T-AHISA

Tanzanian Adolescent HIV Prevention and Treatment Implementation Science Alliance

The Role of Digital Interventions in Enhancing Linkage to Care after HIV Self Testing

Innovations for a Healthier Future

Speaker

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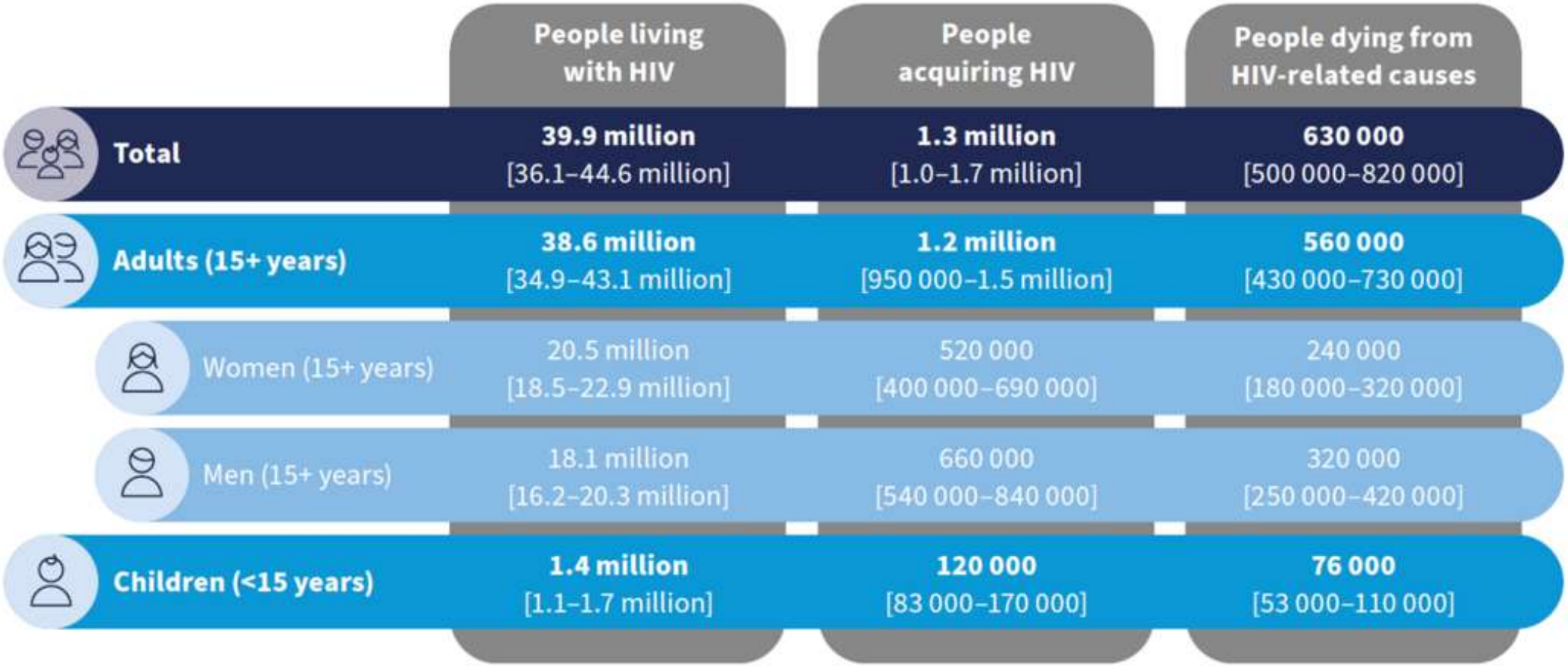
Date

