

Brief Report

Can hepatitis C virus be eliminated by 2030? Saudi Arabia as an example

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The World Health Organization (WHO) has announced its aim to eliminate hepatitis C virus (HCV) worldwide by 2030 (90% reduction of new HCV cases and 65% reduction in mortality).¹ Many countries in the world are underway to achieve this ambitious plan but Saudi Arabia has not yet started according to the recent WHO report. In this brief report, we will explore how this aim can be achieved and examine the epidemiology, health and economic impact and challenges of HCV elimination in Saudi Arabia.

Hepatitis C virus epidemiology and disease burden in Saudi Arabia. Hepatitis C virus is the leading cause of liver cirrhosis, hepatocellular carcinoma as well as the need for liver transplantation in Saudi Arabia and worldwide. There is currently no vaccine for HCV and unlikely to become available soon. Hepatitis C virus is largely asymptomatic until it reaches advanced stages. Hepatitis C virus-related decompensated cirrhosis, hepatocellular carcinoma, and liver transplant rates are likely to triple and the total number of HCV cases will remain the same by 2030 if HCV treatment continues at the current rate of 2.5% annually of all infected cases in Saudi Arabia.²

In 2016, estimates reveal that anti-HCV antibody prevalence in Saudi Arabia among Saudi nationals is about 0.7%, and approximately 70% of these individuals have active infection. An estimated 0.5% of Saudis or roughly 100,000 individuals are actively infected with HCV, of whom about 20,000 (20%) have been previously diagnosed and about 50% of those diagnosed have been treated. Furthermore, 50% of treated HCV patients have been cured using standard therapy with Peg interferon and ribavirin, and an additional 5000 have been treated with new direct-acting antiviral (DAA) therapy in the past 3 years with >90% cure rates.

It is estimated that 70,000 to 80,000 Saudi individuals with active HCV remain undiagnosed. This means that a total of 80,000 individuals (70,000 undiagnosed +

10,000 untreated or unresponsive to standard therapy) will need to be treated urgently in Saudi Arabia until 2030, approximately 8000 individuals with active HCV will require treatment annually. The HCV disease burden is almost exclusively (99%) among Saudis as all expatriates living in Saudi Arabia are tested for HCV before being granted a visa and employment. In addition, 81% of HCV-infected individuals are men and women above the age 40 years.³

The mode of transmission of HCV in Saudi Arabia is unknown but most likely to be through nosocomial infection, unlike the West where 60% of HCV transmission is via intravenous drug use (IVDA). This mode of transmission is almost non-existent in Saudi Arabia because IVDA is extremely rare in clinical practice; this helps to make elimination possible. Elimination of HCV should be based on case finding via mandatory target screening, linkage to care, and aggressive treatment with DAA agents in conjunction with a strategy to prevent new infections.

Currently, approximately 2500 (2.5%) HCV-infected individuals are treated with DAAs annually in Saudi Arabia. In addition, based on analyses conducted by Polaris Observatory, Center for Disease Analysis (CDA) in Denver, USA, in collaboration with a Saudi expert panel, and according to a CDA modeling system based on the natural history of HCV, it is estimated that at least 250-360 Saudi individuals would die annually due to HCV if we delay elimination by one year (Figure 1).² This elimination strategy would not only save Saudi lives but would result in numerous benefits by reduction of the number of individuals with HCV-related cirrhosis, liver cancer, and the need for liver transplantation, in addition to huge financial savings and successful elimination of HCV disease by 2030.

Hepatitis C virus economic and health impact. Hepatitis C virus-related health costs in Saudi Arabia until 2030 are estimated to be 18 billion Saudi Riyals (SR) (CDA special communication), namely, 1.5 billion SR/year. This figure includes direct and indirect health costs for treating early HCV cases, cirrhosis related to HCV and its complications, hepatocellular carcinoma, and HCV-related liver transplantations, hospitalizations and productive work days lost (CDA). While mandatory target HCV screening, subsequent linkage to HCV care and aggressive DAA treatment are essential for elimination and will likely cost less than 30% of the direct HCV health costs; even at moderately high current treatment cost which is likely to become lower as new cheaper generic medicines become more widely available; with estimated cumulative

Disclosure. Authors have no conflict of interest, and the work was not supported or funded by any drug company.

