# FINANCING FOR HEPATITIS C

## CREATING THE INVESTMENT CASE AND DEVELOPING A FINANCING STRATEGY IN NIGERIA


CLINTON HEALTH ACCESS INITIATIVE

World Hepatitis Alliance

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# INTRODUCTION

Nigeria is faced with one of the largest burdens of hepatitis C (HCV) in the world, with an estimated 2.5 million cases across the country.[i] Like other countries with a high burden of HCV, Nigeria's Federal Ministry of Health (FMOH) realizes the urgent need to expand access to diagnosis and treatment in order to reduce morbidity and mortality associated with complications from the disease. Consequently, the Federal Ministry of Health began efforts in 2015 to set the policy framework for launching a national hepatitis programme.

Despite launching the official programme in 2015 and publishing a five-year National Strategic Plan (NSP) and clinical guidelines in 2016, Nigeria's federal and state governments have yet to secure financial resources sufficient to reach programme targets. The HCV programme must compete with other health priorities for a limited pool of domestic funding, which requires strong evidence of the benefits of prioritising HCV. Nigeria's ability to secure adequate resources for HCV is also complicated by the division of health services financing authority between the federal and state governments. Health service delivery across the 36 Nigerian states is primarily managed by autonomous state ministries of health, requiring a significant level of coordination between the federal and state governments to align on programming and financing strategies.

The Federal Ministry of Health (FMOH) realises that without a viable financing plan, HCV funding may never catch up to the growing demand for services. As such, the FMOH, with support from the World Hepatitis Alliance (WHA) and the Clinton Health Access Initiative (CHAI), decided to embark on a project to better define the benefits of scaling up hepatitis C services and develop a strategy for mobilising the necessary resources. In partnership with in-country and global stakeholders, the FMOH aimed to have a viable financing strategy in place by April 2018. By undertaking this work, the FMOH hoped to answer three critical questions:

**1. What will it cost Nigeria to eliminate HCV by 2030?**

**2. How will Nigeria benefit from eliminating HCV?**

**3. How can Nigeria mobilise the necessary resources to achieve elimination?**

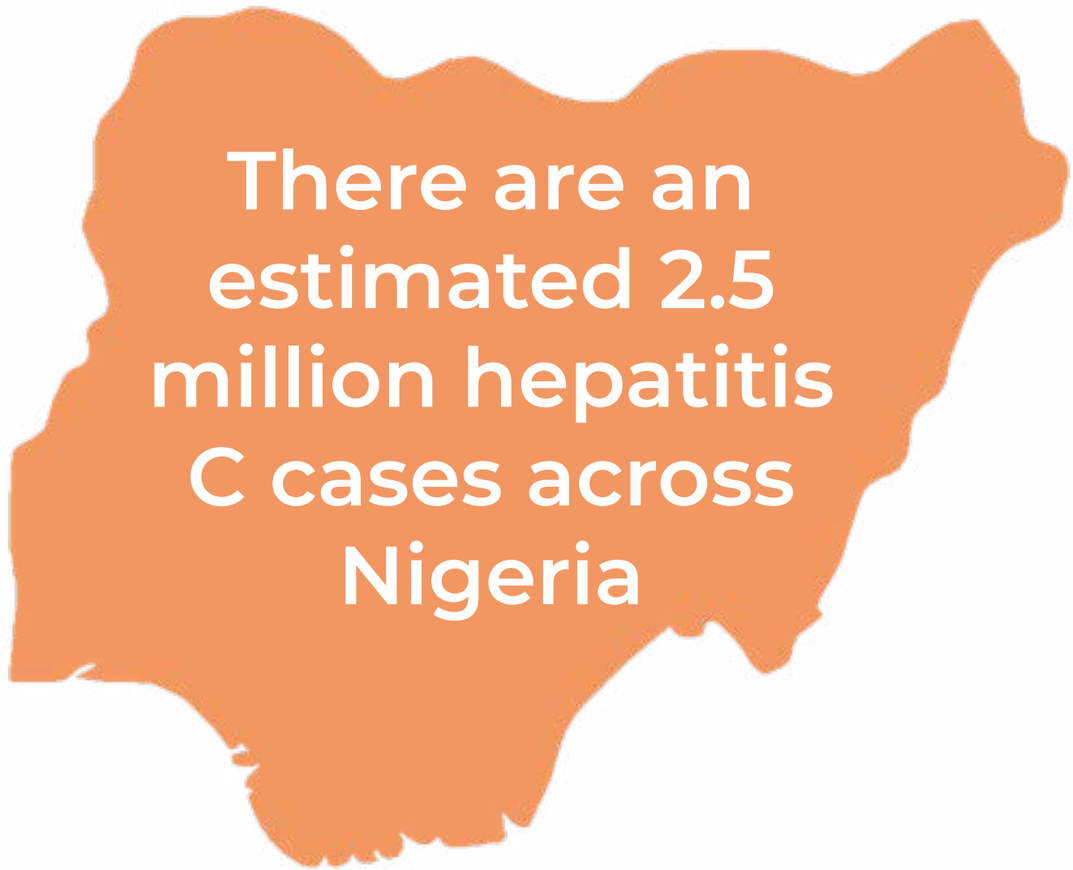
FMOH decided to answer these questions through three major work-streams over a nine-month period:

**1. Costing an HCV elimination programme**

**2. Developing an investment case for HCV elimination**

**3. Crafting a comprehensive financing strategy**

Costing and investment case development started in mid-August 2017 and were finalised by early 2018. Financing strategy work began in the first quarter of 2018 and results were validated during a late March stakeholder meeting. This case study highlights the FMOH's approach, challenges faced and lessons learned from the work to serve as a guide to other countries who are considering similar projects.



# PROGRAMME COSTING

## OBJECTIVE

While the FMOH had already committed to the WHO goal of eliminating HCV as a public health threat by 2030, the resources needed to achieve this target in Nigeria were not yet well understood. The FMOH required a detailed projection of the financing required to scale-up programming in order to:

**a) compare the cost of eliminating to the costs of maintaining the status quo level of service;**

**b) build a financing plan that properly addresses the current gaps.**

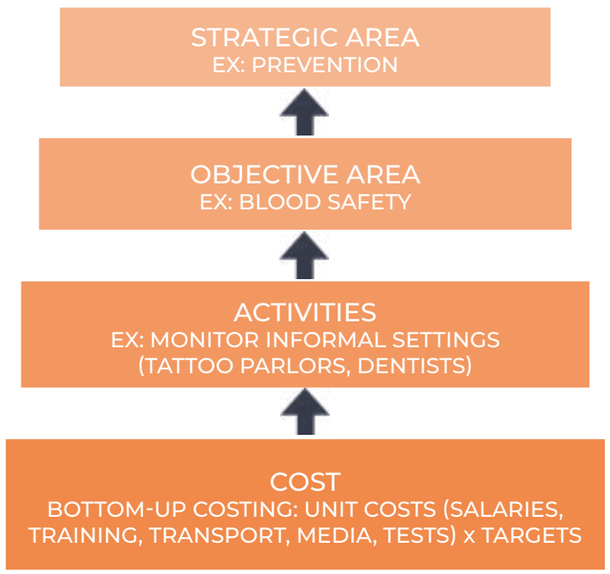
FMOH decided to estimate the cost to eliminate HCV as a public health threat in Nigeria by 2030, defined as a 90 per cent reduction in new infections and mortality from the 2017 baseline.

