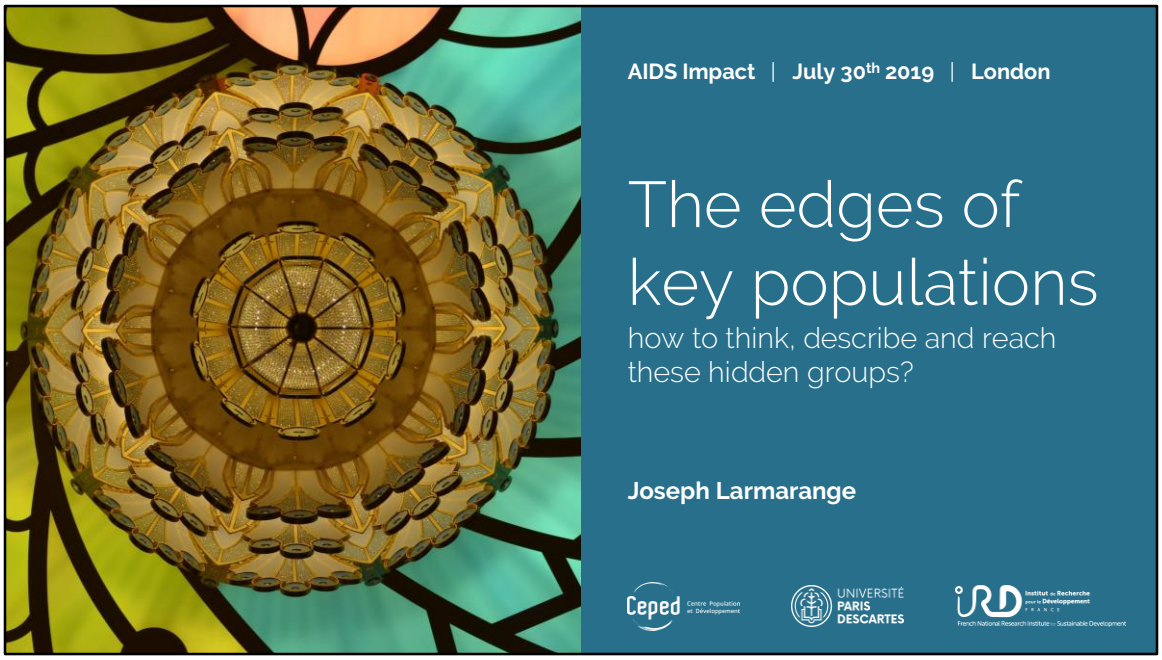


Good morning. I am Joseph Larmarange, a public health demographer at the French Research Institute for sustainable Development. Today, I will speak about the edges of key populations.

Key populations overwhelmingly affected by HIV

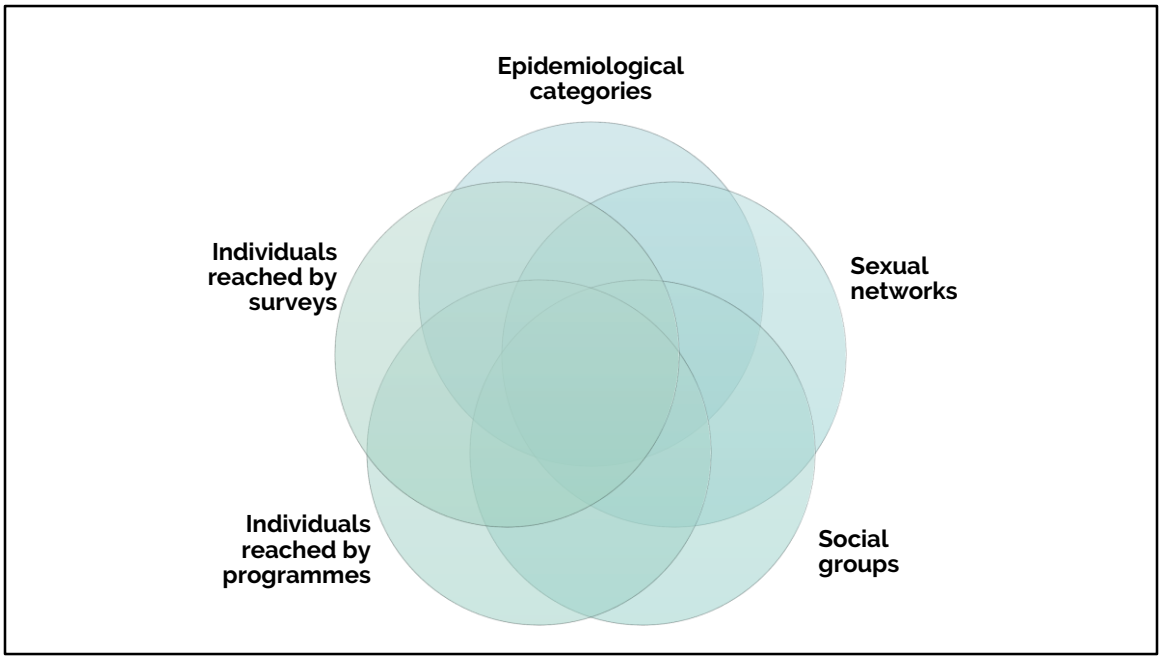
Constrained ressources → targeted strategies

Anne Bekelynck
Pepfar 3.0's HIV testing policy in Côte d'Ivoire (2014-2018): a changing strategy between improvement of testing yield and achievement of the first 90?
Today 11:00-12:30 | Duke 2

In many settings, what is commonly referred to as key populations, in particular, female sex workers, men having sex with men, transgender women and drug users, are overwhelmingly affected by HIV.

