Caring for the aging adult living with HIV

Jessica Castilho, MD, MPH

Vanderbilt University Medical Center

HIV Symposium – "Specializing care for special populations"

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Disclosures

I have no conflicts of interest.

Disclaimer

"Older adult" (def in HIV research):

Someone over the age of 50 years.

Mr. C (53 yo, 9/2017)

CC: routine follow-up

PMHx:

- **HIV** (2001) – last CD4 325, VL UD
- **Myocardial infarction** s/p PCI (2005)
- Depression
- **Hypogonadism** & erectile dysfunction
- **Osteoporisis** - L calcaneous, tibia insufficiency fractures (2012); L wrist fracture after fall (2015)
- **Cirrhosis** 2/2 NAFLD (2013), c/b portal enteropathy and hepatic encephalopathy
- Recurrent **atypical meningioma**, s/p partial resection and XRT
- **3 hospitalizations** in prior 24 mos

Meds:

- DTG/ABC/3TC single pill
- Pantoprazole
- Rifaximin
- Lactulose
- Spironolactone
- Fluoxetine
- Melatonin
- Zoledronic acid

SHx:

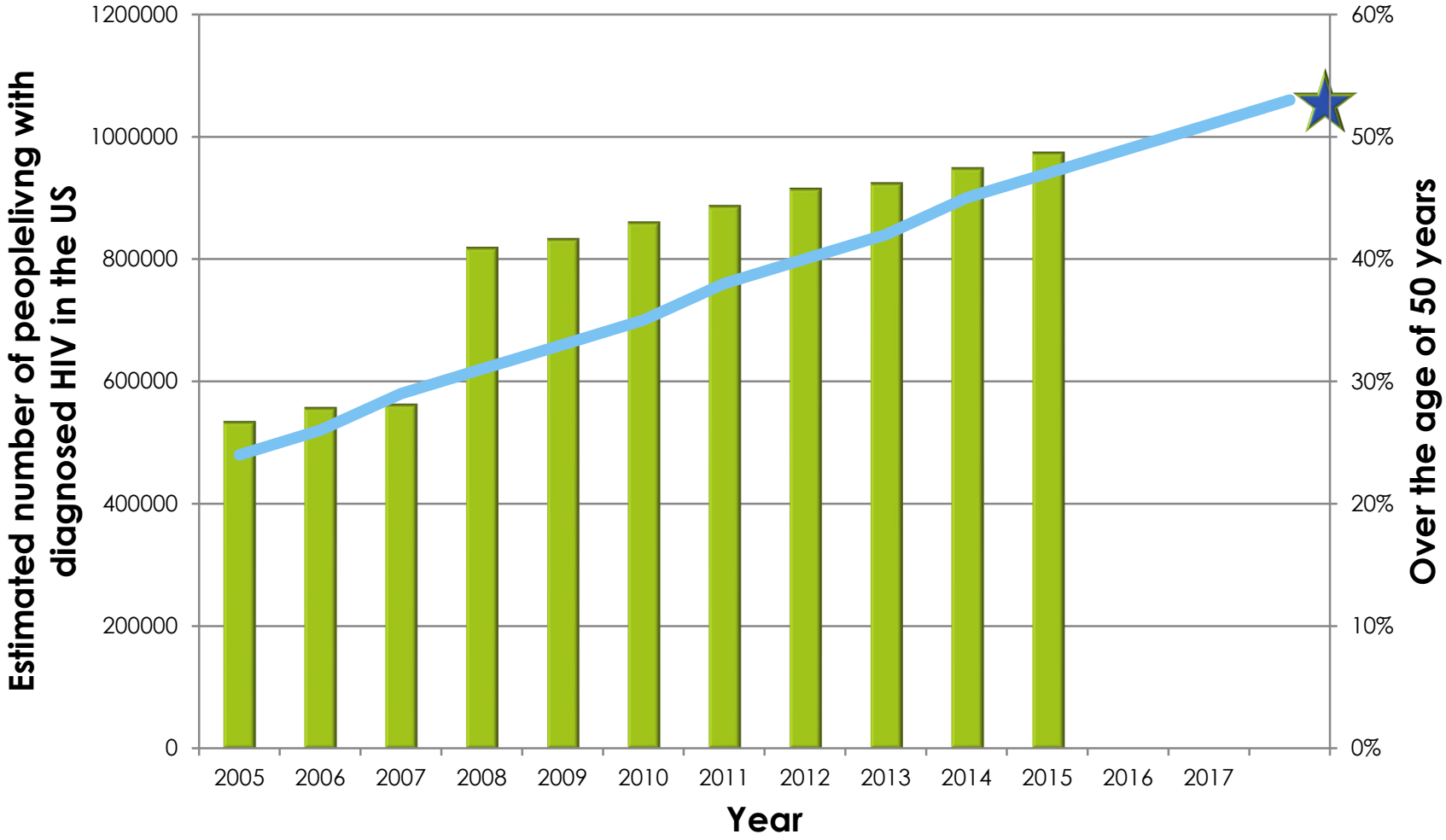
- Retired LPN, now SSDI
- Lives with partner, stays home during the days
- No cigarettes, EtOH, illicits
- Family in East TN

Forest, not trees…

Outline

- Background and epidemiology
- Clinical challenges:
  - Non-communicable diseases & multimorbidity
  - Functional decline & frailty
- Preventive health & geriatric medicine principles
  - Examples: osteoporosis screening, lung cancer screening, and herpes zoster prevention
  - 5 Ms of geriatric medicine
- "Successful aging" & resilience

Aging of PLWH in the US



http://www.cdc.gov/hiv/library/reports/surveillance/2013/surveillance_Report_vol_25.html
http://www.cdc.gov/hiv/pdf/statistics_2011_HIV_Surveillance_Report_vol_23.pdf
https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-report-2016-vol-28.pdf

A modeling study

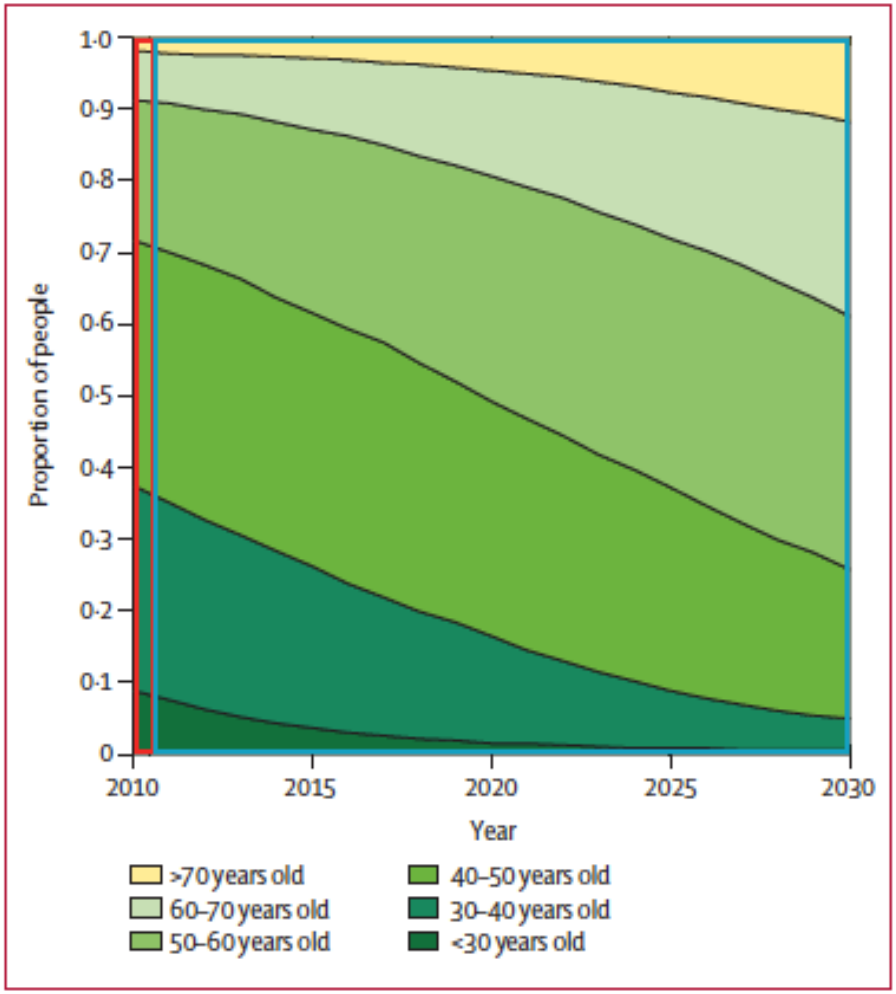


***Figure 2*: Projected age distribution of HIV-infected patients**
The red box shows the age distribution of patients on antiretroviral therapy in clinical care in the Netherlands in 2010, which matches the data exactly, and the blue box shows model output from 2011–30.

