

# A Public Health Value-Based Healthcare Paradigm for HIV

**Sebastian Vermeersch** (✉ [sebastian.vermeersch@hict.be](mailto:sebastian.vermeersch@hict.be))

hict, Gent

**Rémy P. Demeester**

HIV reference centre, University Hospital of Charleroi, Charleroi

**Nathalie Ausselet**

Department of Infectious Diseases, CHU UCL Namur

**Steven Callens**

Department General Internal Medicine, Ghent University Hospital

**Paul De Munter**

Department of Microbiology, Immunology, Transplantation and HIV reference centre, University Hospital Leuven, Leuven

**Eric Florence**

Department of Clinical Sciences, Institute of Tropical Medicine, Antwerp

**Jean-Christophe Goffard**

HIV reference centre, Internal Medicine, C.U.B. Erasme, Université Libre de Bruxelles, Brussels

**Sophie Henrard**

HIV reference centre, Internal Medicine, C.U.B. Erasme, Université Libre de Bruxelles, Brussels

**Patrick Lacor**

HIV reference centre, Universitair Ziekenhuis Brussel, Brussels

**Peter Messiaen**

Department of Infectious Diseases and Immunity, Jessa Hospital, Hasselt

**Agnès Libois**

Division of Infectious Diseases, Saint Pierre University Hospital, Université Libre de Bruxelles, Brussels

**Lucie Seyler**

Infectious diseases and Internal Medicine Department, UZ Brussel

**Françoise Uurlings**

HIV reference centre, Infectious Diseases Department, Liège University Hospital

**Stefaan J. Vandecasteele**

AZ Sint-Jan Brugge Oostende AV

**Eric Van Wijngaerden**

Department of Microbiology, Immunology, Transplantation and HIV reference centre, University Hospital Leuven, Leuven

**Jean-Cyr Yombi**

Department of Internal Medicine and Infectious Diseases, Cliniques Universitaires Saint Luc, Brussels

**Lieven Annemans**

Department of Public Health, Ghent University

**Stéphane De Wit**

Division of Infectious Diseases, Saint Pierre University Hospital, Université Libre de Bruxelles, Brussels

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## Research Article

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# Abstract

**Background:** HIV patients face considerable acute and chronic healthcare needs and battling the HIV epidemic remains of the utmost importance. By focusing on health outcomes in relation to the cost of care, value-based healthcare (VBHC) proposes a strategy to optimize quality of care and cost-efficiency. Its implementation may provide an answer to the increasing pressure to optimize spending in healthcare while improving patient outcomes. This paper describes a pragmatic value-based healthcare framework for HIV care.

**Methods:** A value-based HIV healthcare framework was developed during a series of roundtable discussions bringing together clinical stakeholder representatives from the Belgian HIV reference centers and VBHC specialists. Each round of discussions was focused on a central question translating a concept or idea to the next level of practical implementation: 1) how can VBHC principles be translated into value-based HIV care drivers; 2) how can these value-based HIV care drivers be translated into value-based care objectives and activities; and 3) how can value-based HIV care objectives and activities be translated into value-based care indicators. Value drivers were linked to concrete objectives and activities using a logical framework approach. Finally, specific, measurable, and acceptable structure, process and outcomes indicators were defined to complement the framework.

**Results:** Our framework identifies 10 core value drivers focusing on 4 key areas where HIV care benefits most from improvements: Prevention, improvement of the cascade of care, providing patient-centered HIV care and sustaining a state-of-the-art HIV disease management context. Value drivers are further developed into objectives and activities. For each level of the framework (drivers, objectives and activities), process and outcome-based indicators are suggested.

**Conclusions:** This framework approach outlines how to define a patient- and public health centered value-based HIV care paradigm. . It proposes how to translate core value drivers to practical objectives and activities and suggests defining indicators that can be used to track and improve the framework's implementation in practice.

## Background

Healthcare costs are increasing due to a combination of ageing populations, a rise in prevalence of chronic diseases and a generalization of high-cost interventions. These rising costs are forcing stakeholders to consider how much and how to invest in health and healthcare. Governments therefore look for ways to eliminate inefficient or wasteful spending and maximize value for money. At the same time, budget holders report to find it harder to achieve savings in health care than in other government spending and that they only have blunt tools available to deliver efficiency gains (1). This means that in practice, increasing efficiency often translates into a simple cost-cutting exercise. This does not consider the disparate effects that simple cost cutting can have on patient outcomes across different contexts.

