Lifetime
SURVIVORS

Aging with HIV and the whole life approach

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CDC/HRSA Advisory Committee on HIV, Viral Hepatitis and STD Prevention & Treatment (CHAC)
April 10, 2024

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MEDICINE

Disclosures

- Gilead scientific advisory board, site investigator under clinical research contract managed through JHU
- Merck scientific advisory board, consultant, site investigator under clinical research contract managed through JHU
- ViiV scientific advisory board

1977

First known infant to be born with HIV

1980

RARE CANCER SEEN IN 41 HOMOSEXUALS

Outbreak Occurs Among Men in New York and California —8 Died Inside 2 Years

By LAWRENCE K. ALTMAN

Doctors in New York and California have diagnosed among homosexual men 41 cases of a rare and often rapidly fatal form of cancer. Eight of the victims died less than 24 months after the diagnosis was made.

The cause of the outbreak is unknown, and there is as yet no evidence of contagion. But the doctors who have made the

1982

PEDIATRICS

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Acquired Immunodeficiency Syndrome in Children: Report of the Center Control National Surveillance, 1982 to 1985

Martha F. Rogers, Pauline A. Thomas, E. Thomas Starcher, Mary C. Noa, Timothy J. Bush and Harold W. Jaffe

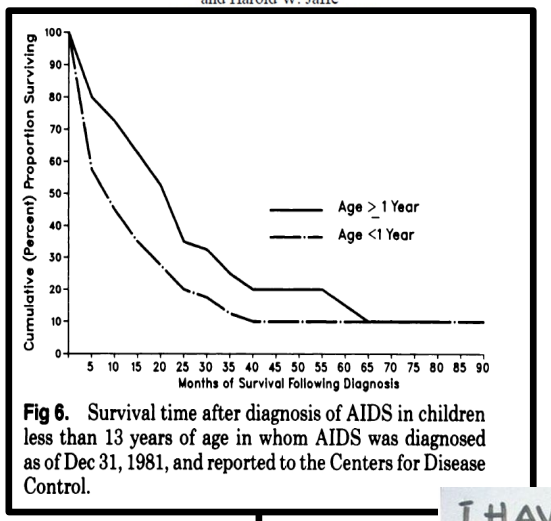


Fig 6. Survival time after diagnosis of AIDS in children less than 13 years of age in whom AIDS was diagnosed as of Dec 31, 1981, and reported to the Centers for Disease Control.