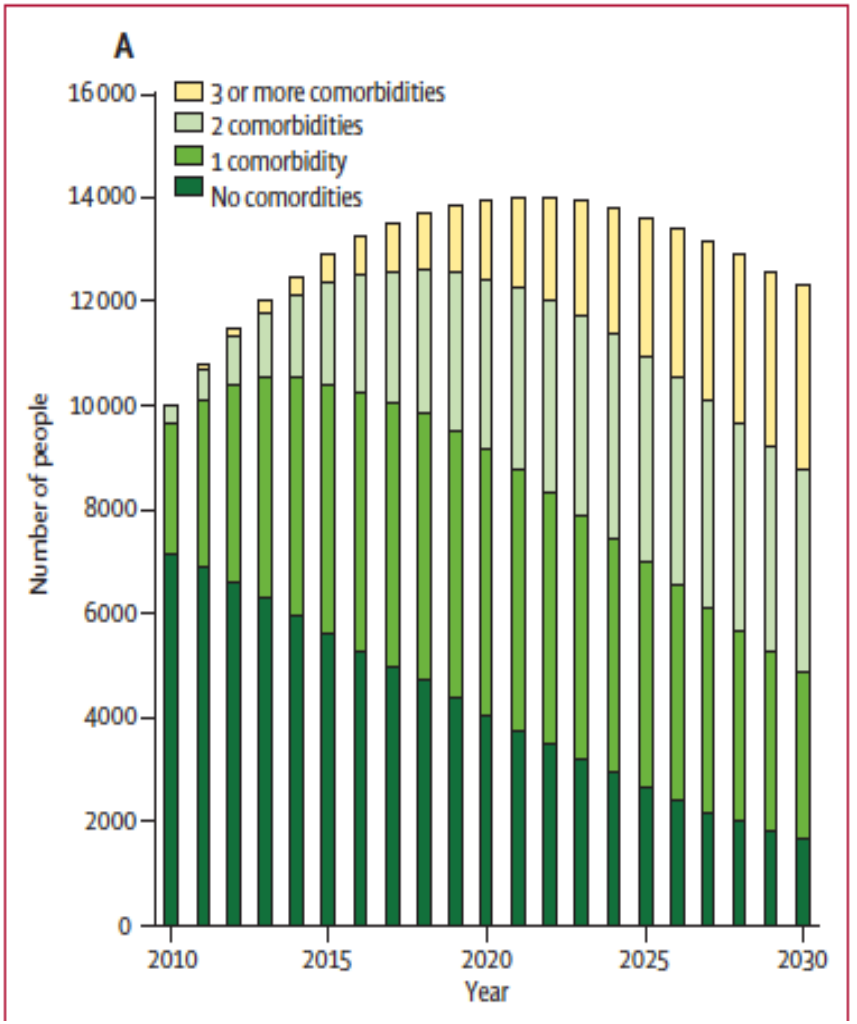
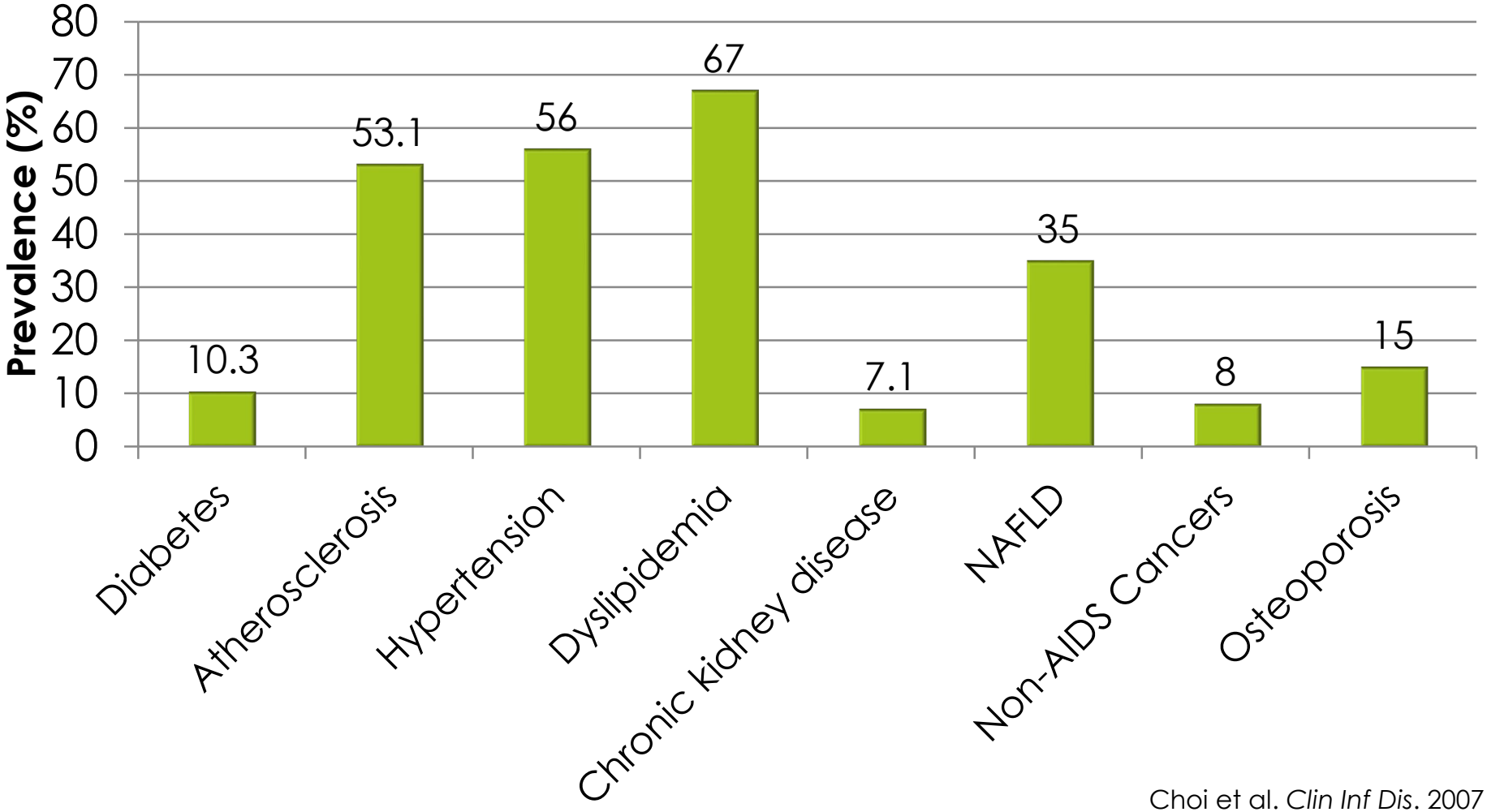


***Figure 3*: Predicted comorbitities**
(A) Predicted burden of NCDs in HIV-infected patients between 2010 and 2030 as simulated by the model. (B) Distribution of the number of NCDs by age group

Smit et al. *Lancet Inf Dis.* 2015

Non-communicable disease (NCD) prevalence in PLWH



Hernandez-Romieu et al. *BMJ Open Diabetes Res Care*. 2017
Post et al. *Ann Internal Med*. 2014

Buchacz et al. *Antivir Ther*. 2013

Shiels et al. *JNCI*. 2013

Choi et al. *Clin Inf Dis*. 2007

Maurice et al. *AIDS* 2017

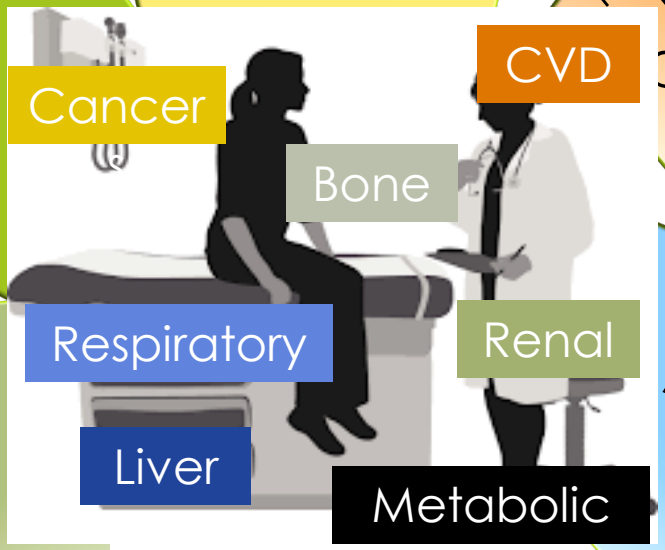
Brown and Qaqish. *AIDS*. 2006

HIV & NCDs: interacting etiologies

Demographic & Anthropometric
- Age, race, sex
- Family history
- BMI

Co-infections & Co-morbidity
- HCV, HBV
- CMV
- Hypertension
- Depression

Immunology & Inflammation
- CD4 nadir, CD4/CD8
- T cell activation/senescence
- IL-6, TNFa, CD14

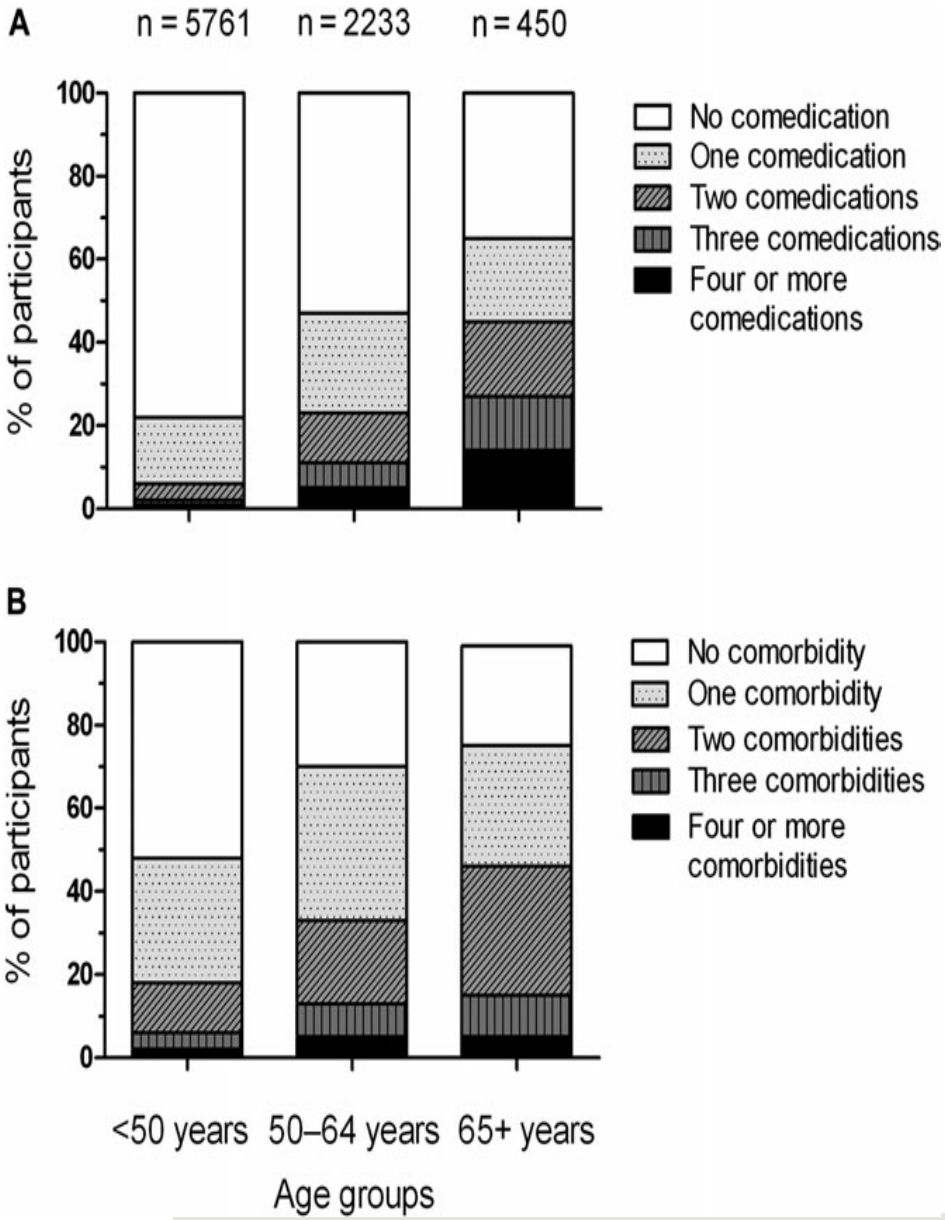


Social Determinants
- Tobacco & alcohol
- Injection Drugs
- Physical inactivity
- Environment
- Nutrition
- SES

((Biologic Aging Processes))

Antiretroviral Therapy & Medication Toxicity
- "D"-drugs
- Protease inhibitors
- Tenofovir

