Cost-effectiveness of HCV Treatment among HIV-positive Individuals in Myanmar

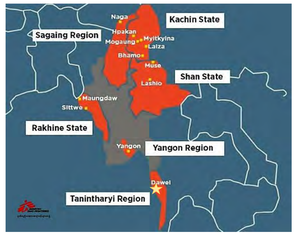
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Introduction

- Over half of those co-infected with hepatitis C virus (HCV) and HIV live in low- and middle-income countries (LMICs)
- New HCV direct-acting antiviral therapies (DAAs) cure >90%, however cost-effectiveness of DAAs among HIV/HCV coinfected individuals in low-income settings is unclear
- In Myanmar, ~220,000 people are living with HIV, ~5.3% are HCV co-infected
- In 2016, Médecins sans Frontières (MSF) began HCV DAA treatment in an HIV cohort in Dawei, Myanmar



AIMS

- **To evaluate the cost of treatment delivery and cost-effectiveness of the MSF-Myanmar HCV treatment program among HIV/HCV coinfected patients in Dawei, Myanmar**
- **To evaluate the cost-effectiveness of proposed simplified HCV treatment protocol**

Methods

Setting and model of care

- Data collected from a prospective cohort study evaluating HCV DAA treatment in a HIV clinic in Dawei, Myanmar
- Included HCV chronically infected (RNA+) patients initiated on interferon-free DAAs, sofosbuvir (SOF)+ daclatasvir (DAC)/ (SOF+DAC+ribavirin (RBV) from Nov 2016-Oct 2017

Costing methods

- Patient-level micro-costing using an ingredients approach from a program provider's perspective
- Obtained costs from financial records and prices from receipts and price lists from Jan-Dec 2017. Personnel time and effort determined through interviews and staff diaries
- Patient-level resource use (Visit number/type, exams, labs, treatment, outcomes) extracted from electronic patient database
- Local and country HCV coordination costs included

Cost Effectiveness Evaluation Methods

- **Model:** Constructed closed cohort Markov HCV disease progression model among HIV-infected individuals, including chronic HCV infection (METAVIR stage F0, F1, F2, F3), compensated cirrhosis (CC), decompensated cirrhosis (DC), and hepatocellular carcinoma (HCC), stratified by treatment history and outcome. Disease state transitions reflected accelerated liver disease progression and excess mortality from DC due to HCV/HIV coinfection
- **Comparator:** HCV DAA treatment for HIV/HCV infected individuals compared to no HCV treatment
- **Outcomes and horizon:** Costs (in 2017 USD$) and health disutilities (in disability-adjusted life years, DALYs) attached to each disease stage and intervention, discounted 3%/year, lifetime time horizon
- **Costs:** DAA treatment costs from this study. HCV disease stage costs obtained from a similar income setting (Cambodia), adjusted by GDP ratio
- **Utilities:** Health disutilities obtained from 2013 Global Burden of Disease Study for HIV and HCV disease stage. Coinfection disutility calculated by [1-((1-HIV disability weight)*(1-HCV disability weight))]
- **Methods:** Probabilistically sampled parameters from uncertainty distributions, generating 1,000 parameter sets. Calculated mean incremental cost-effectiveness ratio (ICER, mean incremental costs/mean incremental DALYs averted)
- Also evaluated simplified treatment protocol, consisting of task-shifting from doctors to nurses, fewer clinical/lab evaluations
- Based on WHO recommendations, evaluated as *highly cost-effective* under willingness-to-pay threshold of one-times the per capita GDP in Myanmar ($1299 in 2017) and *cost-effective* under 3-times per capita GDP ($3897)

Results

- From November 2016 to October 2017, 122 patients were treated: 66 stage F0-F3, 56 CC/DC, 96% (n=117) achieved SVR
- Under the current treatment protocol, DAA treatment cost was $1226 (95%CI 855-1512) for fibrosis stages F0-F3, and $1967 (95%CI 1286-2287) for CC/DC (**Figure 1**). Roughly half (52%) of costs were due to drug costs.

Figure 1. Distribution of patient-level costs for HCV DAA treatment among HIV-infected individuals in Dawei, Myanmar by HCV disease stage (in 2017 USD)

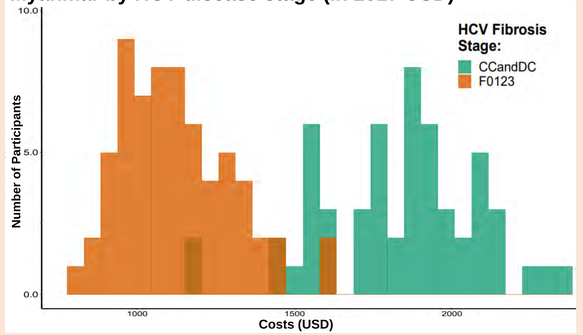


Table 1. Incremental cost-effectiveness of current HCV treatment delivery among HIV-infected individuals in Myanmar

	Cost (USD) per capita		DALY per capita		ICER
	Total mean (95%CI)	Incremental mean (95%CI)	Total mean (95%CI)	Incremental mean (95%CI)	$/DALY averted
No treatment	501.28 (337.04, 668.34)	-	24.21 (23.87, 24.60)	-	-
Current model of care	2038.57 (1770.00, 2331.18)	1537.29 (1432.96, 1662.84)	23.02 (22.85, 23.27)	-1.19 (-1.02, -1.33)	**1289.31**

- Compared to no treatment, HCV treatment among HIV-infected individuals resulted an ICER of $1289/DALY averted (**Table 1**)
- A simplified treatment protocol could result in an ICER of $456/DALY averted compared to no treatment

Conclusions

- HCV treatment of HIV-infected individuals in Myanmar is *highly* cost effective
- HCV treatment among HIV-infected individuals has the potential of being even more cost-effective utilizing a simplified treatment protocol fewer overall evaluations and task-shifting to nursing staff from doctors as long as this does not result in poorer treatment outcomes
- While this study evaluated an MSF HCV treatment program, these results can be informative to the Ministry of Health in Myanmar and other similar LMIC settings