

Aging with HIV in the US & NYC

clinical & community care & services needs,
unmet needs

Jules Levin

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AIDS Treatment Advocacy Project

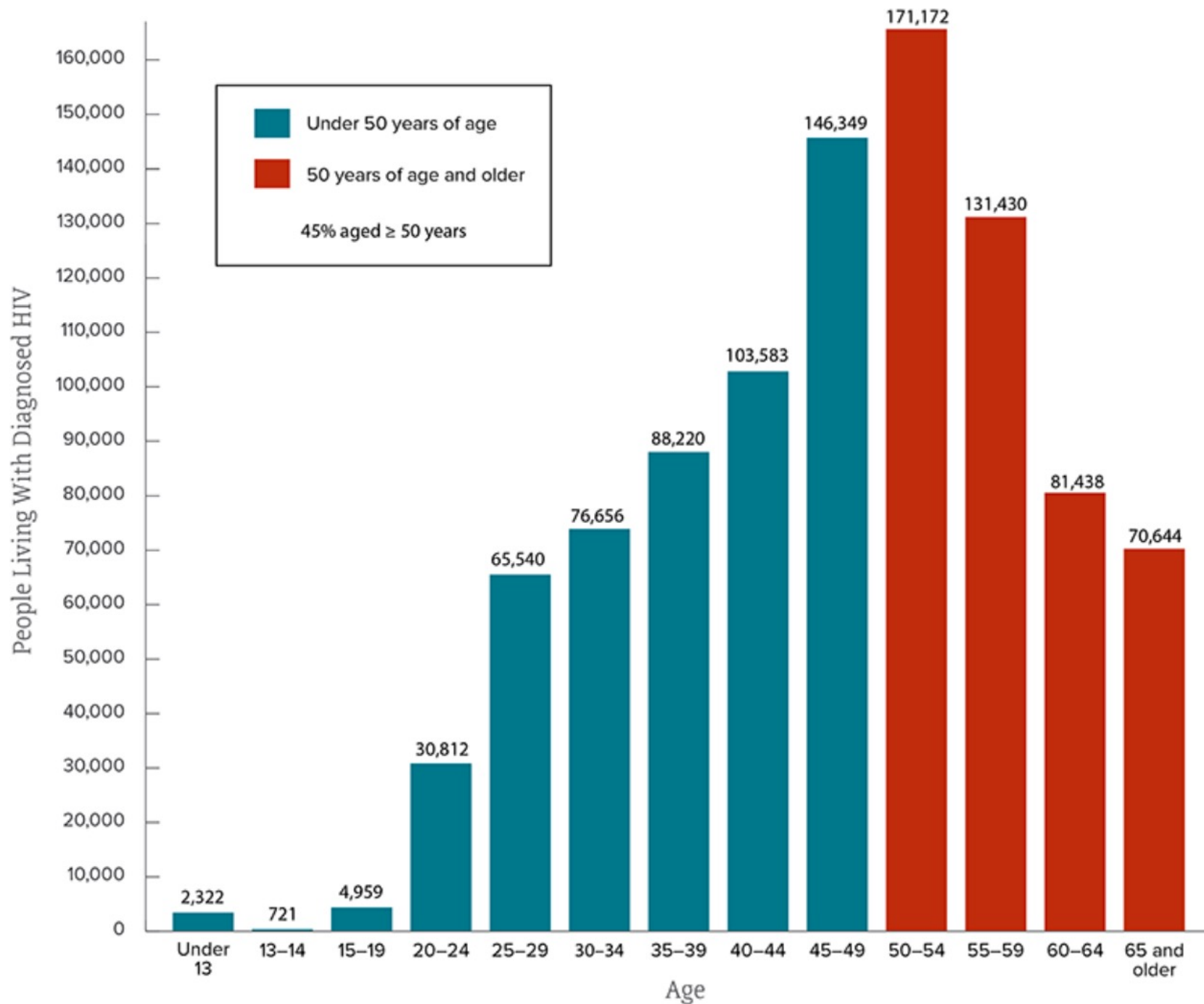
www.natap.org

NATAP

- www.natap.org
- Leader in HIV & hepatitis education & reporting since 1996
- Boosted protease inhibitors
- Hep C - RW Council, DOH 1998
- Check Hep C: Designed & raised \$2 mill funding for
- Education symposiums since 1996, over 40,000 attended, 380 live symposiums in 25 cities – virtual in 2020: 15 webinars including aging specific
- Active Aging & HIV policy, advocacy: recognized problem 15 years ago: went to federal OAR & ACTG agencies

HIV+ for 37 years. 70 now

People Living With Diagnosed HIV by Age, 2015, United States



Source: CDC. [Diagnoses of HIV infection in the United States and dependent areas, 2016](#) . HIV Surveillance Report 2016;28.

NYC: 27% >60 - 77% >40 - 60%>60



DEMOGRAPHIC AND CLINICAL CHARACTERISTICS

HIV/AIDS diagnoses and deaths occurring January 1, 2019 through June 30, 2019; and people diagnosed with HIV, reported in New York City, and presumed to be living as of June 30, 2019¹

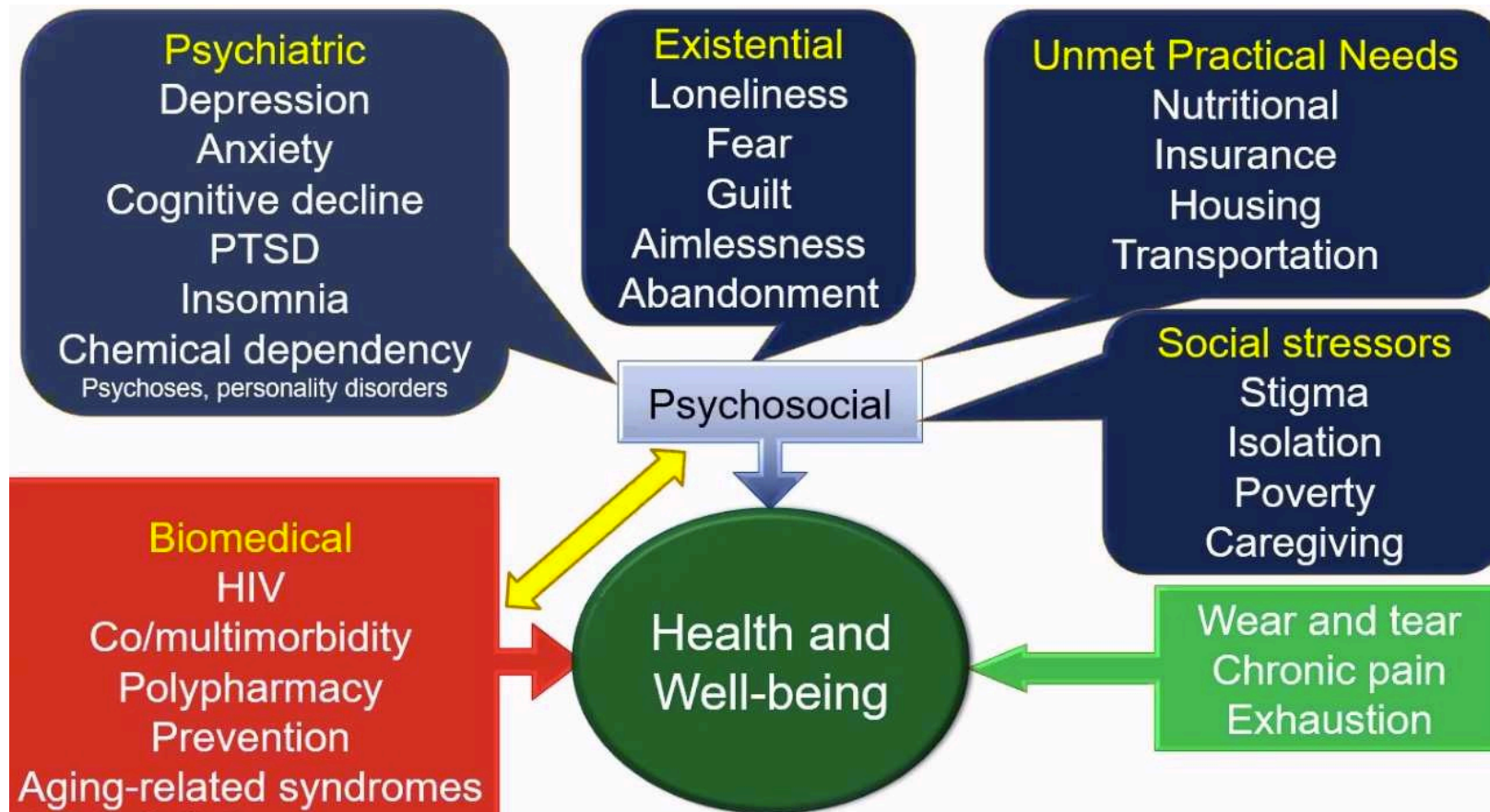
	HIV diagnoses ²							AIDS diagnoses ⁴		PLWH as of 6/30/2019		Deaths ⁵	
	Total		Without AIDS		Concurrent with AIDS diagnosis ³			N	%	N	%	N	%
	N	%	N	%	N	%	Row %						
Total	876	100.0	725	100.0	151	100.0	17.2	535	100.0	127,823	100.0	707	100.0
Gender													
Men	693	79.1	580	80.0	113	74.8	16.3	362	67.7	92,535	72.4	490	69.3
Women	157	17.9	119	16.4	38	25.2	24.2	158	29.5	33,306	26.1	210	29.7
Transgender	26	3.0	26	3.6	0	0.0	0.0	15	2.8	1,982	1.6	7	1.0
Race/Ethnicity⁶													
Black	401	45.8	333	45.9	68	45.0	17.0	279	52.1	55,511	43.4	351	49.6
Latino/Hispanic	328	37.4	268	37.0	60	39.7	18.3	184	34.4	42,202	33.0	244	34.5
White	95	10.8	86	11.9	9	6.0	9.5	45	8.4	25,998	20.3	95	13.4
Asian/Pacific Islander	35	4.0	25	3.4	10	6.6	28.6	20	3.7	3,089	2.4	9	1.3
Native American	1	0.1	1	0.1	0	0.0	0.0	1	0.2	295	0.2	3	0.4
Multiracial	16	1.8	12	1.7	4	2.6	25.0	6	1.1	408	0.3	5	0.7
Unknown	0	0.0	0	0.0	0	0.0	0.0	0	0.0	320	0.3	0	0.0
Age group (years)⁷													
0-12	0	0.0	0	0.0	0	0.0	0.0	0	0.0	68	0.1	0	0.0
13-19	25	2.9	23	3.2	2	1.3	8.0	3	0.6	350	0.3	0	0.0
20-29	315	36.0	285	39.3	30	19.9	9.5	90	16.8	8,622	6.7	8	1.1
30-39	235	26.8	195	26.9	40	26.5	17.0	137	25.6	20,090	15.7	53	7.5
40-49	142	16.2	108	14.9	34	22.5	23.9	109	20.4	24,243	19.0	87	12.3
50-59	104	11.9	72	9.9	32	21.2	30.8	122	22.8	40,492	31.7	203	28.7
60+	55	6.3	42	5.8	13	8.6	23.6	74	13.8	33,958	26.6	356	50.4

