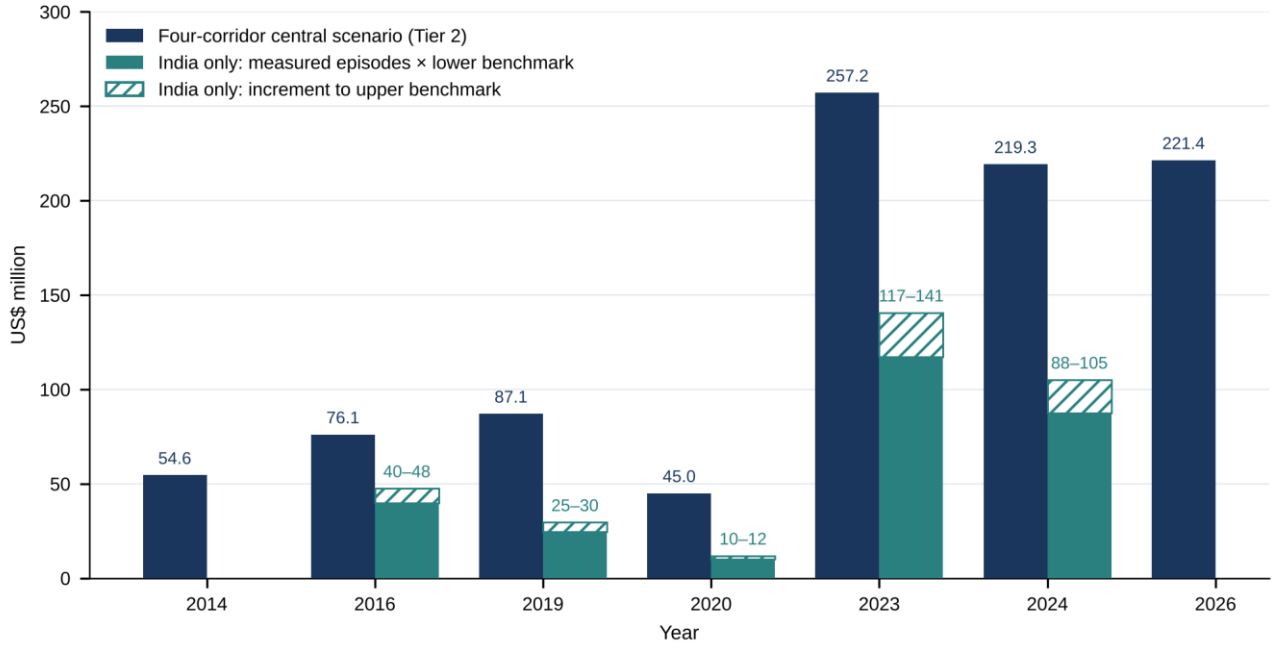


Fig. 6 Selected-year national outbound expenditure envelope: central scenario and India-only range. Navy bars show the four-corridor central scenario (Tier 2). Teal bars show India-only expenditure obtained by multiplying measured Indian episodes (arrivals for 2016, visas for 2019–2024) by the lower benchmark of US$7,143 per patient; the hatched increment extends to the upper benchmark of US$8,571, and labels give the range in US$ millions. No India-only value is shown for 2014 or 2026. Values illustrate scale rather than audited expenditure.

The order of magnitude is consistent. India-only estimates reach US$117–141 million in 2023 and US$88–105 million in 2024, and the four-corridor central scenario exceeds US$200 million in 2023, 2024 and 2026. Because the scenario unit cost is near-constant, each additional 1,000 non-India episodes adds about US$8.7 million. The scenario is therefore most sensitive to the unmeasured residual, which accounts for 45% of total episodes in 2023 and 52% in 2024. These figures are not expressed as a share of national health expenditure, because the sources used do not report a comparable aggregate.

Patient-level barriers in destination countries

Patient barriers are destination-specific in form but structurally related in origin: each arises where an unregulated pathway meets a household with limited liquidity, limited documentation and limited recourse.

