



Research Article

Global Lessons from Economic Blockades: Comparative Impacts on Health Systems with Emphasis on Dental Care in Yemen – A PRISMA-ScR–Guided Scoping Review

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Abstract

Background: Economic sanctions, embargoes, and blockades are globalization-related policy instruments that reshape cross-border trade, financial flows, and humanitarian access, with downstream effects on health systems. Oral health services are particularly vulnerable because they depend on stable international supply chains for dental materials, local anesthesia, and infection-control consumables. **Objectives:** To map and synthesize the available evidence on how economic blockades/sanctions affect health systems and oral health, and to derive transferable lessons relevant to Yemen. **Methods:** A scoping review guided by the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) was conducted. Medical Literature Analysis and Retrieval System Online (MEDLINE)/PubMed, Web of Science, Scopus, the World Health Organization Institutional Repository for Information Sharing (WHO IRIS), ReliefWeb, and targeted United Nations (UN)/humanitarian sources were searched from inception to 05 December 2025. Eligible sources included peer-reviewed empirical studies and rigorously produced reports linking sanctions/embargoes/blockades to health-system outcomes and/or oral-health outcomes. Screening and data charting were performed by the author using pre-specified criteria; uncertainties were resolved by inclusion at screening and documented at full text. **Results:** Of 150 records identified, 50 duplicates were removed before screening. One hundred records were screened; 20 reports were sought for retrieval; 15 were assessed for eligibility; and 10 sources of evidence were included (Cuba, Iraq, Haiti, South Africa, Yemen). Across settings, recurring pathways included constrained imports (medicines, fuel, and clinical consumables), macro-financing shocks, infrastructure degradation, workforce attrition, reduced service availability, and widening inequities. Direct oral-health evidence was sparse, but multiple sources described dental supply disruption, infection-control constraints, and increased unmet need. **Conclusions:** The health impact of sanctions/blockades is mediated by governance, exemption feasibility, and system resilience. Protecting primary care, prevention, and essential supply chains can buffer harm, whereas fragile systems incur disproportionate losses. For Yemen, priorities include protected medical/dental supply corridors, workable financial/banking channels for exempt goods, integration of essential oral health into humanitarian health packages, and reinforcement of public primary care and prevention.

Keywords

Globalization, Economic Sanctions, Blockades and Embargoes, Health Systems, Supply Chains, Humanitarian Access, Oral Health, Yemen

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1. Introduction

Economic sanctions, embargoes and blockades are increasingly used within global governance and geopolitical strategies, often operating through trade, finance and mobility restrictions that reverberate through health systems and social determinants of health. While humanitarian exemptions are commonly specified, implementation barriers (e.g., banking de-risking, licensing delays, and disrupted shipping/insurance) can still constrain access to essential medicines and medical supplies. [1]

Oral health is integral to health and well-being, yet oral health services and dental public-health programs are especially sensitive to supply-chain disruption because they rely on imported dental materials, anesthetics, sterilization and infection-control consumables, and functioning referral pathways. In fragile and conflict-affected settings, these vulnerabilities can translate into deferred urgent care, preventable complications, and widening inequities.

Yemen provides a high-stakes case where protracted conflict, import dependence, and restrictions affecting ports, fuel, and financial channels have contributed to severe service disruption and humanitarian need. This scoping review therefore focuses on sanctions/blockades as globalization-related policy instruments and extracts transferable lessons for health systems and oral health programming in Yemen.

1.1. Review Questions (Population, Concept and Context Framework)

Population: populations living in settings affected by economic sanctions, embargoes, or blockades.

Concept: impacts on health systems (service availability, financing, workforce, supplies, governance) and oral health services/programmes.

Context: low-, middle-, and high-income settings where sanctions, embargoes, or blockades were implemented.

Primary questions: (1) What health-system and oral-health impacts have been reported in embargo/sanctions/blockade settings? (2) Through what mechanisms do these measures affect health systems and oral health? (3) What transferable policy and program lessons are relevant to Yemen?

1.2. Review Scope and Relevance to Yemen

This review maps cross-country evidence on sanctions, embargoes, and blockades as globalization-related policy instruments, with emphasis on pathways affecting health-system functioning and oral health. The synthesis is intended to identify transferable lessons for Yemen, particularly regarding supply chains, financing, infrastructure, service availability, equity, and humanitarian access.