HIV Geriatric Clinics

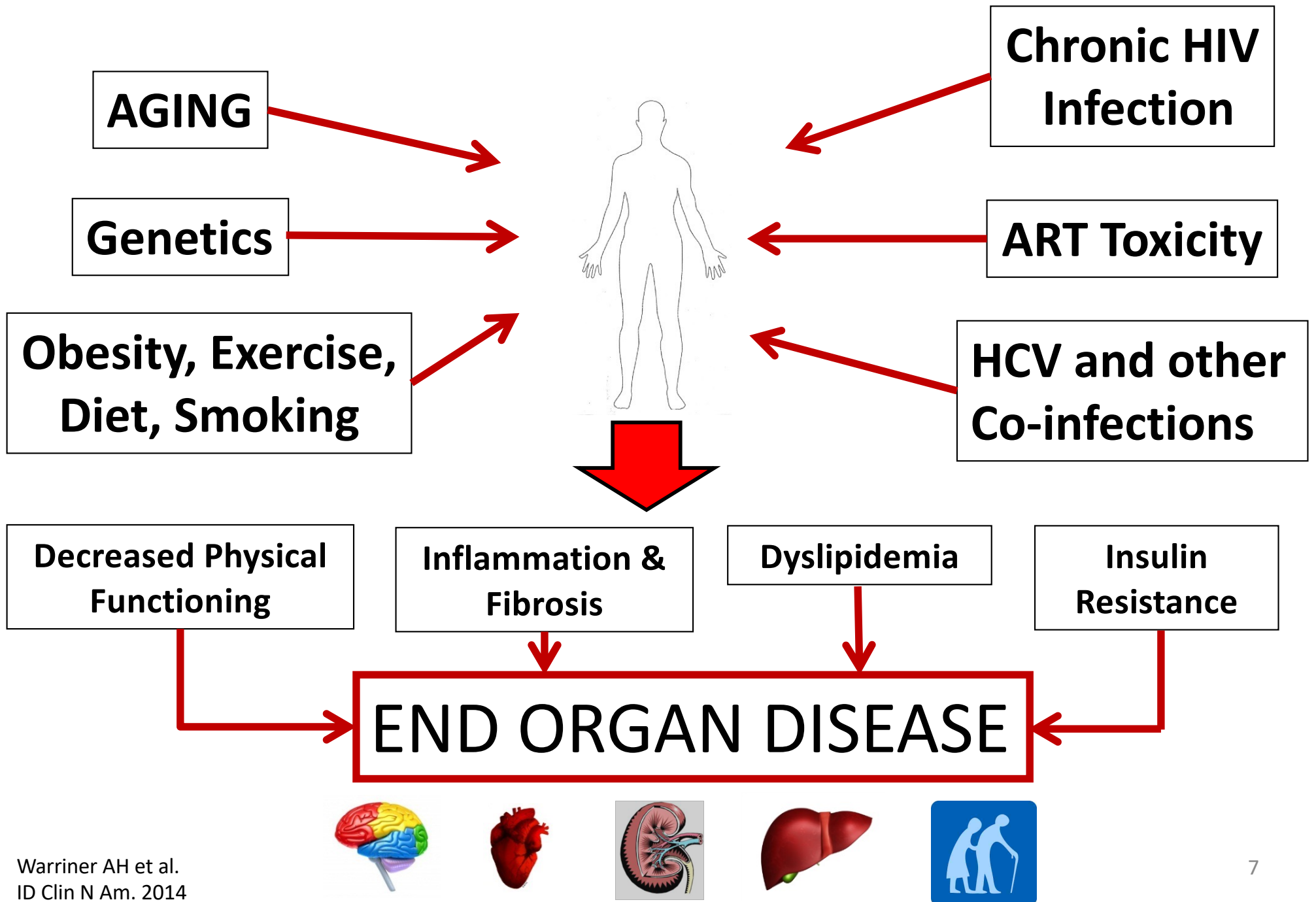
Most common Geri-HIV program is consultative clinic

Location	Clinic/name	Resource	Venue	Comment
Boston (US)	Mass General Hospital/Aging Positively	Fitch	Biweekly in ID clinic	Providers may refer anyone over 50 NP sees patients; develops plan with rest of team
Brighton (UK)	Brighton and Sussex U Hosp Silver Clinic	Vera	Monthly clinic sessions	Referral criteria: >50, difficulty coping at home, multimorbidity, polypharmacy; HIV MD, geriatrician, HIV Clin NS, Pharm
Denver (US)	University of Colorado	Erlandson	Outside consultation	Geriatrician, pharmacist see complicated patients 1-3 times – refer back to 1° care
London (UK)	Chelsea/Westminster	Waters	Separate multidisciplinary clinic	Referral criterion: age Consultant, HIV NP, trainee; supported by specialist pharm and dietician
Montreal (CA)	McGill	Falutz	In HIV Clinic	Geriatrician sees referrals as needed as needed; planning pharm, CGA for >60
New York (US)	CSS at WCM/NYPH	Siegler	Geriatrician weekly visit w/in HIV clinic	No fixed referral criteria Geriatrician follows longitudinally Sponsors arts, support groups, inservices
Salem, VA (US)	SAVI	Oursler	VA clinic	Assess multimorb , sarcopenia, frailty, cognition; Staff: Pharm, neuroψ, RD, endo
San Francisco (US)	Ward 86/Golden Compass	Greene	Geriatric HIV clinic: pharm, screen, geri consult	Referral >70, falls; “navigation”: heart/ mind; strength/bones; screening/link to dental, vision, etc ; SW, CBSS, support groups

