The Graduate Institute of International and Development Studies

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Applied Research Project

Best Practices in Hepatitis Elimination

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Abstract

This paper aims to facilitate the decision-making process and funds allocation strategy of The Hepatitis Fund by identifying and providing a comprehensive overview of factors that contribute to the catalytic success of hepatitis elimination programmes. Given the current geopolitical context – characterised by reduced aid predictability – implementing cost-effective elimination programmes with long-term impacts beyond the completion cycle of projects is more critical than ever. Drawing on concrete examples from programmes carried out in Egypt, Rwanda, Vietnam, and Pakistan, this paper provides 22 recommendations for designing and selecting hepatitis elimination programmes, based on an in-depth desk review of existing literature combined with interviews with viral hepatitis experts. The results emphasise the importance of political commitment, stakeholder inclusion, context-specific programme adaptations, integration into existing health care services, decentralisation efforts, addressing stigma and reduction of accessibility barriers.

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1. Introduction

Viral hepatitis, the deadliest infectious disease, faces a large funding gap despite the availability of effective treatments and vaccines. The long asymptomatic cycle of a hepatitis infection has historically meant that viral hepatitis elimination has been low on the political agenda and underfunded compared to other infection diseases. This has resulted in the limited implementation of elimination programmes – only $500 million out of $8 billion funding per year needed to eliminate viral hepatitis is available.

As the only grant-making platform dedicated solely to the mission of ending viral hepatitis, The Hepatitis Fund aims to assess, select, and fund high-impact projects with the power to create long-term change. This research project was consequently initiated with the aim of facilitating their decision-making process and improving their funds allocation strategy. Based on a review of academic literature and qualitative interviews with viral hepatitis elimination experts from Egypt, Rwanda, Vietnam and Pakistan, this study identifies common factors that contributed to the success of these initiatives in low- and middle-income countries. The retrieved data was used to extract policy recommendations aimed at synthesising learnings, covering areas such as external conditions, government involvement, management of health care, screening and treatment, accessibility, social awareness and applicability.

The first section presents the main objectives and guiding research question, the chosen methodology, as well as the scope and limitations of the research, followed by a section defining and presenting the key concepts. Then, the study dives into a detailed desk review of WHO reports, The Hepatitis Fund publications, and a selection of peer-reviewed articles related to hepatitis elimination. Next, the findings from interviews with hepatitis elimination experts are presented and analysed. The findings are followed by an outline of 22 recommendations for designing and funding cost-effective hepatitis elimination programmes. Lastly, the final chapter presents a hepatitis elimination model, a visual illustration based on the findings and recommendation of this paper.

2. Research Question and Objectives

In partnership with The Hepatitis Fund, this study aims to attain the following key objectives:

- Identify catalytic initiatives that have a positive impact on public health by addressing the burden of viral hepatitis in low- and middle-income countries;
- Analyse factors that made these initiatives effective;
- In the form of a policy-brief, propose recommendations and lessons learned on effective initiatives that will bring us closer to the goal of eliminating viral hepatitis worldwide.

These three objectives fall under the following research question: *What are the most effective public health strategies to catalyse viral hepatitis elimination in low- and middle-income countries?"* In the following section, the methodology employed to tackle the research question is presented.

3. Methodology

To effectively answer the research question, this study draws on a qualitative approach, including a desk review of existing literature as well as the analysis of interviews conducted with key experts in the field of hepatitis elimination.

Desk Review

The desk review aims to provide an in-depth understanding of the current state of research on hepatitis and its successful elimination strategies, drawing on publications by The Hepatitis Fund, WHO reports, as well as a selection of peer-reviewed academic papers. The chapter is divided into three phases to draw a comprehensive picture of the elimination cycle: (1) Prevention and Awareness, (2) Screening and Testing and (3) Treatment and Cure. In line with The Hepatitis Fund's regional focus and the geographical distribution of hepatitis B and C as major health concern, the focus of the literature review is limited to low- and middle-income countries in Africa and Asia. Additionally, countries which have previously shown commitment to the cause of viral hepatitis elimination are prioritised.

Data Collection

This study's primary data was collected through semi-structured interviews with viral hepatitis experts. Based on their previous collaboration with the Hepatitis Fund and their proven success in elimination programmes, four focus countries were selected: Egypt, Rwanda, Vietnam, and Pakistan.

Five interviewees act as key informants for these focus countries: one high-level representative from the Egyptian Ministry of Health, a senior representative from CHAI, active in Rwanda, a programme director from PATH, active in Vietnam, a research and outreach fellow from HEAT and a project lead from MSF, both active in Pakistan. Two interviewees were chosen from within The Hepatitis Fund team to shed light onto the current grant-allocation strategy of the organisation and its priorities. Finally, one respondent from the WHO, an expert and viral hepatitis team lead, offered an institutional perspective on the question, amounting to a total of eight interviews. To best analyse this raw data all the interviews were transcribed.

Analysis and Policy Recommendations

Twenty-two codes were extracted from the raw data using the analysis software ATLAS.ti and NVivo. This coding process was done manually; each transcription being subjected to two separate readings to ensure homogeneity of the analysis across the data and to reduce biases between researchers. The codes were then grouped into seven categories by identifying recurring themes and similarities in successful hepatitis elimination initiatives and strategies. These categories then guided the analysis section of this paper.

Limitations

Due to the scope of this study, only four focus countries could be considered. To achieve more conclusive results, a wider range of contexts should be studied. While the focus countries reflect learnings from different regions and offer valuable insights, they do not reflect all socio-cultural contexts. The context-specific nature of the selected focus countries may, nevertheless, limit the generalisability of findings to other geopolitical or health care settings.

Conducting more interviews with key partners from different sectors would allow for a fuller analysis. Because the focus lay on successful initiatives, it was not possible to identify common characteristics of unsuccessful initiatives. However, doing so could lead to a more comprehensive approach to addressing hepatitis elimination programmes.

The findings of the desk review, rely on published and accessible documentation, which may not capture unpublished data or recent shifts in national programmes. Additionally, given the dynamic nature of the geopolitical landscape, the relevance and applicability of the findings may fluctuate over time, especially in relation to global funding trends. Despite these limitations, the research provides a solid foundation for a systematic approach to hepatitis elimination that can be built upon in the future.

4. Key Terms and Definitions

This section defines the key terms used throughout the paper and provides a framework for the study.

Public Health Approach

Firstly, a *public health approach* is defined by the WHO Viral Hepatitis report as seeking to "ensure the widest possible access to high-quality services at the population level, based on simplified and standardised approaches and to strike a balance between implementing the best-proven standard of care and what is feasible on a large scale in resource-limited settings" (2024a, p. 2). While high-income countries with a lower prevalence of infection and more resources may be able to afford a more individualised approach to care, an overarching public health approach is strongly recommended by the WHO report for the elimination of viral hepatitis in low- and middle- income countries, which are the focus of this paper.

Catalytic Change

Lee and Waddock (2021) argue that when addressing highly complex goals transformation catalysts (TC) have the potential to advance their achievement by "facilitating transformational changes at the systems level" (p. 1). *Catalytic change* is crucial to grant-giving platforms like The Hepatitis Fund as they seek to finance programmes with the potential to create positive change not only within the scope of a project, but well-beyond its completion.

Elimination

In the context of fighting viral hepatitis as a global health threat, *elimination* is defined as "driving new infections and deaths down to half a million for both hepatitis B and hepatitis C, as well as reducing HBsAg in children under 5 years to below 0.1%" (The Lancet, 2022, p. 1). These targets, announced by the WHO in May 2022, are currently not on track: The Lancet predicts an average of 1.42 million new hepatitis C infections per year up to 2030, the year by which the WHO hopes to achieve global elimination.

Programme Effectiveness

Finally, the *effectiveness of programmes* discussed in this paper is not only measured by the immediate output of a programme, but more importantly by the long-term impact it has on the target community and the flexibility with which it can be adapted in the future, even in the face of unforeseen circumstances (Eval Community, n.d.).

5. Findings: Desk Review

This chapter highlights the key findings of an extensive desk review of existing guidelines and literature concerning hepatitis elimination. The subchapters “Prevention and Awareness”, “Screening and Testing” and “Treatment and Cure” act as a guide through the most important aspects of hepatitis elimination while highlighting the nuances of hepatitis B and C.

5.1 Prevention and Awareness

5.1.1 Hepatitis B

The younger a person is at the time of a viral hepatitis infection, the more likely it is to progress from acute to chronic, causing long-term health problems. Hepatitis B is transmitted through infected blood or bodily fluids that come into contact with mucosal membranes or nonintact skin (Pattyn et al., 2021). While vertical transmission can occur throughout the entire pregnancy - and presents the most common path of HBV-transmission - it is during the perinatal period that the chances of the neonatal exposure to cervical secretions or the mixing of maternal and fetal blood is highest. This explains the high rate of chronic infections (around 40 – 50% in endemic areas) in neonates born to mothers with high levels of HBV viremia (Liu et al., 2021; Veronese et al., 2021). While there are several prevention mechanisms that have the potential to reduce new hepatitis B infections, the main barrier is administration of prophylaxis and vaccines for newborns. Particularly in rural areas, a large proportion of births take place outside of health facilities without trained medical professionals, making it difficult to provide HBsAg-positive mothers and their babies with the care needed to prevent transmission (Pattyn et al., 2021).

