

POSITIVE PERSPECTIVES STUDY, WAVE 2 RESULTS REPORT

A view into the lives
of people living with HIV

CONTENTS

A photograph of two Black women sitting outdoors, laughing and taking a selfie with a smartphone. The woman on the left is wearing a patterned top and has her hand raised. The woman on the right is wearing a bright pink blazer over a pink and black patterned top and large green tassel earrings. A blue cup is visible on a table in the foreground. The background shows a blurred outdoor setting with trees and buildings.

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GLOSSARY

Antiretroviral treatment (ART)

Medications used to treat or prevent HIV; can reduce the amount of virus in blood to undetectable levels, preventing HIV-related illness or transmission

Comorbidity

A condition that exists at the same time as another condition

HCPs

Healthcare providers

MLHIV

Men living with HIV

PLHIV

People living with HIV

Polypharmacy

Taking multiple medications – defined in Positive Perspectives 2 as taking five or more pills a day or taking medicines for five or more health conditions

QoL

Quality of life

WLHIV

Women living with HIV



FOREWORD

The way people living with HIV (PLHIV) are cared for is evolving. Thanks to innovations in antiretroviral treatment (ART), HIV is now a long-term, treatable health condition and most PLHIV are living longer, healthier lives.

While there is still more work to be done to ensure universal access to ART, significant progress has been made in reaching the UNAIDS 90–90–90 targets set for 2020:

- 90% of all PLHIV will know their HIV status
- 90% of all people with diagnosed HIV infection will be in medical care and receive sustained ART
- 90% of all people receiving ART will have viral suppression

As HIV care has evolved, the focus has moved away from surviving HIV to living and ageing well with HIV, with improved quality of life (QoL) being the desired goal. Long-term QoL is becoming a critical priority in the care of PLHIV, a target that has become known as the 'fourth 90.'

However, few international HIV studies capture the experiences of PLHIV beyond viral suppression. The Positives Perspectives study, Wave 2 (Positive Perspectives 2) is one of the largest, global, HIV patient-reported outcomes studies to date. Staying true to the goal of meaningful involvement of PLHIV in HIV care from the Denver Principles, the Positive Perspectives 2 research provides perspectives and opinions from a diverse group of PLHIV across the world.

Patient reported data from the Positive Perspectives 2 study provide first-hand information about how care and treatment affect the health and wellbeing of PLHIV beyond viral suppression and offer in-depth insights into the challenges that impact the QoL of PLHIV.

As most PLHIV now live longer, a collaborative and holistic approach to HIV care that facilitates ongoing communication between PLHIV and HCPs can help improve health outcomes and quality of life.



Garry Brough

Lead for Peer Learning, Partnerships & Policy, Positively UK; Co-Founder Bloomsbury Patients Network; Community Representative for NHIVNA, London HIV Clinical Forum and London Fast Track City Leadership Group

A photograph of two men with short hair and beards, wearing dark clothing, kissing in front of a brick wall. The image is partially obscured by a white diagonal shape that contains the report's title and introductory text.

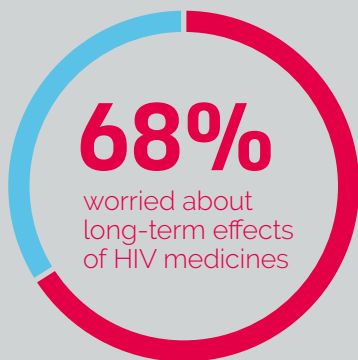
ABOUT THIS REPORT

Building on the unique knowledge gained from the initial Positive Perspectives survey, Wave 1 (Positive Perspectives 1) undertaken in 2017, this report focusses on results from the Positive Perspectives study, Wave 2 (Positive Perspectives 2). It investigates how PLHIV rate their own health, how living with HIV impacts their lives and affects their outlook for the future, as well as examining their interactions and relationships with HCPs and their experiences with ART. The in-depth insights gained from the study can help us address the unmet treatment needs and challenges faced by PLHIV and contribute towards improving QoL. All results in this report are based solely on responses from PLHIV involved in the study.

KEY INSIGHTS

Positive Perspectives 2 results confirm the importance of a holistic approach to HIV care. Empowered PLHIV who are involved in open and active dialogue and joint decision-making with their HPCs were more likely to report undetectable viral load and, more importantly, improved aspects of their QoL.

POLYPHARMACY multiple treatments and HIV



(1,425/2,112*) of PLHIV in the study were worried about the long-term effects of HIV medicines¹



57%
concerned about
multiple medicines

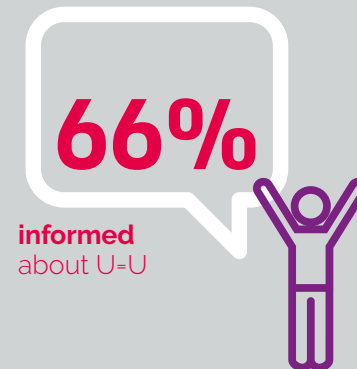
(1,195/2,112*) of PLHIV were concerned about taking more medicines as they grow older¹

OPEN & ACTIVE DIALOGUE



(1,556/2,389) of PLHIV agreed that they would like to be more involved in decisions about their HIV treatment²

UNDETECTABLE = UNTRANSMITTABLE (U=U)



Those who reported being informed of U=U by their HCPs (1,588/2,389) had more favourable health outcomes than those who reported not being informed³

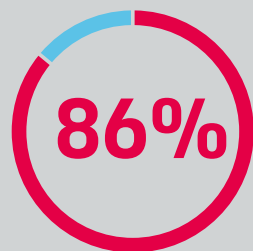
*Total number of participants is 2,112 as the figures were calculated before the inclusion of additional data from Russia and South Africa

KEY INSIGHTS

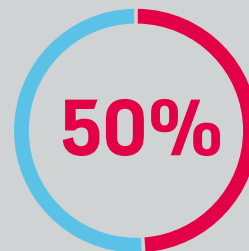
HIV & WOMEN



66% (375/571) of WLHIV in the study reported that their HCPs told them about U=U, **however this leaves 1 in 3 (34%, 196/571) WLHIV who reported they were not told about U=U by their HCPs⁴**