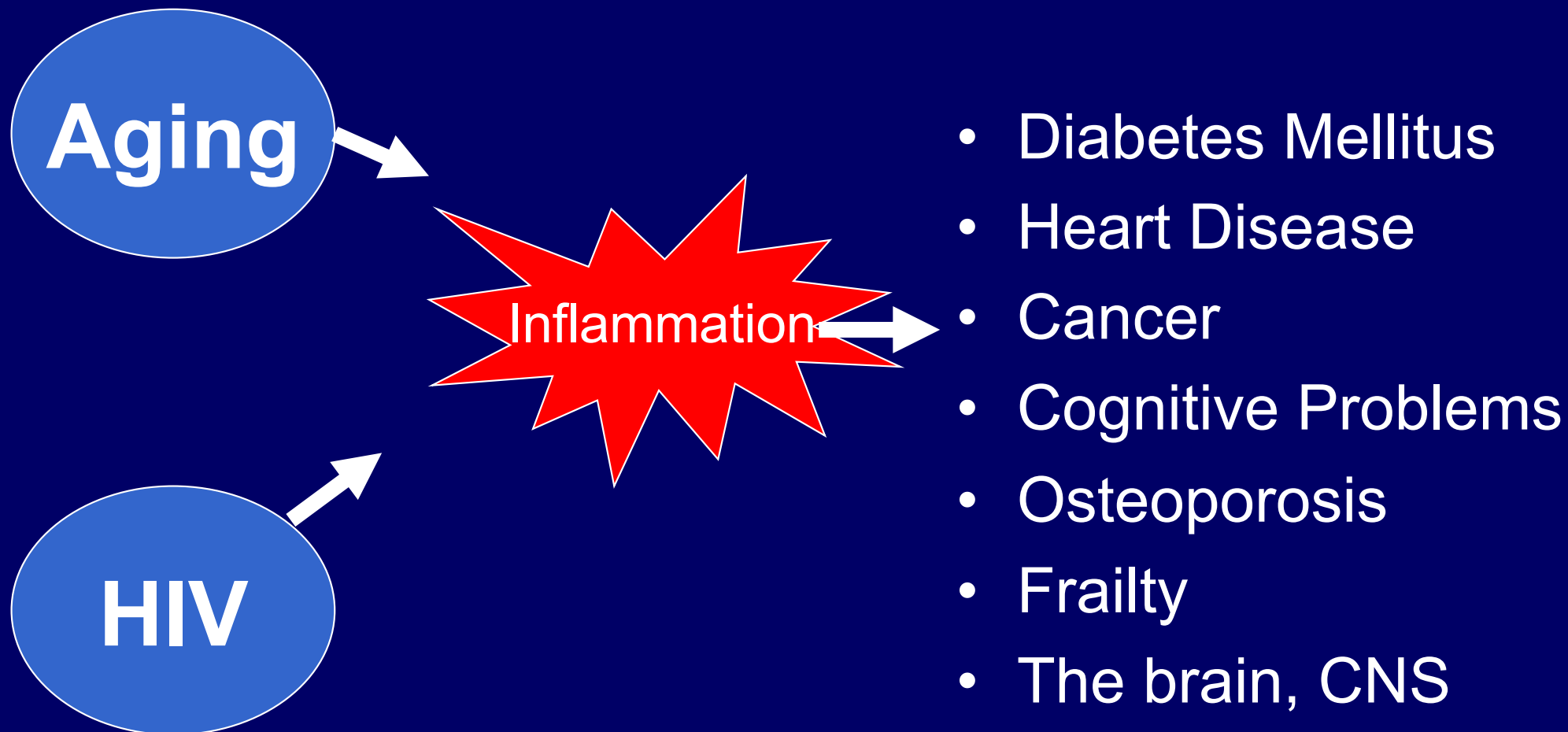
“Aging & HIV Syndrome”



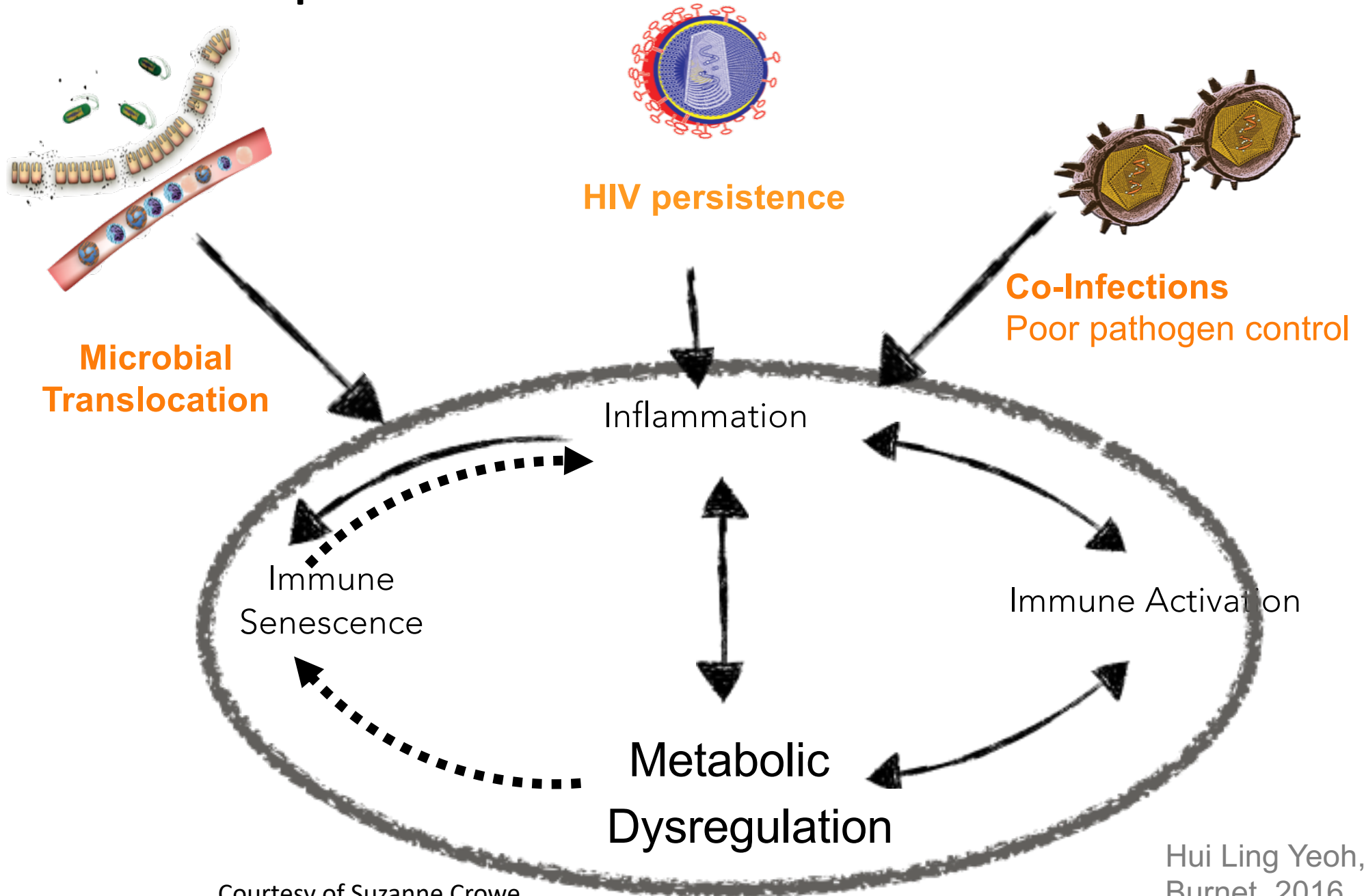
Factors - Impact on Non-AIDS Comorbidities



Aging & HIV: The Inflammation Double Whammy



Microbial translocation, HIV persistence and coinfections cause persistent innate immune activation

