

Supplementary material for “Economic evaluations of health system strengthening activities in low- and middle-income country settings: A methodological systematic review” by Nathaniel Hendrix, *et al.*

Section S1: MEDLINE search strings for first-stage review

First stage, broad search

(“Capacity building” [MeSH Terms] OR “Health Facilities” [MeSH Terms] OR “Health Workforce” [MeSH Terms] OR “Health Personnel” [MeSH Terms] OR “Health Services” [MeSH Terms] OR “Public Health” [MeSH Terms] OR “Delivery of health care” [MeSH Terms] OR “Health care quality” [MeSH Terms] OR “Information systems” [MeSH Terms]) AND (“Costs and cost analysis” [MeSH Terms] OR “Cost benefit analysis” [MeSH Terms] OR “Health care costs” [MeSH Terms]) AND (“Developing countries” [MeSH Terms])

Section S2: MEDLINE search strings for second-stage review

Electronic medical records review

((health system*[tiab] OR Infrastructure*[tiab] OR ((health-care OR healthcare) AND (system*[tiab] OR service*[tiab] OR deliver*[tiab] OR access*[tiab]))) OR ((Human[tiab] AND capital[tiab]) AND resource*[tiab]) **AND** ("Health Care Facilities, Manpower, and Services"[Mesh] OR "Health Services"[Mesh] OR "Delivery of Health Care"[Mesh] OR "Health Services Administration"[Mesh] OR "Health Care Quality, Access, and Evaluation"[Mesh] OR "Health Services Accessibility"[Mesh] OR "Health Information Systems"[Mesh] OR "Health Systems Plans"[Mesh] OR "Health Systems Agencies"[Mesh] OR "Public Health Systems Research"[Mesh] OR "Health Information Interoperability"[Mesh] OR "Healthcare Financing"[Mesh])) AND ((Cost-effectiv*[tiab] OR cost-benefit*[tiab] OR (Economic*[tiab] AND (evalu*[tiab] OR expend*[tiab] OR policy[tiab] OR policies[tiab] OR factor*[tiab] OR theor*[tiab] OR remit*[tiab] OR utility*[tiab] OR benefit*[tiab] OR index[tiab] OR indice*[tiab])) OR “value for money” OR Value[tiab] OR microeconomic*[tiab] OR marcoeconomic*[tiab] OR ((Cost[tiab] OR costs[tiab]) AND (minimiz*[tiab] OR reduc*[tiab] OR increase*[tiab] OR save[tiab] OR saving[tiab] OR analy*[tiab] OR analys*[tiab] OR compar*[tiab] OR measure*[tiab] OR price[tiab] OR pricing[tiab] OR benfit*[tiab]))) **AND** ("Health Care Economics and Organizations"[Mesh] OR "Socioeconomic Factors"[Mesh])) AND ("Developing Countries"[Mesh] OR developing countr*[tiab] OR developing nation*[tiab] OR less developed countr*[tiab] OR less developed nation*[tiab] OR third world nation*[tiab] OR third world countr*[tiab] OR under developed nation*[tiab] OR underdeveloped nation*[tiab] OR under developed countr*[tiab] OR underdeveloped nation*[tiab] OR underserved countr*[tiab] OR underserved area*[tiab] OR developing econom*[tiab] OR resource poor[tiab] OR resource limit*[tiab] OR limited resource*[tiab] OR limiting resource*[tiab] OR low resource[tiab] OR resource constrain*[tiab] OR constrained resource*[tiab] OR middle income countr*[tiab] OR middle income nation*[tiab] OR low income countr*[tiab] OR low income nation*[tiab] OR poor countr*[tiab] OR poor nation*[tiab] OR Imic[tiab] OR Imics[tiab] OR "Africa"[Mesh] OR "Asia"[Mesh] OR "South America"[Mesh] OR "Latin America"[Mesh] OR "Central America"[Mesh] OR africa[tiab] OR asia[tiab] OR south america*[tiab] OR latin america*[tiab] OR central america*[tiab] OR

afghanistan*[tiab] OR albania*[tiab] OR algeria*[tiab] OR samoa*[tiab] OR angola*[tiab] OR argentina*[tiab] OR armenia*[tiab] OR azerbaijan*[tiab] OR bangladesh*[tiab] OR belarus*[tiab] OR belize*[tiab] OR benin*[tiab] OR bhutan*[tiab] OR bolivia*[tiab] OR bosnia*[tiab] OR herzegovina*[tiab] OR botswana*[tiab] OR brazil*[tiab] OR bulgaria*[tiab] OR burkin*[tiab] OR burundi*[tiab] OR cabo verde*[tiab] OR cape verde*[tiab] OR cambodia*[tiab] OR cameroon*[tiab] OR central africa*[tiab] OR chad*[tiab] OR china[tiab] OR chinese[tiab] OR colombia*[tiab] OR comoros[tiab] OR comorian*[tiab] OR congo*[tiab] OR costa rica*[tiab] OR côte d'ivoire[tiab] OR ivorian*[tiab] OR ivory coast[tiab] OR cuba*[tiab] OR djibouti*[tiab] OR dominica*[tiab] OR ecuador*[tiab] OR egypt*[tiab] OR el salvador[tiab] OR salvadoran*[tiab] OR guinea*[tiab] OR eritrea*[tiab] OR eswatini*[tiab] OR swaziland*[tiab] OR ethiopia*[tiab] OR fiji*[tiab] OR gabon*[tiab] OR gambia*[tiab] OR republic of georgia[tiab] OR ghana*[tiab] OR grenada*[tiab] OR guatemala*[tiab] OR guyana*[tiab] OR haiti*[tiab] OR honduras*[tiab] OR india*[tiab] OR indonesia*[tiab] OR iran*[tiab] OR iraq*[tiab] OR jamaica*[tiab] OR jordan*[tiab] OR kazakhstan*[tiab] OR kenya*[tiab] OR kiribati*[tiab] OR democratic people s republic of korea[tiab] OR north korea*[tiab] OR kosovo[tiab] OR kosovar*[tiab] OR kyrgyz*[tiab] OR lao[tiab] OR laos[tiab] OR laotian*[tiab] OR lebanon*[tiab] OR lesotho[tiab] OR liberia*[tiab] OR libya*[tiab] OR madagascar*[tiab] OR malawi*[tiab] OR malaysia*[tiab] OR maldives*[tiab] OR mali[tiab] OR malian[tiab] OR malians[tiab] OR marshall island*[tiab] OR mauritania*[tiab] OR mexico[tiab] OR mexican*[tiab] OR micronesia*[tiab] OR moldova*[tiab] OR mongolia*[tiab] OR montenegr*[tiab] OR morocc*[tiab] OR mozambi*[tiab] OR myanmar*[tiab] OR namibia*[tiab] OR nepal*[tiab] OR nicaragua*[tiab] OR niger[tiab] OR nigerien*[tiab] OR nigeria*[tiab] OR macedonia*[tiab] OR pakistan*[tiab] OR paragua*[tiab] OR peru*[tiab] OR philippines[tiab] OR filipino*[tiab] OR russia*[tiab] OR rwanda*[tiab] OR são tomé and príncipe[tiab] OR senegal*[tiab] OR serbia*[tiab] OR sierra leone*[tiab] OR solomon island*[tiab] OR somalia*[tiab] OR south africa*[tiab] OR sudan*[tiab] OR sri lank*[tiab] OR st lucia*[tiab] OR saint lucia*[tiab] OR st. vincent*[tiab] OR saint vincent*[tiab] OR grenadines[tiab] OR surinam*[tiab] OR syria*[tiab] OR tajikistan*[tiab] OR tanzania*[tiab] OR thailand[tiab] OR thai[tiab] OR thais[tiab] OR timor*[tiab] OR togo[tiab] OR togolese*[tiab] OR tonga*[tiab] OR tunisia*[tiab] OR turkey[tiab] OR turks[tiab] OR turkish[tiab] OR turkmenistan*[tiab] OR tuvalu*[tiab] OR uganda*[tiab] OR ukrain*[tiab] OR uzbekistan*[tiab] OR vanuatu*[tiab] OR venezuela*[tiab] OR vietnam*[tiab] OR viet nam*[tiab] OR west bank[tiab] OR gaza[tiab] OR gazan*[tiab] OR yemen*[tiab] OR zambia*[tiab] OR zimbabwe*[tiab])) AND (electronic medical record[MeSH Terms]) OR (electronic medical records[MeSH Terms])