India. The Indian pathway presents the most demanding administrative requirements. Following the closure of the Indian mission in Somalia, medical visas for Somali nationals are processed through the High Commission in Nairobi and the Embassy in Addis Ababa, obliging applicants to travel to a third country to lodge and complete an application. Under revised guidelines dated 7 October 2024, the Indian hospital must issue a medical invitation letter on letterhead stating the illness, treatment plan and estimated cost, and must ask the patient to make a token advance payment of approximately 25% of the estimated cost of treatment; hospitals are required to have a refund policy. Applicants must pay a fee of US$83 and provide a non-criminal record certificate issued by the Criminal Investigation Department, a bank statement showing sufficient funds for medical and overhead expenses, a referral letter from a local hospital, the invitation letter, proof of the advance payment and original passports [40]. The guidelines state that their aim is to curb misuse of medical visas while continuing to serve genuine patients, and they contain no restriction on the choice of hospital or treatment location [40]. These controls may reduce misuse of the medical-visa category, but they also increase delay and cost and may disproportionately exclude lower-income households whose clinical need is identical.

Türkiye. The Türkiye pathway combines cultural proximity with pronounced intermediary dependence: more than half of Somali patients in the single available study arranged care through facilitator organisations [23]. Satisfaction was generally favourable, averaging 3.30 on a five-point scale, and most respondents would use Turkish services again. The same dataset records substantial negative experience: recurring errors reported by 32.6%, extended waiting times by 16%, elevated cost by 15.4%, insufficient equipment by 10.7% and diagnostic concerns by 8%, and only 42%

reported that language was not a barrier [23]. These findings describe an environment that is preferable to domestic scarcity for many patients but is not uniformly safe, and in which coordination across language and system boundaries shapes outcome.

Egypt. Direct evidence on Somali patients is limited to the 2024 medical convoy [36]. Qualitative work with non-national tuberculosis patients in Cairo, not specific to Somalis and based on interviews conducted in 2011, documents the financial and social costs of sustaining treatment adherence during prolonged foreign residence [57]. The extent to which these findings apply to Somali patients is untested.

Ethiopia. Somali-specific quantified evidence is sparse. Proximity may preserve access for urgent and stabilisation cases and reduce travel cost [45], but the corridor carries its own capacity constraints [46]. The measurement gap itself limits analytical precision and is a priority for data collection.

Four barriers are reported across destinations and appear structural rather than country-specific: intermediary exploitation, including steering toward commission-generating facilities, redundant diagnostic testing and inflated invoicing; language and cultural barriers that undermine informed consent and comprehension of post-operative requirements; the practical absence of legal recourse in alleged negligence, compounded by the cost and complexity of foreign litigation and inconsistent release of medical records [34]; and socio-economic marginalisation during prolonged treatment. A fifth burden arises where treatment fails and death occurs abroad: repatriation of remains requires specialised embalming, sealed caskets, regulatory clearance and air freight, which most Somali patients are unlikely to have insured, obliging families to mount a second fundraising effort in an unfamiliar jurisdiction. These last statements derive from commentary and professional sources and from the authors' synthesis of pathway requirements, rather than from systematic data. Table 12 summarises the destination-specific barrier profile.

Table 12 Destination-specific patient barriers, consequences and evidence strength.

Destination	Principal barrier	Consequence for the patient	Evidence strength
India	Visa processing outside Somalia; extensive documentation; advance token payment of about 25% of estimated cost; hospital invitation letter	Delay; exclusion of lower-income households; administrative friction before treatment begins	Strong
Türkiye	Extensive intermediary dependence; waiting time; recurring errors; cost and diagnostic concerns; language barrier	Variable care navigation; incomplete trust; coordination failure across language and system boundaries	Moderate
Egypt	Financial and social vulnerability during prolonged treatment (indirect evidence)	Adherence risk; psychosocial strain; prolonged household burden	Weak to moderate
Ethiopia	Sparse Somali-specific evidence; navigation and financing constraints; destination capacity limits	Measurement gap constrains precision; proximity may preserve access for urgent cases	Weak
All destinations	Limited legal recourse; inconsistent release of records; no repatriation cover; no post-return handover	Unremedied adverse events; continuity failure; secondary financial shock after death abroad	Weak to moderate

Evidence strength denotes the clarity and traceability of the underlying evidence, not the severity of patient burden.
Sources: [23, 34, 36, 40, 45, 46, 57].