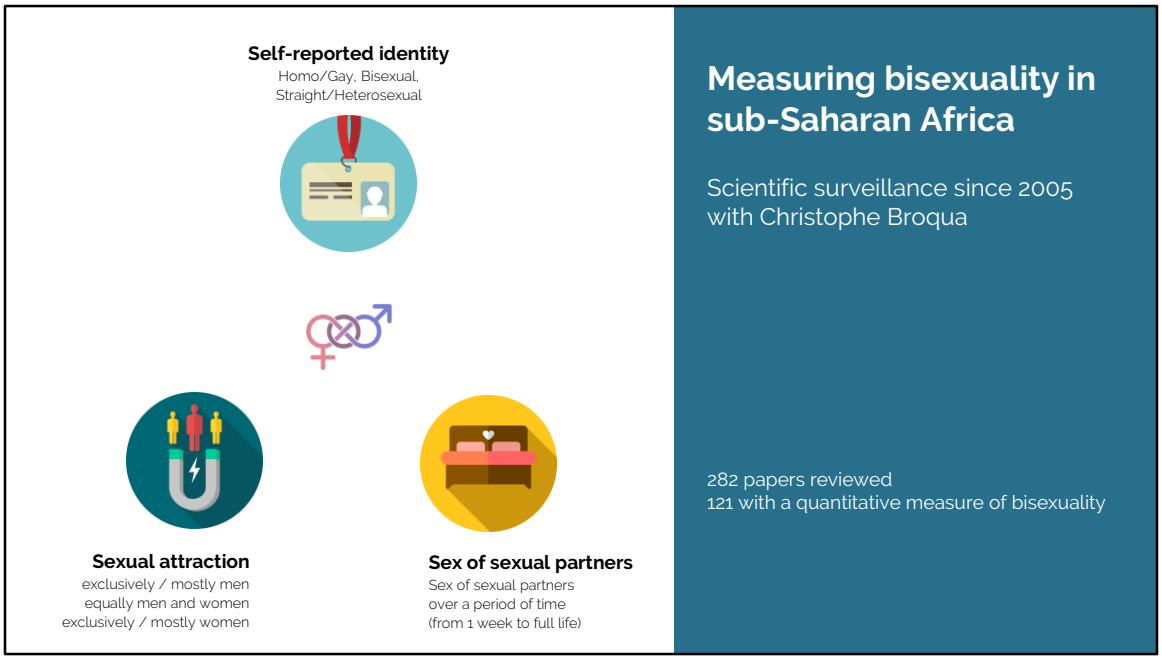
In a context of constrained resources, international donors are refocusing their activities on increasingly targeted strategies, in particular towards these key populations.

Pepfar's policy in Côte d'Ivoire, presented in details later today by Anne Bekelynck, is a good illustration of this.



Epidemiological categorization of at-risk populations has been essential for a better understanding of the epidemics, for modelling, and for designing interventions and programmes.

But too often, there had been a lack of consideration that epidemiological categories do not perfectly match sexual networks, social groups, individuals reached by public or community programmes, or even individuals reached by surveys.

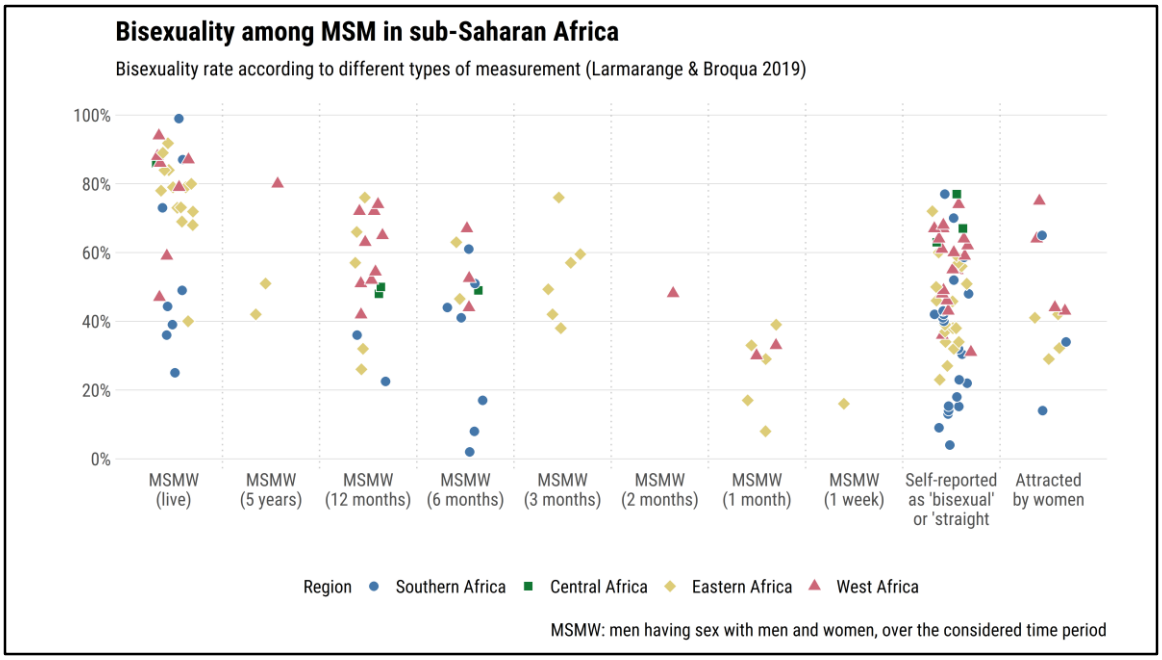


As an example, there are many ways of measuring bisexuality. With Christophe Broqua, we conducted since 2005 a scientific surveillance of all publications on homo-bisexuality in sub-Saharan Africa.
Across quantitative surveys, three main dimensions are used to identify bisexual men:

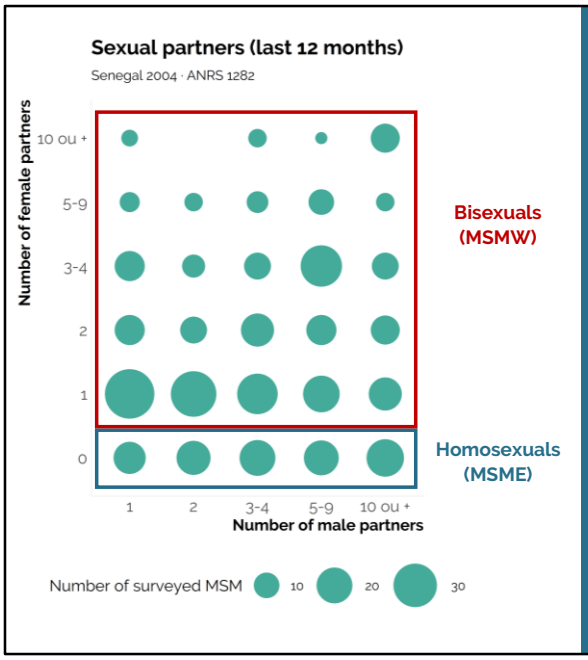
Self-reported identity. The vast majority of surveys used categories like gay, bisexual or straight but very few used local terms.

The sex of sexual partners over a specific period of time, from one week to full life, distinguishing men having sex with men exclusively and men having sex with men and women

And sexual attraction for men and/or women.



When combining all estimates of the proportion of bisexuals among MSM, regardless of the type of indicators, it appears that bisexuality is very common among African MSM, usually at higher rates compared to surveys conducted in other parts of the world.



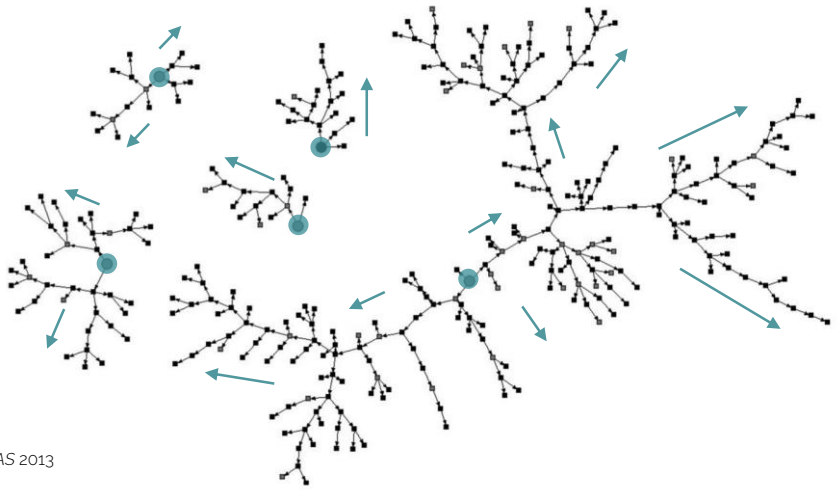
high diversity of situations

However, homosexuals and bisexuals do not constitute two distinct and homogeneous groups. Here, I'm using data from the first African seroprevalence survey conducted in Senegal in 2004. This graph represents the distribution of surveyed MSM according to their number of male and female sexual partners over the last 12 months, the size of each dot corresponding to the number of individuals.

Men having sex exclusively with other men are represented on the bottom row, while the other rows represent men having sex with men and women.

As you can see, there is a high diversity of situations, some men having only one male partner and one female partner, some others having several partners of each sex.

RDS
Respondent Driven Sampling

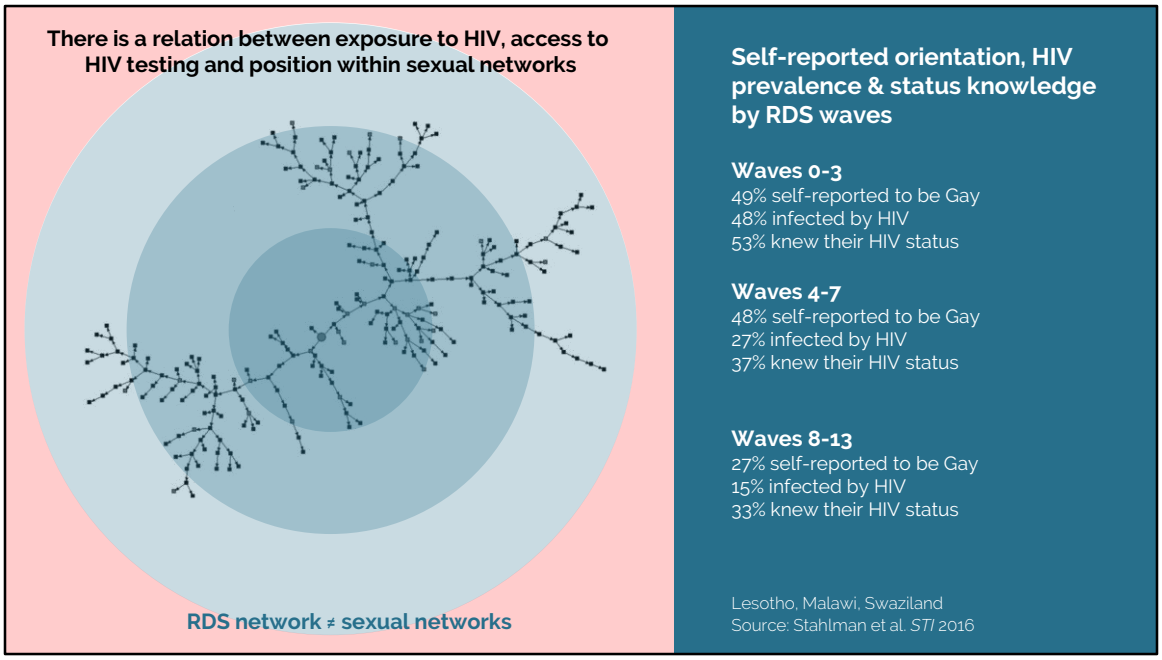


Malawi · Source: Wirtz et al. *JIAS* 2013

Most surveys among MSM used a respondent-driven sampling approach.