An uneven burden: older age



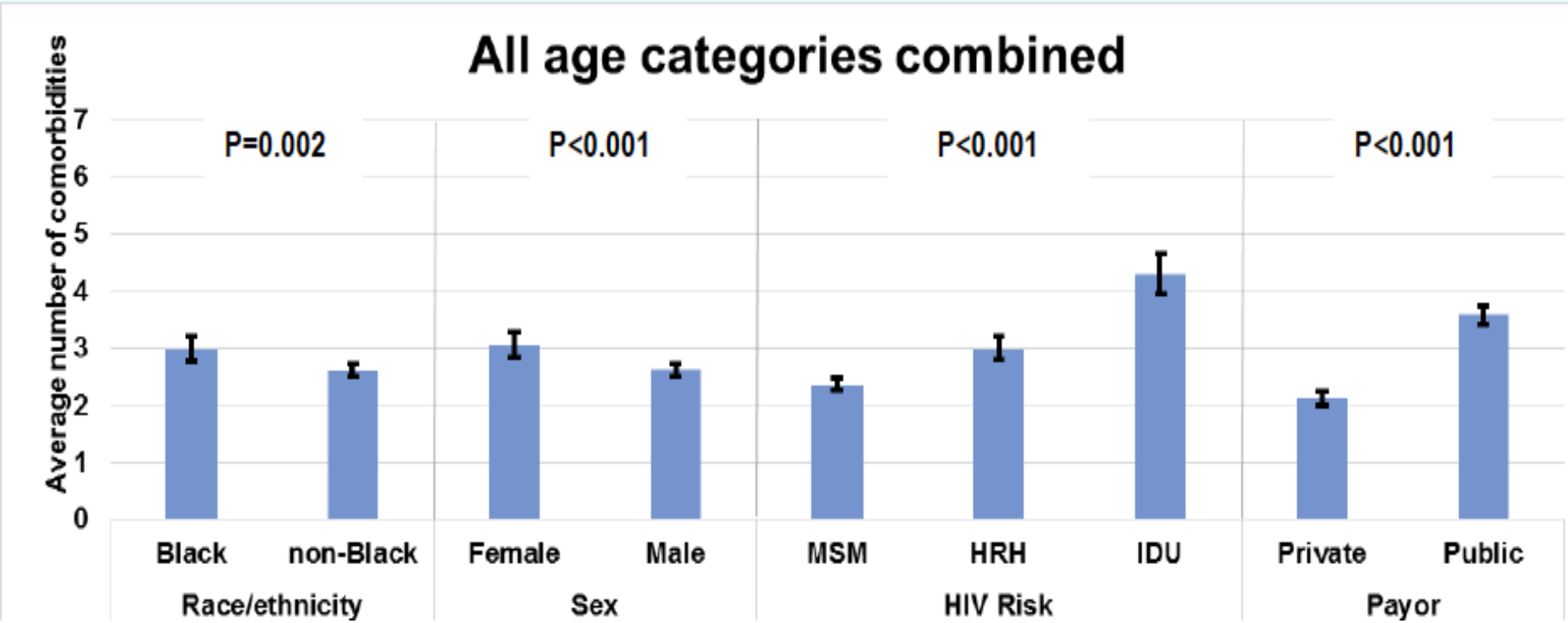
Adjusted* HR [95%CI] for NADEs, ref <50yo

	50-64 yo	≥ 65 yo
Stroke	4.0 [1.9-8.4]	17.7 [7.1-45]
MI	6.0	5.9
Non-trauma fracture	3.9 [1.9-8.2]	10.5 [3.6-31]
Osteoporosis	3.6 [2.0-6.3]	9.1 [4.1-20.3]
Diabetes	2.2 [1.3-3.8]	3.8 [1.8-7.9]
Non-AIDS cancer	3.7 [2.5-5.7]	6.9 [3.9-12.2]
Hosp. for injury	1.4 [0.9-2.1]	4.8 [2.8-8.4]
Hosp. for disease	1.6 [1.4-1.8]	2.9 [2.4-3.5]
Death	1.7 [1.2-2.3]	6.3 [3.9-10.0]

*Included CD4, HIV RNA, sex, h/o IDU, tobacco use, yrs of HIV infx

Hasse et al. *Clin Inf Dis.* 2011

Unequal burden, continued

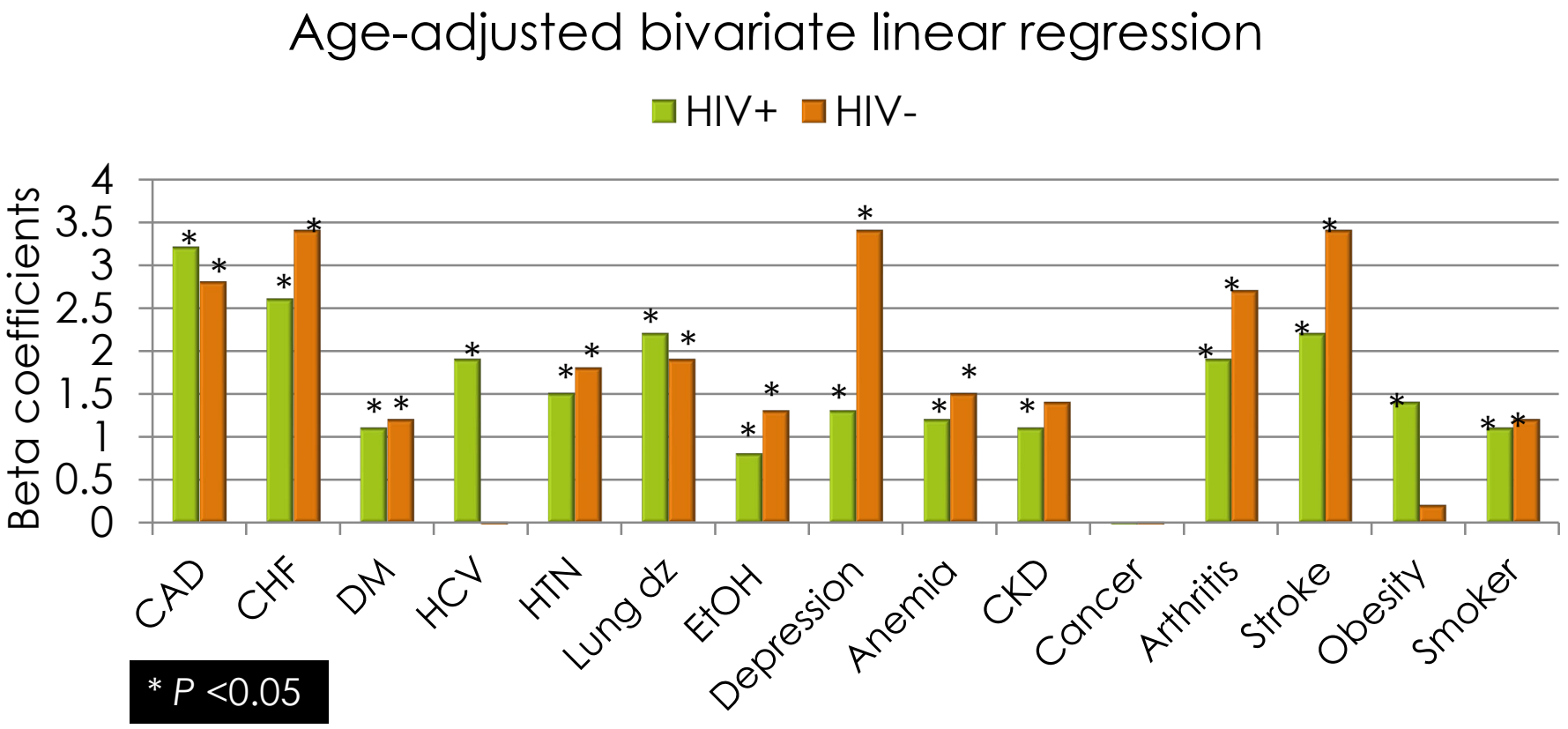


- HOPS analysis of co-morbidities (n=1,540 patients)
- ↑ prevalence of all co-morbidities (except psych) with increasing age
- Multivariable analysis: older age, HIV RF, payor all statistically significant with # of co-morbidities

Palella et al. *CROI* 2017. Abstract #663

Functional Decline

- VACS cohort of 889 HIV+ and 647 HIV- adults
- Cross-sectional study of self-reported difficulty with various physical activities (sum=disability score)



Oursler et al. *AIDS Patient Care STDS.* 2006

NCDs also associated with…

In aging PLWH adults:

- ↑ risk of hospitalization
- ↓ quality of life
- ↑ polypharmacy
- ↑ healthcare utilization
- ↑ risk of cognitive decline
- ↑ risk of frailty

Hotton et al. *JAIDS*. 2016

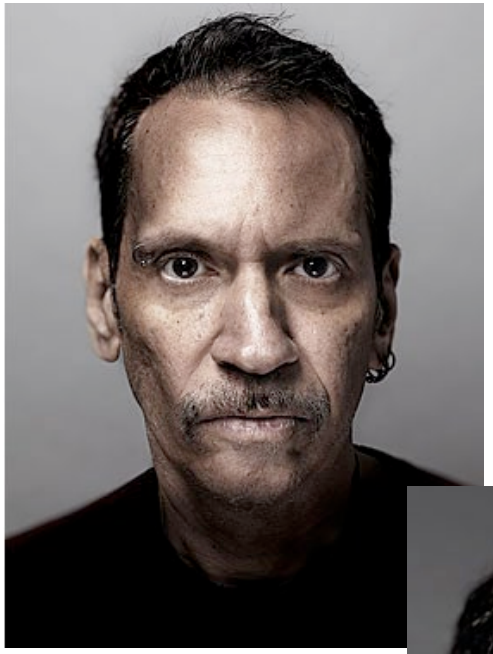
Miller et al. *AIDS Behav*. 2016

Patel et al. *In J STD AIDS*. 2015

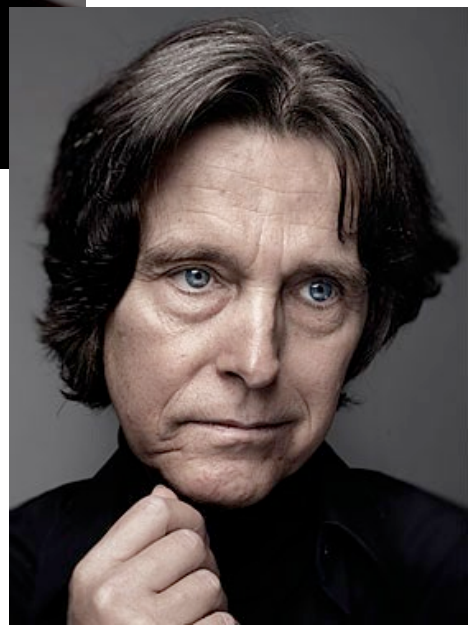
Hasse et al. *Clin Inf Dis*. 2011

Vance et al. *J Neurosci Nurs*. 2014

Brothers et al. *J Inf Dis*. 2014



Age: 52 years
HIV: 17 years
NCDs:
memory loss,
s/p THA x2



Age: 56 years
HIV: 23 years
NCDs:
memory loss,
PN,
lipodystrophy,
fatigue

France, Peter. "Another kind of AIDS crisis." *New York Magazine*. November 1, 2009.

