From HIV Infrastructure to Integrated Chronic Care in Africa

A New Model for HIV, Hepatitis B, Diabetes and Hypertension Care

The 2for1 project – "Integrate to eliminate"

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Diagnosis and treatment gaps persist for hepatitis B Lack of Global Progress (2026)

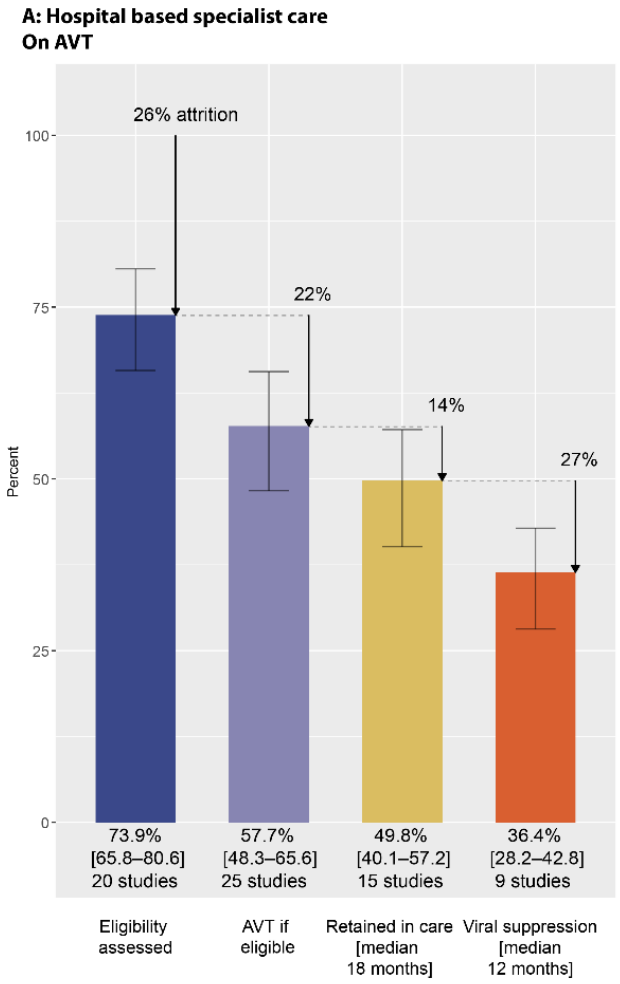
Global targets: latest status of progress[a]

b) Service coverage targets

Indicator		Targets for 2030
Percentage of neonates who received a timely birth-dose of hepatitis B vaccine	45%	90%
Percentage of infants who received a third-dose of hepatitis B vaccine	84%	90%
Percentage of people with chronic HBV infection diagnosed	27%	90%
Percentage of eligible people with chronic HBV infection treated	4.3%	80%
Number of HBV-related deaths per year[d]	+17%	65% reduction compared with 2015
Number of new chronic HBV infections per year	32%	95% reduction compared with 2015

Poor linkage, uptake of treatment and retention Comparison with HIV

Hospital/specialist care models for hepatitis B



Service delivery models and care cascade outcomes for people living with chronic hepatitis B: a global systematic review and meta-analysis

