

Annex 3D. Notes on the Essential UHC Interventions in Annex 3C

Supplementary material for: Watkins, DA, DT Jamison, A Mills, R Atun, K Danforth, and others. 2018. “Universal Health Coverage and Essential Packages of Care.” In *Disease Control Priorities: Improving Health and Reducing Poverty* edited by DT Jamison, H Gelband, S Horton, P Jha, R Laxminarayan, CN Mock, and R Nugent. Volume 9 of *Disease Control Priorities, third edition*. Washington, DC: World Bank.

This Annex provides a running commentary on the interventions contained in EUHC, organized by platform. Most of the comments are related to cost-effectiveness data and/or the authors’ assessment/grading of cost-effectiveness.

A few additional points should be made first. The interventions listed below are meant to identify clinical and public health *services* that are likely to provide good value for money across low- and middle-income settings. The notion of a health service is somewhat broader than the notion of a health *intervention*, though the two overlap substantially.

It is usually implied that each health service belongs on a continuum of care. The continuum of care includes all aspects of high-quality disease management, including as community-based support (like peer groups for chronic diseases), referral and counter-referral and coordination of care between primary providers and specialists, and acute care for complications. Also included in the notion of a health service are the supportive measures that ensure the primary intervention is delivered with maximum effectiveness; these may include measures like nutritional support and intravenous hydration for severe acute illnesses, or periodic provider counseling and education for chronic diseases.

For instance, *DCP3* recommends “management of epilepsy using generic antiepileptic drugs” at health centers. The “center of gravity” of this intervention/health service is the health center, where chronic epilepsy is managed by trained providers on an ongoing basis. However, cases of acute seizure and status epilepticus (complications of epilepsy) also need to be addressed, perhaps at higher-capacitated health centers or first-level hospitals. Referral to neurology and epilepsy specialists may be required for a minority of severe or refractory cases. It is also implied that providers are trained adequately to deliver epilepsy care and patients are identified early and educated about their disease. These issues are not usually spelled out in the intervention definitions but can be elaborated at the country adaptation stage in consultation of local disease experts. For technical details on disease management, the reader is referred to the relevant *DCP3* chapters and volumes (for example, to chapter 5 of *DCP3* volume 4 for more specifics of epilepsy care). In most cases, it is anticipated that countries will adapt and customize these lists of interventions to their contexts and needs.

It is unfortunate that the economic evaluation literature does not uniformly include all costs and potential benefits of the health services listed below. In many cases the interventions in the economic literature have been defined more narrowly than described above, and cost-effectiveness ratios reported on this narrower intervention concept. There is inherent uncertainty in the use of these ratios for setting priorities in diverse settings, many of which have different health system characteristics, cost structures, and epidemiological and demographic contexts than the primary economic evidence. These uncertainties have been considered in the ordinal grading of intervention value-for-money that is provided in Annex 3F. Ultimately, the grading

presented here is best used as a starting point for country-specific economic evaluations of prioritized lists of interventions that draw on local data and experience.

Name of final intervention	Platform	Comments
Conduct a comprehensive assessment of International Health Regulations (IHR) competencies using the Joint External Evaluation tool and develop, cost, finance and implement an action plan to address gaps in preparedness and response	Population-based Health Interventions	Despite the importance of the topic, there were limited economic data to inform the pandemic preparedness package. Recommendations have been crafted around likely population impact rather than value for money per se
Conduct simulation exercises and health worker training for outbreak events including outbreak investigation, contact tracing and emergency response	Population-based Health Interventions	Despite the importance of the topic, there were limited economic data to inform the pandemic preparedness package. Recommendations have been crafted around likely population impact rather than value for money per se
Decentralize stocks of antiviral medications in order to reach at-risk groups and disadvantaged populations	Population-based Health Interventions	Despite the importance of the topic, there were limited economic data to inform the pandemic preparedness package. Recommendations have been crafted around likely population impact rather than value for money per se
Develop and implement a plan to ensure surge capacity in hospital beds, stockpiles of disinfectants, equipment for supportive care, and personal protective equipment	Population-based Health Interventions	Despite the importance of the topic, there were limited economic data to inform the pandemic preparedness package. Recommendations have been crafted around likely population impact rather than value for money per se
Develop plans and legal standards for curtailing interactions between infected persons and uninfected population and implement and evaluate infection control measures in health facilities	Population-based Health Interventions	Despite the importance of the topic, there were limited economic data to inform the pandemic preparedness package. Recommendations have been crafted around likely population impact rather than value for money per se
Ensure influenza vaccine security at national and subnational level	Population-based Health Interventions	Despite the importance of the topic, there were limited economic data to inform the pandemic preparedness package. Recommendations have been crafted around likely population impact rather than value for money per se
Mass media encouraging use of condoms, voluntary medical male circumcision, and STI testing	Population-based Health Interventions	
Mass media concerning awareness on handwashing and health effects of household air pollution	Population-based Health Interventions	
Mass media messages concerning awareness on handwashing and health effects of household air pollution	Population-based Health Interventions	
Mass media messages concerning healthy eating or physical activity	Population-based Health Interventions	

