PRELIMINARY ASSESSMENT OF THE COST OF TREATMENT FOR CHRONIC HEPATITIS C VIRUS (HCV) INFECTIONS WITH SOFOSBUVIR AND FIRST-GENERATION ANTIVIRALS ACROSS EIGHT COUNTRIES

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OBJECTIVES
With nearly 170 million individuals, or 2-3% of the world’s population, infected by various strains of the Hepatitis C virus (HCV), according to the World Health Organisation, treatment for the predominantly chronic and initially asymptomatic disease is crucial to avoiding advanced liver disease, including liver transplant, and possibly death. HCV infections are predominantly undiagnosed and undertreated, with approximately 75% of cases undiagnosed in the United States, according to the Centers for Disease Control and Prevention (CDC), and less than 20% of HCV patients receiving treatment in Europe, according to Health Consumer Powerhouse. The new wave of HCV drugs reaching the market in 2014 offers higher cure rates and shorter treatment times, however, the new antivirals have been met with concerns regarding the costs associated with their use by payors and the World Health Organisation (WHO). We have set out to examine the individual treatment costs of sofosbuvir compared to first-generation antivirals in eight countries.

METHODS
We examined the ex-manufacturer price of Sovaldi (sofosbuvir; Gilead Sciences) and first-generation antivirals Incivek/Incivo (telaprevir; Vertex/J&J) and Victrelis (boceprevir; Merck & Co) in Norway, Denmark, Germany, Luxembourg, Portugal, Slovenia, Turkey, and the United States. Treatment costs were calculated using standard of care protocols for treatment of HCV genotype 1, including individual daily dosage strength and length of recommended treatment for each antiviral. Treatment breakdowns were as follows:

- For sofosbuvir treatment, costs were calculated assuming a daily use for a 400mg strength tablet over a period of 12 weeks
- Telaprevir treatment was calculated as six 375mg tablets daily over a period of 12 weeks
- Boceprevir treatment entailed the administration of 1200mg strength capsules daily for a period of 24 weeks

Interferon and ribavirin costs, any potential discounts or rebates negotiated with payors, and potential follow-up courses of therapy for sofosbuvir were excluded from the study. Prices were extracted from the IHS Life Sciences international pricing database POLI. All foreign currency was converted to USD using the Exchange Rate Converter for comparison.

RESULTS
Data highlighted in Table 1 show that costs of treatment with sofosbuvir varied significantly across the eight countries examined. It does not come as a surprise that the highest cost was observed in the United States, where a 12-week course of treatment is around USD52,051 with sofosbuvir. Conversely, Norway accounts for the lowest USD84,000. The second-highest treatment cost was calculated for Portugal, where it experienced a 16% drop, and the United States, were the price rose nearly 52%.

The costs of treatment with sofosbuvir were still notably higher than the costs of treatment with telaprevir and boceprevir when factoring in the first-generation antivirals’ price at launch instead of 2014. On average, sofosbuvir treatment would be 85% more costly than telaprevir and 190% more costly than treatment with boceprevir.

CONCLUSIONS
Our preliminary assessment has highlighted the variable treatment costs of HCV antivirals across countries. The discrepancies across the eight countries considered reflect considerable differences in pricing and reimbursement policies that characterise highly regulated markets compared to free-pricing markets where price regulation plays little or no role. The individual treatment costs of next-generation therapies is demonstrably higher than older therapies; however, treatments such as sofosbuvir are thought to offer some savings on the overall cost to cure HCV compared to older regimens. Separate research is required to look at the broader treatment costs.

Based on the evidence emerging from the data, treatment costs with next-generation therapies will likely significantly increase expenditure on HCV therapeutics over the next few years. Nevertheless, sofosbuvir has demonstrated cure rates of over 90% in genotype 1 HCV patients with a favourable safety profile, so over the long term, new-generation treatments may potentially help reduce costs associated with re-treatment, medical visits, and advanced liver disease, partially offsetting the immediate-term increase in expenditure that will be incurred by global healthcare systems.