1985

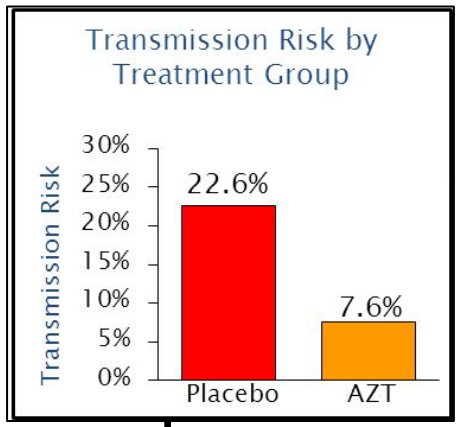
FDA approves 1st HIV ab test

1987

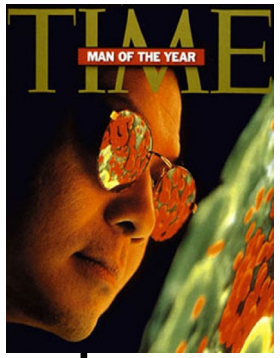
1988

1990

1994



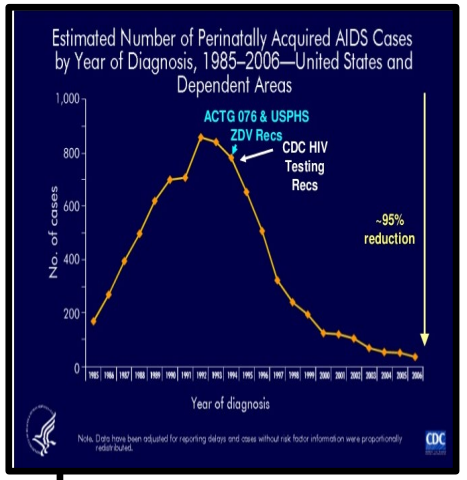
1996



FDA approves Nelfinavir for kids

2003

2006



2013

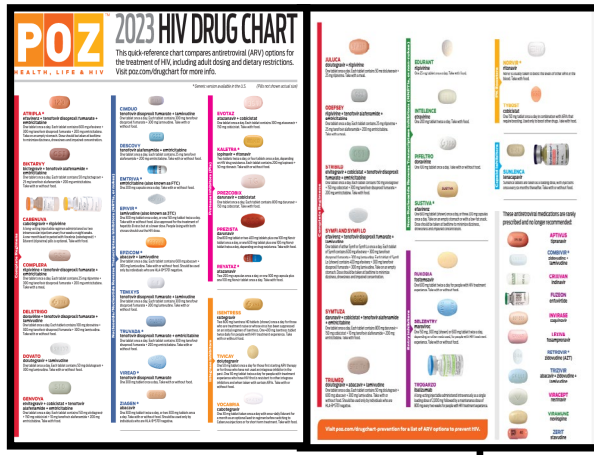
2014

'Cured' HIV Baby is Infected, Doctors Find

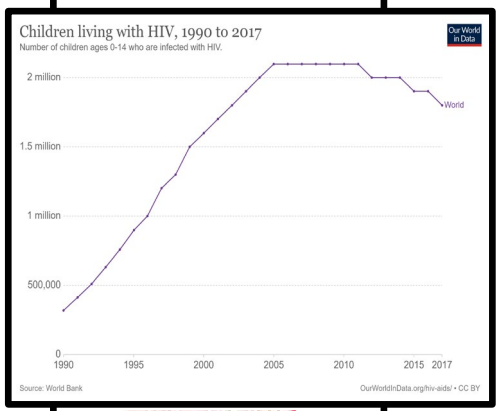
2015

South African child in HIV remission without drugs

2017



2020



2021

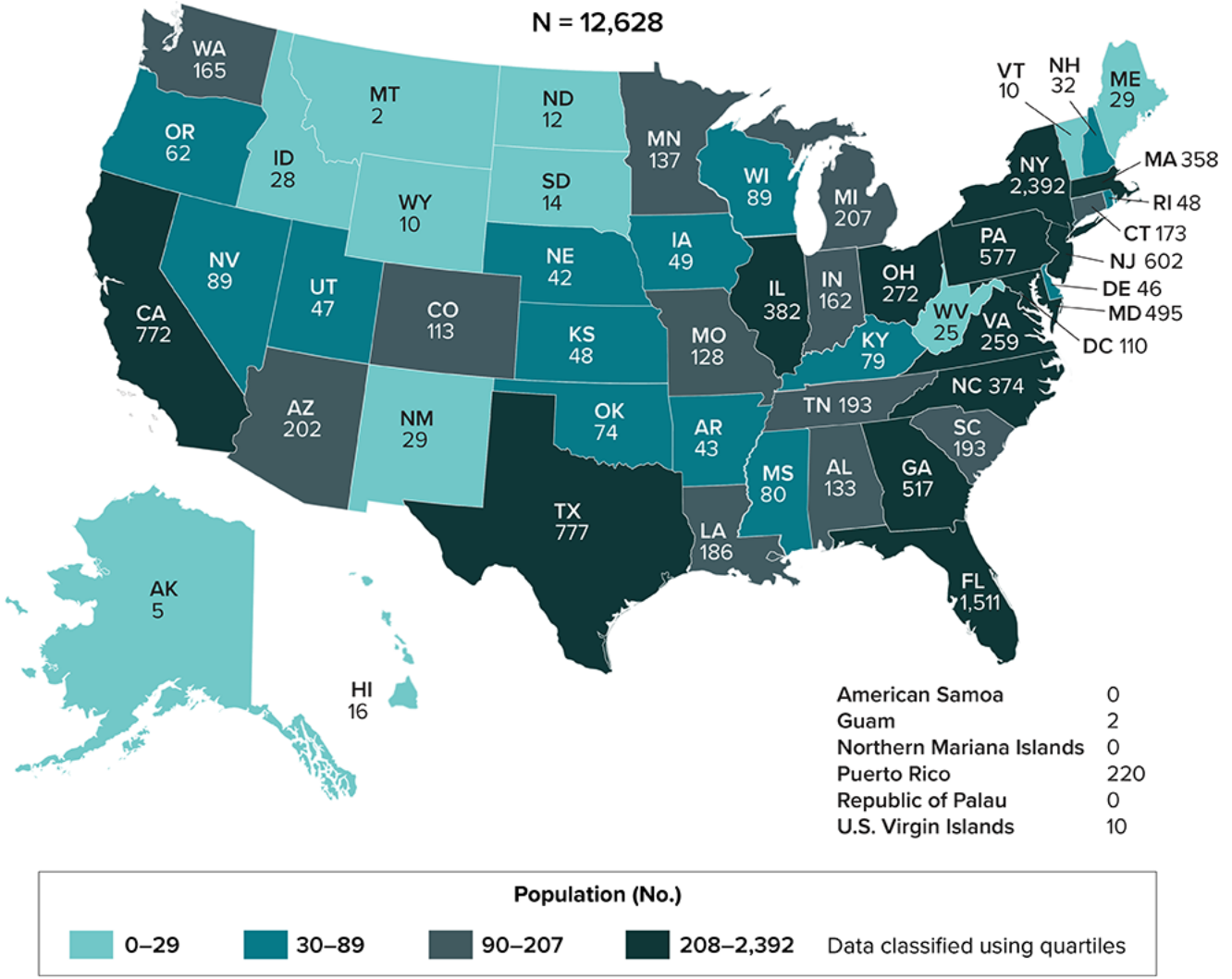
2024

"although they make up only 1% of AIDS patients, they have unique clinical, social, and public health problems that require special attention."

https://www.hiv.gov/sites/default/files/aidsgov-timeline.pdf; Rogers et al. 1987 (79): 1008-1014

FIGURE 39

Persons living with diagnosed perinatally acquired HIV infection, year-end 2021—United States and 6 dependent areas



Note. Data for the year 2021 are preliminary and based on deaths reported to CDC as of December 2022. Data are based on address of residence as of December 2021 (i.e., most recent known address).

Adolescents and Young Adults Aged 13–24 Years Living with Diagnosed HIV Infection by Sex and Transmission Category, Year-end 2021—United States and 6 Dependent Areas

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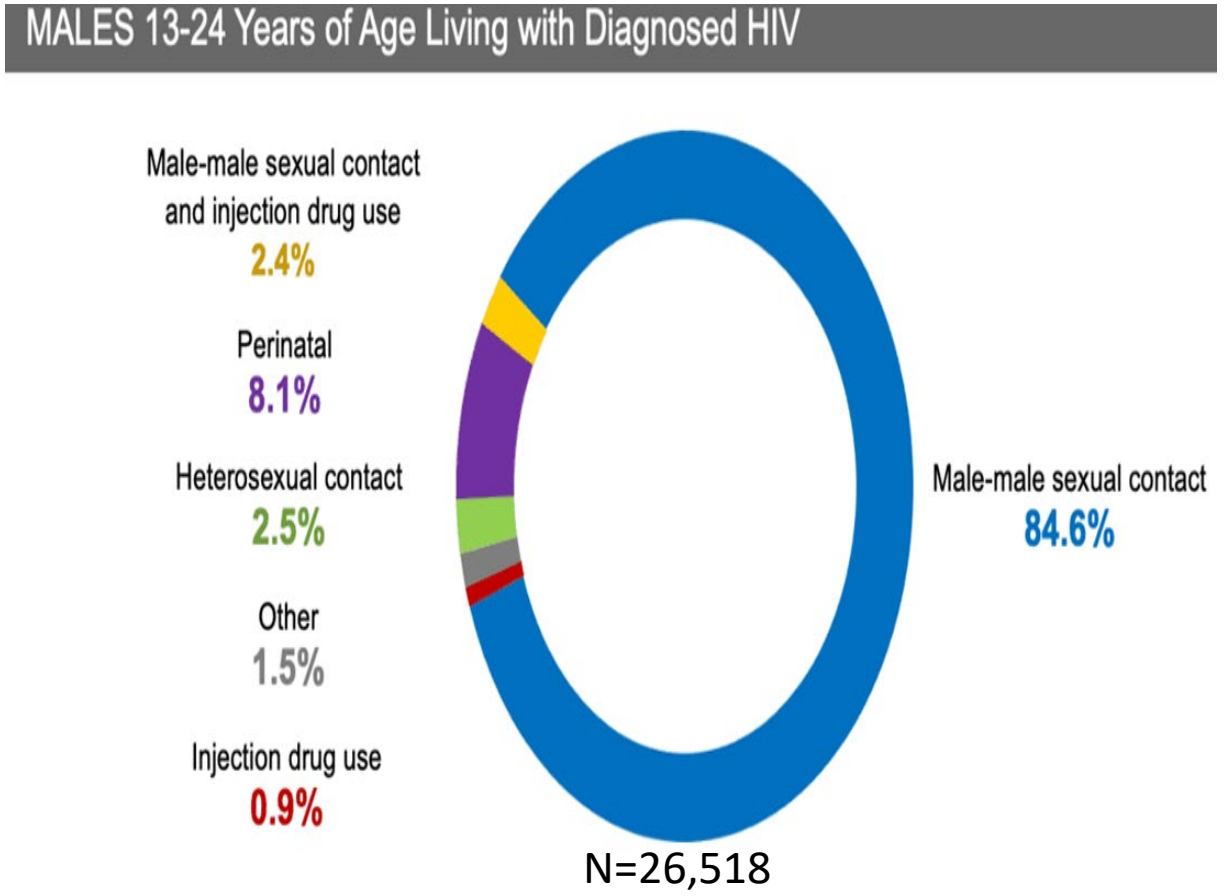
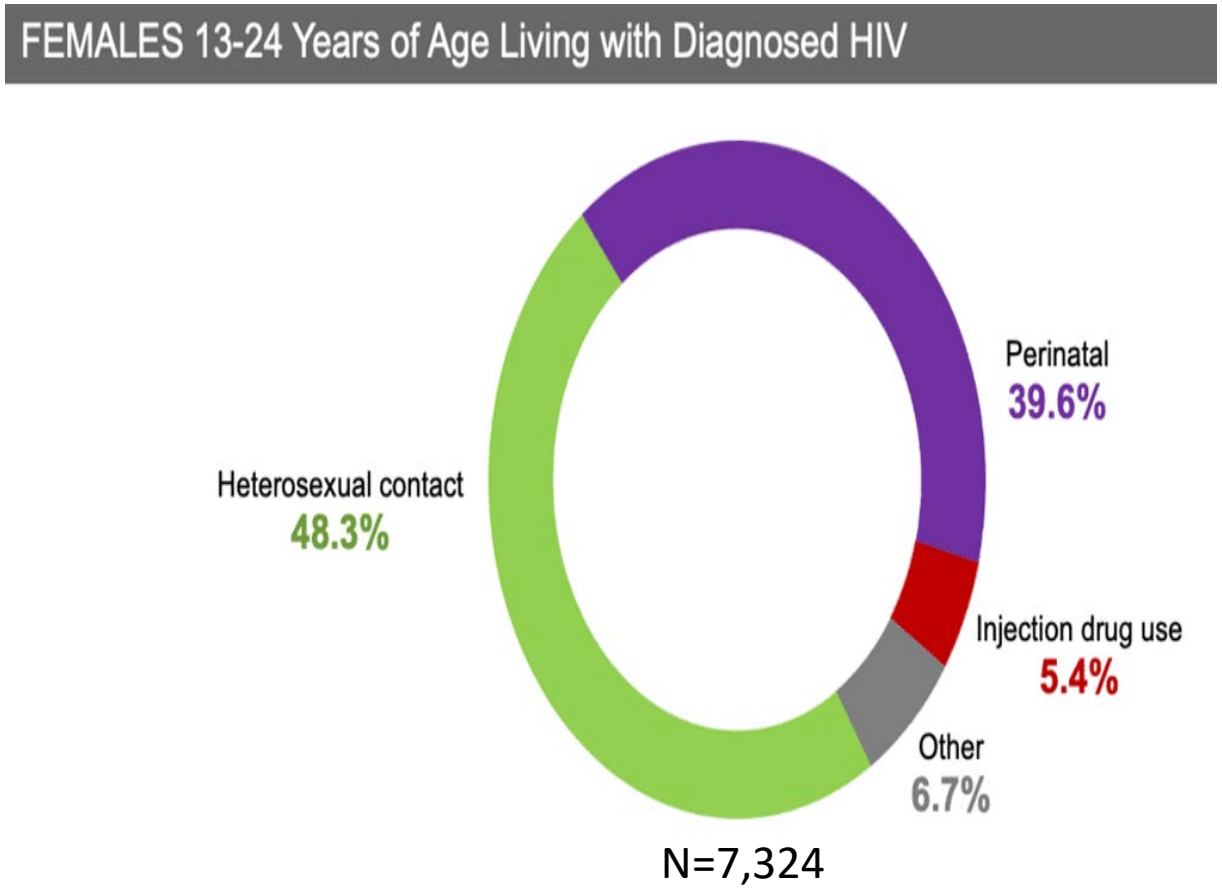
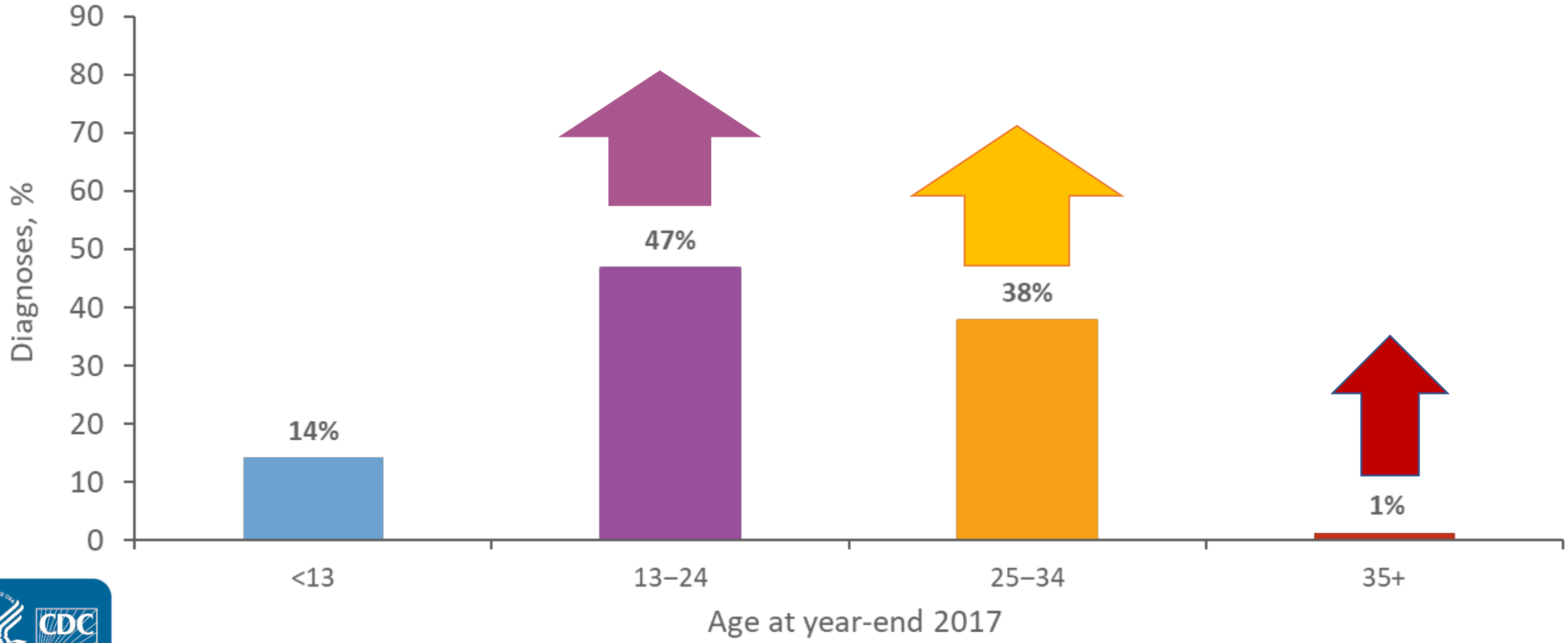




