Effective Knowledge Translation Strategies for Policy and Action Focused on Maternal, Newborn, Child & Adolescent Health and Wellbeing:

A RAPID SCOPING REVIEW

Dr. Janet Curran, Allyson Gallant, Helen Wong, Hwayeon Danielle Shin, Dr. Robin Urquhart, Julia Kontak, Dr. Lori Wozney, Leah Boulos, Julia Bunting, Dr. Zulfiqar Bhutta & Dr. Etienne Langlois

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INTRODUCTION

From 2000 to 2015, Millennium Development Goals (MDGs) brought remarkable improvements to maternal and child health wordwide.[1] In 2005, the Countdown to 2015 for Maternal, Newborn, and Child Survival initiative (referred to as *Countdown*) was introduced with an initial focus on child survival, but later expanded to monitoring the progress of relevant indicators on reproductive, maternal, newborn, and child health.[1] While MDGs were not achieved, the *Countdown to 2015* report noted that a decrease in maternal and child mortality of approximately 50% since 1990, with significant improvements since 2000.[2] Despite showing important progress in terms of some health issues, notable inequalities remain between and within countries for challenging areas such as access to life-saving interventions.[2]

Despite the increased funding, there is still a lack of equitable distribution of human resources and essential policy adoptions for sexual, reproductive, maternal, newborn, child, and adolescent health (SRMNCAH) in most countries.[2] As such, women, newborns, children, and adolescents continue to face critical health challenges, particularly in middle- and low-income countries.[1] In response to the persistent risks to SRMNCAH, *Countdown to 2030* was established to continue the best practices initiated by the *Countdown to 2015.*[3] Furthermore, the world's largest alliance for women's, children's and adolescents' health – the Partnership for Maternal, Newborn & Child Health (PMNCH) – was created and proposed the PMNCH Strategic Plan 2021-2025 to align various stakeholders' efforts and commitments for improving SRMNCAH.[4] Key priorities from the PMNCH Strategic Plan focus on (1) preventable maternal, newborn, and child mortality and morbidity, including stillbirths; (2) sexual and reproductive

health and rights; and (3) adolescent health and wellbeing.[5] The strategic plan also includes a cross-cutting focus on reducing SRMNCAH inequities.

With the current COVID-19 pandemic, there have been substantive and unprecedented changes in health services utilization, including reductions in hospital admissions and visits, and diagnostic and imaging procedures.[6] A World Health Organization (WHO) survey found the greatest disruption to essential healthcare services (e.g., health promotion, preventive services, diagnosis, treatment) among lower-income countries.[7] Furthermore, it has been estimated that a reduction of essential maternal and child health interventions can cause a devastating impact on maternal and child mortality.[8] As such, special efforts are needed to scale-up effective interventions to prevent further harm, reduce preventable deaths and morbidity, and promote equitable distribution of human resources and essential policy adoptions for SRMNCAH.

Improving SRMNCAH across countries of different income levels will require collective action in terms of generating, sharing, brokering, and implementing new knowledge through cross-sectoral and interdisciplinary initiatives.[9] Knowledge translation (KT) is "a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically-sound application of knowledge to improve the health, provide more effective health services, and products and strengthen the healthcare system".[10] KT interventions are strategies that facilitate the uptake of evidence into practice, which are targeted at the level(s) of healthcare professionals, institution, and/or policy. There has been a growing number of KT interventions, as well as frameworks, theories, and models to guide the selection of KT interventions.[11–13]

However, the range of KT strategies and activities related to SRMNCAH improvement remains unknown, thus warranting research in this topic area.

A preliminary search of PROSPERO, MEDLINE, the Cochrane Database of Systematic Reviews and the *JBI Database of Systematic Reviews and Implementation Reports* was conducted in early 2020, and no current or underway systematic reviews on KT interventions for promoting the uptake of evidence into policy and action focused on SRMNCAH were identified. Previous reviews have explored KT interventions targeted at different stakeholder groups, including healthcare providers,[14,15] policymakers,[16] and in the area of child health.[17–20] However, reviews have yet to explore the range of KT interventions that have been utilized at the level of health system, policy, or practice specific to improving SRMNCAH. In light of the global call for action to improve SRMNCAH, it is critical to explore the breadth of available evidence on KT strategies that promote the integration of evidence into policy and practice for improving SRMNCAH.

Objectives:

The aim of this rapid scoping review was to identify existing literature related to KT strategies that promote the uptake of evidence into policy and action focused on improving SRMNCAH and wellbeing. To achieve this aim, four questions were addressed:

1. What are the common KT strategies and activities used to promote the use of evidence to inform policy and action to improve SRMNCAH and wellbeing?

2. How are stakeholders involved in designing or implementing these KT strategies and activities?

3. What are the commonly reported outcomes of KT strategies and activities to promote the use of evidence in SRMNCAH and wellbeing?

4. What are the commonly reported barriers and enablers for using KT strategies and activities to promote the use of evidence in SRMNCAH and wellbeing?

METHODS

This rapid scoping review was conducted in partnership with the PMNCH and a Strategy for Patient-Oriented Research (SPOR) Evidence Alliance research team situated in Nova Scotia, Canada. Stakeholders from the PMNCH met regularly with the research team throughout the review, initially bi-weekly during search strategy development and screening and then monthly during screening. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses - Extension for Scoping Reviews (PRISMA-ScR) criteria were applied to guide the rapid scoping review and report writing.[21] The rapid scoping review protocol was registered on Open Science Framework on June 16th, 2020 (https://osf.io/xpf2k).

Inclusion and Exclusion Criteria

Studies eligible for inclusion in the review included experimental, quasi-experimental and qualitative study designs, as well as analytical observational studies, editorials and commentaries. Studies were excluded if they focused on basic science or clinical management of women, newborn, child or adolescent aspects of health or wellbeing. Systematic reviews were excluded, but the reference lists of relevant reviews were examined to identify additional potential studies for inclusion.

Studies had to report a KT strategy or activity aimed at supporting or improving health systems or policy decisions to support SRMNCAH and wellbeing. KT strategies could be aimed at patients, healthcare providers, healthcare management, health systems, policy makers, civil society organizations, funder or donors, as long as it was within the context SRMNCAH and wellbeing. Studies that targeted these stakeholders outside of SRMNCAH and wellbeing were excluded. Study outcomes relating to the effectiveness of the KT strategy or activity and SRMNCAH were included. Studies that did not report primary outcomes relevant to KT or SRMNCAH were excluded. Finally, included studies were published in English and no date restrictions were applied.

Search Strategy and Information Sources

A comprehensive search strategy was co-developed between the research team, PMNCH stakeholders and an experienced library scientist. The finalized, detailed search strategy can be found in Appendix A. To identify potentially relevant studies, the library scientist applied the search strategy to multiple databases including: MEDLINE ALL, Embase, CINAHL, and Web of Science Core Collection from date of origin to May 2020. Search strategy results were imported into Covidence, an online systematic review management software, and duplicates were removed.[22] Additionally, a search of grey literature was undertaken using Google by a reviewer. Search terms (see Appendix B) were applied in Google and relevant URLs were compiled and verified for inclusion by another team member. Google results were browsed until the reviewer went two pages (20 results) without clicking on a potentially relevant result.

Selection of Sources of Evidence

Title and abstract screening were completed by four trained reviewers. Reviewers worked independently to conduct screening, with each title and abstract compared against the inclusion criteria by two reviewers. Screening conflicts were resolved by a third team member. At the full text screening stage, each article was reviewed and compared against the inclusion criteria again by one reviewer. If the study did not meet the inclusion criteria, it was excluded and the reason for exclusion was noted. Uncertainties at this stage were resolved through discussions within the research team. The reference lists of included full text articles were then reviewed to identify other potential studies for inclusion.

Data Charting & Data Items

The research team and PMNCH stakeholders collaborated on a data extraction tool for included studies. The tool extracted data into four categories: Descriptive details of the study (e.g., authors and year, country, sample characteristics, study design, and SRMNCAH priority), characteristics of KT strategy of activity (e.g., KT strategy details, use of theory, mode of KT delivery, stakeholder involvement), outcomes, and identified barriers and enablers. An example of the data extraction tool can be found in Appendix C. Study data were extracted using the tool by one independent reviewer and was verified by another to ensure all relevant data were captured in the data extraction tool. Critical appraisal of individual sources of evidence were not conducted.

Synthesis of Results

Following data extraction, the country income level of each country identified from the studies was determined using the World Bank website.[23] Study details were grouped into four categories which aligned with each of the research questions: KT strategy, stakeholder engagement, reported outcomes, and types of barriers and enablers identified. Thematic analysis was then applied to each grouping to identify potential trends across country income levels and SRMNCAH priority.

After data was extracted and summarized, the research team presented preliminary findings to PMNCH stakeholders. These stakeholders provided valuable feedback and provided direction for further data analysis. To facilitate summarizing content associated with the KT strategies, details of each KT strategy were mapped to the Behaviour Change Wheel (BCW).[24] The BCW provides a synthesis of 19 behaviour change theories in a comprehensive, theory-based tool that can be used to identify important behaviour change elements to consider in intervention design[25]. The BCW includes nine intervention functions (e.g., *education, modelling, training*) that can be used to guide intervention content and design. It also includes seven policy categories (e.g., *guidelines, service provision, legislation)* to guide implementation of behaviour change interventions and policies. [24] KT strategies were mapped to relevant BCW intervention functions and policy categories by four independent researchers. This work was then verified by another researcher. Researchers met to review BCW coding and discrepancies were resolved through discussion.

RESULTS

Selection of Sources of Evidence

The search strategy returned 11,190 studies for screening. After removing 3,626 duplicates, 7,564 titles and abstracts were screened by reviewers. This stage identified 212 full-text studies to review. Following full-text analysis, 154 studies were excluded, primarily due to primary outcomes which did not address SRMNCAH, strategies that did not address a SRMNCAH priority, or did not contain a KT strategy. A summary of excluded studies and reasons can be found in Appendix D. This left 58 studies included in the review. A review of the reference lists of included studies identified 26 additional studies that met the inclusion criteria. The grey literature search identified one study for inclusion; five additional studies were included from screening the reference list of a relevant systematic review. This resulted in a final total of 90 included studies in the scoping review. The selection process and sources of evidence are summarized in a PRISMA-ScR flow diagram (Figure 1)

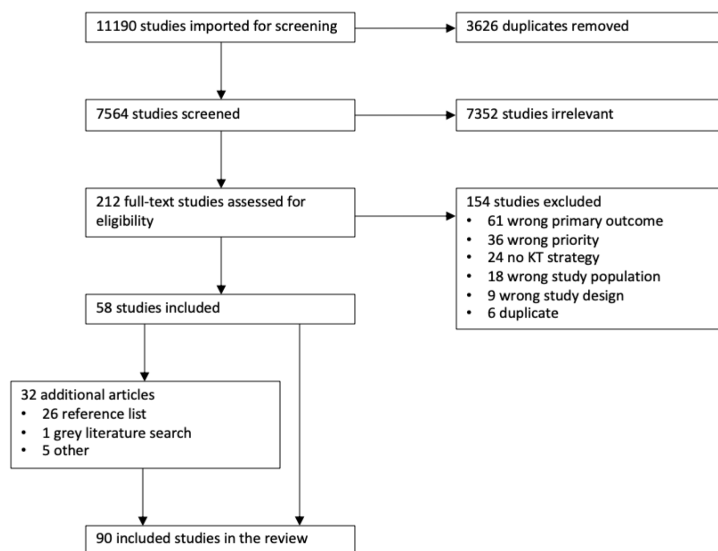

Figure 1. PRISMA-ScR diagram[26]

Characteristics of Sources of Evidence

A summary table of the 90 included studies can be found in Appendix E. All studies were published since 2000, with an increase in relevant publications since 2006 (Table 1). Just over a third (34%) where published between 2011-2015[27–57] and another 34% between 2016-2020.[58–88] Thirty-two percent of studies were quasi-experimental designs,[27,29,30,32,35,36,38,39,48,54,55,63–65,71,72,79,80,87,89–96] with observational (22%),[40,41,43,47,49,56,75,76,81,84,97–106] mixed methods (17%),[44–46,51,57,60–62,68,73,86,107–110] experimental (16%),[28,31,42,66,70,78,82,83,111–116] and qualitative (11%)[33,34,37,53,58,59,67,74,85,117] designs also identified. Two editorials were also included.[69,77]

When stratified by country income level, the majority of the studies (52%) were conducted in high-income countries[27–29,31–33,35,37–39,42,44,45,47–49,53,57,60,61,66,70–72,75,77,78,78,84,87,91,97–99,101,102,104,106–109,111,112,112,113,116], including Canada, the United States, and Australia. Middle-income countries were the setting for 36% of studies[30,34,36,40,43,46,50–52,54,56,67–69,79–81,85,86,89,90,92–96,100,105,114,115,117], including Nepal, Egypt, and Zambia, with only 4% located in low-income countries[62–64,103], such as Uganda and Madagascar. Eight percent of studies included multi-income countries, with six targeting both low and middle-income countries[41,58,65,73,74,76] (e.g., Uganda and Peru), and one targeting middle and high-income countries (e.g., Brazil and Chile).[110] As results were reported by country in these seven studies, we analyzed these studies at each of the appropriate income levels.

The 90 included studies were divided across the SRMNCAH priorities. Child health and wellbeing was the most commonly identified priority, with 30% targeting these concerns.[31,33,36,37,39,40,42,44,47,50,51,55,61,66,71,78,82–84,87,89,93,95,98,102–104,109,112,114] Twenty-eight percent

addressed newborn health and wellbeing or stillbirths.[27,29,30,32,35,38,54,63,64,64,68,72,85,86,90,92,94,99–101,113,115] and one quarter of studied addressed maternal health and wellbeing.[28,41,43,48,49,56,58,59,62,67,76,77,79–81,91,96,97,107,108,116,117] Studies addressing reproductive health and rights (8%),[42,46,53,69,73,74,105,110] sexual health and rights (4%)[34,65,70,75] and adolescent health and wellbeing (4%)[37,45,60,111] priorities were also identified, but in a lower volume compared to studies addressing maternal, child and newborn or stillbirth priorities. Some studies (13%) also included multiple SRMNCAH priorities, with eight targeting both maternal and newborn health and wellbeing,[41,48,50,58,86,88,96,107] two targeting maternal and child health and wellbeing,[56,76] and two targeting maternal, child and newborn health and wellbeing.[79,80] These studies were analyzed at each of the appropriate priority levels.