Frailty?

FRAIL

NOT FRAIL

"frailty" (def): a state of increased vulnerability to poor resolution of homeostasis after a stressor event

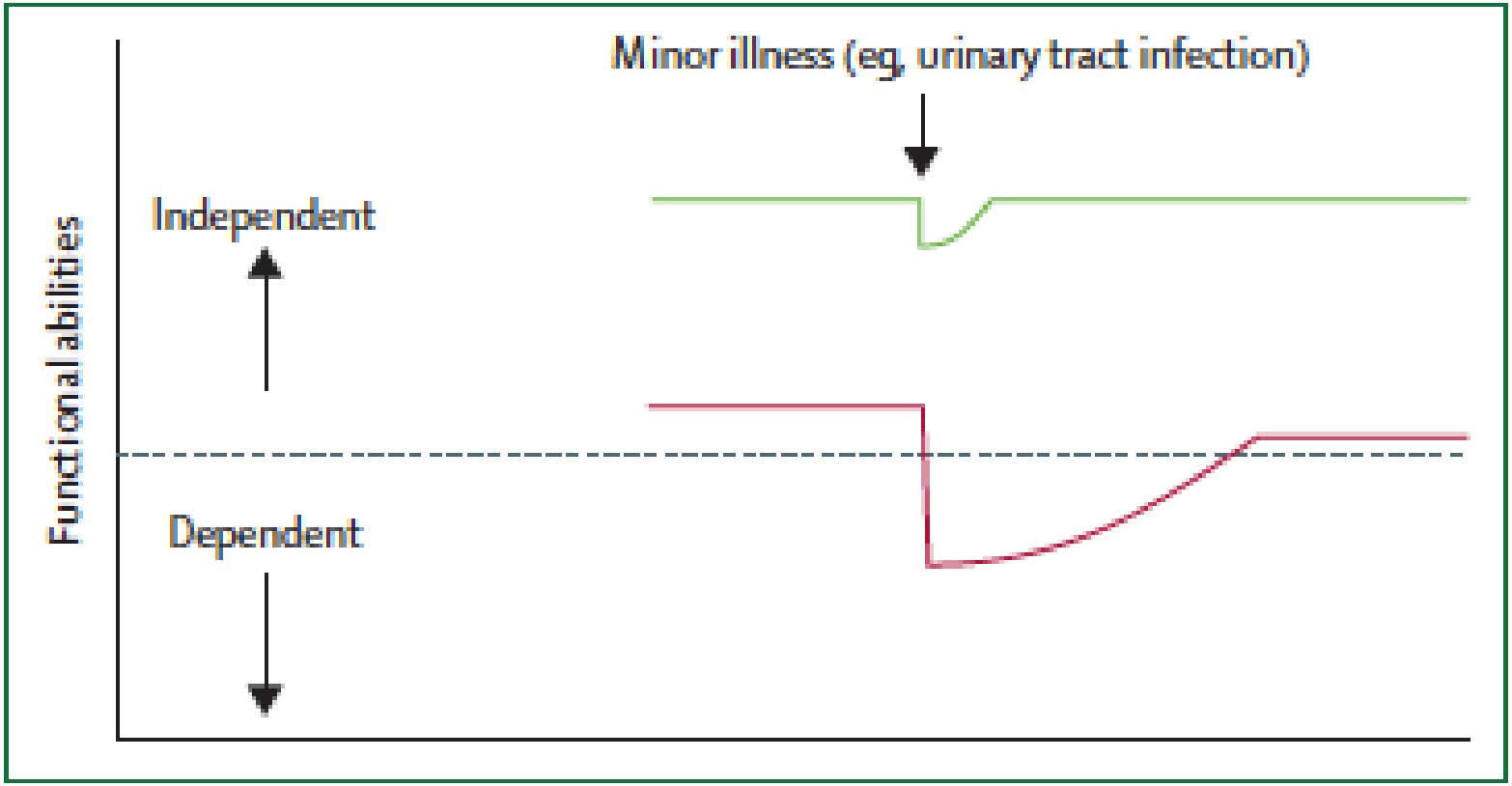
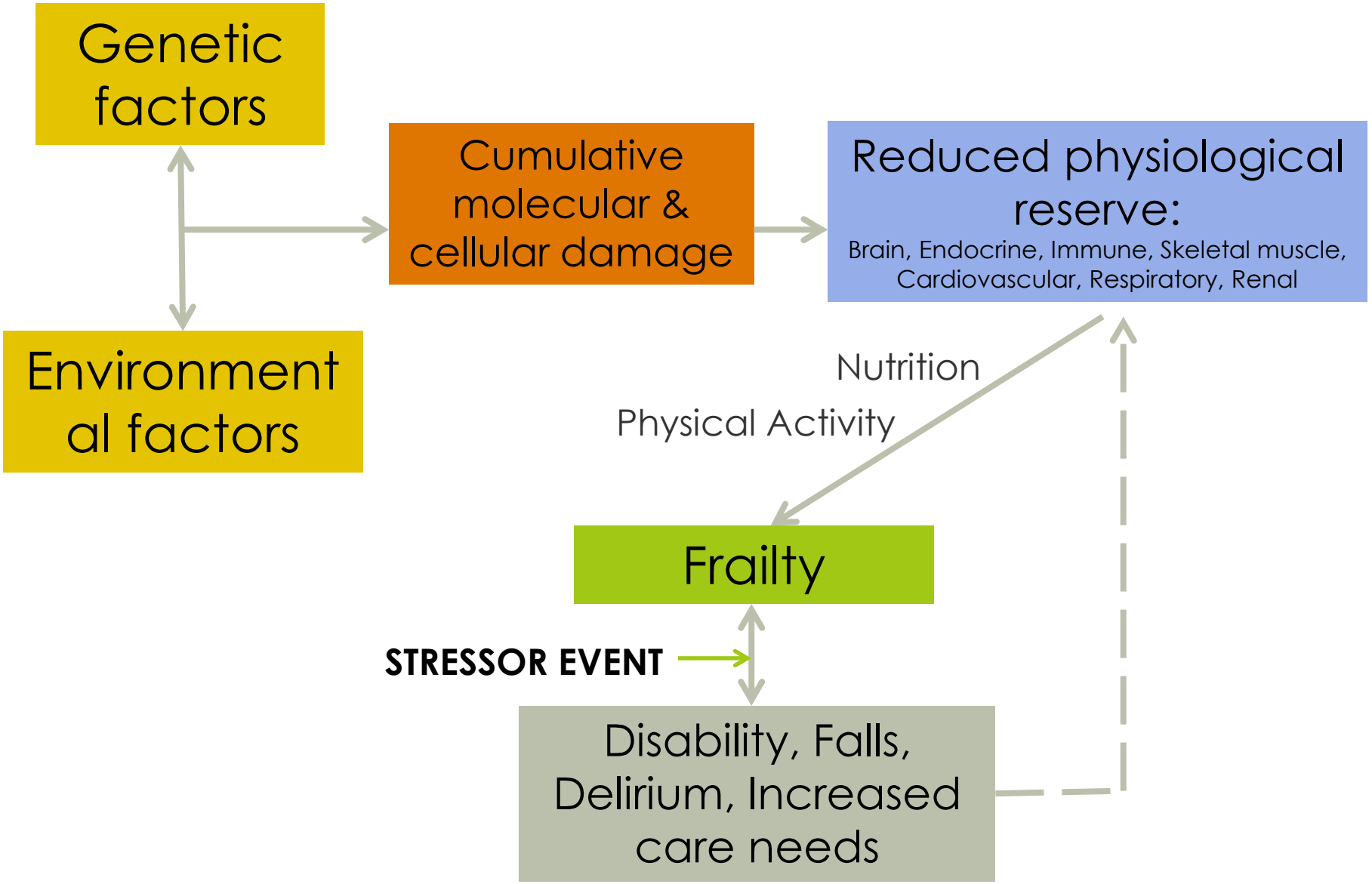


Figure 1: Vulnerability of frail elderly people to a sudden change in health status after a minor illness