There are three main strategies that exist that can prevent vertical transmission of hepatitis B (Veronese et al., 2021).

a) Active immunoprophylaxis through hepatitis B vaccines

b) Passive immunoprophylaxis through hepatitis B immune globulin (HBIG)

c) Antiviral treatment (e.g. with tenofovir disoproxil)

To reduce the likelihood of a transmission from an HBsAg-positive mother to her child, a combined approach of all three strategies would be most effective. However, logistical and financial barriers make such a scenario unrealistic. The administration of the hepatitis B vaccine, which has been commercially available since 1982, is considered the most effective solution as it is easy and inexpensive to administer and provides (active) long-term antiviral immunity against HBV infection (Pattyn et al., 2021). The first dose must be administered 24 hours after birth, otherwise the risk of vertical transmission increases significantly. In addition, two more doses of the vaccine must be injected within six to twelve months to complete the immunisation process. If the HBV status of the mother is known and positive, the administration of HBIG (Hepatitis B Immune Globulin) has also proven to be effective in preventing vertical transmission. However, as HBIG presents a passive immunisation strategy, it is only effective in preventing immediate infections. To ensure future HBV immunity, HBIG must be administered in combination with the hepatitis B vaccine. Another option of transmission prevention is the use of an antiviral treatment, which should ideally begin in the last trimester of pregnancy (week 28 – 32) (Veronese et al.,

2021). Tenofovir disoproxil fumarate (TDF) has proven to be a particularly effective antiviral due to its resilience and safety of its administration and has been subject to frequent testing (Liu et al., 2021).

Given the barriers to financing, distribution and administration of these prevention mechanisms, especially in rural areas of low- and middle-income countries with limited access to health care facilities, active immunisation of neonates i.e. administering vaccines, has shown to be the most effective (Pattyn et al., 2021). However, the uneven (geographical) coverage of these vaccines is a major concern that needs to be further investigated.

The first country to have implemented a universal hepatitis B vaccination programme, which proved highly effective in reducing the HBsAg and HBV prevalence, was Taiwan in 1984 (Chien et al., 2006). Starting with the administration of the birth dose to newborns of HBsAg-positive mothers, the strategy gradually expanded its target population to achieve national coverage. Thanks to a combined administration of the vaccine and HBIG (to babies of HBsAg-positive mothers), just ten years after starting the programme, the HBsAg prevalence in Taiwan had been reduced from 9.8% to 1.3%.

However, globally only 46% of neonates receive the birth dose vaccine and only 87% of these complete the entire immunisation course, despite the WHO recommendation that countries include it in their national immunisation strategy (Liu et al., 2021; Pattyn et al., 2021; WHO, 2024b).

Two approaches emerge in this context. On the one hand integrating viral hepatitis into existing maternal health and childhood vaccination programmes (WHO, 2023). On the other hand, improving the vaccine delivery process could help reduce this problem. Controlled temperature chains (CTCs) would allow for the vaccine to be transported for a limited time at temperatures above the usual recommendation of 2 – 8°C, which is possible due to the heat-resistance of the vaccine (Pattyn et al., 2021). However, a viral monitor for each dose would be required to determine whether the vaccine is safe and effective at the point of administration – an adjustment that few pharmaceutical companies have been willing to make.

5.1.2 Hepatitis C

Unlike hepatitis B, the hepatitis C virus has different genotypes and corresponding subtypes, making the development of a single vaccine incredibly difficult (Lanini et al. 2016). As a result, prevention strategies for hepatitis C do not include national immunisation programmes but instead focus on blood and injection safety. The connection between blood safety and viral infections has been understood and studied since the 1960s (Thijssen et al., 2018). Knowledge of horizontal transmission has led to increased research and the introduction of prevention policies by setting safety standards for blood donor selection, screening techniques, and injection behaviour (Lanini et al., 2016).

The four main prevention mechanisms for hepatitis C transmission are as follows:

a) Injection behaviour among practitioners and (rural) populations

b) Reuse prevention devices (RUP)

c) Blood screening

d) Harm reduction services

Access to information about blood-borne pathogens and their transmission through invasive procedures (injections, surgeries and haemodialysis) is often limited, especially in rural areas. In regions like South Asia, populations even show a clear preference for injectables over oral medication due to beliefs that they cure diseases more quickly and effectively (Janjua et al., 2016). This preference coupled with high levels of (un)qualified private practitioners administering vaccines due to economic incentives, has led to higher levels of injectable administration than necessary. Additionally, financial constraints mean that glass and plastic needles, as well as syringes, are reused instead of being replaced after each use.

Replacing existing medical devices with reuse prevention injection devices (RUPs) could therefore massively reduce the number of reused devices in circulation. For this to happen, however, it must be made affordable and accessible – a goal that can be facilitated through collaborations between pharmaceutical companies and (local) governments (Janjua et al., 2016).

Blood transfusions without prior screening for (viral) diseases are also a common mode of hepatitis C transmission, which can be controlled through mass screening campaigns and mandatory pre-donation blood screenings. Finally, the introduction of harm reduction services for high-risk populations (especially PWID – people who inject drugs) leads to massive reductions of infections globally. Such services include needle exchange programmes, which involves the provision of sterile equipment and appropriate disposal facilities, adequate access to health care services, and opioid substitutions therapy, which replaces the administration of drugs by injectables with prescribed oral medication aimed at reducing withdrawal symptoms (Lanini et al., 2016; Kaberg & Weiland, 2019). To achieve these goals, health care facilities must be affordable and easily accessible, even in remote, rural areas. Such decentralised and patient-centred care also contributes to long-term retention of patients and thus gradually impacts macro-elimination efforts of hepatitis C (Kaberg & Weiland, 2019; Lanini et al., 2016; Taha et al., 2023).

5.2 Screening and Testing

Lack of awareness about a viral hepatitis infection presents a major hurdle in its elimination (Easterbrook et al., 2016). Only 15% of those chronically infected with HCV and around a quarter of those infected with HBV were reported to be aware of their diagnosis, figures that are certainly lower in low-income settings. As a result, treatment is often only administered in the advanced stages of the disease.

Tailoring a national strategy to the elimination of hepatitis therefore requires careful consideration of several key factors (WHO, 2024b; WHO, 2016). First, it is essential to design strategies based on data. While most countries have information about high-risk populations, it is crucial to leverage this data to guide national campaigns and strengthen it through prevalence surveys. Second, actively engaging affected communities is vital for understanding the local context. Third, selecting a strategic mix of testing approaches tailored to the national and epidemiological context, while utilising the existing healthcare network and infrastructure, enhances effectiveness. Additionally, any programme should consider potential stigmatisation of

people living with hepatitis and effectively address this issue. Finally, the programme must be designed cost-effectively, considering the availability of financial and human resources.

The WHO provides guidelines for screening in low- and middle-income countries, distinguishing between high- and low-prevalence countries based on whether the infection rate exceeds 2-5%. The WHO recommends testing the whole population in case of high prevalence, while focusing on high-risk populations where prevalence is low (WHO, 2016). Supporting this suggestion, a study investigated the yield of testing, which is the number of positive test results per total number of tests (Lim, Trickey, et al., 2019). It concluded that in both, high- and low-prevalence settings, focus testing should be the first step to an effective testing-strategy. In high-prevalence settings, however, testing should be expanded to the general population.

Based on the analysis of different hepatitis B and hepatitis C programs globally, high-risk populations are similar for both variants (WHO, 2016; WHO, 2024b). At risk groups include pregnant women, people who use drugs, sex workers, men who have sex with men, health care workers, people living with HIV, transgender people, blood donors, people in prisons or other closed settings and households. Hepatitis B specific target groups are pregnant women and their children, while HIV-infected people are at high risk of coinfection with hepatitis C. Furthermore, within certain birth cohorts, migrant groups and indigenous groups an HCV infection might be very common, due to exposure to specific unsafe health practices. In any case, the screening of all blood donors is essential to reduce the risk of transmission, and the effectiveness of a testing programme is assessed through its ability to link positive patients to the appropriate care.

Identifying high-risk groups is crucial but addressing further barriers in low- and middle-income countries is key to effective hepatitis testing. According to Ishizaki (2017) common barriers to accelerate testing programs are sixfold. One challenge is limited community awareness and education about viral hepatitis. Second, countries lack national guidance or policies to coordinate the implementation. Third, countries often lack funding for testing services. Fourth, untrained health care workers prevent quality assurance of testing. Fifth, poor infrastructure results in poor quality test results. And lastly, many states lack available and affordable HBV and especially HCV treatment.

Learnings can be drawn from different country specific experiences. Literature on Egypt, Thailand and Rwanda inform good practices related to national screening strategies. According to Hassanin (2021), Egypt faced a severe HCV epidemic in 2008, with 15% of its 100 million inhabitants presenting HCV antibodies, indicating exposure to hepatitis C. Among people aged 15–59, 10% suffered from a chronic infection (Hassanin et al., 2021). The epidemic dates back to mass treatment campaigns for a parasitic disease between the 1950s and 1980s, during which inadequately sterilized reusable needles led to the extensive spread of HCV. In 2014, Egypt launched a national program, evolving into a comprehensive elimination strategy by 2018.

Egypt's strategy is characterised by strongly organised and decentralised testing facilities, simplifying access to all citizens. With increased funding in 2018, 5 '820 testing sites were made available including 1' 079 mobile units, which all provided linkage to treatment (Hassanin et al., 2021). A mass media campaign supported the efforts to raise awareness (The World Bank, 2017). As part of the decentralisation strategy, the authorities focused on testing in the Upper Nile region, which is more difficult to reach (Hassanin et at., 2021). Community health workers travelled between villages to conduct the screenings and managed to test more than one million

people in just three months. This effort demonstrated that it is possible to efficiently screen large populations within a short period of time with a strategic and well-organised approach. Within seven months, nearly 50 million Egyptians were screened and between 2014 and 2020, more than four million Egyptians were treated for HCV.

A further strategic decision was Egypt's inclusion of children and adolescents in the testing programmes (Popping, 2019). By collaborating with NGOs like the National Mother and Child Welfare Organisation (NAMCO), stigma among mothers and children, which hindered their willingness to get tested, was reduced. By including young people, their parents also got involved, and they became advocates themselves, further reducing the stigma and raising awareness.

In Thailand, one HCV programme in the province Phetchabun focused on simplified testing at the point-of-care (Wasitthankasem et al., 2023). The strategy involved testing as many as possible with a rapid diagnostic test, re-testing those with positive results using a more precise test, which requires laboratory analysis. This strategy was particularly successful in increasing testing, improving the reliability of the results, and facilitating linkage to treatment and thus informed Thailand's national strategy to address its HCV epidemic. However, the approach requires the access to laboratories, which also raises its costs.