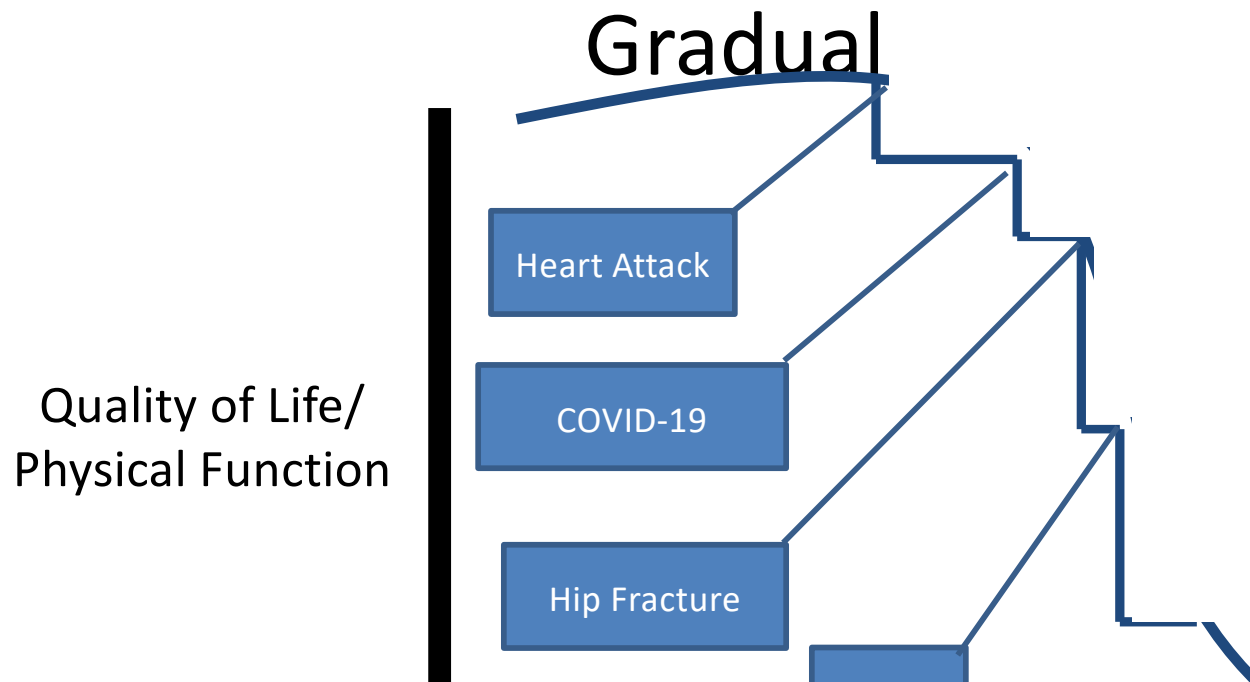


Courtesy of Suzanne Crowe

Hui Ling Yeoh,
Burnet, 2016

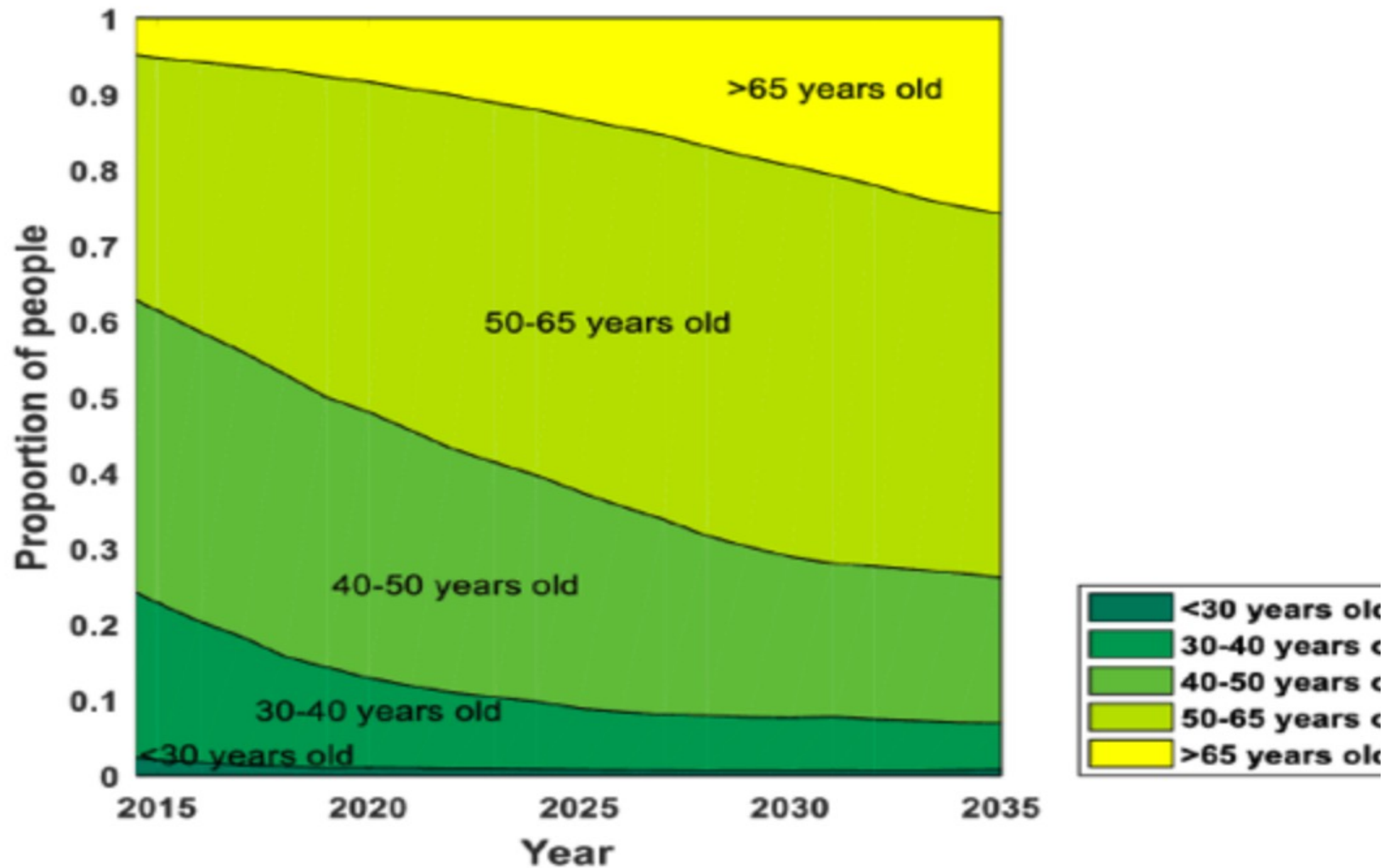
Decline in Function May Not Be

Gradual



A major goal of the treatment of acute illness is to regain function → Use physical and occupational therapy

75% Projected to Be Over 50. 85% of HIV+ projected to Have Cardiovascular Disease in USA, 30% malignancy, 23% diabetes. Care Costs Increase by 40% due to Comorbidities



B.

Fig 2. The age distribution of HIV-positive patients on antiretroviral therapy in A. Italy between 2015 and 2035.

Worsening Problems for Aging PLWH Problems: better care/Services Needed

- Accelerated, accentuated, premature aging: 10 (5-15) years earlier biological aging
- 3-5 times higher rates of comorbidities compared to HIV- of similar age
- Comorbidities increase in numbers as PLWH ages
- **Need EDUCATION** for PLWH: Older Aging HIV+ - many were surprised – never informed about premature aging
- Polypharmacy: some taking 16 medications a day
- **Substance abuse is back** - fear around aging: anxiety; pain, discomfort physically & mentally
- **Physical impairment prematurely**, unable to perform daily normal activities
- **Mental health**: depression, anxiety, abandonment, cognitive impairment
- **Debilitating fatigue & cognitive impairment**
- **Frailty, Falls & fractures** are greater among aging HIV+ & onset is premature for HIV+
- **Obesity** Among HIV+ women: weight increases fat, inflammation, CVD & diabetes
- Cure END AIDS ignores aging PLWH

“Acceleration of Age-Associated Methylation Patterns in HIV-1-Infected Adults”:

Epigenetics is the alteration of DNA through modifications: 14 years accelerated aging

Table 2. Estimating accelerated aging due to HIV-1 infection using a multivariate model.

	Data set 1 Coefficients (SD)	Data set 1 Pr (> t)	Data set 2 Coefficients (SD)	Data set 2 Pr(> t)
Intercept	-0.3158663 (0.041)	1.15×10^{-09}	-0.387857 (0.069)	1.24×10^{-6}
Age	0.0070888 (0.009)	2.08×10^{-09}	0.008762 (0.002)	1.27×10^{-5}
HIV Seropositive	0.0969574 (0.028)	0.0011	0.128649 (0.031)	0.00014
Estimate of accelerated aging*	13.7 years		14.7 years	

*Using the output above, it is estimated that HIV status accelerates age by 13.7 and 14.7 years (defined by HIV coefficient/Age coefficient)

doi:10.1371/journal.pone.0119201.t002

Aging PLWH Problems (cont.)

- **Muscle wasting: frailty, impaired walking:** use of canes, walkers increased
- Comorbidities **Increase healthcare costs**
- **Lipodystrophy & lipoatrophy** persists & contributes to CVD, and inflammation
- **Bone disease & Fractures** higher in PLWH & women with HIV
- ***20 minute medical visits inadequate:*** primary doc & specialists.
- **No Physical therapy**
- **Diet & exercise** improves health – programs needed
- **Psych care absent**, no evaluation, unable to secure psych therapy: should have telehealth mental care
- Home care visits option; home care now does not satisfy older PLWH-abuse-neglect
- Better support services, more personal & caring
- This is our 1st elderly retired generation: deserve better
- Estimated that 75% will be >50 in 8 years: 80% CVD, 30% diabetes & cancers
- Where & how will we **house them:** nursing home placements are up

Patient Concerns & Needs - Care & Services

- Physical disability
- **Aging STIGMA, self-stigma** - all these rise to New Levels in older 65+. is **MUCH** greater in 60+: self-stigma, blame, abandonment by all including healthcare, advocates, govt officials
- **Navigating** healthcare system
- **EDUCATION - Healthcare literacy**, access, understanding lacking in all despite education level
- **Cognitive impairment**
 - Frailty
 - Gait/walking Impairments
 - Osteoporosis, falls, fractures Increase – disability & mortality increased
 - CNS: neuropathy & other affects on the nervous system, sensory
 - Arthritis
 - **homebound**
 - mentally & physically challenged, impaired
 - unable to perform normal daily activities
 - socially isolated, lonely

Patient Concerns & Needs - Care & Services (cont.)

- **Unable to pay bills** (evicted),
- **shop for food**
- - feel abandoned
- - depressed
- Apathy
- Irritability
- Agitation
- Isolated & alone
- - unable to get to medical visit-
- Deprescribing-polypharmacy, **ADHERENCE**: what is adherence level in older HIV+ >65 with muticoorbidities????