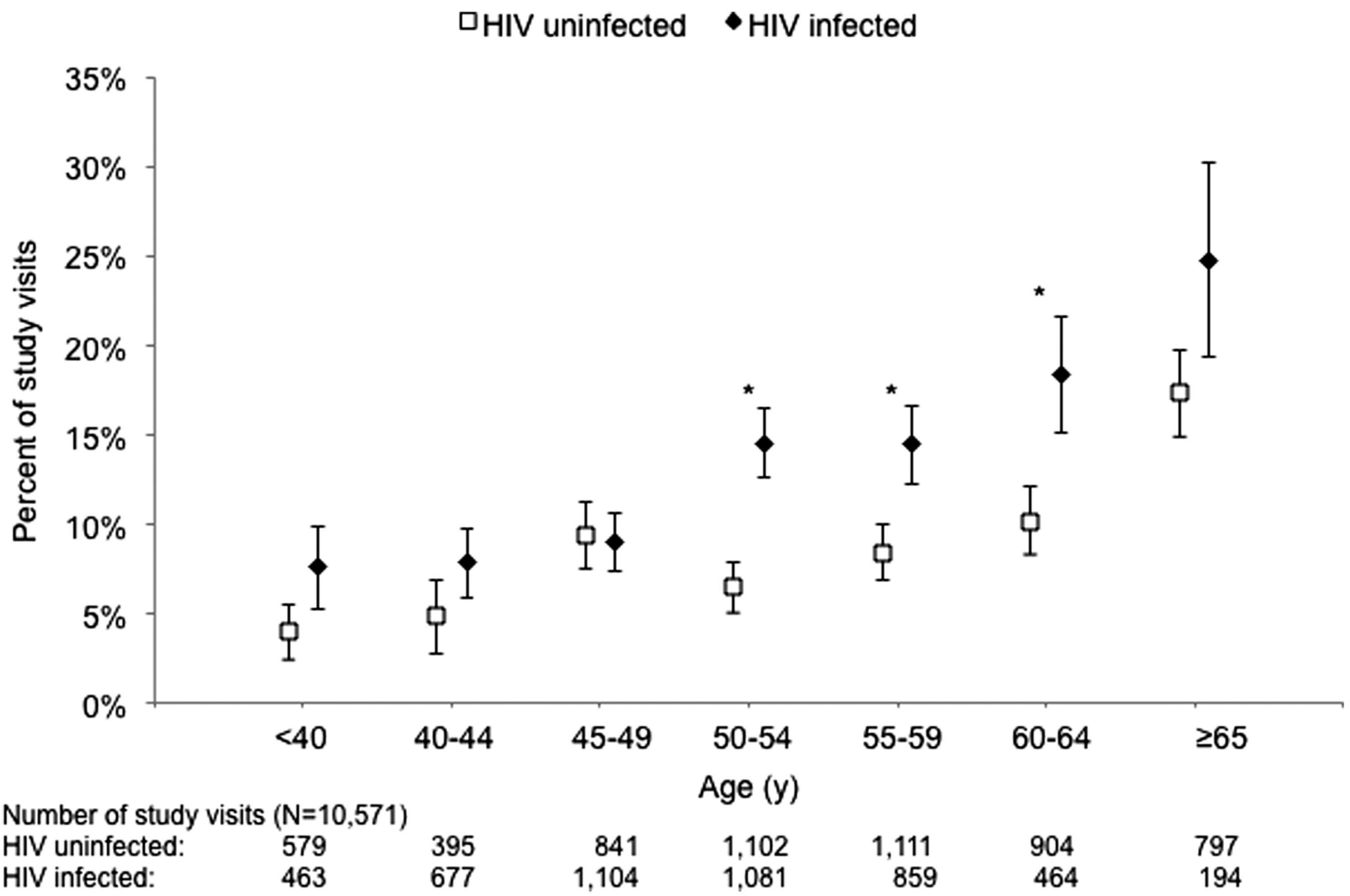
Clegg et al. *Lancet*. 2013;381:752-62

Pathophysiology of Frailty



Adapted from Clegg et al. *Lancet*. 2013;381:752-62

Frailty & HIV

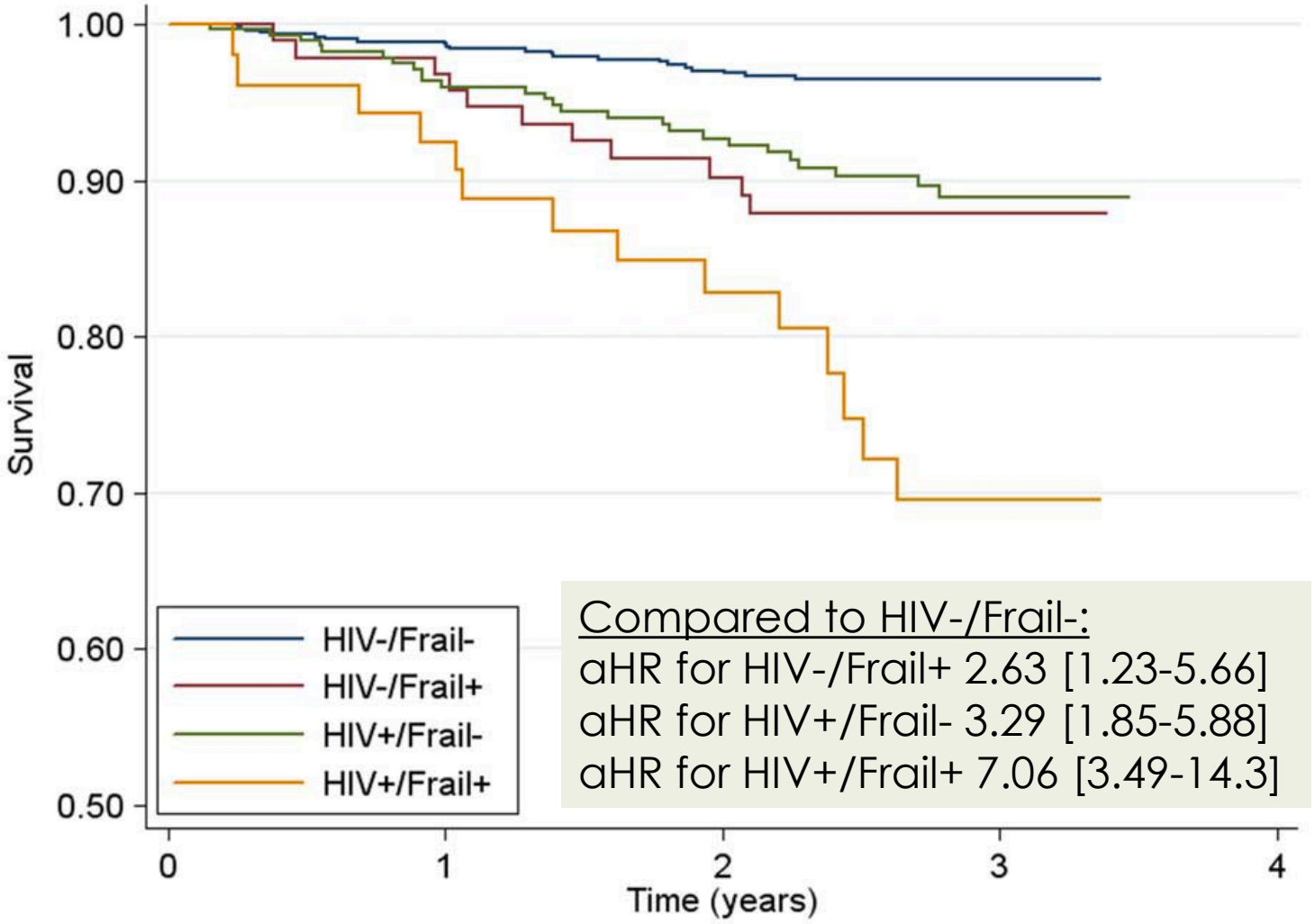


Number of study visits (N=10,571)							
HIV uninfected:	579	395	841	1,102	1,111	904	797
HIV infected:	463	677	1,104	1,081	859	464	194

Fried frailty phenotype present at any study visit in MACS cohort

Althoff et al. *J Geront.* 2014;69:189-98.

Frailty & MORTALITY



Compared to HIV-/Frail-:
aHR for HIV-/Frail+ 2.63 [1.23-5.66]
aHR for HIV+/Frail- 3.29 [1.85-5.88]
aHR for HIV+/Frail+ 7.06 [3.49-14.3]

ALIVE Cohort (2005-2008)

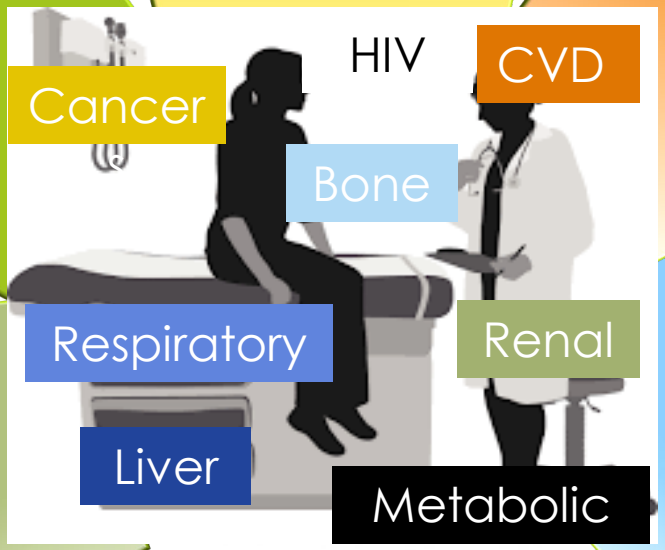
Piggott et al. *PLoS One*. 2013;e54910.

In the clinic…

Screening & Prevention
- Earlier screening for some diseases
- Smoking
- Nutrition

Treatment of NCDs
Adherence to general guidelines

Healthcare Utilization
- Multiple appts & specialists
- Coordination of care



QOL & Function
- Falls
- Depression
- Disability
- Environment
- Social Support
- SES

Attention to Poly-pharmacy
- Drug-drug interactions
- Sedating meds

HIV & Aging clinical guidelines

www.hiv-age.org

HIVAge.org

YOUR GO-TO SITE FOR AGING WITH HIV

CLINICAL RECOMMENDATIONS | CME/CE INFO | JOURNAL ARTICLES | CASE STUDIES

CLINICAL RECOMMENDATIONS

FOLLOW:

The American Academy of HIV Medicine (AAHIVM), the American Geriatrics Society (AGS) and the AIDS Community Research Initiative of America (ACRIA) released the first clinical treatment strategies for managing older HIV patients: The HIV and Aging Consensus Project: Recommended Treatment Strategies for Clinicians Managing Older Patients with HIV in the fall of 2011.

If there is one constant in the field of HIV medicine, it is that of constant change. The science of HIV is an ever changing landscape of new research findings, new medications with new targets and also new side effects. In addition to new populations affected by the epidemic, as the elderly, there is the ever demanding goal of seeking an actual cure for HIV disease.

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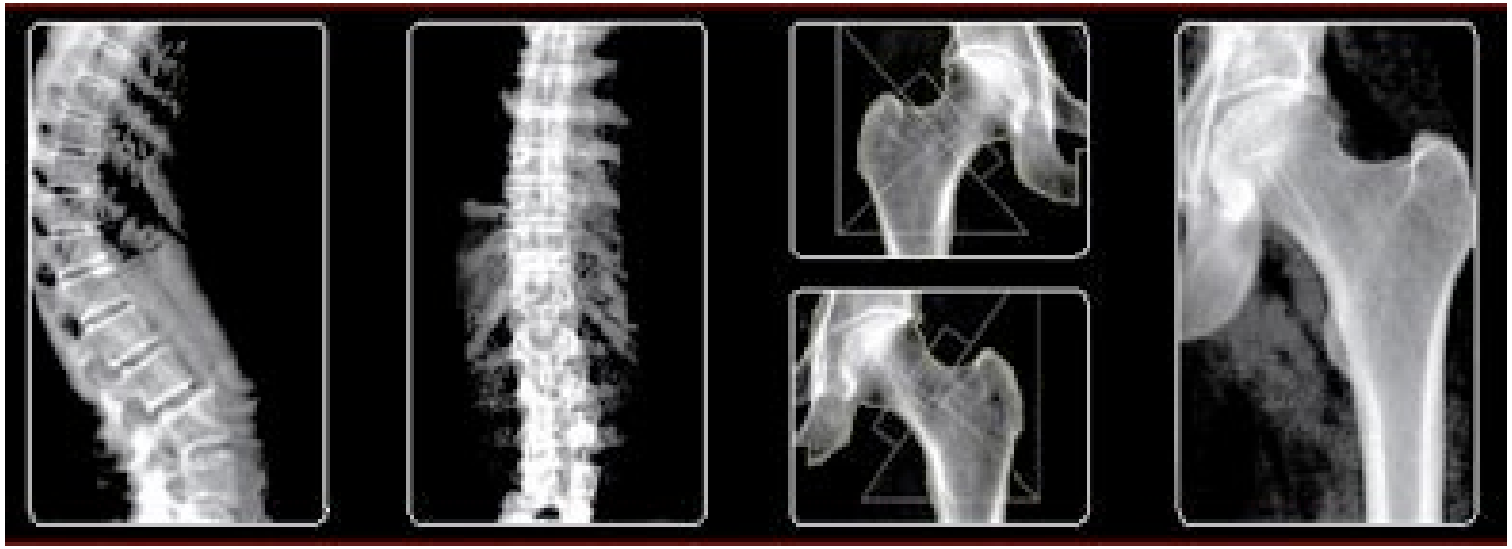
Screening example #1: Osteoporosis