## APPROACH

CHAI and FMOH decided to follow a bottom-up costing approach (outlined in Figure 1) to estimate the cost of elimination. This approach was selected in order to provide the highest degree of accuracy in the costing while allowing flexibility to evaluate the impact of different degrees of coverage on total costs. Having activity-level costs also facilitates identifying financing sources for different activities.

FMOH also wanted to take an iterative consultative approach to developing the elimination budget. CHAI developed an initial approach and framework for input from a technical working group (TWG) comprised of Nigerian HCV stakeholders (see Appendix 1 for the list of stakeholders involved). Rather than consult with the various stakeholders individually, FMOH decided that convening a TWG would be the most effective and efficient way to receive feedback. Individual TWG members were then consulted on specific costing activities relevant to their expertise.

FIGURE 1: CHAI BOTTOM-UP COSTING FRAMEWORK




## STEPS INVOLVED

Developing and refining the costing model involved five major steps:

**1) Setting targets;**

**2) Defining activities;**

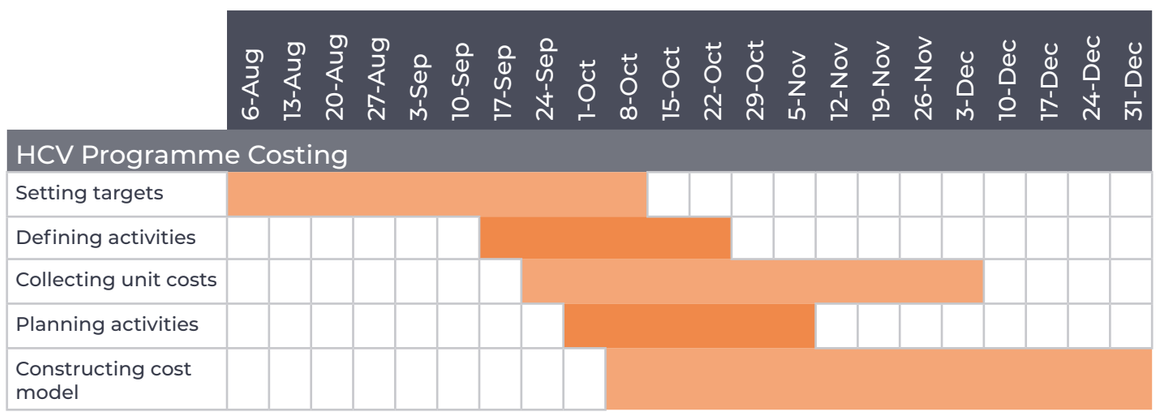
**3) Collecting unit costs;**

**4) Planning activities;**

**5) Constructing cost model.**

These steps are iterative processes, running in parallel, with all inputs and assumptions reviewed consistently throughout model development. The entire process took four months to complete.

FIGURE 2: PROGRAMME COSTING WORK-PLAN



## Step 1: Setting Targets

In order to determine the scope and scale of activities to be costed over the course of an elimination programme, stakeholders must first agree on annual treatment targets. Nigeria's existing five-year National Strategic Plan for Viral Hepatitis only includes treatment targets through 2020 so the FMOH needed to set new patient targets that match the WHO goal of 80 per cent of eligible patients having received treatment by 2030. Prior to the TWG, CHAI developed a draft epidemiological model to inform several treatment scale-up scenarios (Table 1) that would allow Nigeria to reach elimination targets. The annual percentage of remaining chronic patients cured is the differentiating factor between each scenario.

TABLE 1: DRAFT ANNUAL ELIMINATION TREATMENT TARGETS FOR OCTOBER 2017 TWG

| Scenario | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conservative | 27K | 32K | 37K | 42K | 139K | 151K | 161K | 166K | 132K | 99K | 55K | 23K | 6K | 1M |
| Moderate | 77K | 92K | 109K | 126K | 143K | 159K | 170K | 175K | 130K | 89K | 38K | 10K | .5K | 1.3M |
| Aggressive | 77K | 106K | 144K | 188K | 236K | 276K | 290K | 255K | 110K | 54K | 6K | .6K | .01K | 1.75M |

These draft scale-up targets were presented at the TWG for debate on feasibility. During the meeting, civil society organisations advocated to adopt more ambitious annual treatment rates. However, implementing partners, clinicians and state programme managers all argued that reaching the targets proposed in the moderate and aggressive scenarios would be challenging in the early years of the programme. State programme managers highlighted the lack of localised surveillance data and that they would need more time to decentralize to the community level in order to reach moderate or aggressive targets through 2020. Implementing partners and state programme managers agreed that moderate scaleup rates from 2020-2030 could be feasible once the health work force has been properly trained and effective screening strategies have been implemented.

Target setting was an iterative process and annual treatment rates were reevaluated once the final dynamic transmission model was built. Annual scale-up rates were adjusted for each scenario as the modelling work progressed and the effect of patient volumes on costs were better understood. Final annual patient figures are shown in Table 2 below and were shared with the TWG members at the final validation meeting in late March. The conservative scenario achieves elimination by 2030 while the moderate and aggressive scenarios achieve elimination by 2028 and 2030, respectively.

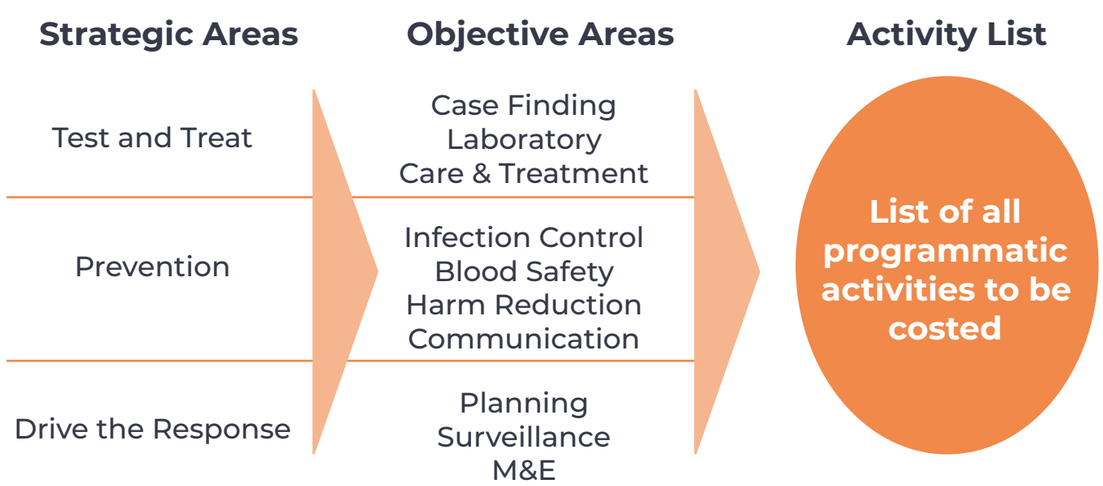
TABLE 2: DRAFT ANNUAL ELIMINATION TREATMENT TARGETS FOR MARCH 2018 TWG

| Scenario | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conservative | 15K | 21K | 26K | 33K | 86K | 112K | 94K | 57K | 30K | 14K | 6K | 2K | 1K | 503K |
| Moderate | 29K | 38K | 44K | 60K | 154K | 93K | 48K | 22K | 9K | 3K | 1K | .5K | .2K | 506K |
| Aggressive | 46K | 52K | 53K | 91K | 168K | 45K | 12K | 3K | 1K | .3K | .1K | .05K | .01K | 475K |

## Step 2: Defining Activities

Breaking down the targets into the list of programmatic activities required to reach targets is the next step. This step in the process is highly consultative, requiring input from different actors with expertise who can advise on the right list of activities and implementation strategies. To reach a consensus on the list of activities to include, CHAI proposed an initial list of high-level strategic and objective areas for members of the TWG to consider at the October project launch meeting (Figure 3).