Publication Date	Country by Income Level	Study Design	SRMNCAH Priorities	Examples of SRMNCAH Health Topics
2000-2005: n=8 **2006-2010:** n=20 **2011-2015:** n=31 **2016-2020:** n=31	**Low:** n= 4 **Low+ Middle:** n= 6 **Middle:** n= 32 **Middle + High:** n= 1 **High:** n= 47	**Experimental:** n=14 **Quasi-experimental:** n= 29 **Observational:** n= 20 **Qualitative:** n= 10 **Mixed methods**: n= 15 **Editorials:** n= 2	**Adolescent**: n=4 **Child:** n=28 **Maternal:** n=14 **Newborn or stillbirths:** n=20 **Maternal + newborn:** n=8 **Maternal + child**: n=2 **Maternal + child + newborn:** n=2 **Reproductive:** n=8 **Sexual:** n=4	**Adolescent:** substance use[111] **Child:** child nutrition[31,39,42,71,78,82,83] **Maternal:** postpartum depression,[49] eclampsia and pre-eclampsia[117] **Newborn or stillbirths:** newborn sleep,[27] newborn vaccination[97] **Reproductive:** Family planning,[46,53,69,73,74,105] abortion[52] **Sexual:** HPV vaccination,[70] STI testing[118]

Table 1. Overview of included studies (n=90)

Synthesis of KT Strategies and Activities:

BCW Policy Categories: Mapping KT strategies to the BCW policy categories identified relevant policy content 60% of studies. Six of the seven BCW policy categories were identified across the strategies, with no strategies applying the *Fiscal* category option. Table 2 provides a summary of all policy categories, examples of KT strategies and exemplar quotes. *Guidelines* and *Service Provision* were the most commonly identified, with G*uidelines* identified in 28% of KT strategies and *Service Provision* identified in 20% of studies. *Guidelines* were implemented in 50% of the low-income countries, compared to only 31% of middle-income and 25% of the high-income countries. *Guidelines* were most frequently used in 50% of KT strategies related to sexual and reproductive health and rights, and 36% of maternal health and well-being strategies. This policy category was less likely to be used in adolescent (27%), newborn (27%) or child (19%) health and wellbeing strategies.

Service Provision was implemented in 89% of the high-income countries, compared to only 5% of middle-income countries and none of the low-income countries. This policy category was divided across SRMNCAH priorities, with the exception of sexual health strategies where it was not applied. Reproductive health included *Service Provision* in 38% of strategies, while 25% of strategies targeting adolescent health and wellbeing included this category.

Number of Policy Categories: Of the KT strategies where policy categories were identified, 74% included one policy category, while 26% applied two or more categories (Table 3). At the multi-category level, *Guidelines* and *Environmental/Social Planning* were identified in

half of the two category strategies. It was more common for low-income countries to use a single policy category, with 40% using one policy category in their strategy and only 20% using multi-category policy strategies. Single policy strategies were consistently identified across the six SRMNCAH priorities, with childhood health and wellbeing strategies most likely to use multiple policy categories.

Policy Category and Definition [119]	Policy Category Identified Across KT Strategies	Policy Category Stratified Country Income Level*	Policy Category Stratified by SRMNCAH priority**	Exemplar Quote
Guidelines (Creating documents that recommend or mandate practice. This includes all changes to service provision)	n= 25	Low: n= 5 (50%) Middle: n= 12 (31%) High: n= 12 (25%)	Adolescent: n= 1 (25%) Child: n=6 (19%) Maternal: n= 9 (35%) Newborn or stillbirths: n=8 (27%) Reproductive: n= 4 (50%) Sexual: n= 1 (50%)	*"The researchers developed and implemented a comprehensive guidelines program about nursing care of total parenteral nutrition for preterm neonates."*[30]
Service Provision (Delivering a service)	n= 18	Low: n= 0 Middle: n= 2 (5%) High: n= 15 (31%)	Adolescent: n= 1 (25%) Child: n=6 (19%) Maternal: n= 4 (15%) Newborn or stillbirths: n=7 (23%) Reproductive: n= 3 (38%) Sexual: n= 0	*"Intervention services were provided with strategies to support adoption of improved childhood nutrition program."*[71]
Communication/Marketing (Using print, electronic, telephonic or broadcast media)	n= 12	Low: n= 2 (20%) Middle: n=4 (10%) High: n= 8 (17%)	Adolescent: n= 0 Child: n=5 (16%) Maternal: n= 3 (12%) Newborn or stillbirths: n= (13%) Reproductive: n= 1 (13%) Sexual: n= 2 (50%)	*"This presentation was beamed on national television. The report was then presented to a meeting of the National Economic Advisory Group, chaired by the President, and coordinated by the Governor of the Central Bank of Nigeria, and also beamed on national television."* [56]
Environmental/Social Planning (Designing and/or controlling the physical or social environment)	n= 11	Low: n= 1 (10%) Middle: n= 4 (10%) High: n= 6 (12%)	Adolescent: n= 0 Child: n=4 (13%) Maternal: n= 5 (19%)	*"The safety program's organizational structure is designed to meet operational objectives providing: Resources and support for*

			Newborn or stillbirths: n=5 (17%) Reproductive: n=0 Sexual: n= 0	*departmental, inpatient, and outpatient unit level safety teams."* [98]
Regulation (Establishing rules or principles of behaviour or practice	n= 7	Low: n= 1 (10%) Middle: n= 2 (5%) High: n= 5 (10%)	Adolescent: n= 0 Child: n=3 (9%) Maternal: n= 1 (3%) Newborn or stillbirths: n=4 (13%) Reproductive: n=0 Sexual: n= 0	*"Two faculty members from each hospital undertook a neonatal resuscitation certification course as per guidelines set out by the AAP/AHA."* [92]
Legislation (Making or changing laws)	n= 3	Low: n= 0 Middle: n= 3(8%) High: n= 0	Adolescent: n= 0 Child: n=0 Maternal: n= 1 (4%) Newborn or stillbirths: n=0 Reproductive: n=2 (25%) Sexual: n= 0	*"The Zambian government authorized the policy change in 2016."* [69]
Fiscal (Using the tax system to reduce or increase the financial cost)	n= 0	N/A	N/A	N/A

Table 2. Summary of BCW Policy Categories identified in KT Strategies by country income level and SRMNCAH priority
* please note country income levels include seven multi-country studies (n=97)
** please note priorities include 12 multi-priority studies (n=104)

Number of Policy Categories per KT Strategy	Number Identified Across KT Strategies	Number Stratified by Country Income Level*	Number Stratified by SRMNCAH priority**
1	n=40	Low: n= 4 (40%) Middle: n= 16 (41%) High: n= 25 (50%)	Adolescent: n= 2 (50%) Child: n= 10 (31%) Maternal: n= 12 (46%) Newborn or stillbirths: n= 14 (46%) Reproductive: n= 5 (63%) Sexual: n= 3 (75%)
2	n=8	Low: n=1 (10%) Middle: n= 3 (8%) High: n=4 (8%)	Adolescent: n= 0 Child: n= 4 (13%) Maternal: n= 2 (8%) Newborn or stillbirths: n= 2 (7%) Reproductive: n= 1 (13%) Sexual: n= 0
3	n=4	Low: n= 1 (10%) Middle: n= 2 (5%) High: n=2 (4%)	Adolescent: n= 0 Child: n= 1 (3%) Maternal: n= 1 (4%) Newborn or stillbirths: n= 2 (7%) Reproductive: n=1 (13%) Sexual: n= 0
4	n=2	Low: n= 0 Middle: n= 0 High: n=2 (4%)	Adolescent: n= 0 Child: n= 1 (3%) Maternal: n= 1 (4%) Newborn or stillbirths: n= 1 (3%) Reproductive: n= 0 Sexual: n= 0

Table 3. Summary of the number of BCW policy categories identified by country income level and SRMNCAH priority
* please note country income levels include seven multi-country studies (n=97)
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BCW Intervention Functions: Mapping the KT strategies to the BCW intervention functions identified all but one strategy contained at least one intervention function. The study where no functions were identified was a KT strategy from a middle-income country targeting sexual health and rights.[34] While no intervention functions were identified in this strategy, it did include content applicable to the BCW policy category level. All nine BCW intervention functions were identified across the KT strategies, *with Education, Training,* and *Environmental*

Restructuring most commonly identified. Table 4 provides a summary of all intervention functions, examples of KT strategies and exemplar quotes.

Education was the most commonly identified element from the included KT strategies, identified in 81% of studies. Types of *Education* provided included modules, staff workshops, slides and other resources. This function was identified in 73 KT strategies across country income levels (88% in high-income countries, 80% of low-income countries, and 77% of middle-income countries). At the SRMNCAH priority level, 91% of child health and wellbeing strategy included an *Education* function. *Education* was also identified in 81% of the maternal health interventions, as well as 75% of each of the reproductive (n=6), adolescent (n=3) and sexual health (n=3) and wellbeing interventions.

Training was identified in 51% of strategies. *Training* typically included conveying skills to staff members and healthcare providers. This element was included 60% of the KT strategies aimed at low-income countries, 52% of high-income countries and 41% of middle-income countries. Strategies stratified by SRMNCAH priority identified *Training* was utilized consistently across each priority.

Environmental Restructuring was identified in 50% of the KT strategies. This element included reorganizing how services were provided, how health centers were set up, and adding additional resources (e.g., tools, team members) in the health centre or health system to facilitate uptake of the KT strategy. This was identified at all three income levels but was more likely to be used in high-income countries (58%), compared to middle (41%) and low-income (40%) countries. Sixty-nine percent of child health and wellbeing strategies included this

function, as well as 50% of each of the sexual and reproductive health and rights strategies. *Environmental Restructuring* was only applied in one of the four (25%) adolescent health and wellbeing strategies.

Number of BCW Intervention Functions: While we identified BCW intervention functions across almost all KT strategies, most strategies employed more than one BCW intervention function (Table 5). Only 26% of the strategies included one function, commonly *Education,* in their KT strategy. The remaining strategies contained between two and six intervention functions, with 33% of strategies using two functions. Of these two intervention functions, *Education* and *Training* or *Education* and *Environmental Restructuring* were the most common pairings.

High-income countries were more likely to use multi-function KT strategies, with 83% of KT strategies at this income level including two or more functions. Stratified by SRMNCAH priority, strategies targeting child health and wellbeing were more likely to employ multi-function strategies, including two strategies which used six intervention functions each.

Intervention Function and Definition [119]	Function Identified Across KT Strategies	Intervention Function Stratified by Country Income Level*	Intervention Function Stratified by SRMNCAH priority**	Examples of KT Strategies Within Function	Exemplar Quote
Education (Increasing knowledge or understanding)	n=73	Low: n= 8 (80%) Middle: n= 30 (77%) High: n= 45 (88%)	Adolescent: n=3 (75%) Child: n=29 (91%) Maternal: n=21 (78%) Newborn or stillbirths: n=23 (77%) Reproductive: n= 6 (75%) Sexual: n=3 (75%)	Education modules, staff workshops, tips for menu planning	*"To introduce the postnatal care package, a 3 day training took place for staff and their supervisors from the maternal and child health clinics and maternity units from four health facilities in one district."* [96]
Training (Imparting skills)	n= 46	Low: n= 6 (60%) Middle: n= 19 (41%) High: n= 26 (52%)	Adolescent: n= 2 (50%) Child: n= 14 (44%) Maternal: n= 12 (46%) Newborn or stillbirths: n= 16 (53%) Reproductive: n= 5 (63%) Sexual: n= 2 (50%)	Developing skills through didactic information or interactive scenarios	*"Canteen managers, canteen staff and parent representatives were invited to attend a training workshop with the aim of providing education and skill development in the policy, nutrition and food label reading, canteen stock and financial management, pricing and promotion, and change management."* [82]
Environmental Restructuring (Changing the physical or social context)	n= 45	Low: n= 4 (40%) Middle: n= 16 (41%) High: n= 30 (58%)	Adolescent: n= 1 (25%) Child: n= 22 (69%) Maternal: n= 10 (38%) Newborn or stillbirths: n= 14 (47%) Reproductive: n= 4 (50%) Sexual: n= 2 (50%)	Providing tools and resources, creating environments which support behaviour, adding team members (e.g., knowledge broker, support officer)	*"Dedicated neonatal unit with reliable water supply, hand-washing facilities, infection control policies and stable power source; Investment in appropriate technology for neonatal care; Dedicated neonatal staff including a paediatrician and neonatal nurse."* [63]
Enablement (Increasing means/reducing barriers)	n=22	Low: n= 5 (50%) Middle: n= 6 (15%) High: n= 14 (29%)	Adolescent: n= 1 (25%) Child: n= 8 (25%) Maternal: n= 6 (23%) Newborn or stillbirths: n= 4 (13%) Reproductive: n= 1 (13%) Sexual: n= 1 (25%)	Prompts and reminders to encourage/support behaviour changes	*"Because practices and agencies face common barriers to improved care delivery, we sought to increase communication among them about how to overcome specific problems in care delivery."* [102]