PLWH and osteoporosis risk

↑ Traditional Risk Factors

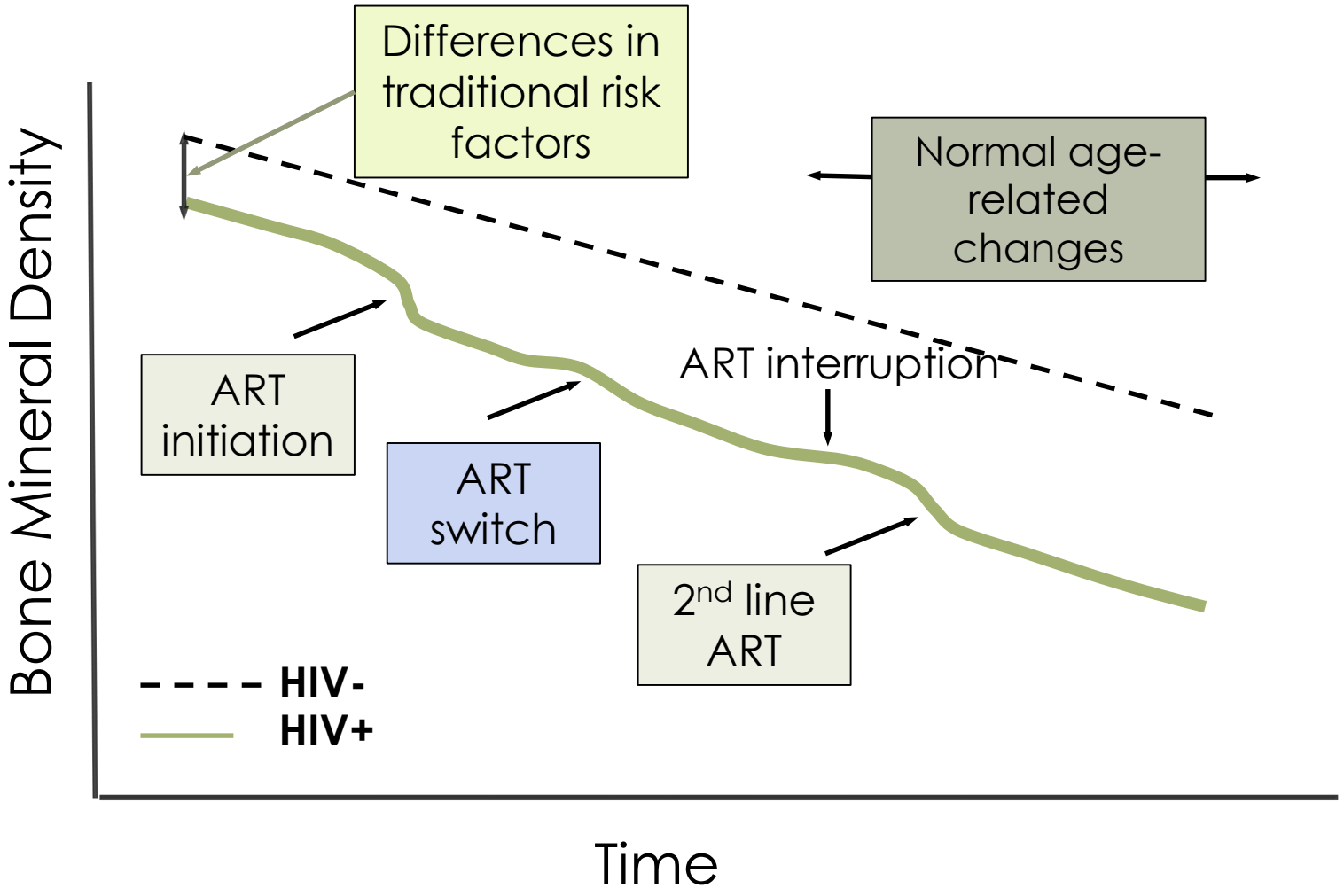
↑ Co-morbidity Risk Factors

HIV Virus

ART

Immune System

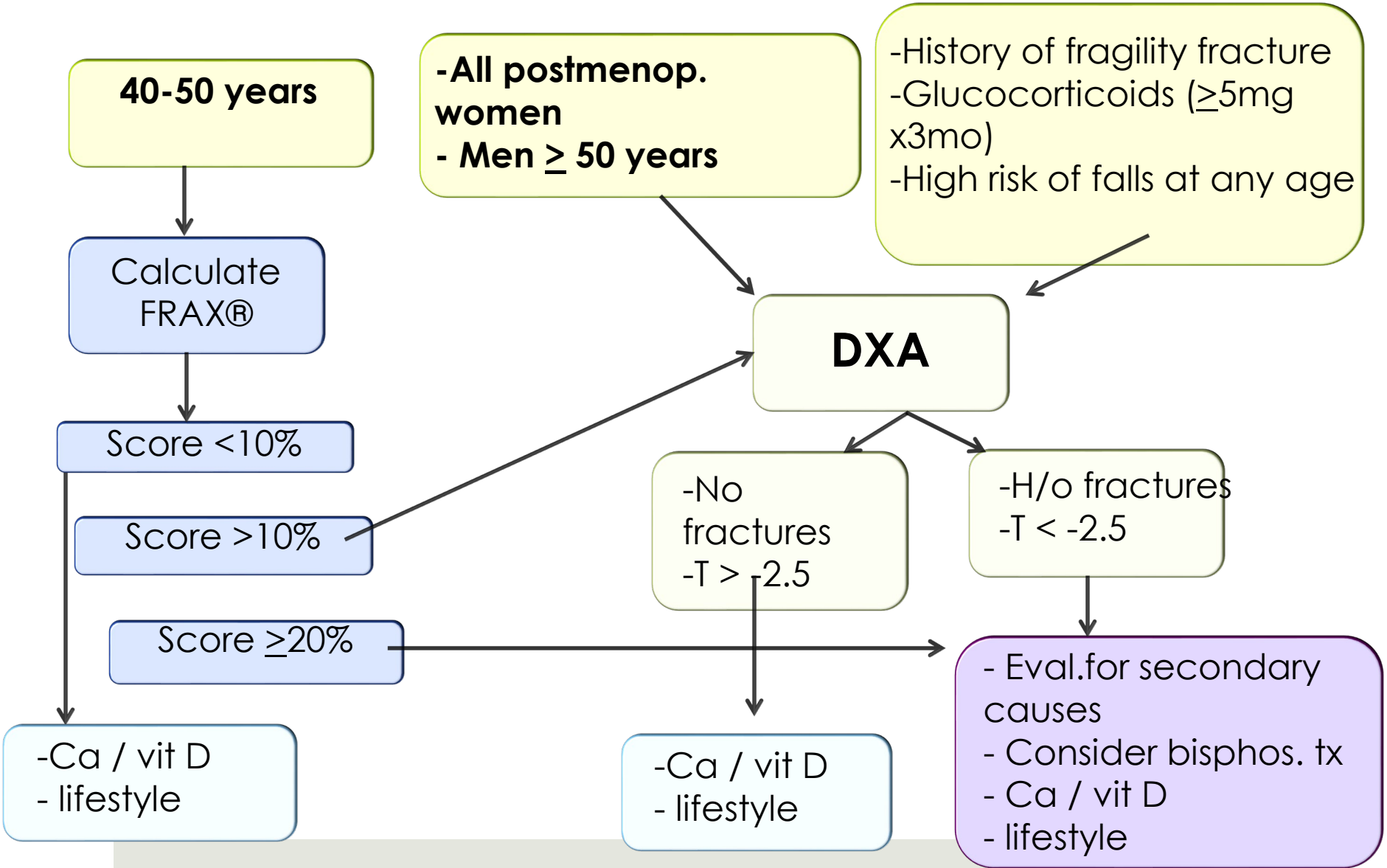
Working hypothesis/paradigm



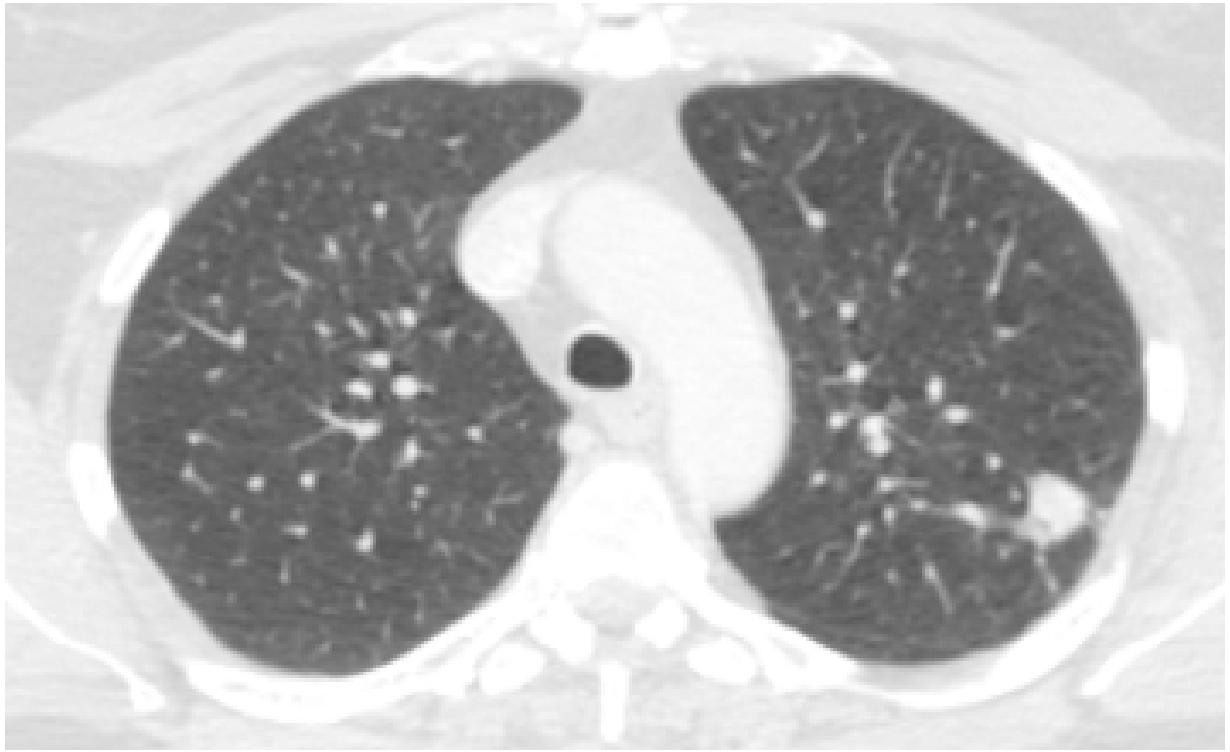
Mallon PW. *Curr Opin HIV AIDS*. 2014

Osteoporosis screening in PLWH

(Brown et al. *Clin Inf Dis.* 2014)