Thailand's national strategy stands out as a very targeted campaign against HBV (Posuwan et al., 2020). Information gained from previous programmes and a national survey led to a focused and cost-effective HBV screening approach, targeting all individuals over 30 years old and high-risk groups using primary health centres.

Rwanda's strategy to eliminate HCV focused initially on targeted screening of high-risk populations, which included prisoners, people infected with HIV, older age groups and sex workers (Handanagic et al., 2024). The strategy later expanded to the general population. The programme focused on decentralisation, and the introduction of simplified testing and treatment methods, focusing on simple rapid diagnosis tests. This allowed the expansion of screening and treatment services at the primary healthcare level. The collaboration with the National Correction Service helped to test prisoners and a local NGO support group facilitated the testing of female sex workers. In total, between 2016–2018, approximately 700'000 Rwandans were screened across these groups and 9'000 thereof were treated for HCV infection.

5.3 Treatment and Cure

Although medicines to treat people with viral hepatitis B and C exist and are becoming increasingly affordable, many countries are still not taking full advantage of these treatments because of policy, programmatic and access barriers (WHO, 2024b). To eliminate viral hepatitis as a public health threat by 2030, the WHO (2022) urges countries to "provide treatment for chronic hepatitis B and C infection to all adults, adolescents and children who are eligible for treatment, especially those with more advanced disease, ensuring that the most effective treatment regimens are accessible and affordable to all populations" (p. 67).

The treatment strategy, as well as the main barriers faced to implement effective strategies will differ when dealing with HBV or HCV. Currently, no cure exists for patients with chronic hepatitis B. However, antiviral treatment through oral medicines can improve long term survival by decreasing the advance of cirrhosis and reduce cases of liver cancer (WHO, 2024c). Therefore, at

present, "nucleos(t)ide analogue therapy is required in most cases" (WHO, 2024d, p. 14). Without the possibility of curing the disease, patients will need to continue this treatment for life, which presents challenges in ensuring consistent access to medication and keeping patients engaged. Research is working on new "cures" for hepatitis B by "eliminating all replicative forms, including cccDNA […] to achieve "functional" cure, defined as a sustained loss of HBsAg (undetectable <0.05 IU/L) and undetectable HBV DNA after stopping treatment" (WHO).

A further essential aspect of hepatitis programme design is the timely linkage to care after a positive test result, a "process of actions and activities that support people testing for hepatitis B or C infection to engage with prevention, treatment and care services as appropriate for their hepatitis B and C status" (WHO, 2024d, p. 23). Multiple factors may hinder the successful uptake of testing and linkage to care: "patient-level factors like mental health problems, substance abuse, misinformation, depression, lack of social or family support and fear of disclosure but also structural or economic factors (such as stigma and discrimination, high cost of care, distance from care sites, transport costs and long waiting times at the facility)" can all impact the patients commitment to care (p. 141).

5.3.1 Hepatitis B

Because most chronic hepatitis B patients are asymptomatic at the time treatment is initiated, convincing them to adhere to lifelong antiviral therapy for HBV can be challenging (Abu-Freha et al., 2021), especially for pregnant women. Indeed, to prevent chronic infection in newborns through vertical transmission, the WHO recommends peripartum antiviral prophylaxis with tenofovir disoproxil fumarate for pregnant women at high risk of transmission (on top of a birth-dose of HBV vaccination for infants) (WHO, 2021).

Thahir et al. (2024) identify psychological and behavioural factors that were successful in encouraging adherence to antiviral therapy during pregnancy, based on a qualitative study in the Democratic Republic of Congo. Their results show that trust in the clinical staff administering the treatment and the information provided by healthcare workers was a key factor encouraging adherence, as well as social support provided mostly by their partners and mothers. The main barriers to treatment adherence identified were fear of stigma and false beliefs surrounding the disease, which calls for more efforts to raise awareness around viral hepatitis and overall health literacy.

5.3.2 Hepatitis C

On the other hand, Hepatitis C can be treated effectively with antiviral medications, curing the patient from the disease and preventing long-term liver damage (WHO, 2024e). The WHO recommends "therapy with pan-genotypic direct-acting antivirals (DAAs) for all adults, adolescents and children down to 3 years of age with chronic hepatitis C infection" (WHO): this oral treatment has very limited side-effects and effectively cures most patients within 12 to 24 weeks. Although treatments were previously very costly, sofosbuvir and daclatasvir are now widely used and available for less than US$ 50 in most low- and middle-income countries (WHO).

As previously mentioned, Egypt is commonly cited as a success-story for its large-scale screenings, but also for its effective linkage to care. Confirmed HCV cases were immediately referred for treatment, typically approved within one week (Hassanin et al., 2021). Call centres contacted people who did not show up for their appointments and scheduled new appointments.

To encourage diagnosed patients to come back for treatment, hepatitis B vaccines were offered for free to those who completed their HCV treatment. Strong political will increased governmental health care spending and the commitment to reaching all sectors of society were among the many factors that made this “100 Million Healthy Lives” campaign possible.

Facilitating the access to testing and treatment, reducing patient disengagement and decentralising treatment services were key factors in the success of HIV elimination initiatives in low- and middle-income countries (WHO, 2024d, p. 146). Decentralisation, defined by the WHO as the “process of delegating significant authority and resources to lower levels of the health system: provincial, regional, district, subdistrict, primary health care and community” (p. 23), has also proven effective in hepatitis C elimination strategies, especially at harm-reduction sites and in primary care.

In countries like Georgia, where people who inject drugs (PWIG) make up 25% of the country’s HCV-infected population, reaching this group of patients is crucial to meet the WHO elimination goals (Luhmann et al., 2015). Several international and national organizations have partnered together to develop and implement a peer support intervention project aimed at overcoming the specific difficulties faced by PWID in accessing HCV treatment (Kikvidze et al., 2018). The programme provided counselling by peer workers at the beginning of the treatment, monthly group discussions among patients, meetings with peer workers and medical staff, all within a harm reduction canter in Tbilisi that typically provides prevention services to about 2600 people. Their project proved to be extremely effective, demonstrating “excellent treatment uptake and retention in care among PWID based in Tbilisi” (p. 19)

6. Findings: Semi-structured Interviews with Experts

This section examines relevant findings from the eight semi-structured interviews conducted with hepatitis experts. The subsections “sustainable funding”, “government involvement”, “management of health care”, “screening and testing”, “accessibility”, “social awareness”, and “applicability” provide an extensive overview of key aspects to consider when designing and funding catalytic hepatitis elimination programmes.

6.1 Sustainable Funding

Hepatitis elimination programmes face significant challenges navigating a resource scarce environment. This chapter addresses hurdles concerning hepatitis elimination funding environments, followed by consequences of chronic underfunding, as well as strategies applied to tackle this challenge successfully.

6.1.1 Funding Gap in Hepatitis Elimination

Funding remains the most significant challenge for hepatitis elimination. While most financial resources ultimately come from national governments, there is a need for both private and institutional donor support. This external financing plays a catalytic role, not only in unlocking additional government resources but also in funding the technical assistance organisations, which are an essential part of these efforts. Governments often rely on external expertise to design effective service delivery models and develop strategic plans tailored to their national contexts. A few characteristics of the donor and aid landscape make it particularly difficult for hepatitis elimination projects to access financial resources.

Most donors tend to prioritise other transmissible diseases like HIV, tuberculosis, or malaria (B. N.). HIV has been established as a more prominent disease in part because of its large community of support, including many celebrities who have been affected and who actively advocate for awareness and funding. Another reason for this is that hepatitis kills indirectly: untreated viral hepatitis can lead to the development of liver cirrhosis or liver cancer, which then becomes the registered cause of death. Hepatitis as a cause of death is, therefore, underreported (F. R.).

A further factor that makes attracting funding for hepatitis elimination challenging is a “co-dependency” among donors. This co-dependency appears in cases when funding follows trends and other large institutional donors. Donors fear entering a new battle against a disease and adding it to the list of world problems. It is therefore crucial for hepatitis to become a priority among major institutional donors, such as the Bill & Melinda Gates Foundation and the Rockefeller Foundation, in order to secure additional donations. These kinds of donor dynamics are especially harmful for small organisations that address lesser-known diseases (B. N.).

Additionally, initiatives targeting hepatitis elimination are often small grass root organisations, which are vulnerable to reputational damage. Donors have become increasingly suspicious of how finances are used. Even minor mistakes can negatively impact other organisations. (B. N.).

Certain country characteristics may also play a crucial role in the ability to attract funding. Attracting donor funding poses a significant challenge for organisations operating in small countries, where small population sizes correspond to a reduced number of individuals affected

by hepatitis. Moreover, the governmental reputation on the international stage can significantly impact an organisation's capacity to secure funding, underscoring the political dimensions of global health aid (O. F.; F. R.).

Finally, donors often maintain a clear and predetermined vision as to how their funding should be utilised, which can create an unequal power dynamic between donors and local governments. As a result, implementing agencies may face restrictions in using the funding effectively, leading to inefficiencies. This dynamic can hinder governments from developing comprehensive, long-term strategies, in which donor contributions are integrated as one component of a cohesive national plan (O. F.).

6.1.2 Consequences of Chronic Underfunding

The funding gap heavily influences the ability to plan long-term programmes and design effective strategies over multiple years. Many states or donors evaluate their funds on a yearly basis, leaving projects in uncertainty. The EU is potentially the only development agency that commits to at least 25 years of financing, which helps development programmes to plan long-term and increase impact (F. R.). The uncertainty leads to lost gains and momentum, prevents the development of sustainable plans and avenues to new financing options. Unclear or time-limited funding commitments pose significant risks for governments, eroding trust in implementing partners and organizations, and ultimately undermining sustained commitment to hepatitis elimination (O. F.).

Furthermore, limited and uncertain funding hampers the ability of governments and organizations to build stable, long-term relationships with diagnostics and treatment suppliers. When demand is low or unpredictable, suppliers are less willing to commit to affordable pricing or invest in the development of essential diagnostic and treatment products. (O. F.).