Home-based maternal and neonatal care review

((health system*[tiab] OR Infrastructure*[tiab] OR ((health-care OR healthcare) AND (system*[tiab] OR service*[tiab] OR deliver*[tiab] OR access*[tiab])) OR ((Human[tiab] AND capital[tiab] AND resource*[tiab]) **AND** ("Health Care Facilities, Manpower, and Services"[Mesh] OR "Health Services"[Mesh] OR "Delivery of Health Care"[Mesh] OR "Health Services Administration"[Mesh] OR "Health Care Quality, Access, and Evaluation"[Mesh] OR "Health Services Accessibility"[Mesh] OR "Health Information Systems"[Mesh] OR "Health Systems Plans"[Mesh] OR "Health Systems Agencies"[Mesh] OR "Public Health Systems Research"[Mesh] OR "Health Information Interoperability"[Mesh] OR "Healthcare Financing"[Mesh])) AND ((Cost-effectiv*[tiab] OR cost-benefit*[tiab] OR (Economic*[tiab] AND (evalu*[tiab] OR expend*[tiab] OR policy[tiab] OR policies[tiab] OR factor*[tiab] OR theor*[tiab]

OR remit*[tiab] OR utility*[tiab] OR benefit*[tiab] OR index[tiab] OR indice*[tiab])) OR "value for money" OR Value[tiab] OR microeconomic*[tiab] OR marcoeconomic*[tiab] OR ((Cost[tiab] OR costs[tiab]) AND (minimiz*[tiab] OR reduc*[tiab] OR increase*[tiab] OR save[tiab] OR saving[tiab] OR analy*[tiab] OR analys*[tiab] OR compar*[tiab] OR measure*[tiab] OR price[tiab] OR pricing[tiab] OR benfit*[tiab]))) **AND** ("Health Care Economics and Organizations"[Mesh] OR "Socioeconomic Factors"[Mesh])) AND ("Developing Countries"[Mesh] OR developing countr*[tiab] OR developing nation*[tiab] OR less developed countr*[tiab] OR less developed nation*[tiab] OR third world nation*[tiab] OR third world countr*[tiab] OR under developed nation*[tiab] OR underdeveloped nation*[tiab] OR under developed countr*[tiab] OR underdeveloped nation*[tiab] OR underserved countr*[tiab] OR underserved area*[tiab] OR developing econom*[tiab] OR resource poor[tiab] OR resource limit*[tiab] OR limited resource*[tiab] OR limiting resource*[tiab] OR low resource[tiab] OR resource constrain*[tiab] OR constrained resource*[tiab] OR middle income countr*[tiab] OR middle income nation*[tiab] OR low income countr*[tiab] OR low income nation*[tiab] OR poor countr*[tiab] OR poor nation*[tiab] OR Imic[tiab] OR Imics[tiab] OR "Africa"[Mesh] OR "Asia"[Mesh] OR "South America"[Mesh] OR "Latin America"[Mesh] OR "Central America"[Mesh] OR africa[tiab] OR asia[tiab] OR south america*[tiab] OR latin america*[tiab] OR central america*[tiab] OR afghanistan*[tiab] OR albania*[tiab] OR algeria*[tiab] OR samoa*[tiab] OR angola*[tiab] OR argentina*[tiab] OR armenia*[tiab] OR azerbaijan*[tiab] OR bangladesh*[tiab] OR belarus*[tiab] OR belize*[tiab] OR benin*[tiab] OR bhutan*[tiab] OR bolivia*[tiab] OR bosnia*[tiab] OR herzegovina*[tiab] OR botswana*[tiab] OR brazil*[tiab] OR bulgaria*[tiab] OR burkin*[tiab] OR burundi*[tiab] OR cabo verde*[tiab] OR cape verde*[tiab] OR cambodia*[tiab] OR cameroon*[tiab] OR central africa*[tiab] OR chad*[tiab] OR china[tiab] OR chinese[tiab] OR colombia*[tiab] OR comoros[tiab] OR comorian*[tiab] OR congo*[tiab] OR costa rica*[tiab] OR côte d'ivoire[tiab] OR ivorian*[tiab] OR ivory coast[tiab] OR cuba*[tiab] OR djibouti*[tiab] OR dominica*[tiab] OR ecuador*[tiab] OR egypt*[tiab] OR el salvador[tiab] OR salvadoran*[tiab] OR guinea*[tiab] OR eritrea*[tiab] OR eswatini*[tiab] OR swaziland*[tiab] OR ethiopia*[tiab] OR fiji*[tiab] OR gabon*[tiab] OR gambia*[tiab] OR republic of georgia[tiab] OR ghana*[tiab] OR grenada*[tiab] OR guatemala*[tiab] OR guyana*[tiab] OR haiti*[tiab] OR honduras*[tiab] OR india*[tiab] OR indonesia*[tiab] OR iran*[tiab] OR iraq*[tiab] OR jamaica*[tiab] OR jordan*[tiab] OR kazakhstan*[tiab] OR kenya*[tiab] OR kiribati*[tiab] OR democratic people s republic of korea[tiab] OR north korea*[tiab] OR kosovo[tiab] OR kosovar*[tiab] OR kyrgyz*[tiab] OR lao[tiab] OR laos[tiab] OR laotian*[tiab] OR lebanon*[tiab] OR lesotho[tiab] OR liberia*[tiab] OR libya*[tiab] OR madagascar*[tiab] OR malawi*[tiab] OR malaysia*[tiab] OR maldives*[tiab] OR mali[tiab] OR malian[tiab] OR malians[tiab] OR marshall island*[tiab] OR mauritania*[tiab] OR mexico[tiab] OR mexican*[tiab] OR micronesia*[tiab] OR moldova*[tiab] OR mongolia*[tiab] OR montenegr*[tiab] OR morocc*[tiab] OR mozambi*[tiab] OR myanmar*[tiab] OR namibia*[tiab] OR nepal*[tiab] OR nicaragua*[tiab] OR niger[tiab] OR nigerien*[tiab] OR nigeria*[tiab] OR macedonia*[tiab] OR pakistan*[tiab] OR paraguay*[tiab] OR peru*[tiab] OR philippines[tiab] OR filipino*[tiab] OR russia*[tiab] OR rwanda*[tiab] OR são tomé and principe[tiab] OR senegal*[tiab] OR serbia*[tiab] OR sierra leone*[tiab] OR solomon island*[tiab] OR somalia*[tiab] OR south africa*[tiab] OR sudan*[tiab] OR sri lank*[tiab] OR st lucia*[tiab] OR saint lucia*[tiab] OR st. vincent*[tiab] OR saint vincent*[tiab] OR grenadines[tiab] OR surinam*[tiab] OR syria*[tiab] OR tajikistan*[tiab] OR tanzania*[tiab] OR thailand[tiab] OR thai[tiab] OR thais[tiab] OR timor*[tiab] OR togo[tiab] OR togolese*[tiab] OR tonga*[tiab] OR tunisia*[tiab] OR turkey[tiab] OR turks[tiab] OR turkish[tiab] OR turkmenistan*[tiab] OR tuvalu*[tiab] OR uganda*[tiab] OR ukrain*[tiab] OR uzbekistan*[tiab] OR vanuatu*[tiab] OR