(491/571) of WLHIV reported that they believe maintaining effective treatment prevents transmission,⁴ however 14% (80/571) reported that they do not believe maintaining effective treatment prevents transmission⁴

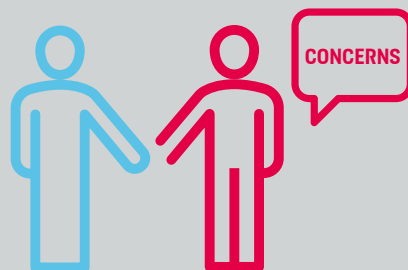


(285/571) of WLHIV were more likely to report suboptimal health compared to 42% (609/1,486) of MLHIV⁴

AGEING WELL WITH HIV

1/4

Almost one-quarter (23%, 161/699) of PLHIV aged ≥50 years reported suboptimal health on all domains (physical/mental/sexual/overall)⁵



Barriers to raising concerns with HCPs, including medicine-related concerns, were reported by 53% (336/632) of treatment-experienced and 84% (56/67) of newly diagnosed* PLHIV aged ≥50 years⁶



EXPERT PANEL

ADVISORY COMMITTEE MEMBERS

The study was run by ViiV Healthcare in collaboration with an international, multi-disciplinary Advisory Committee of experts, including PLHIV, representatives from HIV support groups and HIV physicians.

The Advisory Committee was instrumental to the development of the study themes, as well as being involved in the analysis and communication of the Positive Perspectives 2 study results.



Brent Allan
Senior Advisor,
Policy and Programs for
ICASO based in Toronto
Canada; Co-founder
of the Positive Leadership
Development Institute
Australia/New Zealand



Pholokgolo Ramothwala
Director and founder
of Positive Convention;
Journalist and Author



Giulio Maria Corbelli
Community Engagement
Project Manager at HVTN;
Member of EATG, ECAB
& Policy Working Group;
Member Board of Directors
of PLUS, Italian network
for LGBT PLHIV; Freelance
Journalist



Marvelous Muchenje
Manager, Community
Relations & Communications,
ViiV Healthcare, Canada;
Journalist



Erika Castellanos
Director of Programs at GATE,
Member Communities, Rights
and Gender Advisory Group;
Member of the Board of the
Global Fund; Member ViiV
Positive Action Strategic
Advisory Council



Bruce Richman
Founding Executive
Director Prevention
Access Campaign;
Founder of U=U



Siegfried Schwarze
Member EATG & ECAB;
Member DAGNÄ and
DAIG



Anton Eremin
Infectious Diseases Clinician &
Researcher, Moscow Regional
AIDS Center; HIV consultant,
AIDS.CENTER foundation



Keita Kambara
Member of Japanese Network
of People living with HIV/AIDS
(JANP) Plus



Marta McBritton
President & Co-Founder
of the NGO Barong Cultural
Institute; Educator behavioral
intervention activities



Garry Brough
Lead for Peer Learning,
Partnerships & Policy,
Positively UK; Co-Founder
Bloomsbury Patients
Network; Community
Representative for NHIVNA,
London HIV Clinical
Forum and London Fast
Track City Leadership Group



Diego Garcia Morcillo
Director of Sevilla
Checkpoint; Member
EATG Fast Track City
Leadership Group



David Hardy
Adjunct Professor
of Medicine,
Division of Infectious
Diseases at Johns Hopkins
University School of
Medicine; Chair of the
Board of HIVMA
& AAHIVM



Pascal Pugliese
President of COREVIH Paca
Est (Coordination of the Fight
Against HIV Against HIV
and STIs); Hospital Practitioner,
Clinical Virology Unit,
CHU de Nice

STUDY METHODOLOGY

Positive Perspectives 2 is an international, cross-sectional study conducted in the same countries as Positive Perspectives 1 but also extended to include South Africa and countries in Latin America and the Asia Pacific region. In total, 2,389 PLHIV aged 18 – 84 from 25 countries participated in the study:



The study was conducted between April 2019 and January 2020. Some data included in this report are based on an interim analysis carried out in September 2019 including 2,112 participants; most of this report is based on the full sample size of 2,389 participants.

The study aimed to include a diverse cross-section of PLHIV within each country sample and participants were recruited through:

- Existing panels of PLHIV
- Referrals by respondents
- Working with national charities
- PLHIV support groups and non-governmental organisations
- (NGOs) HIV online communities
- Promoting the research via social media networks

PLHIV were eligible to join the study if they were over the age of 18, diagnosed with HIV and currently receiving ART.

A photograph of two men standing outdoors in a park-like setting with trees in the background. The man on the left has a beard, a tattoo on his neck, and is wearing a yellow and blue plaid shirt. The man on the right has a red beard and is wearing a blue hoodie. They are both smiling and looking at each other. The image is framed by a dark blue triangle on the left and a red triangle on the bottom right.

Chapter 1

POLYPHARMACY

multiple treatments and HIV

POLYPHARMACY

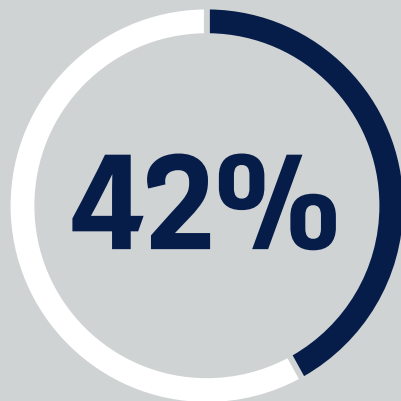
multiple treatments and HIV

Thanks to advances in HIV treatment, the majority of PLHIV who have access to ART now live longer. This also makes the likelihood of 'polypharmacy' (defined in Positive Perspectives 2 as taking five or more pills a day or taking medicines for five or more health conditions), where multiple medications are needed to manage other health conditions (known as comorbidities), more common. Polypharmacy can increase the likelihood of decreased medication adherence and can also increase the risk of serious adverse events.⁷

Positive Perspectives 2 evaluates the relationship between polypharmacy and overall quality of life. The findings also emphasise that, as the treatment needs of PLHIV evolve, ongoing communication between PLHIV and HCPs is critical. A proactive treatment plan that considers the totality of treatments can result in a more holistic care pathway that optimises health outcomes for PLHIV.¹