Discussion

Principal findings

This synthesis supports a single organising interpretation: Somali outbound medical travel functions as an unofficial parallel tertiary-care system. It is privately financed, minimally regulated, unmeasured outside the India corridor, and generated principally by domestic deficits in diagnostics, specialised treatment and continuity of care. Three findings sustain this interpretation.

First, the phenomenon is substantial and, in one corridor, measurable. The Indian series alone documents a minimum of 61,465 episodes across nine reported years. The post-pandemic trajectory indicates more than a return to earlier volumes: medical visas issued in 2023 were 4.8 times the 2019 level, and the 2024 level remained 3.6 times higher despite a 25% contraction. Whether this reflects the release of deferred demand, deepening domestic shortage or both cannot be determined from movement data. A policy framework that treats outbound travel as marginal would nevertheless be working from a false premise about its scale.

Second, the clinical profile corresponds to the pattern expected where tertiary infrastructure is absent. Patients travel for the services that fail first in such systems: oncology, advanced

cardiovascular care, renal replacement and transplantation, advanced diagnostics and selected reproductive and orthopaedic services. The correspondence between what is reported as unavailable domestically and what is sought abroad is strongest in oncology, where the absence of reported radiotherapy capacity makes foreign referral a clinical necessity for an entire category of patients [15–17]. This alignment is consistent with a supply-determined phenomenon, although the available data cannot exclude a contribution from preference or perceived quality, which the Garowe survey suggests is also present [18].

Third, the mechanisms through which outcomes may be compromised recur across the sources examined: late presentation, financial interruption, intermediary-mediated coordination risk and discontinuity after return. The absence of a registry does not make these mechanisms speculative; it makes them unquantified. The distinction matters because the appropriate response to an unquantified but consistently described mechanism is to build the measurement instrument rather than to await evidence that the current architecture cannot produce. We stress that these mechanisms are inferred from the structure of the pathway and from evidence in other settings, and that no Somalia-specific outcome study was identified.

From a systems perspective, the measurement asymmetry between corridors is more than a technical limitation. Accurate quantification of outbound referral is a precondition for strategic purchasing, for credible bilateral negotiation and for targeted domestic investment in the service lines where leakage is greatest. A health authority that cannot count its outbound referrals cannot price them, cannot negotiate them and cannot decide rationally between purchasing them abroad and producing them at home.

Relation to the wider literature

These findings draw on and qualify the patient-mobility literature. That literature developed largely around discretionary flows in which price, waiting time and amenity are the operative variables and the patient retains a functioning domestic alternative [26, 27]. The Somali case belongs to a

different category, examined in work on South–South medical travel and on the equity implications of patient mobility for lower- and middle-income countries [29–31]. In that category, travel is compensatory, the domestic alternative is absent rather than inferior, and the binding constraint is household liquidity rather than consumer preference.

This distinction has a corollary that a consumption-based reading does not capture. Where mobility is discretionary, outbound flows represent a transfer of consumption. Where mobility is compensatory, they represent a transfer of the tertiary-care function itself, including its financing, its clinical governance and its accountability, to jurisdictions in which the origin state has no regulatory standing. The Somali patient abroad is less a consumer exercising choice in a market than a citizen receiving an essential service outside any system that can be held responsible for its quality, cost or continuation.