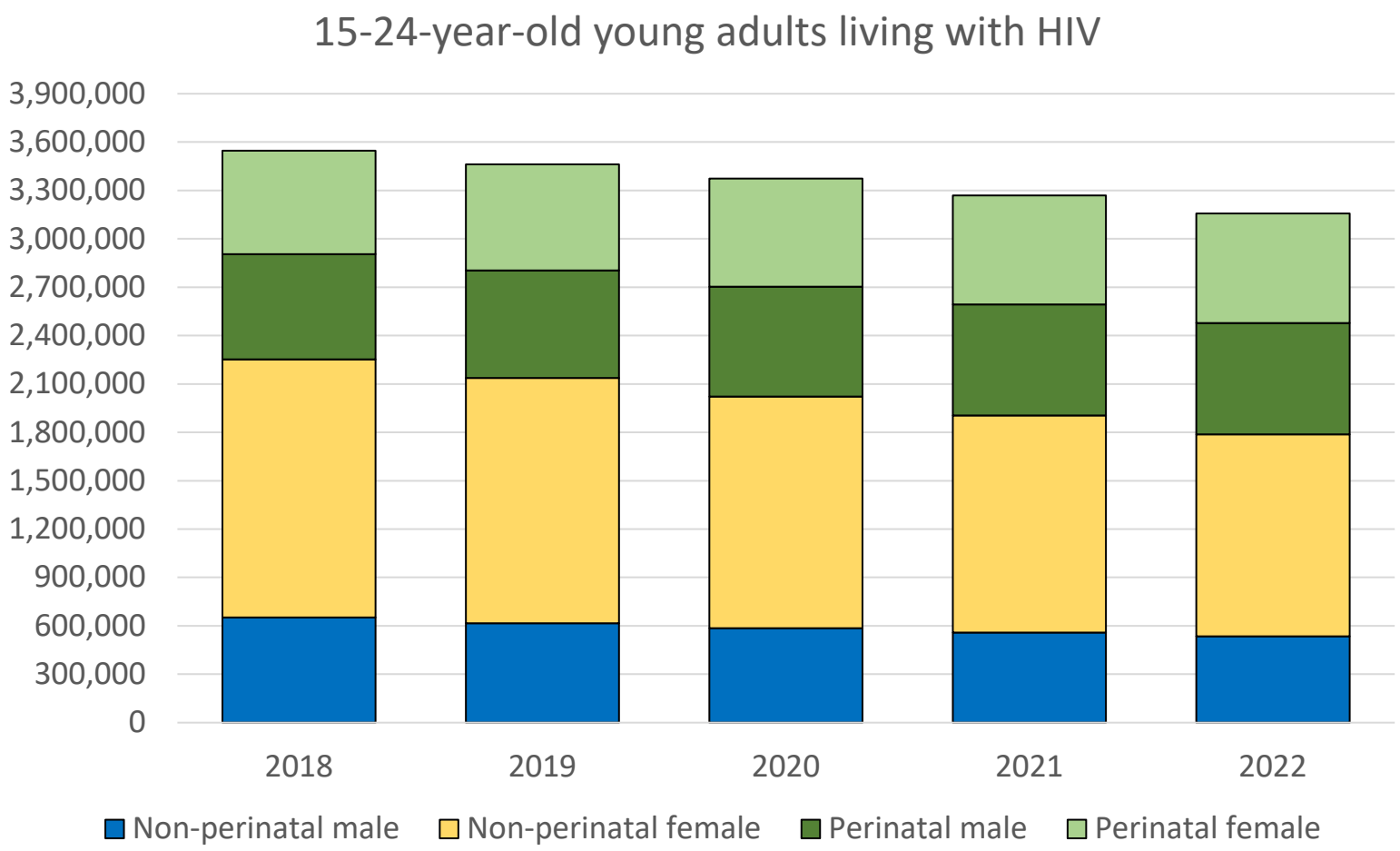
CDC. Diagnoses of HIV Infection in the U.S. and dependent areas, 2021. HIV Surveillance Report, 2021; Vol 34. Published May 2023

Age Distribution of Persons Living with Diagnosed Perinatally Acquired HIV Infection, Year-end 2017—United States and 6 Dependent Areas (N = 11,924)