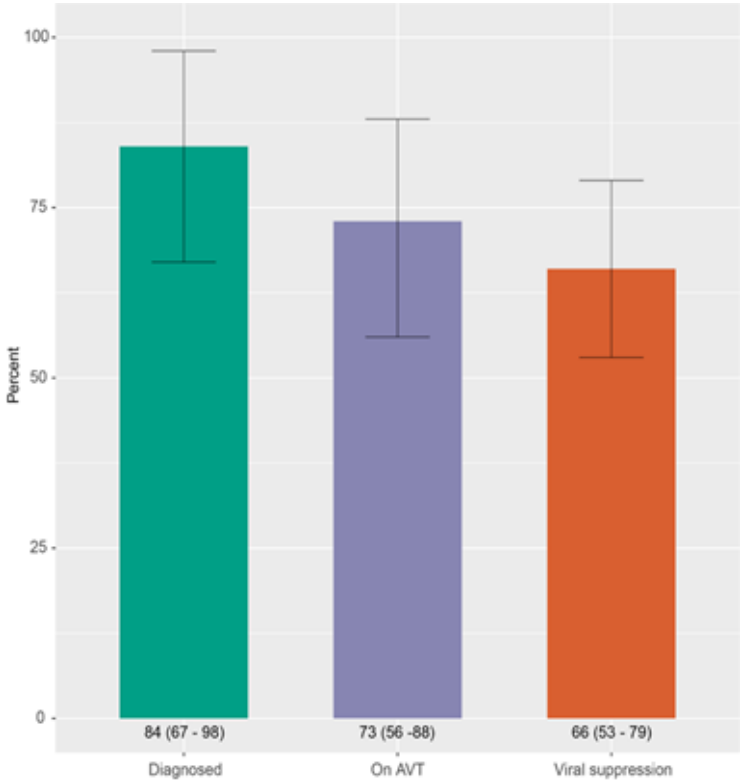
Summary

Background Chronic hepatitis B is a leading cause of cirrhosis and hepatocellular carcinoma globally. In 2022, only 13% of the 254 million people with chronic hepatitis B were diagnosed and 3% were treated, highlighting a major gap in care provision. We aimed to comprehensively review service delivery models and their outcomes across the hepatitis B care cascade.

Methods For this systematic review and meta-analysis, we searched PubMed, Embase, and Scopus for observational and interventional studies of chronic hepatitis B service delivery models that reported care outcomes, published between May 1, 2013, and July 15, 2024, with no language restrictions. Care cascade outcomes were the proportion of people diagnosed with hepatitis B who were assessed for treatment eligibility; the proportion of eligible people who started antiviral therapy; the proportion retained in care; and the proportion on therapy who had HBV DNA viral suppression. We evaluated pooled outcomes across hospital-based specialist care; co-managed care between primary and specialist care; community screening with linkage to specialist care; community screening with passive linkage to care; community test and treat clinics; primary care; and integrated care with antenatal, non-communicable disease, HIV, prison health, and substance misuse services and clinics, using a generalised linear mixed model with logit link and study random effects. For within-study comparisons of different models, we used inverse variance weighting to estimate the pooled risk ratio (RR). Heterogeneity was assessed with I^2. This study is registered with PROSPERO (CRD42023410009).

Findings Of 4883 studies identified in the search, we included 106 studies comprising 110 cohorts from 50 countries in our meta-analysis. 45 (41%) of 110 cohorts were from low-income and middle-income countries and 65 (59%) were from high-income countries. 76 (72%) of 106 studies were observational, 23 (22%) were non-randomised interventional studies, and seven (7%) were randomised trials. Treatment eligibility assessment occurred in 73·9% (95% CI 65·8–80·6; I^2=98·5%) of patients for hospital-based specialist care (20 cohorts), 63·1% (53·0–72·2; I^2=99·9%) for co-managed care (23 cohorts), 50·4% (25·9–74·8; I^2=99·7%) for primary care (four cohorts), 82·3% (58·7–93·8; I^2=96·1%) for community screening with linkage to specialist care (ten cohorts), 33·2% (23·1–45·1; I^2=98·6%) for community screening with passive linkage to care (three cohorts), 56·9% (40·2–72·1; I^2=98·8%) for diagnosis in antenatal clinics and post-delivery linkage to specialist care (five cohorts), 75·0% (37·7–93·7; I^2=0·0%) for integrated care with harm reduction services (two cohorts), and 85·4% (78·0–90·6; I^2=0·0%) for integrated care with prison health services (two cohorts). Initiation of antiviral therapy when eligible was 78·1% (95% CI 68·1–85·7; I^2=99·2%) in hospital-based specialist care (25 cohorts), 67·2% (55·5–77·1; I^2=95·8%) in co-managed care (11 cohorts), 49·3% (32·4–66·4; I^2=87·9%) in primary care (four cohorts), 97·7% (80·6–99·8; I^2=39·2%) in community screening with linkage to specialist care (seven cohorts), and 49·4% (22·1–77·0; I^2=84·0%) for integrated care with non-communicable disease clinics (two cohorts). Higher rates of treatment eligibility assessment (RR 2·07 [95% CI 1·65–2·59], p<0·0001; I^2=97·1%; three cohorts) and initiation of antiviral therapy (1·45 [1·13–1·85], p=0·0031; I^2=0·0%; three cohorts) were observed in hospital-based specialist versus primary care models. Retention in care, assessed between 12 and 48 months, was 87·7% (95% CI 79·9–92·8; I^2=96·7%) in patients on antiviral therapy in hospital-based specialist care (13 cohorts) and 47·2% (95% CI 12·2–73·6, I^2=99·5%) in patients not receiving antiviral therapy (two cohorts). Overall, retention was higher in patients with versus without antiviral therapy (RR 1·72 [95% CI 1·16–2·54]; p=0·019). HBV DNA viral suppression for patients on antiviral therapy in specialist care (nine cohorts)