Positive Perspectives 2 data show that many PLHIV in the study reported polypharmacy or were taking other medicines in addition to their ART:

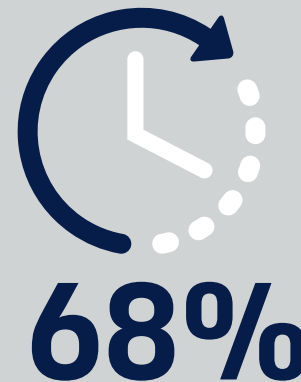


Overall prevalence of polypharmacy amongst PLHIV in the study¹
(887/2,112*)

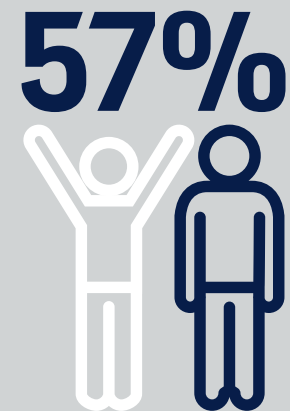


82%

(1,731/2,112*) of PLHIV reported taking at least one non-HIV pill daily¹



(1,425/2,112*) of PLHIV were worried about the long-term effects of HIV medicines¹



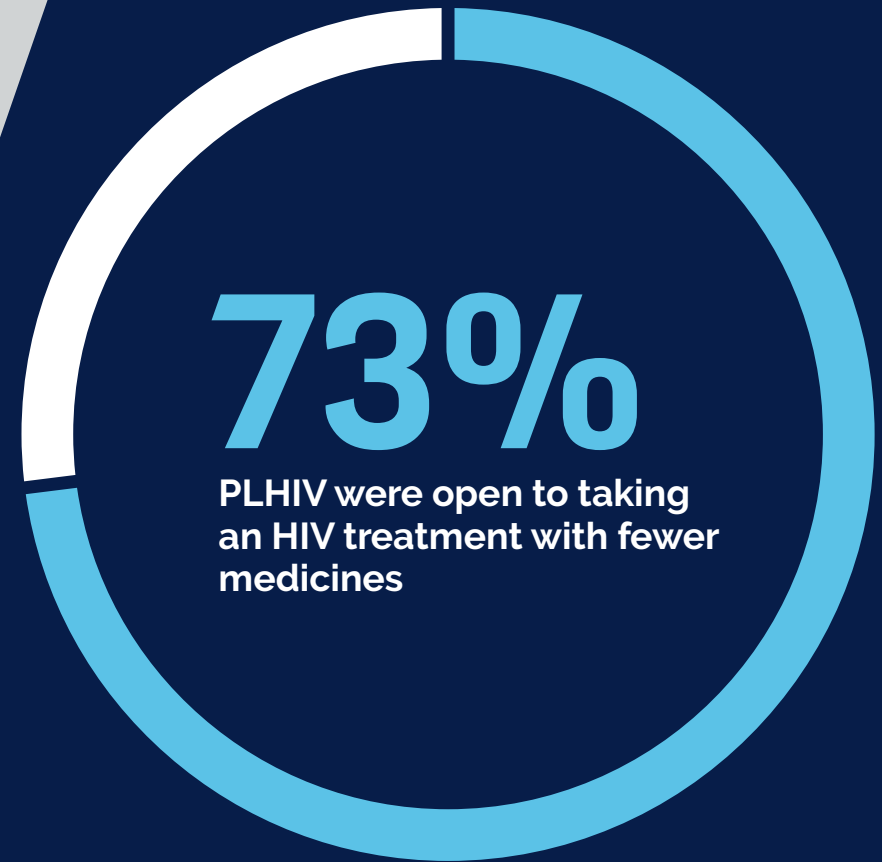
(1,195/2,112*) of PLHIV were concerned about taking more medicines as they grow older¹

Chapter 1

After controlling for the presence of comorbidities, Positive Perspectives 2 results also show that polypharmacy is strongly associated with poorer QoL.

Even among those study participants who self-reported that their HIV was virologically-controlled, polypharmacy was associated with less favourable health outcomes and treatment satisfaction¹

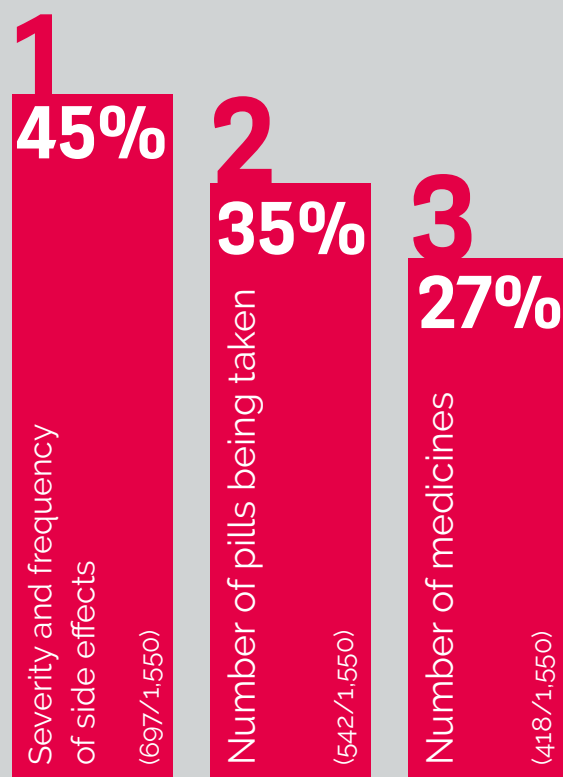
Conversely, after controlling for the presence of comorbidities, optimal overall health is almost 20% higher among those without polypharmacy - 63% (1,322/2,112*) vs 47% (984/2,112*), regardless of reported virologic control¹



Positive Perspectives 2 data show that 73% (1,544/2,112*) of PLHIV were willing to switch to an HIV treatment composed of fewer medicines (as long as their viral load remains suppressed)¹

*Total number of participants is 2,112 as the figures were calculated before the inclusion of additional data from Russia and South Africa

The top three reasons cited for switching treatment were to reduce:¹



Among those in the study who had been living with HIV ≥ 2 years (1,841), a comparison of treatment priorities **at the time of initiating ART**, versus **at the time of the study**, revealed that the three treatment priorities with the largest increase in importance over time were:



Minimizing the long-term impact of HIV treatment - **16 percentage points difference (44% vs 60%)¹**



Keeping the number of medicines in the HIV treatment to a minimum - **15 percentage points difference (35% vs 50%)¹**



Ensuring minimal side effects - **12 percentage points difference (55% vs 67%)¹**

¹This question was answered by people in the study who had ever switched treatment (1,550)

¹Total number of participants is 2,112 as the figures were calculated before the inclusion of additional data from Russia and South Africa



KEY TAKEAWAYS

It is important for PLHIV to plan ahead with their HCPs to ensure their evolving treatment needs are met and any other health conditions are taken into consideration.

