Fever evaluation, comprehensive

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Description of condition and intervention

Fever evaluation is an important component of routine health care. Presenting with fever is a common symptom reported by individuals for seeking health care. Causative agents for fever could range from infections caused by like bacterial, viral, protozoal, fungal organisms or non-infectious causes. Two guidelines by World Health Organization on Integrated Management of Adolescent and Adult Illness (IMAI) guidelines for health workers at first level facilities (health centers and first-level) (WHO 2009), and also at district hospitals (WHO 2011) provide guidance to health professionals about management of febrile illnesses including fever, especially in resource-limited settings.

In this evidence brief, we present the effects and costs of the following intervention being analysed in FairChoices:DCP Analytical tool:

Pneumonia (severe), IV antibiotics

Diarrhea (severe), oral rehydration therapy (ORT), IV fluids if needed, antibiotics for dysentery and zinc

*Malaria treatment with ACT preceded by RDT if feasible**

International guidelines

Organization	Indications/recommendations	Applicability in LIC & Lower MIC settings
WHO 2009	Integrated Management of Adolescent and Adult Illness (IMAI). Guidelines for first-level facility health workers at health centre and district outpatient clinic	
WHO 2011	IMAI district clinician manual: hospital care adolescents and adults: guidelines for the management of illnesses with limited-resources	

Intervention attributes

Type of interventions

Table 1: Type of interventions & delivery platform

Intervention	Type	Delivery platform
Pneumonia (severe), IV antibiotics	Curative	First-level hospital
Diarrhea (severe), ORT, IV fluids if needed, antibiotics for dysentery and zinc	Curative	First-level hospital
Malaria treatment with ACT preceded by RDT if feasible*	Curative	First-level hospital

Equity

In addition to considerations like cost-effectiveness and health systems factors, dimensions of equity can be relevant for priority setting. The opportunity for a long and healthy life varies according to the severity of a health condition that individuals might have, so there are inequities in individuals' opportunities for long and healthy lives based on the health conditions they face. Metrics used to estimate the severity of illness at an individual level can be used to help prioritize those with less opportunity for lifetime health. FairChoices: DCP Analytics Tool uses Health adjusted age of death (HAAD), which is a metric that estimates the number of years lived from birth to death, discounting years lived with disability. A high HAAD

thus represents a disease less severe in terms of lifetime health loss, while a low HAAD represents a disease that is severe on average, causing early death or a long period of severe disability. It is also possible to estimate the distribution of HAAD across individuals with a health condition. FairChoices shows for each intervention an average HAAD value of the conditions that are affected by respective interventions that have health effects. Additionally, a plot shows HAAD values for around 290 conditions (Johansson KA et al 2020).

Time dependence

High level of urgency. Treatment outcomes may be affected by some days of delay.

Population in need of interventions

Table 2: Population in need of interventions

Intervention	**Treated population**		**Affected population**		**Disease state addressed**
	Treated age	Treated fraction	Affected age	Affected fraction	
Pneumonia (severe), IV antibiotics	5 to 99 years both genders; incidence based	0.2*	5 to 99	0.2*	For effects: Lower respiratory infections
Diarrhea (severe), ORT, IV fluids if needed, antibiotics for dysentery and zinc	5 to 99 years both genders; incidence based	0.2*	5 to 99	0.2*	For effects: Diarrheal diseases
Malaria treatment with ACT preceded by RDT if feasible*	**The effects and costs of this intervention are considered in the malaria cluster.				

* Assumed based on expert opinion

Intervention effect and safety

Table 3: Effect and safety of interventions for fever evaluation

Effect of intervention		Certainty of evidence
Mortality (due to condition) Pneumonia, oral antibiotics (Efficacy for IV antibiotics (vs no care) assumed same as amoxicillin efficacy for pneumonia case management in children)	0.7 relative risk reduction) (Johansson KA et al 2020 & Theodoratou E et al 2010)	See appendix
Diarrhea, oral rehydration therapy (ORT), IV fluids (efficacy assumed here is same for diarrhea management with ORT)	0.93 (Pecenka CJ et al 2015 & Munos, Walker, Black 2010)	

Model assumptions

Table 2: Summary of model parameters and values used in FairChoices – DCP Analytical Tool

Category	**Model parameter**	**Notes**
Interventions	Pneumonia (severe), IVantibiotics Diarrhea, ORT, IV fluids if needed, antibiotics for dysentery and zinc	
Cost calculation		
Treated population	See Table 2	Global Burden of disease study 2019

Gender		
Age		
Treated fraction		
Effect calculation		
Affected Population	See Table 2	
Affected gender		
Affected fraction age		
Affected fraction		
Comparison	placebo or other care	
Mortality Reduction (RRR) Pneumonia (severe)	0.7	
Diarrhea (severe), ORT, IV fluids	0.93	

Intervention Cost

The cost for fever evaluation (adolescents/adults) and comprehensive management, clinically unstable according to the WHO IMAI guidelines, with the referral of unstable individuals, was calculated using the cost of managing complicated cases of typhoid fever, Dengue, and influenza-associated hospitalizations as a proxy with the total cost based on the sum of management of each condition, i.e., 75.21 USD (India.2004) (Sur D et al 2009), 197.04 USD (India,2012) (Shepard DS et al 2014) and 50.88 USD (Bangadesh,2010) (Bhuiyan MU et al 2014) consecutively. Each cost is divided by three to get the average cost for managing an unstable case of fever.

References

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Appendix

Literature Review for effectiveness & safety

This literature search is an example of Level 1 review where intervention inputs taken from DCP3 or generated in an ad hoc manner (e.g., quick google search found one study of cervical cancer screening cost-effectiveness that was used to create an effectiveness parameter for that intervention).

Level of evidence of efficacy studies:

1. low (expert opinions, case series, reports, low-quality case control studies)
2. moderate (high quality case control studies, low quality cohort studies)
3. high (high quality cohort studies, individual RCTs)
4. very high (multiple RCTs, meta-analysis, systematic review, clinical practice guidelines).