Persuasion (Using communication to induce positive or negative feelings)	n= 11	Low: n= 1 (10%) Middle: n= 2 (5%) High: n= 10 (21%)	Adolescent: n= 0 Child: n= 8 (25%) Maternal: n=3 (12%) Newborn or stillbirths: n= 1 (3%) Reproductive: n= 0 Sexual: n= 1 (25%)		*"Reports on research studies that have used the FOCUS to show meaningful change following speech-language interventions."* [87]
Modelling (Providing an example for people to aspire to or imitate)	n= 7	Low: n= 0 Middle: n= 3 (8%) High: n= 4 (8%)	Adolescent: n= 0 Child: n= 2 (6%) Maternal: n= 2 (8%) Newborn or stillbirths: n= 2 (7%) Reproductive: n= 1 (13%) Sexual: n=0	Role-playing scenarios	*"A hospital nurse champion was identified for each facility to serve as a leader, with responsibilities of training personnel, facilitating implementation, and identifying and addressing barriers."* [72]
Incentivisation (Creating expectation of reward)	n= 5	Low: n= 0 Middle: n= 1 (3%) High: n= 4 (8%)	Adolescent: n= 0 Child: n= 4 (13%) Maternal: n= 0 Newborn or stillbirths: n= 0 Reproductive: n= 1 (13%) Sexual: n= 0	Non-financial rewards or education credits	*"Participants received 1 hour of continuing medical education credit for their participation, and physicians were awarded Maintenance of Certification Part 4 points for completion of the program."*[70]
Coercion (Creating expectation of punishment or cost)	n= 2	Low: n= 1 (10%) Middle: n= 1 (3%) High: n=0	Adolescent: n= 0 Child: n= 0 Maternal: n= 1 (4%) Newborn or stillbirths: n= 2 (7%) Reproductive: n= 0 Sexual: n=0		*"The program also included monthly compliance reporting of each NICU in the health care system to the administrative data center."* [35]
Restriction (Using rules to reduce the opportunity to engage in the	n= 1	Low: n=0 Middle: n= 1 (3%) High: n=0	Adolescent: n= 0 Child: n=0 Maternal: n= 0 Newborn or stillbirths: n=1 (3%) Reproductive: n=0		*"The program involved ordering all blood products with electronic order entry. If a transfusion order did not comply with the Intermountain Healthcare transfusion guidelines, the ordering clinician could check an "other" category. If the "other" field was*

target behaviour)			Sexual: n= 0		*selected, a prompt was given to explain why the transfusion was being ordered outside of guidelines."* [35]

Table 4. Summary of BCW intervention functions identified in KT strategies by country income level and SRMNCAH priority
* please note country income levels include seven multi-country studies (n=97)
** please note priorities include 12 multi-priority studies (n=104)

Number of Intervention Functions per KT Strategy	Number Identified Across KT Strategies	Number Stratified by Country Income Level*	Number Stratified by SRMNCAH priority
1	n=23	Low: n=2 (20%) Middle: n= 13 (33%) High: n=8 (17%)	Adolescent: n= 2 (50%) Child: n=6 (19%) Maternal: n= 9 (35%) Newborn or stillbirths: n= 9 (30%) Reproductive: n=3 (38%) Sexual: n= 0
2	n=29	Low: n=2 (20%) Middle: n= 11 (28%) High: n=16 (35%)	Adolescent: n= 1 (25%) Child: n=9 (28%) Maternal: n=6 (23%) Newborn or stillbirths: n=14 (47%) Reproductive: n=2 (25%) Sexual: n= 1 (25%)
3	n=22	Low: n=2 (20%) Middle: n= 7 (18%) High: n=15 (27%)	Adolescent: n= 1 (25%) Child: n= 9 (27%) Maternal: n=10 (39%) Newborn or stillbirths: n=3 (10%) Reproductive: n=2 (25%) Sexual: n= 1 (25%)
4	n=13	Low: n=3 (30%) Middle: n= 4 (10%) High: n=8 (15%)	Adolescent: n= 0 Child: n=5 (16%) Maternal: n= 1 (4%) Newborn or stillbirths: n=5 (17%) Reproductive: n=1 (13%) Sexual: n= 1 (25%)
5	n=0	N/A	N/A
6	n=2	Low: n=0 Middle: n= 0 High: n=2 (4%)	Adolescent: n= 0 Child: n=2 (7%) Maternal: n= 0 Newborn or stillbirths: n=0 Reproductive: n=0 Sexual: n= 0

Table 5. Summary of the number of BCW Intervention functions identified in KT Strategies by country income level and SRMNCAH priority

* please note country income levels include seven multi-country studies (n=97)

** please note priorities include 12 multi-priority studies (n=104)

Mode of KT Delivery: Seventy-two percent of KT strategies identified the mode of KT delivery, with the majority using one mode of delivery, while 27% used two or more modes (Table 6). The majority of these studies used in-person (59%) as the sole mode of delivery. Of the multi-modal delivery strategies, in-person delivery was also included as a mode in all but one study. High-income countries used more multi-mode interventions, such as in-person with additional online or web-based components, compared to those in low- and middle-income countries.

While in-person delivery was the most common mode of delivery within these KT strategies, it is interesting to note the shift in technology used over the past few decades. Despite some strategies continuing with the use of booklets and printed resources, the integration of internet use across strategies appeared in the early 2000s. For instance, one study from 2003 used a multi-modal approach of CD-ROMs and internet with their KT strategy.[111] Studies published between 2018-2020 have continued to use evolving trends in technology, such as webinars and social media,[77,87] as modes of delivery.

Mode	**Studies (n=74)**
In-person	n= 44
Online (e.g., webinar, online course)	n= 5
Written resources (e.g., booklet, mailed information)	n= 4
Media campaigns (e.g., print and mass media)	n= 1
Multimodal	
In-person + written resource	n= 6
In-person + online	n= 5
In-person + phone	n= 4
In-person + phone + online	n= 2

In-person + online + written	n= 1
Online + written+ CDs	n= 1
In-person + video + PowerPoint	n= 1

Table 6. Summary of modes of KT strategy delivery

Dose of KT Strategy: Heterogeneity exists within the dose of KT strategies identified from each study. As most KT strategies were education-based, education sessions were offered in a range of ways. This typically included one dose of the education session, either as a one-hour or full-day training session. Some education sessions were provided as multiple modules, where they were offered online and could be completed at the participants' discretion. Other workshops were offered in multiple doses, such as four full-day workshops occurring over the course of eight months. The few non-education strategies, such as adding a knowledge broker to a workplace, were typically completing over the course of 6-12 months.

Synthesis of Stakeholder Involvement

Across the included studies, there was an overall lack of description provided on how stakeholders were involved in designing or implementing KT strategies. From the included studies, 31% did not provide any description of stakeholder engagement. Of the remaining studies that did provide details, the level of detail varied by article, with some simply acknowledging stakeholders were engaged, while others provided a more comprehensive view of the stakeholder groups involved and their roles. Table 7 summarizes types of stakeholder groups by both country income level and SRMNCAH priority. Commonly identified stakeholder groups included: government and policy makers, healthcare providers, civil society organizations [e.g., non-governmental organizations (NGO)], members of the public (e.g.,

patients, family members, or the general public), and members of the research community. Engagement with these groups was distributed across country income level, with two notable exceptions. First, government and policymakers were engaged by low (50%) and middle-income (62%) countries much more often than in high-income (8%) countries. Additionally, civil society organizations were also more likely to be engaged in lower (60%) and middle-income (48%) countries compared to high-income (27%) countries.

Across the SRMNCAH priorities, stakeholder engagement was dispersed across the priorities. It was noted that priorities addressing reproductive health and rights were more likely to include policymakers and government as well as civil society organizations compared to other priorities. Half of strategies addressing adolescent health and wellbeing and 50% of sexual health and rights priorities engaged healthcare providers including clinicians, nurses and allied healthcare professionals (e.g., physiotherapists, dietitians), while only 13% of reproductive health and rights priorities engaged these stakeholders. Involvement of researcher communities was identified across all six priorities but was rarely used in newborn health and wellbeing or stillbirth strategies (7%).

Type of Stakeholders involved in KT Strategy	Stakeholders by Country Income Level*	Stakeholders by SRMNCAH Priority**
Policymakers, Government	Low: n= 5 (50%) Middle: n= 24 (62%) High: n= 4 (8%)	Adolescent: n= 1 (25%) Child: n= 4 (13%) Maternal: n= 9 (35%) Newborn or stillbirths: n= 3 (10%) Reproductive: n= 5 (63%) Sexual: n= 2 (50%)
Healthcare Providers and Administrators	Low: n= 5 (50%) Middle: n= 17 (44%) High: n= 23 (48%)	Adolescent: n= 2 (50%) Child: n= 10 (31%) Maternal: n= 11 (42%) Newborn or stillbirths: n= 9 (30%) Reproductive: n= 1 (13%) Sexual: n= 2 (50%)
Civil Society Organizations (e.g., NGO)	Low: n= 6 (60%) Middle: n= 19 (48%) High: n= 13 (27%)	Adolescent: n= 1 (25%) Child: n= 4 (13%) Maternal: n= 3 (13%) Newborn or stillbirths: n= 2 (7%) Reproductive: n= 5 (63%) Sexual: n= 2 (50%)
Public	Low: n= 2 (20%) Middle: n= 1 (3%) High: n= 10 (21%)	Adolescent: n= 2 (50%) Child: n= 3 (9%) Maternal: n= 1 (4%) Newborn or stillbirths: n= 2 (7%) Reproductive: n= 1 (13%) Sexual: n= 1 (25%)
Research Community	Low: n= 3 (30%) Middle: n= 10 (26%) High: n= 17 (35%)	Adolescent: n= 1 (25%) Child: n= 9 (28%) Maternal: n= 10 (38%) Newborn or stillbirths: n= 2 (7%) Reproductive: n= 2 (25%) Sexual: n= 1 (25%)

Table.7 Summary of stakeholder engagement by country income level and SRMNCAH priority
* please note country income levels include seven multi-country studies (n=97)
** please note priorities include 12 multi-priority studies (n=104)

Number of Stakeholder Groups: In addition to the number of stakeholder groups identified, multiple studies engaged with more than one stakeholder group. The majority of multi-stakeholder groups included two stakeholder groups, and two studies included five stakeholder groups. Table 8 summarizes examples of stakeholder groupings stratified by country income level, and Table 9 provides groupings stratified by SRMNCAH priority. At the

country income level, government and civil society pairings were most common in middle-income groups, with only one identified in low-income countries and none identified in high-income countries. High-income countries were more likely to include healthcare providers, commonly in addition to research community members or with the public.

Across SRMNCAH priorities, stakeholder engagement between researchers and healthcare providers and administrators was the most commonly cited collaboration. Stakeholder engagement between government and civil societies was noticeable in reproductive health (38%), especially as only eight studies were categorized in this priority. The only priority area that had more than four stakeholder groups involved was maternal health and wellbeing.

Number of Stakeholder Groups	Country Income Level	Types of Stakeholder Groups
2 Groups	Low= 2	-Government + civil society (n=1) -Practitioners + public (n=1)
	Middle=8	- Government + civil society (n=5) - Civil society + practitioner (n=2) - Civil society + research community (n=1)
	High= 13	-Practitioner + research community (n=7) -Practitioner + public (n=4) -Practitioner + civil society (n=1) -Public + research community (n=1)
3 Groups	Low= 2	-Practitioner + civil society + research community (n=1) -Government + civil society + practitioners (n=1)
	Middle=9	- Government + civil society + practitioners (n=5) - Civil society + practitioner + research community (n=2) - Government + civil society + community (n=1) - Government + practitioner + research community (n=1)
	High= 8	-Civil society + practitioner + research community (n=5) -Practitioner + civil society +public (n=2) -Practitioner +research community + public (n=1)
4 Groups	Low= 1	-Government + practitioners + civil society +research community (n=1)

	Middle=4	-Government + practitioner + civil society + research community (n=4)
	High= 3	-Government + practitioners + civil society + research community (n=2) -Government +public +civil society + research community (n=1)
5 Groups	Low= 1	-Government + practitioners + civil society +public +research community (n=1)
	Middle= 1	-Government + practitioners + civil society + public + research community (n=1)
	High= 0	N/A

Table 8. Summary of multiple stakeholder groups engaged by country income level

Number of Stakeholder Groups	SRMNCAH Priority	Types of Stakeholder Groups
2 Groups	Newborn Health/Wellbeing or Stillbirths (n = 4)	Practitioner/Administer + Civil Society (n = 2) Practitioner/Administer + Public (n = 1) Civil Society + Government (n = 1)
	Maternal Health/Wellbeing (n = 6)	Research Community + Practitioner/Administrator (n= 4) Research Community + Government (n = 1) Practitioner/Administrator + Government (n = 1)
	Child Health/Wellbeing (n = 9)	Research Community + Practitioner/Administrator (n = 6) Practitioner/Administrator + Government (n = 1) Practitioner/Administrator + Public (n = 1) Civil Society + Government (n = 1)
	Sexual Health/Rights (n = 0)	N/A
	Adolescent Health/Wellbeing (n = 3)	Research Community +Practitioner/Administrator (n=1) Practitioner/Administrator + Public (n= 1) Government + Civil Society (n=1) Practitioner/Administrator + Government (n=1)
	Reproductive Health/Rights (n = 4)	Civil Society + Government (n = 3) Research Community + Practitioner/Administer (n = 1)
3 Groups	Newborn Health/Wellbeing or Stillbirths (n = 3)	Practitioner/Administer + Civil Society + Government (n = 1) Research Community + Practitioner/Administer + Public (n = 1)