FIGURE 3: STRATEGIC AND OBJECTIVE AREAS INCLUDED IN COSTING




TWG members agreed that the proposed list of strategic and objective areas was comprehensive. With well-defined strategic and objective area scope in place coming out of the TWG, FMOH and CHAI developed a full list of supporting activities and targets. Various members of the TWG were consulted individually to lend their particular expertise to certain programmatic areas. Project resource constraints restricted the ability to cost an elimination programme with considerations for each of the 36 Nigerian states. CSOs and state programme managers from the 6 geopolitical zones of Nigeria were consulted to ensure regional variance was well accounted for.

During the TWG it became apparent that input from a wide range of stakeholders, both programmatically and geographically, would be essential to developing a strong activity list in Nigeria, where implementation practices vary significantly from state to state. For example, a CSO supporting harm reduction services in northern Nigeria mentioned that needle exchange is not a major aspect of harm reduction in his region as sterile needles are readily available at a low cost. However, Rivers State in southern Nigeria includes needle exchange in their harm reduction package of services.

## Step 3: Collecting Unit Costs

Once a full activity list was in place, CHAI and FMOH assigned each with a unit cost. Developing a unit cost for each activity can be a time-intensive exercise due to the breadth of programme scope. As a thorough costing study for each activity would be time and resource intensive, FMOH decided to leverage recent costing exercises from other disease areas. These included the 2017 Global Fund HIV application and 2017-2018 EMTCT Activity Costing[1] and may also include the 2017-2021 HIV NSP costing. Any remaining gaps were addressed through budget and expenditure data input from TWG members or bottom-up costing at facility level as a last resort.

At the October TWG, members committed to supporting the unit cost collection efforts where possible. The TWG discussed whether and how to factor in facility operating and overhead costs across objective areas. Without the time or resources to conduct individual studies on the contribution of HCV scale-up to operating and overhead costs (such as building maintenance, utilities and management staff), it was decided such indirect costs would be factored into costing as a percentage of total cost for that objective area. The cost attribution methodology was informed by past costing exercises performed by FMOH HIV, TB and malaria programmes.

Once CHAI completed the preliminary list of activities and their unit cost, relevant stakeholders were contacted to complete any missing activities or information.

1 FMOH and CHAI decided not to rely on costing inputs for the previous Viral Hepatitis NSP as a bottom-up costing was not conducted and there are more up to date costing exercises available.

TABLE 3: ILLUSTRATIVE LIST OF COST DATA REQUIREMENTS, SOURCES AND COLLECTION METHODS

| Data Type | Potential Sources | Collection Methods |
|---|---|---|
| **Start-up costs**<br>– Project/programme planning (guidelines, M&E framework, prevalence studies)<br>– Hiring of staff (salary grades and time involved at various levels)<br>– Training and capacity building (development of training materials, job aides, SOPs)<br>– IEC<br>– Infrastructure (lab equipment) | – Project expense reports/ receipts<br>– Recent costing from other disease programmes<br>– FMOH and MOF resources | – Review of budgets and expense reports<br>– Review of recent costing exercises performed in-country<br>– Interviews with MOH, MOF, stakeholders |
| **Recurring Costs**<br>– Lab commodities<br>– Lab equipment depreciation<br>– Sample transport costs<br>– Procurement and supply chain<br>– Training and mentorship<br>– Prevention activities (testing blood supply, OST, needle exchange, outreach)<br>– Drug commodities<br>– M&E/surveillance/planning<br>– IEC | – National/ international cost estimates<br>– Costing from other disease areas<br>– CHAI forecasts<br>– FMOH and MOF resources | – Review of budgets and expense reports<br>– Interviews with MOH, MOF, stakeholders |

## Step 4: Planning Activities

In addition to assigning a cost to each activity, assumptions must be made on the timing, frequency and scale of each activity. Similar to cost collection efforts, FMOH planned to leverage previously published planning and costing exercises to determine the appropriate frequency and scale of activities. TWG members with expertise in different areas were consulted.

The focus of the October TWG was to establish the scope of activities and did not delve into the inputs and assumptions for each line item. However, the TWG did discuss several key aspects of the activity planning methodology. The FMOH and TWG members agreed that activity planning should only factor in the incremental costs of scaling-up HCV services. For example, the procurement of lab equipment used for HCV implementation but financed by another programme will not be included in the costing. In this case, the budget will only account for the reagents and consumables for tests run on shared equipment.

The TWG also discussed how to allocate human resources across objective areas. The FMOH and state programme managers are confident that existing resources can be leveraged for diagnosing and treating HCV to a certain degree, but additional capacity will be required and must be accounted for in the budget. The TWG also emphasised that significant resources may be required at the community level in the later years of the programme. As treatment and prevention efforts increase, overall prevalence will begin to decline, making it more challenging to find asymptomatic patients. Given this, more personnel will need to be assigned to community outreach efforts in the later years of the programme to reach elimination.

State programme managers emphasised that any new clinical hires would not solely focus on HCV – thus the methodology for costing new human resources should be determined by the time it takes to test or manage each HCV patient multiplied by the number of patients targeted per year.

**Considerations for HBV:**

**Multiple civil society organisations involved in the TWG raised concerns that HBV is not being included in the financing strategy development and advocated for its inclusion. This is a valid concern given that HBsAg prevalence in Nigeria is 11 per cent and HBV services are expensive and often limited to the private sector.**

**If possible and relevant to their context, other countries may consider performing this exercise for both HBV and HCV simultaneously.**

## Step 5: Constructing Cost Model

All the outputs from Steps 1 through 4 were inputted into an excel model. Outputs of the model were organised in several different ways, including by strategic area, objective area and cost category.

FIGURE 4: EXAMPLE OF COSTING MODEL STRUCTURE

| | | | | | | #of Units | Total cost |
|---|---|---|---|---|---|---|---|
| Strategic Area | Objective Area | Activity | Cost category | Unit | Unit cost | Y1 Unit (Start up) | Y1 Cost (Start up) |
| Test & Treat | Case Finding | Refine guidelines (screening, testing and treatment) | Meetings | per meeting | $ 12,500 | 2 | $ 25,000 |
| Test & Treat | Case Finding | Provide guidelines and job aides | Printing | per document | $ 5 | 675 | $ 3,375 |
| Test & Treat | Case Finding | Train health care workers in screening | Training | per #HCWs trained | $ 40 | 135 | $ 5,400 |
| Test & Treat | Case Finding | Hire additional staff to screen | HR | per #HCWs staffed | $ 2,000 | 135 | $ 270,000 |
| Test & Treat | Case Finding | Conduct community screening campaigns | Programme | per # of campaigns | $ 4,000 | 2 | $ 8,000 |

Additionally, the budget included conservative, moderate and aggressive versions based on treatment scale-up rates. Additional analysis on the forecasted cost of drug and diagnostic commodities was factored into each scale-up scenario. The overall cost of an elimination programme is highly sensitive to commodity cost assumptions as they are a major driver of case finding, testing and treatment objective area budgets.

The final outputs of the cost model are outlined in Table 4 below. Despite achieving elimination on a faster timeline (2026), the Aggressive scenario is the least expensive of the three due to the significant number of infections averted compared to the Moderate and Conservative scenarios.