Some individuals are recruited within the community and constitute the seeds of the survey.

They are asked to recruit other members of the community to participate in, creating a first wave. The latter are in turn invited to recruit other participants, resulting in a second wave. And so on.



Combining surveys conducted in Lesotho, Malawi and Swaziland, Sthalman and colleagues showed that

Among MSM from the first 4 waves, 49% self-reported to be Gay, 48% were infected by HIV and 53% knew their HIV status.

Among waves 4 to 7, 48% self-reported to be Gay, 27% were infected by HIV and 37% knew their HIV status.

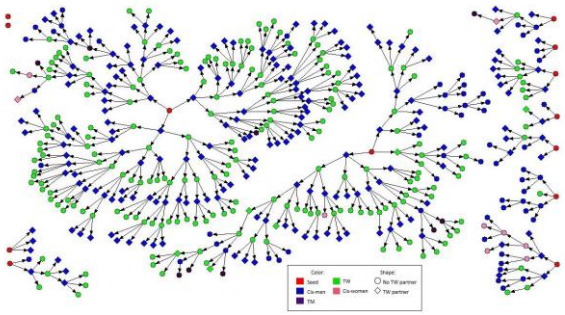
Among waves 8 to 13, 27% self-reported to be Gay, 15% were infected by HIV and 33% knew their HIV status.

It seems that there is a relation between exposure to HIV, access to HIV testing and position within sexual networks, between the centre and the edges.
But it should be noted that RDS waves are a very imperfect proxy of the position within sexual networks or social groups.

In addition, these surveys are not representative of all men having sex with other men.

Some MSM are not observed.
There is a difference between the age of survey participants and the reported age of their male sexual partners.
On the field, peer educators similarly report their difficulties to reach older MSM, in particular, those who are married.

Long et al.
"Little to no overlap of sexual networks of transgender women and MSM in Lima, Peru"
CROI 2019



› Modified RDS design starting with TW

› Partners of TW did not define themselves as homosexuals

› They do not have male cisgender partners

Population separate from MSM social and sexual networks

A recent study presented last February at CROI showed that there is little to no overlap of sexual networks of transgender women and MSM in Lima, Peru.

They used a modified respondent-driven sampling design, starting with transgender women and asking them to recruit their sexual partners, asking the latter to recruit their sexual partners as well and so on.

In this context, the majority of transgender women' sexual partners do not define themselves as homosexual and do not have cisgender (which simply means non-transgender) male partners.

Partners of transgender women are a unique population separate from MSM social and sexual networks.

Transidentity in sub-Saharan Africa

Poteat et al. *PLoS Med* 2017

data from 8 countries

HIV prevalence:
› Transgender women: 23.5%
› Cisgender male: 7.3%

Definition of transgender women:
having answered "transgender" or "women" to a question on gender identity

Coulaud *PhD Thesis* 2019

CohMSM cohort
Burkina Faso, Côte d'Ivoire, Mali and Togo

	homo/gay	bisexual
only a man	16%	37%
both a man and a woman	21%	21%

The distinction between gender expression, gender identity, sexual role and sexual orientation remains blurred for a majority of respondents (Kama and Simporé 2018).

However, the situation of transgender women differs according to the context.

In a study that used data from eight RDS surveys conducted in sub-Saharan Africa, the authors distinguished "transgender women" and "cisgender men" having sex with other men. HIV prevalence was 24% among transgender women and 7% among cisgender male. For this study, those who answered "female" to a question on gender were merged with those who explicitly answered "transgender" to the same question. In fact, few participants defined directly themselves as transgender in these surveys.

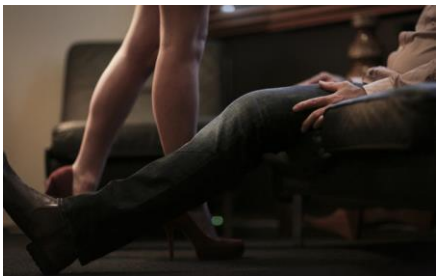
In many African countries, there is no incompatibility in defining oneself as "gay" or "MSM" at a question on sexual orientation while declaring oneself as versatile or "a woman" to a question on gender identity. In the CohMSM cohort set up in Burkina Faso, Côte d'Ivoire, Mali and Togo, 16% reported both "homosexual/gay" and being "only a man", 21% "homosexual/gay" and being "both a man and a woman", 37% "bisexual" and being "only a man" and 21% "bisexual" and being "both a man and a woman".
In this context, questions on gender identity would rather tend to reflect a distinction of the Yossi/Woubi type, Wolof terms used to distinguish respectively those who are supposed to play a male role (and by extension being the insertive partner) and those who are supposed to play a female role (and by extension being the receptive partner) in a male homosexual relationship.

The distinction between gender expression, gender identity, sexual role and sexual orientation remains blurred for a majority of respondents.