17 March, 2025

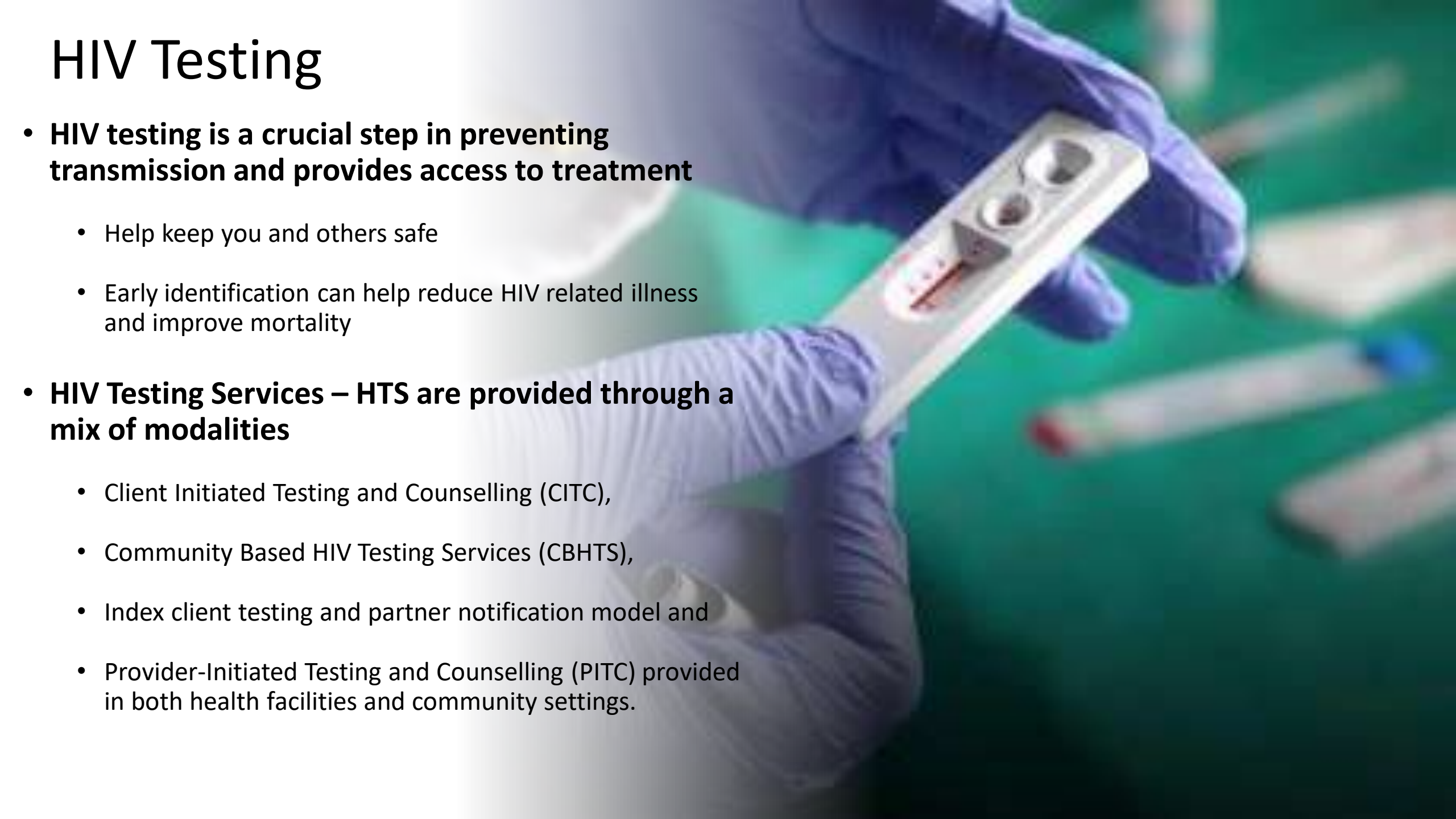
Global burden of HIV



Source: UNAIDS/WHO estimates, 2024.

HIV Testing

- **HIV testing is a crucial step in preventing transmission and provides access to treatment**
  - Help keep you and others safe
  - Early identification can help reduce HIV related illness and improve mortality
- **HIV Testing Services – HTS are provided through a mix of modalities**
  - Client Initiated Testing and Counselling (CITC),
  - Community Based HIV Testing Services (CBHTS),
  - Index client testing and partner notification model and
  - Provider-Initiated Testing and Counselling (PITC) provided in both health facilities and community settings.