Yusuf and Agwu. Expert Review of Anti-Infective Therapy. Sep 2020

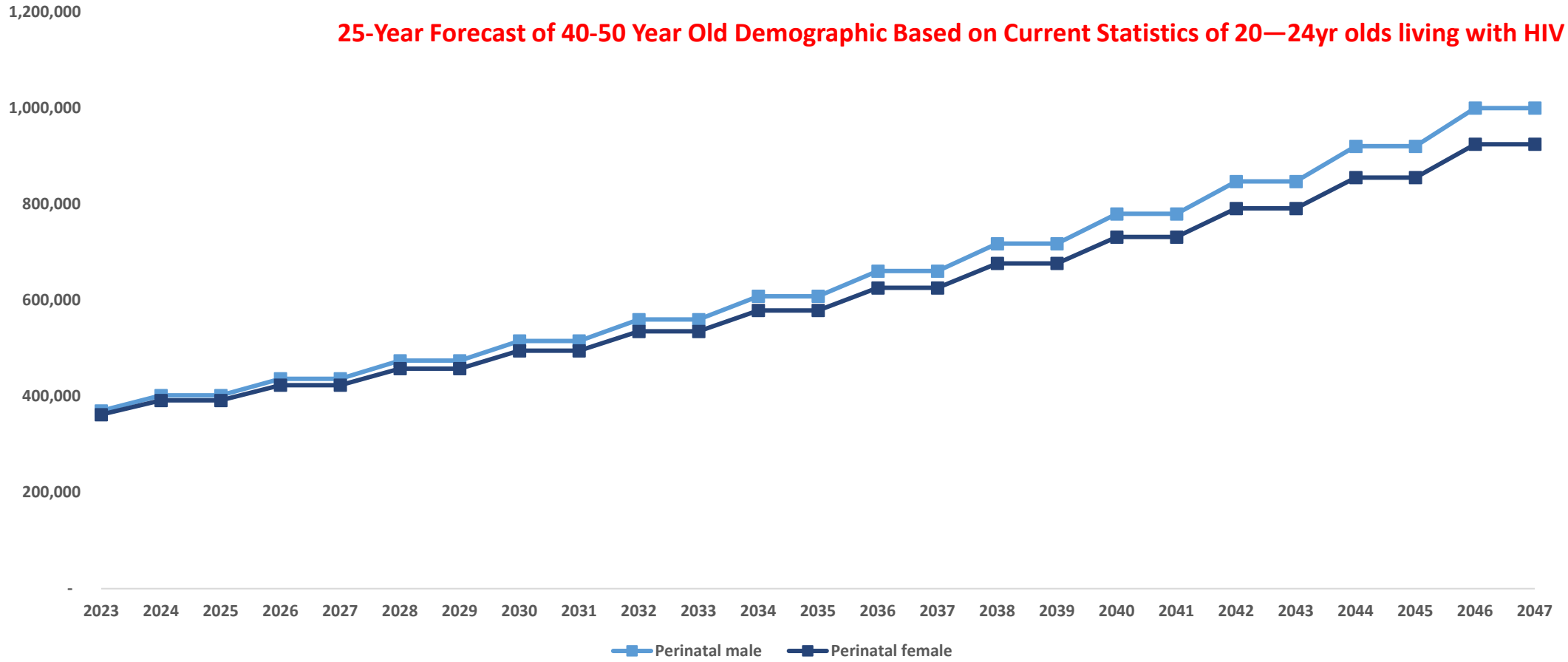
Global data: 15-24 y/o with HIV by sex & acquisition mode



UNAIDS

Courtesy of Dr. Mutsa Bwakura-Dangarembizi

25-year forecast of individuals with PHIV (in mid-adulthood)



UNAIDS

Courtesy of Dr. Mutsa Bwakura-Dangarembizi

Many Lifetime Survivors are thriving……

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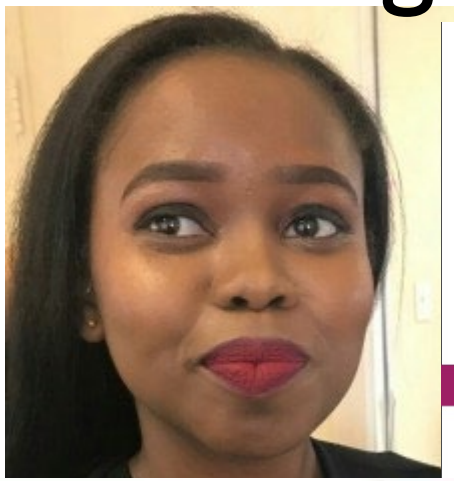
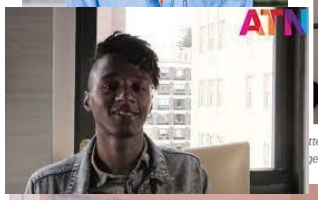
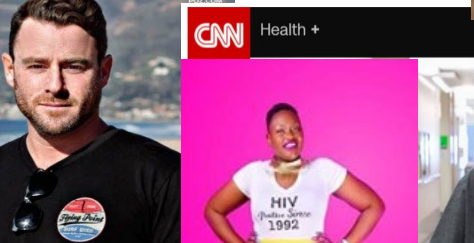
Health | Nation & World

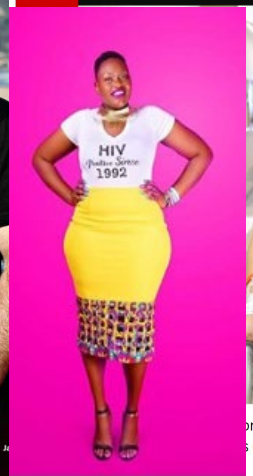
First wave of babies born with HIV nearing 30

Originally published October 9, 2010 at 6:15 am | *Updated October 9, 2010 at 8:16 am*









"I really want people to reconsider what living with HIV means," she said from her hospital bed two days after her operation. "If anyone is proof that you can live a lifetime with HIV, that is myself. I've been living with HIV for 35 years -- pretty much the length of the epidemic in the United States."

…r, marathon runner, public health specialist, and transplant pioneer (1st HIV+ livin…
…s old via blood transfusion

WATCH! Women's Advocacy and Treatment Coalition on HIV

As We See It: Wisdom and the Unique Experiences of Women Born with HIV

In honor of National Women and Girls HIV/AIDS Awareness Day (**#NWGHAAD**), The Well Project is excited to host an important discussion on the experiences of women born with HIV. We invite all people living with HIV, providers, and allies to join us for this necessary conversation.

Wednesday, March 10, 2021 | 12:30 PM - 2:00 PM EST

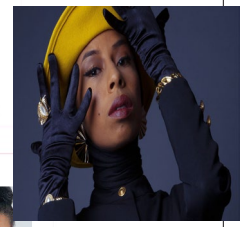
CO-HOSTS

Porchia Dees

Ieshia Scott

SPEAKER

Allison Agwu, MD, ScM



LIVESTREAM ON

PANELISTS

Kalee Garland

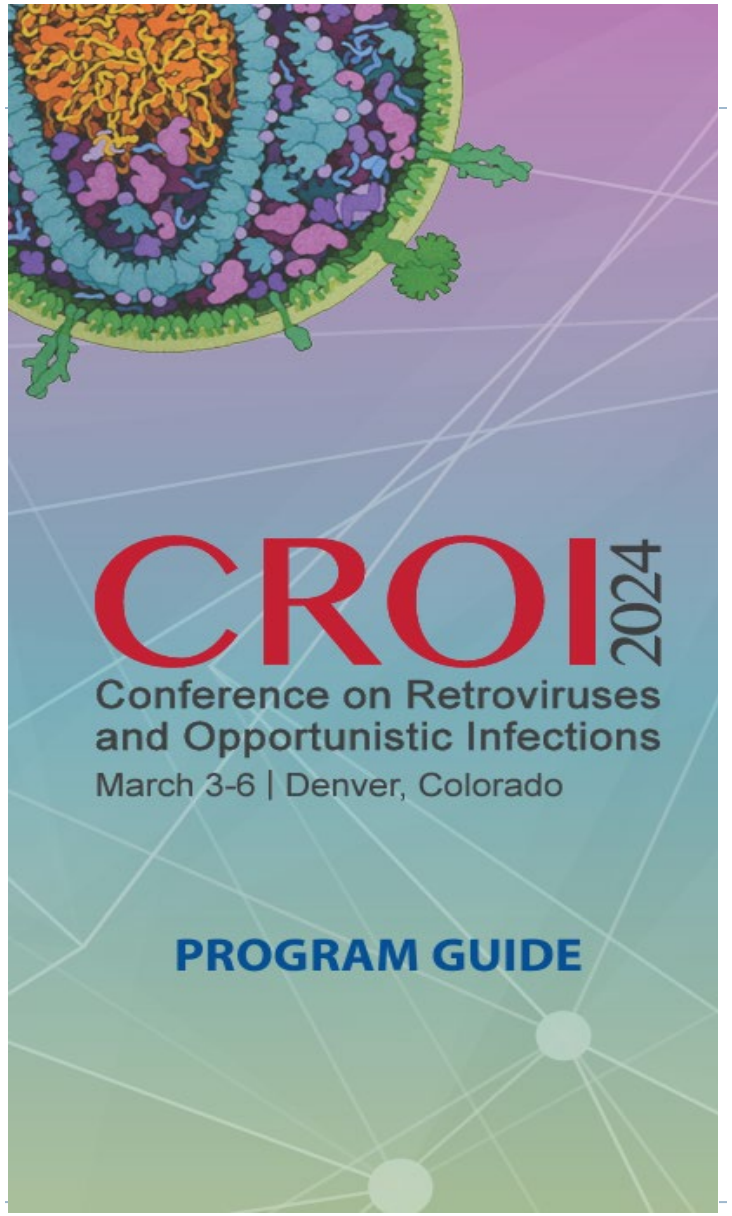
Grissel Granados

L'Orangelis Thomas

Zora Voyce

…21 to sign up for updates!