TABLE 4: PROGRAMME COSTING BY ELIMINATION SCENARIO (USD)

| Strategic Area | Objective Area | Conservative | Moderate | Aggressive |
|---|---|---|---|---|
| Test & Treat | Care & Treatment | $617.61M | $672.55M | $539.94M |
| | Case Finding | $146.51M | $164.29M | $156.27M |
| | Diagnosis | $91.08M | $95.78M | $92.17M |
| Prevention | Blood Safety | $86.53M | $84.30M | $84.30M |
| | Harm Reduction | $103.79M | $115.68M | $116.55M |
| | Infection Control | $31.98M | $31.98M | $31.98M |
| Drive the Response | Communication | $2.423M | $2.423M | $2.423M |
| | M&E | $45.52M | $53.51M | $57.82M |
| | Planning & Admin. | $102.94M | $111.74M | $99.35M |
| | Surveillance | $18.39M | $21.05M | $22.49M |
| Grand total (2018 - 2030) | | $1.247B | $1.353B | $1.203B |

Once finalised, the cost outputs for each scenario were input into the investment case cost-effectiveness model.

# LESSONS LEARNED

**Several key takeaways emerged from the programme costing process:**

1. Strong leadership from the Ministry of Health was essential to coordinating input from public and private sector partners to ensure that the scenarios costed can be operationalised. This is particularly relevant in Nigeria where health sector service delivery is highly fragmented amongst federal, state and private players.

2. Holding a multiple day TWG was extremely valuable in building consensus on methodology and setting an informed path forward for defining and costing activities.

3. Prioritising the development of the epidemiological model early in the project facilitated target setting. Without the ability to build and vet draft scale-up targets with the TWG, activity costing would have been delayed and required a significant effort to solicit feedback from stakeholders on an individual basis.

4. While utilising previous budget estimates or partner expenditure data can be an efficient approach, the process of obtaining such information can be politically sensitive and may take several months to complete

5. The decision to evaluate only HCV may be politically sensitive depending on the relative burden of the two diseases in a country. If only HCV can be done due to limited resources, messaging should be clear that HCV is not being prioritised over HBV but that limited project resources and the lack of a cure makes the inclusion of HBV in an investment case challenging.



# INVESTMENT CASE DEVELOPMENT

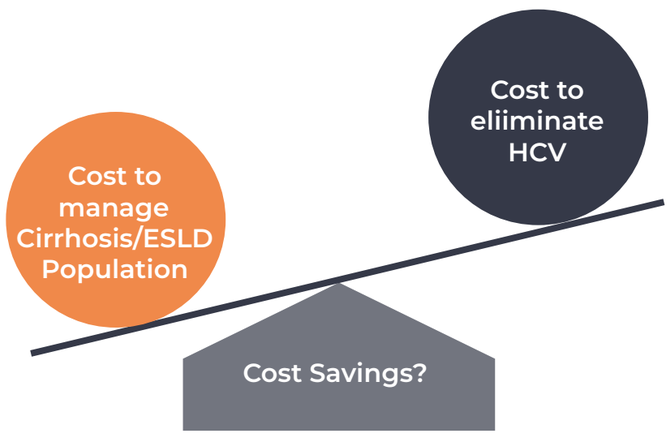
## OBJECTIVE

In Nigeria, political support for HCV service expansion has yet to translate into sufficient financial resources. This can be partially attributed to a poor understanding of the clinical and economic benefits of HCV elimination by potential decision-makers and funders. The structure of the investment case was designed to estimate the clinical, societal and financial benefits of pursuing the elimination of HCV for the purposes of mobilising resources for the programme.

## APPROACH

In order to make the investment case, the FMOH decided it required a cost-effectiveness analysis to both demonstrate the reduction in morbidity/mortality on the HCV population and the potential cost savings generated from eliminating HCV. Ultimately, the model weighs the economic liability of the status quo against the costs/benefits of the three different HCV elimination scenarios.

FIGURE 5: INVESTMENT CASE ANALYSIS FRAMEWORK




## STEPS INVOLVED

Building an investment case involves three major steps:

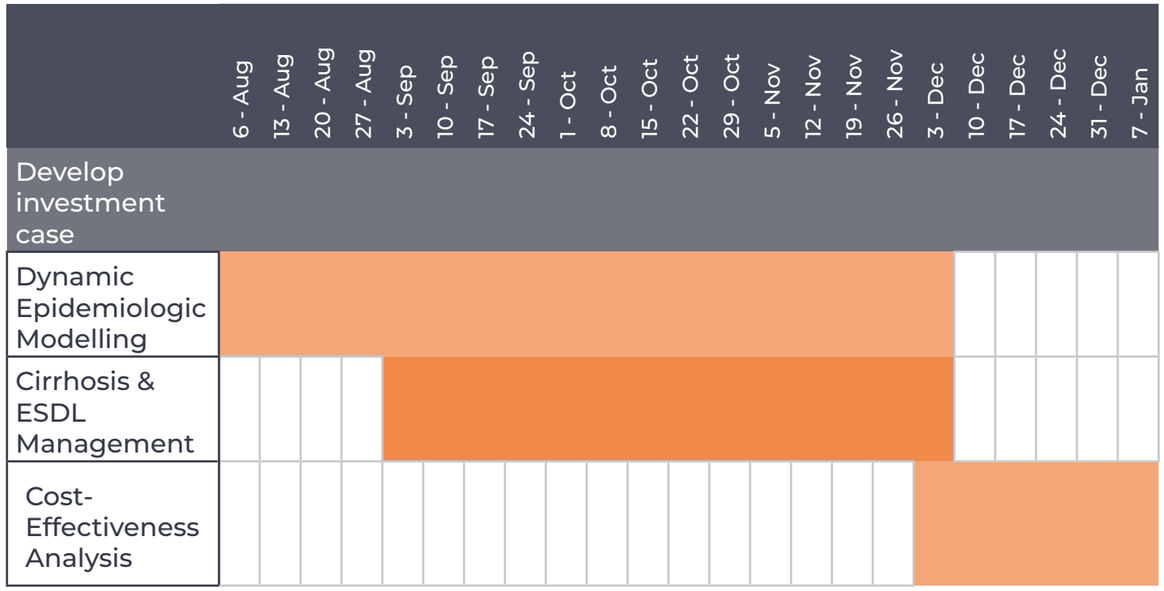
1) Dynamic epidemiological modelling;

2) Cirrhosis and end-stage liver disease costing;

3) Cost-effectiveness analysis.

This approach is aligned with best practices in cost-effectiveness analysis for HCV and will provide FMOH with a transparent output to share with potential funders. This process was completed within six months (August – January)..

FIGURE 6: INVESTMENT CASE WORK-PLAN



## STEP 1: DYNAMIC EPIDEMIOLOGICAL MODELLING

The backbone of a strong investment case is an epidemiological model, tailored to the local context, which models disease incidence, fibrosis progression and clinical outcomes over time based on the rate of treatment scale-up. Key parameters for the model are descibed in Table 5.