Predict Aging will get worse with time

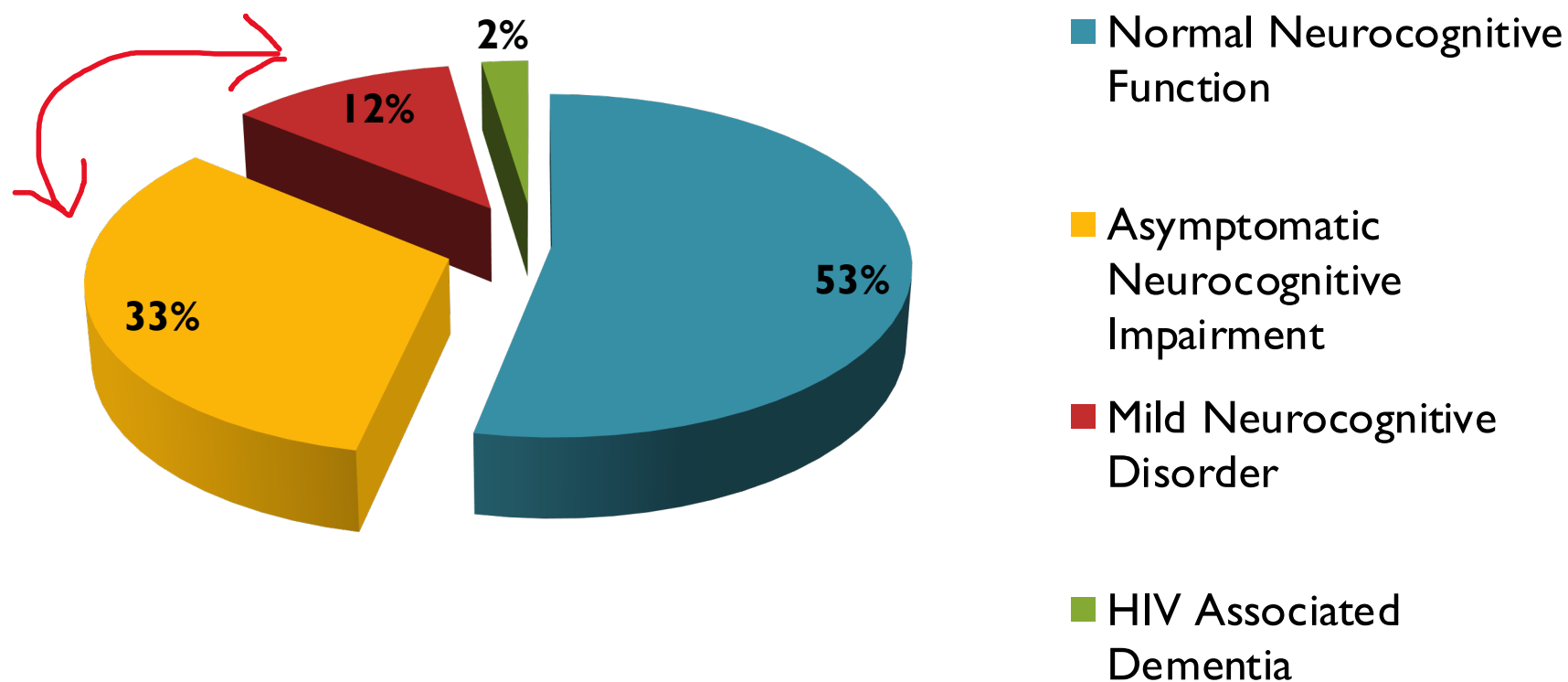
Survival may be reduced for some – 9 years for HIV+: 6.8 yrs if ART started with 500 cd4 – maybe 11-12 years for long term survivors, who started ART with low CD4, Kaiser Permanente study 2020. factors: smoking, mental health, poverty, stress, substance abuse history, trauma, African-American.

More will become....

- Frail
- Physically & mentally impaired & disabled
- Unable to perform normal daily activities
- Hospital & death rates will worsen

Current puzzle (2020): persistent mild forms of neurocognitive impairment in treated HIV

- 1555 person USA urban CHARTER cohort - 71% on antiretroviral therapy (excluding most 'confounded' participants):



Many individuals with 'co-morbidities' in this cohort.

Adapted from: Heaton, et al. *Neurology*. 2010;75; 2087.

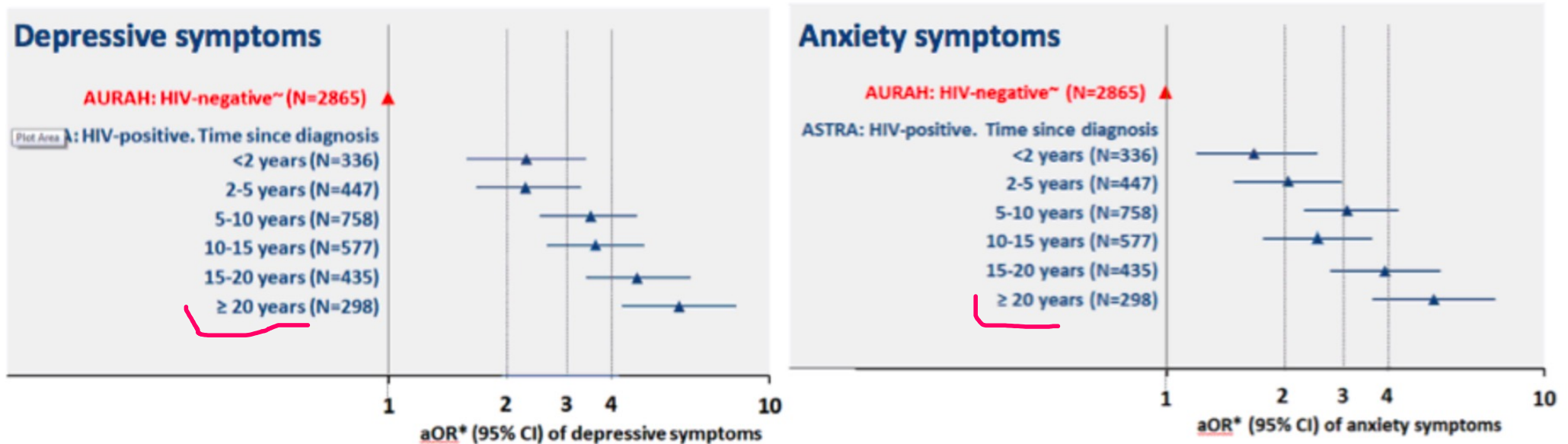
Also: Robertson, et al. *AIDS* 2007, 21:1915; Simioni, et al. *AIDS* 2010, 24: 1243.

Depression & Anxiety 2-3x Higher & increases with Age

Table 2: Depression and anxiety by HIV-status and ART/viral load status

*OR=odds ratio, adjusted for matching variables. ~Reference group	Depressive symptoms (PHQ-9 ≥ 10)		Anxiety symptoms (GAD-7 ≥ 10)		Depression: treated or symptoms		
N	%	aOR (95% CI)*	%	aOR (95% CI)*	%	aOR (95% CI)*	
AURAH HIV-negative~	2865	10.5	1	9.6	1	16.2	1
ASTRA HIV-positive	2865	27.0	3.3 (2.6, 4.2)	21.6	2.7 (2.1, 3.5)	34.6	2.6 (2.0, 3.2)
ASTRA HIV-positive:							
On ART, VL≤50c/mL	2120	25.9	3.1 (2.4, 3.9)	21.0	2.7 (2.0, 3.5)	34.2	2.6 (2.1, 3.2)
On ART, VL>50c/mL	315	33.7	4.4 (3.2, 6.1)	28.9	4.0 (2.8, 5.6)	39.7	3.3 (2.4, 4.4)
Not on ART	395	26.8	3.3 (2.4, 4.5)	18.5	2.3 (1.6, 3.2)	32.4	2.4 (1.8, 3.2)

Figure 1: Depression and anxiety by time since HIV-diagnosis



**50% 50-59, 50% >60:
Living alone,
having depression,
4 or more comorbidities,
having anxiety all associated with feeling lonely.**

Figure 1. Percent of older people living with HIV classified as lonely by age group, $t(929) = -2.81, p < 0.01$.