The findings also align with evidence on health financing in fragile and conflict-affected settings, which describes minimal prepayment, dominant out-of-pocket payment, high external dependence and weak stewardship of private provision [58]. Somalia's trajectory towards universal health coverage has been analysed in these terms [3, 7, 59], and outbound medical travel should be incorporated into that analysis as a manifestation of coverage failure rather than treated as a separate phenomenon. Catastrophic health expenditure is conventionally defined by the share of household resources absorbed by health payments [32, 56, 60]. Catastrophic expenditure was not measured for outbound care in any source identified, but a mean direct cost of US$8,543 per episode [18], equivalent to roughly nine months of the mean monthly income reported by Somali patients treated in Türkiye [23], makes it a likely consequence for many households. Direct measurement is a priority.

Clinical implications: referral quality and continuity

The findings suggest that the quality of the referral may be nearly as consequential as the quality of the destination facility. Excellent international care cannot compensate for inadequate initial

staging, incomplete pre-referral assessment or absent follow-up. In oncology, nephrology and advanced cardiology, the care continuum is only as strong as its weakest transition, and the Somali pathway contains three such transitions in sequence: the referral decision, the cross-border transfer and the post-return handover.

Three clinical consequences are plausible, though none has been measured. First, referral appropriateness is unassessed. Without pre-referral staging standards, some patients may travel who cannot benefit, expending household resources on interventions that were not clinically indicated, while others who would benefit do not travel at all. Second, the returning patient re-enters a system with no guaranteed record of what was done. Without discharge summaries, operative notes, pathology reports, implant specifications and medication plans, domestic clinicians may be asked to manage complications from procedures they cannot reconstruct. Systematic evidence from other settings associates better continuity with better health outcomes [22]. Third, the cost pressure of extended accommodation may encourage early return, which would shorten the interval for monitoring at the point where domestic capacity to intervene is weakest. This last proposition is a hypothesis and should be tested.

These are addressable problems, and they are addressable at modest cost relative to infrastructure investment. Standardised pre-referral staging protocols, a mandatory structured discharge dataset as a condition of any publicly facilitated referral, tele-specialist review before referral is authorised and a named domestic clinician accountable for each returning patient would together address a large part of this gap without requiring a new hospital.

Economic and financing implications

The financial evidence supports a conclusion that is counter-intuitive but consequential: Somalia already pays for tertiary care, and pays substantially. Applying a published benchmark to the measured Indian series alone gives US$88–105 million for 2024 and US$117–141 million for 2023, and the four-corridor central scenario places 2024 expenditure at approximately US$219 million, or

about 1.8% of projected gross domestic product. These are planning envelopes, not accounts, but their order of magnitude is not in doubt. What the country does not do is pay efficiently. Expenditure is disaggregated across thousands of individual foreign invoices, mobilised through emergency fundraising and informal social support, and settled without price negotiation, quality assurance, outcome verification or any mechanism for capturing value. The question facing policymakers is therefore not whether to finance tertiary care but whether to continue financing it in the least efficient and most inequitable manner available.

Three implications follow. First, the appropriate policy objective is not the elimination of outbound referral. Some rare and highly complex services will remain more efficiently purchased from accredited foreign providers than produced domestically, particularly where domestic volumes would be too low to sustain safe practice. The objective is to reduce avoidable referral, to govern unavoidable referral and to repatriate the service lines where volume and cost jointly justify domestic production.

Second, that judgement requires an appraisal discipline that does not currently exist. Comparing external purchase with domestic production requires capital cost, workforce requirements, maintenance and consumables, quality assurance, projected referral volume, unit cost at that volume, expected health outcomes and equity effects to be assessed together. Oncology diagnostics, chemotherapy day care, dialysis quality networks, advanced imaging and histopathology are the strongest candidates on current evidence, because they combine high reported leakage, high volume and relatively contained capital requirements, and they strengthen domestic diagnostic capability more broadly.

Third, financial protection must be designed for the specific risk profile of outbound care. A conventional benefit package that excludes foreign treatment leaves the catastrophic exposure entirely with the household. A package that covers it without referral governance transfers an unmanaged cost to the public purse. A defensible intermediate position is a catastrophic-illness

protection mechanism covering defined high-leakage conditions, accessed only through an authorised referral pathway, with negotiated package pricing and mandatory outcome reporting as conditions of payment. This treats financial protection and referral governance as a single instrument rather than two competing ones, and it is compatible with the emerging social health insurance architecture.

