



Rwanda launches a 5-year national hepatitis C elimination plan: A landmark in sub-Saharan Africa

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Ambitious global targets have been set for the elimination of hepatitis C virus (HCV), including diagnosis of 90% of individuals with chronic HCV infection and treatment of 80% of confirmed cases of HCV by 2030.¹ However, in sub-Saharan Africa (SSA) – home to 15% (11 million people infected with HCV) of the global HCV burden – only 5.7% and 2.2% of those living with HCV have been diagnosed and those with confirmed HCV infection treated, respectively.^{2,3} Many countries in other global regions, such as the Americas, Europe and Australia, have now incorporated HCV elimination targets into their national strategic plans, and several, including Australia, Egypt, Georgia, Iceland and the Netherlands, are on track to achieve these targets by 2030.^{4–6} Substantial focus has been placed on micro-elimination of HCV in key populations, such as people who inject drugs and prisoners, as a constructive first step towards broader elimination in their general populations.⁷

In low-middle income countries, several programmes have developed national strategies or plans for viral hepatitis control, but many do not specifically target elimination, and most lack high-level endorsement or successful steps towards implementation.⁸ Nevertheless, several programmes have stood out. Georgia established a well-organized and well-resourced national HCV elimination plan with the support of strong international collaborators, whilst Egypt and Mongolia – low-middle income countries with high HCV prevalence – have well-established national HCV elimination programmes backed by high-level commitments from their respective governments.^{9–11} Both India and Pakistan have recently made commitments to scale up access to free diagnosis, treatment, and care of HCV using direct-acting antivirals (DAAs) under new national hepatitis strategic frameworks, leveraging the declining prices of generically-produced DAAs and strong regional and state level approaches.^{12,13}

In SSA and in low-income countries more generally, competing needs including unfinished agendas around major vertical conditions from the Millennium Development Goals have led to limited prioritization, attention and resources for HCV. These

countries face ongoing challenges in strengthening preventive and primary health care systems for maternal and child health, developing laboratory capacity, and improving the weak registration and procurement systems for essential drugs.¹⁴ On average, low-income countries spend approximately \$37 per capita on health care per annum, with less than 20% of that amount being financed through government resources.¹⁵ Recent analyses have suggested that to implement an essential package of health services to achieve goals of Universal Health Coverage (UHC), governments should spend \$86 USD per capita or more.^{16,17} This gap in current spending highlights the current challenge low-income countries face in financing interventions for conditions such as HCV, even if proven to be cost-effective or cost-saving in several settings.

In Rwanda, the current HCV seroprevalence is 4–5%, with higher prevalence in HIV-infected individuals (4.7%), prisoners (6.5%), and adults over 55 years of age (16.5%).^{18–20} Systematic HCV screening for donated blood was initiated in 1999, and training and implementation of safe injection practices among health-care workers was conducted in conjunction with HIV control programmes.²¹ A national hepatitis control unit was established in 2011, and in 2013, the first guidelines for viral hepatitis were developed and disseminated. At that time, individual testing for HCV was available through ELISA-based antibody testing at only 1 referral site and confirmatory nucleic acid testing (NAT) at 2 sites in the country. Treatment for HCV remained limited to 4 referral hospitals using interferon-based therapies and as of mid-2015, only 253 patients were documented to have received interferon-based HCV treatment in the country.²²

Building off its highly decentralized and robust HIV programming, Rwanda has now developed HCV diagnostic capacities by using existing HIV testing platforms and laboratory transport systems. Currently, all hospitals in country use WHO prequalified rapid diagnostic tests for anti-HCV antibody detection and ELISA tests are available at 13 sites. HCV NAT is performed at 9 sites, including the National Reference Laboratory, 2 referral hospitals and 6 provincial hospitals. Since 2017, through HCV testing at these health facilities and annual screening campaigns, an estimated 700,000 individuals have been tested.

In 2015, several DAA regimens were introduced in the national guidelines, including sofosbuvir/ribavirin, sofosbuvir/ledipasvir and sofosbuvir/daclatasvir. Currently, DAAs are pro-

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cured through the government's central procurement agency from originator companies with the current cost of a 12-week regimen of sofosbuvir/ledipasvir being \$780 USD.²³ However, through ongoing WHO pre-qualification of generic medications and volume-based price negotiations, the price of DAAs in Rwanda is expected to decrease substantially. As of May 2018, a total of 110 prescribing physicians from district hospitals have been trained in HCV management, including initiation of therapy with DAAs for HCV treatment. Several public and private insurances currently cover civil servant, military and other private formal sector employees for HCV diagnostic and treatment services. As a result of these efforts, treatment with DAAs has now reached over 10,000 patients in Rwanda. A study conducted on HCV DAA-based treatment outcome in the national programme has shown a 12-week sustained virologic response (SVR) rate of 91.5%.²⁴ In a recent clinical trial using sofosbuvir/ledipasvir at a referral centre in Kigali, there was an overall 12-week SVR rate of 87%, though this was significantly lower in patients with genotype 4r.²⁵ A revision of the national guidelines is currently underway, including additional pangenotypic regimens for both treatment-naïve and treatment-experienced individuals.