thewellproject



Interactive Symposium-02 | Living Into Young Adulthood With Perinatal HIV

4:00 PM -5:30 PM • Four Seasons Ballroom 1 CME

Objectives: At the completion of the session, participants will be able to:

- Describe the epidemiology of the growing cohorts of young adults who have grown up living with HIV
- Identify health and social challenges young adults with perinatally-acquired HIV are facing in their HIV care and transition into adult life, including the burden of mental health disorders and social inequities that drive poorer health outcomes in ways that differ from those without HIV
- Explain how life-long HIV and antiretroviral therapy exposures impact inflammation and associated cardiometabolic complications

Target Audience: This session is directed to clinicians, epidemiologists, advocates, and others involved in the care and study of adolescents and young adults with HIV.

Level of Knowledge: It is assumed that the participants will be familiar with pediatric and adolescent HIV clinical management and with the long-term impacts of HIV and antiretroviral therapy on physical and mental health.

Conveners

Allison L. Agwu, *The Johns Hopkins University School of Medicine, Baltimore, MD, USA*

Victor Reyes, *Howard University, Washington, DC, USA*


21 | 4:00 PM | **Epidemiology of Perinatally-Acquired HIV Among Adolescents and Young Adults**
Mutsawashe F. Bwakura-Dangarembizi, *University of Zimbabwe, Harare, Zimbabwe*

22 | 4:20 PM | **Historic Evolution of HIV and Mental Well-Being Among Adults Living With Perinatally-Acquired HIV**
Ezer Kang, *Howard University, Washington, DC, USA*

23 | 4:40 PM | **Cardiometabolic Risks and Complications: Adolescents and Young Adults With Perinatally-Acquired HIV**
Sahera Dirajlal-Fargo, *Ann & Robert H Lurie Children's Hospital of Chicago, Chicago, IL, USA*

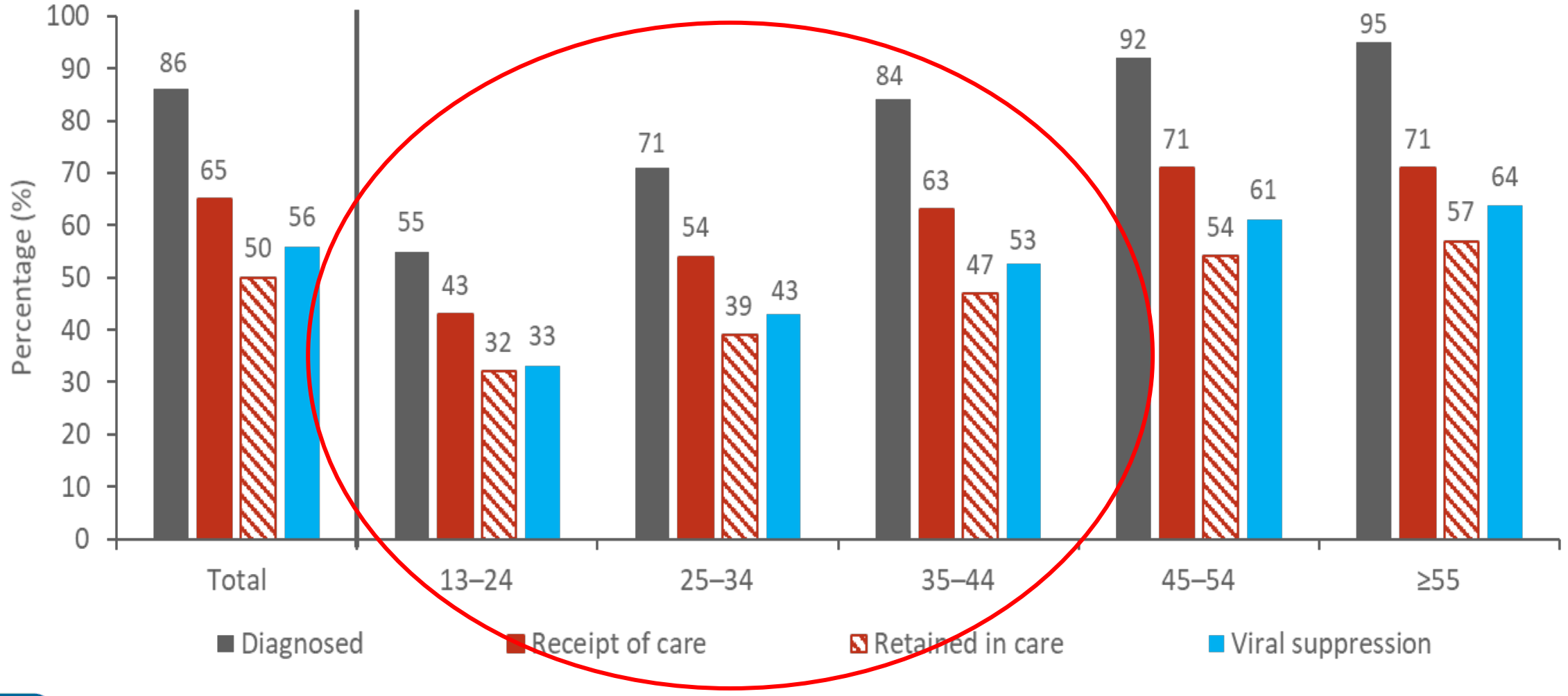
5:00 PM | **Audience Questions and Answers**

LB Late-Breaking NIS New Investigator Scholarship

Photo credit: Annette Sohn

https://watch.croiwebcasts.org/croi2024/n/day/all

Persons Living with Diagnosed or Undiagnosed HIV Infection
HIV Care Continuum Outcomes, by Age, 2018—United States



Note. Receipt of medical care was defined as ≥1 test (CD4 or VL) in 2018. Retained in continuous medical care was defined as ≥2 tests (CD4 or VL) ≥3 months apart in 2018. Viral suppression was defined as <200 copies/mL on the most recent VL test in 2018.

Life course perspective for Lifetime Survivors

	2nd Decade 10-19 years	3rd Decade 20-29 years	4th Decade 30-39 years	5th Decade 40-49 years	≥6th Decade ≥50 years
					
Environmental/Psychosocial Factors					
Life events	School Trade School/College Employment Parent/guardian loss	Trade School/College Employment Partnerships Children Parent/guardian loss	Employment Partnerships Children Parent/guardian loss	Employment Partnerships Parent/guardian loss	Employment/Retirement Partnerships
Self-management	Parental/caregiver involvement wanes	Self-management			Self-management May need assistance
Disclosure	Disclosure (to self) Disclosure to others	Disclosure of status to partners, children, friends, others			
Stigma	Internal and external stigma				

Yusuf & Agwu. Expert Review of Anti-Infective Therapy. Sep 2020

Zinyemba TP et al. J Econ Surveys 2019; **Yusuf** and Agwu. Expert Review of Anti-Infective Therapy. Sep 2020

Life course perspective for Lifetime Survivors

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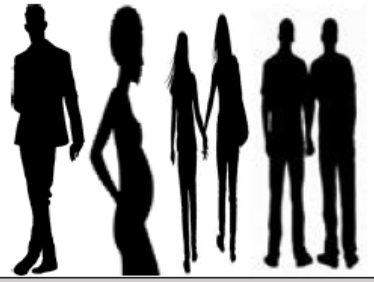
					