		Research Community + Practitioner/Administer + Civil Society (n = 1)
	Maternal Health/Wellbeing (n = 3)	Research Community + Practitioner/Administer + Civil Society (n = 1) Research Community + Practitioner/Administer + Public (n = 1) Research Community + Practitioner/Administer + Government (n = 1)
	Child Health/Wellbeing (n = 4)	Researcher + Practitioner/Administer + Public (n = 1) Research Community + Civil Society + Government (n = 1) Research Community + Public + Civil Society (n = 1) Research Community + Practitioner/Administer + Government (n = 1)
	Reproductive Health/Rights (n = 1)	Practitioner/Administer + Public + Civil Society (n = 1)
4 Groups	Newborn Health/Wellbeing or Stillbirths (n = 1)	Research Community + Practitioner/Administer + Civil Society + Government (n = 1)
	Maternal Health/Wellbeing (n = 2)	Research Community + Practitioner/Administer + Civil Society + Government (n = 2)
	Child Health/Wellbeing (n = 1)	Research Community + Practitioner/Administer + Civil Society + Government (n = 1)
	Sexual Health/Rights (n = 2)	Research Community + Practitioner/Administer + Civil Society + Government (n = 1) Research Community + Practitioner/Administer + Public + Government (n = 1)
	Adolescent Health/Wellbeing (n = 0)	N/A
	Reproductive Health/Rights (n = 2)	Research Community + Practitioner/Administer + Civil Society + Government (n = 2)
5 Groups	Maternal Health/Wellbeing (n = 2)	Research Community + Practitioner/Administer + Public + Government + Media (n = 1) Research Community + Practitioner + Civil Society + Government + Media (n = 1)

Table 9. Summary of multiple stakeholder groups engaged by SRMNCAH priority

Synthesis of Outcomes:

Nearly 80% of KT strategy outcomes were reported at a one level (e.g., patient or healthcare provider level), with 21% studies reporting multiple outcome levels (e.g., healthcare provider and system levels; Table 10). Almost every study noted a positive change in outcomes following KT strategy implementation, although these trends did not always reach statistical significance. At the single outcome level, 38% of outcomes were at the healthcare provider level and 29% at system level. Examples of healthcare provider outcomes included increased knowledge, adopting new behaviours, and incorporating and using new tools and clinical guidelines in the workplace. Examples of system outcomes included improvements in length of stay, better quality of care, reduction in safety incidents, reduction in antimicrobial resistance, and decreases in morbidity and mortality rates. Only 5% of strategies included patient outcomes (e.g., improved newborn sleep), however patient outcomes were more likely to be included in multi-level outcomes, along with healthcare provider and system level outcomes. Of the multi-level outcome studies, 17% had outcomes at two levels (e.g., patient and healthcare providers, healthcare providers and system, or patient and system) and 4% of studies included three level outcomes (e.g., patient, healthcare provider and system).

Healthcare provider outcomes were mostly reported in high-income (44%) and low-income (40%) countries, compared to 26% of middle-income countries, while system level outcomes were more common in low-income (40%) and middle-income (41%) countries. Healthcare provider outcomes were identified across the SRMNCAH priorities, ranging from 23-75% for maternal health and wellbeing strategies to those for adolescent wellbeing, respectively. While fewer maternal health and wellbeing strategies included healthcare

provider level outcomes, nearly half of these strategies (48%) were aimed at system level outcomes. Childhood health and wellbeing strategies were also most likely to address multi-level outcomes compared to all other priorities.

Outcome level(s)	**Outcome level Stratified Country Income Level***	**Outcome level Stratified by SRMNCAH priority****
Healthcare providers (n=34)	Low: n= 4 (40%) Middle: n= 10 (26%) High: n= 21 (44%)	Adolescent: n= 3 (75%) Child: n= 12 (38%) Maternal: n= 6 (23%) Newborn: n= 8 (27%) Reproductive: n= 3 (38%) Sexual: n= 2 (50%)
System (n=26)	Low: n= 4 (40%) Middle: n= 16 (41%) High: n= 11 (23%)	Adolescent: n= 0 Child: n= 8 (25%) Maternal: n= 11 (42%) Newborn: n= 4 (13%) Reproductive: n= 3 (38%) Sexual: n= 0
Patient (n=5)	Low: n= 0 Middle: n= 2 (5%) High: n= 3 (6%)	Adolescent: n= 1 (25%) Child: n= 1 (3%) Maternal: n= 1 (4%) Newborn: n= 1 (3%) Reproductive: n= 1 (13%) Sexual: n= 0
Policy makers and knowledge users (n=4)	Low: n= 0 Middle: n= 2 (5%) High: n= 2 (4%)	Adolescent: n= 0 Child: n= 1 (3%) Maternal: n= 2 (8%) Newborn: n= 0 Reproductive: n= 0 Sexual: n= 1 (25%)
Childcare providers (n=2)	High: n= 2 (4%)	Child: n= 2 (7%)
Multi-level outcomes		
Healthcare provider+ System (n=4)	Low: n= 1 (10%) Middle: n= 2 (5%) High: n= 2 (4%)	Adolescent: n= 0 Child: n= 1 (3%) Maternal: n= 0 Newborn: n= 2 (7%) Reproductive: n=0 Sexual: n=1
Patient + Healthcare provider (n= 4)	Low: n= 0 Middle: n= 1 (3%) High: n= 3 (6%)	Adolescent: n= 0 Child: n= 2 (6%) Maternal: n= 2 (9%) Newborn: n= 0

		Reproductive: n= 0 Sexual: n= 0
Patient + System (n=7)	Low: n= 1 (10%) Middle: n= 3 (8%) High: n= 3 (6%)	Adolescent: n= 0 Child: n= 2 (7%) Maternal: n= 0 Newborn: n= 4 (13%) Reproductive: n=1 (13%) Sexual: n=0
Patient + Healthcare provider + System (n=2)	Low: n= 0 Middle: n= 1 (3%) High: n= 1 (2%)	Maternal: n= 1 (4%) Newborn: n= 1 (3%)
Childcare provider +Parents + System (n=1)	High: n= 1 (2%)	Child: n= 1 (3%)

Table 10. Summary of outcome levels by country income level and SRMNCAH priority
* please note country income levels include seven multi-country studies (n=97)
** please note priorities include 12 multi-priority studies (n=104)

Synthesis of Barriers and Enablers

Similar to the description of stakeholder engagement, few studies reported barriers and enablers to using KT strategies to promote the use of evidence in SRMNCAH and wellbeing. Less than half of the studies (46%) outlined barriers and even fewer identified enablers (41%) to their KT strategies. When studies included barriers and enablers, the level of detail provided varied across the studies, with some studies providing a brief list of these factors while other studies provided more comprehensive details and how each affected the KT strategy.

Identified Barriers: Table 11 outlines the common barriers across country income levels. A clear barrier across all country income levels was limited resources. Most studies that noted the lack of resources identified there was inadequate availability or accessibility of resources, primarily in the form of funding for KT strategies, required to appropriately implement or sustain the KT strategy. While this was identified at all country income levels, low-income countries (40%) were most likely to identify it as a barrier. Additionally at the low-income level, attitudes of healthcare providers were identified as a barrier as there was resistance or low

buy-in from this group to implement the KT strategy. Middle-income countries were more likely to note that poor planning, especially poor communication, was a barrier, while high-income countries also noted poor partnerships may have limited the success of the KT strategy.

Country Income Level*	Barriers Mentioned Across Studies	Exemplar Quotes:
Low (n=10)	Workload, lack of resources, attitude, lack of knowledge	*"4 out of 10 Peace Corps Volunteers reported some resistance to the teaching by older midwives in their health centres."*[64]
		"staff turnover is high and there are no mechanisms for tracking whether a new provider in a facility received training and materials in a previous position."[74]
Middle (n=39)	Language barriers, poor planning, poor communication, lack of time, limited support/partnership, lack of resources, attitude, lack of knowledge	*"Another point raised was the general lack of project funds available, restricting group members to mainly target the areas close by and not those in greatest need. Also, when having meetings at different places in a commune, it would have been appropriate to be able to attract people, which, in the Vietnamese context, necessitates a financial incentive."* [34]
		"Several factors may have contributed to this: ineffective planning and communication, in that no specific person at facility or district level was nominated to coordinate."[34]
High (n=48)	Lack of time, limited support/partnership, skills/training, geographical constraints, lack of resources, attitude, lack of knowledge	*"Lack of funding and other necessary resources and the absence of concrete evidence of the impact of KB's were identified as barriers to implementing knowledge brokering."*[37]

	"A number of barriers to providing foods in accordance with nutrition guidelines have been reported. These include food service staff challenges with modifying recipes, inadequate access to updated menu planning resources…."[66]
	" absence of interdisciplinary team work… poor cooperation and collaboration between general and mental health sectors."[28]

Table 11. Summary of barriers identified by country income level
* please note country income levels include seven multi-country studies (n=97)

At the SRMNCAH priority level, inadequate team knowledge or skills was commonly identified as a barrier across child and maternal health and wellbeing, and sexual health and rights priorities. This lack of knowledge included limited skills or training in healthcare providers, lack of expert clinicians, and lack of local expertise. At the newborn health and wellbeing or stillbirth priority, time constraints and low stakeholder engagement were more likely to be identified compared to other priorities. Identified barriers from adolescent health and wellbeing and reproductive health and rights priorities included competing priorities, lack of resources and time constraints. Table 12 provides a comprehensive view of these barriers for each priority.

SRMNCAH Priorities	Barriers Mentioned Across Studies	Exemplar Quote:
Newborn Health/Wellbeing or Stillbirths (n = 30)	Competing priorities, coordination issues, lack of appropriate knowledge on team, physical environment, communication issues, lack of	"*Also, some facilitators were thought to lack skills in communication, which was considered a key feature in their role.*"[85]

	resources, stakeholder engagement difficulties, time constraints	*"Engagement: the composition of the teams was highlighted as being a barrier. For example, more village health workers should have been included in the groups, and it would also have been appropriate to include other village representatives."*[85]
		"Delays in implementing parts of the change management plan were as a result of time constraints."[99]
Maternal Health/Wellbeing (n = 26)	Competing priorities, coordination issues, differing agendas, timelines and objectives of research/policy, communication issues, lack of resources, lack of appropriate knowledge on team, minimal evidence, physical environment, time constraints, staff and training limitations, technical issues.	*"Program implementation was also challenged by a fairly high incidence of case manager turnover."*[108]
		"If research teams lack the capacity for KT, they will find it extremely difficult to raise MNCH knowledge users' awareness of research findings in order to facilitate the use of those findings to improve maternal and child health outcomes."[79]
		"Pregnant patients prefer information from provider: Patients want to discuss eligibility with a provider; MAs prefer provider answer more complicated questions for pregnant women."[59]
		"It is likely that resource limitations, which are often more pronounced in LMIC settings, are more important barriers to the implementation of evidence based policies than to the prior use of evidence in policy and guideline development."[120]
Child Health/Wellbeing		

(n = 32)	Coordination issues, Differing agendas, timelines and objectives of research/policy, lack of adequate knowledge on team, communication issues, minimal evidence, lack of resources, time constraints, stakeholder engagement difficulties, technical issues.	*"Limited availability of clinicians with expertise (limited number of skilled people dealing with too many issues in parallel)."*[40]
		"The evidence readily available at the initiation of the guidelines updating process was not complete enough to be used by Policymakers; Researchers started working on building evidence seven months after the process was initiated by the MoH."[40]
Sexual Health/Rights (n = 3)	Coordination issues, communication issues, lack of appropriate knowledge on team, time constraints, training limitations, lack of resources	*" the first round of rollout supervisory visits revealed limited implementation of these procedures. Several factors may have contributed to this: ineffective planning and communication (in that no specific person at facility or district level was nominated to coordinate)."* [34]
		"lack of local expertise in this type of activity which is often undertaken by NGOs, or lack of efficacy on the part of local laboratory staff."[34]
Adolescent Health/Wellbeing (n = 4)	Competing priorities, coordination issues, physical environment, lack of resources, staff and training limitations, time constraints, technical issues	
Reproductive Health/Rights (n = 8)	Competing priorities, minimal evidence, physical environment, lack of resources, time constraints.	

Table 12. Summary of barriers identified by SRMNCAH priority

Identified Enablers: In contrast to the barriers identified, the most common enabler identified across studies was supportive partnerships (e.g., government or health authorities). This enabler was identified across all country income levels (Table 13). Low-income countries also noted the importance of positive attitudes from healthcare providers and study personnel. High-income countries identified the importance of increasing knowledge, as it helped ensure healthcare providers had the appropriate education and training to successfully use the KT strategy.

Country Income Level*	Enablers Mentioned	Exemplar Quotes:
Low (n=10)	Improved knowledge, access to resources, positive attitude	*"Alongside the workbook itself, outside support built capacity and focused attention on the work…In Uganda, everyone who worked on this project was volunteering their time and had many other priorities. Having outside support brought focus to this work."*[58]
		"8/ 10 health centres had a doctor and in contrast to the resistance among certain older midwives, all the doctors welcomed the training."[64]
Middle (n=39)	Knowledge tailoring, planning, external support/partnership, accessible resources, positive attitudes	*"The success of NeoKIP was partly attributed to its ability to engage various members of the healthcare system, particularly at commune level…The strategies applied in NeoKIP were still affecting people in that manner after the NeoKIP intervention had ended, and, although no facilitators arranged further meetings beyond the project, the healthcare workers still applied the same approach, focusing on knowledge*

		issues, and employing the means used in the intervention."[85]
High (n=48)	supportive partnerships, skills and training, accessible resources, positive attitudes	*"Much of the program's success is a result of the core team's interdisciplinary structure and its ability to develop effective collaborative relationships across various disciplines and departments."*[98]
		"Staff training and empowerment: Best practices (changes in protocol and procedure); Justification for providing vaccines under a standing order; Empowering clinical staff to provide vaccinations before patients saw providers and increasing staff autonomy."[59]

Table 13. Summary of enablers identified by country income level
* please note country income levels include seven multi-country studies (n=97)

Across SRMNCAH priorities, collaboration with stakeholders was a commonly identified enabler across maternal health and wellbeing, newborn health and wellbeing and stillbirths, and reproductive health and rights priorities. This enabler was also identified in adolescent health and wellbeing and reproductive health and rights priorities. Enablers specific to childhood health and wellbeing priorities were strong leadership and developing accessible and useable resources. Table 14 provides a comprehensive view of these enablers for each priority.