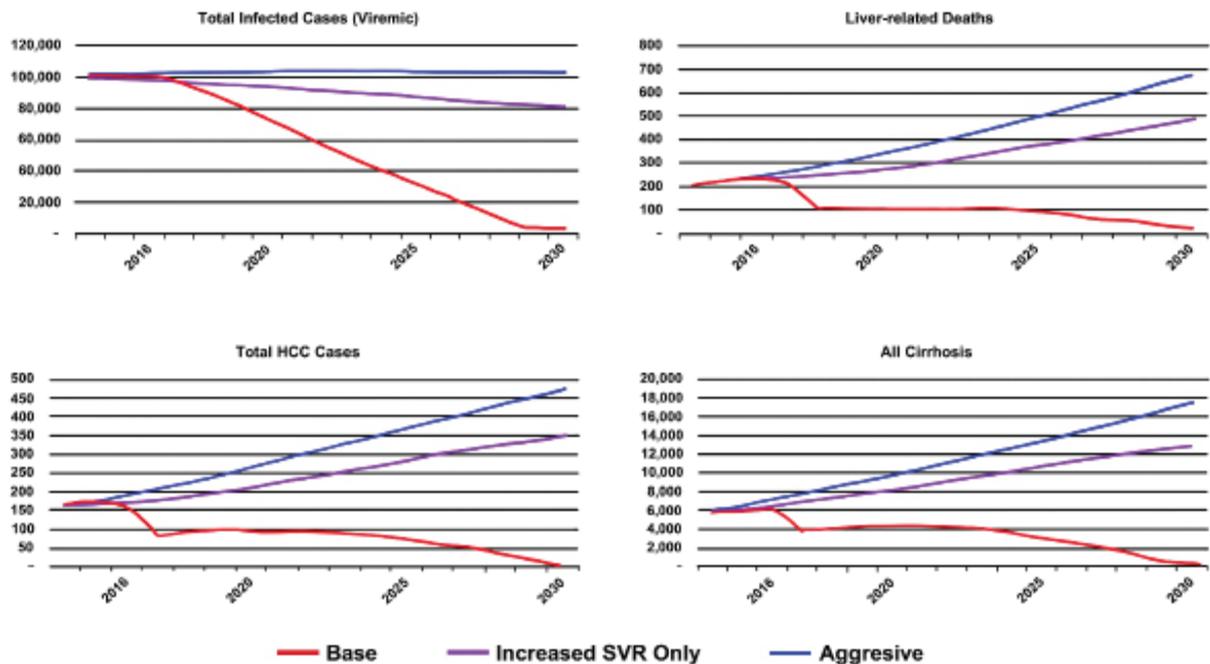


Figure 1 - Changes of HCV morbidity and mortality from 2016 to 2030. SVR - sustained virological response. HCC - hepatocellular carcinoma. Copyright permission from The Saudi Gastroenterology Association. Aljumah AA, Abaalkhail F, Al-Ashgar H, Assiri A, Babatin M, Al Faleh F, et al. Saudi J Gastroenterol 2016; 22: 269-281.

financial saving of at least 10 billion SR until 2030 (CDA). Elimination of HCV disease by 2030 would result in approximately 90% reduction in HCV new cases, avoiding at least about 3000 deaths, 260 fewer cases of hepatocellular carcinoma, 7800 fewer cases of HCV-associated cirrhosis, and 440 fewer cases of decompensated cirrhosis until 2030 (conservative estimates based on CDA).

Benefits of HCV elimination in Saudi Arabia beyond 2030: 1) Meeting the WHO year 2030 elimination plan with regards to HCV and the 2030 Saudi vision plan. 2) Avoidance of approximately 3000 HCV related deaths among Saudi individuals between 2018 and 2030. 3) Huge financial short- and long-term savings for all health care institutions. 4) Improved linkage to care for all diagnosed HCV cases. 5) Almost complete elimination of HCV-related cirrhosis. 6) Almost complete elimination of HCV-related hospitalization. 7) Almost complete elimination of HCV-related decompensated cirrhosis. 8) Significant reduction in new cases of HCV-related hepatocellular carcinoma. 9) Almost complete elimination of the need for HCV-related liver transplantation. 10) Minimizing HCV-related extra hepatic manifestations of the disease. 11) Improvement in the general well-being

of Saudi society. 12) Almost complete elimination of HCV pool and minimization of new HCV infections and transmission. 13) Provision of robust data about community-based HCV disease epidemiology and its impact. 14) Excellent opportunity for HCV research studies that can establish Saudi Arabia as a global leader in the elimination of HCV. 15) Reduced productivity loss and hospitalizations for advanced HCV patients. 16) Development of a central database for Saudi HCV positive patients. 17) Improvement of HCV public awareness program in Saudi Arabia.