UNAIDS Global Estimates for HIV, 2020 (includes diagnosis)
<15% drop off for treatment/suppression



Funding shock
Evolving impact of the global health aid crisis

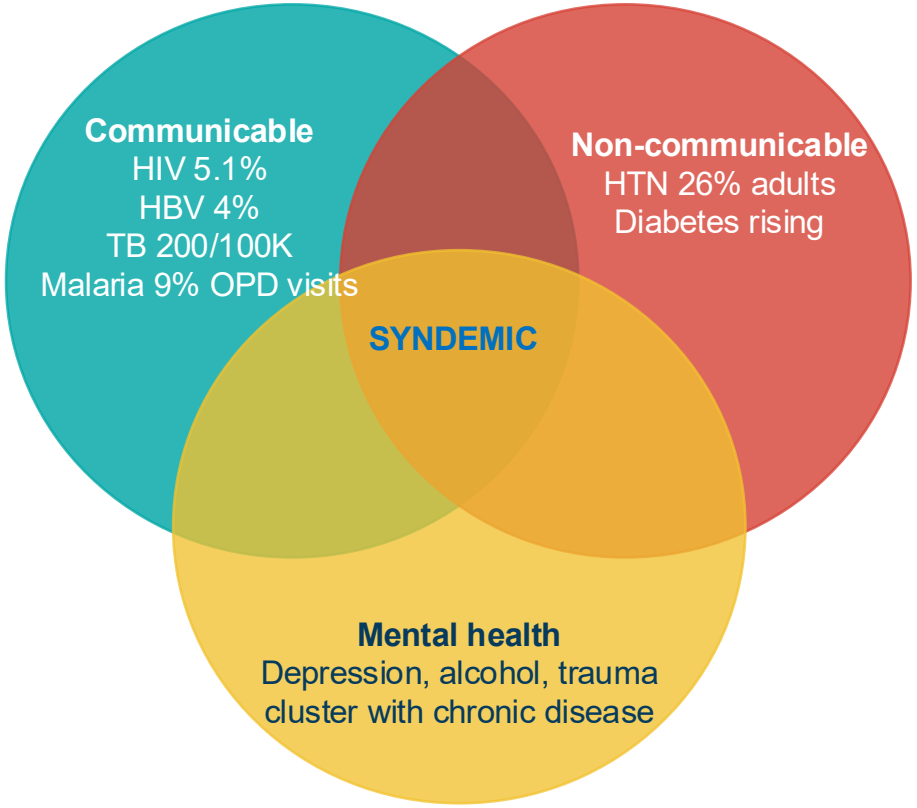
- Pause and cuts of US foreign aid in January 2025, including operations of USAID and USCDC in global operations and programs especially the President's Emergency Plan for AIDS Relief (PEPFAR)
  - Major cuts in TB, HIV, immunization and vaccines, maternal and child health, response to disease outbreaks and emergency/humanitarian response
  - PEPFAR supports HIV programming, and where majority of the hepatitis programs leverage on, which will be impacted
  - Impact to funding for most United Nations agencies, including WHO
  - Program and service disruptions across many countries