Screening example #2: Lung cancer



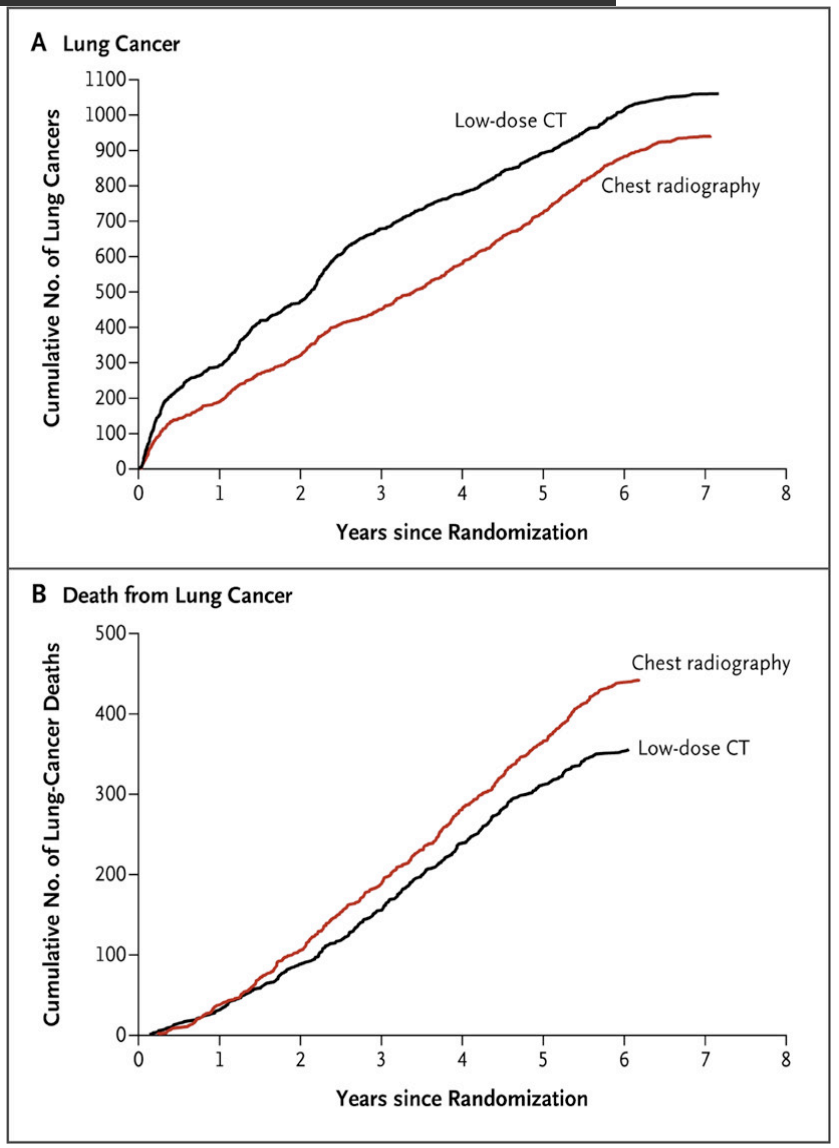
Lung Cancer in PWHIV

- Most commonly occurring cancer and leading cause of cancer mortality in PLWH
- Two- to four-fold increased risk of lung cancer in PLWH compared to general populations
- Diagnosed at younger ages (54 vs 58yrs), more advanced stage, and is associated with increased mortality, with a 5-year survival rate of 16%

Engels et al. *J Clin Onc*. 2006

Lung cancer screening

- Low-dose scan (LDCT)
- Adults aged 55-74 years with a smoking history of ≥30 pack years
- Randomized to screening by LDCT or chest x-ray
- Reduced lung cancer mortality by 20%



National Lung Screening Trial. *New Eng J Med*. 2011

Lung Cancer screening in PWHIV

- **French ANRS HIV CHEST study** demonstrated LDCT screening in PWHIV age ≥40 years, ≥20 pack-years, and CD4 nadir ≤350 cells/μL was effective and feasible for lung cancer detection. Most lung cancer cases occurred in participants ≤55 years.
- **Copenhagen study** assessing LDCT among PWHIV for lung cancer found comparable prevalence of lung cancer with what is detected in the general population. Current CD4 and CD4 nadir were associated with LDCT outcomes.

Makinson et al. *AIDS*. 2016

Ronit et al. *AIDS*. 2017

Prevention example: Herpes zoster

Zoster vaccines

Zostavax® (2006)

- Live-attenuated vaccine, 1 dose
- Reduces risk of zoster by 51% and PHN by 67%
- Immunocompetent adults ≥ 60 years of age
- Patients with HIV should "tell their doctor"

Shingrix® (2017)

- Recombinant vaccine, 2 doses (2-6 months apart)
- Reduces risk of zoster and PHN by >90%
- Immunocompetent ≥ 50 years of age
- Phase 3 trial excluded persons with immunosuppressive conditions (including HIV)

https://www.cdc.gov/shingles/vaccination.html

Lal et al. *New Eng J Med.* 2015

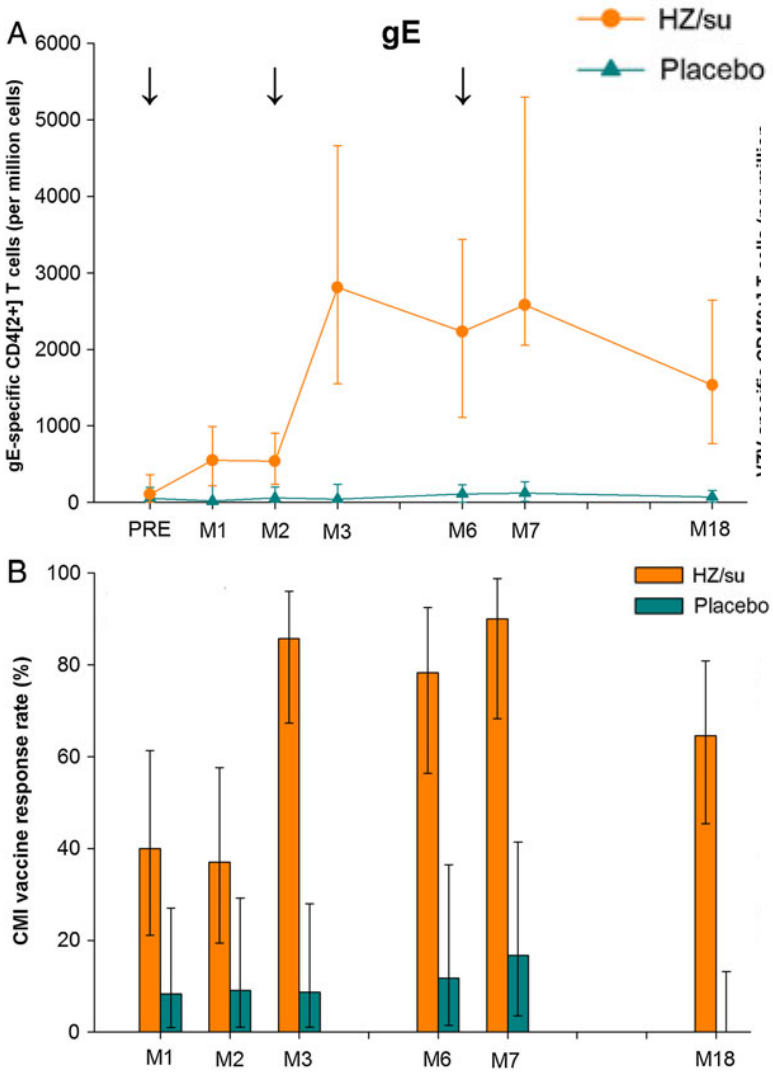
Live vaccine safe & immunogenic in PLWH

- Blinded, randomized trial to assess safety and immunogenecity study of PLWH on ART with CD4 ≥200 to receive 2 doses of vaccine, followed for 24 weeks (n=395)
- No age-based inclusion criteria (median age = 49 yrs). Median CD4 = 362
- No difference in safety outcomes between vaccine and placebo arms other than injection site reactions (42 vs 12%, $p<0.001$).
- 1 suspected case of zoster in placebo arm, 3 in the vaccine arm (none were the vaccine strains of VZV)
- Found immunogenecity (change in antibody titers) outcomes similar to those reported in studies of older, HIV-negative adults

Benson et al. *Clin Inf Dis.* 2018

Recombinant vaccine safe & immunogenic in PLWH

- Phase 1/2, randomized trial assess safety and immunogenecity study of PLWH including patients on on ART with CD4 ≥200 (n=94), on ART with CD4 50-199(n=14), and ART naïve with CD4 ≥500 (n=15) to receive placebo or 3 doses of vaccine (0, 2m, 6m)
- Median age = 46 years; median CD4 ~600
- Significant increase in humoral and cell-mediated immune responses after 2nd dose, which were sustained >18 months
- 1 case of zoster (vaccine recipient after 1st and only dose)



Berkowitz et al. *J Inf Dis.* 2015

Screening & Prevention in older PLWH

Examples	Unique guidelines for PLWH?
Many/Most: colorectal/breast/cancer screening, glaucoma, abdominal aortic aneurysm, influenza	No
Conditions more frequent or occur at younger ages in PLWH:	
Osteoporosis	Yes
Lung cancer	No - but maybe there should be
Herpes zoster	Mixed answer – no definitive guidelines but likely recombinant vaccine should be given in all ≥50 years

Implementing geriatric medicine into HIV clinical care – the 5 Ms

- **Matters most** – goals of care
- **Mind** – depression, dementia
  - *Tools:* Montreal Cognitive Assessment, international HIV dementia scale, PHQ-9
- **Mobility**- falls prevention
  - *Tools:* timed get-up and go, falls questions, Tinetti gait & balance test
- **Medications** – polypharmacy, dose-adjustment for age, DDI
  - *Tools:* America Geriatrics Society Beers criteria
- **Multi-complexity** – multimorbidity, bio-psycho-social situations
  - *Tools:* Fried frailty assessment, ADL/IADLs, VACS index score

Adapted from presentation by Dr. Alison Moore. *9th International Workshop on HIV & Aging*. 2018

Mr. C (53 yo, 9/2017)