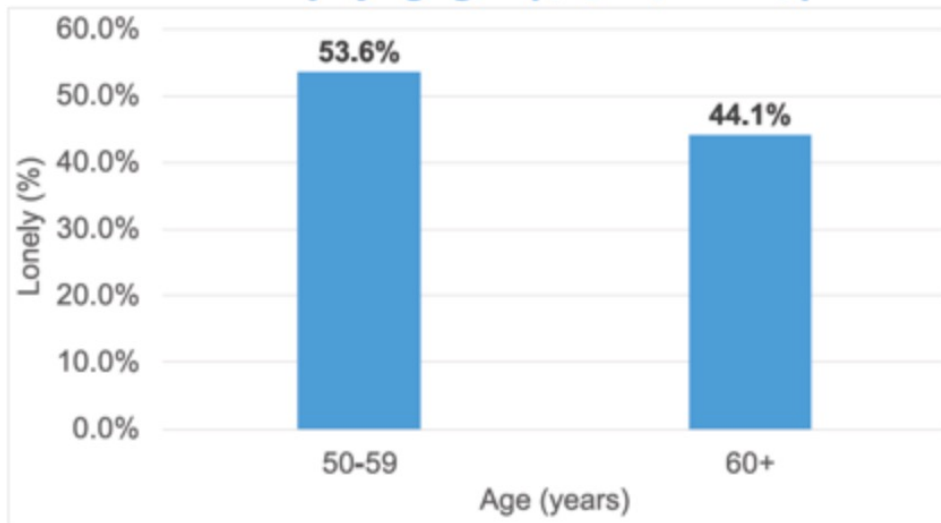
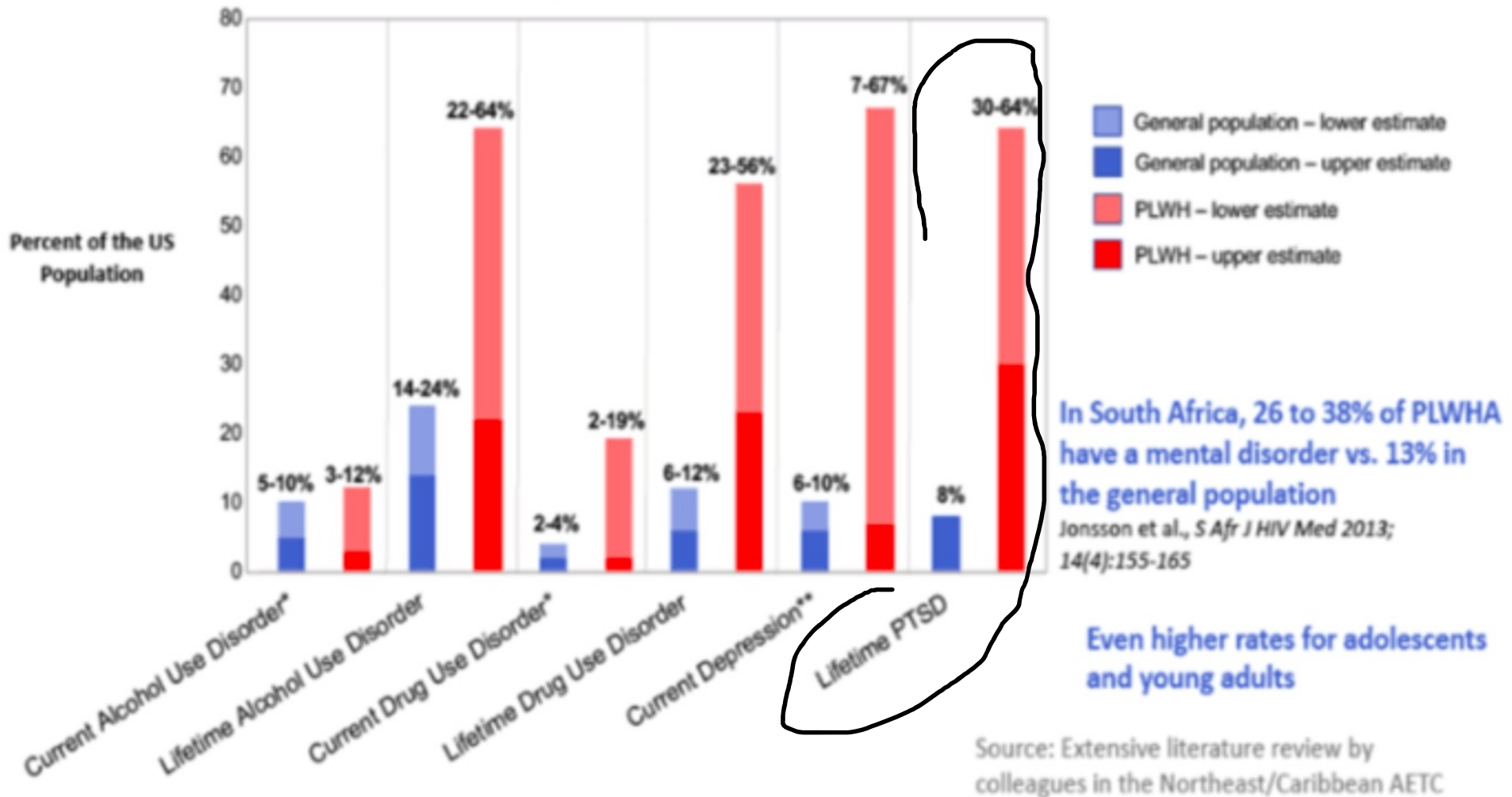


Table 2. Risk Ratios (RR) of Factors Most Strongly Associated with Loneliness and Age

Variable	RR for Loneliness	95% CI	RR for Older Age (60 or Older vs. Under 60)	95% CI
Living Alone	1.70	1.50 - 1.92	1.43	1.22 - 1.68
More than Four Comorbid Conditions	1.71	1.41 - 2.08	1.30	1.06 - 1.61
Depression	2.23	2.02 - 2.48	0.76	0.60 - 0.95
Anxiety	1.85	1.66 - 2.08	0.79	0.62 - 0.98
Feeling "Distant from Friends"	2.78	2.38 - 3.13	0.87	0.78 - 0.96

PTSD

Rates of selected psychiatric disorders: United States general population vs PLWHA



Contribution of aging

THE LANCET

HIV

Volume 4, Issue 9, September 2017, Pages e411-e422



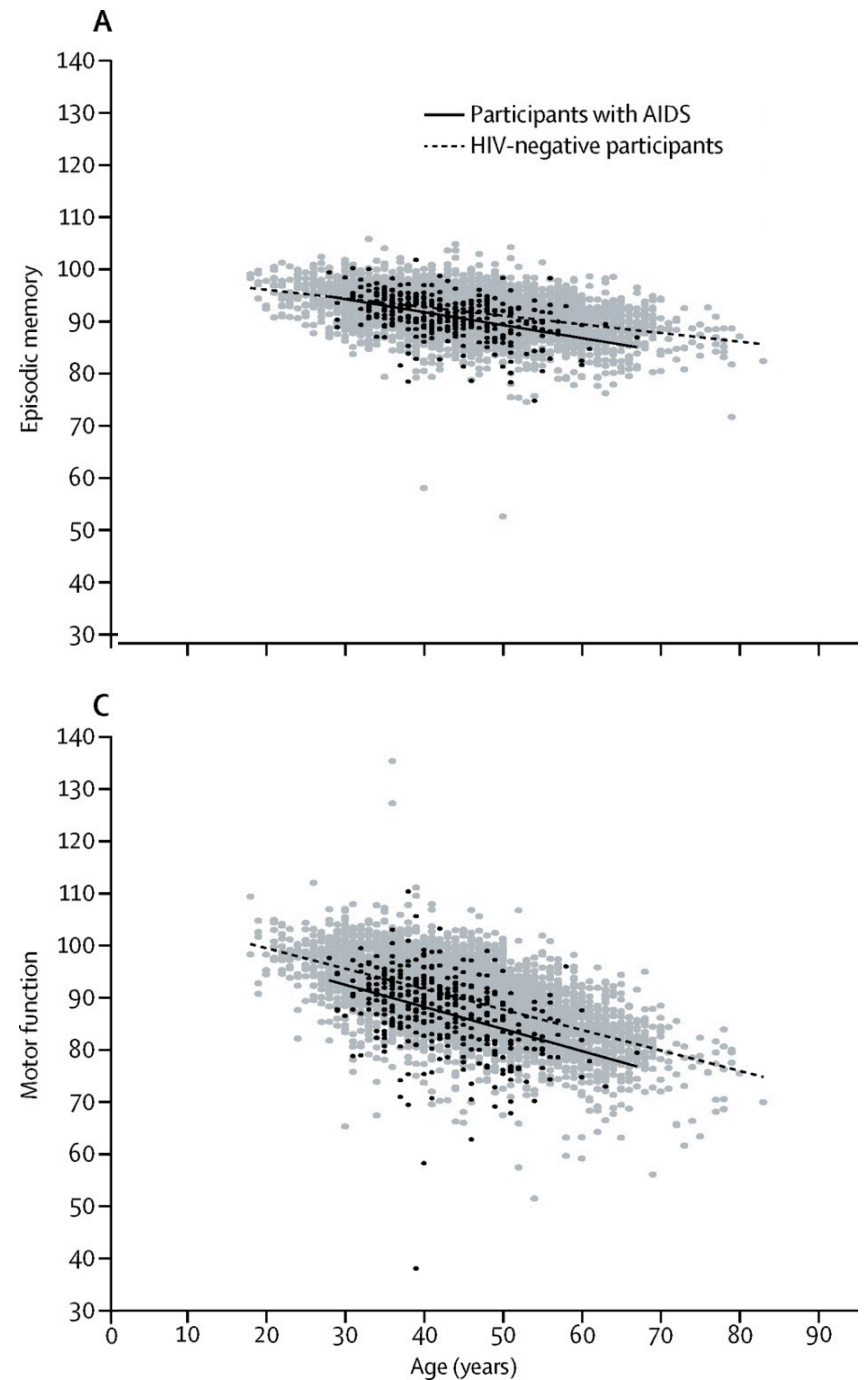
Articles

Effect of ageing on neurocognitive function by stage of HIV infection: evidence from the Multicenter AIDS Cohort Study

Dr Prof Karl Goodkin MD ^a  , Prof Eric N Miller PhD ^b, Prof Christopher Cox PhD ^c, Sandra Reynolds MA ^c, Prof James T Becker PhD ^d, Prof Eileen Martin PhD ^e, Prof Ola A Selnes PhD ^f, David G Ostrow MD ^g, Prof Ned C Sacktor MD ^f, Multicenter AIDS Cohort Study

Aging has greater effect on memory and motor function in men with AIDS diagnosis vs. HIV- men in the MACS.*

*After controlling for duration of infection.



