

Benefits of hepatitis B treatment in Australia: health and economic impacts of nucleos(t)ide analogues (NUCs)

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Background: NUC therapy in the form of tenofovir disoproxil fumarate (TDF) and entecavir (ETV) stand as first-line treatments for hepatitis B in Australia. While impact of NUCs on reducing incidence of cirrhosis and liver cancer is well characterized through longitudinal studies, health and economic benefits within an Australian chronic hepatitis B (CHB) cohort are yet to be quantified.

Methods: Total mortality, survival time, and lifetime costs of CHB in Australia were compared for a natural history and a NUC treatment cohort using a Markov model. Rates of disease progression and treatment effectiveness were drawn from the literature and were reflective of individuals with treatment eligible CHB. Key costs of disease were considered disease management, hospitalization, liver transplants, and treatment; each estimated using an ingredients-based approach. Analysis took the health-providers perspective and used 2023 \$AU discounted at 5% per annum. Monte Carlo sampling was used to quantify uncertainty (95% Credible Interval of 1000 model simulations).

Results: Without treatment, there were 443 (95%CrI: 182, 795) CHB-related deaths per 1000 people with treatment-eligible CHB, with average lifetime costs of \$23,500 (95%CrI: 12,500, 67,900) per person. On NUCs, CHB-related deaths were reduced to 174 (95%CrI: 64, 245) with average lifetime costs of \$32,800 (95%CrI: 21,100, 54,100) per person. Survival benefits from treatment were estimated at 5.8 (95%CrI: 1.2, 16.9) years, at an incremental cost of \$1585 (95%CrI: -2702, 19551) per year of life gained. When total costs were adjusted for survival benefits, NUC therapy added a cost of \$131 (95%CrI: -2091, 748) per person per year. Of this, \$318 was incurred for treatment, but \$188 averted in disease management and treatment costs.

Conclusion: NUC therapy produces significant survival benefits among people living with CHB in Australia. The economic benefit is more complex; however, NUC treatment represents high value against national willingness-to-pay thresholds.

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