TABLE 5: EPIDEMIOLOGICAL MODEL PARAMETERS

| Parameters | Local Data Available? | Sources Used |
|---|---|---|
| Baseline viraemic burden by fibrosis stage | Yes | Nigeria prevalence study; Center for Disease Analysis fibrosis stage breakdown estimates[i] |
| Incidence rate | No | Breban et al. 2014[ii] |
| Disease progression rates | No | Martin et al. 2013[iii] ; Micallef et al. 2003[iv]; Mondelli et al. 200[v]; Wiese et al. 2014[vi] |
| Liver disease-related mortality rates | No | Townsend et al. 2012[vii] |

A key limitation of modelling the Nigeria disease burden is the lack of local data inputs to drive the analysis. Members of the TWG, specifically SOGHIN, were consulted on the availability of local data; however, they were only able to provide insight into prevalence. This limitation was discussed at the TWG and received push-back from stakeholders who expressed concern with utilising a model that heavily relies on data from outside Nigeria. Clinical members of the TWG mentioned that most LMICs face a similar paucity of local data and suggested that the impact of non-Nigerian inputs should be investigated with sensitivity analysis. A consensus was reached to utilise published data from other countries to fill modelling gaps and include the sensitivity analysis.

The model follows the three treatment scale-up scenarios agreed upon with the TWG and were modified at several stages in the process.

FIGURE 7: STATUS QUO SCENARIO FROM EPIDEMIOLOGICAL MODEL

| Year | HCV-infected compartments | | | | | | Model outputs | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | l.acute | l.chronic | l.cirrhotic | l.hcc | l.dc | l.all | births | cum. births | nat. deaths | cum. nat. deaths | cum. esld. deaths |
| 2018 | 25,725 | 2,198,787 | 231,007 | 7,453 | 8,656 | 2,471,627 | 145,865 | 7,275,536 | 127,165 | 6,342,775 | 4,484 |
| 2019 | 27,727 | 2,168,891 | 214,053 | 10,415 | 14,017 | 2,435,103 | 146,588 | 14,587,239 | 127,795 | 12,717,080 | 14,788 |
| 2020 | 27,519 | 2,141,136 | 198,909 | 11,316 | 17,161 | 2,396,041 | 147,313 | 21,935,128 | 128,427 | 19,122,932 | 27,771 |
| 2021 | 27,096 | 2,113,739 | 185,372 | 11,298 | 18,828 | 2,356,333 | 148,040 | 29,319,315 | 129,061 | 25,560,429 | 41,812 |
| 2022 | 26,653 | 2,086,522 | 173,261 | 10,893 | 19,523 | 2,316,852 | 148,771 | 36,739,959 | 129,698 | 32,029,708 | 56,065 |
| 2023 | 26,214 | 2,059,466 | 162,414 | 10,347 | 19,594 | 2,278,035 | 149,506 | 44,197,244 | 130,339 | 38,530,931 | 70,093 |
| 2024 | 25,783 | 2,032,580 | 152,688 | 9,771 | 19,272 | 2,240,094 | 150,245 | 51,691,366 | 130,983 | 45,064,268 | 83,672 |
| 2025 | 25,362 | 2,005,875 | 143,955 | 9,213 | 18,717 | 2,203,122 | 150,988 | 59,222,530 | 131,630 | 51,629,898 | 96,699 |
| 2026 | 24,952 | 1,979,365 | 136,103 | 8,694 | 18,034 | 2,167,147 | 151,735 | 66,790,944 | 132,282 | 58,228,002 | 109,135 |
| 2027 | 24,553 | 1,953,064 | 129,032 | 8,218 | 17,292 | 2,132,158 | 152,486 | 74,396,818 | 132,936 | 64,858,765 | 120,981 |
| 2028 | 24,165 | 1,926,985 | 122,655 | 7,785 | 16,534 | 2,098,124 | 153,241 | 82,040,363 | 133,595 | 71,522,368 | 132,255 |
| 2029 | 23,787 | 1,901,141 | 116,893 | 7,393 | 15,791 | 2,065,005 | 154,001 | 89,721,789 | 134,257 | 78,218,996 | 142,988 |
| 2030 | 23,419 | 1,875,543 | 111,678 | 7,038 | 15,077 | 2,032,755 | 154,765 | 97,441,307 | 134,923 | 84,948,832 | 153,213 |

## STEP 2: CIRRHOSIS & ESLD MANAGEMENT COSTING

Evaluating the cost-effectiveness of HCV elimination requires an in-depth understanding of the current (status quo) costs of HCV to the health system. This costing provides insight into costs that the health system will face if chronic HCV patients lack access to treatment and continue to develop expensive complications requiring specialised care to manage.

In order to estimate the costs associated with the status quo scenario, FMOH and CHAI surveyed Nigerian gastroenterologists and hepatologists to collect cost and frequency data on the services, procedures, visits, tests and non-DAA drugs provided annually across cirrhotic and end-stage liver disease populations: compensated cirrhotics, decompensated cirrhotics and hepatocellular carcinoma patients. To streamline data collection efforts, a CHAI-developed costing template was distributed to the head of the Society for Gastroenterology and Hepatology in Nigeria (SOGHIN), who then distributed the tool throughout its member network (See Appendix 2 for the questionnaire). SOGHIN was the ideal partner for this exercise due to their experience with managing these patient populations in their clinics across Nigeria.

From the data collected, CHAI estimated the average cost of different procedures as well as the current service coverage rate for cirrhosis and HCC management. This information was integrated into the cost-effectiveness model. The methodology was presented and accepted as a valid approach at the October TWG and final results were disseminated at the March TWG.

## STEP 3: COST-EFFECTIVENESS ANALYSIS

The cirrhosis/ESLD, programme costing and epidemiological models were combined to assess the cost-effectiveness of the treatment scale-up scenarios compared to the status quo scenario. The disease-burden outcomes of the analysis include the total number of HCV infections, cirrhotic liver patients, and end stage liver disease patients with either hepatocellular carcinoma or decompensated cirrhosis. The cost outcomes include the total cost of disease management for HCV infected patients, for end stage liver disease patients, and for patients receiving treatment under each scenario. The key outputs of each scenario of the model include:

- **Disease management costs;**
- **Elimination programme costs;**
- **QALYs saved;**
- **Cost-effectiveness ratio.**

Figure 8 below demonstrates the clinical benefits of each elimination scenario compared to the status quo.

FIGURE 8: CLINICAL BENEFITS OF ELIMINATION

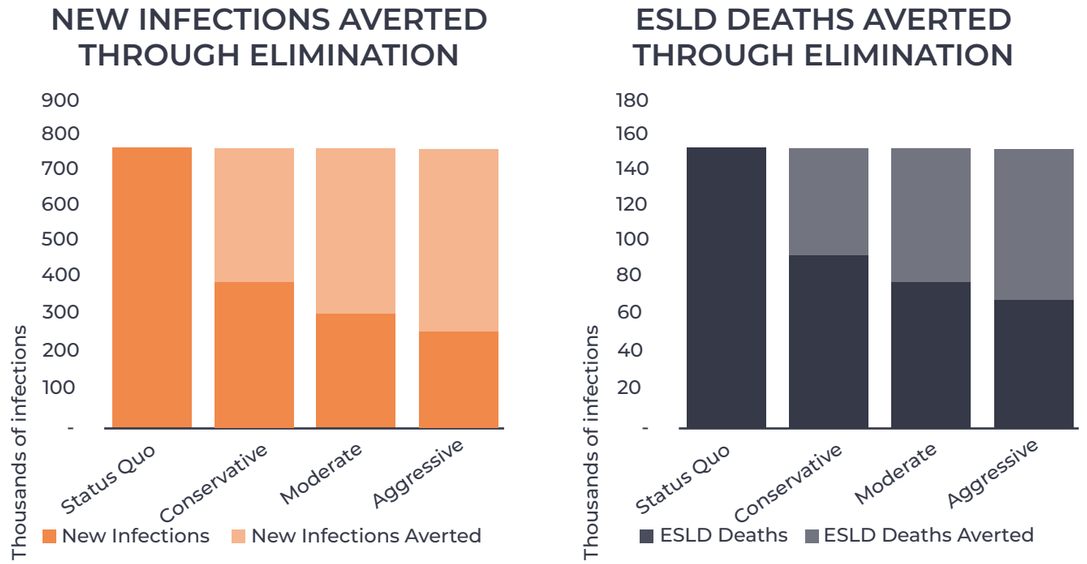



Table 6 below demonstrates the cost-effectiveness of each elimination scenario compared to the status quo.