venezuela*[tiab] OR vietnam*[tiab] OR viet nam*[tiab] OR west bank[tiab] OR gaza[tiab] OR gazan*[tiab] OR yemen*[tiab] OR zambia*[tiab] OR zimbabwe*[tiab])) AND (((((maternal care pattern[MeSH Terms])) OR (maternal health[MeSH Terms])) OR (maternal health service[MeSH Terms])) OR (health service, maternal child[MeSH Terms])) OR (infant health[MeSH Terms]))

Task shifting review

((((health system*[tiab] OR Infrastructure*[tiab] OR ((health-care OR healthcare) AND (system*[tiab] OR service*[tiab] OR deliver*[tiab] OR access*[tiab])) OR ((Human[tiab] AND capital[tiab]) AND resource*[tiab]) **AND** ("Health Care Facilities, Manpower, and Services"[Mesh] OR "Health Services"[Mesh] OR "Delivery of Health Care"[Mesh] OR "Health Services Administration"[Mesh] OR "Health Care Quality, Access, and Evaluation"[Mesh] OR "Health Services Accessibility"[Mesh] OR "Health Information Systems"[Mesh] OR "Health Systems Plans"[Mesh] OR "Health Systems Agencies"[Mesh] OR "Public Health Systems Research"[Mesh] OR "Health Information Interoperability"[Mesh] OR "Healthcare Financing"[Mesh])) AND ((Cost-effectiv*[tiab] OR cost-benefit*[tiab] OR (Economic*[tiab] AND (evalu*[tiab] OR expend*[tiab] OR policy[tiab] OR policies[tiab] OR factor*[tiab] OR theor*[tiab] OR remit*[tiab] OR utility*[tiab] OR benefit*[tiab] OR index[tiab] OR indice*[tiab])) OR "value for money" OR Value[tiab] OR microeconomic*[tiab] OR marcoeconomic*[tiab] OR ((Cost[tiab] OR costs[tiab]) AND (minimiz*[tiab] OR reduc*[tiab] OR increase*[tiab] OR save[tiab] OR saving[tiab] OR analy*[tiab] OR analys*[tiab] OR compar*[tiab] OR measure*[tiab] OR price[tiab] OR pricing[tiab] OR benfit*[tiab])))) **AND** ("Health Care Economics and Organizations"[Mesh] OR "Socioeconomic Factors"[Mesh])) AND ("Developing Countries"[Mesh] OR developing countr*[tiab] OR developing nation*[tiab] OR less developed countr*[tiab] OR less developed nation*[tiab] OR third world nation*[tiab] OR third world countr*[tiab] OR under developed nation*[tiab] OR underdeveloped nation*[tiab] OR under developed countr*[tiab] OR underdeveloped nation*[tiab] OR underserved countr*[tiab] OR underserved area*[tiab] OR developing econom*[tiab] OR resource poor[tiab] OR resource limit*[tiab] OR limited resource[tiab] OR limiting resource*[tiab] OR low resource[tiab] OR resource constrain*[tiab] OR constrained resource*[tiab] OR middle income countr*[tiab] OR middle income nation*[tiab] OR low income countr*[tiab] OR low income nation*[tiab] OR poor countr*[tiab] OR poor nation*[tiab] OR Imic[tiab] OR Imics[tiab] OR "Africa"[Mesh] OR "Asia"[Mesh] OR "South America"[Mesh] OR "Latin America"[Mesh] OR "Central America"[Mesh] OR africa[tiab] OR asia[tiab] OR south america*[tiab] OR latin america*[tiab] OR central america*[tiab] OR afghanistan*[tiab] OR albania*[tiab] OR algeria*[tiab] OR samoa*[tiab] OR angola*[tiab] OR argentina*[tiab] OR armenia*[tiab] OR azerbaijan*[tiab] OR bangladesh*[tiab] OR belarus*[tiab] OR belize*[tiab] OR benin*[tiab] OR bhutan*[tiab] OR bolivia*[tiab] OR bosnia*[tiab] OR herzegovina*[tiab] OR botswana*[tiab] OR brazil*[tiab] OR bulgaria*[tiab] OR burkin*[tiab] OR burundi*[tiab] OR cabo verde*[tiab] OR cape verde*[tiab] OR cambodia*[tiab] OR cameroon*[tiab] OR central africa*[tiab] OR chad*[tiab] OR china[tiab] OR chinese[tiab] OR colombia*[tiab] OR comoros[tiab] OR comorian*[tiab] OR congo*[tiab] OR costa rica*[tiab] OR côte d'ivoire[tiab] OR ivorian*[tiab] OR ivory coast[tiab] OR cuba*[tiab] OR djibouti*[tiab] OR dominica*[tiab] OR ecuador*[tiab] OR egypt*[tiab] OR el salvador[tiab] OR salvadoran*[tiab] OR guinea*[tiab] OR eritrea*[tiab] OR eswatini*[tiab] OR swaziland*[tiab] OR ethiopia*[tiab] OR fiji*[tiab] OR gabon*[tiab] OR gambia*[tiab] OR republic of georgia[tiab] OR ghana*[tiab] OR grenada*[tiab] OR guatemala*[tiab] OR guyana*[tiab] OR haiti*[tiab] OR honduras*[tiab] OR