PLHIV should be encouraged to discuss any concerns about their QoL, as well as current and future treatment needs, with their HCPs.

Please visit www.viivhealthcare.com for more information about the Positive Perspectives 2 study

A man with short brown hair, wearing a red long-sleeved shirt and blue jeans, is sitting on a green lawn. He is holding a small, scruffy grey and white dog in his arms. The dog is wearing a red collar. In the background, there is a brick house with white window frames and a small tree. The image has a blue triangle on the left and a red triangle on the bottom right.

Chapter 2

OPEN AND ACTIVE DIALOGUE

OPEN AND ACTIVE DIALOGUE

While suppressing the HIV virus is the main goal of HIV treatment, PLHIV can also work with their HCPs to aim for care that considers physical and emotional needs and also helps improve QoL.

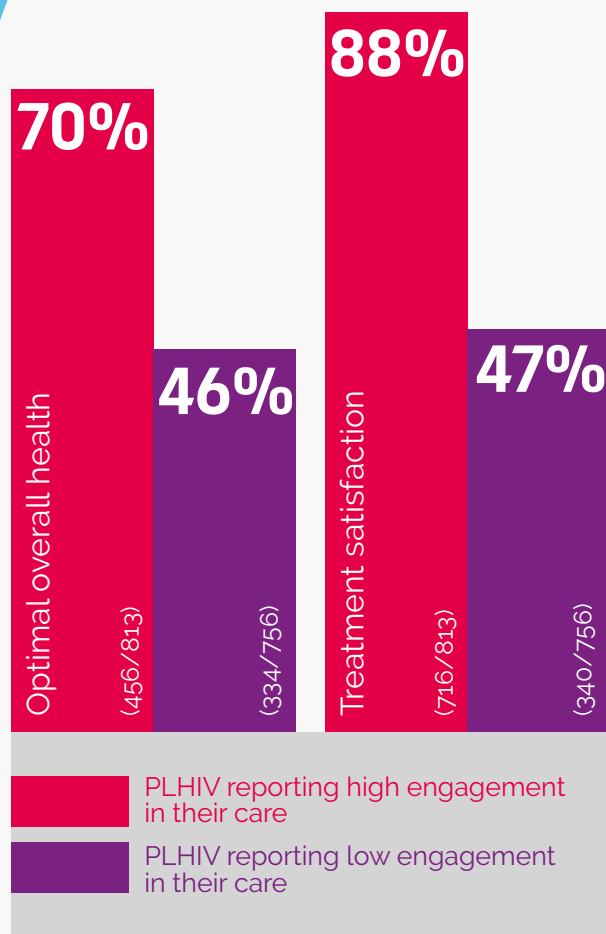
This all-encompassing approach, which also includes peer support, is known as 'holistic care'. Open and active dialogue between HCPs and PLHIV, coupled with support from peers and community organisations, enables PLHIV to feel comfortable discussing their treatment desires and concerns as well as their lifestyles and to collaborate with their HCPs to effectively manage their HIV.^{8,9}

Data from the initial Positive Perspectives 1 survey showed that having open discussions with their HCPs helps PLHIV to feel empowered, educated and informed about their therapy choices.⁸ This is further supported by data from Positive Perspectives 2 that demonstrate that HCP-PLHIV engagement was associated with significantly better health outcomes, and improving the quality of communication between PLHIV and HCPs may better support the fourth go goal of improving QoL.²