2. Methods

2.1. Design and Reporting

This scoping review followed Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) reporting guidance and Joanna Briggs Institute (JBI) scoping review methodology. PRISMA-ScR is used for transparent reporting of scoping reviews, including eligibility criteria, information sources, selection processes, and evidence mapping. [2, 3]

2.2. Protocol

No protocol was registered before commencing the review. This was due to the applied, time-sensitive policy focus and resource constraints. To mitigate bias, eligibility criteria, information sources, and charting fields were defined a priori and are reported in the Methods.

2.3. Eligibility Criteria

Included sources were (i) peer-reviewed empirical studies (quantitative, qualitative, or mixed methods) and (ii) rigorously produced institutional reports (e.g., World Health Organization (WHO), United Nations (UN), or major humanitarian organizations) that explicitly linked sanctions, embargoes, or blockades to health-system outcomes and/or oral-health outcomes. Opinion-only pieces without empirical or documentary evidence, purely economic analyses without health outcomes, and sources unrelated to sanctions/blockades were excluded.

2.4. Information Sources and Search Strategy

Searches were conducted in Medical Literature Analysis and Retrieval System Online (MEDLINE)/PubMed, Web of Science Core Collection, Scopus, the World Health Organization Institutional Repository for Information Sharing (WHO IRIS), and ReliefWeb. Targeted searches of UN/humanitarian portals were also conducted for Yemen-relevant documentation. The final search date was 05 December 2025. The search information used for this review is reported in this section.

2.5. Selection Process

Screening was performed by the author. Titles/abstracts were screened first, followed by full-text assessment. Where eligibility was uncertain at title/abstract, records were retained for full-text review. Full-text exclusion reasons were logged and are reported in Supplementary Table S1 (Additional file 2).

2.6. Data Charting and Synthesis

A standardized charting form captured publication type, setting, sanctions mechanism, outcomes, and key findings. Evidence was synthesized narratively and mapped by country and by pathway (trade/supply chains, financing/banking, infrastructure, workforce, service delivery, equity).

2.7. Critical Appraisal

Although not mandatory for scoping reviews, a pragmatic appraisal was conducted to inform interpretation. Peer-reviewed observational studies were appraised using the Appraisal tool for Cross-Sectional Studies (AXIS) where applicable, and grey-literature reports were appraised using the Authority, Accuracy, Coverage, Objectivity, Date and Significance (AACODS) checklist. Appraisal results are summarized

in Additional file 1 and are not used as exclusion criteria. [4, 5]

3. Results

3.1. Study Selection

Searches identified 150 records; 50 duplicates were removed before screening, leaving 100 records for title/abstract screening. After screening ($n=100$), 20 reports were sought for retrieval; five were not retrieved. Fifteen full texts were assessed; five were excluded with reasons; and 10 sources of evidence were included in the review (Figure 1). Full-text exclusions with reasons are listed in Supplementary Table S1 (Additional file 2).