Sex work

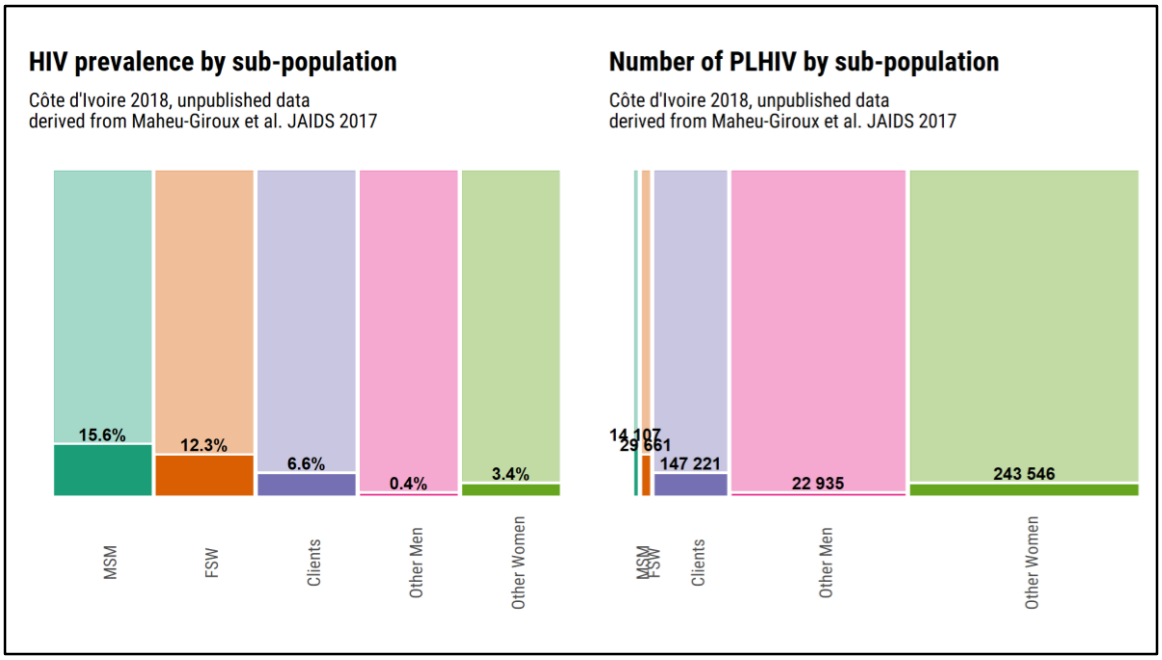
Continuum of sexual-economic exchanges
(cf. Paula Tabet)
→ challenge for defining SW category

Many surveys among FSW
but very few among their clients



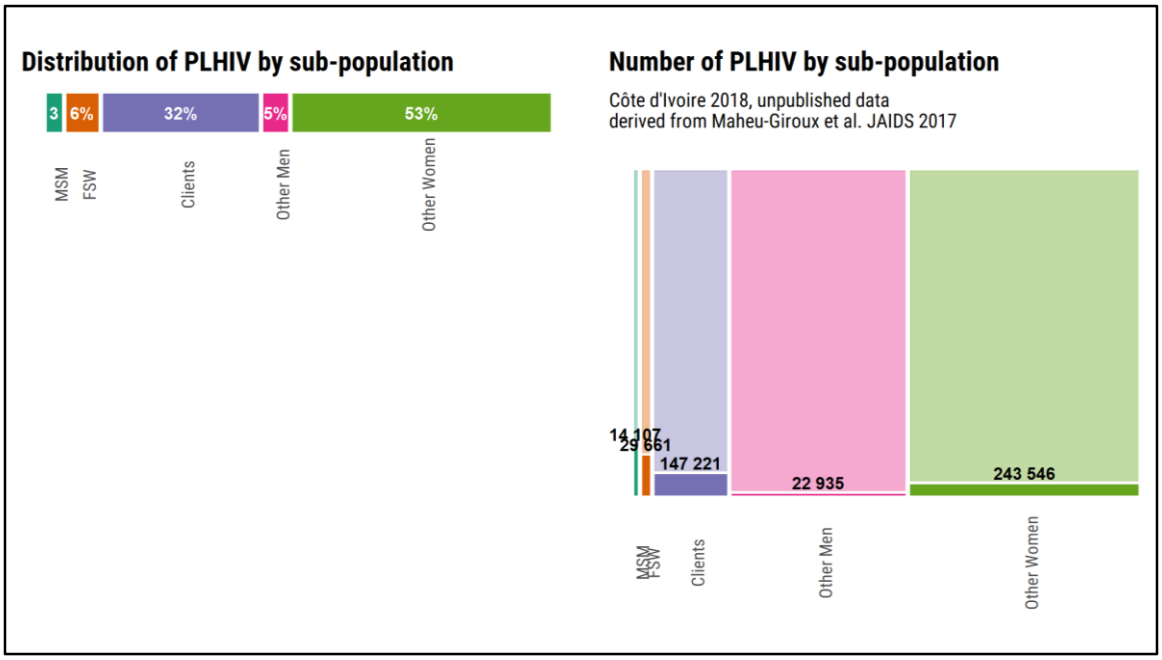
Regarding sex work, we know that defining precisely who are sex workers is challenged by the continuum of sexual-economic exchanges and practices.

If they have been much research on different subgroups of female sex workers (regular vs. occasional, self-defined vs. hidden), very few surveys have been conducted among their clients, although they constitute an important part of the dynamic of HIV epidemics.