HIV Self-testing

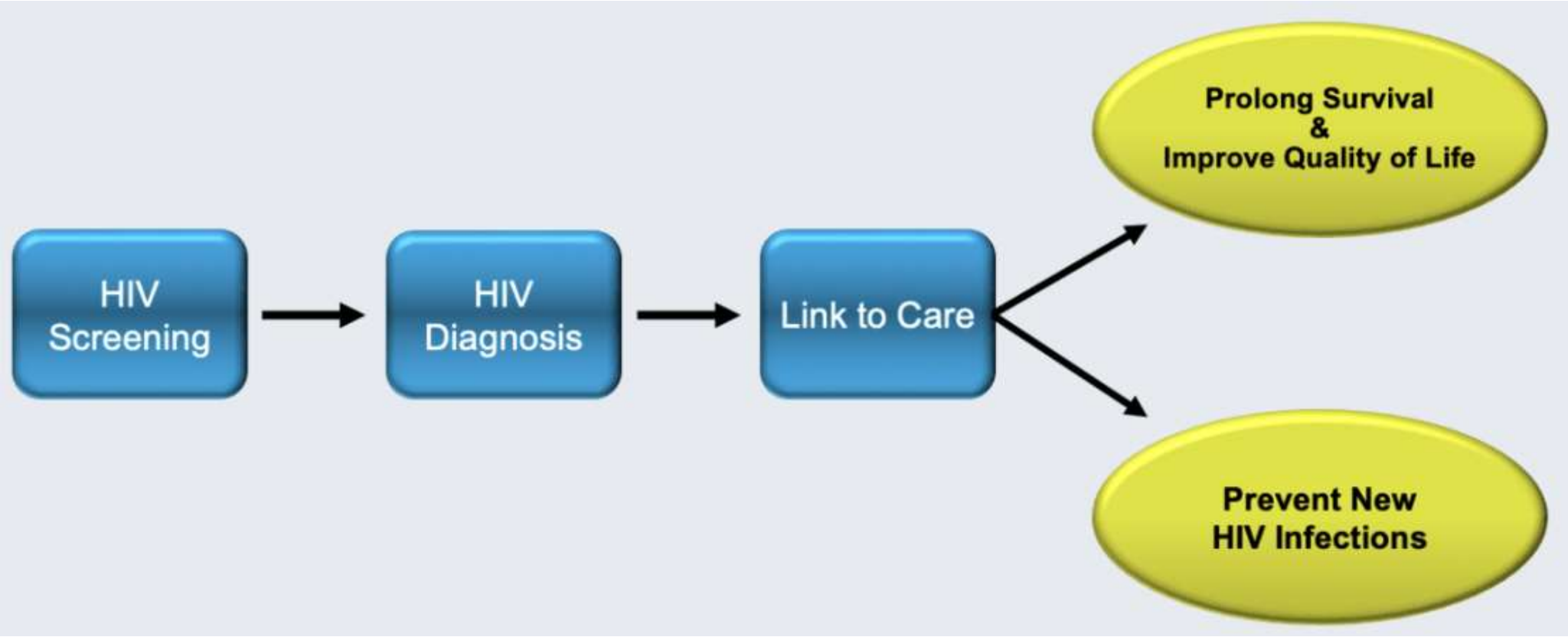
- Backgroung of HIVST
  - First proposed in 1986
  - Increasingly available since 2016 – WHO recommendations
  - More than 100 countries have put policies to support HIVST
- Prio research shows
  - Enhace HIV testing uptake for key populations
  - Increase community levels of HIV testing
  - Promote partners testing
  - Higher ART initiation
- The success of HIVST programmes depends on the effective linkages to subsequent care and treatment services
- However, measuring or monitoring linkages to HIV care following reactive HIVST results can be challenging given the private nature of HIVS

Linkage to care

- Defined as the completion of a first medical clinic visit within 1 month after an HIV diagnosis.
- The WHO defines linkage to care as the time from HIV diagnosis to enrolment in HIV care or treatment
- Linkage to care is a crucial early step in successful HIV treatment
- It is a necessary step to ART initiation and viral suppression.

Source: Adapted from HRSA. HIV Care Continuum

Main goals of linkage to care



Barriers to linkage to care

Stigma and Discrimination: Fear of social stigma and discrimination from healthcare providers can prevent people from disclosing their HIV status and seeking care.

Financial Constraints: Costs associated with transportation and treatment can be prohibitive for some individuals.