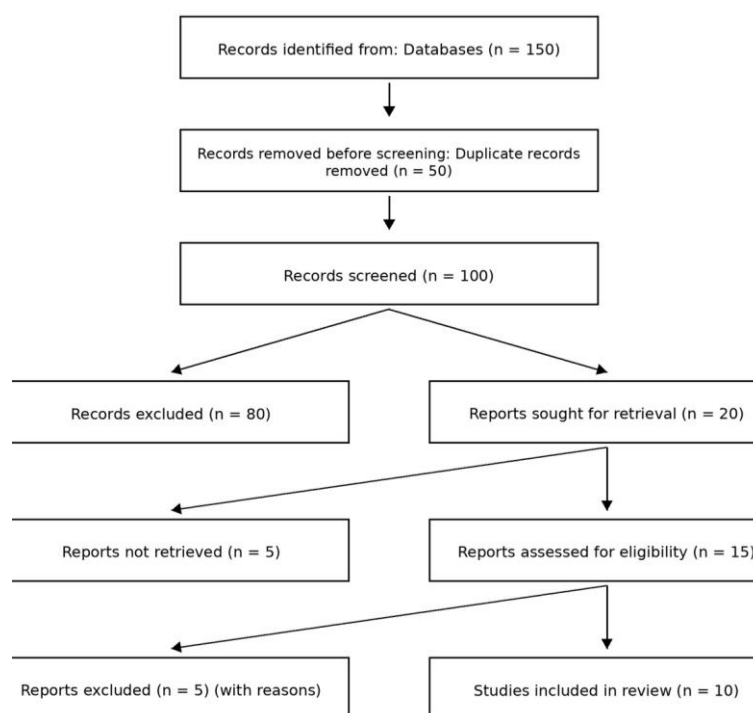


Figure 1. PRISMA flow diagram of study selection.

3.2. Characteristics of Included Sources

The 10 included sources spanned five country contexts: Cuba ($n=2$), Iraq ($n=2$), Haiti ($n=1$), South Africa ($n=1$), and Yemen ($n=4$). Study types included policy/case analyses, a review/commentary with data, cross-sectional and demographic analyses, empirical and historical/policy analyses, a health-policy and planning case study, geospatial analysis, a policy report, and a human-rights/advocacy report. The exposures examined included the U.S. embargo, UN sanctions, conflict-related restrictions on imports and access, and economic

blockade. Most sources reported health-system outcomes such as supply constraints, mortality, facility functionality, financing, service access, and inequities; oral-health relevance was predominantly indirect, with Yemen-focused sources describing service and supply constraints relevant to dental care. Table 1 summarizes these characteristics.

3.3. Critical Appraisal Summary

Critical appraisal was conducted to support interpretation (not to exclude evidence). Across included sources, reporting quality varied, with common limitations including incomplete

description of data sources and potential confounding from co-occurring conflict and macroeconomic shocks. Appraisal

judgments for each source are provided in Additional file 1.

Table 1. Summarizes the key characteristics of included sources of evidence.

Source	Country / period	Design / type	Sanctions/blockade exposure	Key health-system outcomes	Oral-health relevance
Spiegel & Yassi (2004)	Cuba	Policy/case analysis	US embargo	Primary-care orientation; resilience mechanisms	Notes prevention orientation; indirect relevance to oral health
Drain & Barry (2010)	Cuba	Review/commentary with data	US embargo	Medicine/supply constraints; outcomes paradox	Highlights supply constraints affecting care broadly
Ali et al. (2000)	Iraq	Cross-sectional survey analysis	UN sanctions (1990s)	Childhood mortality signals; regional differences	No direct oral-health outcomes
Daponte & Garfield (2000)	Iraq	Demographic analysis	UN sanctions (1990s)	Child mortality estimates; health system deterioration context	No direct oral-health outcomes
Gibbons & Garfield (1999)	Haiti	Empirical analysis	Embargo (1991–1994)	Nutrition/mortality/service use declines	No direct oral-health outcomes
Coovadia et al. (2009)	South Africa	Historical/policy analysis	Sanctions within political transition	Health inequities; system reforms post-transition	No direct oral-health outcomes
Qirbi & Ismail (2017)	Yemen	Health policy & planning case study	Conflict + restrictions affecting imports/access	Facility functionality, workforce, financing constraints	Mentions service constraints relevant to dental care
Garber et al. (2020)	Yemen	Geospatial analysis	Conflict setting with access constraints	Access to healthcare; facility functionality distribution	Applies to dental service access
World Bank (2021)	Yemen	Policy note/report	Macroeconomic/import constraints in conflict	Health financing, system gaps, policy priorities	Notes supply and service constraints
OMCT (2022)	Yemen	Human rights/advocacy report	Economic blockade	Humanitarian access, imports and essential goods constraints	Mentions medical/dental supply impacts (qualitative)

3.4. Synthesis of Findings

Across contexts, sanctions/blockades influenced health systems through interlinked pathways: (1) constrained imports and disrupted supply chains; (2) macro-financing and banking constraints; (3) infrastructure degradation (fuel/electricity/water); (4) workforce attrition and unpaid salaries; (5) reduced service availability and quality; and (6) widening inequities, particularly affecting vulnerable groups.