TABLE 6: FINAL OUTPUTS OF C/E ANALYSIS (USD)

| Cost Inputs | Status Quo | Conservative | Moderate | Aggressive |
|---|---|---|---|---|
| Disease Management Costs | $4.937B | $2.083B | $1.597B | $1.402B |
| Elimination Costs | $0.000B | $1.247B | $1.353B | $1.203B |
| **Total Costs** | **$4.937B** | **$3.330B** | **$2.950B** | **$2.605B** |
| Cost-effectiveness results[a] | Status Quo | Conservative | Moderate | Aggressive |
| C/E | 2.67 | 1.80 | 1.60 | 1.41 |
| Average CER | - | -4,158 | -4,028 | -4,126 |
| **ACER Interpretation** | | **Cost-saving** | **Cost-saving** | **Cost-saving** |

a. The outcomes (or E for effectiveness) in these results was measured in quality-adjusted life-years.

The outputs of the cost-effectiveness model form the basis of the argument for HCV elimination financing. Equipped with a strong cost-effectiveness argument, CHAI, FMOH and members of the TWG can began to interface with potential financers on what financing mechanisms might work for HCV scale-up in Nigeria.

# LESSONS LEARNED

**Several key takeaways have emerged from the investment case development process thus far:**

1. Soliciting input from partners in the early stage of the project by hosting a TWG was helpful to ensure that the investment case methodology is sound and outputs of the work will be applicable to the Nigeria financing context.

2. Finding a strong collaborator to collect cirrhosis/ESLD management cost data has been vital to the development of a strong status quo cost scenario. Working with a partner like SOGHIN has helped CHAI and FMOH avoid conducting a time-consuming and expensive cirrhosis/ESLD costing exercise.

3. Prioritising the development of the epidemiological model early on in the project was essential to facilitating both the investment case and programme costing processes.

4. Although local inputs are ideal, an investment case can still be built using some external assumptions as long as sensitivity analysis is performed on key assumptions that could affect the model.

# FINANCING STRATEGY DEVELOPMENT

## OBJECTIVE

Nigeria's priority health interventions face strong competition for a limited pool of resources. A strong clinical and cost-savings argument for HCV elimination is required to begin making the case for financial resources to be allocated to elimination programming. A well-coordinated financing strategy will be key to driving successful fundraising efforts within Nigeria and with external partners.

## APPROACH

Unlike HIV/TB/Malaria, HCV lacks the necessary domestic and international resources to finance commodities and programming for elimination. FMOH must identify different approaches to effectively fundraise and finance programming than they have for other more well-established public programmes. A strategic mix of financing options, centrally coordinated by the FMOH, will need to be pursued to facilitate the level of programming required to eliminate HCV.

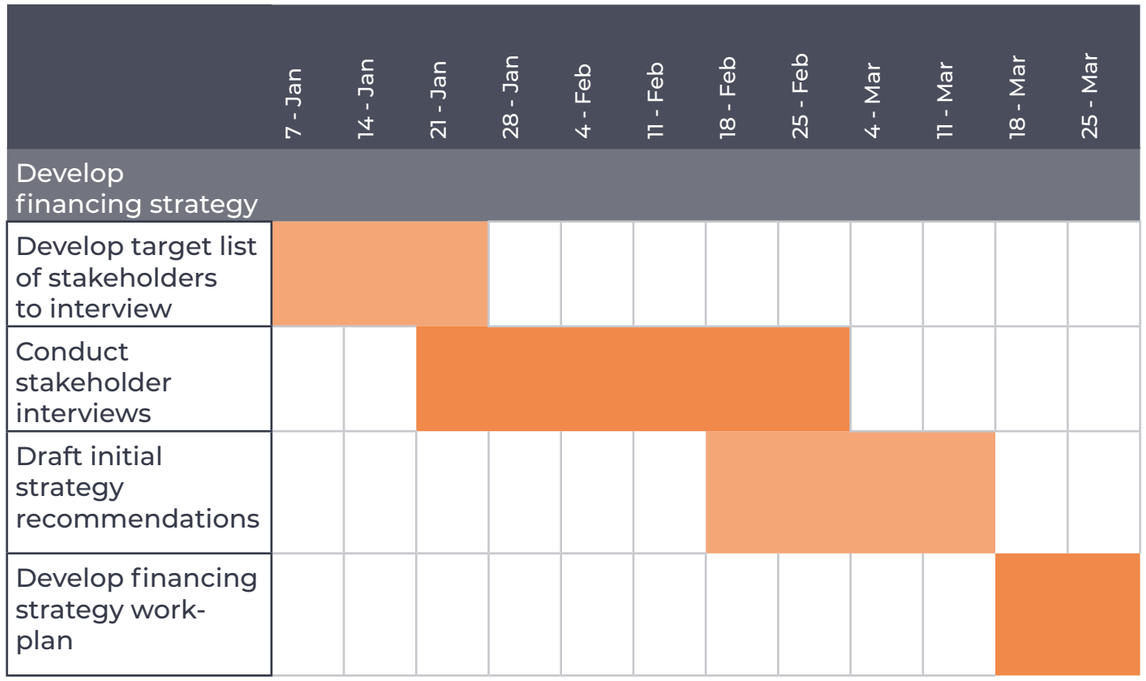
CHAI and FMOH decided to craft an elimination financing strategy by soliciting input from a wide-range of individuals with experience in health and development financing in Nigeria.

## STEPS INVOLVED

**The financing strategy development phase involved four major steps:**

1. **Developing list of interview targets;**
2. **Conducting interviews;**
3. **Drafting initial recommendations;**
4. **Crafting a financing work-plan.**

FIGURE 9: FINANCING STRATEGY WORKPLAN



## STEP 1: DEVELOPING A LIST OF INTERVIEW TARGETS

CHAI and FMOH developed an initial list of potential financing mechanisms to help determine which groups should be contacted for interviews. Table 7 is a list of potential financing mechanisms used to help guide the process of determining who should be involved in the interview process.

TABLE 7: POTENTIAL MECHANISMS TO GUIDE INTERVIEW TARGETS

| APPROACH | POTENTIAL FINANCING MECHANISM |
|---|---|
| Traditional financing models | • State and federal budget lines<br>• Public health insurance programmes<br>• Development bank loans<br>• Donor funding<br>• Academic grants |
| Innovative domestic sources | • Application for recoverable grants (buy-downs)<br>• Revolving drug funds<br>• Earmarked taxes/levies<br>• Remittances and diaspora bonds |
| Private sector funding | • Private sector health insurance<br>• Conditional funding (Development impact bonds, social impact bonds)<br>• Microfinance or micro-insurance programmes<br>• Bank or employer-facilitated loans<br>• CSR funding |

Casting a wide net for potential interview candidates helped to ensure that no key aspects of the development financing landscape were missed during this process. Table 8 is the initial draft list of interview targets. Given that HCV fundraising in Nigeria will require a non-traditional approach, it was important to prioritise a mix of both public and private sector groups as both are likely to play a key role in resource mobilisation.

