The Impact of Expanding Antiviral Treatment Criteria at a Population Level in the Republic of Korea: A modeling analysis

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BACKGROUND

HBV is a major disease burden in the Republic of Korea. Current antiviral treatment for hepatitis B Virus (HBV) decreases disease progression, however, it does not eradicate the virus and is only offered to a subset of chronically infected individuals.

OBJECTIVE

This study examined the impact of expanding treatment criteria on the future disease burden of HBV in Korea at the population level through modeling.

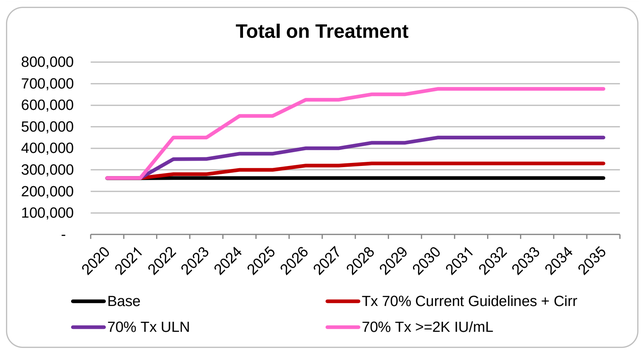
METHODS

The PRoGReSs Model, a dynamic country-level transmission and disease burden model, was calibrated to Korean data and estimated the HBV disease progression and mortality (Table 1). The inputs and outputs of the model were discussed with the authors over the course of two meetings. Three scenarios were developed and compared to the Base case which maintained the current eligibility requirements and treatment levels (Figure 1). An economic analysis was also conducted.

Table 1. Korean Model Inputs

Korean Model Parameters	Value
Total HBsAg+ Population (2016) [1]	1,478,500
Total Diagnosed (2020)	1,125,400
Newly Diagnosed	19,600
On Treatment (2019)	262,000

Figure 1. Annually Treated by Scenario



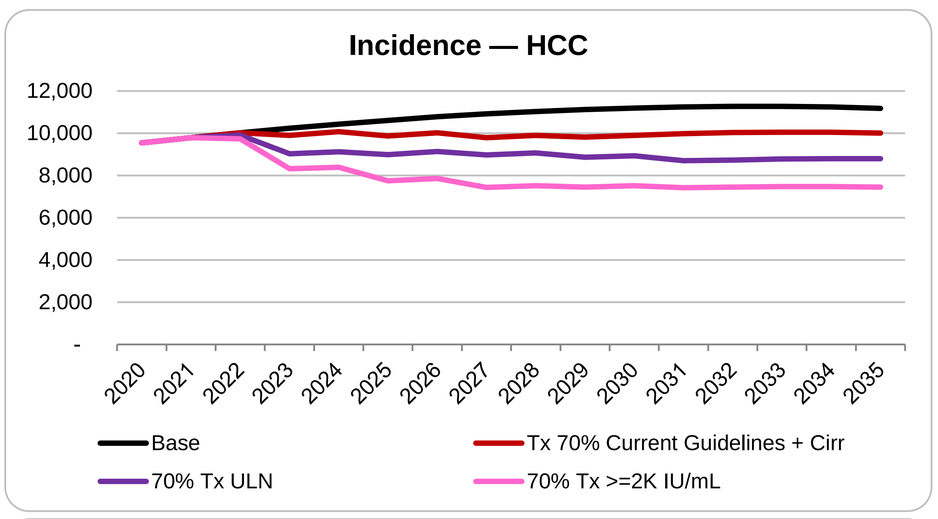
RESULTS

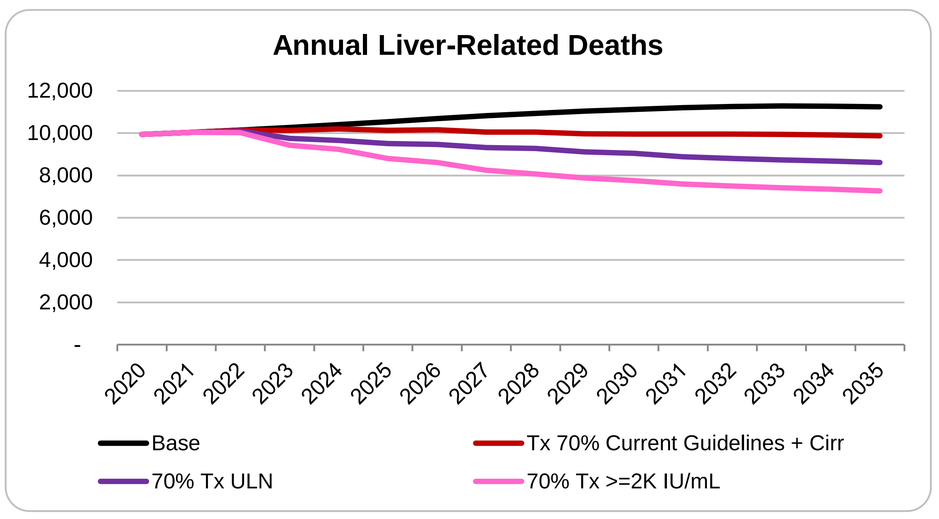
Scenarios

- The Base Case assumed that the current treatment and diagnosis levels would be maintained through 2035
- Tx 70% Current Guidelines + Cirrhosis treats 70% of those that would eligible if the current guidelines were altered to include every individual with cirrhosis
- 70% Tx ULN treats 70% of those that would be eligible if the ALT restriction was dropped to the ULN (>30)
- 70% Tx ≥2,000 IU/mL examines the impact of removing HBeAg status and ALT restrictions were and treating 70% of those with a viral load ≥2,000 IU/mL