- Multiple governments including UK, Germany, France, Switzerland, Netherlands and Sweden also reduced aid resulting in additional gaps in global aid

https://www.unaids.org/en/impact-US-funding-cuts
https://www.kff.org/global-health-policy/issue-brief/the-trump-administrations-foreign-aid-freeze-and-global-health-the-biggest-gaps-left-on-the-donor-landscape/
https://www.euronews.com/health/2025/03/07/utterly-devastating-global-health-groups-left-reeling-as-european-countries-slash-foreign-
WHO media briefing on global health issues with Dr Tedros, 17 March 2025: https://www.youtube.com/watch?v=hbr2B30htPM

Burden shift
Adapt response to reflect syndemic reality

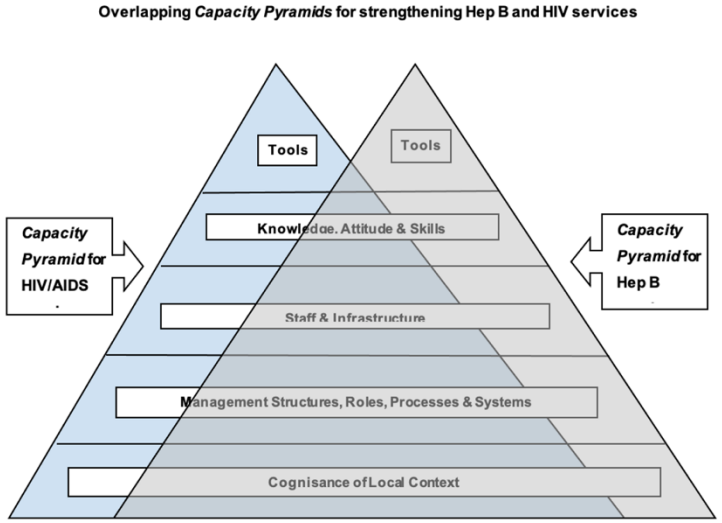
- HIV, HBV, diabetes, hypertension, mental health and social needs increasingly coexist in the same person.
- Burden in Africa is shifting from acute, single episodes to chronic, multi-cause conditions.
- Much of the system was built around vertical programs, separate registers and repeated visits.
- Poverty, urbanization, food insecurity, displacement, alcohol, stigma and transport costs cluster with disease and amplify poor outcomes



HIV-HBV Integration builds on convergence of key opportunities

1. Multiple synergies between HIV and HBV care and NCDs (hypertension and diabetes). Requirement for lifelong suppressive antiviral therapy, use of a tenofovir based regimen, monitoring of viral load to confirm viral suppression, interventions to support long-term adherence and retention in care.

***2. Capacity Pyramid* shows overlapping areas of capacity (eg. laboratory and pharmacy infrastructure eg. between HIV and HBV) where resources may be shared**, supported through Global Fund, PEPFAR and national governments.



3. Availability of highly effective low cost tenofovir through multiple generic manufacturers at a negotiated price ceiling of $30 per year, and also of dual therapy (TNF + 3TC/FTC) through ART or PreP programs.

4. Recent launch and dissemination of 2024 WHO hepatitis B guidelines that substantially simplify and expand eligibility for treatment to > 50% of those with CHB, including adolescents and women of reproductive age.

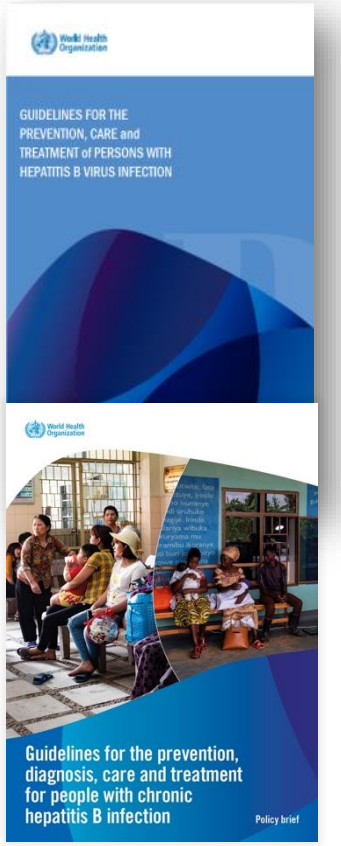
5. Recent momentum and adoption by many countries in SSA of triple elimination of MTCT for HIV, HBV and syphilis