6.1.3 Strategic Responses

To navigate this landscape of financial scarcity, different hepatitis elimination projects have developed effective strategies. For example, to access a wider range of donors, organisations can aim to offer testing for a wider range of diseases. Also, integrating services into existing health care systems is crucial to avoid the vulnerability of vertical programmes. Integrating hepatitis treatment into public health services and working closely with government partners reduces vulnerability to shifting donor priorities and strengthens the long-term sustainability of efforts. (O.F.).

The main goal to unlock governmental resources is to attract catalytic funding. Catalytic funding should be understood as a means of unlocking larger opportunities and as a force for change within each country's context. While governments may have access to financial resources, hepatitis elimination often competes with other pressing health priorities and may not receive the necessary attention. In response, CHAI has strategically leveraged modest donor funding to implement targeted projects that demonstrate impact and support evidence-based advocacy, helping to elevate hepatitis on national health agendas (O.F.).

It has been extremely important for PATH in Vietnam, CHAI in Rwanda, and for organisations in Uganda to help governments leverage the use of Global Fund financing for hepatitis, which has, for a long time, only financed HIV, malaria, and tuberculosis (O.F.). Furthermore, PATH has leveraged partnerships to navigate a low-resource environment to receive money from different

sources by aligning with services that are paid for by Gilead, USAID, UNITAID, and others (K.G.).

6.2 Government Involvement

With the inclusion of hepatitis elimination in the Global Health Sector Strategy and the Sustainable Development Goals, the WHO and the UN have the power to set the global health agenda and signal to its member states which diseases are perceived as a particular health threat and should therefore be tackled adequately (O.L.; F.R.; WHO 2016; WHO 2024a). In this sense, countries that are member states of the WHO already express their general agreement with the WHO's standards, goals and strategies. While the Global Health Sector Strategy influences the priorities of Member States, and many have already included hepatitis elimination in their national health strategy, the actual implementation and long-term commitment of governments to the process of their hepatitis elimination strategy is ultimately up to the respective governments themselves (O. L.).

As resources are generally limited, funding is only allocated to population health and more specifically hepatitis elimination if it is perceived as an urgent public health concern. Thus, the prevalence of viral hepatitis together with the overall interests of the country – often linked to its level of development – strongly influences this governmental willingness (F.R.; WHO 2016). If the prevalence is negligible (compared to other diseases), the government will be less willing to allocate funds for elimination projects targeting the disease in question. However, the importance of national commitment by the local government was stressed by all interviewees when discussing the successful implementation of sustainable, catalytic hepatitis elimination strategies. This willingness is essential because hepatitis elimination projects are short-term investments - often by international funds, INGOs and foreign governments - to help a government initiate an elimination strategy. However, the task of long-term sustainability falls back on the government, which means that it is responsible for doing the “heavy lifting” of the project (F.R.; K.A.).

Other indicators of a country’s willingness to commit to hepatitis elimination include a retrospective look at health and hepatitis programmes already planned or implemented, existing public health legislation, adaptation and adoption of public health guidelines provided by IOs such as the WHO, the commitment to changing and simplifying existing policies, and the openness to working with development funding and international organisations (K.A.; F.R.; O.F.). However, the most important signal a government can give, according to our interviewees, is through the allocation of funding, which shows how much the cause is valued. However, while the interviewees agreed that the funding of an elimination programme without a convincing “buy-in” from the local government is not worth the investment, the success of a hepatitis elimination programme does not only depend on the government, but also on the integration of a variety of other stakeholders. A successful hepatitis elimination programme will emerge from the communication, collaboration and co-design of the government at the national, provincial and community level and the inclusion of local NGOs, INGOs, the private sector, the health care system and community leaders (K.A.; K.G.).

Multisectoral engagement, which has been used in the HIV context, is relatively new to hepatitis. Nevertheless, it a central “policy decision to ensure that all actors from the various segments of the country are part of the discussion for health” (O.L.). As a result, the integration of a variety of stakeholders makes it easier to address the key needs within the different sectors of the population, and to adapt accordingly to the different challenges faced on the ground (K.G.). The multisectoral approach and the integration of local actors, especially at the community level, is another way of conveying governmental

commitment to the cause of hepatitis elimination. This was particularly evident in Egypt's national "100 Million Healthy Lives" campaign, during which the government invested 265 million USD in hepatitis C screening, testing and treatment. To test the entire population – including all regions and social classes – the government worked with all sectors of society, NGOs, the private sector, the health care sector, community leaders and even celebrities to promote their campaign and to screen and test people inside and outside health care facilities (Hassanin 2021).

6.3 Management of Health Care

Once financial resources are secured and government commitment to hepatitis elimination is established, the next critical challenge lies in understanding and adapting programmes to the local context, beginning with an in-depth assessment of the existing health care infrastructure. Unlike many high- and middle-income countries, low-income countries often lack well-equipped health facilities that can deliver accessible, high-quality treatment to their population without leaving anyone behind. The way the health care system is structured can also determine who has access to hepatitis services within a country. For instance, in Pakistan testing and treatment is only available to holders of a national ID card, leaving thousands of people, especially residents of slums and migrant communities, excluded from these services (K.A.). Designing interventions that are context-sensitive and responsive to community-specific needs, while simultaneously contributing to the long-term strengthening of health systems, is a central objective of The Hepatitis Fund and other organisations engaged in the global hepatitis response (B.N.).

6.3.1 Integrating Diseases

The first aspect of integration that has gained much attention is the integration of hepatitis services within the existing elimination efforts of other viral and communicable diseases. The triple elimination approach, widely advocated for by the WHO, encourages global health actors to build maternal and child programmes and services that include testing, treatment and prevention for HIV, syphilis and HBV all under one roof. Especially in rural locations, reaching mothers and newborns in time to deliver effective vaccination and treatment remains a challenge. Considering that mothers in low-income settings may not have frequent or easy access to healthcare infrastructures, providing treatment for not only one but three transmittable diseases enables more impactful and effective care for mothers. At the time of delivery, a short window of time allows for effective prevention of transmission to newborns: providing babies with vaccines against all diseases in time necessitates an integrated approach to service delivery. Bringing together teams from the immunisation sector, Mother and Child teams, as well as HIV and HBV services constitute the "Cadillac of integration!" (O.L.)

This integration strategy can also be applied when other diseases have overlapping key groups. For example, strong delivery channels already established by HIV and TB programmes can be harnessed to include hepatitis to treat their overlapping key populations (e.g., people who inject drugs, men who have sex with men). This is especially relevant as the three diseases have proven links of comorbidity and coinfection (O.L.)

Pushing integration one step further, the interviews highlight an increasing demand for an overall more integrated approach to healthcare service delivery. A successful example is Egypt's hepatitis

C elimination strategy: the large-scale national campaign omitted any reference to hepatitis, rather reframing the initiative as a broad, population-wide health intervention. As Egypt's hepatitis epidemic spread out across the entire population (not condensed in some key groups), it was crucial to design a strategy that would allow access to people from all income brackets. Offering a free and comprehensive health checkup, including assessments for diabetes, hypertension, and body mass index, on top of hepatitis C testing facilitated high engagement across diverse socioeconomic groups (H.Z.).

6.3.2 Integration into the Local Health Care System

Integration can also be applied to the introduction of hepatitis care within a country's existing health structure and primary health care services. This strategy stood out as one of the key points of action taken by the different organisations, as well as one with the most catalytic impact. Although dependent on strong and consistent political engagement, this avenue helps mitigate many of the hurdles standing in the way of patients' accessibility to testing, vaccination and cure.

Firstly, decentralising hepatitis cure from the tertiary level to the primary level can be a very effective way to bring medicine closer to the population. In low-income settings and especially in rural or hard-to reach areas, enabling patients to receive diagnosis, care and treatment for viral hepatitis at their closest healthcare facility is crucial to eliminating viral hepatitis in these regions. The WHO is currently advocating to include treatment for both hepatitis B and C "at least at the district hospital level in the primary health care system" (O.L.). This has already been achieved in Rwanda, and "is something that can be replicated in various other countries as well as in low-income parts of Africa" (O.L.). In Vietnam, hepatitis B services are well decentralised, unlike the hepatitis C structure: although screening services were available at local clinics, patients who tested positive could only obtain treatment for hepatitis C at the tertiary level - the provincial hospital. Reaching this centralised facility often involved long hours of travel for people coming from rural areas, decreasing the likelihood of a successful linkage to care (B.N.). The MSF-led project in Pakistan did exactly this, stationing the hepatitis C services within small medical facilities that already carried out basic health care services, enabling them to test and treat any at-risk patient coming in for another medical issue. Echoing the Decentralising hepatitis services stands out as a key way of accessing hard-to-reach populations. This also aligns with findings from the literature review, that highlight the importance of trust in the population's willingness to be screened or undergo treatment. Allowing people to access hepatitis services at their local clinic and by familiar physicians, may result in a higher uptake of services.

Collaborating with the Ministry of Health to decentralise services also enabled MSF to identify and strengthen a rural health centre with additional resources, allowing them to be more effective in their overall service delivery (K.A.). Many small-scale health care facilities, especially in rural areas, lack basic medical equipment- it is not uncommon to find a clinic without running water or sufficient anaesthetics, let alone operating theatres (F.R.). Public health initiatives working within existing primary health structures have a higher chance of producing change lasting beyond the scope or the programme. As the Hepatitis Fund seeks to leave a catalytic impact and produce lasting change for local populations long after the closure of a specific project, encouraging the integration of internationally funded projects directly into the public health system is a cost-efficient and sustainable way to provide catalytic change for the benefitting communities.

6.3.3 Mobile Health Clinics

For the most hard-to-reach populations, for example housebound women, nomadic communities, people living in slums and many more, mobile clinics can be leveraged to bring health care directly to the doorstep of these communities. These interventions can range from large-scale door to door initiatives to setting up a screening corner in a mosque.