	Interventions	
Mass media messages concerning sexual and reproductive health and mental health for adolescents	Population-based Health Interventions	
Mass media messages concerning use of tobacco and alcohol	Population-based Health Interventions	
Sustained vector management for Chagas disease, visceral leishmaniasis, dengue, and other nationally important causes of nonmalarial fever	Population-based Health Interventions	
Systematic identification of individuals with TB symptoms among high-risk groups and linkage to care (“active case finding”)	Population-based Health Interventions	
Adolescent-friendly health services including: provision of condoms to prevent STIs; provision of reversible contraception; treatment of injury in general and abuse in particular; and screening and treatment for STIs	Community	No primary economic data; component interventions generally provide good value for money (see, e.g., Sheehan and others, Lancet 2017, chapters 1 of DCP3 volumes 2, 6, and 8)
Antenatal and postpartum education on family planning	Community	Cost-effectiveness is generally not a relevant measure of value for money for family planning services
Cardiac and pulmonary rehabilitation programs	Community	There were no economic data identified regarding rehabilitation care in low- and middle-income countries; assessments of value-for-money are derived from literature in high-income countries
Childhood vaccination series (diphtheria, pertussis, tetanus, polio, BCG, measles, hepatitis B, Hib, rubella)	Community	
Community-based HIV testing and counseling (for example, mobile units and venue-based testing), with appropriate referral or linkage to care and immediate initiation of lifelong ART	Community	
Conduct larviciding and water-management programs in high malaria transmission areas where mosquito breeding sites can be identified and regularly targeted	Community	
Counseling of mothers on providing thermal care for preterm newborns (delayed bath and skin-to-skin contact)	Community	
Detection and management of acute severe malnutrition and referral in the presence of complications	Community	

Detection and treatment of childhood infections (iCCM), including referral if danger signs	Community	No primary data; this is included in RMNCH investment case packages and generally regarded as having high value for money
Early childhood development rehabilitation interventions, including motor, sensory, and language stimulation	Community	There were no economic data identified regarding rehabilitation care in low- and middle-income countries; assessments of value-for-money are derived from literature in high-income countries
Early detection and treatment of Chagas disease, human African trypanosomiasis, leprosy, the leishmaniases	Community	
Early identification of lead poisoning and counseling of families in remediation strategies for sources of environmental exposure	Community	In some settings, lead chelation therapy or other medical approaches may be appropriate; however there are no economic data to support this approach in low- and middle-income countries
Education campaigns for the prevention of gender-based violence	Community	
Education of schoolchildren on oral health	Community	
Education on handwashing and safe disposal of children's stools	Community	
Exercise-based pulmonary rehabilitation for patients with obstructive lung disease	Community	
For malaria due to <i>P. vivax</i> , test for G6PD deficiency; if normal, add chloroquine or chloroquine plus 14-day course of primaquine	Community	
Functional interventions for self-care for individuals with disabilities	Community	There were no economic data identified regarding rehabilitation care in low- and middle-income countries; assessments of value-for-money are derived from literature in high-income countries
HIV education and counseling for pregnant women, sex workers, people who inject drugs, men who have sex with men, and transgender individuals, and PLHIV and their partners	Community	
Household HIV testing and counseling in high-prevalence settings, with appropriate referral or linkage to care and immediate initiation of lifelong ART	Community	
Identify and refer patients with high risk including pregnant women, young children and those with underlying medical conditions	Community	Despite the importance of the topic, there were limited economic data to inform the pandemic preparedness package. Recommendations have been crafted around likely population impact rather than value for money per se
In all malaria-endemic countries, diagnosis with rapid test or microscopy (including speciation) followed by treatment with ACTs (or current first-line combination)	Community	