india*[tiab] OR indonesia*[tiab] OR iran*[tiab] OR iraq*[tiab] OR jamaica*[tiab] OR jordan*[tiab] OR kazakhstan*[tiab] OR kenya*[tiab] OR kiribati*[tiab] OR democratic people s republic of korea[tiab] OR north korea*[tiab] OR kosovo[tiab] OR kosovar*[tiab] OR kyrgyz*[tiab] OR lao[tiab] OR laos[tiab] OR laotian*[tiab] OR lebanon*[tiab] OR lesotho[tiab] OR liberia*[tiab] OR libya*[tiab] OR madagascar*[tiab] OR malawi*[tiab] OR malaysia*[tiab] OR maldives*[tiab] OR mali[tiab] OR malian[tiab] OR malians[tiab] OR marshall island*[tiab] OR mauritania*[tiab] OR mexico[tiab] OR mexican*[tiab] OR micronesia*[tiab] OR moldova*[tiab] OR mongolia*[tiab] OR montenegr*[tiab] OR morocc*[tiab] OR mozambi*[tiab] OR myanmar*[tiab] OR namibia*[tiab] OR nepal*[tiab] OR nicaragua*[tiab] OR niger[tiab] OR nigerien*[tiab] OR nigeria*[tiab] OR macedonia*[tiab] OR pakistan*[tiab] OR paragua*[tiab] OR peru*[tiab] OR philippines[tiab] OR filipino*[tiab] OR russia*[tiab] OR rwanda*[tiab] OR são tomé and principe[tiab] OR senegal*[tiab] OR serbia*[tiab] OR sierra leone*[tiab] OR solomon island*[tiab] OR somalia*[tiab] OR south africa*[tiab] OR sudan*[tiab] OR sri lank*[tiab] OR st lucia*[tiab] OR saint lucia*[tiab] OR st. vincent*[tiab] OR saint vincent*[tiab] OR grenadines[tiab] OR surinam*[tiab] OR syria*[tiab] OR tajikistan*[tiab] OR tanzania*[tiab] OR thailand[tiab] OR thai[tiab] OR thais[tiab] OR timor*[tiab] OR togo[tiab] OR togolese*[tiab] OR tonga*[tiab] OR tunisia*[tiab] OR turkey[tiab] OR turks[tiab] OR turkish[tiab] OR turkmenistan*[tiab] OR tuvalu*[tiab] OR uganda*[tiab] OR ukrain*[tiab] OR uzbekistan*[tiab] OR vanuatu*[tiab] OR venezuela*[tiab] OR vietnam*[tiab] OR viet nam*[tiab] OR west bank[tiab] OR gaza[tiab] OR gazan*[tiab] OR yemen*[tiab] OR zambia*[tiab] OR zimbabwe*[tiab])) AND (task-switch*[tiab])) OR (task switch*[tiab])

Table S1: Characteristics of included studies*Table S1A: Characteristics of studies included in first stage of review*

First author	Year published	Setting	Interventions	Class of HSS	Comparator	Time horizon	Discounting	Perspective	Model type (if applicable)
Arora ¹	2017	India and Bangladesh	Telephone management of pressure ulcers for people with spinal injuries	Platforms	Control arm of randomized controlled trial	12 weeks	None	Partial societal	Not simulation based
Barasa ²	2012	Kenya	Dissemination of guidelines for pediatric emergency care	Workforce	Control arm of cluster randomized trial	18 months	3%	Health system	Not simulation based
Broughton ³	2013	Niger	Quality improvement to prevent post-partum hemorrhage	Governance	Same site(s) before intervention	Not stated	3%	Health system w/ and w/o donor funding	Decision tree
Burn ⁴	2014	All LICs	Pulse oximeter use during surgery	Tools	Modeled usual care	1 year	3%	Health system	Decision tree
Buttorff ⁵	2012	India	Task-shifting for mental health care (provided by lay health workers)	Workforce	Control arm of cluster randomized trial	1 year	None	Partial societal	Not simulation based
Chen ⁶	2012	Nicaragua	Volunteer orthopedic surgeon trips	Platforms	Expert evaluation of likely counterfactuals	Lifetime	3%	Health system	Not simulation based
Colbourn ⁷	2015	Malawi	Women's community groups; quality improvement in maternal / child health	Governance	Control arm of cluster randomized trial	10 years	3%	Health system	Not simulation based
Driessen ⁸	2012	Malawi	Implementation of electronic medical records	Tools	Modeled usual care	1 year	5%	Health system	Not simulation based
Gertler ⁹	2014	Argentina	Pay for performance incentives for use and quality of maternal and child health services	Governance	Control arms in natural experiment	Lifetime	3%	Health system	Not simulation based
Hayford ¹⁰	2014	Bangladesh	Extended clinic hours, vaccinator training, active surveillance, and community participation in vaccination	Workforce	Same site(s) before intervention	1 year	None	Health system	Not simulation based
Howlader ¹¹	2011	Bangladesh	Strengthening maternal care in community health centers	Platforms	Modeled usual care	Not stated	None	Health system	Not simulation based
Jansen ¹²	2014	India	Facilitating improved follow-up for cleft palate surgeries	Platforms	Same site(s) before intervention	2.5 years	None	Health system	Not simulation based
LeFevre ¹³	2013	Bangladesh	Improved training and mobilization in neonatal community care with or without the addition of home-based care	Platforms	Control arm of cluster randomized trial	Lifetime	3%	Health system + partial societal perspective	Not simulation based
Lewycka ¹⁴	2013	Malawi	Training of women's groups and peer counselors for maternal and infant health	Workforce	Control arm of cluster randomized trial	Lifetime	None	Health system	Not simulation based
Luangasanatip ¹⁵	2018	Thailand	Hand-washing promotion among ICU healthcare workers	Workforce	Modeled usual care	Lifetime	3%	Health system	Microsimulation