HIV care is one field where the pressure of managing budget versus delivering outcomes is of particular importance. Despite significant advances in combined antiretroviral therapy (cART), such as single-tablet treatment regimens, and the development of efficient prevention tools such as pre-exposure prophylaxis (PrEP), the HIV epidemic is far from over (2, 3). Investments in HIV prevention, diagnosis and treatment remain essential from all perspectives: the patient's perspective, the health care budget perspective, and the societal and public health's perspective (4). The face of HIV care is also changing. Improved efficacy of treatment and better follow-up of patients has transformed HIV into a chronic disease with a life expectancy close to age-matched HIV-negative controls. HIV-positive individuals have however a greater prevalence of multimorbidity than HIV-negative individuals and a higher number of non-infectious comorbidities, partly due to aging, duration of the HIV infection and polypharmacy (5). This means HIV-related health needs are increasingly important and complex (6). To face these challenges, it is important to develop HIV healthcare paradigms that prevent new infections, ensure quality of care, deliver valuable patient outcomes, and enable efficient and effective use of limited resources.

Value-based healthcare (VBHC) offers a strategy to govern healthcare. Its aim is to optimize quality of care and cost-efficiency (7). It is based on two key principles. The first focuses on health outcomes in relation to the cost of care. The second is to consider the delivery of healthcare services across care delivery units (7).

There is no single unifying definition of what VBHC means in practice (8). Different conceptual approaches to define VBHC exist. Porter *et al.* (7, 9, 10) focus on clinical outcomes and the cost-value balance associated with full cycles or episodes of care across different healthcare units. Others suggest a different approach. Berwick *et al.* (11), for instance, focus on the patient's individual experience of care and the cost-value balance on a population level. The latter opens a perspective for more prevention, equity, and a public health approach. The translation of these various conceptual approaches into practice can take different forms as well (8, 12–15).

The current paper describes a pragmatic value-based healthcare framework for HIV care. It proposes a methodological approach to build from the foundations of VBHC towards HIV-specific value drivers. Each driver defines an activity or capability with a high potential to increase the value delivered by HIV care. Next, it details how to translate these value drivers into objectives, activities, and quality indicators. In the discussion section, we outline how this approach addresses shortcomings in VBHC paradigms. Finally, we explain how this generalized framework can be leveraged to fuel national HIV-care plans and inform HIV health care organization.

## Methods

### **Roundtable discussions leveraging a translational approach.**

The value-based HIV healthcare framework was developed during a series of roundtable discussions between June 2017 and December 2020. These roundtable discussions brought together clinical

stakeholder representatives from the Belgian HIV reference centers (HRC) and VBHC specialists. Prior to each round of discussions, a working group of clinical and VBHC experts formulated a proposal for discussion. This proposal was discussed and amended over the course of a series of meetings with a broader group of experts until consensus was achieved. The roundtables themselves were structured using a translational approach. Each round of discussions was focused on a central question translating a concept or idea to the next level of practical implementation. Three such rounds of discussion were organized:

1. How VBHC principles can be translated into value-based HIV care drivers.
2. How value-based HIV care drivers can be translated into value-based care objectives and activities.
3. How value-based HIV care objectives and activities can be translated into value-based care indicators.

Our translational approach was inspired by Bonde et al. (8), where the different translations in transitioning from a DRG (Diagnosis Related Group)-financing based system to a value-based financing healthcare system in nine hospital departments in a region in Denmark led to new kinds of accountability relations with budget holders.

For each question, we considered both the public healthcare and a patient-centered HIV care perspective. This is of particular importance for infectious diseases where healthcare activities serve to deliver health outcomes to patients and to protect health outcomes for the public. In the case of HIV, a patient with an undetectable viral load will not transmit the infection to others. Hence, the more people are diagnosed and treated; the less new infections will occur in the community.

## Identifying value in HIV

The first translation in our framework approach aims at the heart of VBHC: defining 'value' within the scope of HIV care and prevention. In VBHC, what constitutes value directly implies the incentives to optimize for.