Political economy: financial leakage and policy incentives

Sustained outbound expenditure of this magnitude has consequences beyond the health sector. An outflow of the order of the scenarios in Table 11, which range from US$45 million to US$257 million across the selected years, is a leakage of foreign exchange from an economy already characterised by high external dependence in the financing of health [37, 55, 61]. The central scenario implies that Somalia's participation in the global medical-travel market is structurally asymmetric: payments flow outward to capitalise the health sectors of destination states while domestic tertiary capacity remains limited. The effect of that leakage on fiscal capacity and on domestic investment in health cannot be estimated from the sources available and is an inference.

A further effect may operate on the incentives facing domestic policy. Where those with the greatest political and economic influence can exit the domestic system, the constituency demanding its improvement may be correspondingly weakened, a dynamic described in general terms in the exit–voice literature [62]. Outbound travel could therefore act as a pressure-release valve that suppresses the political demand that would otherwise drive investment in radiotherapy capacity, transplant programmes and tertiary staffing. This hypothesis is plausible, but we identified no study that tests it for Somalia. A parallel mechanism may operate on human capital: clinicians trained to subspecialty level, including through the re-established surgical residency programme [50], may find domestic environments lacking the infrastructure in which to practise. If so, training must be accompanied by infrastructure, or it risks accelerating the loss it is intended to reverse.

Countervailing conditions have emerged. Somalia's attainment of the Heavily Indebted Poor Countries Completion Point and the associated reduction in sovereign debt have been reported to create fiscal space that did not previously exist [37]. Whether that space is applied to the tertiary platforms where leakage is concentrated, or absorbed elsewhere, is a policy choice.

Policy implications and recommended actions

The evidence supports a sequenced programme of six interventions, ordered so that governance and measurement precede capital investment. The sequencing is deliberate. Investing in infrastructure before establishing referral governance risks building capacity that referral patterns will bypass, whereas establishing governance first generates the data required to direct investment. Table 13 sets out the recommended actions, proposed responsible institutions and expected gains.

Table 13 Policy recommendations, institutional responsibility and expected gains.

Policy domain	Recommended action	Proposed lead institution	Expected gain
Referral governance	Establish a national cross-border care and referral programme with standardised pre-referral staging, clinical triage rules, authorisation criteria and a compulsory structured discharge handover	Ministry of Health and Human Services, with the social health insurance authority	Fewer avoidable referrals; safer and better documented unavoidable travel
Data systems	Establish a national outbound-referral registry recording diagnosis, disease stage, destination facility, financing mechanism, procedure and outcome at 30, 90 and 180 days after return	Ministry of Health and Human Services; national statistical authority	Measurable morbidity, mortality, continuity and financial-protection outcomes; an auditable basis for purchasing
Financial protection	Develop catastrophic-illness protection for defined high-leakage conditions through pooled national financing, accessed only through the authorised referral pathway	Social health insurance authority; Ministry of Finance	Reduced distress financing and asset depletion; equity in access to tertiary care
Domestic capacity	Invest sequentially in oncology diagnostics, chemotherapy day care, dialysis quality networks, advanced imaging, histopathology and selected cardiac diagnostics, appraised against full-cost comparison with external purchase	Ministry of Health and Human Services; development partners	Progressive, evidence-directed reduction of external dependency
Regulation of intermediaries	License medical facilitators; require disclosure of fees and of any financial relationship with destination facilities; establish a patient complaints and redress mechanism	Ministry of Health and Human Services; regulatory authority	Reduced exploitation; price transparency; a route to redress
Bilateral health diplomacy	Negotiate referral compacts with India, Türkiye, Ethiopia and Egypt covering package pricing, navigation and interpretation support, records release and minimum outcome-data sharing	Ministry of Foreign Affairs; Ministry of Health and Human Services	Accountability, predictable pricing and verifiable outcome reporting

The institutions named are proposals by the authors and do not represent agreed mandates.

