A scoping review to understand that state of the science of scale-up of cancer control interventions in low- and middle-income countries

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RESEARCH OBJECTIVE

- Cancer deaths in low-resource settings will nearly double by 2040.
- Evidence-based interventions (EBIs) for cancer early detection and prevention (e.g., breast and cervical cancer screening, human papilloma virus vaccinations) have lowered cancer-related mortality in high-income countries and have been tested at limited scale in low-to-middle income countries (LMIC).
- However, LMICs face barriers to scaling-up EBIs in under-resourced health systems. This reflects, in part, the dearth of evidence for strategies to scale cancer control interventions in LMICs.
- **Thus, we conducted the first scoping review to delineate the state of scale-up of cancer control EBIs in LMICs, including cancer types targeted, implementation strategies used, and barriers related to scale-up.**

METHODS

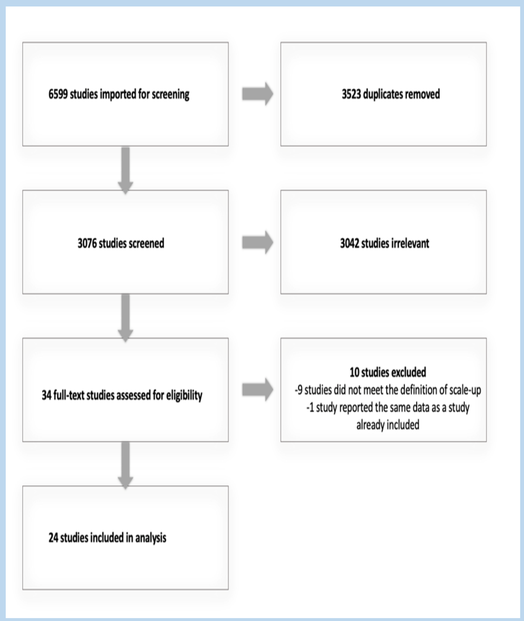
We searched six electronic databases to identify literature in English between 2012-2022.

Studies were included if they reported scale-up or met one of two definitions:

1) Described deliberate efforts to increase the impact of EBIs to benefit more people and to foster policy and program development or
2) Assessed the ability of an efficacious small scale health intervention to be successfully expanded under real-world conditions.

Two independent reviewers screened citations for inclusion. Data abstraction was performed by one reviewer and verified by a second reviewer.

PRISMA diagram



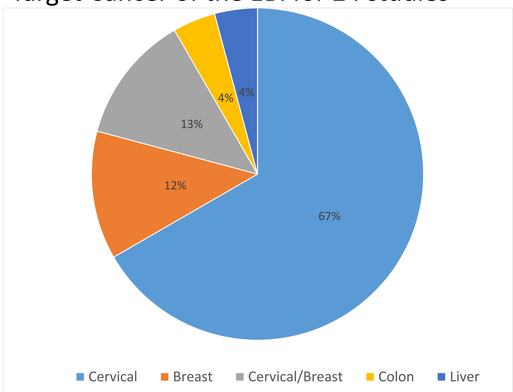
RESULTS

- Our search yielded 6599 eligible abstracts and **24 studies were ultimately included.**
- 54.2% (n=13) studies explicitly mentioned "scale-up".
- All 24 studies involved stakeholder relationships. Multilevel relationships reported included: international partners, national partners, national Ministry of Health (MoH), regional partners, community partners, international pharmaceutical partners, and/or academic partners.
- 20.8% (n=5) were low-income countries, 33.3% (n=8) were lower-middle income countries, 37.5% (n=9) were upper-middle income countries, and 8.3% (n=2) of studies included more than one country.
- Most studies (n=17, 70.8%) scaled-up early detection/secondary prevention EBIs.
- Two studies utilized Implementation Science (IS) frameworks (Consolidated Framework for Implementation Research and RE-AIM) to scale up.
- Commonly reported methods were synonymous with IS strategies.
- Many "implementation science" outcomes were mentioned, including feasibility, acceptability, and sustainability.
- Barriers identified included prohibitive costs and infrastructure issues.

Implementation Science Scale-up Strategies

Implementation Strategies Utilized to Scale Up	# studies using strategy (%)
Train and educate stakeholders	19 (79.2%)
Change infrastructure	16 (66.7%)
Engage consumers	14 (58.3%)
Develop stakeholder interrelationships	12 (50.0%)
Use evaluative and iterative strategies	10 (41.7%)
Utilize financial strategies	6 (25.0%)
Provide interactive assistance	5 (20.8%)
Adapt and tailor to context	3 (12.5%)

Target Cancer of the EBI for 24 studies



Implementation Science Outcomes

IS outcomes mentioned by name	N	Percent (%)
Studies referring to Imp Sci Outcomes	22	88
Re-Aim outcomes- # total studies	7	29.2
Reach	3	12.5
Effectiveness	2	8.3
Adoption	4	16.7
Implementation	1	4.2
Maintenance	1	4.2
Proctor - # total studies	22	88
Fidelity	3	12.5
Adherence	2	8.3
Acceptability	9	37.5
Appropriateness	1	4.2
Feasibility	10	41.7
Penetration	6	25.0
Implementation cost	2	8.3
Sustainability	9	25.0
Adaptability	2	8.3

Barriers to Scale-up Identified

Barrier	Example
Individual-level	
Patients' fidelity (follow-up) to program	•Poor communication about follow-up visits from providers to patients •Commuting costs and due to poor communication •Difficulties tracking referred patients •Expansion of participants and program •Missed repeat cryotherapy at one-year for those who tested VIA positive •Embarrassment by female patients being screened by a male doctor
Lack of information	Little knowledge about the disease: •HPV and the HPV vaccine •Breast cancer
Low participant compliance	•Low screening uptake or adherence •Varied compliance within specific subgroups (higher socioeconomic status of the participants in terms of education levels and employment status)
Lack of access and resources	•High costs of service and financial concerns •No insurance
Health systems-level	
Poor infrastructure to support a program	•Lack of ability to see referral through after screening for VIA, leading to program failure to treat VIA positive eligible women •Lack of pathology related infrastructure like lack of histopathologists
Inaccurate reporting of program use	•Varied performance of the screening across geographic areas not clearly reported and under counting patients who completed follow up treatment,
Resource allocation and use	•Lack of personnel /providers (at different levels including supervision staff, specialized personnel like gynecologist) available for the delivery of the intervention •Fatigue among existing staff; staff turnover •Unavailability of the coordinating nurse, especially during Ramadan holidays •Low provider: patient ratio in urban areas, impacted number of patients screened and treated •Lack of supplies and specific equipment needed to perform screen and treatment; stock-outs of key supplies including diagnostic kits (i.e., cryotherapy machine, gas for machine)
Community-level	
Link to community	•Targeting and reaching the eligible group •Lack of community health care worker ties at a blood bank compared to the community •Community transformations, due to high rates of migration out of service delivery area
Values system/alignment with values	•The need for an HPV vaccine not in line with controversial issues such as virginity, which leads to refusal to vaccination. Identifying a need to connect with churches about health education.

CONCLUSION

- As cancer is increasing in LMICs, there is a scarcity of scaled-up cancer control EBIs.
- We synthesized barriers at the individual-, health systems-, and community-levels.
- When scaling-up, emphasis should be on system level barriers, as a successful program at scale is dependant on a streamlined and efficient health system.
- Utilizing IS strategies can address many of the multilevel barriers identified.
- When scaling-up EBIs in LMICs, utilizing multiple disciplines, including IS, may help synthesize knowledge across studies and accelerate scale-up progress.

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