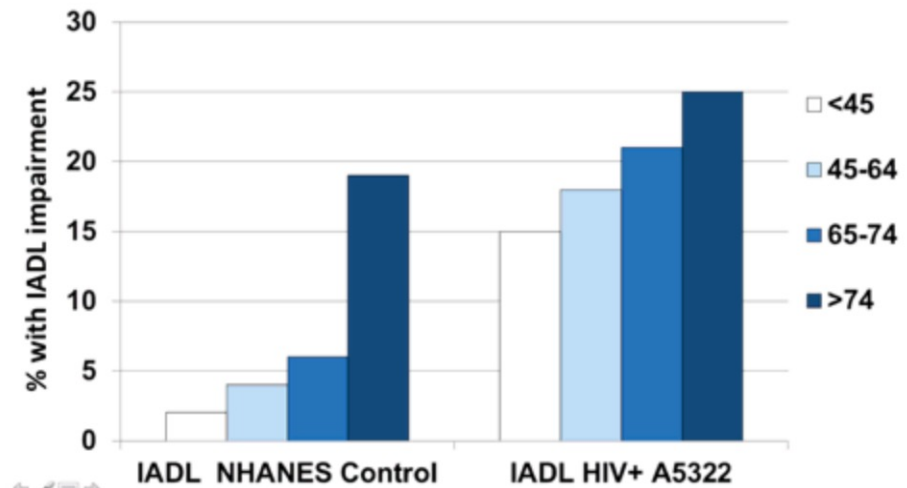
HAILO ACTG:
Factors
Associated with
Limitations in
Daily Activity
Among Older
HIV+ Adults.... **2-**
4x rates worse
daily functioning.

N=1000

Age 51(46-56).

15%>60

Impairment by Age, Compared to NHANES Controls



Summary of Key Findings

- Middle-aged and older HIV-infected participants had 2-3 x higher rate of IADL disability compared to the general population (NHANES).
- Neurocognitive impairment was the only comorbidity associated with IADL impairment.
- Strong associations between IADL impairment and socioeconomic & lifestyle factors were seen.
- Notably, HIV-related factors were not associated with IADL impairment.

Unable to Perform Normal Daily Activities of Living

- strong association between disability & socioeconomic (education, health insurance)/ socioeconomic disadvantages & lifestyle factors (smoking, physical activity): proxy for financial resources/employment/housing access - inability to mobilize resources, stigma, ageism, gender identity, no family-alone, no social support, temporary disability

Table 2. Type of Impairment Present Among Participants with at Least One IADL Impairment

Type of Impairment	Total (N=178)	IADL impairment at baseline	
		1 impaired category (N=115)	≥2 impaired categories (N=63)
Housekeeping difficulty	48%	39%	63%
Transportation difficulty	36%	25%	56%
Shopping difficulty	28%	10%	59%
Laundry difficulty	20%	4%	48%
Finance management difficulty	14%	10%	21%
Cooking difficulty	15%	7%	29%
Difficulty in using the phone	12%	2%	30%
Difficulty with medications	5%	2%	11%

Demographic and clinical patients characteristics

Slide 25

Variable	Total (n=492) Mean (SD)[n]	HIV- (n=200) Mean (SD)[n]	<10 yy (n=65) Mean (SD)[n]	[10-20yy] (n=144) Mean (SD)[n]	>20yy (n=83) Mean (SD)[n]	P- Value
Sex (F)	23.37% [115]	27.5% [55]	18.46% [12]	20.83% [30]	21.69% [18]	
Age	78.05 (2.82)[492]	78.34 (2.91)[200]	77.77 (2.26)[65]	77.96 (3.11)[144]	77.76 (2.41)[83]	0.241
BMI	26.37 (4.39)[408]	27.9 (4.42)[184]	26.09 (4.24)[50]	24.82 (3.86)[109]	24.92 (3.86)[65]	<0.001
Current smoker	12.53% [53]	8.89% [16]	13.21% [7]	16.24% [19]	15.07% [11]	0.251
Hypertension	291 (69.12%)	128 (64.97%)	38 (69.09%)	83 (76.85%)	40 (68.97%)	0.202
Type 2 Diabetes Mellitus	117 (28.4%)	49 (25%)	11 (20.37%)	33 (32.35%)	21 (36.84%)	0.132
Cardiovascular Disease	131 (32.59%)	72 (36.73%)	15 (29.41%)	26 (26.8%)	17 (30.36%)	0.337
Chronic Kidney Disease	71 (22.33%)	7 (7.29%)	13 (22.81%)	32 (30.48%)	19 (33.33%)	<0.001
Chronic Obstructive Pulmonary Disease	50 (12.56%)	31 (15.98%)	4 (8%)	7 (7.22%)	7 (12.73%)	0.133
Dislypedemia	203 (64.86%)	45 (46.88%)	27 (50%)	87 (82.86%)	43 (76.79%)	<0.001
Multimorbidity	208 (71.23%)	62 (65.26%)	28 (58.33%)	73 (77.66%)	43 (81.13%)	0.019
Polypharmacy	145 (39.19%)	70 (35%)	20 (51.28%)	30 (35.29%)	25 (55.56%)	0.024

Guaraldi. 2016
Comorbidities
Workshop

UCSF Geriatric Clinic golden Compass. 2015 N=155 age 57 (54-62) 94% men. - multidisciplinary team of physicians, nurses, pharmacists, and social workers: “takes a team of people to take good care of an older person with HIV”.

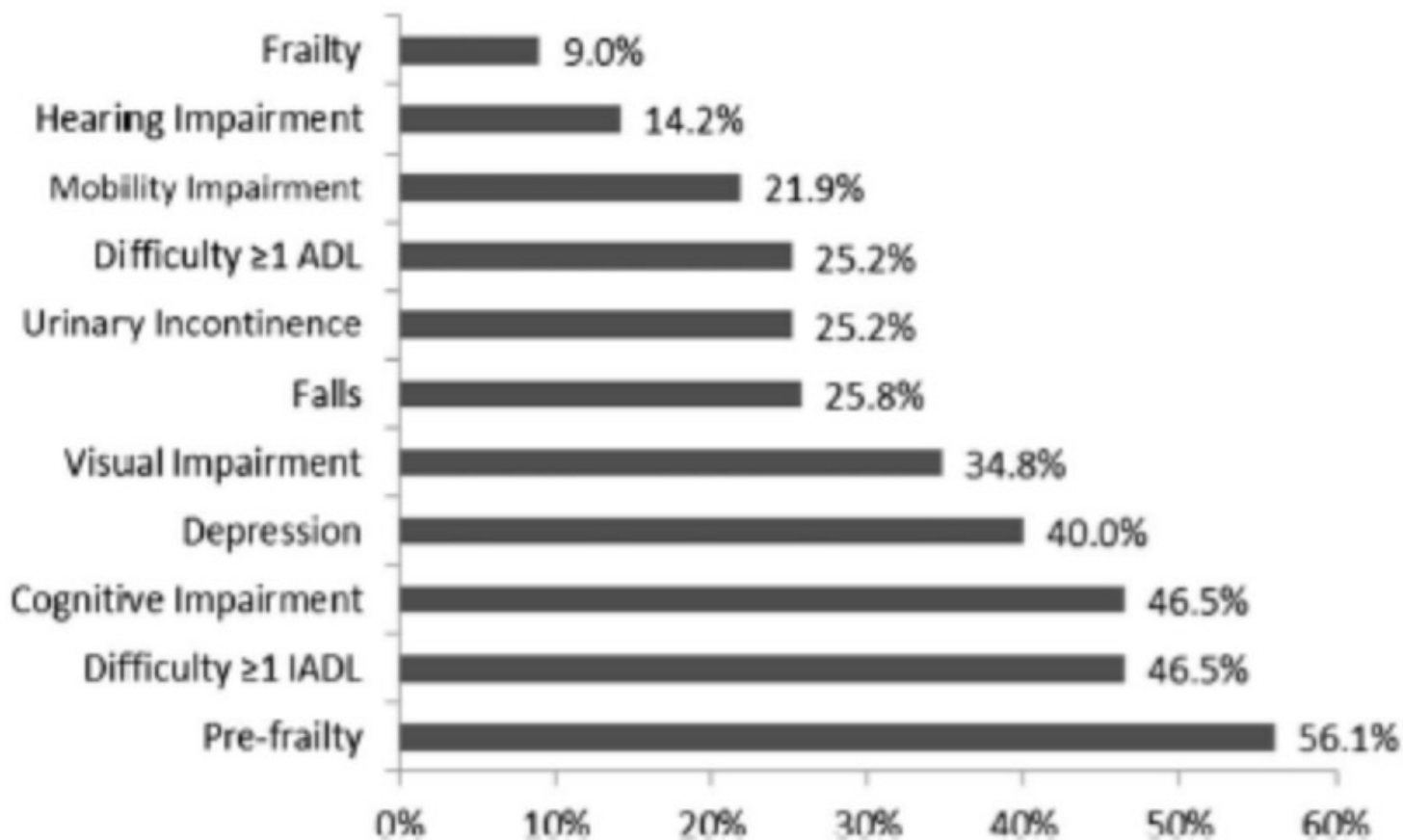
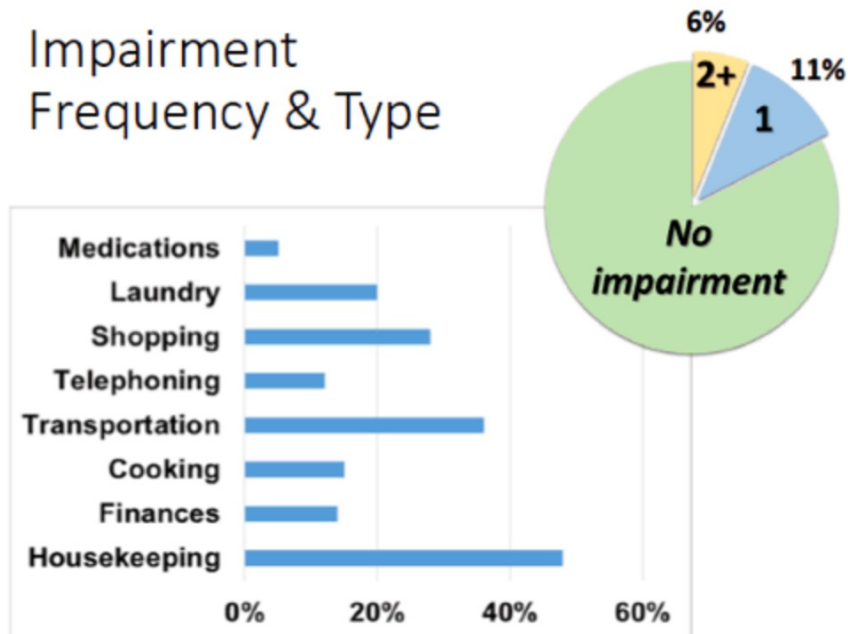