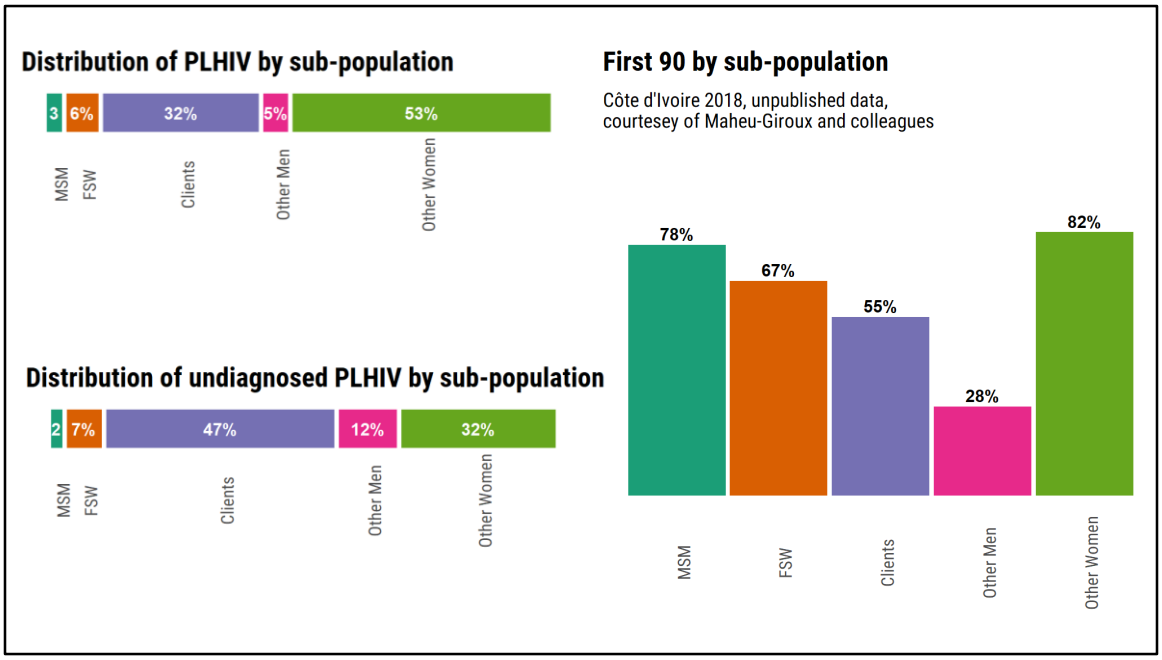


To illustrate the relative importance of different subgroups, I will use data from 2018 in Côte d'Ivoire, derived from a dynamic compartmental mathematical model developed by Mathieu Maheu-Giroux, Marie-Claude Boiley and colleagues.
On this first slide, you can see the HIV prevalence for 5 subgroups considered by the model: MSM, FSW, clients of FSW, other men and other women. These figures highlight the fact that Côte d'Ivoire has a mixed epidemic: prevalence is high among MSM and FSW, respectively 16 and 12%. It is relatively low but still generalized at 3% among women in the general population. For men, the model distinguished clients of FSW and other men with respectively a prevalence of 7 and below 1%.

When we take into account the size of each sub-population, represented here by the width of each bar, another picture emerges.

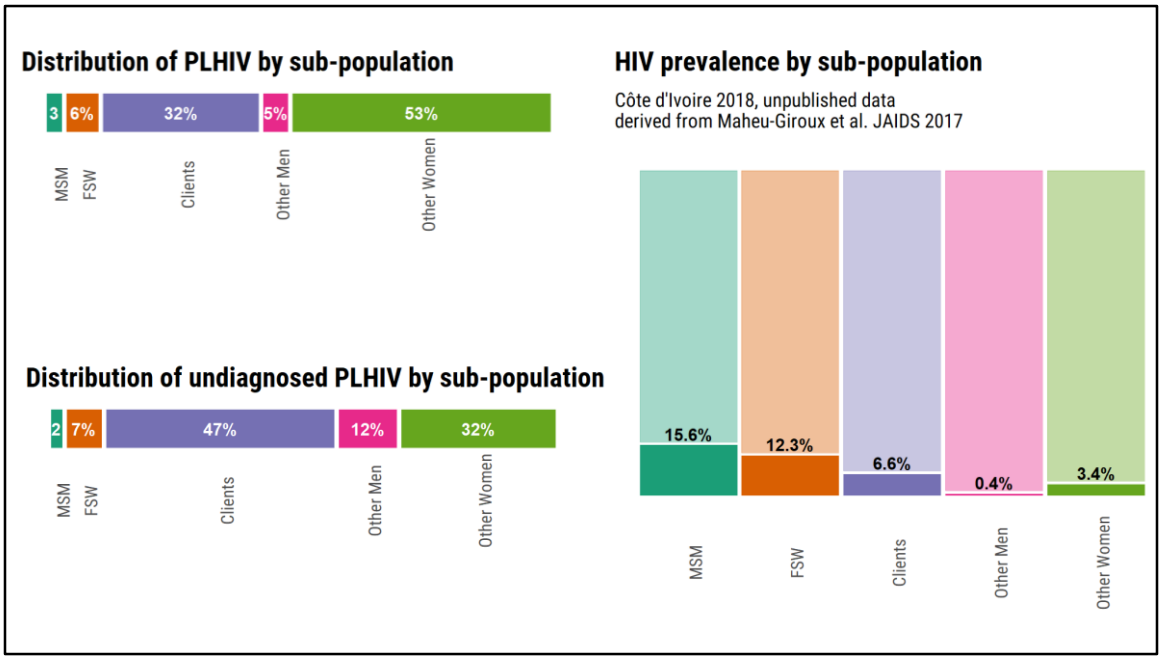


Among all people living with HIV, MSM and FSW account only for 3 and 6% respectively, while other women represent half of them, and clients of FSW a third.