The HEAT-led elimination programme in Pakistan leveraged a cold-chain-proof transportable system put in place during the Covid-19 pandemic to bring hepatitis testing and treatment directly into the homes of an entire community (N.A.). Frontline workers screen entire households for hepatitis B and C, before conducting a second laboratory test for those who screened positive. Once the results were confirmed, the health care worker returned to the house to provide vaccines and treatments to every member in the household. This proved to be a particularly effective method to reach housebound women and children with little or no access to health care. By meeting patients directly at their doorstep, patient retention is made easier as the mobile clinic can return to the location. However, it is also a very costly program (N.A.).

Vast populations in Pakistan live in slums, without access to key infrastructure including education and health care. The interviews highlight that these populations cannot be considered "urban populations" instead requiring a tailored health service delivery (K.A.). The latest MSF led programme in the Macha Colony carried out a vast, door-to-door mobilisation campaign encouraging inhabitants to get screened in meeting points corner. These vans-made-clinics would allow for the treatment of positively tested patients on the same day and avoid the loss of any follow-up (K.A.).

Another notable example showcasing the potential of "clinics on wheels" includes reaching the nomadic Bedouin communities of Egypt's South Sinai – populations that mostly avoid engagement with modern health care and rely on long – established cultural practices and traditional healing methods. To foster trust and encourage participation in the screening campaign, small medical teams drove directly to them and explained the benefits of testing to community leaders, offering treatment to those who consented (H.Z).

Lastly, considering the persistent stigma surrounding viral hepatitis, some individuals from higher socioeconomic backgrounds may refuse to undergo testing. To effectively reach these populations, mobile clinics can also be installed in urban areas, including inside large offices, banks, telecom and petrol companies (H.Z.).

6.3.4 Capacity Building

Capacity building has a high potential to drive substantial, catalytic change by transferring skills and expertise that will stay within the community long after a programme is closed. The first, most obvious example consists in increasing the pool of qualified and professional community health care workers to deliver essential services. For example, self-testing kits are available for hepatitis C and HIV and enable community health workers to screen their local population. Also noteworthy is the fact that many key roles within the hepatitis elimination intervention chain do not require medical skills at all– for example, several projects have carried out capacity building programmes for community members to go house to house and spread awareness on the disease and encourage members to visit the nearest screening centre. In Rwanda, "foot soldiers" where community leaders or schoolteachers were successfully empowered and trained to raise

awareness and provide information within their community. (O.L.) Leveraging easy-to-use kits and considering all roles necessary in fighting viral hepatitis can be an effective way to broaden the pool of healthcare workers able to delivery these services in rural communities, areas that some high-qualified doctors may resist going to (O.L.).

Another way in which externally funded programmes build lasting capacity, and a sustainable knowledge transfer is by embedding their staff within the Ministry of Health. For example, CHAI sees its role as a "technical assistance partner" as key to their catalytic success: "Our goal is to build government capacity in areas where support is requested, with a focus on long-term sustainability. True success is demonstrated when we can responsibly transition our support and see continued progress and impact sustained by local systems."(O.F.)

To ensure health care workers remain up to date with the latest guidelines and medical advancements, CHAI supports the government to facilitate routine training at the provincial level, cascading mentorship down to primary health care centers. However, workforce retention remains a challenge—trained professionals are often lost to higher-paying opportunities in the private sector, leaving public facilities understaffed. Additionally, delivering in-person training is logistically difficult and costly, as it requires staff to leave their posts for several days and travel to centralized locations. To address this, Rwanda, in partnership with CHAI, developed an e-learning platform including national hepatitis C training content and other health program content. This digital approach offers a practical and scalable solution, strengthening capacity while minimizing disruptions to service delivery. (O.F.).

6.4 Screening and Treatment

The primary focus of programme-implementing agencies and technical assistance organisations is the effective testing and treatment of affected populations. Although strategic priorities may differ between programmes and country contexts, designing and implementing appropriate testing and treatment models is essential for achieving public health goals. A well-defined strategy is essential for ensuring not only efficient service delivery but also enabling programme scale-up and maximising overall impact.

6.4.1 Hepatitis C Elimination Strategy

There are two ways to screen patients for hepatitis C: the rapid test, which provides an instant result, and a PCR test, which requires a laboratory analysis. To combat hepatitis C, a curable disease, screening and treatment are highly effective. The WHO has also developed simplified guidelines on how to approach this strategy (WHO, 2016).

Both CHAI and PATH have implemented a simplified test-and-treat approach for hepatitis C, which involves initial screening using a rapid diagnostic test to detect antibodies, followed by confirmatory viral load testing to identify chronic infection. This approach is often decentralized and integrated into existing health systems to ensure faster turnaround of results. By streamlining the diagnostic process, it enables earlier treatment initiation, supports program scale-up, and enhances financial feasibility for national health systems. (O.F.; K.G.).

Contrary, The MSF project "Bending-the-Curve" and the HEAT project, both conducted in Pakistan, apply a test-diagnostic-treat approach, where a reflex sample is used in cases when the rapid test is positive. The blood sample taken on the doorstep is then transported in a cooling kit

to the laboratory. Disease such as anaemia, common in Pakistan, may be incompatible with hepatitis treatment. In fact, unnecessary treatments could even worsen the condition. Considering that the rapid test has a 30% false-positive rate, these projects have decided to include confirmation tests, even though such tests are often financially demanding. Egypt also implemented a two-step testing protocol, incorporating a PCR confirmation test. However, in hindsight, PCR confirmation may not be necessary in Egypt's context (H.Z.; K.A.; N.A.).

Although confirmation tests avoid overtreatment, they might not be necessary in all health settings, especially considering their financially straining nature. The decision to implement confirmation tests, instead of a simplified test and treat approach, should therefore be based on the local health context, the financial feasibility and the potential of non-adherence to the treatment cycles by positively tested patients are not retained in the process.

A further consideration is the adequate treatment duration. The MSF project provides the commonly used direct-acting antiviral (DAA) treatment for 12 weeks instead of 24 weeks. The 12-week treatment has proven to be 96% effective, which is proof of adequate effectiveness and avoids overtreatment (K.A.).

6.4.2 Hepatitis B Elimination Strategy

Hepatitis B presents a unique set of challenges in the context of public health, as it is a treatable yet incurable disease. An added layer of complexity arises from the risk of vertical (mother-to-child) transmission, which remains a significant driver of new infections globally. In response to these challenges, the hepatitis community continues to seek greater alignment in its strategic approaches. Two primary pathways have emerged: first, the prevention of vertical transmission; and second, the reduction of hepatitis B-related mortality through the testing and treatment of individuals living with the infection.

From CHAI's perspective—specifically in contexts like Rwanda and other countries in sub-Saharan Africa where hepatitis B birth-dose coverage remains very low (with the average coverage at just 36% in the region), the prevention of new infections through vertical transmission should be a key priority. This focus is supported by the cost-effectiveness and feasibility of existing medical interventions like vaccination and treatment prophylaxis, which can be seamlessly integrated into maternal and child health platforms. Importantly, these efforts align closely with global health priorities, such as the Triple Elimination initiatives, which aims to eliminate mother-to-child transmission of HIV, syphilis, and hepatitis B. This strategic alignment has drawn the attention of cross-cutting donors like Gavi and the Global Fund, both of which have begun investing in hepatitis B birth dose vaccination and triple elimination programmes. (O.F.).

This emphasis is further justified by epidemiological data: approximately 70% of new hepatitis B infections occur through vertical transmission. Infants exposed to the virus at birth face an exceptionally high risk of chronic infection, with an estimated 90% developing long-term disease, in contrast to significantly lower rates of chronicity in adults (O.F.).

Nevertheless, focusing solely on the rollout of the hepatitis B birth dose vaccination may not be sufficient. Pregnant women with high viral loads remain at risk of transmitting the virus despite birth dose administration, highlighting the need for prophylactic antiviral treatment during pregnancy. In addition, women who require treatment for their own health should be initiated and supported on lifelong therapy. However, current strategies to link women to care and retain

them in treatment throughout and beyond pregnancy require significant strengthening to ensure long-term health outcomes and prevent vertical transmission effectively. (O.F.).

Furthermore, while birth dose vaccination rollouts have begun, coverage will take time. Coupled with the fact that treatment guidelines for the adult population remain complex and in need of further simplification, despite the publication of simplified guidelines in 2024, it is evident that a comprehensive strategy must address both prevention of new infections and treatment of existing cases (O.F.).

The perspective on the decision to set a focus point shifts with the rate of birth-dose coverage. The birth-dose coverage in Vietnam is significantly higher, at 80%, making vertical transmission less of a problem. Therefore, PATH approaches this matter comprehensively, focusing strongly on test and treatment. While the goal is to achieve herd immunity by expanding infant vaccination, we are still in a period where many adults need access to tests and treatment. PATH expands services to tenofovir prophylaxis as well as immunoglobulin (IVIG) treatment for babies exposed to hepatitis B (K.G.).

In conclusion, a focus on prevention is the most feasible option and has the potential to have the greatest impact, particularly in settings with low birth-dose vaccination rates. This is due to its ability to integrate into existing health platforms and the effectiveness and affordability of the vaccinations. However, hepatitis B should be tackled comprehensively, with provisions of effective prophylactic treatment to women giving birth, including a retention strategy for mothers leaving birth facilities, the provision of prophylactic treatment of babies exposed to hepatitis B, and test and treating people living with hepatitis B.

6.4.3 Connecting Patients to Treatment

Timely linkage to care is a critical factor in ensuring that individuals who test positive for hepatitis successfully initiate treatment. Extended delays between diagnosis and treatment increase the risk of patient drop-out, particularly in resource-limited or decentralised settings. In recognition of this, the WHO strongly advocates for treatment initiation at the point of testing, recommending integrated “one-stop-shop” models that streamline care and minimize barriers for patients (O.L.).