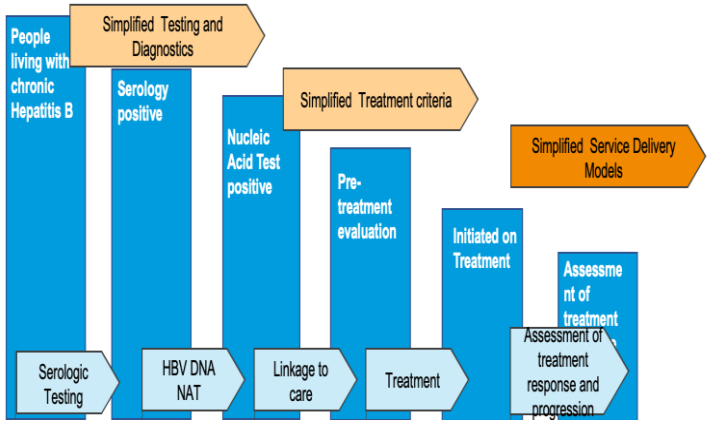
6. Successful implementation of the "2for1" pilot model at two HIV clinics in northern Uganda.

2024 WHO Hepatitis B Guidelines across the cascade of prevention, diagnosis, treatment & care

- **Who to treat**
  - Expanding criteria for treatment (lower APRI score >0.5 and HBV DNA threshold >2000 IU/ml)
  - Expanding treatment for adolescents (including some immune tolerant)
- **First-line treatment**
  - TDF or Entecavir (preferred), TDF/3TC or TDF/FTC (alternative), TAF (specific age groups/ clinical situations)
- **PMTCT**
  - Expanding criteria for use of antiviral prophylaxis to all HBsAg positive pregnant women, where no access to HBV DNA testing
- **Simplifying diagnosis**
  - Use of PoC HBV DNA viral load and reflex viral load testing
  - Delta virus testing – Who to test and how to test and reflex testing
- **Simplifying service delivery**
  - Good practice principles for promoting adherence and retention in care
  - Decentralisation, integration and task-sharing

29 recommendations (14 new or updated)





https://www.who.int/publications/i/item/9789240090903

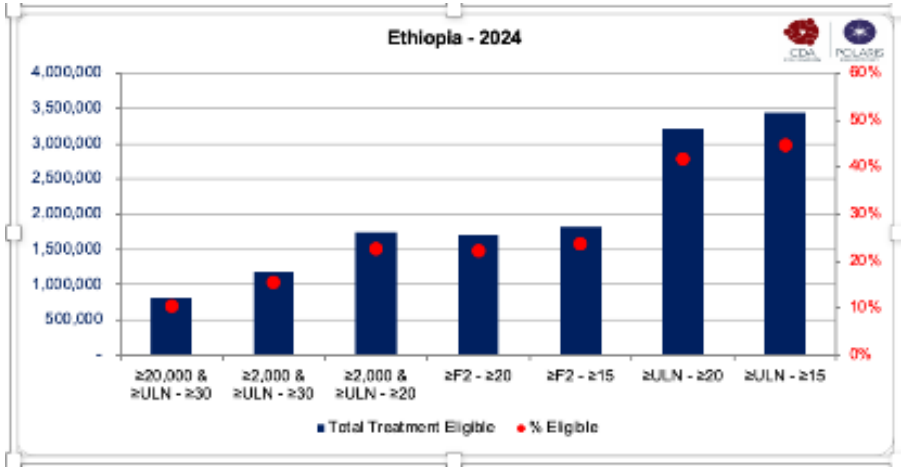
Expanded treatment eligibility - Key messages