Three implementation observations follow from the evidence. The registry should be designed to serve purchasing as well as surveillance, because a dataset built only for epidemiological

monitoring will not support contract negotiation. Facilitator licensing should be introduced together with the referral programme rather than after it, since an authorised pathway that competes with an unregulated one is likely to be bypassed. And bilateral compacts should prioritise records release and outcome reporting over price alone, because price concessions without documentation transfer savings to the payer while leaving the continuity problem unaddressed.

A minimum outbound-referral dataset

Converting the current debate from anecdote into auditable measurement requires a defined minimum dataset, collected at three points: referral, discharge, and follow-up at 30, 90 and 180 days after return. The specification below is deliberately parsimonious, comprising variables that a district-level clinician can capture without specialist informatics support, and it is proposed as the operational core of the registry in Table 13.

- **At referral:** patient identifier; age and sex; region of residence; primary diagnosis and disease stage; indication for referral; domestic services already attempted; date of referral decision; intended destination and facility; and declared financing mechanism.
- **At discharge from the destination facility:** dates of admission and discharge; procedure or regimen delivered; completion status; major complication; unplanned intensive-care admission; in-hospital death; total invoiced cost; and confirmation that a structured discharge summary, pathology report and medication plan have been issued to the patient.
- **At 30, 90 and 180 days after return:** survival status; treatment interruption; medication continuity; readmission; reoperation; functional status; patient-reported experience; and household financial consequences, including borrowing, asset sale and reduction in essential consumption.

Even partial implementation would transform the evidence base. A registry capturing referral and discharge alone would permit the first defensible estimate of referral appropriateness and immediate

clinical outcome, and adding the 90-day follow-up point would permit the first measurement of continuity failure, which this synthesis identifies as the dominant unmeasured risk.

Strengths and limitations

The main strengths of this synthesis are its explicit separation of measured, inferred and unquantifiable evidence; its reconciliation of definitionally different movement indicators without summing them; its reporting of the derivation, unit cost and measured share of every expenditure envelope; and its refusal to construct outcome rates that the evidence cannot support. Several limitations should nevertheless be stated, in approximate order of analytical importance.

1. **Imperfect proxies for care episodes.** The principal quantitative series relies on official arrival and visa indicators rather than linked clinical utilisation data. Arrivals and visas issued are not interchangeable, visas may be issued and not used, and counts represent episodes rather than individuals, which is consequential for conditions requiring repeated travel. The 2022 arrival figure diverges from the visa count without explanation in the source tables.
2. **Gaps and definitional discontinuity.** The Indian tables available to us omit 2018, and the two Indian series are not interoperable. The series should be read as adjacent rather than continuous.
3. **Destination asymmetry and scope.** Türkiye provides a single-year anchor, and Ethiopia and Egypt lack publicly reported nationality-specific series. All four-corridor estimates therefore carry much greater uncertainty than India-only estimates. The scenario residual in Table 11 is an author-specified planning value, not an observation, and the near-constant implied unit cost shows that the scenario is driven by the assumed episode count. Other destinations, including Kenya, were outside the defined scope and are not captured.
4. **Small and non-random cost and financing evidence.** The cost profile derives from a snowball sample of 106 travellers in one regional city, collected within a feasibility study and not designed to measure the magnitude of medical travel. The household financing figures

derive from a non-probability survey concentrated in one region. Neither can be generalised nationally, and catastrophic expenditure was not measured for outbound care.

5. **Market-derived benchmarks.** The per-patient benchmark used for the Indian envelope is a market average for all international patients to India and not a Somali-specific cost. Procedure prices are drawn from commercial sources of low evidential weight.
6. **Outcome measurement constraints.** Aggregate morbidity, complication and mortality rates for Somali outbound patients cannot be derived from public sources without a Somalia-side referral registry and destination-side linkage. Outcomes are interpreted through proxies and mechanisms, and no rate should be inferred that this paper does not state.
7. **Review methods.** The review was not registered, record counts at each screening stage were not retained so that a PRISMA flow diagram cannot be provided, and duplicate independent screening and extraction is not documented. Heterogeneity precluded meta-analysis and formal risk-of-bias assessment, so credibility was appraised by provenance and definitional clarity.