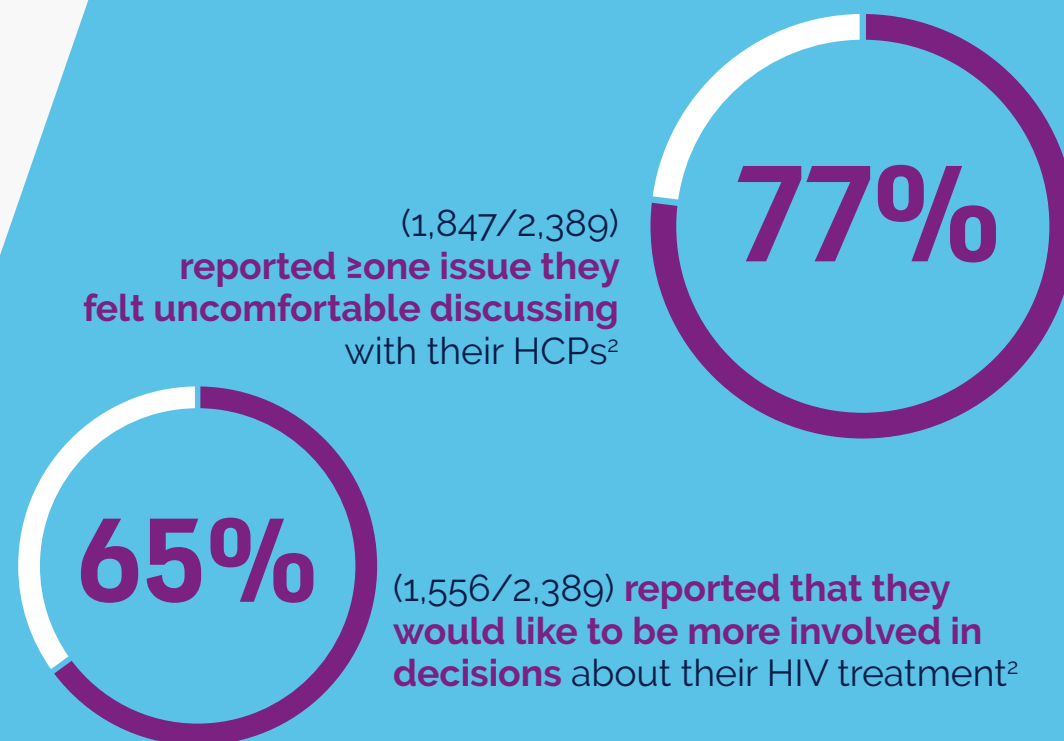


Chapter 2

HCP-PLHIV engagement was associated with better health outcomes:²



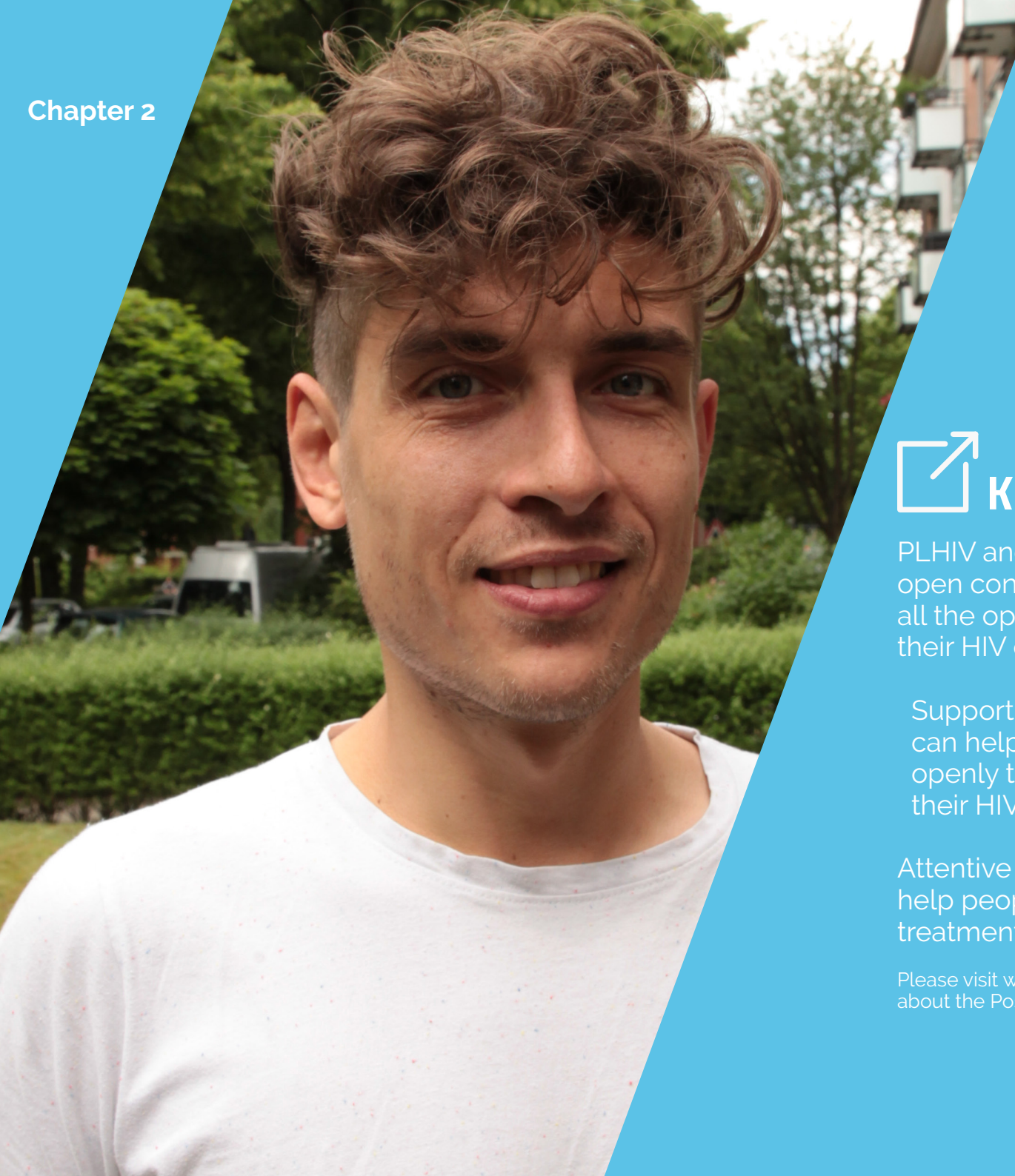
Significant numbers of PLHIV in the study reported not feeling comfortable discussing important HIV-related issues with their HCPs:



The top issues considered treatment priorities among those who had been living with HIV ≥ 2 years (1,841) were:

- concerns regarding ART side-effects (67%, 1,234/1,841)
- long-term impacts of HIV medicines (60%, 1,114/1,841)

Yet among those rating these issues as a priority, approximately **1/3** were uncomfortable discussing them with their HCPs (32%, [400/1,234] and 38% [426/1,114] respectively)²



KEY TAKEAWAYS

PLHIV and HCPs should be encouraged to have open conversations to make sure they understand all the options available to help manage their HIV care.

Support from peers and community organisations can help PLHIV to build their confidence in talking openly to their HCPs about how to best manage their HIV care.

Attentive listening as part of active dialogue can help people feel comfortable discussing their treatment goals.