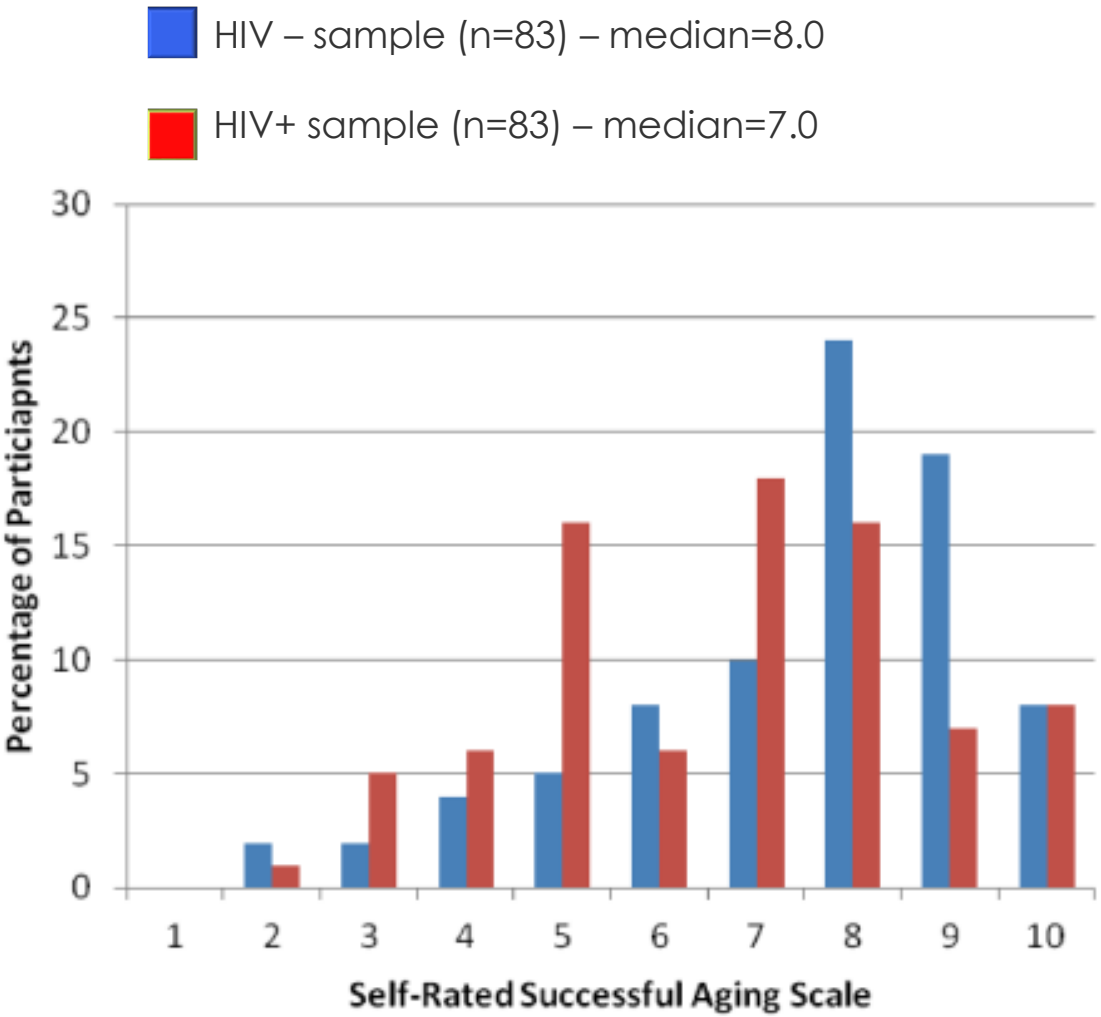
"TREE" PLAN

1. HIV: controlled, stable
   - Check routine labs
   - Continue DTG/ABC/3TC
2. CAD: no sx of ischemia
   - follow-up with Cardiology
3. Cirrhosis: no volume overload, min. HE
   - Continue meds
   - Follow-up with Hepatology
   - UTD for HCC screening
4. Depression: euthymic
   - Continue fluoxetine, melatonin
5. Dementia

"FOREST" PLAN

1. Quality of life
   - enjoyed recent cruise vacation
2. Safety
   - Discussed driving restrictions with patient
3. Falls prevention
   - Reviewed household risks
   - PT referral for balance/strength
4. Poly-pharmacy review
   - Discontinue PPI if sx improved, consider H2 blocker to reduce osteoporosis risk
5. Healthcare utilization
   - Did not check labs at last visit, will obtain this time.

"Successful aging"



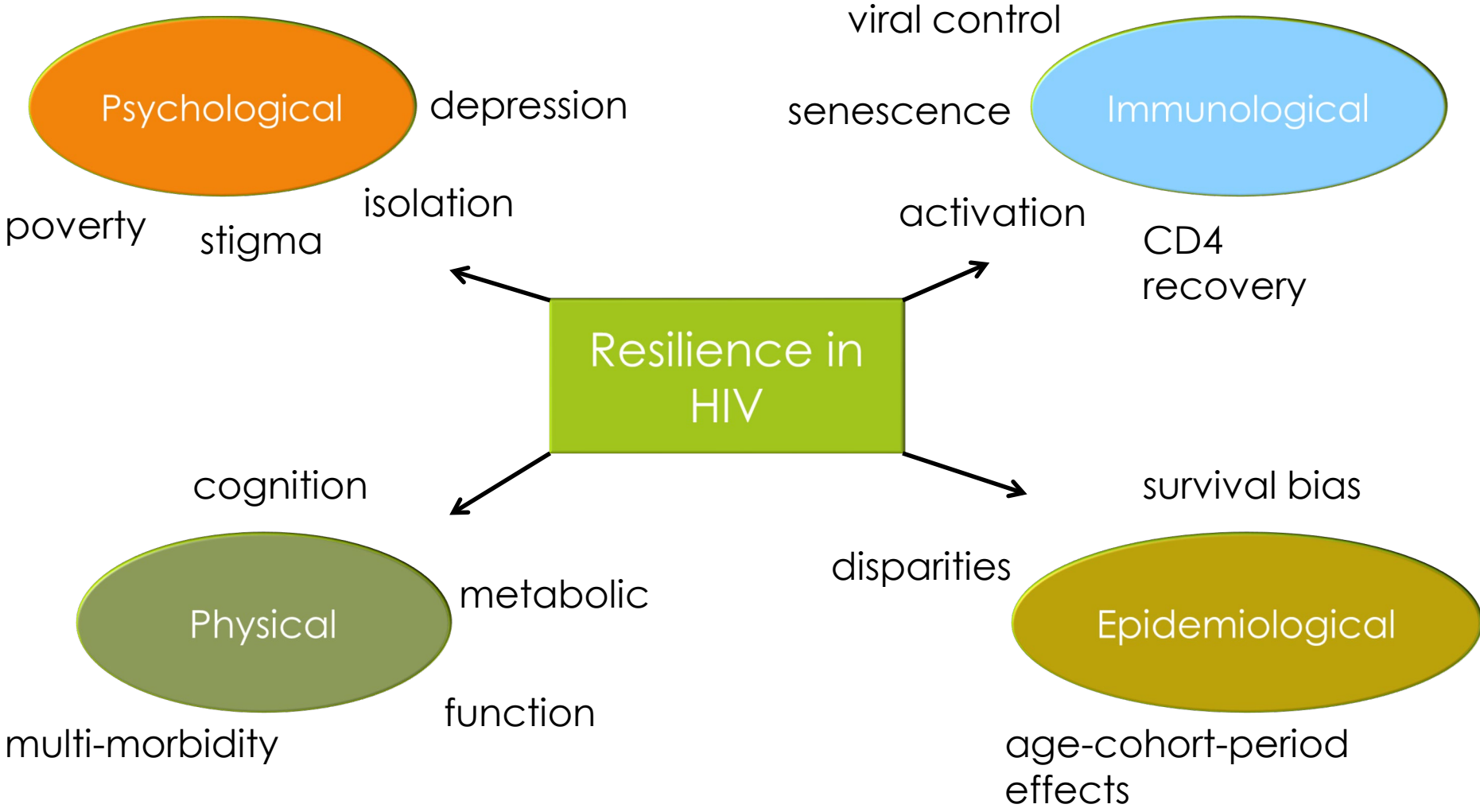
Higher Self-Reported Successful Aging scores correlated with:

- Improved physical and mental functioning
- Lower depression scores
- Increased happiness
- Resilience
- Optimism
- Personal mastery
- Lower perceived stress

Moore et al. *J Clin Psychiatry*. 2013.

Resilience:

the ability to become strong, healthy, or successful again after something bad happens



Healthspan not lifespan: building resilience in PLWH

In PLWH, higher levels of resilience associated with:

- Older age
- Shorter time since HIV dx
- Lower prevalence of depression & anxiety symptoms, less difficulty with ADLs
- Mediation of stress from negative life events

McGowan et al. *AIDS and Behav.* 2018.

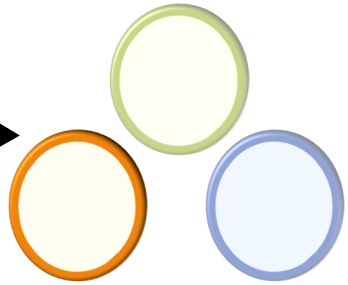
Fang et al. *Aging Ment Health.* 2015.

Lifecourse model of resilience

Wellness

Adverse Live Event

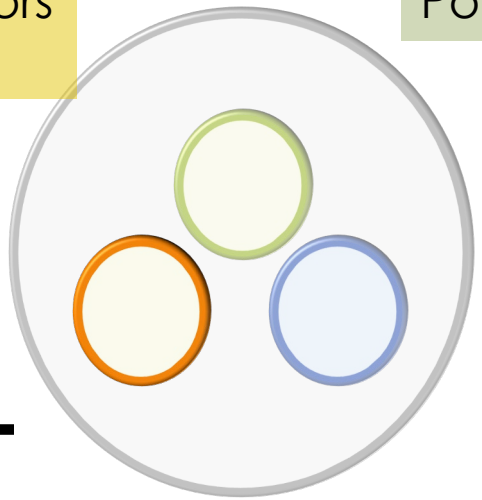
Perception: Stressful



Disruption

Energy
Motivation
Access

Activation of Resources



Coping Processes
Emotional Regulation

Reintegration

Individual:
Optimism
Self-efficacy
Health behaviors
Sense of purpose

Social:
Relationships
Culture
Engagement

Environmental:
Aging in place
Programs
Policy

Adapted from Wister et al. *Int J Aging Hum Dev*. 2016.

Conclusions

- Older PLWH is a special but increasingly predominant population in our clinics.
- The causes, individualized care, and prevention of multi-morbidity in PLWH are complex and demanding.
- However, awareness of geriatric syndromes and principle of geriatric medicine can aid in providing best care.
- Applying a lifecourse approach to caring for PLWH will build resilience and improve healthspans, not just lifespans, of PLWH.