In countries where it is a public health concern, prevention of FGM (may be for daughters of women of reproductive age)	Community	
In high malaria transmission settings where rapid tests and microscopy are unavailable, presumptive treatment of febrile illness with ACTs (non-severe cases) or ACTs plus antibiotics (severe cases)	Community	
In high malaria transmission settings, indoor residual spraying (IRS) in selected areas with high transmission and entomologic data on IRS susceptibility	Community	
In high malaria transmission settings, intermittent preventive treatment in infancy (except where seasonal malaria chemoprophylaxis is being provided)	Community	
In high malaria transmission settings, intermittent preventive treatment in pregnancy	Community	
In low malaria transmission settings, addition of single low-dose primaquine to first-line treatment	Community	Value for money in low-resource settings is constrained by feasibility and relevance; many low-income countries have high, not low transmission
In low malaria transmission settings, case investigation, reactive case detection, proactive case detection (including mass screening and treatment)	Community	Value for money in low-resource settings is constrained by feasibility and relevance; many low-income countries have high, not low transmission
In the context of an emerging infectious outbreak, provide advice and guidance on how to recognize early symptoms and signs and when to seek medical attention	Community	Despite the importance of the topic, there were limited economic data to inform the pandemic preparedness package. Recommendations have been crafted around likely population impact rather than value for money per se
In the Sahel region, seasonal malaria chemoprophylaxis	Community	
Individualized environmental modifications (for example, adaptations to a house)	Community	There were no economic data identified regarding rehabilitation care in low- and middle-income countries; assessments of value-for-money are derived from literature in high-income countries
Life skills training in schools to build social and emotional competencies	Community	
Management of labor and delivery in low risk women by skilled attendants, including basic neonatal resuscitation following delivery	Community	
Management of lymphedema	Community	
Mass drug administration for lymphatic filariasis, onchocerciasis, schistosomiasis, soil-transmitted helminthiasis and trachoma, and foodborne trematode infections	Community	

Mass drug administration in low malaria transmission settings (including high-risk groups in geographic or demographic clusters)	Community	Value for money in low-resource settings is constrained by feasibility and relevance; many low-income countries have high, not low transmission
Mass social marketing of insecticide-treated nets	Community	This intervention is assumed to be financed out of pocket except in certain groups (e.g., women attending antenatal care)
Parent training for high-risk families, including nurse home visitation for child maltreatment	Community	High-income country estimates range from cost-saving to >US\$ 1 million per case of maltreatment prevented
Pneumococcus vaccination	Community	A variety of cost-effectiveness estimates have been published that appear too good to be true. Cost-effectiveness probably depends mostly on the price of the vaccine and is more favorable if GAVI subsidy is available. Treatment of pneumonia is a highly effective and cost-effective substitute in settings where vaccine subsidies are unavailable
Pressure area prevention, and supportive seating interventions for wheelchair users	Community	There were no economic data identified regarding rehabilitation care in low- and middle-income countries; assessments of value-for-money are derived from literature in high-income countries
Promotion of breastfeeding or complementary feeding by lay health workers	Community	
Provision and training in the use of basic assistive products (such as canes, braille displays, and other aides) and compensatory strategies needed to communicate and perform activities of daily living	Community	There were no economic data identified regarding rehabilitation care in low- and middle-income countries; assessments of value-for-money are derived from literature in high-income countries
Provision of condoms to key populations, including sex workers, men who have sex with men, people who inject drugs, transgender populations, and prisoners	Community	
Provision of cotrimoxazole to children born to HIV-positive mothers	Community	
Provision of harm reduction services such as safe injection equipment and opioid substitution therapy to people who inject drugs	Community	
Provision of iron and folic acid supplementation to pregnant women, and provision of food or caloric supplementation to pregnant women in food-insecure households	Community	
Provision of vitamin A and zinc supplementation to children according to WHO guidelines, and provision of food supplementation to women and children in food insecure households	Community	
Rotavirus vaccination	Community	A variety of cost-effectiveness estimates have been published that appear