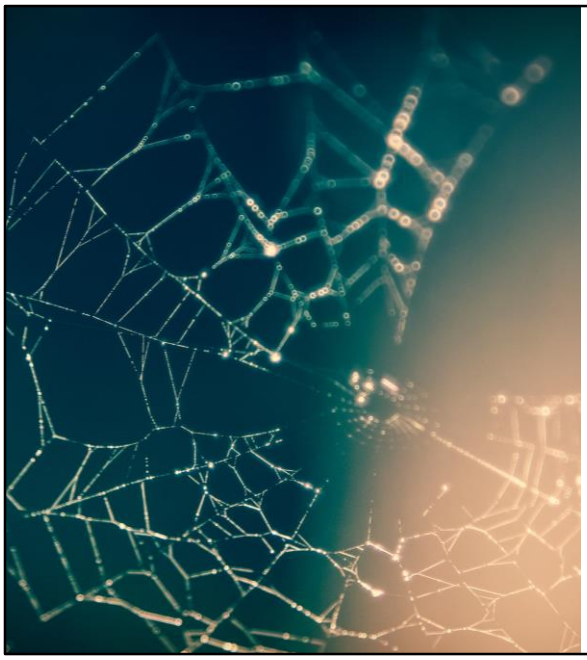


Let's now consider as well the first 90, i.e. the proportion of PLHIV knowing their status. HIV status knowledge is quite good among MSM, FSW and other women but much lower among clients and other men.

When combining the distribution of PLHIV by sub-population and estimates of the first 90, we can compute the distribution of undiagnosed PLHIV by sub-group. It appears that half of the undiagnosed people are clients.



Often, our representations of HIV epidemics are based on our knowledge of the relative HIV prevalence by sub-groups (displayed again on the right), suggesting that most of the epidemic is concentrated in key populations. But in the context of a mixed epidemic, when we consider population size and absolute numbers, the situation appears completely differently.



Who transmit and who acquire HIV?

According to the same model,
in Côte d'Ivoire, between 2005 and 2015

- MSM:
  4% of those acquiring HIV
  4% of transmitters
- FSW:
  5% of those acquiring HIV
  19% of transmitters
- **44% of HIV infections occurred between a client of FSW and a no-FSW women**

Source: Mathieu Maheu-Giroux et al. *JAIDS* 2017

The same model estimated the dynamic of HIV transmissions between 2005 and 2015 in Côte d'Ivoire.
Over that period, MSM accounted for 4% of new infections and 4% of transmitters.

If FSW accounted for only 5% of the individuals who acquired HIV, they were at the origin of 19% of new infections.

Furthermore, 44% of HIV infections occurred between a client and a no-FSW woman.

If key populations are overwhelmingly affected by HIV and play an important role in the dynamic of epidemics, most of the gaps could be located in sub-groups with lower HIV prevalence.

We will never achieve the 1st 90 if we do not accept to implement testing strategies in low yield groups.

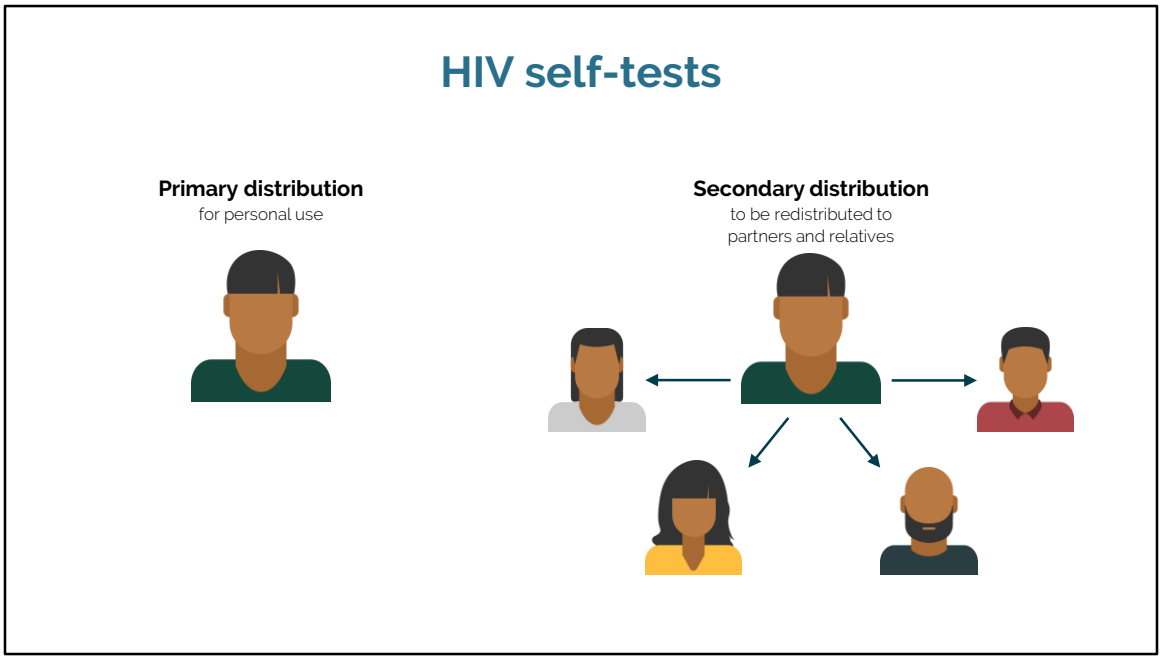
UTT trials
HIV incidence outcomes

Trial	BCPP		PopART		SEARCH		TasP	
Country	Botswana		South Africa / Zambia		Kenya / Uganda		South Africa	
Arm	C	I	C	I	C	I	C	I
Universal testing at baseline	-	✓	-	✓	✓	✓	✓	✓
Repeated universal testing	-	ongoing targeted	-	✓	-	✓	✓	✓
Universal treatment	-	✓	-/✓	-/✓	-/✓	✓	-	✓
HIV incidence								
Annual incidence for 100 person-years	0.92	0.59	1.55	1.24	0.27	0.25	2.27	2.11
Reduction (I vs C)	31% reduction		20% reduction		not significant, but 32% reduction in intervention arm between years 1 & 3		not significant	

Note:
both intervention arms were pooled for PopART.