TABLE 8: INITIAL LIST OF INTERVIEW CANDIDATES

| ORGANISATION |
|---|
| FMOH National Hepatitis Programme |
| Health Financing Unit, FMOH |
| Private Sector Health Alliance of Nigeria |
| Department of Technical Services, MOF |
| Department of International Economic Relations, MOF |
| Senate Committee on Health |
| National Centers for Disease Control |
| Taraba State MOH |
| Nasarawa State MOH |
| Lagos State MOH |
| WHO Nigeria |
| International Financing Corporation |
| Islamic Development Bank |
| World Bank Nigeria |
| Private Banks |
| National Primary Health Care Development Agency |
| Society of Gastroenterology & Hepatology in Nigeria (SOGHIN) |

Not all candidates were able to participate in the interview process and additional groups/individuals were added as interviews took place.

## STEP 2: CONDUCTING INTERVIEWS

During the interview process, each stakeholder was asked a series of guiding questions to help CHAI and FMOH develop a deeper understanding of:

- The long-term health financing strategy of Nigeria and how the viral hepatitis programme might align itself with these plans;
- What short-term catalytic financing options might help the programme expand activities immediately while long-term financing is secured;
- Ideas for financing mechanisms that were previously not considered and what individuals/groups should be contacted for further discussion;
- Past successes and failures in health and development financing along with the lessons learned from the experience;
- A sense for impact, scalability, sustainability and feasibility of various approaches to financing considered for HCV elimination.

A more detailed list of guiding questions used during the interview process are included in the appendix. For many individuals, viral hepatitis elimination is a new concept and the initial interview sessions were usually focused on sensitisation on the disease, the potential for elimination and background on the investment case developed for HCV. Follow up conversations were often necessary and usually yielded valuable input on strategic financing as the interviewee had already had a chance to digest the HCV context in Nigeria.

## STEP 3: DRAFTING INITIAL RECOMMENDATIONS

After concluding all stakeholder interviews, CHAI and FMOH developed a series of initial recommendations to be presented to the TWG members for feedback. A validation meeting was held in late March to present final outputs of the programme costing and investment case along with a series of potential financing options. The initial financing recommendations developed were driven by several themes that emerged during the interview process:

- Securing sustainable financing from multiple domestic and external sources will be key to driving an elimination programme;
- The government has an appetite to finance health programmes with long-term debt in partnership with development banks;
- Earmarked taxes/levies specifically for HCV (or vertical health programmes) are politically challenging to enact;
- Donors, development banks, and all government stakeholders must receive a clear signal from FMOH on the importance of eliminating HCV in Nigeria.

In addition to potential financing mechanism to pursue, recommendations were made on how to better position the HCV FMOH programme for long-term success with financing efforts. Table 9 details the recommendations discussed during the March TWG.

TABLE 9: INITIAL FINANCING RECOMMENDATIONS FOR MARCH TWG

| Priority action items | Resource gap target | Target timeline for success | Potential for impact | Suggested next steps |
|---|---|---|---|---|
| Launch HCV RDFs (or incorporate into existing mechanisms) | Commodities | Within 1 year | Strong short-term option | Share Nasarawa State success story with other high burden states looking to launch treatment availability |
| Operationalise NHIS at accredited hospitals | Commodities | Within 1 year | Strong short and long-term option | Share NHIS recent decision to cover viral hepatitis commodities with state programme managers and advise them on how to link hospitals with NHIS |
| Incorporate HCV into BHCPF plans | Programming | During the 18 months prior to review | Strong long-term option | Coordinate with FMOH planning unit on how to approach Minister of Health |
| Establish standalone viral hepatitis programme within FMOH | Programming and commodities | Within 1 year | Limited | Establish a plan for building a proposal to the Minister of Health and the National Assembly |
| Pursue GF resources | Commodities | Next funding round (TBD) | Limited | Discuss HCV integration with Nigeria GF portfolio manager |

| Priority action items | Resource gap target | Target timeline for success | Potential for impact | Suggested next steps |
|---|---|---|---|---|
| Apply for academic grants | Programming | As RFPs are released | Limited | Monitor RFPs and hold discussions with in-country academic partners |
| Begin donor and development bank outreach | Commodities and programming | Within 1 year | Strong long-term option | FMOH and TWG members to coordinate on approaching potential donors and development banks |

## STEP 4: CRAFTING A FINANCING WORK-PLAN

During the March validation meeting, it was suggested that a financing working group made up of TWG members be established to further vet and prioritise recommendations for action. The TWG called for volunteers and the newly established working-group consists of CSOs, government, academia and NGO partners to ensure broad, cross-sector representation. At the close of the meeting, the financing sub-group agreed to develop a financing work-plan for the programme and meet periodically to move the agenda forward. They also committed to reporting back to the TWG on progress and to hold each other accountable to agreed-upon responsibilities.

# LESSONS LEARNED

**Several key takeaways have emerged from the financing strategy development process thus far:**

1. **Significant input from the Ministry of Financing is key to understanding the long-term health financing context along with what options have had success in the past.**
2. **Multiple interviews with stakeholders are often necessary to receive the desired level of feedback. Interviewees often lack the viral hepatitis context so follow up conversations were often required after initial sensitisation.**
3. **Stakeholders outside of the health sphere should be interviewed to develop the most complete sense of what financing options have worked or not worked in the past.**
4. **When developing recommendations, consider both short term catalytic options to jump-start programming along with approaches for long-term financing that often take longer to develop.**
5. **Programme recommendations should include potential financing mechanism to pursue along with steps that should be taken to better position the programme for fundraising.**
6. **Sharing financing recommendations in a TWG session was key to establishing a working-group responsible for moving the elimination financing agenda forward.**
7. **Holding a TWG to validate financing recommendations was valuable in establishing a path forward to further vet and prioritise financing options for the programme to pursue.**

# STAKEHOLDER INVOLVEMENT

The FMOH considers strong stakeholder consultation to be vital to ensuring that outputs are accurate and can be operationalised in the Nigeria HCV context and useful in demonstrating the value of HCV elimination to potential financing partners. To do so, a mix of public and private partners has been involved in the project and will continue to be key partners in the development of the costing, investment case and financing strategy.

TABLE 10: INVESTMENT CASE DEVELOPMENT STAKEHOLDERS

| Stakeholder | Involvement in Process |
|---|---|
| FMOH | • The National Hepatitis Programme (NHP) led all costing and investment case efforts and coordinate all stakeholder involvement together with CHAI<br>• Dr Sunday Aboje of the National Hepatitis Programme acts as the head of the TWG and is spearheading the project for the FMOH<br>• The NHP consulted with other groups within the FMOH:<br>  ◦ The Health Financing Division and National Health Insurance Scheme.<br>  ◦ The National AIDS and STIs Control Programme (NASCP).<br>  ◦ The Health Planning, Research and Statistics Department.<br>  ◦ The National Primary Health Care Development Agency. |
| State MOH Programme Managers | • Each state in Nigeria has a standalone Ministry of Health to lead programme implementation. As the primary implementers across disease areas, state MOH programme managers were relied upon for input on all aspects of the costing process to ensure that model outputs are representative of the state context |
| Ministry of Finance, Department of Technical Services and International Economic Relations Division | • The Ministry of Finance played an important role in advising fundraising strategy development, particularly with regards to debt financing. |
| Society of Gastroenterologists and Hepatologists in Nigeria (SOGHIN) | • Private sector gastroenterologists and hepatologists have the most experience with local HCV context and lead all cirrhosis and end stage liver disease management costing efforts.<br>• They will also contribute to activity planning, target setting and unit cost collection efforts.<br>• As members of the TWG, they will be invited to participate in all workshops and asked to review model drafts for input. |
| Civil Society organisations | • CSOs act as advisors within the TWG and played a key role in guiding activity planning, unit cost collection and vetting financing options.<br>• As members of the TWG, they will be invited to participate in all workshops and asked to review model drafts for input. |
| WHO Nigeria | • WHO Nigeria has led normative guidance and strategic planning efforts in coordination with the FMOH and plays an important consultative role in target setting, activity planning and costing methodology and all aspects on investment case development. |