Please visit www.viivhealthcare.com for more information about the Positive Perspectives 2 study

Chapter 3

UNDETECTABLE = UNTRANSMITTABLE (U=U)

UNDETECTABLE = UNTRANSMITTABLE (U=U)

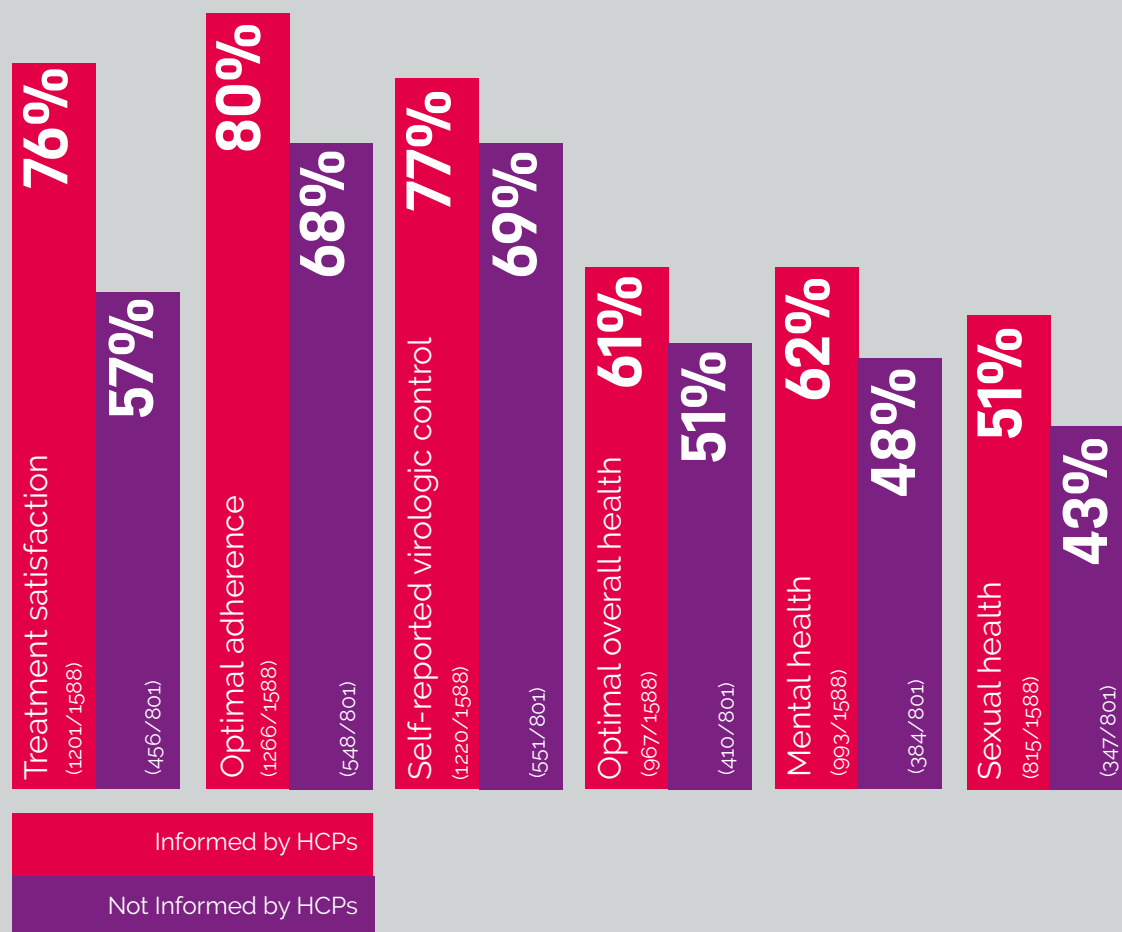
If PLHIV are on treatment and maintain undetectable levels of the virus (i.e. viral load < 200 copies/ml)¹⁰, they cannot transmit the virus to their sexual partners. The landmark PARTNER study looked at over 58,000 instances of sex without a condom, where one partner was HIV positive and one was HIV negative. Results found that where the HIV positive partner was on an effective treatment – reducing the amount of the virus to ‘undetectable’ levels – there were zero cases of HIV transmission i.e.

Undetectable = Untransmittable.¹¹



HCPs now have further incentive to inform PLHIV about U=U; Positive Perspectives 2 data show a direct correlation to improved health outcomes among those made aware of U=U by their HCPs:

Those that reported being informed of U=U by their HCPs (66%, 1,588/2,389) had more favourable outcomes than those who reported not being informed. They were also significantly more likely than those not informed to report:³



Just over one-third (34%, 801/2,389) of PLHIV in the study reported they were not told about U=U by their HCPs, and men who have sex with women are the least likely group to report having been given this information³



KEY TAKEAWAYS

As part of open and active dialogue between HCPs and PLHIV, an opportunity for HCPs exists to share the empowering message of U=U with all PLHIV to help improve health outcomes and QoL.³

Please visit www.viivhealthcare.com for more information about the Positive Perspectives 2 study



Chapter 4

HIV AND WOMEN

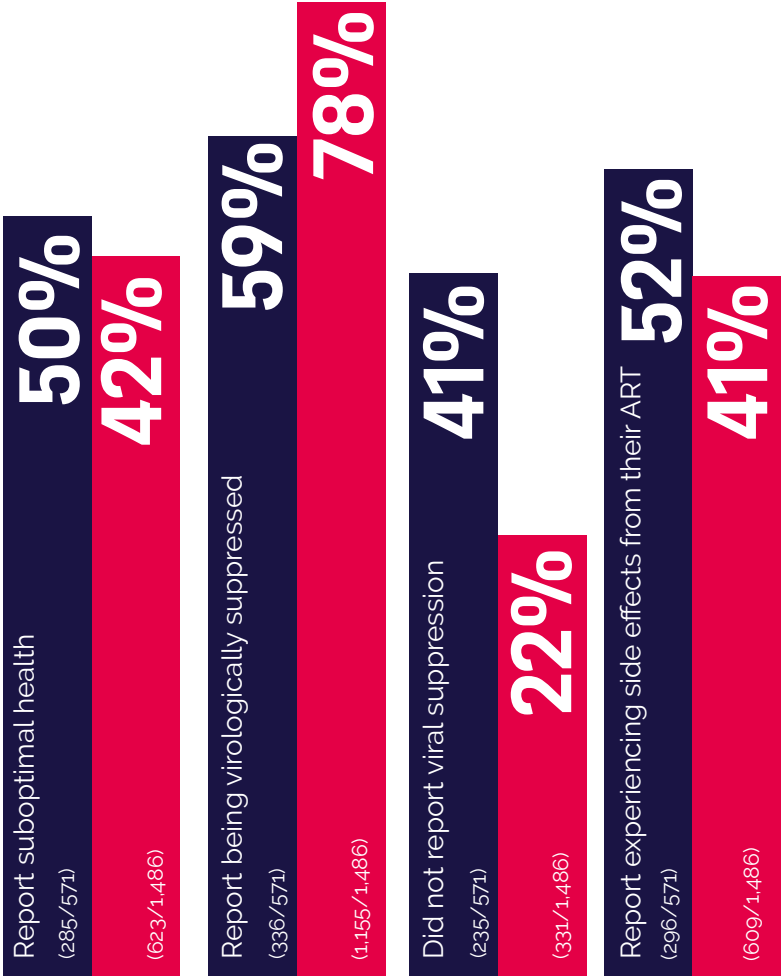
HIV AND WOMEN

Today, women make up more than half (52%) of all people living with HIV worldwide,¹² and HIV and AIDS is now the leading cause of death globally for women aged 15-44.¹³

Positive Perspectives 2 data shine a light on some of the gender-based differences in the experience of HIV care between women living with HIV (WLHIV) compared to men living with HIV (MLHIV) and emphasise some of the specific challenges faced by WLHIV.