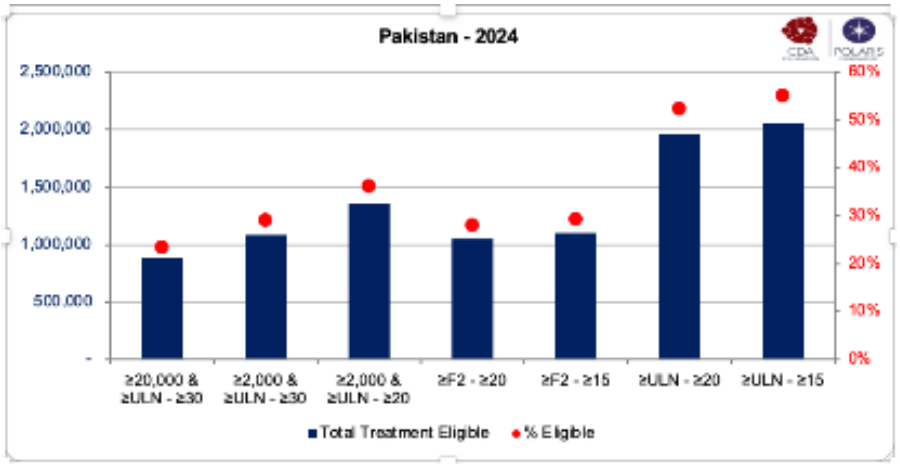
- Recommendations now focus mainly on **who to treat**
- Inclusion of **all** age groups (adults and adolescents, including women of reproductive age (pregnant and non-pregnant)
  - **Allows a common entry point for treatment,** simplifying guidelines and implementation
  - Will mean many more pregnant and non-pregnant women will be on treatment for their own health. Complements expanded eligibility for antiviral prophylaxis – option for continuous treatment post-partum

- **Four and/or options for meeting treatment eligibility**
  - Will capture high proportion **(≈ 50%) of all HBsAg vs. 8-15% previously.**
  - **Applicable to all settings – where there is ready or limited or no access to HBV DNA assays**. Majority of HBsAg +ve will meet criteria for treatment without need for HBV DNA assay. Only 1 of 4 options requires access to HBV DNA.
  - **Use of non-invasive tests** (APRI/TE) (≥F2): greatest individual benefit in reducing liver cancer, cirrhosis and liver related mortality

Modelling: impact of changing age, HBV DNA and ALT levels eligibility for treatment

Proportion eligible according to different hypothetical treatment eligibility criteria





Successful implementation of Integrated HBV and HIV service delivery model — “2-for-1” project in West Nile region, Uganda

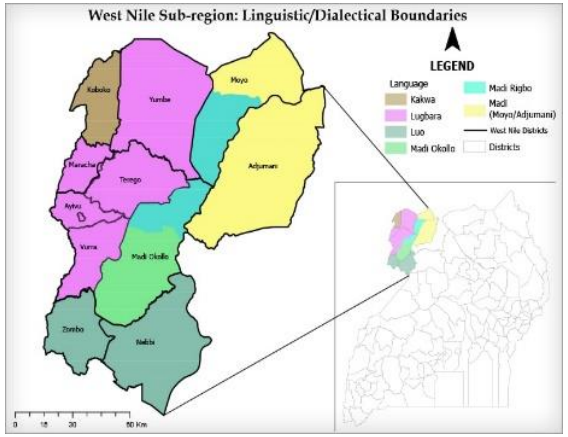
- **West Nile region of Uganda**
  - Composed of 10 districts
  - Total population: ~3,000,000 (2018)

- **High Burden of HIV and HBV**
  - HIV 3.1%, HBV prevalence 3.8% (UPHIA 2017)

- **Arua and Koboko districts**
  - Arua regional referral hospital (ARRH)
  - Koboko district hospital (KDH)

- **The 2 hospitals have**
  - HIV dedicated clinic - Donor funded, well served
  - HBV dedicated clinic - Locally funded, poorly served

- **“2for 1” model**
  - Integrate care for HBV-mono infected patients within existing HIV care system
  - Implemented at two public health facilities – regional referral and district hospital



Feasibility and Acceptability "2-for-1" integrated HBV and HIV

Training

- Design of bespoke training curriculum for HCWs
- CME - In person and virtual
- Services free of charge
- Integrated peer-support

Feasibility and acceptability

- Informant interviews and 6 focus group discussions (HIV and HBV patients and staff)
- Qualitative interviews- most patients and health care providers considered integration as feasible and beneficial
  - Convenience and increased access to HBV clinic care
  - Opportunity to receive more comprehensive care (counseling, health education, peer support)
- Concerns about rise in stigma associated with integration and lack of community awareness


Nankya-Mutyoba et al. BMC Medical Education (2022) 22:297 https://doi.org/10.1186/s12909-022-03329-3