However, implementing one-stop-shop approaches can be challenging in community-based testing programmes. In such contexts, the logistical complexity of delivering both diagnostic and treatment services outside clinical settings often necessitates alternative models. In smaller or more localised programmes, the personal connection between health care workers and community members, created especially in door-to-door testing campaigns, can be leveraged for follow-up and counselling work. For instance, in the HEAT programme, patients with a confirmed positive diagnosis were revisited by health care workers, who encouraged them to attend the nearest health facility for treatment. In cases where in-person follow-up was not feasible, doctors conducted telephone consultations and arranged for medication to be delivered directly to the patient’s home. In Rwanda, peer- and community counsellors were also crucial in encouraging patients to care (O.L).

MSF’s operation in Pakistan implemented a door-to-door testing strategy and aimed to minimise the interval between diagnosis and treatment by encouraging patients to present at treatment

centres on the same day. This approach reduced attrition by expediting care, especially when compared to standard pathways in the broader health care system (K.A.).

One notable barrier to timely treatment is the requirement for PCR confirmation testing. While PCR tests provide diagnostic accuracy, it also introduces delays that may result in patient loss to follow-up. Therefore, the reflex-testing method, where a blood sample is immediately collected and transported in a cooling kit, is important as to not require a second visit or a referral to another testing centre (N.A.; K.A.). In settings where the delay between the result and treatment would lead to the loss of patients, omitting PCR confirmation may be considered. However, this was not an issue in the testing programmes in Pakistan (N.A.).

Another approach that demonstrates effective linkage to care on a national scale is Egypt's hepatitis C elimination campaign. A core component of the Egyptian strategy was the integration of a digital database that enabled automatic referral of positive cases. Once individuals received a positive result via rapid diagnostic testing, they were registered in a national platform using their ID number and immediately referred to the nearest diagnostic and treatment centre. Importantly, patients had the flexibility to select a different location if it better suited their personal circumstances, such as proximity to work or family. This adaptability reduced logistical barriers and supported patient retention (H.Z.).

To further ensure linkage to care, Egypt implemented an active follow-up system. Teams contacted patients after diagnosis to confirm their engagement in treatment and to address any issues with accessing services (H.Z.). Egypt's impressive linkage to care was also highlighted in the literature review, in particular the use of call centres to contact people who did not show up for their appointments and scheduled new appointments. Other creative methods were employed to encourage diagnosed patients to come back for treatment, like offering hepatitis B vaccines for free to those who completed their HCV treatment.

In addition, the Egyptian Ministry of Health launched a mobile application (Sahat Masr), which allowed patients to identify nearby service centres, manage appointments, and receive treatment-related information. This tool helped maintain patient engagement and facilitated movement between locations without disrupting the treatment process (H.Z.)

In rural and hard-to-reach areas, where digital access was limited, local community leaders and volunteers played a vital role. They conducted door-to-door visits to remind patients of their treatment appointments and supported adherence by reinforcing community trust in the programme (H.Z.).

6.5 Accessibility

Accessibility of hepatitis elimination services to the general population is a crucial success factor and must thus be ensured. An important aspect concerning access is the affordability of services, which is ensured through collaboration with pharmaceutical companies to negotiate low medication prices and ultimately provide tests and treatment free of charge to patients. Furthermore, logistical barriers must be eliminated to ensure hepatitis elimination services are accessible to the general population.

6.5.1 Affordable Resources

To ensure broader access to hepatitis testing and treatment, reducing the cost of medical tools through strategic price negotiations is essential. Egypt exemplifies this approach by negotiating both the price and quantity of testing materials. Additionally, by leveraging its domestic capacity to produce generic treatment components, Egypt focused on securing lower prices for chemical inputs, successfully reducing treatment costs from $1,000 to $39 (H. Z.). Similarly, CHAI supported the Rwandan government in negotiating reduced prices for hepatitis C diagnostics and treatment, culminating in a benchmark agreement that evolved into a global access framework (O.F.). PATH has also engaged in price negotiations as part of its hepatitis elimination initiatives. These negotiations have demonstrated a strong catalytic effect, often motivating governments to expand their efforts once they recognise the feasibility of achieving public health goals at significantly reduced costs (K.G.).

CHAI's market shaping approach goes beyond price negotiations. By working closely with manufacturers and product developers, CHAI supports the design and introduction of products that reflect user needs—accelerating access in low- and middle-income countries. CHAI takes a holistic view of the market ecosystem, balancing supply and demand. Price reductions are paired with pooled demand, volume guarantees, and government partnerships to ensure system readiness. This includes updating guidelines, building diagnostic capacity, strengthening supply chains, and training health workers—so that affordable, high-quality medicines ultimately reach patients. (O.F.).

6.5.2 Services Free-of-Charge Patients

Although the cost of hepatitis C treatment has dropped significantly to around $60 per course, this price remains a substantial barrier for many patients—especially in low- and middle-income countries where it can equal or exceed a month's income. In settings where testing and treatment are not provided free of charge, such as in some states in Nigeria, program scale-up may be slower due to limited access (O.F.). In contrast, countries like Rwanda, Egypt, and both CHAI-supported projects in Pakistan offer hepatitis services free of charge, enabling broader population access. This approach not only removes financial barriers but also builds public trust and strengthens awareness efforts. (O. F.; H. Z.; N. A; K. A.)

Nevertheless, the MSF project shows that free-of-charge testing is no guarantee to reach the whole population. Despite reaching the entire population, 30% remained unscreened, with many believing that other issues took precedence over hepatitis C screening (K.A.). In Vietnam, everything except testing is covered by the health care system. However, testing for a certain price requires more awareness building and more financial resources to subsidise the price. To tackle this challenge, partnering with social enterprise hospitals helps to reduce prices significantly (K.G.).

6.5.3 Infrastructure and the Last Mile

In low-income countries, it is very often very difficult to reach all segments of the population. Therefore, a clear plan to reach different communities and overcome infrastructure barriers is essential. For instance, many workers in such settings cannot leave work, or purchase a bus ticket to drive to the testing site. Concepts to bridge the last mile are therefore important and can be innovative. For instance, the Hepatitis Fund has funded bicycles in China for health care workers

or delivered cash transfers for bus tickets (F. R.). In Uganda, a transport system for babies for HIV testing has also been leveraged to test for hepatitis B (O.L.). Such infrastructure challenges especially emerge when treatment is centralised and therefore often far away from the patient (B.N.). A challenge in Vietnam, for instance, is how to maintain prophylaxis treatment for pregnant women once they leave the care facility.

6.6 Social Awareness

Hepatitis elimination must be given greater prominence in the international health landscape. Furthermore, programmes should be tailored to the local context and demonstrate a deep understanding of the local socio-cultural environment.

6.6.1 International Awareness

The importance of considering the aspect of social awareness when addressing viral hepatitis elimination is critical to the development of a sustainable, catalytic elimination programme. Social awareness occurs at different levels – the international, national and the local. The first relates to the placement of hepatitis on the global health radar. Again, the WHO plays a major role in advocating for the elimination of the most urgent global health threats. However, this agenda-setting also relies on the work and engagement of communities lobbying for their disease to be taken seriously – more prominent cases being HIV, TB and malaria. With limited resources circulating, it becomes a battle between direct competitors to see who can make their case the loudest. Because viral hepatitis doesn't have the same community to advocate for its (international) recognition, funding suffers and so do the projects that can realistically be implemented (B. N.). Thus, without the critical component of successful advocacy, despite the availability of vaccines, treatments and cures, viral hepatitis currently doesn't realistically stand a chance of being eliminated (F.R.).

6.6.2 Local and National Awareness

But it is not only at the international level that advocacy for viral hepatitis is essential – it must take place other levels too, especially within affected communities. Because hepatitis infections go unnoticed for a lengthy period due to the lack of initial symptoms, only a fraction of those infected are aware of their status (Easterbrook et al. 2016). To advance elimination efforts, the disease must be known and better understood – what it is, what its long-term symptoms are, and how it is transmitted (O.L.). Advocacy is one of the cheapest and most cost-effective types of intervention when it comes to hepatitis elimination as "awareness towards education and empowering people to be in charge of their own health can change how communities perceive [health] and how communities can take charge [of it]" (B. N.). The goal of advocacy is therefore not only to make people aware of hepatitis specifically, but to change their health-seeking behaviour and knowledge of what to do in the case of infection (K.A.).

As seen in the HEAT project in Pakistan, the community was initially sceptical when door-to-door testing was conducted. However, as community members heard about the increasing number of positive test results, they began to proactively come forward and request testing. Thus, the knowledge about and the new perception of the risk of hepatitis was able to change the health-seeking behaviour of individuals and thus acted indirectly as a communication strategy (N. A.).

Another example is the screening of pregnant women in Vietnam who, once made aware of the risk of vertical transmission of hepatitis B to their babies, were likely to get tested during their next pregnancy, demonstrating the long-term impact of education and awareness campaigns on local populations (B. N.).

More classical types of advocacy campaigns consist of the distribution of awareness materials that include prevention awareness and sensitisation on what viral hepatitis is and how it is transmitted, or the conduct of community meetings, typically held by community leaders (N.A.). What is essential to a successful advocacy campaign is the inclusion of the community's preferences, norms and practices – the strategy must be designed around community needs, not imposed upon them (N.A.). Flexibility from the implementing partners is thus required to determine the type of health information that is preferred, which can also constitute more informal practices, such as word of mouth or through social media (K.G.).

To ensure the consideration of cultural conditions, the target population must be defined and understood - even within the same country or province, needs may vary. This is especially true when comparing urban and rural, or urban and slum populations. The availability of infrastructure, education and health care, as well as the presence and importance of religion and cultural beliefs, will vary drastically between such populations, so strategies must be flexible and adaptable (K.A.).