SRMNCAH Priorities	Enablers Mentioned	Exemplar Quotes:
Newborn Health/Wellbeing or Stillbirths (n = 30)	Collaboration with stakeholders, leadership and management, monitoring/evaluation, readiness for change, resource availability, system support	*"The following aspects were found to support knowledge implementation and sustainability in relation to the former NeoKIP trial: Engagement, Project management, Tailoring to context, and Funding."*[85]
		"Collaboration with physician and

Maternal Health/Wellbeing (n= 26)	Collaboration with stakeholders, culture of environment, integrated knowledge translation strategies, monitoring/evaluation, readiness to change, management, system support, useful deliverables, value for evidence	*nursing providers also was critical to the success of the initiative."*[106]
		" The three key categories of influence on the policymaking process – ideas, interests and institutions – were therefore in alignment, facilitating the uptake of evidence into policy making."[117]
		"Changing practice may be difficult and challenging, however, it can be done. Steering committee and work team members attribute several factors to the initial success of the initiative. Foremost was the commitment of committee members to change the work based on evidence and the underlying assumption of doing what is best for the patients."[106]
Child Health/Wellbeing (n = 32)	Collaboration with stakeholders, implementation efforts, culture of environment, knowledge translation strategies, leadership and management, monitoring and evaluation, resources, system support, validity of work, useful deliverables	*"Staff reported that the most valuable components of the BSC were having a designated TF-CBT site coordinator, clinical training in the TF-CBT model, and weekly TF-CBT implementation team meetings at their agency."*[44]
		"Research synthesis included key messages; Research synthesis was written in plain and easy English and translated into local language; Research synthesis was short and compliant with the SUPPORT recommendations; Research synthesis was widely made permanently available online."[68]
Sexual Health/Rights (n = 4)	Collaboration with stakeholders	
Adolescent Health/Wellbeing (n = 4)	Advocacy, collaboration with stakeholders, monitoring and evaluation, useful deliverables	
Reproductive Health/Rights (n = 8)	Advocacy, collaboration with stakeholders, implementation efforts, system support, validity of work, monitoring/evaluation	*"In Nigeria, building the advocacy capacity of providers for motivating change at higher levels of the health system, as well as leveraging*

	community groups – those linked to facilities – for filling immediate resource gaps." [73]
	"Engaging government officials throughout the research and advocacy processes was critical to policy advocacy efforts." [69]
	"*Both countries have built-in efforts to facilitate the use of national and WHO materials and ensure that providers have the skills to deliver quality services and use the materials provided during training*." [74]

Table 14. Summary of enablers identified by SRMNCAH priority

DISCUSSION

Summary of Evidence

This rapid scoping review identified 90 studies published since 2000 which utilized KT strategies to support the use of evidence for improving SRMNCAH and wellbeing. While we identified a wide range of studies across countries of different income levels and SRMNCAH priorities, most KT strategies were implemented in high-income countries and primarily focused on maternal, newborn or stillbirths, or child health and wellbeing topics. Our findings illustrate that the majority of KT strategies included an *Education* component and strategies were commonly aimed at addressing healthcare provider and system-level level outcomes. While few details were typically provided on stakeholder engagement, or on barriers and enablers in the KT process, it was noted in studies that did provide these details that collaboration with stakeholders and building partnerships with local actors, such as government or health authority, facilitated use of KT strategies. Future research needs to ensure details about

stakeholder engagement and facilitators and limitations to KT are explicitly provided in publications. While this review has identified many KT strategies to address SRMNCAH across multiple country income levels, future work should focus on conducting a systematic review to determine the effectiveness of these strategies and potential BCW intervention functions and policy categories associated with effective KT strategies.

Low- and middle-income countries used a range of education and training strategies and were most likely to engage with diverse stakeholder groups, including government, policy makers and civil societies, compared to high-income countries. However, these countries also identified a lack of funding and resources as the most common barrier to implementing and sustaining KT strategies. As only ten of the identified KT strategies were implemented in low-income countries, more work is needed in these countries to move research evidence into practice to improve SRMNCAH outcomes while addressing the economic, resource, and health system barriers they experience.

Millennium Development Goals (MDGs)

The majority of studies included content and strategies relevant to addressing different MDGs, primarily MDGs four and five. MDG four aims to reduce child mortality, particularly in children aged five years and younger.[120] Ten percent of the studies we identified aimed to reduce newborn and childhood mortality, particularly neonatal mortality, in low and middle-income countries.[27,41,56,63,76,85,90,94] Additionally, four of these studies also aimed to address maternal mortality.[41,56,76,94] Strategies at this level included education strategies targeting healthcare providers to ensure quality care is provided to help support health outcomes in

newborns and children, and one strategy outlined an advocacy campaign targeting government members to support free health services for pregnant women and children to help reduce mortality rates.[56] Providing these educational and training opportunities to healthcare providers and adding resources to health systems help target the specific healthcare provider and health system barriers often experienced in low and middle-income countries.[121,122] However it is recommended to include other sectors beyond the health system in these strategies, and these multi-sectoral strategies will need to be sustainable to ensure continual access to high quality healthcare for children.

MDG five aims to improve maternal health, by improving access to reproductive health interventions, quality healthcare during pregnancy, and access to skilled midwives and healthcare providers during labour and delivery.[120] We identified multiple strategies aimed at addressing the health concerns within this MDG. All but one of the eight reproductive health and rights strategies identified in this review targeted family planning, particularly in middle-income countries.[46,52,53,69,73,74,105] The remaining reproductive strategy that did not address family planning provided training to build capacity among healthcare providers to support providing reproductive health services.[110] Positive trends in outcomes were identified following the implementation of these strategies, and may represent useful strategies to replicate in low-income countries in the future. When considering implementing strategies in these countries, it will be important to consider differences in social, cultural and economic factors which may need to be addressed within the strategy to have the best chance at success.

We also identified five maternal health and wellbeing strategies which directly addressed improving pre-term labour management, labour and delivery outcomes and perinatal care, although primarily in high-income countries.[67,88,106,107,116] These strategies typically included utilizing clinical guidelines and education for nurses to help support improvements in these maternal outcomes. These identified strategies clearly aim to improve maternal health, however as most are implemented in high-income countries it represents a significant gap in understanding relevance in low and middle-income countries. While it is promising and needed to support maternal health in every country, those in low and middle-income countries experience more barriers to high quality healthcare, accessible health services and trained healthcare providers during labour and delivery.[120,121] It is important to ensure future work is aimed at addressing these barriers in low and middle-income countries to continue to support maternal health.

Several studies in this rapid review were relevant to the first MDG goal; to eradicate extreme poverty and hunger, particularly undernutrition in newborns and children. We identified multiple strategies addressing newborn nutrition and childhood nutrition, however all but one of these strategies were implemented in high-income countries.[31,42,66,71,78,82,83,90] Due to the global differences in the availability and accessibility of nutrient-dense food, the childhood nutrition concerns in most high-income countries are primarily overconsumption of food and childhood obesity,[123–125] whereas poverty and extreme hunger is a considerable concern in low and middle-income countries. The childhood nutrition strategies from high-income countries were typically school nutrition programs and some included an element of physical activity to help support healthy childhood development and dietary behaviours in

school aged children.[31,39,42,71,78,82,83] While it is important to prevent the potential long-term health consequences of childhood obesity, these studies do not contribute towards eradicating poverty and hunger. We identified a significant gap in available KT strategies to support the sustained availability and accessibility of nutrient-dense food, specifically in the context of low- and middle-income countries and the unique barriers experienced in these countries.

Limitations

Due to the rapid nature of this scoping review, it is possible we may have missed relevant strategies in the search. However, our literature and grey literature searches identified a range of relevant strategies across countries and SRMNCAH priorities. As this is a scoping review, we did not conduct a critical appraisal of the evidence sources against any standardized appraisal tools. Finally, findings from the review are up to date as of August 2020. It is possible additional relevant strategies may have been published between running the search strategy and report writing, especially with the surge of research and publications as a result of the COVID-19 pandemic. However, this review provides a comprehensive idea of KT strategies which have been published over the past 20 years to address the health and wellness of women, newborns, child and adolescents.

Conclusions

We identified 90 strategies supporting the uptake of evidence into practice to support SRMNCAH and wellbeing. Most KT strategies in this area are being implemented in high-income countries and aimed at maternal, newborn and child health and wellbeing. Additionally, very few of these strategies have been used in low-income countries. Further research into the

effectiveness of KT strategies is required to determine vital content to include in strategies to help improve health outcomes and achieve maternal, newborn, child and adolescent development goals in low- and middle-income countries.

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ABBREVIATIONS:

BCW: Behaviour Change Wheel

KT: Knowledge Translation

MDG: Millennium Development Goals

PMNCH: Partnership for Maternal, Newborn & Child Health

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

SPOR: Strategy for Patient-Oriented Research

SRMNCAH: Sexual, Reproductive, Maternal, Newborn, Child, and Adolescent Health

WHO: World Health Organization

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APPENDIX A- Search Strategy

1 exp Diffusion of Innovation/
2 Information Dissemination/
3 Translational Medical Research/
4 ((disseminat* or implement* or share? or sharing or translat*) adj2 (activities or activity or approach? or model? or plan? or planning or program* or strategies or strategy or advanc* or better* or boost* or enhanc* or forward* or further* or improv* or increas* or bolster* or sustain* or uphold*)).ti,ab,kw,kf.
5 (evidence* adj2 (adapt* or adopt* or diffus* or disseminat* or exchang* or implement* or mobili* or share? or sharing or transfer* or translat* or utilis* or utiliz* or uptake)).ti,ab,kw,kf.
6 (information adj2 (adapt* or adopt* or diffus* or disseminat* or exchang* or mobili* or propagat* or share? or sharing or spread* or transfer* or translat*)).ti,ab,kw,kf.
7 (innovation? adj2 (adapt* or adopt* or diffus* or disseminat* or exchang* or implement* or mobili* or propagat* or share? or sharing or spread* or transfer* or translat* or transmi* or uptake)).ti,ab,kw,kf.
8 (knowledge adj2 (adapt* or adopt* or diffus* or disseminat* or exchang* or implement* or mobili* or propagat* or share? or sharing or spread* or transfer* or translat* or transmi* or uptake)).ti,ab,kw,kf.
9 (research adj2 (adapt* or adopt* or diffus* or disseminat* or exchang* or implement* or mobili* or propagat* or share? or sharing or spread* or transfer* or translat* or transmi* or utilis* or utiliz* or uptake)).ti,ab,kw,kf.
10 or/1-9 [KT]
11 Cartoons as Topic/
12 exp Mass Media/
13 Pamphlets/
14 Newspapers as Topic/
15 Webcasts as Topic/
16 Guidelines as Topic/
17 ((knowledge or evidence) adj (product? or summary or summaries or brief* or report? or portal? or repositor* or database? or center? or centre?)).ti,ab,kw,kf.
18 (advocacy brief* or strategy brief*).ti,ab,kw,kf.
19 (position statement? or consensus statement? or policy statement?).ti,ab,kw,kf.
20 (booklet? or brochure? or cartoon* or comic? or flyer? or infograph* or pamphlet? or poster?).ti,ab,kw,kf.
21 (media adj2 (communicat* or diffus* or disseminat* or exchang* or mobili* or populari* or propagat* or publici* or share? or sharing or spread*)).ti,ab,kw,kf.
22 (briefing? or news or newspaper? or press release?).ti,ab,kw,kf.
23 (thematic report? or accountability report? or evaluation report?).ti,ab,kw,kf.
24 (strategic plan? or annual report? or progress report?).ti,ab,kw,kf.
25 (online communication? or web communication? or video? or webcast* or podcast*).ti,ab,kw,kf.
26 (toolkit? or tool or tools or roadmap? or road map?).ti,ab,kw,kf.
27 (guideline? or standards).ti,ab,kw,kf.
28 or/11-27 [products]
29 10 and 28 [KT products]

30 ((evidence or information or innovation? or knowledge or research) adj2 (adapt* or adopt* or diffus* or disseminat* or exchang* or implement* or mobili* or propagat* or share? or sharing or spread* or transfer* or translat* or transmi* or uptake) adj2 (activities or activity or approach? or initiative? or plan? or policies or policy or procedure? or program* or scheme? or strategies or strategy)).ti,ab,kw,kf.
31 or/1-3
32 (activities or activity or approach? or initiative? or plan? or policies or policy or procedure? or program* or scheme? or strategies or strategy).ti.
33 31 and 32 [KT activities]
34 30 or 33 [KT activities or strategies]
35 29 or 34 [KT products, activities, or strategies (INTERVENTION)]
36 exp Administrative Personnel/
37 exp Policy Making/
38 (administrator? or decision maker? or policy maker? or policymaker?).ti,ab.
39 (knowledge user? or stakeholder?).ti,ab.
40 (advisory or board or committee? or task force?).ti,ab.
41 (((policy or policies) adj making) or policymaking or ((policy or policies) adj2 develop*) or ((policy or policies) adj2 analys?s) or (health adj (policy or policies))).ti,ab.
42 (legislator? or legislation?).ti,ab.
43 (health system? or health care system? or healthcare system? or system? level or system? manage*).ti,ab.
44 (civil societ* or third sector or non government* organi?ation? or nongovernment* organi?ation? or ngo or ngos).ti,ab.
45 (donor? or funder? or funding agen* or grant* agen*).ti,ab.
46 or/36-45 [POPULATION]
47 Reproductive Health/ or Reproductive Health Services/ or Family Planning Services/ or Sexual Health/ or Circumcision, Female/ or Menstruation/ or exp Puberty/ or exp Contraception/ or exp Sexually Transmitted Diseases/ or exp Sex Offenses/ or Intimate Partner Violence/ or Gender-Based Violence/ or Sex Work/ or exp Human papillomavirus 16/ or Human papillomavirus 18/ or Uterine Cervical Neoplasms/ or (reproductive or reproduction or family planning or sexual* or early marriage or child marriage or child bride? or female genital mutilation or female circumcision or menstruation or menstrual or puberty or contraception or contraceptive* or condom? or sexually transmitted infection* or sexually transmitted disease* or hiv or aids or coerc* or rape or forced sex or abortion? or intimate partner violence or gender based violence or sex work* or transactional sex or hpv or cervical cancer?).ti,ab,kw,kf.
48 exp Women's Health/ or exp Women's Health Services/ or Women/ or (wom#n? or female? or mother? or maternal or widow?).ti,ab,kw,kf.
49 exp Maternal Health Services/ or Pregnant Women/ or exp Pregnancy/ or (birth or childbirth or mother* or maternal* or maternity or preconception or prenatal* or perinatal* or antepartum or ante-partum or intrapartum or intra-partum or neonatal* or neo-natal* or postnatal* or post-natal* or postpartum or post-partum or pregnan*).ti,ab,kw,kf.
50 exp Infant/ or (fetus* or foetus* or fetal* or foetal* or baby or babies or neonate* or neo-nate* or newborn* or new-born* or infant*).ti,ab,kw,kf.