		too good to be true. Cost-effectiveness probably depends mostly on the price of the vaccine and is more favorable if GAVI subsidy is available. Treatment of diarrhea is a highly effective and cost-effective substitute in settings where vaccine subsidies are unavailable
Routine contact tracing to identify individuals exposed to TB and link them to care	Community	Despite lack of economic data, this is widely regarded as a key component of TB control programs
School-based HPV vaccination for girls	Community	Cost-effectiveness depends greatly on the price of the vaccine; may not be realistic for low-income settings without a price reduction (such as GAVI subsidies)
School-based education on sexual health, nutrition, and health lifestyle	Community	
Self-managed treatment of migraine	Community	
Tetanus toxoid immunization among schoolchildren and among women attending antenatal care	Community	
Total Community Treatment for yaws	Community	
Training and retraining for disorders of speech, swallowing, communication, and cognition	Community	
Training, retraining, and exercise programs that address musculoskeletal injuries and disorders, including chronic low back and neck pain	Community	There were no economic data identified regarding rehabilitation care in low- and middle-income countries; assessments of value-for-money are derived from literature in high-income countries
Vision prescreening by teachers; vision tests and provision of ready-made glasses on-site by eye specialists	Community	
WASH behavior change interventions, such as community-led total sanitation	Community	
Among all individuals who are known to be HIV positive, immediate ART initiation with regular monitoring of viral load for adherence and development of resistance	Health Center	
Annual flu vaccination and pneumococcal vaccine every five years for individuals with underlying lung disease	Health Center	This intervention may be challenging to implement in settings where an adult vaccine schedule is not in widespread use
As resources permit, hepatitis B vaccination of high-risk populations, including healthcare workers, PWID, MSM, household contacts, and persons with multiple sex partners	Health Center	Lack of cost-effectiveness data in populations other than children
Basic management of musculoskeletal and neurological injuries and disorders, such as simple exercises prescription and sling or cast provision	Health Center	There were no economic data identified regarding rehabilitation care in low- and middle-income countries; assessments of value-for-money are derived from literature in high-income countries

Calcium and vitamin D supplementation for primary prevention of osteoporosis in high-risk individuals	Health Center	
Dental extraction	Health Center	
Detection and treatment of childhood infections with danger signs (IMCI)	Health Center	
Drainage of dental abscess	Health Center	
Drainage of superficial abscess	Health Center	
Early detection and treatment of neonatal pneumonia with oral antibiotics	Health Center	
Essential palliative care and pain control measures, including oral immediate release morphine and medicines for associated symptoms	Health Center	Cost-effectiveness is not a relevant measure of value for money for palliative care/pain control
Evaluation and management of fever in clinically stable individuals using WHO IMAI guidelines, with referral of unstable individuals to first-level hospital care	Health Center	No primary economic data are available in low- and middle-income countries; however, these are potentially curable conditions that use inexpensive drugs and syndrome-based guidelines; hence they are likely to provide good value for money
Exercise programs for upper extremity injuries and disorders	Health Center	There were no economic data identified regarding rehabilitation care in low- and middle-income countries; assessments of value-for-money are derived from literature in high-income countries
Expanded palliative care and pain control measures, including prevention and relief of all physical and psychological symptoms of suffering	Health Center	Cost-effectiveness is not a relevant measure of value for money for palliative care/pain control
Focused use of vaccines for endemic infections, such as dengue, JEV, typhoid, meningococcus, and others	Health Center	Cost-effectiveness of individual vaccines depends on local factors as well as vaccine price
For individuals testing positive for hepatitis B and C, assessment of treatment eligibility by trained providers followed by initiation and monitoring of antiviral treatment when indicated	Health Center	While economic data are available in high-income countries, suggesting these are cost-effective, it is unlikely that these drugs will be cost-effective in low- and middle-income countries until prices fall near to the cost of production
For PLHIV and children under five who are close contacts or household members of individuals with active TB, perform symptom screening and chest radiograph; if there is no active TB, provide isoniazid preventive therapy according to current WHO guidelines	Health Center	
Health center pathology services	Health Center	Cost-effectiveness is often not relevant for pathology services in general since these underpin the delivery of other (cost-effective) interventions