Manasyan ¹⁶	2010	Zambia	Training midwives in essential newborn care	Workforce	Same site(s) before intervention	1 year	None	Health system	Not simulation based
Nandi ¹⁷	2015	India	Scale-up of home-based neonatal care	Platforms	Modeled usual care	1 year	None	Health system	Markov model
Pitt ¹⁸	2016	Ghana	Home-based neonatal care	Platforms	Control arm of cluster randomized trial	Lifetime	3%	Health system	Not simulation based
Prinja ¹⁹	2018	India	Mobile electronic medical record program with reminders for guidelines based care	Tools	Control arm of cluster randomized trial	Lifetime	3%	Health system + partial societal perspective	Decision tree
Sabin ²⁰	2012	Zambia	Training traditional birth attendants in neonatal emergencies	Workforce	Control arm of cluster randomized trial	Lifetime	3%	Partial societal	Not simulation based
Seaman ²¹	2020	GBD-region specific averages of all LMICs within region	Hepatis B vaccination with controlled temperature chain protocol and compact prefilled auto-disable syringes	Tools	Modeled usual care	Lifetime	3%	Health system	Microsimulation
Shepard ²²	2020	Zimbabwe	Results-based financing for maternal and child care	Governance	Control arm of cluster randomized trial	Lifetime	3%	Health system	Multipurpose tool (LiST by Health Policy Project)
Somigliana ²³	2011	Uganda	Obstetrics-focused ambulance service	Tools	Expert evaluation of likely counterfactuals	Lifetime	3%	Health system	Not simulation based
Stenberg ²⁴	2019	67 LMICs	Strengthening primary care and supporting, cross-sectoral interventions as part of universal health coverage	Governance	Modeled usual care	Lifetime	3%	Health system	Multipurpose tool (OneHealth Tool)
Tripathy ²⁵	2010	India	Women's community groups teaching new mothers about health of self and infant	Platforms	Control arm of cluster randomized trial	Lifetime	3%	Health system	Not simulation based
Vossius ²⁶	2014	Tanzania	Training in neonatal resuscitation	Workforce	Same site(s) before intervention	Lifetime	3%	Health system	Not simulation based
Zeng ²⁷	2018	Zambia	Results-based financing for maternal and child care	Governance	Control arm of cluster randomized trial	Lifetime	3%	Health system	Multipurpose tool (LiST by Health Policy Project)

First author	Effectiveness measure	Utility elicitation	Effectiveness estimate source	Cost estimate source	Sensitivity analyses	Thematic emphases
Arora	Patient QALYs pre/post	EQ-5D of patients	Primary data: Patient survey in randomized trial	Microcosting of resource and time use	Probabilistic sensitivity analysis, cost-effectiveness acceptability curve, alternative perspective (health system)	Precision, realism
Barasa	Average % improvement in 14 indicators between intervention and control sites; DALYs estimated by external source	Global Burden of Disease study	Primary data: Results of cluster randomized trial	Mixed: Gross costing for resource use, microcosting for time spent	Probabilistic sensitivity analysis (Monte Carlo methods)	Generality, realism
Broughton	Post-partum hemorrhages, DALYs, deaths averted; compliance with birth management and newborn care standards	Literature review	Primary data: Interviews with clinic staff	Gross costing: Project accounting records	Probabilistic sensitivity analysis (Monte Carlo methods)	Precision, realism
Burn	DALYs averted (discounted; disability due to non-fatal hypoxic brain injury not included)	Global Burden of Disease study	Secondary data: Systematic review	Microcosting: Modeled annualized cost of use for "Lifebox" pulse oximeters plus treatment of additional hypoxia cases detected by pulse oximetry	Probabilistic sensitivity analysis of some effectiveness and cost parameters	Generality, precision
Buttorff	QALYs produced; work days gained; psychiatric symptom score	Mapping of disability survey onto utility weights	Primary data: Results of WHO Disability Assessment Schedule in cluster randomized trial	Microcosting: Patient healthcare costs and time costs; staff costs; diagnostic costs	One way sensitivity analysis based on bootstrapped costs	Precision, realism
Chen	DALYs averted	Global Burden of Disease study	Secondary data: Expert evaluation	Microcosting of resource and time use	One way sensitivity analysis of discount rate and age weighting factor in utility function	Precision, realism
Colbourn	Maternal, neonatal, and perinatal mortality; DALYs averted (attributable to reduced mortality only)	Global Burden of Disease study	Primary data: Results of cluster randomized trial	Mixed: Gross costing for resource use, microcosting for time spent	Probabilistic sensitivity analysis (Bayesian methods)	Precision, realism
Driessen	Length of hospital stays, time transcribing medical records, laboratory use	None	Secondary data: Literature review	Microcosting using secondary data	Scenario analysis with reduced benefit and reduced personnel	Precision, realism
Gertler	Ten tracers indicating quality of maternal and child health services; DALYs for neonatal death and low birth weight only	Assumption, literature review	Primary data: Results of natural experiment	Gross costing: Governmental and project accounting records	One way sensitivity of health outcomes (neonatal deaths and low birth weights averted) only	Precision, realism
Hayford	Fully immunized children	None	Primary data: Results of pre/post analysis	Mixed: gross costing for resource use, microcosting for time spent	None	Precision, realism
Howlader	Maternal mortality	None	Secondary data: Literature review	Secondary data using "ingredients approach"	None	Generality, precision
Jansen	Number of follow-up appointments kept	None	Primary data: Results of pre/post analysis	Mixed: Gross costing for resource use, microcosting for time spent	None	Precision, realism
LeFevre	Neonatal deaths averted; DALYs averted	None (DALY calculation based on life expectancy at birth only)	Primary data: Results of cluster randomized trial	Mixed: gross costing for health system costs, microcosting for patient costs	Probabilistic sensitivity analysis	Generality, realism
Lewycka	Years of life lost	None	Primary data: Results of cluster randomized trial	Gross costing: Project accounting records	None	Precision, realism