Cuba: multiple analyses describe how strong primary care, prevention, and public-sector orientation buffered embargo-related resource constraints, with system design playing a mediating role. [6, 7]

Iraq: empirical analyses during the 1990s sanctions period reported increased childhood mortality indicators and severe constraints on medicines, water/sanitation and health system

functioning, complicating attribution because of overlapping conflict impacts. [8, 9]

Haiti: embargo-era analyses reported deteriorations in nutrition and child mortality and declines in service use, illustrating how trade and aid restrictions can cascade into avoidable health losses. [10]

South Africa: sanctions interacted with broader political economy changes; the post-transition period included major policy reforms, but deep inequities persisted, emphasizing the importance of governance and redistribution mechanisms. [11]

4. Discussion

This scoping review maps evidence across five country contexts and identifies consistent globalization-related mech-

anisms through which sanctions/blockades affect health systems: constraining cross-border trade and logistics, restricting finance and payment channels, and limiting humanitarian access. These mechanisms can reduce availability of essential medicines and clinical consumables, undermine service delivery, and widen inequities. [1]

A key cross-context lesson is the mediating role of health system resilience and governance. Settings with strong primary care, prevention and publicly coordinated service delivery appear better able to absorb external shocks, whereas fragile systems experience cascading failures across infrastructure, workforce and supply chains. For Yemen, where import dependence is high and conflict has damaged infrastructure, sanctions-like constraints can magnify shortages and disrupt continuity of care. [6, 7, 11-14]

Oral health evidence was limited relative to broader health system evidence, reflecting chronic under-representation of oral health in humanitarian and health-systems research. Nevertheless, multiple pathways directly implicate oral health services: (i) supply disruptions for anesthetics, restorative materials and infection-control items; (ii) fuel/power interruptions affecting sterilization and clinic operations; and (iii) prioritization patterns within humanitarian health packages that often exclude basic oral health services. [12-15]

4.1. Policy Implications for Yemen

For Yemen, the findings support protected supply corridors for medical and dental goods; practical financial/banking mechanisms to operationalize exemptions; inclusion of essential oral health interventions (pain relief, infection control, emergency care, atraumatic restorative treatment, and prevention) in humanitarian health packages; and reinforcement of primary care and community prevention as shock absorbers.

4.2. Limitations

The evidence base is heterogeneous and causal attribution is challenging because sanctions/blockades often co-occur with armed conflict and economic crises. The review included English-language sources, which may introduce language bias. Screening was conducted by a single reviewer; this was mitigated by conservative inclusion at screening and transparent documentation of exclusion reasons. Finally, oral health-specific outcomes were rarely measured, limiting specificity of inferences.

5. Conclusion

Economic blockades and sanctions affect health systems through globalization-linked channels that disrupt trade, finance, and humanitarian access. Health system resilience and governance mediate the magnitude of harm. In Yemen, feasible mitigation strategies include protected supply chains, workable exemptions, and integration of essential oral health

into humanitarian and primary-care strategies.

6. Recommendations

Based on the evidence mapped in this review, the following recommendations are proposed for Yemen: (i) establish protected medical and dental supply corridors; (ii) operationalize financial and banking channels for exempt health goods; (iii) include essential oral health services, including pain relief, infection control, emergency dental care, atraumatic restorative treatment, and prevention, in humanitarian health packages; and (iv) reinforce primary care and community prevention to reduce inequities and protect continuity of care during blockade-related shocks.

Abbreviations

AACODS	Authority, Accuracy, Coverage, Objectivity, Date and Significance.
AXIS	Appraisal tool for Cross-Sectional Studies.
DOI	Digital Object Identifier.
JI	Joanna Briggs Institute.
MEDLINE	Medical Literature Analysis and Retrieval System Online.
OMCT	World Organisation Against Torture.
PCC	Population, Concept and Context.
PRISMA-ScR	Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews.
UN	United Nations.
WHO	World Health Organization.
WHO IRIS	World Health Organization Institutional Repository for Information Sharing.

Author Contributions

Salah Mohammed Salem Bin Hafedh: Conceptualization; Data curation; Formal Analysis; Investigation; Methodology; Writing – original draft; Writing – review & editing.

Supplementary Material

The supplementary material can be accessed at <https://doi.org/10.11648/j.ajhpm.20260102.11>

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Conflicts of Interest

The author declares no conflicts of interest.

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