Hepatitis B and C testing of individuals identified in the national testing policy (i.e., based on endemicity and risk level), with appropriate referral of positive individuals to trained providers	Health Center	Screening is only cost-effective in settings where antiviral treatment is cost-effective and feasible
Identify and refer to higher levels of health care patients with signs of progressive illness	Health Center	Despite the importance of the topic, there were limited economic data to inform the pandemic preparedness package. Recommendations have been crafted around likely population impact rather than value for money per se
Interventions to support caregivers of patients with dementia	Health Center	Despite the importance of the topic, there were limited economic data to inform the pandemic preparedness package. Recommendations have been crafted around likely population impact rather than value for money per se
Long-term combination therapy for persons with multiple CVD risk factors, including screening for CVD in community settings using non-lab-based tools to assess overall CVD risk	Health Center	Cost-effectiveness varies widely by setting and "absolute risk" threshold -- generally cost-effectiveness ratios are 2-3x that of secondary prevention (see Gaziano and others, Lancet 2006)
Low-dose inhaled corticosteroids and bronchodilators for asthma and for selected patients with COPD	Health Center	Low cost-effectiveness is driven in part by the high price of inhalers (see Stanciole and others, BMJ 2012)
Management of bipolar disorder using generic mood-stabilizing medications and psychosocial treatment	Health Center	
Management of complications following FGM	Health Center	
Management of depression and anxiety disorders with psychological and generic antidepressant therapy	Health Center	
Management of epilepsy using generic anti-epileptics	Health Center	
Management of labor and delivery in low risk women (BEMNOC) including initial treatment of obstetric/delivery complications prior to transfer	Health Center	
Management of miscarriage/incomplete abortion and post abortion care	Health Center	
Management of non-displaced fractures	Health Center	Generally regarded as cost-effective when delivered as part of an outpatient surgical package
Management of preterm premature rupture of membranes, including administration of antibiotics	Health Center	
Management of schizophrenia using generic anti-psychotic medications and psychosocial treatment	Health Center	
Opportunistic screening for hypertension for all adults and initiation of treatment among individuals with severe	Health Center	

hypertension and/or multiple risk factors		
Partner notification and expedited treatment for common STIs, including HIV	Health Center	Data are only available for HIV
PMTCT of HIV (Option B+) and syphilis	Health Center	
Post gender-based violence care including, counseling, provision of emergency contraception, and rape-response referral (medical and judicial)	Health Center	
PrEP for discordant couples and others at high risk of infection such as commercial sex workers (in high prevalence settings)	Health Center	Cost-effectiveness depends greatly on individual baseline risk of acquiring HIV (see Verguet and others, BMJ Sexually Transmitted Infections 2013)
Provide iron and folic acid supplementation to pregnant women, as well as food/caloric supplementation to pregnant women in food insecure households	Health Center	
Provider-initiated testing and counseling for HIV, STIs, and hepatitis, for all in contact with health system in high prevalence settings, including prenatal care with appropriate referral/linkage to care including immediate ART initiation for those testing positive for HIV	Health Center	
Provision of aspirin for all cases of suspected acute myocardial infarction	Health Center	No cost-effectiveness studies identified; however, has high benefit-cost ratios according to Copenhagen Consensus and other groups
Provision of condoms and hormonal contraceptives, including emergency contraceptives	Health Center	Cost-effectiveness is generally not a relevant measure of value for money for family planning services
Provision of insecticide-treated nets to children and pregnant women attending health centers	Health Center	
Psychological treatment for mood, anxiety, ADHD and disruptive behavior disorders	Health Center	Economic data on this intervention are from high-income countries only
Psychosocial support and counseling services for individuals with serious, complex, or life-limiting health problems and their caregivers	Health Center	Cost-effectiveness is not a relevant measure of value for money for palliative care/pain control
Resuscitation with basic life support measures	Health Center	Cost-effectiveness may not be a valid criterion (difficult to measure)
Review of prosthetics, orthotics, and splints, with referral to hospital if indicated	Health Center	There were no economic data identified regarding rehabilitation care in low- and middle-income countries; assessments of value-for-money are derived from literature in high-income countries
Screening and brief intervention for alcohol use disorders	Health Center	832 (screening and brief interventions for alcohol use disorders); 23392 (intervention for problem drinkers)

Screening and management of albuminuric kidney disease with ACEi or ARBs, including targeted screening among people with diabetes	Health Center	
Screening and management of diabetes among at-risk adults, including glycemic control, management of blood pressure and lipids, and consistent foot care	Health Center	Data suggest this is “cost-saving,” but this depends on the comparator; cost-effectiveness is probably not this favorable but is still very favorable
Screening and management of diabetes in pregnancy (gestational diabetes or preexisting type 2 diabetes)	Health Center	Cost-effectiveness is probably more favorable than data suggest
Screening for latent TB infection following a new diagnosis of HIV, followed by yearly screening among PLHIV at high risk of TB exposure	Health Center	
Secondary prophylaxis with penicillin for rheumatic fever or established rheumatic heart disease	Health Center	
Stockpile and consider treating early high-risk patients with ant viral medications according to nationally endorsed guidelines	Health Center	Despite the importance of the topic, there were limited economic data to inform the pandemic preparedness package. Recommendations have been crafted around likely population impact rather than value for money per se
Suturing laceration	Health Center	No primary economic data; likely very cost-effective when delivered as part of an outpatient surgical package
Syndromic management of common sexual and reproductive tract infections (e.g., urethral discharge, genital ulcer, etc.) according to WHO guidelines	Health Center	
Targeted screening for congenital hearing loss in high-risk children using otoacoustic emissions testing	Health Center	
Tobacco cessation counseling, and use of nicotine replacement therapy in certain circumstances	Health Center	Probably not as cost-effective as studies suggest, especially if nicotine replacement therapy is being used
Treatment of acute pharyngitis in children to prevent rheumatic fever	Health Center	
Treatment of caries	Health Center	No primary economic data; likely very cost-effective when delivered as part of an outpatient surgical package
Voluntary medical male circumcision service provision in settings with high prevalence of HIV	Health Center	
Counseling of mothers on providing kangaroo care for newborns	Health Center*	
Diagnosis of TB, including assessment of rifampicin resistance using rapid molecular diagnostics (UltraXpert), and initiation of first-line treatment per current WHO guidelines for drug-	Health Center*	