51 exp Child/ or exp Pediatrics/ or (child* or kid or kids or girl or girls or boy or boys or preschool* or pre-school* or kindergarten* or school age* or elementary school* or juvenile* or minors or p?ediatric? or first-grader* or second-grader* or third-grader* or fourth-grader* or fifth-grader* or sixth-grader* or seventh-grader* or eighth-grader* or middle school* or junior high*).ti,ab,kw,kf.

52 Adolescent/ or Young Adult/ or (teen* or youth* or adolescen* or juvenile* or (young adj2 (adult* or person* or individual* or people* or population*)) or youngster* or highschool* or ((secondary or high*) adj2 (school* or education)) or pubescen*).ti,ab,kw,kf.

53 or/47-52 [RMNCAH filter]

54 35 and 46 and 53

APPENDIX B- Grey Literature Search Strategy

SRMNCAH Priority	Search Terms
Reproductive health and rights	"evidence | information | innovation | knowledge | research" "diffusion | dissemination | exchange | implementation | mobilization | sharing | spread | transfer | translation | uptake" "activities | approach | model | plan | program | strategy" "reproductive | sexual | puberty | menstruation" -site:ncbi.nlm.nih.gov
Sexual health and rights	"evidence | information | innovation | knowledge | research" "diffusion | dissemination | exchange | implementation | mobilization | sharing | transfer | translation | uptake" "activities | approach | model | plan | program | strategy" "contraception | contraceptive | condoms | sti | std | hiv | aids | "safe sex"" -site:ncbi.nlm.nih.gov "evidence | information | innovation | knowledge | research" "diffusion | dissemination | exchange | implementation | mobilization | sharing | transfer | translation | uptake" "activities | approach | model | plan | program | strategy" ""sex work" | "transactional sex" | hpv | "cervical cancer"" -site:ncbi.nlm.nih.gov
Maternal health and wellbeing	"evidence | information | innovation | knowledge | research" "diffusion | dissemination | exchange | implementation | mobilization | sharing | spread | transfer | translation | uptake" "activities | approach | model | plan | program | strategy" "rape | forced sex | coercion | abortion | "intimate partner violence"" -site:ncbi.nlm.nih.gov "evidence | information | innovation | knowledge | research" "diffusion | dissemination | exchange | implementation | mobilization | sharing | spread | transfer | translation | uptake" "activities | approach | model | plan | program | strategy" "health" "women | female | mother | maternal | widow" -site:ncbi.nlm.nih.gov "evidence | information | innovation | knowledge | research" "diffusion | dissemination | exchange | implementation | mobilization | sharing | spread | transfer | translation | uptake" "activities | approach | model | plan | program | strategy" "health" "birth | childbirth | maternity | prenatal | perinatal | neonatal | postnatal | postpartum | pregnancy" -site:ncbi.nlm.nih.gov
Newborn health and wellbeing or stillbirths	"evidence | information | innovation | knowledge | research" "diffusion | dissemination | exchange | implementation | mobilization | sharing | spread | transfer | translation | uptake" "activities | approach | model | plan | program | strategy" "health" "infant | baby | neonatal | newborn | fetal" -site:ncbi.nlm.nih.gov

Children health and wellbeing	"evidence | information | innovation | knowledge | research" "diffusion | dissemination | exchange | implementation | mobilization | sharing | spread | transfer | translation | uptake" "activities | approach | model | plan | program | strategy" "health" "children | pediatric | kids | girls | boys | "school age"" -site:ncbi.nlm.nih.gov
Adolescent health and wellbeing	"evidence | information | innovation | knowledge | research" "diffusion | dissemination | exchange | implementation | mobilization | sharing | spread | transfer | translation | uptake" "activities | approach | model | plan | program | strategy" "health" "adolescents | teens | teenagers | youth | "young adults"" -site:ncbi.nlm.nih.gov

APPENDIX C- Data Extraction Guidelines

INFORMATION TO BE EXTRACTED FOR EACH ARTICLE/REPORT	INTRUCTIONS
Section 1 – Study Description	
Author and publication year	What is the first author's last name and initial? What year was the manuscript or report published? Make a note if there are multiple papers on the same study.
Country	Where did the study take place? If multi-site study or approach, please list all countries.
Objectives	What were the study objectives or research questions? Also include overall aim if reported. Please copy text directly from the paper.
Design	What was the study design? Please select from the drop down list. If not listed, please selected other and make a note in the comment section.
Sample	What were characteristics of the sample? • List sample size for each study arm and/or study population. Describe age range, sex, gender characteristics. • Choose from study populations: health care providers, health systems managers, policy makers, civil society organizations, funders, and/or donors.
Setting	What setting was the study conducted in (e.g. community, hospital, school)?
PMNCH priority	Which PMNCH priority is the focus? (1) **Sexual health/rights:** "…well-being in relation to sexuality…requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence…"[126] (2) **Reproductive health/rights:** "…a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and to its functions and processes. Reproductive health implies that people are able to have a satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so."[127] (3) **Maternal health/wellbeing:** "…health of women during pregnancy, childbirth and postnatal period…ending preventable maternal death…reducing maternal injury and disability to promote health and well-being".[128]

	(4) **Newborn health/wellbeing or stillbirths:** "…focus on improving care around the time of birth and the first week of life…poverty, poor nutrition and insufficient access to clean water and sanitation are all harmful factors, as is insufficient access to quality health services such as essential care for newborns…health promotion, disease prevention services (such as vaccination) and treatment of common childhood illnesses are essential if children are to thrive as well as survive."[129] (5) **Child health/wellbeing:** "The early childhood years are a period of great opportunity but also great vulnerability. Responsive caregiving and nurturing, balanced nutrition, and safe environment are important for children to live, learn, grow, and develop to their full potential."[130] For the purpose of our review, children include those up to the age of 10 years. (6) **Adolescent health/wellbeing:** "…ages 10 to 19…to grow and develop in good health, adolescents need information, including age-appropriate comprehensive sexuality education; opportunities to develop life skills; health services that are acceptable, equitable, appropriate and effective; and safe and supportive environments. They also need opportunities to meaningfully participate in the design and delivery of interventions to improve and maintain their health. Expanding such opportunities is key to responding to adolescents' specific needs and rights."[131]
Function of interest	What is the main function of interest of the paper? (1) **Service delivery** (e.g. best practices for the provision of care, school food programs) (2) **Policymaking** (e.g. development or implementation of local or global policy, description of internal or external policy constraints) (3) **Financing** (e.g. enhance sustainable funding or investments, improving global or domestic spending, prioritizing investments) (4) **Accountability** (e.g. outlining governance structures, reporting or oversight frameworks) (5) **Advocacy** (e.g. activities that aim to bring about policicital or societal change, development of a multistakeholder coalition)
Section 2 – Characteristics of KT Strategies	
Underlying theory	Did authors report the use of theory (e.g. research utilization models or theories of planned behavior)? • Some examples of underlying theories: Giorgi's phenomenological approach; interactive model; TELOS framework; Walt and Gilson policy analysis triangle; network theory; WHO building blocks; realist framework, etc. • Author may report the use of more than one theory; please make note of them all.

	• If no underlying theory reported, use "NR".
KT strategies	What were the reported KT strategies? • For the propose of this review, KT strategies refer to activities that are explicitly used in the process of promoting the use of research evidence or some other knowledge product (e.g. policy brief) in practice. • Examples of activities: conducting a needs assessment, assessing barriers and facilitators, disseminating a guide or handbook, or developing strategic partnerships.[132]
Dose	What were the duration, frequency, and timing or proximity of the KT strategies to the action or use? • Examples: duration = 1 hour, frequency = single episode, timing = immediately preceding the decision or event.
Participants	Who was targeted by the KT strategies (e.g. NGO, policymakers, donors)?
Personnel	Who was required to conduct or deliver the KT strategies (e.g. researchers; policymakers; health experts; members of research institutes;)?
Stakeholders	Who are formally listed as stakeholders in the project (e.g. health systems, industry, purchasers, payers, policy makers, researchers, practitioners, patients or caregivers who are impacted by study findings)? Were stakeholders actively involved in the project? If yes, how were they involved (e.g. developing the research questions, designing or implementing the KT strategies, designing outcome measures)?
Contextual factors	Were any contextual factors reported that might influence delivery or uptake of the KT strategy (e.g. language barriers, health system reform, political changes)? When applicable, please copy text directly from the paper. When not reported, use "NR".
Section 3 – Outcomes of KT Strategies	
Outcomes	What were the reported outcome measures of the KT strategies (e.g. change in knowledge; improved understanding of health policy-making process; production of action plan)? When applicable, please copy text directly from the paper.
Effect	What was the direction of the effect for the main outcome? (1) Positive (2) Negative (3) Neutral
Section 4 – Barriers and Enablers of KT Strategies	

Barriers	What were the reported barriers for using KT strategies to promote the use of evidence? When applicable, please copy text directly from the paper. When not reported, use “NR”.
Enablers	What were the reported enablers for using KT strategies to promote the use of evidence? When applicable, please copy text directly from the paper. When not reported, use “NR”.

APPENDIX D- Excluded Studies and Reasons for Exclusion

Reason of Exclusion	Number of studies and citations
No SRMNCAH outcome(s)	n=61 [133–193]
No SRMNCAH priority	n=36 [80,194–228]
No KT strategy	n=24 [136,137,229–250]
Wrong study population	n=18 [251–264]
Wrong study design	n=9 [83,265–276]
Duplicate	n=6 [133–135,229,265,277]

APPENDIX E- Characteristics of Included Studies

Author & Year	Country	Country Income Level	Primary Objective	Health Topic	SRMNCAH Priority	Study Design	Sample Characteristics	BCW Intervention Functions Summary	BCW Policy Categories Summary
Abney-Roberts et al., 2015[27]	USA	High	To prevent sleep-related infant deaths by applying recommendations from the American Academy of Pediatrics	Newborn sleep	Newborn health/wellbeing or stillbirths	Quasi-experimental	150 healthcare providers (e.g., nurses and physicians from obstetrics, pediatrics and family medicine)	Education	
Agapidaki et al., 2013[28]	Greece	High	To improve pediatricians' ability to identify and manage maternal depression by implementing a targeted education program	Maternal depression	Maternal health/wellbeing	Experimental	43 pediatricians	Education Environmental Restructuring Persuasion	Guidelines
Agency for Healthcare Research and Quality, 2016[88]	USA	High	To decrease maternal and neonatal adverse events, and to improve patient safety, team communication, and quality of care	Perinatal care	Maternal health/wellbeing	Observational	Labour & delivery units	Education Environmental Restructuring Training	Service Provision
Ainsworth et al., 2014[29]	USA	High	To reduce and prevent newborn falls	Newborn fall prevention	Newborn health/wellbeing or stillbirths	Quasi-experimental	Healthcare providers, mothers and their infants	Education Environmental Restructuring	Regulation
Akter et al., 2009[89]	Bangladesh	Middle	To identify changes in antimicrobial use following the implementation of an educational intervention targeting physicians	Antimicrobial use	Child health/wellbeing	Quasi-experimental	All physicians working in pediatric wards at the participating hospital	Education	
Al-Rafay & Al-Sharkawy, 2012[30]	Egypt	Middle	To evaluate changes in nurses' knowledge following an education program to address total parenteral nutrition guidelines	Newborn nutrition	Newborn health/wellbeing or stillbirths	Quasi-experimental	40 nurses	Education Training	Guidelines

Alkon et al., 2014[31]	USA	High	To evaluate a nutrition and physical activity program implemented at childcare centres	Child nutrition and physical activity	Child health/wellbeing	Experimental	137 childcare providers from 17 childcare centres. Centres included a total of 552 children who were in the program (aged 3-5 years)	Education Environmental Restructuring	Guidelines
Allen & Jeffery, 2006[90]	Nepal	Middle	To design and implement an educational newborn care program targeting healthcare providers to decrease infant morbidity and mortality	Newborn care	Newborn health/wellbeing or stillbirths	Quasi-experimental	30 healthcare providers (e.g., junior doctors, nurses, community health workers)	Education	
Allen & Schafer, 2015[32]	USA	High	To implement practices which promote optimal infant feeding	Infant nutrition	Newborn health/wellbeing or stillbirths	Quasi-experimental	Healthcare providers, pregnant women, and new mothers and their infants	Education Environmental Restructuring Enablement	Service provision Communication/ Marketing Environmental/ Social Planning
Alton et al. 2006[98]	USA	High	To describe a pediatric patient safety program	Pediatric patient safety	Child health/wellbeing	Observational	Healthcare providers, health systems managers	Education Environmental Restructuring	Service provision Communication/ Marketing Environmental/ Social Planning Regulation
Alvarez et al., 2019[58]	Peru and Uganda	Low and middle	To determine the useability and usefulness of a workbook to provide support and guidance in global health systems	Maternal and newborn health	Maternal Health/Wellbeing	Qualitative	8 participants (e.g., researchers, policymakers or other stakeholders)	Education	Guidelines
Anaby et al., 2015[33]	Canada	High	To improve healthcare providers' knowledge and to change practice to support children with disabilities	Activities with children and youth with physical disabilities	Child health/wellbeing	Qualitative	14 healthcare providers (e.g., occupational therapists, physiotherapists, speech language pathologist)	Education	Service Provision
Ansbro et al., 2015[34]	Zambia	Middle	To explore healthcare providers' experience of using rapid syphilis testing	Syphilis	Sexual health/rights	Qualitative	40 healthcare providers		Guidelines