I do not have time to develop on the 4 Universal Test and Treat trials (BCPP, PopART, SEARCH and ANRS TasP), who just published their primary results.

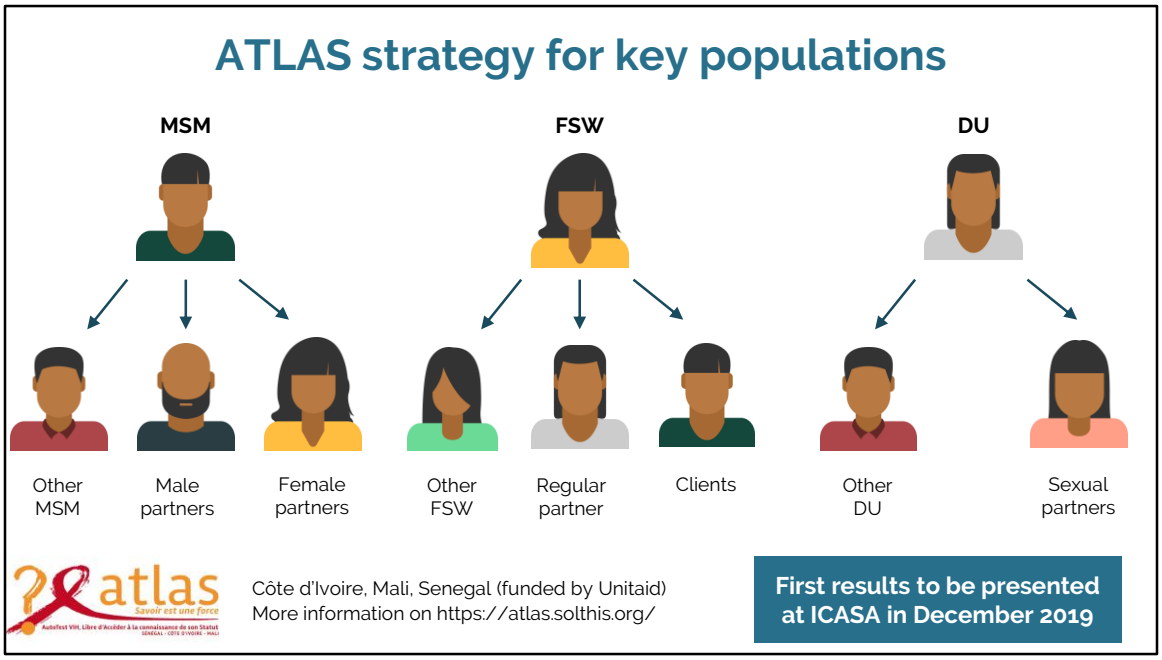
The important point here is that a reduction in terms of HIV incidence between intervention and control arm was observed only when the control arm was not including universal testing.
Although costly, universal testing, in some way or another, will be crucial to achieving epidemic control.



Where it is not feasible to implement universal testing, we need at least to develop strategies to reach exposed groups beyond key populations.
HIV self-testing is one of those strategies to consider.

If HIV self-tests can be distributed through primary distribution, i.e. by distributing test kits to individuals reached by programmes for their personal use,

it is also possible to consider secondary distribution where several kits are distributed to primary contacts in order to be redistributed to their partners and relatives.



Funded by Unitaid, the ATLAS programme aims to promote and deploy HIV self-testing in Côte d'Ivoire, Mali and Senegal and to distribute half a million self-tests through various delivery channels, targeting in particular key populations. Secondary distribution is central in ATLAS strategy.

More precisely, we hope that through MSM, we will be able to reach their male partners, including hidden MSM, as well as their female partners.

Through female sex workers, we want to reach other FSW (including occasional ones), their clients et their regular partners.

Through drug users, we expect to reach by secondary distribution other drug users not seen by peer educators and their sexual partners.

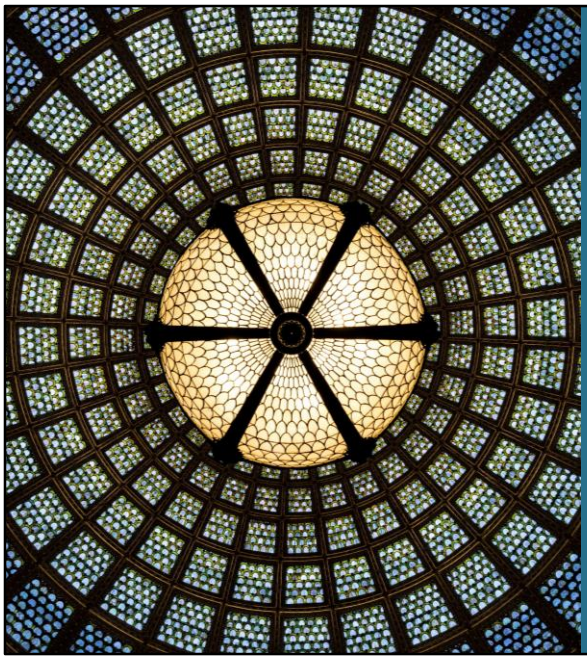
Distribution just started in Mali and Senegal and is about to start in Côte d'Ivoire. First results should be presented at ICASA in December this year.

In conclusion

Key populations are heterogenous groups with fuzzy outlines.

The centres are usually more exposed to HIV, with higher HIV prevalence, and are also better accessing community services and care.
The edges are more difficult to reach and less known. Even if HIV prevalence is lower, they could represent a higher number of people living with HIV.

Epidemic control, which implies universal testing and universal access to lifelong treatment and care, will never be achieved if we do not take into account all these sub-populations not directly defined as key populations but connected, through social and sexual networks, to them.



Merci

Slides available on
http://joseph.larmarange.net

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Mathieu Maheu-Giroux,
the ATLAS Research Team

Merci