susceptible TB; referral for confirmation, further assessment of drug resistance, and treatment of drug-resistant TB		
Long term management of ischemic heart disease, stroke, and peripheral vascular disease with aspirin, beta blockers, ACEi, and statins (as indicated) to reduce risk of further events	Health Center*	Varies, but generally very cost-effective in a wide variety of settings (see Gaziano and others, Lancet 2006)
Magnesium sulfate for women with eclampsia	Health Center*	
Management of neonatal sepsis, pneumonia and meningitis using injectable and oral antibiotics	Health Center*	Probably more cost-effective than literature suggests
Medical management of heart failure with diuretics, beta-blockers, ACEi, and mineralocorticoid antagonists	Health Center*	
Opportunistic screening for cervical cancer using visual inspection or HPV DNA testing followed by treatment of precancerous lesions with cryotherapy	Health Center*	
Pharmacological termination of pregnancy	Health Center*	Cost-effectiveness is generally not a relevant measure of value for money for family planning services
Screening and management of hypertensive disorders in pregnancy	Health Center*	Cost-effectiveness is probably more favorable than data suggest
Screening for HIV in all individuals with a diagnosis of active TB, and if HIV infection is present, start (or refer for) ARV treatment and HIV care	Health Center*	
Appendectomy	First-level Hospital	
Assessment, provision and training in the use of assistive products, including assistive devices for hearing	First-level Hospital	There were no economic data identified regarding rehabilitation care in low- and middle-income countries; assessments of value-for-money are derived from literature in high-income countries
Assisted vaginal delivery using vacuum extraction or forceps	First-level Hospital	
Basic skin grafting	First-level Hospital	
Burr hole to relieve acute elevated intracranial pressure	First-level Hospital	No primary data; possibly life-saving in selected cases, but depends on extent of injury and rehabilitation potential
Calcium and vitamin D supplementation for secondary prevention of osteoporosis	First-level Hospital	Probably reasonably cost-effective as first step; see Brandao and others 2012 (Annex 3B)
Colostomy	First-level Hospital	

Combination therapy, including low-dose corticosteroids and generic disease-modifying antirheumatic drugs (including methotrexate), for individuals with moderate to severe rheumatoid arthritis	First-level Hospital	Probably not cost-saving (depends on comparator) but possibly very cost-effective (see Annex 3B for details)
Compression therapy for amputations, burns, and vascular or lymphatic disorders	First-level Hospital	There were no economic data identified regarding rehabilitation care in low- and middle-income countries; assessments of value-for-money are derived from literature in high-income countries
Detection and management of fetal growth restriction	First-level Hospital	Value for money depends on having referral mechanisms in place for abnormal scans; may not be feasible in low-income settings
Early detection and treatment of early-stage cervical cancer	First-level Hospital	No primary economic data; generally regarded as having good value for money
Escharotomy/fasciotomy	First-level Hospital	No primary economic data; can be life- or limb-saving for severe burns
Evaluation and acute management of swallowing dysfunction	First-level Hospital	There were no economic data identified regarding rehabilitation care in low- and middle-income countries; assessments of value-for-money are derived from literature in high-income countries
Evaluation and management of fever in clinically unstable individuals using WHO IMAI guidelines, including empiric parenteral antimicrobials and antimalarials and resuscitative measures for septic shock	First-level Hospital	No primary economic data are available in low- and middle-income countries; however, these are potentially curable conditions that use inexpensive drugs and syndrome-based guidelines; hence they are likely to provide good value for money
Fabrication, fitting, and training in the use of prosthetics, orthotics, and splints	First-level Hospital	There were no economic data identified regarding rehabilitation care in low- and middle-income countries; assessments of value-for-money are derived from literature in high-income countries
First-level hospital pathology services	First-level Hospital	Cost-effectiveness is often not relevant for pathology services in general since these underpin the delivery of other (cost-effective) interventions
Fracture reduction	First-level Hospital	
Full supportive care for severe childhood infections with danger signs	First-level Hospital	No primary economic data; included in RMNCH investment case packages and generally regarded as having high value for money
Hernia repair including emergency surgery	First-level Hospital	
Hysterectomy for uterine rupture or intractable postpartum hemorrhage	First-level Hospital	
In settings where sickle cell disease is a public health concern, universal newborn screening followed by standard prophylaxis against bacterial infections and malaria	First-level Hospital	Cost-effectiveness depends mostly on incidence (prevalence of sickle cell disease genetic traits), very cost-effective in high-incidence settings