For example, when conducting door-to-door screening in Pakistan, many men were not at home during the working week and were therefore missed in the initial screening process. As a result, the programme assessed the situation and opened a screening facility in a location where male heads of households would congregate. In this example, the solution was to start screening on Fridays at the mosque, where men would gather to pray and could thus be screened together. While this solution made sense in the community in question, it's not necessarily applicable to other provinces, let alone other countries with different cultural contexts (N.A.). Celebrating successes and giving credit to local actors was also identified as a key factor in keeping the community engaged over time, further boosting morale and learnings (H.Z.; (K.G.)). However, even with celebrated successes, such learnings can only be so effective. Another critical component of a successful elimination strategy is trust. This is as relevant between the government and the implementing NGO as it is between the community and local actors. This trust is naturally built over time and requires open communication, awareness building and the provision of promised services and resources (O.F.; K.G.). Especially through the last point, the provision of services, i.e. free screening, testing, treatment and cure, the local government can convincingly demonstrate its commitment to the cause of hepatitis elimination and thus help to build trust within the community (H.Z.).

In countries like Egypt and Rwanda, where public trust in government health systems is generally high, it is easier to encourage widespread testing and adherence to health recommendations. In contrast, countries such as the DRC and Pakistan face greater challenges due to historical mistrust stemming from individuals' previous negative experiences with screening and vaccination campaigns (O.F.; K. A.). Once this trust is broken, it is difficult to rebuild but remains possible through consistent communication and the provision of medical services (F. R.; H. Z.). However, despite all these efforts, it is important to acknowledge that a certain proportion of the population is still likely to refuse treatment, due to personal beliefs and preferences. Therefore, even the most comprehensive hepatitis elimination programmes have limitations that cannot be circumvented (K.A.).

Finally, the issue of stigma associated with the transmission of viral hepatitis must be addressed. Especially for hepatitis C, which is commonly transmitted through drug use or sexual contact between men, many people are reluctant to get tested (WHO 2024d). Indeed, fear of stigma and false beliefs surrounding viral hepatitis was identified in the literature review as one of the main barriers to treatment adherence, showing how important it is to design programmes considering stigma and raise awareness around viral hepatitis. To overcome this barrier, screening can be extended to entire population segments rather than focusing exclusively on high-risk groups. Additionally, instead of creating an elimination campaign tailored exclusively towards the elimination of hepatitis, hepatitis testing (as well as HIV, syphilis, etc.) can be integrated into larger health campaigns.

6.7 Applicability

Establishing catalytic goals at the outset of programme design is a central priority within The Hepatitis Fund's allocation strategy (B.N.). In the context of increasingly limited funding, the design of programmes and public health initiatives that maximise catalytic impact has become more critical than ever—and wasting resources has become increasingly costly.

6.7.1 Research and Planning

Firstly, thorough research and planning before the beginning of the programme is needed to understand contextual specificities and nuances. Accurate and precise data must be collected to identify high-risk groups and the scope of the spread (O.L.). Without this information, a successful intervention strategy would have been impossible. At the design stage, considering learnings and best practices from other comparable projects and contexts is encouraged to avoid duplicating mistakes and in turn gain efficiency. In a second stage, continuous data collection is crucial in order to track the elimination progress, identify emerging challenges, adapt accordingly and refine the project regularly and was emphasised by all interviewees. In Egypt, tracking the elimination progress day-by-day to identify emerging challenges and adapt accordingly was a key part of the success of the effectiveness of the elimination strategy. Additionally, collected data was used in Egypt to establish an online platform to enhance the referral to treatment mechanism and track patients' care pathway. Another strategy that relies on precise and reliable data is the first implementation of pilot projects. CHAI's programmes in Rwanda enabled them to implement efficient, small-scale projects that can rapidly be entirely taken up by the local authorities.

6.7.2 Sharing Results

Moreover, publishing findings in peer-reviewed medical journals ensures the entire hepatitis community remains informed and aligned in the pursuit of increasingly catalytic investments. To ensure programmes remain evidence-based as they scale, generating implementation research is essential. Within HBV eMTCT efforts, more evidence is needed to identify effective service delivery models that ensure every newborn receives the hepatitis B birth dose within 24 hours. This is particularly challenging in contexts where a large share of births occur outside formal health facilities. As one stakeholder noted, "What concerns me are countries like Nigeria, Ethiopia, the DRC—much of sub-Saharan Africa—where out-of-facility deliveries are still the norm. We have yet to find scalable solutions to reach mothers and newborns outside health facilities." (O.F.)

6.7.3 Mitigating Unavailable Data

In the absence of reliable data and guidelines, learning visits between comparable countries can help to avoid the duplication of errors and facilitate the exchange of best practices. These types of learning visits, which have been carried out between Togo, Benin and Burkina Faso, have shown success in fostering peer-to-peer learning across low-middle-income countries and an overall catalytic learning opportunity. Visiting other countries and seeing how their hepatitis elimination programmes are managed allows for the broader use of existing data and data systems and allows for the export of lessons learned to similar contexts, thus saving time and resources in the development and implementation of elimination strategies (O.L.).

7 Conclusion

This paper aims to facilitate and improve the decision-making process and funds allocation strategy of The Hepatitis Fund by identifying and providing a comprehensive overview of factors that contribute to the catalytic success of hepatitis elimination programmes. The creation and compilation of such factors is especially relevant in today's polarised geopolitical context, in which the provision of international aid is both unsure and highly competitive. Such a context makes the identification of cost-effective strategies in disease elimination programmes essential in achieving long-term impacts beyond the completion cycle of projects. Drawing on concrete examples from four focus countries, namely Egypt, Rwanda, Vietnam, and Pakistan, this paper provides 22 recommendations for designing and selecting hepatitis elimination programmes, based on an in-depth desk review of existing literature combined with interviews with viral hepatitis experts.

The data has shown that securing government involvement in the form of funding and support demonstrates political commitment. It also increases the chances to sustain the momentum gained through the implementation of a hepatitis elimination project. Additionally, the inclusion of various stakeholders at national, provincial and community level helps create a dialogue surrounding the health context of the country in question and thus increases shared knowledge through communication and coordination. This communication and knowledge in turn allows for more flexibility to adapt programmes when and where necessary according to the needs of the target population, thus increasing the likelihood of acceptance and participation in the programme. By integrating hepatitis elimination programmes into existing local infrastructure all the way from the primary to the tertiary health care level, access to testing and treatment services is facilitated, which builds trust between the local government, the programme-implementing partner and the target population. This inclusion prevents the isolation of hepatitis elimination services and can thus counter perceptions of stigma. Another mechanism to foster trust and increase accessibility is by providing the testing and treatment services free of charge – made possible when local governments engage in strategic price negotiations with pharmaceutical companies to reduce structural barriers. Additionally, investing in advocacy campaigns helps inform local populations about viral hepatitis, its symptoms and effects as well as paths of transmission, which facilitates acceptance and participation in hepatitis elimination programmes by the populations. To make these findings applicable to different contexts the systematic collection of data and cross-country collaborations to share findings has proven to be effective in creating successful, evidence-based interventions.

Twenty-two recommendations were extracted from the primary data, which cumulatively provide an extensive overview of the different areas of hepatitis elimination programmes. That said, it is worth bearing in mind that this research is centred on the concept of a 'public health approach'. The WHO strongly recommends such an approach when designing and funding programmes to eliminate viral hepatitis in low- and middle-income settings, as it involves "ensuring the widest possible access to high-quality services at the population level, based on simplified and standardised approaches and to strike a balance between implementing the best-proven standard of care and what is feasible on a large scale in resource-limited settings" (2024a, p. 2). In line with this consideration, this study aimed to highlight effective, impactful, accepted and sustainable initiatives, with a focal point on identifying the most cost-effective strategies. Prioritising catalytic impact and cost-effectiveness naturally led to recommendations that may

overlook other considerations, particularly those related to treating individuals with late-stage chronic hepatitis infection such as cirrhosis of the liver or liver cancer. Although addressing the late stages of a hepatitis infection as well as possible moral and ethical considerations was beyond the scope of this research project, policymakers and healthcare practitioners are urged to keep these in mind when drafting programmes and eliminations strategies. Further research is needed to save lives and make the symptoms and effects of hepatitis more bearable, providing the best possible quality of life for those affected.

8 Policy Recommendations

Sustainable Funding:

Recommendations to successfully navigate an increasingly scarce resource environment.

1. **Access more funding by aligning programmes with large donors' priorities.**

Programmes that strategically integrate hepatitis services into broader disease testing, such as HIV, malaria, and tuberculosis, are better positioned to access diverse donor funding. Aligning services to large donor's requirements (Global Fund, GAVI and others) further strengthens the funding case. Programmes focused on HBV can unlock more funding when building their strategy into the triple elimination initiative.

2. **Develop a strategy for sustainable governmental funding**.

Governments are ultimately responsible for leading and funding hepatitis elimination programmes themselves. Organisations should tailor their services to support the government and use their funding to strategically unlock further governmental resources, e.g. by investing in data collection to engage in data-based advocacy.

Government Involvement:

Recommendations to successfully address the government's role in hepatitis elimination.

3. **Focus on elimination programmes in countries with funding previously allocated to hepatitis elimination.**

Demonstrated government commitment to hepatitis elimination is essential to the sustainability of an elimination project. The allocation of government funds for public health and hepatitis elimination is the most important indicator of political commitment. While internationally funded programmes can help create momentum, efforts will be not be sustainable if the local government doesn't continue them after the end of the project. Therefore, financial investments in hepatitis elimination are not recommended without a demonstrated willingness by the local government to commit to the cause in the long term.

4. **Engage various stakeholders in elimination programmes to foster collaboration.**

Programmes that involve a variety of stakeholders including the local government, INGOs, NGOs, the private sector, community leaders and other local actors promote learnings from different sectors of society and allow for a broadening of the discussion about health. This communication and collaboration between stakeholder allow for increased flexibility when implementing and adjusting elimination programmes.

5. **Address existing legislation barriers to facilitate the administration of and access to testing, treatment and cure.**

Existing policies may present structural barriers to access and integration of health services. This can affect both the individual seeking health care and the partner implementing the programme.

Addressing such legislation with the aim of simplifying existing policies allows elimination programmes to be more flexible and adapt to the population concerned.

Management of Health Care:

Recommendations to successfully address the role of the health care infrastructure.