BMC Medical Education

RESEARCH Open Access

A training for health care workers to integrate hepatitis B care and treatment into routine HIV care in a high HBV burden, poorly resourced region of Uganda: the '2for1' project

Joan Nankya-Mutyoba[1*], David Ejalu[1], Claude Wandera[2], Rachel Beyagira[3], Jacinto Amandua[3], Emmanuel Seremba[4], Kaggwa Mugagga[5], Andrew Kambugu[2], Alex Muganzi[2], Philippa Easterbrook[5] and Ponsiano Ocama[4]


Mutyoba et al. BMC Health Services Research (2023) 23:59 https://doi.org/10.1186/s12913-022-08924-0

BMC Health Services Research

RESEARCH Open Access

Feasibility and acceptability of integrating hepatitis B care into routine HIV services: a qualitative study among health care providers and patients in West Nile region, Uganda

Joan Nankya Mutyoba[1*], Claude Wandera[2], David Ejalu[1], Emmanuel Seremba[3], Rachel Beyagira[4], Jacinto Amandua[2], Kaggwa Mugagga[5], Andrew Kambugu[2], Alex Muganzi[2], Philippa Easterbrook[5] and Ponsiano Ocama[3]

"--"They [community] will accept because the treatment is free being given by the Government so if you are to buy the medicine out there it is very expensive."
- Hepatitis Clients FGD

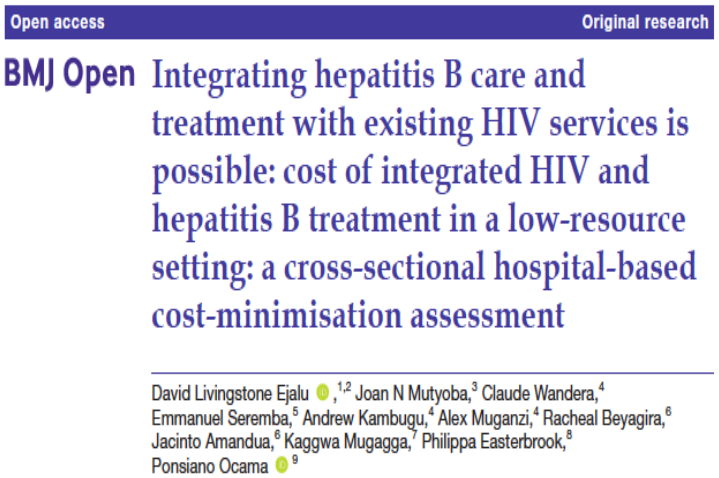
"Of course things to do with sickness are not easy; there are people who will be surprised to see me there and it's not good to put us together because we still have the fear of people saying we might be having HIV.." - Hepatitis Clients FGD

Cost-savings "2-for-1" integrated HBV and HIV

Costings

- Pathways defined for previous separate and integrated clinics
- Costs based on personnel costs, fixed costs, consumables and utilities, medicines, labs and other costs in clinical care pathways
- Annual cost per patient was simulated based on total amount of resources spent for all patient visits to the facility for HBV or HIV care per year
- Arua regional hospital higher costs than Koboko and drugs and diagnostics accounted for bulk of costs
- Integrated care saved around $30-40 per patient per year

HBV cost (USD)				HIV Cost (USD)		
Cost Centre	Standalone	Integrated	Change in cost	Standalone	Integrated	Change in cost
Personnel	28.40	13.76	-51.5	15.71	13.76	-12.4
Fixed costs	1.93	3.02	57.1	3.86	3.02	-21.7
Consumables	2.93	4.82	64.8	5.92	4.82	-18.6
Drugs	64.12	64.12	0.0	82.10	82.10	0.0
Labs	66.22	66.22	0.0	68.92	68.92	0.0
Total	**163.59**	**151.95**	**-7.1**	**176.52**	**172.63**	**-2.2**



Achieving integration at multiple levels

Making integration measurable, affordable and durable

1 Leadership and governance adaptations

National leadership cascaded to sub-national levels

2 Health financing

Move towards pooled financing and integrated budgeting
Domestic resource mobilization

3 Health Workforce support

Build PHC competencies for multi-condition care and community linkages.