On 11th December 2018, Rwanda took a bold step towards achieving the global hepatitis elimination targets with the launch of a 5-year HCV elimination plan with high-level governmental endorsement – the first of its kind in the SSA region (Fig. 1). The aim of the national HCV elimination plan is to achieve 90% treatment coverage for all estimated infections, exceeding the 90%–80% diagnosis and treatment targets for HCV elimination (Box 1). In addition, it is projected that this ambitious goal will be achieved by 2024, well in advance of the global 2030 timeline (Box 1). The plan projects to screen over 4 million individuals and treat approximately 112,000 adults. The initial estimate of the total budget required for this HCV elimination effort is \$113 million USD over 5 years; however, this estimate will soon be revised to incorporate new prices for diagnostic commodities and medications currently under negotiation, which is expected to substantially reduce the initial budget estimate. The budget for HCV elimination includes procurement of testing commodities and medications, expansion of the health workforce (general practitioners,

- Expected number of individuals screened: 4,064,919
- Expected number of individuals for confirmatory testing: 232,069
- Expected number of individuals treated: 112,000
- Expected number of individuals achieving SVR12: 110,880 (cumulative)
- Estimated number of new infections averted: 10,638
- Estimated number of premature deaths averted: 35,000
- Total estimated cost of elimination plan: \$113 million USD

Box 1. Key highlights of the Rwanda hepatitis C elimination plan: 2019–2024. SVR12, sustained virologic response at 12 weeks.

nurses, laboratory technicians), training of key health personnel, development of guidelines and monitoring tools, mentorship and supervision activities, and community awareness campaigns. Price reductions of DAAs are expected to result in a substantially lower overall budget estimate. In comparison, the annual national budget for HIV-related activities is \$187 million.²⁶ This plan, if fulfilled, is projected to avert 10,638 new infections and over 35,000 premature deaths, resulting in dramatic human and economic returns on this potential investment.

Overall, the Rwanda HCV Elimination Plan provides a roadmap for Rwanda's HCV programmatic activities and serves as a commitment from the highest levels of government to achieve these ambitious goals. This commitment is rooted in an equity-based approach to treating all who are suffering from this high-morbidity, yet highly curable, infectious disease. This plan will require careful planning and execution, a high level of efficiency generation through integration with existing healthcare infrastructure and platforms, and most importantly, generation and mobilization of significant financial resources, both internal and external. However, Rwanda has delivered on such commitments in the past, achieving and exceeding global targets in the face of other crucial health system challenges. With the launch of its HCV Elimination Plan, Rwanda aims to lead the charge against a crucial public health emergency in SSA and provide a much-needed model for an effective HCV control programme in the region.

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Authors' contributions

Grace Umutesi, MPH: This author contributed to manuscript development and had final decision on submission for publication. Fabienne Shumbusho, MD: This author contributed to manuscript development and review. Fredrick Kateera, MD, PhD: This author contributed to manuscript development and review. Janvier Serumondo, MD MPH, MSc: This author contributed to manuscript review. Jules Kabahizi, MD: This author contributed to manuscript review. Emmanuel Musabeyezu, MD: This author contributed to manuscript review. Alida Ngwije: This author contributed to manuscript review. Neil Gupta, MD, MPH: This author contributed to manuscript development and review. Sabin Nsanzimana, MD, PhD: This author contributed to manuscript development and review.



Fig. 1. Rwanda launches a 5-year HCV elimination plan. Pictured from left to right: Frederick Kateera, Partners In Health/ Inshuti Mu Buzima (PIH/IMB); Joel Mubiligi, PIH/ IMB; Sabin Nsanzimana, Rwanda Biomedical Center (RBC), Rwanda Ministry of Health (MOH); Olufunmilayo Lesi, World Health Organization; Jeanine Condo, RBC, MOH; Ira Magaziner, Clinton Health Access Initiative (CHAI). (Photo credit: Asher Habinshuti).

Supplementary data

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