6. **Promote the triple elimination approach to HBV to expand the impact of the programme and improve efficiency.**

The triple elimination initiative involves maternal and child programmes that include testing, treatment and prevention for HIV, syphilis and HBV all under one roof. Especially in rural locations, this integrated approach increases the likelihood of reaching mothers and newborns in time to deliver effective vaccination and treatment. Providing treatment for not only one but three transmittable diseases enable a more impactful and effective protection against vertical transmission.

7. **Deliver decentralised services at the primary level health care.**

Decentralising hepatitis services from tertiary to primary care, the lowest level of access, can effectively enhance outreach by bringing hepatitis care closer to the community and expanding access to the service. This approach enables local clinicians to screen at-risk patients during routine visits for other health concerns, increasing early detection. Being closer to the community also reduces travel time, increasing the likelihood of successful and sustainable linkage to care. By strengthening local clinics, decentralisation can improve the overall delivery of health services to populations in more remote areas.

8. **Integrate hepatitis elimination programmes into existing health care systems.**

Embedding elimination programmes within the public health care system can create lasting impact beyond the completion of the project. Collaborating with Ministry of Health personnel and training health care professionals within the primary health care structure ensures meaningful knowledge transfer and builds local capacity. This approach not only strengthens existing systems but also supports the long-term sustainability of disease elimination efforts. Furthermore, integrated projects are less vulnerable to funding cuts.

9. **Access hard-to-reach populations with the help of mobile health units.**

Mobile health units have proven highly effective in expanding health care coverage by delivering services directly to communities. These units enable health care teams to reach otherwise underserved groups. Mobile clinics can also be deployed in workplaces or positioned near places of worship to engage people who may not visit traditional health care facilities. Their flexibility also supports follow-up care and strengthens linkage to ongoing treatment and support services. However, since utilisation is costly, it should be carefully considered and targeted.

Treatment:

Recommendations to successfully address the treatment of hepatitis.

10. **Consider confirmation testing as part of HCV programmes based on local context, patient retention risks, and cost-effectiveness.**

The test and treat approach excels in terms of efficiency and scalability. However, it might lead to overtreatment, which can result in complications in certain health contexts. For example, in settings with a high prevalence of anaemia, hepatitis treatment may worsen health conditions. Additionally, confirmation testing may be financially unfeasible and lead to unsuccessful linkage to care. If confirmation testing is deemed appropriate, the reflex testing approach in door-to-door strategies has proven to be effective.

11. **Apply 12-week treatment cycles for hepatitis C when using direct-acting antiviral treatment (DAA).**

Regardless of the liver conditions of positively tested patients, a 12-week treatment (instead of a 24-week treatment) of direct-acting antiviral treatment (DAA) has been proven to be successful in curing 96% of patients in a hepatitis elimination programme in Pakistan. All stages of liver fibrosis were effectively addressed with this policy simplification and helped avoid overtreatment.

12. **Focus on the prevention of vertical hepatitis B transmission.**

Most new hepatitis B infections occur through the transmission from mother to child at birth. Therefore, the prevention of vertical transmission is the most effective strategy to combat hepatitis B infections, and should thus be a programme priority, especially in settings where the birth dose vaccination is low. Furthermore, programmes that prevent vertical transmission have greater access to financial resources, are medically more (cost-)effective, and are more easily integrated into existing maternal and child health platforms.

13. **Develop a strategy to provide mothers with prophylactic treatment after leaving the birth facility.**

In regions with high birth rates, it is crucial to ensure that mothers continue to receive prophylactic treatment. Although this treatment is usually given to reduce the risk of transmitting HBV to their infants, many HBV elimination programmes lack sustained strategies to ensure continuity of care across multiple pregnancies.

14. **Test and treat in "one-stop shops".**

To ensure successful linkage to care, it is important to reduce the time between testing and treatment. Referrals for positively tested patients to other treatment sites delay the process and are a barrier to linkage to care. Testing and treating at the same place prevent discontinuation.

Accessibility:

Recommendations to successfully ensure the access to necessary services.

15. **Provide test and treatment services at no cost for the patient.**

The provision of free services builds trust and lowers the access barrier by reducing opportunity costs for patients, making it easier to scale up elimination projects.

Social Awareness:

Recommendations to successfully address local contexts.

16. **Develop elimination programmes that are mindful of and responsive to societal stigma.**

Viral hepatitis is considered a stigmatised disease within various communities, which can prevent people from undergoing testing due to fear of social backlash. To avoid singling out individuals, elimination programmes can be embedded within a broader campaign aimed at improving the overall health of the community or integrated into elimination programmes of other diseases.

17. **Collaborate with community leaders and trusted local actors.**

Trusted local actors, such as community leaders, serve as key entry points into communities and as powerful collaborators to the programme. They can provide support and advocacy, increasing the population's willingness to participate in elimination programmes. Additionally, they may supply essential information about the needs of, and social-cultural conditions present in the target population, which is crucial when launching information campaigns and providing services.

18. **Invest in education campaigns that raise awareness about viral hepatitis.**

Designing local hepatitis advocacy and information campaigns educates people about the disease, including symptoms and long-term health complications, possible prevention strategies, modes of transmission and types of treatment and cure. With access to this information, populations are more likely to actively seek out testing and screening possibilities in the future.

19. **Tailor hepatitis elimination strategies to the health and socio-cultural context of the target population.**

When designing a hepatitis elimination strategy, the specificities of the geographical location and demographic composition of the community in question must be properly assessed, enabling a tailored elimination strategy. These adaptations may be the result of differences in (access) to infrastructure, education and health care, as well as political, cultural and religious factors. If such contextual elements are not considered, there is a risk that certain parts of a community will be neglected or that acceptance will be limited, which could negatively affect the commitment and adherence to the introduced elimination strategy.

20. **Provide Reuse Prevention Syringes (RUPs) and implement an effective waste management system for injectables.**

Safe injection practices are essential for reducing the horizontal transmission of viral hepatitis. This is particularly true in contexts where injectable treatments are frequent. Where resources and human capacity are limited, proper sterilisation and disposal of injecting equipment may consequently suffer. Thus, to prevent further transmission through unsafe medical and injection practices, the introduction of single-use needles and syringes, combined with an effective waste management system, can help ensure safe testing and the administration of appropriate treatments and cures.

Applicability:

Recommendations to implement elimination projects on an evidence basis.

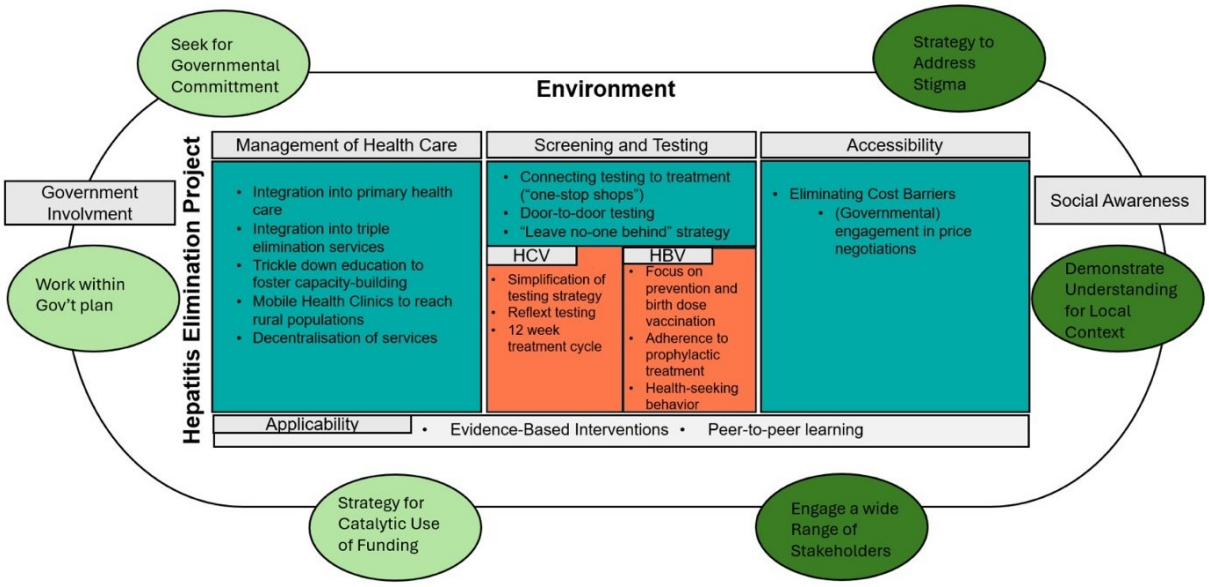
21. **Invest in data collection, monitoring, reporting and publishing to ensure adaptability and create a well-informed hepatitis elimination space.**

Accurate, thorough and responsible data collection must be carried out throughout hepatitis interventions and efficiently shared with all key stakeholders within the hepatitis sector. By regularly reflecting on which measures are working, and which measures are not, elimination strategies can be adjusted quickly – making sure investments remain relevant and effective. Moreover, publishing findings in peer-reviewed medical journals ensures the entire hepatitis community remains informed and aligned in the pursuit of increasingly catalytic investments.

22. **Encourage peer-to-peer learning visits to foster greater inter-regional collaboration.**

Peer-to-peer learning visits have proven effective in promoting knowledge exchange and strengthening collaboration among low- and middle-income countries. This is especially impactful in contexts where data is lacking. By adapting successfully proven strategies to similar settings, countries can save time and resources in the development and implementation of their own elimination programmes.

9 The Hepatitis Elimination Model



The hepatitis elimination model provides a visual illustration of the most important recommendations for effective elimination programmes. Each programme is situated within an environment consisting of a government that needs to provide funding and support to ensure the programme has a sustainable impact, and a societal context with local actors and characteristics that need to be considered. The programme itself, the inner part of the model, is based on three pillars: 'Management of Healthcare', 'Screening and Testing' (including HCV- and HBV-specific nuances) and 'Accessibility'. These three pillars rest on the foundation of "Applicability", meaning they should be informed by data and peer-to-peer learning.

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