Lack of Awareness: Inadequate knowledge about HIV and treatment options can lead to delayed care seeking.

Poor Follow-Up: Inadequate follow-up mechanisms after HIV testing can hinder linkage to care.

Digital technologies in falitating linkage to HIV care

- Landscape of digital technologies
  - Machine Learning (ML)
  - Social media platforms
  - Mobilie interventions (Phone calls, SMSs)
  - Big data
  - Artificial Intelligence (AI)
  - Chatbox

Efforts to develop DHI's

Article 1

Public Health Reviews
REVIEW
published: 16 February 2024
doi: 10.3389/phrs.2024.1606354

Digital Intervention Services to Promote HIV Self-Testing and Linkage to Care Services: A Bibliometric and Content Analysis—Global Trends and Future Directions

Bibliometrics analysis

- Performance analysis
- Collaboration analysis
- Thematic mapping

Content analysis

Key themes

Results

- Performance Analysis:
  - Total of **289 documents** from **149** sources analyzed.
  - Average annual scientific growth rate of **12.25%** with **16.57 citations** per document.
- Collaboration Analysis:
  - **2146 authors** participated, with an average of **8.17 co-authors** per document.
  - **45.33% of collaborations** were international, indicating strong global partnerships.
- Science Mapping
  - Co-word analysis –identified key themes
    - Digital intervention, HIV self-testing, Linkage to care and Strategies for successful implementation
  - Thematic clusters –were identified
    - Alcohol, Men, Health outcomes, Care, **User acceptance** and Behavioral change

Main Informations

DESCRIPTION	RESULTS
Main Information About Data	
Timespan	1992-2023
Sources (Journals, Books, etc)	149
Documents	289
Annual Growth Rate %	12.25
Document Average Age	3.82
Average citations per doc	16.57
References	1
Document Contents	
Keywords Plus	826
Author's Keywords	952
Authors	
Authors	2146
Authors of single-authored docs	1
Authors' Collaboration	
Single-authored docs	1
Co-Authors per Doc	8.17
International co-authorships %	45.33
Document Types	
Article	264
Review	25

Findings from the Content analysis

Digital intervention

The content analysis highlight that DHI have shown improvement in HIV testing and linkage to care.

Challenges include technological barriers, and the need for tailored interventions for different populations

HIV Self testing

Widely accepted, especially among hard-to-reach populations.

Concerns about accuracy, linkage to care, and the need for counselling and suppo rt services post-test.

Linkage to Care

Emphasizes the importance of timely linkage after a positive HIV test.

Barriers include stigma, lack of awareness, and transportation issues. Facilitators include peer support and digital tools like SMS reminders

Strategies for Successful Implementation

Emphasized user-centered design, integration with existing healthcare systems, and ensuring equitable access to digital health interventions

Article 2

- **Data source** – Tanzania Self Testing Education and Promotion (STEP) project
- **Measures:** Two outcome variables:
  - (1) comfort talking with an HIV counsellor.
  - (2) comfort receiving texts from an HIV counsellor.

Results cont…

- **Outcome variable 1**: Comfortability talking to a HIV Counsellor on National HIV Hotline following HIVST
  - Logistic Regression of the Association Between Participants' Comfortability Talking to A HIV Counsellor on National HIV Hotline Following HIVST and Predictor Variables Showing Unadjusted and Adjusted Odds Ratio