Luangsanatip	QALYs gained; deaths averted	Literature review	Secondary data: Literature review	Mixed: Gross costing for administrative costs, microcosting for resource use and time spent	Numerous two-way sensitivity analyses	Generality, precision
Manasyan	Lives saved; DALYs averted	None (DALY calculation based on life expectancy at birth only)	Primary data: Results of pre/post analysis	Microcosting of resource and time use	None	Precision, realism
Nandi	Incidence of severe neonatal morbidity; neonatal deaths averted	None	Secondary data: Literature review	Secondary data: Cluster randomized trial from Prinja 2013	100 sample probabilistic sensitivity analysis on incidence, case fatality rate, demand, efficacy, and cost parameters	Generality, realism
Pitt	Neonatal mortality, (discounted 3% per year) life-years saved	None	Primary data: Results of cluster randomized trial	Unclear (included both direct and indirect costs)	One-way sensitivity analysis on costs, number of births, interventions, and intervention effectiveness	Precision, realism
Prinja	Infant deaths averted; episodes of illness averted; DALYs averted	Global Burden of Disease study	Primary data: Results of cluster randomized trial	Secondary: estimated payment associated with HCW performance increase, other costs taken from other studies conducted in North India	Probabilistic sensitivity analysis on all parameters	Precision, realism
Sabin	Deaths averted; DALYs averted	Global Burden of Disease study (only DALYs averted by avoiding deaths are counted)	Primary data: Results of cluster randomized trial	Microcosting of resource and time use	One-way sensitivity analysis of all parameters	Precision, realism
Seaman	DALYs averted	Global Burden of Disease study	Secondary data: Literature review	Microcosting: Known product costs for cold chain strengthening and prefilled syringes	Probabilistic sensitivity analysis	Generality, precision
Shepard	QALYs based on lives saved, according to LiST tool	Assumption	Primary data: Results of cluster randomized trial	Microcosting of resource and time use	One way sensitivity analysis based on mean / SD of costs and outcomes produced by exposed / control clinics	Generality, realism
Somigliana	Life years saved	None	Secondary data: Expert evaluation	Gross costing: Accounting records from district hospital and ambulance service	Threshold analysis of cost of ambulance	Precision, realism
Stenberg	Deaths averted; gains in life expectancy at birth	None	Secondary data: Life table approach from WHO	Modeled: WHO cost projections for meeting sustainable development goals	None	Generality, precision
Tripathy	Lives saved; life-years saved	None	Primary data: Results of cluster randomized trial	Gross costing: Project accounting records	None	Precision, realism
Vossius	Lives saved; DALYs averted	None (DALY calculation based on life expectancy at birth only)	Primary data: Results of pre/post analysis	Gross costing: Project and governmental accounting records	Probabilistic sensitivity analysis	Precision, realism
Zeng	Lives saved; QALYs based on lives saved	Global Burden of Disease study	Primary data: Results of cluster randomized trial	Mixed: Microcosting for pharmaceuticals, gross costing for other expenditures	Scenario analysis showing only expanded use of services without increase in quality	Precision, realism

DALY: Disability-Adjusted Life Year; GBD: Global Burden of Disease; HCW: Health Care Worker; HSS: health system strengthening; L(M)IC: Low- (and Middle-) Income Country; QALY: Quality-Adjusted Life Year

Table S1B: Characteristics of studies on electronic medical records

First author	Year published	Setting	Interventions	Class of HSS	Comparator	Time horizon	Discounting	Perspective	Model type (if applicable)
Driessen ⁸	2012	Malawi	Implementation of electronic medical records	Tools	Modeled usual care	1 year	5%	Health system	Not simulation based
Sabin ²⁰	2012	Zambia	Training traditional birth attendants in neonatal emergencies	Workforce	Control arm of cluster randomized trial	Lifetime	3%	Partial societal	Not simulation based
Xue ²⁸	2012	China	Implementation of electronic medical records	Tools	Same site(s) before intervention	5 years	None	Health system	Not simulation based

First author	Effectiveness measure	Utility elicitation	Effectiveness estimate source	Cost estimate source	Sensitivity analyses	Thematic emphases
Driessen	Length of hospital stays, time transcribing medical records, laboratory use	None	Secondary data: Literature review	Microcosting using secondary data	Scenario analysis with reduced benefit and reduced personnel	Precision, realism
Sabin	Deaths averted; DALYs averted	Global Burden of Disease study (only DALYs averted by avoiding deaths are counted)	Primary data: Results of cluster randomized trial	Microcosting of resource and time use	One-way sensitivity analysis of all parameters	Precision, realism
Xue	Length of hospital stay, infection rate, mortality	None	Primary data: Results of pre/post analysis	Gross costing: Project accounting records	None	Precision, realism

Table S1C: Characteristics of studies on home-based maternal and neonatal care

First author	Year published	Setting	Interventions	Class of HSS	Comparator	Time horizon	Discounting	Perspective	Model type (if applicable)
Jo ²⁹	2019	Bangladesh	Enhanced home-based maternal and neonatal healthcare	Platforms	Control arm of cluster randomized trial	Not stated	3%	Health system	Not simulation based
LeFevre ¹³	2013	Bangladesh	Improved training and mobilization in neonatal community care with or without the addition of home-based care	Platforms	Control arm of cluster randomized trial	Lifetime	3%	Health system + partial societal perspective	Not simulation based
Mathewos ³⁰	2017	Ethiopia	Home-based maternal and neonatal care	Platforms	Control arm of cluster randomized trial	Lifetime	3%	Health system	Not simulation based
Nandi ¹⁷	2015	India	Scale-up of home-based neonatal care	Platforms	Modeled usual care	1 year	None	Health system	Markov model
Pitt ¹⁸	2016	Ghana	Home-based neonatal care	Platforms	Control arm of cluster randomized trial	Lifetime	3%	Health system	Not simulation based