End-period incompleteness and reporting bias. Complete annual figures for 2025 and 2026 remain unavailable, and the 2026 scenario is a projection. Evidence tends to appear where medical-travel sectors are commercially developed or reports are in English, which may overlook local reporting and informal corridor patterns.

The average direct cost of US$8,543 should be replaced as soon as possible with a nationally representative prospective patient cost survey that covers indirect and post-return expenses.

Conclusions

Somali cross-border health care seeking is not elective medical tourism. It is a privately funded, lightly governed, and largely unmeasured substitute for missing domestic tertiary care, better understood as a sign of health-system performance than as consumer behavior.

The evidence presented here supports four claims. The scale is notable: the Indian corridor alone records at least 61,465 episodes across nine reported years, with medical visas in 2023 reaching 4.8 times the 2019 level. Clinical logic is clear: patients travel for services that fail first when tertiary infrastructure is absent, and no domestic option is reported for radiotherapy. Economic impact is significant: a mean direct household cost of US$8,543 per episode, in a setting with 3.5% insurance coverage in the available survey, makes catastrophic spending likely, while aggregate outflows near US$219 million in the 2024 central scenario represent about 1.8% of projected gross domestic product. The pattern is unequal: access seems limited by household liquidity and documentation rather than clinical priority.

The most important finding is what cannot be confirmed. No reliable statement can be made about whether Somali patients treated abroad survive, recover, continue treatment, or suffer avoidable harm, because no tool exists to record it. The policy agenda is therefore ordered. Measurement and governance come first: a national outbound-referral registry with a minimal dataset, an authorized referral pathway with standardized staging and discharge handover, and licensing of medical facilitators. Financial protection follows, aimed at defined high-leakage conditions and tied to that pathway. Bilateral referral compacts turn unavoidable foreign referral from an unregulated private transaction into a governed one. Domestic capacity investment, guided by registry evidence, starts with oncology diagnostics, chemotherapy, dialysis, and advanced imaging. The proposed measurement tools are inexpensive and technically simple, and their absence rather than their cost is the limiting factor.

List of abbreviations

MedCOI: Medical Country of Origin Information

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses

SIDRA: Somali Institute for Research Development and Analysis

US$: United States dollar

WHO: World Health Organization

Declarations

Not applicable. This study analysed only publicly available documents and previously published materials. No human participants were recruited, no patient-level identifiers were accessed and no intervention was undertaken.

Consent for publication

Not applicable.

Availability of data and materials

"All data analyzed in this study are available in the publicly accessible sources cited in the References. The derivation of the Indian series, along with the expenditure benchmarks and scenario expenditure envelope, is provided in Additional File 1. The extraction template and tier-assignment log are available from the corresponding author upon reasonable request."

Competing interests

The authors confirm they have no financial conflicts of interest. AYA is a physician and Health systems expert with PhD in Heath economic and the Riyaada Institute for Leadership and Governance is his affiliation ; this work had no link to the Social Health Insurance Authority. Their professional input is the sole role to note when declaring no competing interests for all authors, including AYA.

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Authors' contributions

AYA conceived the study, designed the analytical framework and evidence-tiering protocol, led data extraction and synthesis, and drafted the manuscript. AHM contributed to source identification, data extraction, verification of the destination-corridor evidence and critical revision of the Results and Discussion. MHM contributed clinical interpretation of the disease-profile and outcome-domain analysis and critically revised the manuscript for intellectual content. All authors read and approved the final manuscript and accept accountability for all aspects of the work.

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Supplementary information

Additional file 1. Format: XLSX. Title: Derivation of the Indian movement series, expenditure benchmarks and scenario expenditure envelope. Description: worksheets listing the Indian arrival and visa series with sources and totals, the per-patient benchmark envelope for India, and the decomposition of the scenario envelope in Table 11 into measured and scenario components, with the implied cost per episode. Calculations are live formulas.

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