Characteristics	n (%)	Unadjusted OR (95% CI)	P -Value	Adjusted OR (95% CI)	P -Value
Previous HIV Testing					
No	49 (9.7)	Reference		Reference	
Yes	456 (90.3)	1.02 (0.46 – 2.27)	0.954	1.01 (0.43 – 2.38)	0.979
Access to Mobile Phone					
No	10 (2.0)	Reference		Reference	
Yes	495 (98.0)	0.56 (0.71 – 4.49)	0.590	0.85 (0.09 – 7.82)	0.887
Participants sharing mobile phone with other individuals					
No	407 (80.6)	Reference		Reference	
Yes	98 (19.4)	1.49 (0.78 – 2.88)	0.228	1.35 (0.67 – 2.73)	0.407
History of receiving HIV-related text message					
No	361 (71.5)	Reference	0.102	Reference	0.048
Yes	144 (28.5)	0.66 (0.40 – 1.09)		0.55 (0.31 – 0.99)	
History of sending friend in camp text message about HIV					
No	393 (77.8)	Reference		Reference	
Yes	112 (22.2)	0.65 (0.40 – 1.10)	0.104	0.70 (0.38 – 1.29)	0.249
Comfortability texting friend about HIVST					
No	**87 (17.2)**	**Reference**	**<0.001**	**Reference**	**<0.001**
Yes	**418 (82.8)**	**3.37 (1.97 – 5.76)**		**3.08 (1.73 – 5.48)**	
Comfortability texting friend about HIV					
No	**266 (52.7)**	**Reference**	**<0.001**	**Reference**	**<0.001**
Yes	**239 (47.3)**	**3.84 (2.20 – 6.72)**		**3.39 (1.89 – 6.07)**	
Aware of National HIV Hotline					
No	487 (96.5)	Reference	0.600	Reference	0.713
Yes	18 (3.6)	1.49 (0.33 – 6.60)		1.34 (0.28 – 6.29)	

Results cont…

- **Outcome variable 2:** Comfortability Receiving Text Message from HIV Counsellor Following HIVST
  - Logistic Regression of the Association between Participants' Comfortability Receiving Text from HIV Counsellor Following HIVST and Predictor Variables Showing Unadjusted and Adjusted Odds Ratio

Characteristics	n (%)	Unadjusted OR (95% CI)	P -Value	Adjusted OR (95% CI)	P -Value
Previous HIV Testing					
No	49 (9.7)	Reference		Reference	
Yes	456 (90.3)	0.77 (0.35 – 1.69)	0.515	0.73 (0.32 – 1.68)	0.464
Access to Mobile Phone					
No	10 (2.0)	Reference		Reference	
Yes	495 (98.0)	0.44 (0.05 – 3.52)	0.590	0.58 (0.07 – 5.13)	0.624
Participants sharing mobile phone with other individuals					
No	407 (80.6)	Reference		Reference	
Yes	98 (19.4)	1.25 (0.70 – 2.22)	0.446	1.14 (0.61 – 2.10)	0.683
History of receiving HIV-related text message					
No	361 (71.5)	Reference	0.195	Reference	0.054
Yes	144 (28.5)	0.73 (0.46 – 1.17)		0.59 (0.34 – 1.01)	
History of sending friend in camp text message about HIV					
No	393 (77.8)	Reference		Reference	
Yes	112 (22.2)	0.88 (0.52 – 1.48)	0.638	1.04 (0.58 – 1.88)	0.888
Comfortability texting friend about HIVST					
No	**87 (17.2)**	**Reference**	**0.001**	**Reference**	**0.003**
Yes	**418 (82.8)**	**2.52 (1.49 – 4.25)**		**2.28 (1.31 – 3.95)**	
Comfortability texting friend about HIV					
No	**266 (52.7)**	**Reference**	**<0.001**	**Reference**	**<0.001**
Yes	**239 (47.3)**	**2.96 (1.83 – 4.80)**		**2.74 (1.66 – 4.53)**	
Aware of National HIV Hotline					
No	487 (96.5)	Reference	0.396	Reference	0.254
Yes	18 (3.6)	0.64 (0.23 – 1.80)		0.53 (0.18 – 1.57)	

Article 3

Mhando et al. BMC Health Services Research (2024) 24:1084
https://doi.org/10.1186/s12913-024-11466-2

BMC Health Services Research

RESEARCH Open Access

Clients' and providers' perspectives in informing a digital health intervention to improve linkage to care after Index HIV self-testing in Hai and Moshi Districts, Tanzania

- Focuses on perspectives from both clients and providers
  - Real-world experiences, attitudes, perceptions and challenges on the potential DHIs
  - Contextual factors affecting feasibility, acceptability and scalability of DHI
- Methodology
  - Settings: Kilimanjaro, Tanzania – Four health facilities
  - Semi-structure interviews