Treatment and Treatment-related Factors					
Antiretroviral treatment	Simple regimens* Increased responsibility of ART	Simple regimen Increased complex regimens due to development of resistance Full responsiblilty of ART	Simple regimen Increased complex regimens due to development of resistance Full responsiblilty of ART		
Adherence	May wane with decreased parental/caregiver involvement, stigma and nondisclosure to peers	Adherence variable Increased risk of resistance			
Co-morbidities	OIs if nonadherent with immune compromise Non-AIDS comorbidities	Inflammation, accelerated ageing, increased risk of comorbidities	Inflammation, accelerated ageing, ↑ risk of comorbidities		
Care Delivery	Pediatric/Adolescent care; transition from pediatric to adolescent or adult care may occur	Transition to adult care	Adult Care		
Risk factors	Tobacco, substance use may commence, modifiable risk factors begin	Increased weight gain, engagement in modifiable risk factors			

Yusuf and Agwu 2021

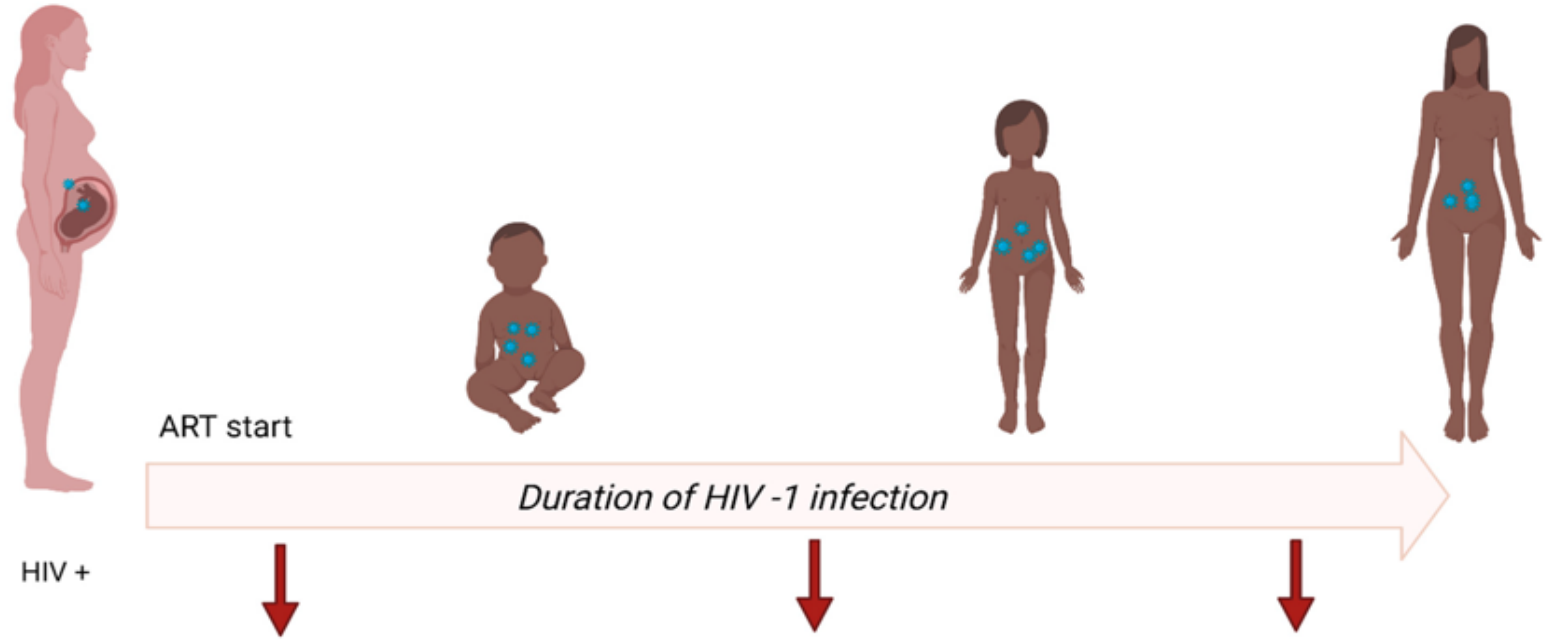
The Most Common Causes of Death by Age Group

Most common causes of death in the U.S. by age group (2020)

	1	2	3	4
5-9 y/o	Unintentional Injury	Malignant Neoplasms	Congenital Anomalies	Homicide
10-14 y/o	Unintentional Injury	Suicide	Malignant Neoplasms	Homicide
15-24 y/o	Unintentional Injury	Homicide	Suicide	Malignant Neoplasms
25-34 y/o	Unintentional Injury	Suicide	Homicide	Heart Disease
35-44 y/o	Unintentional Injury	Heart Disease	Malignant Neoplasms	Suicide
45-54 y/o	Malignant Neoplasms	Heart Disease	Unintentional Injury	Covid-19
55-64 y/o	Malignant Neoplasms	Heart Disease	Covid-19	Unintentional Injury

Source: CDC

HIV-1 Persistence in Survivors of Early HIV



Factors influencing HIV-1 reservoir establishment in early life:

- Maternal immune dynamics during preganancy
- Variants transmitted from mother to child
- Maternal ART
- Unique immune environment in early life

Reservoirs in long term ART suppressed children

- Limited biomarkers of reservoir size
- Low genetic diveristy
- Reservoir persists by clonal expansion

Long-term effects of HIV persistence

- Lifelong ART adherence is challanging
- Increased risk for developing illnesses associated with immunosenescence

How will lifetime survivors be affected?

Deeks SG 2013; Vance DE et al. Am J Nurs. 2010 March ; 110(3): 42–49; Chiappini E. etal. Aging. 2018; Katusiime MG et al. Viruses 2021.

How will we know what's happening?

- Voices of lifetime survivors
- Case reports/series
- Observational data
- Longitudinal cohorts
  - Current cohorts*
    - PHACS (AMP Up)
    - IeDEA
    - NA-ACCORD
    - UK cohorts
    - COHERE
    - Others
- Qualitative & quantitative data
- Modeling studies
  - CEPAC

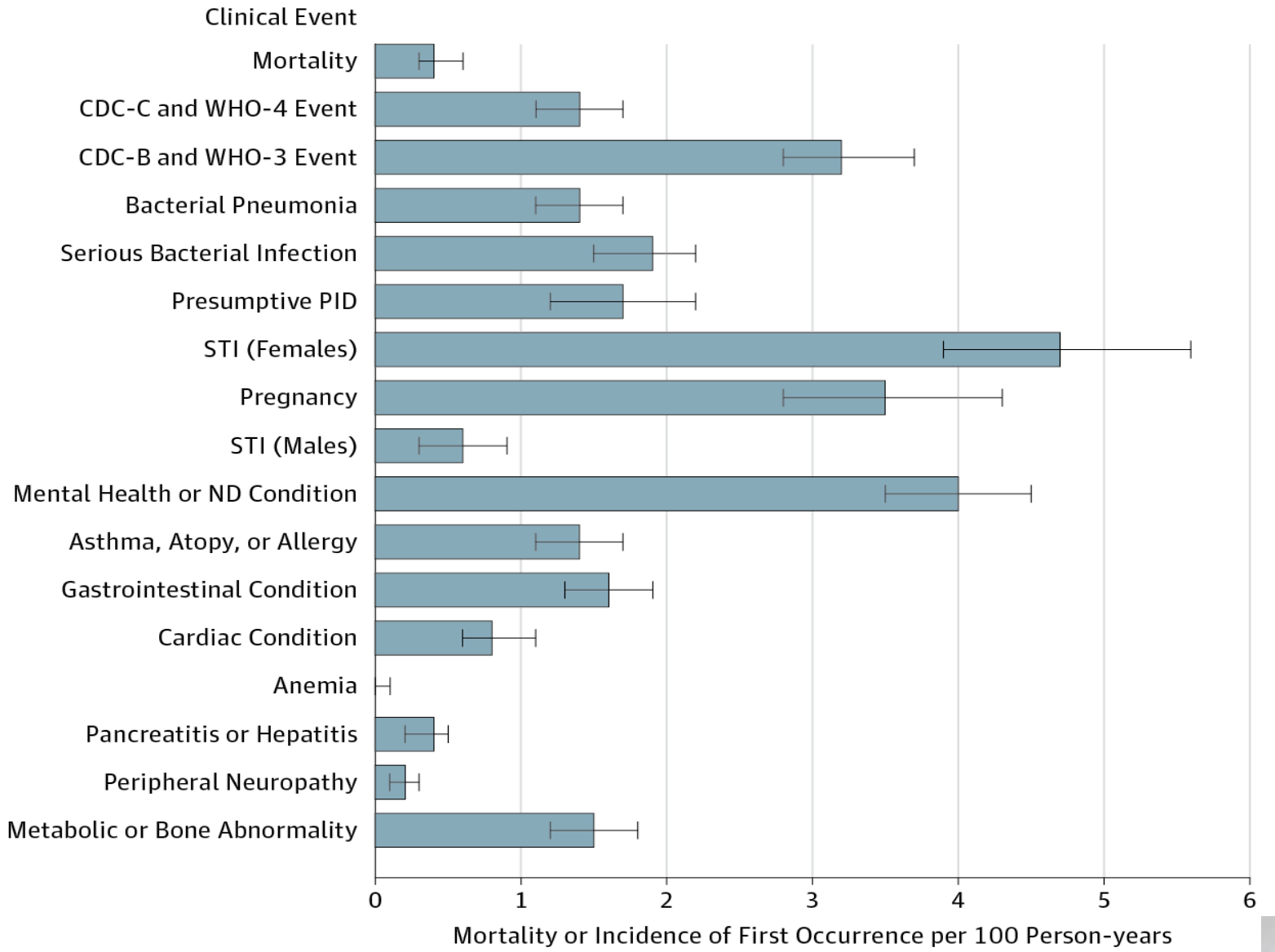
*not all inclusive; each has limitations