Baer et al., 2011[35]	USA	High	To determine the effectiveness of a NICU blood transfusion and monitoring system 12 months following implementation	Neonatal blood transfusions	Newborn health/wellbeing or stillbirths	Quasi-experimental	Four NICUs	Environmental Restructuring Enablement Coercion Restriction	Service Provision
Barnard et al., 2017[59]	USA	High	To identify barriers and enablers to establishing standing orders to vaccinate during pregnancy	Vaccination during pregnancy	Maternal health/wellbeing	Qualitative	38 healthcare providers and staff members (e.g., medical directors, practice administrators, nurses, medical assistants)	Education	Service Provision
Becker-Haimes et al., 2017[60]	USA	High	To explore the acceptability and feasibility of a toolkit designed for healthcare providers working across mental health settings.	Youth mental health	Adolescent health/wellbeing	Mixed methods	Quantitative: 70 clinicians Qualitative: Six randomly selected clinicians from the quantitative study	Education	
Berglund et al., 2010[91]	Ukraine	Middle	To determine the effectiveness of the W.H.O's Effective Perinatal Care package implemented at maternity hospitals	Perinatal care	Maternal Health/Wellbeing	Quasi-experimental	Healthcare providers at three maternity hospitals (e.g., obstetricians, neonatologists, pediatricians, anesthesiologists, midwives, pediatric nurses)	Environmental Restructuring Training Enablement	
Boyko et al., 2016[61]	Canada	High	To explore the usefulness of deliberative dialogue utilized by the Preventing Violence Across the Lifespan (PreVAiL) Research Network during a biennial team meeting	Child maltreatment	Child Health/Wellbeing	Mixed methods	44 participants in the deliberative dialogue (e.g., researchers, knowledge users, policymakers)	Education	
Braddick et al., 2016[62]	Uganda	Low	To assess compliance with postpartum hemorrhage clinical guideline recommendations, and identify barriers and enablers to using the recommendations	Postpartum hemorrhage	Maternal Health/Wellbeing	Mixed methods	Quantitative: 154 births Qualitative: 18 healthcare provider interviews (e.g., physicians, midwives)	Education	Guidelines
Brennan et al., 2013[36]	Ghana	Middle	To increase nurses' knowledge and skills in pediatric resuscitation through the WHO Emergency Triage and Assessment Treatment program	Pediatric resuscitation	Child Health/Wellbeing	Quasi-experimental	41 nurses	Education Training Modelling	

Brown et al., 2005[99]	UK	High	To identify the barriers creating delays in surgery and develop guidelines for management of undescended tests	Undescended testes	Newborn Health/Wellbeing or Stillbirths	Observational	Healthcare providers and hospital staff	Education Environmental Restructuring	Service Provision Guidelines
Burgoine et al., 2018[63]	Uganda	Low	To reduce neonatal mortality through the implementation of two neonatal health interventions	Neonatal mortality	Newborn Health/Wellbeing or Stillbirths	Quasi-experimental	57 healthcare providers (e.g., midwives, nurses, interns)	Education Environmental Restructuring Training Enablement	Guidelines Environmental/ Social Planning
Cameron et al., 2011[37]	Canada	High	To determine healthcare administrators' perceptions of the barriers and enablers in using a knowledge broker to support implementing measures aimed at children with cerebral palsy needs	Cerebral palsy	Child Health/Wellbeing	Qualitative	Healthcare administrators from 27 pediatric healthcare centres	Education Environmental Restructuring	Service Provision
Carlo et al., 2009[100]	Zambia	Middle	To improve nurse midwives' knowledge and skills following completion of an American Academy of Pediatrics Neonatal Resuscitation Program	Neonatal resuscitation	Newborn Health/Wellbeing or Stillbirths	Observational	127 nurse midwives	Education Training	
Carmona et al., 2015[57]	USA	High	To improve healthcare providers' ability to provide high quality adolescent healthcare	Teen health	Adolescent Health/Wellbeing	Mixed methods	109 healthcare providers from 15 sites	Training	Guidelines
Close et al., 2016[64]	Madagascar	Low	To determine the effectiveness of a knowledge translation and implementation model aimed at training Peace Corps Volunteers to then train healthcare staff in rural communities	Neonatal resuscitation	Newborn Health/Wellbeing or Stillbirths	Quasi-experimental	10 Peace Corps Volunteers trained 42 healthcare providers in 10 communities	Training Enablement	
Crone et al., 2006[101]	Netherlands	High	To determine long-term use of a smoking cessation program to prevent passive smoking around children	Baby exposure to smoke in the household	Newborn Health/Wellbeing or Stillbirths	Observational	39 baby health clinic managers, 255 nurses and 68 physicians	Education Training	Communication/ Marketing
Cunningham & Cardy, 2020[87]	Canada	High	To improve speech language pathologists' knowledge and intention to utilize a tool designed to support participation-focused outcome measurements	Child speech	Child Health/Wellbeing	Quasi-experimental	46 speech language pathologists	Education Persuasion	

Daniels et al., 2008[117]	South Africa	Middle	To determine perceived and actual utilization of research in policy and legislation development	Eclampsia and pre-eclampsia	Maternal Health/Wellbeing	Qualitative	15 interviews with local researchers and policy makers	Education	Legislation
Davies et al., 2002[107]	Canada	High	To determine the effectiveness of an interactive, educational workshop to support nurses to implement fetal health surveillance guidelines	Labour and delivery	Maternal Health/Wellbeing	Mixed methods	Four hospitals sites (2 intervention, 2 control). Between 14-35 nurses from the intervention hospitals participated in each of the four education modules	Education Environmental Restructuring Training	
Deorari et al., 2001[92]	India	Middle	To improve newborn health outcome and reduce incidence of newborn resuscitation by providing healthcare providers with neonatal resuscitation training	Neonatal resuscitation	Newborn Health/Wellbeing or Stillbirths	Quasi-experimental	Physicians and nurses at 14 hospitals	Environmental Restructuring Training	Regulation
Di Noia et al., 2003[111]	USA	High	To promote a youth substance abuse prevention program through pamphlets, CD-ROMs, and the Internet to encourage use and recommendations for the program	Adolescent substance abuse prevention	Adolescent Health/Wellbeing	Experimental	188 staff members employed at junior high schools, youth-focused non-profit organizations, and government bodies aimed at preventing youth substance abuse	Education Environmental Restructuring	
Ding et al., 2008[93]	China	Middle	To reduce inappropriate antibiotic prescribing in the pediatric intensive care unit (PICU)	Antibiotic prescribing	Child Health/Wellbeing	Quasi-experimental	Pediatricians	Education Environmental Restructuring	Guidelines Environmental/ Social Planning
Dobbins et al., 2009[112]	Canada	High	To evaluate three KT strategies aimed at supporting healthy childhood bodyweight	Childhood obesity	Child Health/Wellbeing	Experimental	108 public health departments	Education Environmental Restructuring Training	
Edwards et al., 2016[65]	Jamaica, Kenya, Uganda and South Africa	Low and Middle	To improve HIV care by implementing nurse leadership hubs	HIV	Sexual Health/Rights	Quasi-experimental	167 participants (e.g., nurses, staff nurses, managers, researchers, decision makers, community representatives)	Education Environmental Restructuring Training Enablement	Communication/ Marketing

English et al., 2010[108]	USA	High	To outline the design and implementation of a perinatal tobacco cessation program	Perinatal tobacco cessation	Maternal Health/Wellbeing	Mixed methods	11 lay case managers attended the first training session, 8 participated in the second session	Education Training Modelling	
Eriksson et al., 2017[85]	Vietnam	Middle	To identify barriers and enablers to implementation and sustainability of a knowledge translation strategy, the Neonatal Knowledge Into Practice (NeoKIP) trial	Neonatal mortality	Newborn Health/Wellbeing or Stillbirths	Qualitative	Interviews: 6 interviews with healthcare directors or representatives from healthcare facilities Focus groups: 6 focus groups with previous stakeholders in the NeoKIP trial	Environmental Restructuring Training	
Farner et al., 2014[38]	USA	High	To improve healthcare providers' screening for critical congenital heart disease through the design, implement and evaluate an educational program	Newborn screening for critical congenital heart disease	Newborn Health/Wellbeing or Stillbirths	Quasi-experimental	215 nurses participated across 13 hospitals	Training Modelling Environmental restructuring Education	Regulation
Finch et al., 2012[39]	Australia	High	To increase use of an intervention to encourage physical activity for children at childcare centres, and to improve childcare managers' knowledge of physical activity recommendations for children and perceived acceptability of the intervention	Childhood physical activity	Child Health/Wellbeing	Quasi-experimental	228 childcare centres participated in the intervention, 164 childcare centres were the control	Training Enablement Incentivisation	
Finch et al., 2019[66]	Australia	High	To determine effectiveness of an intervention aimed at improving compliance with childcare nutrition guidelines in childcare centres	Childhood nutrition	Child Health/Wellbeing	Experimental	24 childcare centres participated in the intervention, 20 participated in the control from baseline data collection	Education Training Environmental Restructuring	Regulation

George et al., 2018[67]	Sri Lanka	Middle	To hold a consultation with regional users of the WHO safe childbirth checklist to promote knowledge exchange, support improve maternal health outcomes, and offer high quality care during childbirth	Labour and delivery	Maternal Health/Wellbeing	Qualitative	60 participants (e.g., obstetricians, gynecologists, nurses, researchers, implementers, government officials, and 12 funders from low, middle, and high-income countries)	Education	
Gera et al., 2019[68]	India	Middle	To evaluate an intervention aimed at improving newborn vaccination uptake in health facilities	Newborn vaccination	Newborn Health/Wellbeing or Stillbirths	Mixed Methods	141 public health facilities participated in the intervention Qualitative: interviews with health managers	Training	
Gichane et al., 2019[69]	Zambia	Middle	To outline the process of advocating for policy changes to allow for non-clinical healthcare workers to provide injectable contraception	Contraception/ Family planning	Reproductive Health/Rights	Editorial	Not reported	Education Environmental Restructuring Modelling	Legislation
Gilkey et al., 2019[70]	USA	High	To improve uptake of the HPV vaccine through use of a quality improvement program	HPV vaccination	Sexual Health/Rights	Experimental	13 clinics received the intervention, while 12 were placed in the wait-list control group. 43 pediatric physicians participated across the intervention clinics, while 35 participated across the control clinics	Training Incentivisation	
Goering & Wilson, 2002[106]	USA	High	To decrease variance and improve management of pre-term labour through the guideline implementation	Pre-term labour	Maternal Health/Wellbeing	Observational	Nursing staff	Education Enablement	Guidelines Environmental/ Social planning
Goyet et al., 2014[40]	Cambodia	Middle	To identify barriers to KT strategies aimed at pneumonia	Pneumonia	Child Health/Wellbeing	Observational	Interventions targeted clinicians, health managers, policymakers	Education Environmental Restructuring Enablement	

Grady et al., 2019[71]	Australia	High	To determine effectiveness of a strategy aimed at improving compliance with dietary guidelines and daycare centres	Childhood nutrition	Child Health/Wellbeing	Quasi-experimental	27 daycare centres participated in the intervention services, 19 centres participated in the control services	Environmental Restructuring Training Enablement Persuasion	Service Provision
Guillory, et al., 2017[72]	USA	High	To identify an appropriate implementation strategy for newborn screening for critical congenital heart disease across multiple hospitals	Newborn screening for critical congenital heart disease	Newborn Health/Wellbeing or Stillbirths	Quasi-experimental	117 physicians, hospital administrators and other healthcare professionals	Education Environmental Restructuring Training Modelling	
Hardee et al., 2019[73]	Nigeria and Uganda	Low and Middle	To determine effectiveness of two interventions which utilize a voluntary, rights-based family planning (VRBFP) approach to measure health and rights outcomes	Family planning	Reproductive Health/Rights	Mixed Methods	15 intervention healthcare facilities Qualitative: 16 interviews with healthcare providers, health facility managers, supervisors, and representatives from collaborating human rights organizations Focus Groups: male champions for the project, and facility and community healthcare workers	Education Environmental Restructuring Training Enablement	
Hulton et al., 2014[41]	Ethiopia, Ghana, Malawi, Nigeria, Sierra Leone, and Tanzania	Low and Middle	To outline and describe the Evidence for Action (E4A) program and its contributions to reduce rates of maternal and newborn mortality	Maternal and newborn mortality	Maternal Health/Wellbeing	Observational	Case studies of each of the E4A countries: Ethiopia, Ghana, Malawi, Nigeria, Sierra Leone, and Tanzania	Persuasion Coercion	Communication/ Marketing Guidelines Regulation
Jeffery et al., 2004[94]	Macedonia	Middle	To outline the design and implementation of an education intervention aimed at improving perinatal health practices	Maternal and newborn mortality	Newborn Health/Wellbeing or Stillbirths	Quasi-experimental	115 physicians and nurses	Education Training	