Overall, WLHIV in the study reported significantly poorer health outcomes compared with MLHIV, and reported less viral suppression and more treatment-related side effects.⁴

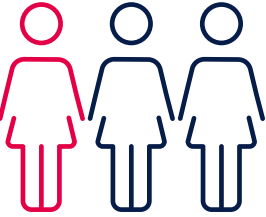


⁴Total number of participants is 2,112 as the figures were calculated before the inclusion of additional data from Russia and South Africa

Despite over two thirds (69%, 393/571) desiring greater involvement in their care, **a significantly higher proportion of WLHIV were uncomfortable discussing treatment issues with HCPs** due to:⁴



Positive Perspectives 2 data show that those who reported being informed of U=U by their HCPs had more favourable health outcomes, yet many WLHIV reported they were not informed:⁴



1 in 3 (34%, 196/571) WLHIV reported their HCPs had not told them about U=U and did not believe maintaining effective treatment prevents transmission⁴



KEY TAKEAWAYS

WLHIV face different challenges to MLHIV and it is important that these are addressed to help improve health outcomes.

Open discussions with HCPs regarding treatment, mental health, pregnancy and sexual intimacy can help WLHIV to feel empowered and get the answers they need to help them live well with HIV.

Please visit www.viivhealthcare.com for more information about the Positive Perspectives 2 study

Chapter 5

AGEING WELL WITH HIV



AGEING WELL WITH HIV

The number of PLHIV aged ≥ 50 years is currently estimated to be almost 9 million and is increasing.¹⁴

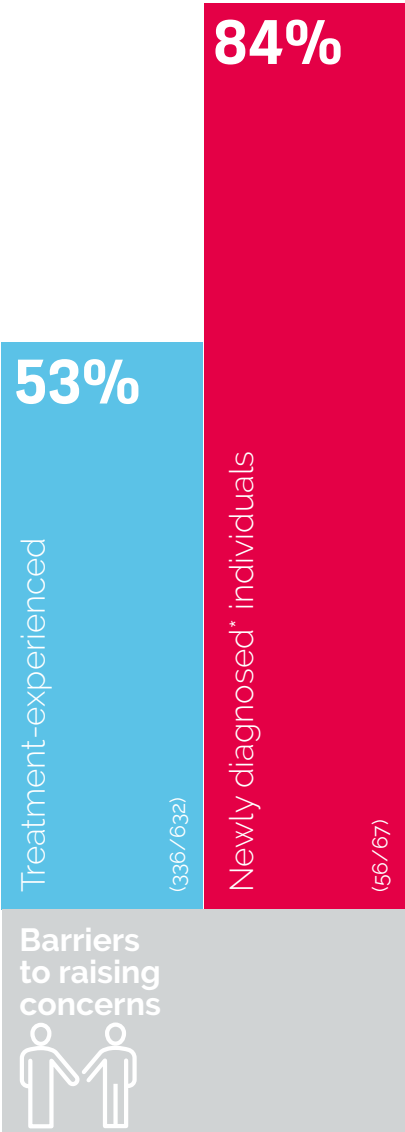
It isn't always possible for PLHIV to make planning for the future a top priority. As the majority of PLHIV are now living longer, it is important they are engaged in open dialogue with their HCPs to help address their evolving treatment needs over a lifetime and to understand how identifying and planning for these with their HCPs can improve health outcomes. This is particularly important as PLHIV are often more vulnerable to age-related health conditions such as cardiovascular disease, type 2 diabetes, kidney disease, liver disease, osteoporosis and several cancers as they age, compared to those not living with HIV.¹⁵

In the study almost one-quarter (23%, 161/699) of PLHIV aged ≥ 50 years reported suboptimal health on all domains (physical/mental/sexual/overall).

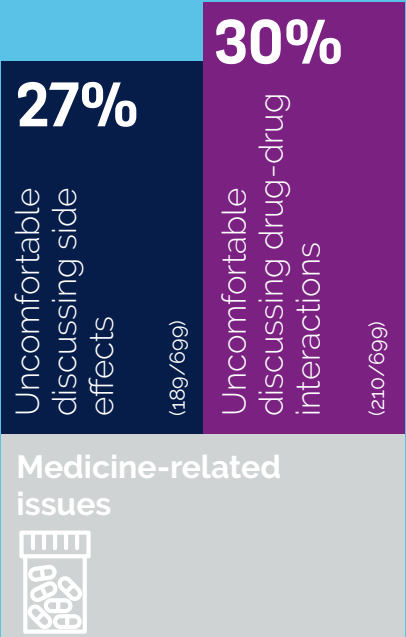
Groups most at risk were those reporting two or more comorbidities, poor adherence, treatment dissatisfaction or gastrointestinal side effects from ART.⁵



Communication issues can hinder optimisation of care, with over half of PLHIV aged ≥50 years reporting barriers to raising concerns, including medicine-related concerns, with their HCPs:⁶



For medicine-related issues, **more than a quarter of PLHIV aged ≥50 years (27%, 189/699) self-reported as being uncomfortable discussing side effects of HIV medications with their HCPs**, while approximately one-third (30%, 210/699) reported being uncomfortable discussing concerns about drug-drug interactions⁶



*Newly diagnosed in the study was defined as PLHIV who have been diagnosed from January 2017



KEY TAKEAWAYS

The priorities of PLHIV evolve as they grow older, highlighting the importance of HCPs and PLHIV having ongoing open discussions to address changing needs.