Findings

- Demographic information

Participants group	Total participants	Male participants	Female participants	Age range	HCWs roles
Overall	**42**				
Health care workers (HCWs)	16	4	12	24 - 57	**8** Nurses, **3** Doctors, **3** Non-physician clinicians, and **2** Counsellors
Male clients'	9	9		22 - 58	
Female clients	17		17	22 - 51	

- Perceived benefits of digital health intervention use
  - Digital health reminders
    - Reminders for medication adherence
    - Maintaining their prescribed medication schedules
  - Increased understanding and encouragement to seek HIV care
    - Updates and information on health
    - Enhances understanding of health issues
    - Improving knowledge

Findings cont…

- Perceived barriers to digital health intervention use
  - Stigma, lack of trust, and lack of privacy
    - Fear of messages being seen by others leading to stigma
    - Concerns over privacy
  - Concerns about costs and technical difficulties
    - Financial implications on DHI
    - Accessibility issues or low-literacy individuals
  - Concerns about wrong numbers and difficulties in contacting clients
    - Incorrect contact information

Findings cont..

- High Self-Efficacy Toward Digital Health Intervention Use
  - Confidence in engagement
    - Trusted sources
  - Perception of Benefits
    - Healthcare workers believe that interventions can effectively reach patients who may not visit healthcare facilities.
- Recommendations for Digital Health Intervention
  - Content of Messages
    - Health importance and the need for testing
    - Reassure individuals about life after an HIV diagnosis
  - Frequency and Timing of Interventions
    - Daily messages and considering appropriate timing
  - Language Preference
    - Kiswahili for better understanding
  - Method of Communication
    - Calls and texts, with preference varying among participants
    - Diverse communication channels, including social media and community education.

Article 4: Experts Perspectives On Digital Health Intervention To Improve HIV Self-testing and Facilitate Linkage to Care

- Focus: Exploring insights from global experts and practitioners in HIV research and digital health.
- Participants, Sampling, and Recruitment:
  - Purposive and Snowball Sampling
  - Key Informant Interviews (N = 17) with professionals from institutions like Ifakara Health Institute, AMREF, FHI 360, EGPAF, MUHAS, and Tanzania's Ministry of Health.
- Theoretical Framework:
  - CFIR (Consolidated Framework for Implementation Research)
  - Five CFIR domains: intervention characteristics, inner setting, outer setting, individual characteristics, and implementation process.
- Data Collection:
  - Zoom and one face-to-face interview in Swahili and English.
  - Interviews lasted 40–60 minutes, audio-recorded, transcribed, and translated into English.
- Data Analysis:
  - Thematic Analysis
  - Content analysis

Findings

- **CFIR Domains Explored**:
  - **Innovation Characteristics**: Experts highlighted the need for high-quality digital health interventions tailored to user needs, accessible, and culturally relevant.
  - **Inner and Outer Settings**: Emphasis on the importance of aligning interventions with local healthcare infrastructure and external factors like policy support.
  - **Individual Characteristics**: Individual experiences and professional backgrounds shaped unique insights into intervention impact.
  - **Implementation Process**: Recognized challenges and facilitators in implementing digital health solutions for HIVST.
- **Challenges Identified**:
  - Accessibility, digital literacy, and data privacy emerged as major challenges, impacting the potential effectiveness of digital health in HIV care.
- **Facilitators**:
  - Supportive policies, robust healthcare networks, and technology integration were identified as key facilitators for successful intervention deployment.

Overall Discusion

- **Digital health intervention addressing critical gap**
  - HIVST increase accessibility and privacy
  - SMS/ Calls reminders can bridge the gap
  - Potential of DHI to increase adherence, facilitating communication
- **User centric design as a key enabler**
  - User needs
  - Addressing privacy concerns
- **Barriers and facilitators**
  - Limited digital literacy
  - Facilitators include Strong mobile penetration (93.1%), healthcare support, National eHealth strategy

Overall Recommendations

- **User-Centric Design**
  - tailored to address stigma, privacy concerns, and technical challenges faced by men in Tanzania.
- **Enhanced Accessibility**
  - Simplify technical elements and create user-friendly interfaces to improve accessibility.
- **Government Support**
  - Government funding
- **Data Interoperability**
  - Interoperability for seamless data exchange
- **Capacity Building**
  - training healthcare providers to implement DHI

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thank you