The narrow focus of value in VBHC as 'health outcomes relative to monetized inputs' should be more closely looked at. From the restricted point of view of organizational units aiming to increase efficiency, it may be appropriate. From a broader public health perspective however, we argue it is not: in such an approach, there is no incentive to optimize the total 'value' achieved by the healthcare system (16,17).

Our extended value-based framework is broader than the traditional but narrow interpretation of VBHC (i.e., cost-effectiveness at the healthcare provider level). It adds value at the health care provider, the healthcare system, and the public health level as well. Our framework therefore includes:

- Value from the perspective of the patient (patient outcomes)
- Value from the perspective of the healthcare payer and provider (optimized delivery of care)

- Value from the public health perspective (societal value)

To be successful, our VBHC framework needs to target improving patient, healthcare payer, provider, and societal outcomes. We first considered key challenges in HIV care before considering how best to tackle them. This allowed us to identify the value drivers that focus on maximizing the outcomes that matter most.

## Formulating objectives and linked activities

The second translation focuses on linking value drivers to more specific objectives and activities. For this, we leveraged a top-down logical framework approach (logframe approach) (18). First, each value driver was specified as a broad goal to be achieved. Next, these goals were translated into objectives that – if met – can meaningfully impact these broad goals. Finally, for each objective, example activities were proposed of which the results help achieve the stated objectives.

## Identifying indicators

Indicators are the linchpin of a VBHC implementation. They allow to measure performance and improve implementation at each level of the framework. The final translation layer considers three types of indicators:

1. *Structure* indicators.
2. *Process* indicators.
3. *Outcome* indicators.

This approach inspired by the Donabedian-model (19,20) identifies the requirements in the organization of care, the activities performed and the outcomes achieved to deliver VBHC. It allows to pinpoint exactly what works or does not work in a real-world implementation. The indicators are selected based on being valid, reliable, relevant, and applicable (21). As such the approach provides a robust basis for accountability and a comprehensive starting point for continuous improvement.

Structure indicators cover the context in which care is delivered, including facilities, equipment, human resources as well as organizational characteristics, such as staff training and payment methods. These are the most context-specific element of our framework. Ideally, the grassroots level should define these in conjunction with the government in a retrograde way: starting from the outcome and process indicators, one can re-define the requirements for organization of care. The logframe approach can then be used in a bidirectional way to identify how to best organize and remunerate the efforts made on the field to achieve the goals described.

## Results

Figure 1 summarizes our value-based HIV healthcare framework and the three levels of translation (L) applied in its development.

## Key challenges and value drivers

We identified four core areas where HIV care would benefit most from improvements:

1. *Prevention.* HIV prevention requires an integrated strategy that links prevention and care.
2. *Improvement of the cascade of care by optimizing the steps related to the care of HIV.*
  - Increase the number of people aware of their serostatus and reduce the number of undiagnosed people living with HIV (PLWH).
  - Ensure timely access to HIV care for all diagnosed PLWH.
  - Ensure prompt access to ART for all those in care and ensure achievement of an undetectable viral load for all those on ART.
  - Ensure retention in care for all those entered in HIV care.
3. *Providing patient-centered HIV health care.* The aim of patient centered HIV-care is to help provide all PLWH with the best possible quality of life. Living with an HIV infection is more than a medical issue. PLWH often also deal with a complex set of social, psychological, sexual, and other issues.

Life expectancy for PLWH has increased. As a result, PLWH may be subject to comorbidities which are not directly related to the HIV infection. PLWH are also at increased risk of developing age-related health problems such as atherosclerosis related disease, diabetes, the metabolic syndrome, chronic kidney failure, neurocognitive diseases, and osteoporosis. It is important to prevent and manage these comorbidities.

Maintaining sexual and reproductive health is important. Prevention, screening, and treatment of other STIs (sexually transmitted infections) is important given the interactions between HIV and other STIs. For example, the presence of an STI can increase the risk of HIV transmission and acquisition. Sexual problem and relationship issues are frequent in PLWH. Finally, prevention of mother to child transmission needs specific attention.