In settings where specific single-gene disorders are a public health concern (e.g., thalassemias), retrospective identification of carriers plus prospective (premarital) screening and counseling to reduce rates of conception	First-level Hospital	Value for money depends on population acceptance of changes in mating practices based on screening results
Induction of labor post-term	First-level Hospital	No primary economic data; included in RMNCH investment case packages and generally regarded as having high value for money
Initial assessment, and prescription, and provision of individualized interventions for musculoskeletal, cardiopulmonary, neurological, speech and communication, and cognitive deficits, including training in preparation for discharge	First-level Hospital	There were no economic data identified regarding rehabilitation care in low- and middle-income countries; assessments of value-for-money are derived from literature in high-income countries
Insertion and removal of long-lasting contraceptives	First-level Hospital	Cost-effectiveness is generally not a relevant measure of value for money for family planning services
Irrigation and debridement of open fractures	First-level Hospital	
Jaundice management with phototherapy	First-level Hospital	No primary economic data; generally regarded as having good value for money
Management of acute coronary syndromes with aspirin, unfractionated heparin, and generic thrombolytics (when indicated)	First-level Hospital	
Management of acute critical limb ischemia with unfractionated heparin and revascularization where available, with amputation as a last resort	First-level Hospital	
Management of acute exacerbations of asthma and COPD using systemic steroids, inhaled beta-agonists, and, if indicated, oral antibiotics and oxygen therapy	First-level Hospital	Unclear whether economic data cited in the Annex are applicable to this intervention
Management of bowel obstruction	First-level Hospital	
Management of labor and delivery in high risk women, including operative delivery (CEMNOC)	First-level Hospital	
Management of maternal sepsis, including early detection at health centers	First-level Hospital	
Management of newborn complications, neonatal meningitis, and other very serious infections requiring continuous supportive care (IV fluids, oxygen, etc.)	First-level Hospital	No primary economic data; included in RMNCH investment case packages and generally regarded as having high value for money
Management of osteomyelitis, including surgical debridement for refractory cases	First-level Hospital	
Management of septic arthritis	First-level	

	Hospital	
Management of severe acute malnutrition associated with serious infection	First-level Hospital	
Management of severe malaria, including early detection and provision of rectal artesunate in community settings followed by parenteral artesunate and full course of ACT	First-level Hospital	No primary data; judged likely to be very cost-effective in these settings
Maternal corticosteroids for women with preterm labor	First-level Hospital	Probably more cost-effective than literature implies
Medical management of acute heart failure	First-level Hospital	
Mobilization activities following acute injury or illness	First-level Hospital	There were no economic data identified regarding rehabilitation care in low- and middle-income countries; assessments of value-for-money are derived from literature in high-income countries
Placement of external fixator and use of traction for fractures	First-level Hospital	
Prevention and relief of refractory suffering and of acute pain related to surgery, serious injury, or other serious, complex or life-limiting health problems	First-level Hospital	Cost-effectiveness is not a relevant measure of value for money for palliative care/pain control
Refer cases of treatment failure for drug susceptibility testing; enrol those with MDR-TB for treatment per WHO guidelines (either short or long regimen)	First-level Hospital	
Relief of urinary obstruction by catheterization or suprapubic cystostomy	First-level Hospital	
Removal of gallbladder including emergency surgery	First-level Hospital	This intervention requires a qualified general surgeon and is by definition not included in the DCP3 HPP, which is designed around the human resource constraints of low-income countries. Some low-resource countries and regions have high burdens of biliary diseases and may wish to make this service available through publicly-financed UHC to high-risk groups (who are more likely to benefit), or to all individuals using cost-sharing or cost-recovery mechanisms
Repair of perforations (e.g., perforated peptic ulcer, typhoid ileal perforation)	First-level Hospital	
Resuscitation with advanced life support measures, including surgical airway	First-level Hospital	Cost-effectiveness may not be a valid criterion (difficult to measure)
Surgery for ectopic pregnancy	First-level Hospital	
Surgery for filarial hydrocele	First-level	