First author	Effectiveness measure	Utility elicitation	Effectiveness estimate source	Cost estimate source	Sensitivity analyses	Thematic emphases
Jo	Neonatal deaths averted; DALYs averted	None (DALY calculation based on life expectancy at birth only)	Primary data: Results of cluster randomized trial	Gross costing: Project accounting records	Probabilistic sensitivity analysis	Precision, realism
LeFevre	Neonatal deaths averted; DALYs averted	None (DALY calculation based on life expectancy at birth only)	Primary data: Results of cluster randomized trial	Mixed: gross costing for health system costs, microcosting for patient costs	Probabilistic sensitivity analysis	Generality, realism
Mathewos	Neonatal deaths averted; DALYs averted	None (DALY calculation based on life expectancy at birth only)	Primary data: Results of cluster randomized trial	Gross costing: Project accounting records	Probabilistic sensitivity analysis	Precision, realism
Nandi	Incidence of severe neonatal morbidity; neonatal deaths averted	None	Secondary data: Literature review	Secondary data: Cluster randomized trial from Prinja 2013	100 sample probabilistic sensitivity analysis on incidence, case fatality rate, demand, efficacy, and cost parameters	Generality, realism
Pitt	Neonatal mortality, (discounted 3% per year) life-years saved	None	Primary data: Results of cluster randomized trial	Unclear (included both direct and indirect costs)	One-way sensitivity analysis on costs, number of births, interventions, and intervention effectiveness	Precision, realism

Table S1D: Characteristics of studies on task-shifting

First author	Year published	Setting	Interventions	Class of HSS	Comparator	Time horizon	Discounting	Perspective	Model type (if applicable)
Buttorff ⁵	2012	India	Task-shifting for mental health care (provided by lay health workers)	Workforce	Control arm of cluster randomized trial	1 year	None	Partial societal	Not simulation based
Chanda ³¹	2011	Zambia	Task shifting to community health workers for treatment of uncomplicated malaria	Workforce	Unblinded trial based on patient-preferred treatment	Lifetime	5%	Health system	Not simulation based
Datiko ³²	2010	Ethiopia	Task shifting to health extension workers for treatment of tuberculosis	Workforce	Control arm of cluster randomized trial	Not stated	3%	Partial societal	Not simulation based
Do Prado ³³	2011	Brazil	Task shifting to home-based guardians for directly observed treatment of tuberculosis	Workforce	Unblinded trial based on patient-preferred treatment	1 year	None	Partial societal	Not simulation based
Patouillard ³⁴	2011	Ghana	Task shifting to community health workers for intermittent preventative treatment for malaria	Workforce	Control arm of cluster randomized trial	Not stated	3%	Health system	Not simulation based
Puett ³⁵	2012	Bangladesh	Task shifting to community health workers for treatment of severe acute malnutrition	Workforce	Control arm of cluster randomized trial	Lifetime	3%	Health system	Not simulation based
Sabin ²⁰	2012	Zambia	Training traditional birth attendants in neonatal emergencies	Workforce	Control arm of cluster randomized trial	Lifetime	3%	Partial societal	Not simulation based
Yan ³⁶	2014	China	Task shifting to community organizations for HIV prevention and care	Workforce	Same site(s) before intervention	Not stated	None	Health system	Not simulation based

First author	Effectiveness measure	Utility elicitation	Effectiveness estimate source	Cost estimate source	Sensitivity analyses	Thematic emphases
Butorff	QALYs produced; work days gained; psychiatric symptom score	Mapping of disability survey onto utility weights	Primary data: Results of WHO Disability Assessment Schedule in cluster randomized trial	Microcosting: Patient healthcare costs and time costs; staff costs; diagnostic costs	One way sensitivity analysis based on bootstrapped costs	Precision, realism
Chanda	Properly identified and treated cases	None	Primary data: Results of open-label trial	Mixed: Gross costing for administrative costs, microcosting for resource use and time spent	None	Precision, realism
Datiko	Fully treated cases	None	Primary data: Results of cluster randomized trial	Microcosting of resource and time use	One-way sensitivity analysis of all parameters	Precision, realism
Do Prado	Fully treated cases	None	Primary data: Results of open-label trial	Microcosting of resource and time use	None	Precision, realism
Patouillard	Fully treated children	None	Primary data: Results of cluster randomized trial	Microcosting of resource and time use	None	Precision, realism
Puett	Deaths averted; DALYs averted	Global Burden of Disease study	Primary data: Results of cluster randomized trial	Microcosting of resource and time use	Probabilistic sensitivity analysis of costs	Generality, realism
Sabin	Deaths averted; DALYs averted	Global Burden of Disease study (only DALYs averted by avoiding deaths are counted)	Primary data: Results of cluster randomized trial	Microcosting of resource and time use	One-way sensitivity analysis of all parameters	Precision, realism
Yan	Cases of HIV identified	None	Primary data: Results of pre/post analysis	Microcosting of resource and time use	None	Precision, realism

Table S2: Review of all included studies using the Consolidated Health Economic Evaluation Reporting Standards (CHEERS) checklist