4. *Sustaining a state-of-the-art HIV disease management context.* Monitoring and evaluation are vital management and learning tools. Epidemiological surveillance of the HIV epidemic is essential to guide the public health priorities. Surveillance of clinical and psychosocial parameters should also be considered. Also of importance are operational and clinical research, and training programs required to educate all stakeholders concerned.

We thus identified 10 core value drivers to form the basis of our value-based HIV healthcare framework:

### ***Prevention:***

1. Prevent new infections.

***Improvement of the cascade of care:***

2. Reduce the number of undiagnosed patients.

3. Link diagnosed patients to care.

4. Achieve and maintain virologic control.

5. Retain in care.

***Providing patient-centered HIV care:***

6. Support patient's quality of life.

7. Prevent and manage comorbidities.

8. Maintain sexual and reproductive health.

***Sustaining a state-of-the-art HIV disease management context:***

9. Support public health surveillance.

10. Improve knowledge through research and training.

## **Objectives, activities, and indicators.**

Table 1 provides an overview of the breakdown of the 10 value drivers of our framework into objectives, activities and key indicators as established during our roundtable discussions.

## **Discussion**

The concept of VBHC has gathered considerable interest since its inception by Porter and Teisberg (7). The conceptual clarity of focusing on what matters for patients in relation to the total cost of care, provides an interesting perspective to stakeholders looking to achieve more at lower cost. Its implementation has however also triggered debate around some of its limitations. These include its narrow definition of value (16, 17), its hospital-centered focus on organization of care, and its neglect of important healthcare drivers such as the value of health promotion, equity, and the quality of life of healthcare professionals. Despite these limitations, the core principles of VBHC continue to be some of the most important principles driving healthcare reform in theory and practice.

Alternative value-based healthcare paradigms have been implemented before. See (8) for the aforementioned example of an experiment in applying VBHC into healthcare governance in Denmark, (12)

for a paper focusing on the development of public performance indicators with an emphasis on quality, (14) for an overview of Danish case studies, or (15) for an study exploring how representatives of four pilot teams experienced implementing VBHC in a large Swedish University Hospital over a period of two years. A notable example in HIV care is found in the Dutch OLVG hospital (22–24) that has developed and implemented a VBHC based approach to drive the organization of care for their HIV patients. In many of these examples, the focus of the VBHC implemented is on the operational aspects of care, i.e., how to optimize delivery of care in a single or small group of care center(s), without directly considering the broader public health perspective.

HIV is a prime example of a disease area suited for the application of VBHC principles. HIV care combines prevention and treatments (acute with chronic care). Even with a controlled viral load, PLWH need specific follow-up for the rest of their lives. Also, PLWH need multidisciplinary follow-up for HIV-related, HIV-treatment related, and age-related comorbidities. These characteristics make the disease area ill-suited for an activity-based healthcare financing schemes, which mostly reward volume of care over delivery of cross-functional health outcomes.

What is particular to HIV care, and is often overlooked in VBHC paradigms, is the public health aspect. A good control of infectious diseases does not only lead to advantages for the patient (better personal health) but also to the society (less cases due to reduced onwards transmission). Any consideration of value in HIV care should include aspects that serve this public health interest.

Our value-based HIV healthcare paradigm is unique in two ways. First, in the way it combines patient and public health value drivers. Second, in its approach to translate a general VBHC framework to a practical implementation level. This includes a primary focus on areas of improvement to identify the value drivers that matter most.

We see several immediate areas of application of our value-based HIV-care framework. First, it should inform national HIV plans. National HIV actions should reflect the framework's value drivers. Second, the objectives and activities defined our framework can drive the organization of care across healthcare providers and settings. By retrograde examination of the value drivers and their associated objectives and activities, stakeholders can engage in meaningful debate on how care should be organized to meet the stated goals and objectives most effectively. Finally, the indicator set can help to transition from data collection solely for epidemiological and budgetary control, to data collection with a view to also enhance value in care.

To be successful, our framework relies on a few external factors. One crucial element is the use of payment models that reward delivery of value in care over volume in care (25). Various outcome-driven and mixed outcome-activity based payment models exist. Another is a performant IT system to support integrated care and the measurement of costs and outcomes. This system should be easy to use, work across healthcare settings and healthcare professionals and should be well integrated in the daily clinical practice to avoid administrative overburden.