	Hospital	
Surgical termination of pregnancy by manual vacuum aspiration and dilation and curettage	First-level Hospital	Cost-effectiveness is generally not a relevant measure of value for money for family planning services
Trauma laparotomy	First-level Hospital	
Trauma-related amputations	First-level Hospital	
Tubal ligation	First-level Hospital	Cost-effectiveness is generally not a relevant measure of value for money for family planning services
Tube thoracostomy	First-level Hospital	No primary economic data; judged likely to be cost-effective when delivered as part of a first-level hospital surgical package
Universal newborn screening for congenital endocrine or metabolic disorders (e.g., congenital hypothyroidism, phenylketonuria) that have high incidence rates and for which long-term treatment is feasible in limited resource settings	First-level Hospital	Probably not as cost-effective as literature suggests; cost-effectiveness greatly depends on incidence of particular disorder and whether a newborn screening program is already in place
Vasectomy	First-level Hospital	Cost-effectiveness is generally not a relevant measure of value for money for family planning services
Cataract extraction and insertion of intraocular lens	Referral and Specialty Hospital	
Elective surgical repair of common orthopedic injuries (for example, meniscal and ligamentous tears) in individuals with severe functional limitation	Referral and Specialty Hospital	Pilot studies in literature suggest specialized orthopedic surgical platform could have good value for money
Full supportive care for preterm newborns	Referral and Specialty Hospital	Cost-effectiveness estimates assume that advanced/tertiary services are available locally
Insertion of shunt for hydrocephalus	Referral and Specialty Hospital	
Management of acute ventilatory failure due to acute exacerbations of asthma and COPD; in COPD use of bilevel positive airway pressure preferred	Referral and Specialty Hospital	
Management of refractory febrile illness including etiologic diagnosis at reference microbiological laboratory	Referral and Specialty Hospital	No primary economic data are available in low- and middle-income countries; however, these are potentially curable conditions that use inexpensive drugs and syndrome-based guidelines; hence they are likely to provide good value for money
Referral-level hospital pathology services	Referral and	Cost-effectiveness is often not relevant for pathology services in general

	Specialty Hospital	since these underpin the delivery of other (cost-effective) interventions
Repair of anorectal malformations and Hirschsprung's Disease	Referral and Specialty Hospital	
Repair of cleft lip and cleft palate	Referral and Specialty Hospital	
Repair of club foot	Referral and Specialty Hospital	Ranges across countries (see Grimes BMJ Global Health 2016)
Repair of obstetric fistula	Referral and Specialty Hospital	No primary economic data; probably cost-effective in high-volume centers
Retinopathy screening via telemedicine, followed by treatment using laser photocoagulation	Referral and Specialty Hospital	
Specialized TB services, including management of MDR- and XDR-TB treatment failure and surgery for TB	Referral and Specialty Hospital	
Specialty pathology services	Referral and Specialty Hospital	Cost-effectiveness is often not relevant for pathology services in general since these underpin the delivery of other (cost-effective) interventions
Surgery for trachomatous trichiasis	Referral and Specialty Hospital	
Treatment of early stage breast cancer with appropriate multimodal approaches (including generic chemotherapy), with curative intent, for cases that are detected by clinical examination at health centers and first-level hospitals	Referral and Specialty Hospital	
Treatment of early stage colorectal cancer with appropriate multimodal approaches (including generic chemotherapy), with curative intent, for cases that are detected by clinical examination at health centers and first-level hospitals	Referral and Specialty Hospital	
Treatment of early-stage childhood cancers (such as Burkitt and Hodgkin lymphoma, acute lymphoblastic leukemia, retinoblastoma, and Wilms tumor) with curative intent in pediatric cancer units or hospitals	Referral and Specialty Hospital	

Urgent, definitive surgical management of orthopedic injuries
(for example, by open reduction and internal fixation)

Referral and
Specialty
Hospital

Pilot studies in literature suggest specialized orthopedic surgical platform
could have good value for money

Use of percutaneous coronary intervention for acute myocardial
infarction where resources permit

Referral and
Specialty
Hospital

Probably less cost-effective than literature suggests in settings where
facilities do not yet exist