The disease burden by scenario was estimated through 2035 with all scenarios reducing the burden when compared to base (Figure 2). Increasing treatment slightly while including all cirrhotic patients would save an estimated 11,800 live through 2035, while loosing restrictions to only ≥2,000 IU/mL would save an estimate 37,000 lives (Table 2).The current Health Insurance Review and Assessment Service (HIRA) threshold as well as GNI per capita were considered in the economic analysis. All scenarios were found to be highly cost-effective through 2035 (Figure 3).

Figure 2. HBV Disease Burden by Scenario 2020-2035





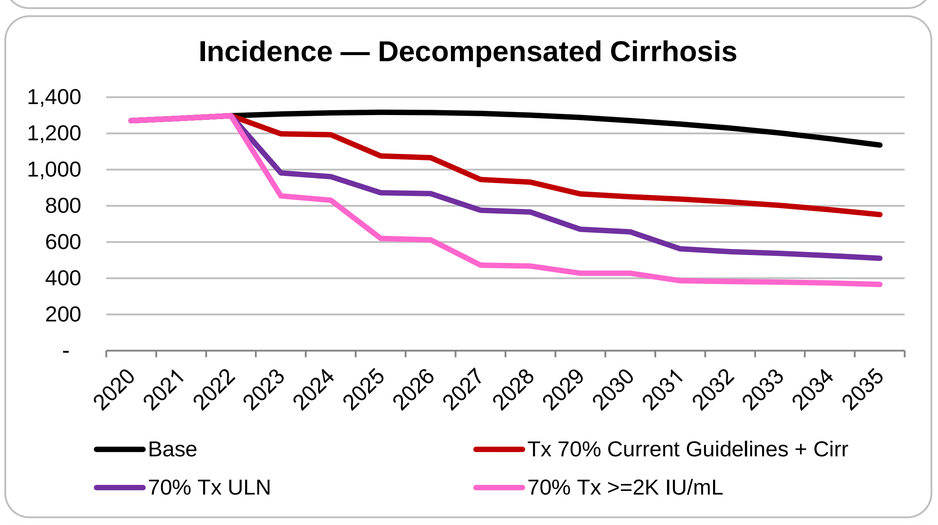
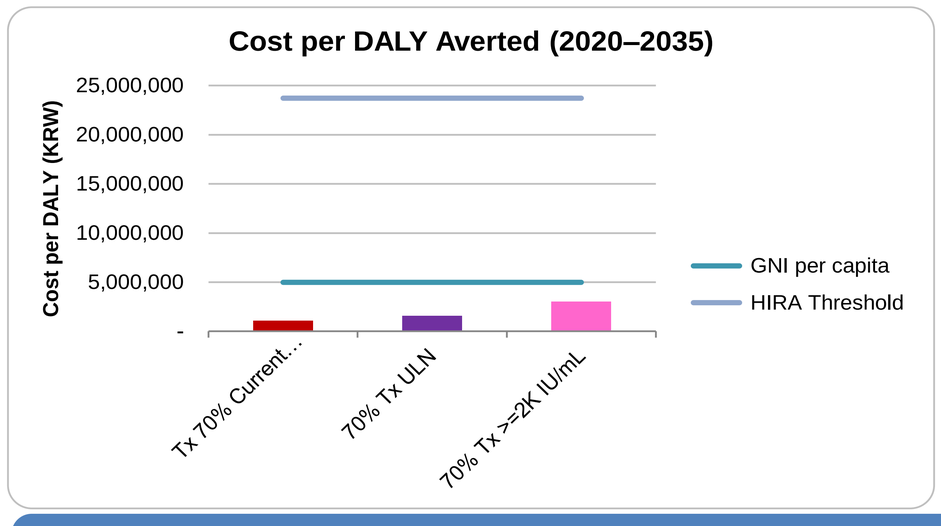


Table 2. Disease Burden Outputs by Scenario 2020-2035

Scenario	Cases of Decomp Cirrhosis Averted	Cases of HCC Averted	Deaths Averted
Tx 70% Current Guidelines + Cir	4,300	13,000	11,800
70% Tx ULN	7,200	26,700	23,000
70% Tx ≥2,000 IU/mL	9,800	43,300	37,000

Figure 3. ICER by Scenario 2020-2035



CONCLUSIONS

Expanding treatment criteria in Korea would result in almost 12,000 lives saved, but by fundamentally shifting the guidelines this number could be doubled or tripled. As many of these individuals are of working-age the incremental cost effectiveness ratio (ICER) for all scenarios were found to be highly cost-effective, well below the current HIRA threshold as well as the GNI per capita.

REFERENCES

1. Yim SY, Kim JH. The epidemiology of hepatitis B virus infection in Korea. Korean J Intern Med 2019; 34(5):945-53

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