4 Health information systems

Integrated patient records

5 Health commodities

Integrated pharmacy, lab and supply chain systems
Multi-disease testing

6 Community Systems

Integrated outreach approaches
Self-management and household centred care emphasized

The “2for1” – Integrate to Eliminate
Objectives – four phases

To achieve a clear integration pathway - from establishment and evaluation of different integrated care models, to advocacy for policy change, and then widespread adoption and scale-up:

- **Establish** different HBV integrated care models within HIV/ART and/or NCD clinics at urban and rural sites in five SSA countries.
- **Evaluate**: feasibility; effectiveness across cascade of care; acceptability to patients and providers; and cost-effectiveness of integrated vs. non-integrated care models
- **Advocate**: Evidence base to inform policy change, engaging funders, MOH, and partners.
- **Implement and adopt**: Implementation strategy + toolkit to enable scale-up and adoption of integrated HBV–HIV/NCD care models across SSA.

The “2for1” – Integrate to Eliminate
Models of care

- Three variants of innovative integration models are planned and reflect the approaches being adopted at different facility levels in five project countries (**South Africa, Kenya, Malawi, Zimbabwe, Uganda, and Burkino Faso)**:
  - **HIV platform expansion**: Adding HBV and NCD services into established HIV clinics, leveraging staff, infrastructure, laboratories, and pharmacies.
  - **Chronic care clinic integration**: Embedding HIV and HBV services into existing or new NCD-focused chronic care clinics, often linked to outpatient services.
  - **Stepwise integration**: Introducing HBV services initially through HIV clinics as a transitional model, with gradual evolution to comprehensive CCD clinics.

- **Target population for testing and linkage** - **pregnant women** with CHB identified from routine testing in ANC clinics + **general population** identified from facility or community-based testing (linked with HIV)

Evidence generation - EVALUATE

- Comprehensive evaluation of the feasibility, acceptability (to patients and staff), effectiveness, cost and cost-savings of delivering HBV care through integration with HIV or chronic NCD services at 16 sites.
- ***Measurement of:***
- (i) **Feasibility** - ability to deliver steps in HBV care with available ART facility, staff and resources through HBV project proforma data collection and facility records.
- (ii) **Acceptability** (to patients and staff) through quantitative and qualitative assessment using proforma adapted from that used in previous Uganda 2for1 project.
- (ii) **Effectiveness**: attainment of high coverage across cascade of HBV care (linkage to care, uptake of treatment, attainment of viral suppression, adherence and retention in care), and maintenance of high-quality HIV and NCD care across care cascade. Assessed through facility records supplemented by laboratory records.
- **(iv) Cost-effectiveness:** assessed through detailed costing studies of integrated vs. non integrated HBV care at sites across five countries, and development of a model for individual based integrated HBV and HIV/NCD care.

Benefits and Challenges of Integration

Early lessons learned from implementation experience of integration

✓ Benefits of Integration

1 **Workforce flexibility & staff satisfaction:** Expanded staff skill set across conditions.

2 **Improved patient experience:** Most HIV patients prefer integrated clinic; stigma concerns reducing.

3 **More effective sharing of human resources:** Integrated roster allows flexible staff re-assignment in emergencies.

4 **Expanded NCD screening & follow-up:** Better data capture with early evidence of NCD care improvement.

5 **Re-purposing of space to support integration**

6 **Evolving multi-disease lab & shared pharmacy:** HIV confidentiality concerns now addressed.

7 **Integrated outreach & community linkage:** Better community service; liaison with village health teams.

⚠ Challenges

1 **Data systems & interoperability:** Remain the largest implementation constraint.

2 **Non-HIV chronic disease outcomes poorly captured:** Comparable indicators for HBV, hypertension and diabetes not yet routinely available.

3 **Human resources:** Existing shortages in nursing staff compounded by expanding patient demand.

4 **Training:** Difficulties in CCM training for general staff on HIV/ART management; weekly CME active in some facilities.

5 **Variable hepatitis B knowledge:** Wide variation in experience with HBV care across facilities.

6 **Referral pathways not well defined:** Unclear when and where to up-refer or down-refer stable patients.

Acknowledgements – Integration champions