

Annex 14C. Studies Reporting the Cost-Effectiveness of Diagnostics and Treatments for Nonmalarial Fevers

Supplemental material for: Crump, J.A., P.N. Newton, S.J. Baird, and Y. Lubell. 2017. "Febrile Illness in Adolescents and Adults." In *Disease Control Priorities* (third edition). Volume 6, *Major Infectious Diseases*. Edited by K.K. Holmes, S. Bertozzi, B.R. Bloom, and P. Jha. Washington, DC: World Bank.

Suputtamongkol and others (2010) estimated the cost-effectiveness of three leptospirosis tests and of empirical treatment with doxycycline as compared to a baseline of no treatment. The evidence suggested that given the relatively poor test sensitivities and the low cost of doxycycline, empirical treatment of patients suspected with leptospirosis was the optimal strategy. The authors note however that this conclusion could have been different if the evaluation had accounted for the longer-term costs associated with antimicrobial resistance.

González-Canudas and others (2011) evaluated the cost-effectiveness of influenza POCTs for the detection of influenza A H1N1 in Mexico City. Despite relatively high pre-test probabilities of disease in patients with influenza-like symptoms and high sensitivity of clinical judgment, the study concluded that the few additional cases detected with the use of the rapid test and the reduction in unnecessary antivirals would lead to cost-savings for the health system and be cost-beneficial when accounting for productivity losses.

Robays and others (2008) find that switching from melarsoprol to the more costly and more effective eflornithil for the treatment of human African trypanosomiasis was a cost-effective strategy. Similarly Olliaro and others (2009) and Meheus and others (2010) evaluated the cost-effectiveness of combination treatments over mono-therapy for leishmaniasis in India, concluding that these could be cost-effective and mitigate the probability of emerging antimicrobial resistance. All these analyses however assumed that patients had already been correctly diagnosed with hemagglutination test and leishmaniasis, despite the challenges to do so in routine care, where these treatments are poorly targeted in the absence of appropriate diagnostic tests.

Buchanan and others (2010) modeled the costs and benefits of a yet undeveloped pre-referral rectal antimicrobial suppositories for severe febrile illness, both alone and in combination with an antimalarial suppository. Their model predicts enormous potential gains if such a formulation was developed and scaled up in areas where access to health facilities is limited. They estimate the cost per DALY averted for the combined antibacterial and antimalarial suppository at \$8 and \$70 in sub-Saharan Africa and Asia, respectively. These estimates were most sensitive to the assumptions regarding access to healthcare before and after receiving the suppository.

References

- Buchanan, J., B. Mihaylova, A. Gray and N. White. 2010. "Cost-effectiveness of pre-referral antimalarial, antibacterial, and combined rectal formulations for severe febrile illness." *PLoS One*. 5: e14446.
- González-Canudas, J., J. M. Iglesias-Chiesa, Y. Romero-Antonio, C. Chávez-Cortes, J. G. Gay-Molina and R. Rivas-Ruiz. 2011/ "Cost-effectiveness in the detection of influenza H1N1: clinical data versus rapid tests." *Revista Panamericana de Salud Publica*. 29: 1-8.
- Meheus, F., M. Balasegaram, P. Olliaro, S. Sundar, S. Rijal, and others. 2010. "Cost effectiveness analysis of combination therapies for visceral leishmaniasis in the Indian subcontinent." *PLoS Neglected Tropical Diseases*. 4: e818.
- Olliaro, P., S. Darley, R. Laxminarayan and S. Sundar. 2009. "Cost-effectiveness projections of single and combination therapies for visceral leishmaniasis in Bihar, India." *Tropical Medicine and International Health*. 14: 918-925.
- Robays, J., M. E. Raguenaud, T. Josenando and M. Boelaert. 2008. "Eflornithine is a cost effective alternative to melarsoprol for the treatment of second-stage human West African trypanosomiasis in Caxito, Angola." *Tropical Medicine and International Health*. 13: 265-271.
- Suputtamongkol, Y., W. Pongtavornpinyo, Y. Lubell, C. Suttinont, S. Hoontrakul, K. Phimda, K. Losuwanaluk, D. Suwancharoen, S. Silpasakorn, W. Chierakul and N. Day (2010). "Strategies for diagnosis and treatment of suspected leptospirosis: a cost benefit analysis." *PLoS Neglected Tropical Diseases*. 4: e610.