Jones et al., 2015[42]	Australia	High	To determine effectiveness of a complex intervention aimed at improving childcare nutrition and physical activity practices in childcare centres	Childhood nutrition and physical activity	Child Health/Wellbeing	Experimental	62 childcare centres participated in the intervention, while 60 centres served as the control	Education Environmental Restructuring Training Enablement	Communication/ Marketing
Kapungu et al., 2013[43]	Ghana	Middle	To reduce postpartum hemorrhage by designing and implementing a community-based misoprostol distribution intervention	Postpartum hemorrhage	Maternal Health/Wellbeing	Observational	74 healthcare providers	Education Environmental Restructuring Training Enablement	
Kingsnorth et al., 2020[84]	Canada	High	To address barriers and enablers to a knowledge translation intervention to improve clinic care provided at a pediatric rehabilitation hospital	Children with physical disabilities and complex health needs	Child Health/Wellbeing	Observational	Healthcare providers	Education Environmental Restructuring Enablement Persuasion	
Kraft et al., 2018 [74]	Ethiopia and Senegal	Low and Middle	To describe the perceived use and impact of using the WHO family planning guidance and tools	Family planning	Reproductive Health/Rights	Qualitative	Interviews with: 5 WHO regional advisers, 6 policy makers, 7 disseminators, 4 implementers and 4 end-users	Education	Guidelines
Lang et al., 2015[44]	USA	High	To improve healthcare providers' use of trauma-focused cognitive behavioural therapy and improve outcomes in children through the use of evidence-based practice	Mental health	Child Health/Wellbeing	Mixed methods	16 agencies participated. Across agencies 77 clinicians, 33 supervisors, and 23 senior leaders participated in training. 734 children across the 16 agencies used the therapy approach	Education Training Persuasion	

Makkar et al., 2016[75]	Australia	High	To test strategies to improve policymakers' use of Web Centre for Informing Policy in Health with Evidence from Research (CIPHER) usage and engagement with research evidence	Various sexual health topics (e.g., sexually transmissible infections, menopause, breast and cervical screening, and men's sexual health)	Sexual Health/Rights	Observational	223 policymakers from 27 organisations accessed the platform during the study period	Education Environmental Restructuring Persuasion	Communication/ Marketing
Margolis et al., 2001[102]	USA	High	To improve the processes of health services and care delivery, particularly between healthcare providers and families, to support child health outcomes	Child health outcomes	Child Health/Wellbeing	Observational	8 pediatric and family healthcare practices participated	Education Environmental Restructuring Training Enablement	Service Provision Guidelines Regulation
Mello et al., 2013[45]	USA	High	To identify adoption and implementation strategies for integrating an alcohol screening tool into regular practice for pediatric trauma patients	Alcohol use	Adolescent Health/Wellbeing	Mixed methods	7 pediatric trauma centres. A key informant was identified at each site Qualitative: monthly check-in and feedback conversations with project managers at each site	Education Training Enablement	Service Provision
Melnyk et al., 2010[113]	USA	High	To implement the evidence-based Creating Opportunities for Personal Empowerment program and determine its effectiveness on nurses' beliefs of evidence-based practice	Premature birth	Newborn Health/Wellbeing or Stillbirths	Experimental	81 nurses, 48 participated in implementation group and 33 participated in the comparison group	Education Training	Service Provision
Mody et al., 2013[46]	Bangladesh, China, Indonesia, Myanmar, Mongolia, Solomon Islands, Tonga, Vanuatu and Vietnam	Middle	To assess the use of family guidelines and associated tools as part of the Strategic Partnership Program	Family planning	Reproductive Health/Rights	Mixed methods	Workshop participants: program managers, Ministry of Health staff, clinicians and regional and country office staff from WHO/UNFPA. Questionnaire: provided to Ministries of Health	Education Training	Communication/ Marketing Guidelines
Okonofua et al., 2011[56]	Nigeria	Middle	To describe the findings from multiple advocacy activities	Maternal and child mortality	Maternal Health/Wellbeing	Observational	Interviews with 6 State Governors and/or	Education	Communication/ Marketing

			designed to provide free health services to pregnant women and children				Commissioners of Health	Modelling Persuasion	Guidelines
Ongolo-Zogo et al., 2018[76]	Cameroon and Uganda	Low and Middle	To assess how KT platforms have supported Millennium Development Goals through health system policy-making and decision making processes	Maternal and child health	Maternal Health/Wellbeing	Observational	Primarily stakeholders and decision makers	Education Environmental Restructuring Training	
Pariyo et al., 2005[103]	Uganda	Low	To determine the effects of scaling-up an intervention aimed at the integrated management of childhood illnesses to improve health outcomes in young children (under 5)	Childhood illness	Child Health/Wellbeing	Observational	316 healthcare facilities across 10 study districts. 427 healthcare workers participated across these facilities	Education Training Enablement	
Rowe et al., 2009[114]	Benin	Middle	To evaluate the effectiveness of additional training supports developed for healthcare providers who completed training in Integrated Management of Childhood Illness on child health outcomes	Childhood illness	Child Health/Wellbeing	Experimental	1244 consultations for any illness across 16 small communes. Consultations were conducted by 267 healthcare workers at 114 health facilities.	Education Environmental Restructuring Training Incentivisation	
Russell et al., 2010[109]	Canada	High	To evaluate knowledge brokers and their impact in a knowledge translation intervention and measurement tools to understand motor function in children with cerebral palsy	Cerebral palsy	Child Health/Wellbeing	Mixed methods	122 physiotherapists across three provinces	Education Environmental Restructuring	Service Provision
Schreiber et al., 2009[104]	USA	High	The purpose of this study was to identify, implement, and evaluate strategies to support integrating scientific research evidence into clinical decision making	Physiotherapy	Child Health/Wellbeing	Observational	5 Pediatric physiotherapists	Education Environmental Restructuring Training Incentivisation	
Schreiber et al., 2015[47]	USA	High	To outline a KT program designed to increase physiotherapists' knowledge and use of standardized outcome measures	Physiotherapy	Child Health/Wellbeing	Observational	17 Physiotherapists from a pediatric outpatient facility	Education Environmental Restructuring Training Modelling Enablement	

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Schwartz et al., 2015[48]	USA	High	To use a multi-stakeholder partnership to develop and implement evidence-based breastfeeding support and training strategies	Breastfeeding	Maternal Health/Wellbeing	Quasi-experimental	8 health centres with predominantly culturally diverse patients implemented the 10 steps to support breastfeeding	Education Environmental Restructuring Training	Service Provision Communication/ Marketing, Guidelines Environmental/ Social Planning
Segre et al., 2011[49]	USA	High	To describe the development and implementation of the train-the-trainer program aimed at maternal depression screening	Perinatal depression	Maternal Health/Wellbeing	Observational	42 individuals were trained from 32 maternal and child health agencies	Environmental Restructuring Training	
Segre et al., 2018[77]	USA	High	To describe a research and government partnership implementing 'listening visits' in health centres to support maternal mental health	Postpartum depression	Maternal Health/Wellbeing	Editorial	18 maternal health clinics	Education Training Enablement	Guidelines
Senarath et al., 2007[115]	Sri Lanka	Middle	To evaluate a program aimed at training healthcare providers to improve newborn care practices	Newborn care	Newborn Health/Wellbeing or Stillbirths	Experimental	120 healthcare providers. 59 participated in the intervention (27 midwives, 19 nurses and 13 physicians) while 61 participated in the control (26 midwives, 19 nurses and 16 physicians)	Education Training	
Seward et al., 2018[78]	Australia	High	To evaluate the effectiveness of a complex intervention aimed at improving compliance with child nutrition guidelines and children's dietary intake	Childhood nutrition	Child Health/Wellbeing	Experimental	45 childcare centres- 25 participated in the intervention and 20 participated in the control	Education Environmental Restructuring Persuasion	Guidelines
Simioni et al., 2017[86]	Argentina	Middle	To support the regionalization of a perinatal health strategy policy as a to improve health outcomes	Maternal and premature/newborn health	Newborn Health/Wellbeing or Stillbirths	Mixed methods	Participants completed the first workshop and 49 participated in the second workshop	Training	Environmental/ Social Planning

Simmons, 2007[105] (Chapter 2)	Viet Nam	Middle	To describe the process of scaling up an intervention to provide injectable contraceptives to improve quality of care and family planning services	Contraception/ family planning	Reproductive Health/Rights	Observational	21 provinces in Viet Nam - Each provincial team included provincial health and family planning sector representatives	Education	Guidelines
Simmons, 2007[110] (Chapter 8)	Brazil, Bolivia, Chile	Middle and High	To implement training the trainer methods to build capacity and provide innovative training in the area of reproductive health services	Reproductive health services	Reproductive Health/Rights	Mixed methods	Brazil: 9 training centre teams. 98 trainers were trained, and 1921 providers trained Bolivia: 8 training centre teams. 34 trainers were trained, and 741 providers trained Chile: 3 training centre teams. 21 trainers were trained, and 395 providers trained	Education Environmental Restructuring Training	Service Provision
Singh et al., 2013[50]	Ghana	Middle	To test local change ideas which could be scaled up later as part of a national child survival improvement project	Maternal and infant health	Newborn Health/Wellbeing or Stillbirths	Quasi-experimental	27 healthcare facilities	Education	Environmental/. Social Planning
Snelgrove-Clarke, 2010[116]	Canada	High	To evaluate two educational interventions to improve nurses' use of clinical guidelines during labour and delivery	Labour and delivery	Maternal Health/Wellbeing	Experimental	93 nurses participated in the first intervention and 62 nurses participated in the second intervention	Education Enablement	Guidelines
Sobel et al., 2011[51]	Philippines	Middle	To evaluate the impact of a training workshop for healthcare providers to provide newborns with a Hepatitis B vaccination, in line with a new vaccination policy	Newborn Hepatitis B vaccination	Newborn Health/Wellbeing or Stillbirths	Mixed methods	45 health centre staff, 120 community healthcare workers and 23 healthcare providers from 9 healthcare centers	Education Environmental Restructuring	Guideline

Sundaram et al., 2015[52]	Ghana	Middle	To determine the effectiveness of a multi-stakeholder partnership program developed to provide comprehensive abortion and post-abortion care services	Abortion	Reproductive Health/Rights	Quasi-experimental	457 healthcare providers (116 physicians and 341 across midwives, nurses, medical assistants) participated across 166 healthcare facilities. The intervention group comprised 197 participants from 64 healthcare facilities, the first control group included 148 participants from 58 healthcare facilities, and the second control group included 112 participants across 44 healthcare facilities.	Environmental Restructuring Training	Service Provision Guidelines Legislation
Tarasoff et al., 2014[53]	Canada	High	To evaluate the effectiveness of a theatre-based KT intervention design to improve healthcare providers' knowledge and attitudes of assisted human reproduction for LGBTQ people	Family planning	Reproductive Health/Rights	Qualitative	30 health professionals attended the workshop (e.g., physicians, nurses, social workers, health managers)	Training	Service Provision
Twum-Danso et al., 2014[54]	Ghana	Middle	To test the feasibility and scale up of a postnatal care policy to improve care	Postnatal care	Newborn Health/Wellbeing or Stillbirths	Quasi-experimental	30 teams from 27 rural health facilities	Education	Guidelines
Uneke et al., 2017[80]	Nigeria	Middle	To improve researchers and policymakers' the knowledge and capacity to use KT to promote evidence-informed policymaking in maternal, newborn and child health and wellbeing	Maternal, newborn and child health	Maternal Health/Wellbeing	Quasi-experimental	38 participants (e.g., researchers, government members) attended the workshop	Education	
Uneke et al., 2018[79]	Nigeria	Middle	To improve researchers and policymakers' competence to apply KT to promote evidence-informed policymaking in maternal, newborn and child health and wellbeing	Maternal, newborn and child health	Maternal Health/Wellbeing	Quasi-experimental	45 participants (e.g., research team members, project managers or steering committee members, government health agency members, NGO and charity members)	Education Environmental Restructuring	

Uskun et al., 2008[95]	Turkey	Middle	To improve healthcare providers' knowledge of immunization and increase immunization coverage through an education intervention	Childhood vaccination	Child Health/Wellbeing	Quasi-experimental	229 primary healthcare workers (89 physicians,88 midwives, 38 health officers, 14 nurse)	Education	
Vlad et al., 2016[81]	India	Middle	To describe a multi-stakeholder partnership to develop comprehensive clinical guidelines to reduce maternal mortality	Postpartum haemorrhage	Maternal Health/Wellbeing	Observational	400 healthcare staff working in 8 maternity wards	Environmental Restructuring Training Enablement	Environmental/ Social Planning
Warren et al., 2010[96]	Kenya	Middle	To evaluate the impact of a new postnatal intervention to improve healthcare workers' counselling on maternal and newborn health	Maternal and newborn health	Maternal Health/Wellbeing	Quasi-experimental	76 healthcare providers from 4 health facilities	Education	Service Provision
Wolfe et al., 2014[55]	USA	High	To develop evidence-based guidelines and complementary training for healthcare providers to support sharing life-altering information in pediatric settings	Health communication	Child Health/Wellbeing	Quasi-experimental	142 healthcare providers (54 physicians, 32 fellows and residents, 18 medical students, 14 health assistants, 15 nurses, 6 physiotherapists, 3 social workers)	Education Environmental Restructuring	Guidelines Environmental/ Social planning
Wolfenden et al., 2017[82]	Australia	High	To evaluate the implementation and compliance with a healthy school canteen policy, nutrient quality of foods provided at the canteens	Childhood nutrition	Child Health/Wellbeing	Experimental	70 primary schools with canteens (35 assigned to both intervention and control groups)	Education Environmental Restructuring Training Enablement Persuasion Incentivisation	Communication/ Marketing Environmental/ Social Planning
Yoong et al., 2016[83]	Australia	High	This study aimed to examine the impact of providing printed educational materials on childcare service cooks' intentions to use nutritional guidelines and provide fruit and vegetables on their menu	Childhood nutrition	Child Health/Wellbeing	Experimental	77 childcare centres (38 control and 39 intervention)	Education	Communication/ Marketing