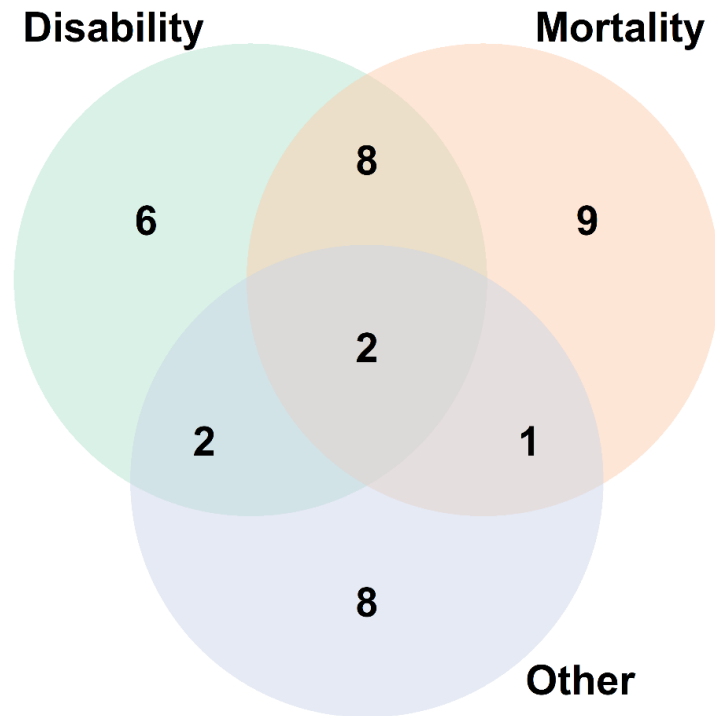
	Target population and subgroups	Setting and location	Study perspective	Comparators	Time horizon	Discount rate	Choice of health outcomes	Measurement of effectiveness	Measurement and valuation of preference-based outcomes	Estimating resources and costs	Currency, price date, and conversion	Choice of model	Assumptions	Analytic methods	Results: Study parameters	Results: Incremental costs and outcomes	Results: Characterizing uncertainty	Results: Characterizing heterogeneity
Arora, 2017	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	N
Barasa, 2012	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	N
Broughton, 2013	N	Y	Y	Y	N	Y	Y	Partial	Y	Y	Partial	Y	Y	Y	Y	Y	Y	N
Burn, 2014	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Partial	Partial	Y	Y	Y	Y	N
Buttorff, 2012	Y	Y	N	Y	Y	NA	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	Y
Chanda, 2011	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	NA	NA	Y	Y	Y	N	N
Chen, 2012	Y	Y	Y	Partial	Y	Y	Y	Partial	Partial	Y	Y	NA	NA	Y	Y	Y	N	Y
Colbourn, 2015	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	N
Datiko, 2010	Y	Y	Y	Y	N	Y	Y	Y	NA	Y	Y	NA	NA	Y	Y	N	Y	N
Do Prado, 2011	Y	Y	Y	Y	Y	NA	Y	Y	NA	Y	Y	NA	NA	Y	Y	Y	N	N
Driessen, 2012	Y	Y	N	Partial	Y	Y	Y	Y	NA	Y	Partial	NA	NA	Y	Y	Y	Y	N
Gertler, 2014	Y	Y	Y	Y	Y	Y	Partial	Y	Y	Y	Y	NA	NA	Y	Partial	Y	Partial	N
Hayford, 2014	Y	Y	Y	Y	Y	NA	Partial	Y	NA	Y	Y	NA	NA	Y	Y	Y	N	N
Howlander, 2011	Y	Y	Y	Partial	Y	Y	Partial	N	NA	Y	Y	NA	NA	Y	Y	Partial	N	N
Jansen, 2014	Y	Y	Partial	Partial	Y	NA	Y	Y	Y	Y	Y	NA	NA	Y	Y	N	Partial	N
Jo, 2019	Y	Y	Y	Y	N	N	Y	Y	NA	Y	Partial	NA	NA	Y	Y	Y	Y	N

	Target population and subgroups	Setting and location	Study perspective	Comparators	Time horizon	Discount rate	Choice of health outcomes	Measurement of effectiveness	Measurement and valuation of preference-based outcomes	Estimating resources and costs	Currency, price date, and conversion	Choice of model	Assumptions	Analytic methods	Results: Study parameters	Results: Incremental costs and outcomes	Results: Characterizing uncertainty	Results: Characterizing heterogeneity
LeFevre, 2013	Y	Y	Y	Y	Y	Y	Y	Y	Partial	Y	Y	NA	NA	Y	Y	Y	Y	Y
Lewycka, 2013	Y	Y	Y	Y	Y	N	Y	Y	NA	Y	Y	NA	NA	Y	Y	Y	Y	N
Luangasanatip, 2018	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Manasyan, 2010	Y	Y	Partial	Y	Y	NA	Y	Y	Partial	Y	Y	NA	NA	Y	Y	Y	N	N
Mathewos, 2017	Y	Y	Y	Y	Y	Y	Y	Y	Partial	Y	Y	NA	NA	Y	Y	Y	Y	N
Nandi, 2015	Y	Y	Partial	Y	Y	NA	Y	Y	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y
Patouillard, 2011	Y	Y	Y	Y	N	Y	Y	Y	NA	Y	Y	NA	NA	Y	Y	Y	N	N
Pitt, 2016	Y	Y	Y	Y	Y	Y	Y	Y	Partial	Partial	Y	NA	NA	Y	Y	Y	Y	N
Prinja, 2018	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
Puett, 2012	Y	Y	Y	Y	Y	Y	Partial	N	NA	Y	Y	NA	NA	Y	Y	Y	Y	N
Sabin, 2012	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	N
Seaman, 2020	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Shepard, 2020	Y	Y	Y	Y	Y	Y	Y	Y	Partial	Y	Partial	Y	Y	Y	Y	Y	Y	Y
Somigliana, 2011	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	Partial	NA	NA	Y	Y	Y	Y	N
Stenberg, 2019	Y	Y	N	Y	Y	N	Y	Y	NA	Y	Y	Y	Partial	Y	Y	Y	Y	Y

Supplemental material	BMJ Publishing Group Limited (BMJ) disclaims all liability and responsibility arising from any reliance placed on this supplemental material which has been supplied by the author(s)					BMJ Global Health		
						Tripathy, 2010	Y	Target population and subgroups
						Vossius, 2014	Y	Setting and location
						Xue, 2012	Y	
						Yan, 2014	Y	
						Zeng, 2018	Y	
							Partial	Study perspective
							Y	Comparators
							Y	Time horizon
							Y	Discount rate
							Y	Choice of health outcomes
							Y	Measurement of effectiveness
							NA	Measurement and valuation of preference-based outcomes
							Y	Estimating resources and costs
							Partial	Currency, price date, and conversion
							NA	Choice of model
							NA	Assumptions
							Y	Analytic methods
							Partial	Results: Study parameters
							Y	Results: Incremental costs and outcomes
							N	Results: Characterizing uncertainty
							N	Results: Characterizing heterogeneity

Hendrix N, et al. *BMJ Global Health* 2022; 7:e007392. doi: 10.1136/bmjgh-2021-007392

Figure S1: Count of studies reporting different combinations of health outcomes (n = 36).



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