Challenges of HCV elimination. A major challenge to the elimination plan is diagnosing new cases as most known cases have been treated and cured, in many countries they are 'running out' of new HCV patients to treat according to the world hepatitis alliance (WHA).⁵ Saudi Arabia has 80% of HCV burden not yet diagnosed and nowadays, there are few new patients being referred for therapy hence, there is a need for a screening program to detect new previously undiagnosed cases. Currently premarital screening for HCV is mandatory for all Saudis and the prevalence of anti-HCV antibodies in this group after testing >2,000,000 individuals was found to be 0.33%, namely, 1 in 300 individuals tested (special communication with

the Ministry of Health) was HCV antibody positive. This group comprises mainly of young individuals with a lower HCV prevalence than in the general population who are likely to receive DAA therapy if found to be truly positive with active HCV that is positive HCV-RNA. Therefore, targeting above 40 years of age through mandatory target screening will likely identify most of the undiagnosed HCV cases in Saudi Arabia. This age group (40-75 years) comprises about 25% of all Saudi nationals, meaning that mandatory screening of about 5,000,000 Saudi individuals is needed to identify them; this is more cost-effective than screening the whole population.

An additional 15% or more of HCV cases are likely to be diagnosed through the existing mandatory premarital screening program and special population screening such as dialysis patients, blood bank screening of donors, hospital-based patients and other high-risk groups (namely, blood transfusion patients before 1992, hemophilia patients, and those with a history of intravenous drug abuse, prisoners, and so forth), hence, identifying at least 95% of all HCV cases in Saudi Arabia.

Other challenges toward WHO elimination plan in addition to reinforcing infection control and preventive measures in general include political will, sustainable funding, improve access to cheap generic DAA, raising awareness, eliminating stigma, establishing better therapeutic options for children and pregnant women, improve point-of-care generally but particularly for IVDA patients, expanding the pool of those who treat HCV including family medicine physicians, treating all HCV-RNA positive cases discovered from pre-marital screening program through effective referral and recall system, and development of effective HCV vaccines in the future and many others.⁵

Efficacy of DAA HCV therapy. All oral DAA agents for HCV provide cure rates of about 95% in patients treated for 8-12 weeks, with negligible adverse events.⁴ The availability of these highly effective therapies for HCV has made elimination of this disease possible and achievable. These DAAs can be made available by several pharmaceutical companies through “Saudi special access treatment programs” at variable cost. In addition, some are already available in generic forms with equivalent potency, efficacy, and adverse effect profiles as brand medications as shown previously by Freeman et al.⁵ Thus, a large number of patients can be treated at a small fraction of the current high treatment cost (generic medications cost less than 5-10% of

the current brand medication price). Newer DAA medications on multiple clinical trials have reported higher cure rate (up to 100%) and are pan-genotypic (cure all HCV genotypes) with little or no resistance even in treatment-experienced patients and their cost is coming down quickly in view of the competitions from generic medications. Currently, 82 countries have viral hepatitis plans, only 9 countries are on-track to reach their 2030 elimination goal for HCV as per Polaris Observatory report.⁶

Early HCV diagnosis, treatment and cure will prevent disease progression for those infected and result in reduction of the HCV pool, complications and transmission to others.

In conclusion, HCV in Saudi Arabia is the leading cause of cirrhosis, decompensated cirrhosis hepatocellular carcinoma and the need for liver transplantation. This disease can be eliminated by 2030 or before through target screening of individuals 40-75 years of age in both genders, linkage to care, aggressive DAA therapy of about 8000 individuals annually and reinforcing preventive strategy.

This elimination plan will result in at least 3000 Saudi lives being saved, savings of about 10 billion SR, and numerous other benefits and advantages. In view of the availability of new highly effective DAA therapies, this HCV elimination plan can be achieved only by a strong political will to fulfill WHO aim and perfectly fits the year 2030 Saudi vision plan. This HCV elimination plan provides an opportunity to screen for several other important medical conditions, such as hepatitis B virus, diabetes mellitus, hypertension, obesity, dyslipidemia, and others in this vulnerable age group (40-75 years) and develop important early preventive national health strategies to combat these highly prevalent ‘silent killer’ diseases. A similar elimination strategy can be adopted and applied in any country worldwide taking into consideration country-specific variables that may influence the different aspects of the elimination strategy.

The Saudi government, Ministry of Health, and all various health sectors should consider focusing on elimination of common, important, and costly prevalent diseases that directly lead to the loss of many Saudi lives and has considerable impact on society’s wellbeing such as HCV and other diseases with similar significant health and economic impact. This is analogous to the situation with the smallpox virus (100% elimination) and polio virus (99.9% elimination) as a result of vaccination.

In brief, WHO HCV ambitious elimination plan by 2030 as described above for Saudi Arabia is a win-win situation for the patient, family, society, all health sectors, and Saudi government and hope to see it professionally executed soon.

Acknowledgment. We would to thank eScianta (Editing, Research and Analytics) for English Editing Company (www.escienta.com)

Received 12th March 2018. Accepted 13th July 2018.

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