# APPENDICES

## APPENDIX 1: LIST OF TWG MEMBER ORGANISATIONS

| ORGANISATION |
|---|
| FMOH National Coordinator, NASCP |
| SOGHIN |
| Viral Hepatitis Assoc. of Nigeria (VHAN) |
| Elohim Foundation |
| Hajo NCD Prevention |
| Beacon Youth Initiative |
| Chagro-Care Trust |
| State MOHs & State Coordinators |
| CIND |
| NIMR |
| WHO |
| FMOH: Prevention Lead, NASCP |
| FMOH: Medical Officer (PMTCT) |
| Advocacy for the Prevention of Hepatitis in Nigeria (APHIN) |
| Gammun Centre for Care and Development |
| Grassroot Economic Empowerment Initiative (GREEINPROJECT) |
| Hope Life Support & Empowerment Initiative |
| LiveWell Initiative LWI |
| SHECA Foundation |
| Shepherd Care Initiative |
| Trinity Healthcare Foundation |
| VHAN |
| Women and Children Health Empowerment Foundation |



## APPENDIX 2: CIRRHOSIS/ESLD COSTING QUESTIONNAIRE

| | |
|---|---|
| Step 1: | Compile complete list of services, procedures, visits, tests, and non-DAA drugs involved in HCV patient management in Nigeria along with a cost for each. Do not include items that are not currently offered to patients in Nigeria. A potential list is provided - remove or add items from the initial list as needed. |
| Step 2: | For each disease state page, list unit cost items involved in routine care by choosing from unit cost inputs page. |
| Step 3: | Provide frequency per year for each unit cost item on each disease page. |
| Step 4: | Provide a high and low estimate for the number of years a patient typically remains in each disease state. |

## PATIENT MANAGEMENT UNIT COST INPUTS

| Input | Unit | Cost/Unit | Source |
|---|---|---|---|
| Visits: Examination fee | 1 examination | $3.00 | *Example* |
| Visits: AST/ALT | 1 test | | |
| Visits: CBC | 1 test | | |
| Visits: Ultrasound | 1 test | | |
| Hospital stays: Hospitalization fee | 1 hospital stay | | |
| Hospital stays: AST/ALT | 1 test | | |
| Hospital stays: CBC | 1 test | | |
| Hospital stays: Ultrasound | 1 test | | |
| Hospital stays: Coagulation test | 1 test | | |
| Hospital stays: Urea/ creatinine | 1 test | | |
| Hospital stays: Fresh frozen plasma | 1 test | | |
| Hospital stays: CT scanner | 1 test | | |
| Antibiotics | 1 dose | | |

| Input | Unit | Cost/Unit | Source |
|---|---|---|---|
| Diuretics: Spironolactone | 1 dose | | |
| Drugs: Fluid | 1 dose | | |
| Drugs: Aldacton | 1 dose | | |
| Drugs: PPI | 1 dose | | |
| Drugs: Sorbitol | 1 dose | | |
| Drugs: Endoscopic Variceal Ligation | 1 dose | | |
| Drugs: Albumin | 1 dose | | |
| Drugs: Paracentesis | 1 dose | | |
| Drugs: Vitamin K | 1 dose | | |
| Drugs: Antibiotics (2) | 1 dose | | |
| Endoscopy | 1 test | | |
| Liver biopsy | 1 test | | |
| Transcatheter arterial chemoembolization | 1 procedure | | |
| Operation | 1 procedure | | |
| Liver transplant | 1 procedure | | |
| Radiofrequency ablation | 1 procedure | | |
| Percutaneous ethanol injection | 1 procedure | | |
| Transcatheter arterial chemoembolization | 1 procedure | | |
| Sorafenib | 1 dose | | |

## CIRRHOTIC MANAGEMENT PROTOCOL

| | Low est. | High est. |
|---|---|---|
| Estimate of years in disease state | | |

| Intervention | Units/year | Cost/unit | Total cost | Notes/ Assumptions |
|---|---|---|---|---|
| Visits: Examination Fee | | $3.00 | $ | *Example* |
| Total Annual Cost Per Cirrhotic Patient | | | | |

## DECOMPENSATED CIRRHOTIC MANAGEMENT PROTOCOL

| | Low est. | High est. |
|---|---|---|
| Estimate of years in disease state | | |

| Intervention | Units/year | Cost/unit | Total cost | Notes/ Assumptions |
|---|---|---|---|---|
| Visits: Examination Fee | | $3.00 | $ | *Example* |
| Total Annual Cost Per Decompensated Cirrhotic Patient | | | | |

## HEPATOCELLULAR CARCINOMA MANAGEMENT PROTOCOL

| | Low est. | High est. |
|---|---|---|
| Estimate of years in disease state | | |

| Intervention | Units/year | Cost/unit | Total cost | Notes/ Assumptions |
|---|---|---|---|---|
| Visits: Examination Fee | | $3.00 | $ | *Example* |
| Total Annual Cost Per Hepatocellular Carcinoma Patient | $ | | | |

## APPENDIX 3: GUIDING INTERVIEW QUESTIONS

### Health Financing Landscape

| Question | Notes |
|---|---|
| Do you anticipate the overall budget for health in Nigeria to increase or decline in the near future? | |
| What is the strategy for integrating financing for new or emerging health priorities into the broader HF approach in Nigeria? | |
| Are there any recent success stories you could share where a health or non-health programme was able to raise financing? What were the main drivers of success? | |

### Impact

| Question | Notes |
|---|---|
| What is the range of income that this mechanism could generate? | |
| Are there any examples of other programmes that have used this approach and what level of resources they were able to raise? | |

### Feasibility

| Question | Notes |
|---|---|
| Does this approach have a proven track record of success in Nigeria health sector or beyond? If so, what was the process like? | |
| Are there the necessary resources, capacity and political support to implement this? | |
| Does this approach align with broader HF policy objectives? | |
| Who would need to be involved in the decision-making process to move this forward? Would legislative changes be required? | |
| Are partners and systems already in place to support implementation? | |
| Are there significant administrative and upfront costs involved? | |

### Health Financing Landscape

| Question | Notes |
|---|---|
| Is this a viable long-term option without external resource support? it possible to start small and scale further in the future? | |
| Does this option provide the NHP with the level of ownership required to effectively implement the programme? | |
| Is this approach limited to reaching certain geographies or populations? | |
| Could it be easily scaled across states and at the federal level? How long would it take to scale nationally? | |

### Equity, ethics and externalities

| | |
|---|---|
| Would this financing option negatively affect spending elsewhere in the health sector? | |

### Closing questions

| | |
|---|---|
| Are there financing options not listed that HCV stakeholders should consider? | |
| Are there any ongoing financing initiatives where HCV integration would make sense? | |



# ENDNOTES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