Addressing treatment concerns, such as the effects of other medicines, can help improve QoL and help PLHIV be prepared for healthy ageing with HIV.

Please visit www.viivhealthcare.com for more information about the Positive Perspectives 2 study

CALLS TO ACTION

COMMUNITY-BASED ORGANISATIONS

- Community-based organisations and peer groups can support PLHIV to build confidence to discuss their individual needs with their HCPs beyond being undetectable to help improve QoL

HCPs

- HCPs can advocate for and implement more holistic approaches to HIV care, including measures of QoL for PLHIV
- HCPs can continue regularly evaluating PLHIV concerns about treatment, comorbidities and polypharmacy to help alleviate anxieties and worry experienced by PLHIV
- HCPs can continuously stress the advantages of viral suppression, including U=U

PLHIV

- PLHIV should feel empowered to play active roles in their HIV care; they should engage in open dialogue with their HCPs, discussing future plans and long-term health concerns, including polypharmacy

PUBLIC HEALTH

- Public health officials can develop standards of care that enable HCPs to effectively measure and optimise QoL
- Associations of clinicians can advocate for and provide care beyond viral suppression, developing initiatives that maintain and optimise QoL over the long-term
- Public health campaigns can support informing the public about U=U to help minimise stigma and discrimination



ABOUT ViiV HEALTHCARE

ViiV Healthcare is a global specialist HIV company established in November 2009 by GlaxoSmithKline (LSE: GSK) and Pfizer (NYSE: PFE) dedicated to delivering advances in treatment and care for people living with HIV and for people who are at risk of becoming infected with HIV. Shionogi joined in October 2012. The company's aim is to take a deeper and broader interest in HIV/AIDS than any company has done before and take a new approach to deliver effective and innovative medicines for HIV treatment and prevention, as well as support communities affected by HIV.

For more information on the company, its management, portfolio, pipeline and commitment, please visit www.viivhealthcare.com.

We would like to thank all those involved in the Positive Perspectives 2 study, including PLHIV, community organisations, activists and HCPs. With their support, we are working to elevate the voices of PLHIV worldwide.

REFERENCES

1. Okoli C, de los Rios P, Eremin A, Brough G, Young B, Short D. Relationship Between Polypharmacy and Quality of Life Among People in 24 Countries Living With HIV. *Prev Chronic Dis* 2020;17:190359. DOI: <http://dx.doi.org/10.5888/pcd17.190359>
2. Okoli C, Brough G, Allan B, Castellanos E, Young B, Eremin A, Corbelli GM, Mc Britton M, Muchenje M, Van de Velde N, de los Rios P. Putting the heart back into HAART: greater HCP-patient engagement is associated with better health outcomes among persons living with HIV (PLHIV) on treatment; Poster PED 0808 Presented at the 23rd International AIDS Conference, July 6–10, 2020.
3. Okoli C, Richman B, Allan B, Brough G, Castellanos E, Young B, Eremin A, Corbelli GM, McBritton M, Hardy D, Muchenje M, Van de Velde N, de los Rios P. A tale of two 'U's and their use by healthcare providers: a cross country analysis of information sharing about undetectable = untransmittable (U=U); Poster PED 0773 Presented at the 23rd International AIDS Conference, July 6–10, 2020.
4. Okoli C, de los Rios P, Muchenje M, Young B. Treatment experiences, perceptions towards sexual intimacy and child-bearing, and empowered decision making in care among women living with HIV; Positive Perspectives; Presented at the 10th International Workshop on HIV & Women, Boston, MA, March 6–7, 2020.
5. Short D, Spinelli F, Okoli C, de los Rios P. Clinical and sociodemographic characteristics associated with poor self-rated health across multiple domains among older adults living with HIV; Oral OAD 0903 Presented at the 23rd International AIDS Conference, July 6–10, 2020.
6. Short D, Spinelli F, Okoli C, de los Rios P. Understanding the changing treatment concerns of older people living with HIV and difficulties with patient-provider communication; Poster PED 0787 Presented at the 23rd International AIDS Conference, July 6–10, 2020.
7. Edelman EJ, Gordon KS, Glover J, McNicholl IR, Fiellin DA, Justice AC. The next therapeutic challenge in HIV: polypharmacy. *Drugs & Aging* 2013;30(8):613–28. <https://link.springer.com/article/10.1007/s40266-013-0093-9>
8. ViiV Healthcare. Data on File – Positive Perspectives Survey 2017. www.viivhealthcare.com/en-gb/hiv-treatment-and-care/the-positive-perspectives-survey/
9. Chen, W. et al. Engagement with Health Care Providers Affects Self- Efficacy, Self-Esteem, Medication Adherence and Quality of Life in People Living with HIV. *Journal of AIDS & Clinical Research* 2013, 04(11).
10. NAM AIDSMAP. What does undetectable = untransmittable (U=U) mean? www.aidsmap.com/about-hiv/what-does-undetectable-untransmittable-uu-mean
11. Rodger AJ, Cambiano V, Bruun T et al. Sexual Activity Without Condoms and Risk of HIV Transmission in Serodifferent Couples When the HIV-Positive Partner Is Using Suppressive Antiretroviral Therapy. *JAMA* 2016, 316(2)
12. UNAIDS. Core Epidemiology Slides. Available at: https://www.unaids.org/sites/default/files/media_asset/UNAIDS_2017_core-epidemiology-slides_en.pdf . Last accessed June 2020.
13. Global health estimates 2016: deaths by cause, age, sex, by country and by region, 2000–2016. Geneva: World Health Organization; 2018. https://www.who.int/healthinfo/global_burden_disease/estimates/en/index1.html Last accessed June 2020.
14. UNAIDS. Get on the fast-track, the life-cycle approach to HIV 2016. www.unaids.org/sites/default/files/media_asset/Get-on-the-Fast-Track_en.pdf
15. Burki T. People ageing with HIV face an uncertain future. *The Lancet HIV*. Feature, Volume 6, PE816–E817, December 01, 2019. DOI: [https://doi.org/10.1016/S2352-3018\(19\)30381-9](https://doi.org/10.1016/S2352-3018(19)30381-9).