	NADC		MI		ESLD		ESRD	
	No diagnosis (n=60095)	Diagnosis (n=1405)	No diagnosis (n=29168)	Diagnosis (n=347)	No diagnosis (n=34657)	Diagnosis (n=387)	No diagnosis (n=35365)	Diagnosis (n=255)
Demographics								
Age								
<40 years	29429 (49%)	317 (23%)	13749 (47%)	63 (18%)	16641 (48%)	124 (32%)	16344 (46%)	94 (37%)
40–49 years	20584 (34%)	550 (39%)	10217 (35%)	144 (41%)	12474 (36%)	160 (41%)	13042 (37%)	101 (40%)
50–59 years	8239 (14%)	390 (28%)	4220 (14%)	106 (31%)	4528 (13%)	80 (21%)	4835 (14%)	41 (16%)
≥60	1843 (3%)	148 (11%)	982 (3%)	34 (10%)	1014 (3%)	23 (6%)	1144 (3%)	19 (7%)
Male	46330 (77%)	1093 (78%)	23475 (80%)	298 (86%)	27354 (79%)	334 (86%)	27974 (79%)	178 (70%)
Race and ethnicity								
White	25075 (42%)	692 (49%)	13429 (46%)	193 (56%)	14560 (42%)	207 (53%)	15022 (42%)	30 (12%)
Black	21658 (36%)	534 (38%)	10831 (37%)	123 (35%)	11693 (34%)	108 (28%)	11452 (32%)	205 (80%)
Hispanic	7683 (13%)	111 (8%)	3106 (11%)	20 (6%)	4379 (13%)	43 (11%)	4756 (13%)	12 (5%)
Other	3033 (5%)	44 (3%)	1308 (4%)	10 (3%)	1269 (4%)	7 (2%)	1333 (4%)	1 (0%)
Unknown or missing	2646 (4%)	24 (2%)	494 (2%)	1 (0%)	2756 (8%)	22 (6%)	2802 (8%)	7 (3%)
HIV transmission risk								
MSM	31370 (52%)	742 (53%)	16103 (55%)	193 (56%)	17514 (51%)	180 (47%)	17114 (48%)	67 (26%)
IDU	6885 (11%)	204 (15%)	2971 (10%)	44 (13%)	4231 (12%)	97 (25%)	3912 (11%)	52 (20%)
Heterosexual contact	15397 (26%)	343 (24%)	7559 (26%)	84 (24%)	9224 (27%)	73 (19%)	9065 (26%)	108 (42%)
Other, unknown, or missing	6443 (11%)	116 (8%)	2535 (9%)	26 (7%)	3688 (11%)	37 (10%)	5274 (15%)	28 (11%)

Yusuf 2021; CDC. Pediatric HIV Surveillance 2018; Althoff et al Lancet HIV 2019; Griffith OFID 2018

Long-term morbidity of HIV +/- ART

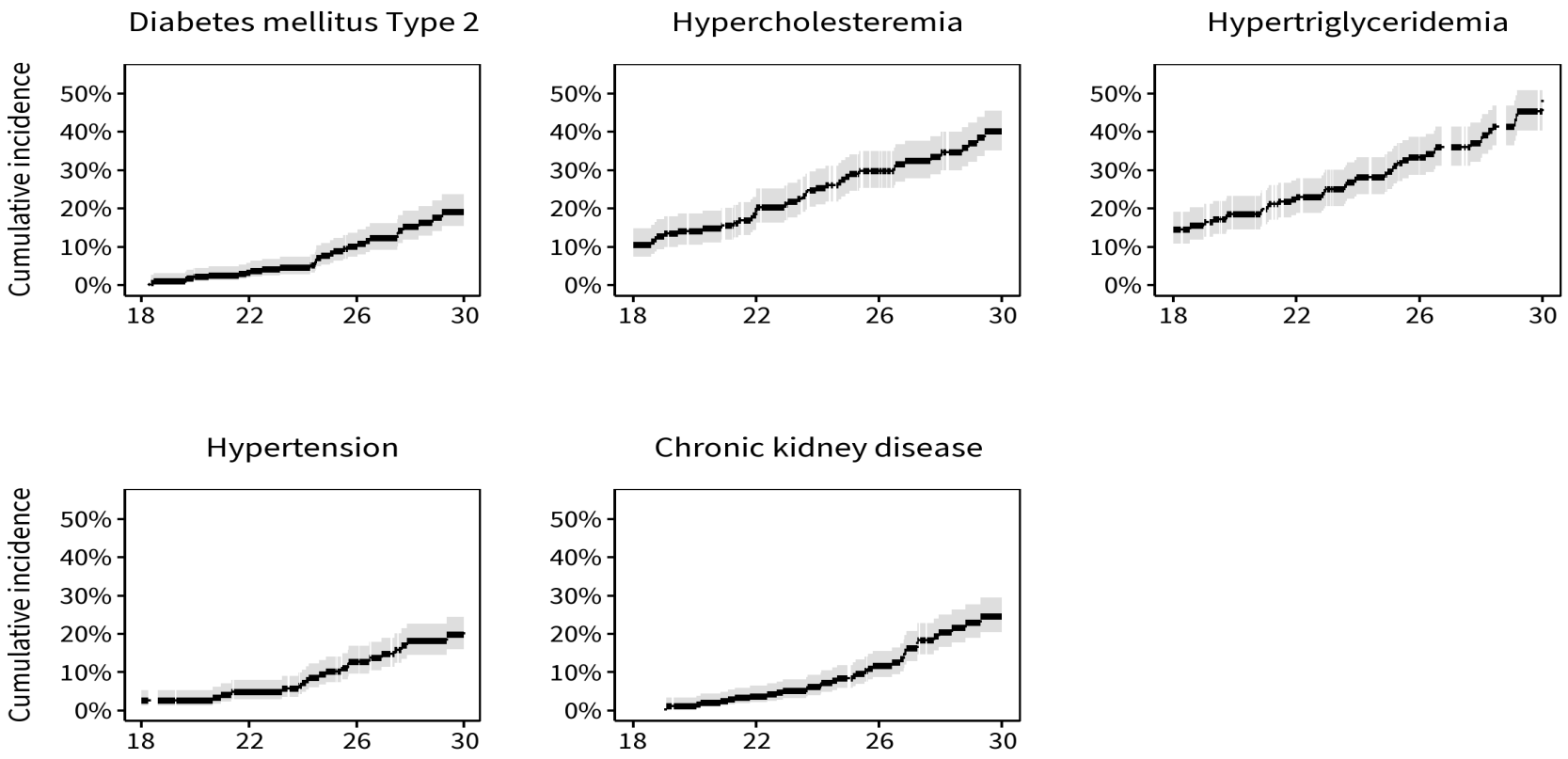
- Cardiovascular disease
- Pulmonary
- Malignancy
- Medication side effects:
  - kidney, bone, liver, other
- Metabolic abnormalities:
  - mitochondrial toxicity
  - lipodystrophy/lipoatrophy
  - insulin resistance
  - weight gain
- Central nervous system
  - Mental health and cognition
  - strokes, cognitive effects, dementia
- Longstanding inflammation
- Unknown?
  - Consequences of lifelong ART?
  - Consequences of lifelong HIV?