Our approach has several limitations that warrant further consideration. First, this exercise has been developed by HIV physicians and VBHC experts only, no other stakeholders have been directly involved. Second, despite our explicit intent to generalize our concepts to be applicable outside of the direct context of its developers, our resulting framework may not be the best fit for settings with a strongly different HIV epidemiology and/or healthcare structure. The objectives and activities most suitable to deliver on the value drivers may differ if the framework approach is used by different stakeholders in different settings. Stakeholders looking to leverage our framework should validate each of our three translations in their own context and use the tools suggested to tailor the resulting value-drivers, objectives and activities and indicators.

## Conclusions

Our framework approach outlines how to define a patient- and public health centered value-based HIV care paradigm. It proposes how to translate core value drivers to practical objectives and activities and suggests defining indicators that can be used to track and improve the framework's implementation in practice.

## Abbreviations

(c)ART	(Combined) antiretroviral therapy
DRG	Diagnosis related group
HCP	Healthcare professionals
HCW	Healthcare workers
HRC	HIV reference centers
Logframe	Logical framework
MSM	Men who have sex with men
PLWH	People living with HIV
PEP	Post-exposure prophylaxis
PrEP	Pre-exposure prophylaxis
PWID	People who inject drugs
STI	Sexually transmitted infection
VBHC	Value-based healthcare

## Declarations

### Ethics approval and consent to participate

The participants to the roundtable are the co-authors to the paper.

### Consent for publication

Not applicable.

### Availability of data and materials

No patient data was used and the roundtable discussions were not based on any specific dataset.

### Competing interests

SV is an employee of Hict. Hict has received consultancy fees from Gilead. LA received fees for lectures from Gilead. Other authors declare no financial or non-financial competing interests.

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There has been no significant financial support for this work that could have influenced its outcome.

### Author's contributions

All authors were involved in the development of the framework. SV, RPD, SC and LA made substantial contributions to the development of the indicator set, which was reviewed, amended and completed by all authors. SV, RPD and LA drafted the initial manuscript. All authors reviewed and contributed to the final manuscript, which was approved by all authors.

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## Tables

Due to technical limitations, table 1 is only available as a download in the Supplemental Files section.

# Figures

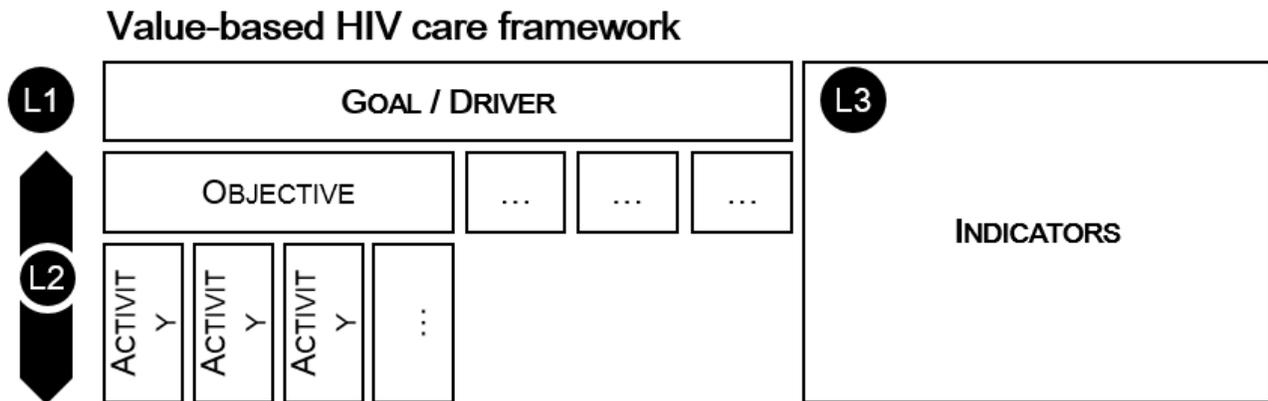


Figure 1

Extended value-based HIV healthcare framework. L1–L3 indicate the three layers of translation performed in its development.

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Table1.xlsx](#)