Griffith D et al. OFID 2018; Hazra R et al.; Izbudak, Agwu J Neurorad 2013;, **Venkataramani** 2012; Eckard et al Curr HIV/AIDS 2016; **Neilan** et al JAMA Peds 2017

Non-AIDS Defining Comorbidities by age 30

Cumulative incidence of selected non-AIDS defining comorbidities by age 30 among young adults with perinatally-acquired HIV in the NA-ACCORD, 2000 to 2019



Total sample: 375 participants. Bands indicate 95% confidence interval.

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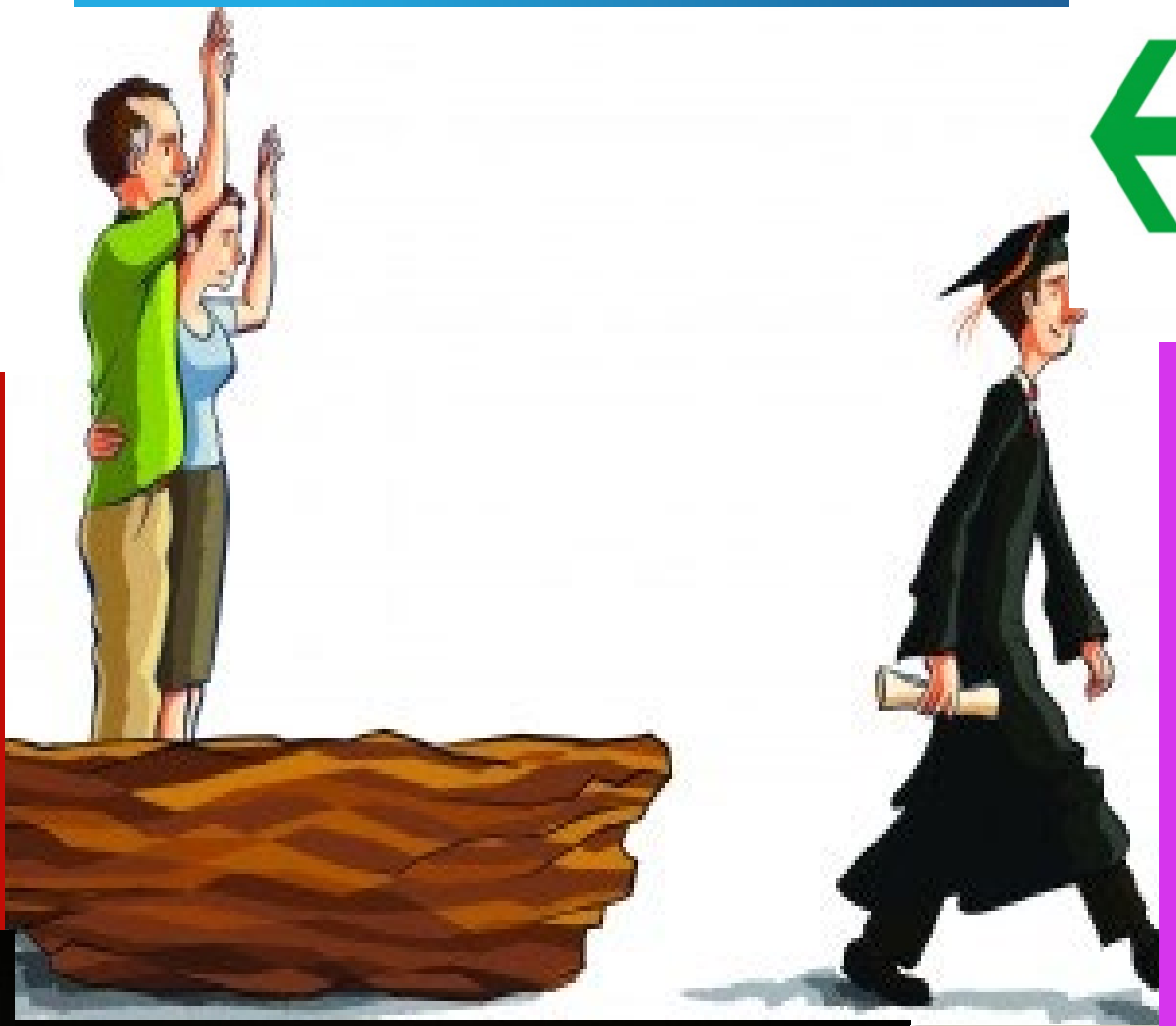
Haw NJL et al. AIDS 2024


KISS ME
I'M 25


KEEP
CALM
I'm
Outta
Here


NO




I CAN'T
KEEP CALM
I'M
TOO
EXCITED!


EXIT

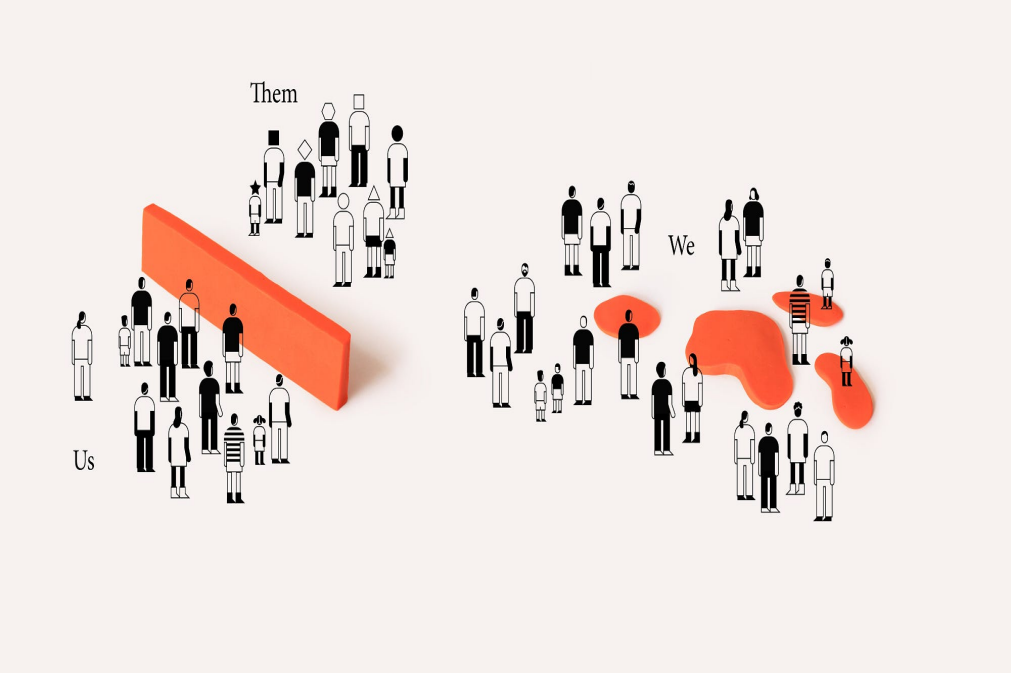

Sorry I'm late, but I
didn't want to come.
someecards
user card

What is successful transition?

Transfer + Engagement + Retention
+
Equal /Better Clinical Outcomes
=
Successful Transition

Agwu and Jao 2016

How do we improve outcomes?



https://www.oar.nih.gov/hiv-policy-and-research/research-priorities

Conclusion

- Lifetime survivors, a unique population, are aging into adulthood
- They have challenges and potential comorbidities that may impact their outcomes across the lifespan
  - Awareness of the potential impact of lifetime HIV is key
- This population needs to be included when designing and conducting research and optimizing clinical care

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Acknowledgements

The Lifetime Survivors

ACE

Bartlett team

IPC/PAHAP

WICY team

JHU HIV Clinical Research team

Center of Adolescent and Young Adult Health

Pediatric & Adult Infectious Diseases Divisions

Family & support network

Slides/pictures:

Dr. Mutsa Bwakura-Dangarembizi

Dr. Annette Sohn

Dr. Jason Haw

National Institute of Mental Health

NIMHD National Institute on Minority Health and Health Disparities

National Institute of Allergy and Infectious Diseases

Eunice Kennedy Shriver NICHD National Institute of Child Health & Human Development

Center for AIDS Research Johns Hopkins University

U.S. Department of Health and Human Services HRSA Health Resources and Services Administration Maternal and Child Health Bureau

PAVE Martin Delaney Collaboratory Pediatric Adolescent Virus Elimination