FIGURE 1. Frequencies of geriatric syndromes. Each bar reflects the percentage of participants with each geriatric syndrome. Actual percentages are shown at the end of each bar. Horizontal axis only shown to 60%.

Impairment Frequency & Type



Frequency of impairments among participants with IADL impairment

Why Might Middle-Aged or Older HIV-infected Adults be Particularly Vulnerable to Reporting Disability?

- May have difficulty accessing usual resources for older adults (churches, senior centers), etc due to HIV or gender/sexual identity stigma
- Fractured family relationships; few have adult children that take on the caregiver role
- Economic challenges from long-term disability (limited financial reserves, retirement plans, long-term care insurance, etc)

Emerging importance of chronic ***comorbidities in patients > 75*** in France: **doubled rates of CVD/cancers/stroke/bone/hypertension-tripled kidney failure**, # with 4 comorbidities

Table 5 : Age-associated non communicable comorbidities (AANC)

N(%)	Elderly [50-75[n=12748	Geriatric ≥75 n=430	P. value
Diabetes	1195 (9.4)	96 (22.3)	< 0.001
Hypertension	2685 (21.1)	182 (42.3)	< 0.001
Hyperlipidemia	2700 (21.2)	120 (27.9)	0.001
Cardio-vascular disease	1081 (8.5)	89 (20.7)	< 0.001
Stroke	319 (2.5)	27 (6.3)	< 0.001
Osteoporosis	626 (4.9)	36 (8.4)	0.002
Neoplasia	1526 (12)	97 (22.6)	< 0.001
Renal failure*	594 (4.7)	60 (14)	< 0.001
Depression	2114 (16.6)	65 (15.1)	NS
Liver fibrosis	620 (4.9)	10 (2.3)	0.021
Number of AANC			< 0.001
- 0-1	9058 (71.1)	197 (45.8)	
- 2-3	3147 (24.7)	173 (40.2)	
- ≥4	543 (4.3)	60 (14)	

*eGFR <60 ml/mn/1,73m²

African-Americans. & Latinos have 3-4 higher rates.

“Chronic health conditions in

Medicare beneficiaries

65 years and older with HIV infection”
HIV+ beneficiaries were more likely to be Hispanic, African-American, male

Table 4. Adjusted odds ratios for the number of chronic conditions as an index among Medicare beneficiaries at least 65 years old with HIV infection^a.

HIV+ vs. HIV– (N=29 060 402)	aOR (95% CI)	Wald χ^2 Pvalue
Number of chronic conditions ^b		
0	Reference	Reference
1	2.38 (2.21, 2.57)	<0.0001
2	2.63 (2.46, 2.83)	<0.0001
3	2.98 (2.46, 2.83)	<0.0001
4	4.13 (3.87, 4.41)	<0.0001
5	7.07 (6.61, 7.56)	<0.0001
Sex		
Male	2.11 (2.06, 2.17)	<0.0001
Female	Reference	Reference
Age (for each year younger)	0.94 (0.93, 0.94)	<0.0001
Race/ethnicity		
Unknown race	0.77 (0.40, 1.48)	0.43
Non-Hispanic white	Reference	Reference
African-American	3.86 (3.75, 4.00)	<0.0001
Other race	1.16 (0.98, 1.37)	0.09
Asian/Pacific Islander	0.62 (0.60, 0.70)	0.18
Hispanic	3.41 (3.29, 3.54)	<0.0001
Native American	0.70 (0.54, 0.91)	0.007
Had dual coverage	2.31 (2.24, 2.38)	<0.0001
ESRD	1.44 (1.23, 1.68)	<0.0001

CI, confidence interval; ESRD, end stage renal disease; aOR, adjusted odds ratio.

^aHIV+ beneficiaries were those with ICD-9-CM, or DRG codes with a diagnosis of HIV, HIV– were beneficiaries without these codes.

^bChronic health conditions were defined by ICD-9-CM, diagnosis or procedure codes, or HCPCS codes.

ESRD: 0.1% in HIV- vs 0.5% HIV+, OR 4.77

PLWHIV were also approximately five times as likely to have the current reason for Medicare enrollment be listed as ESRD, OR 4.77

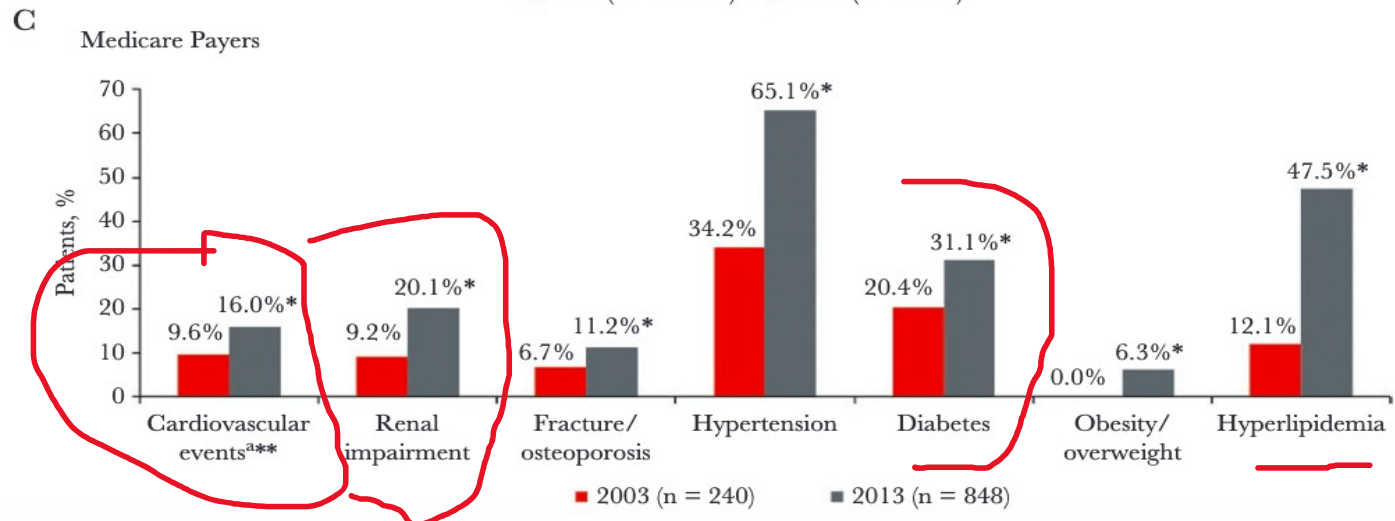
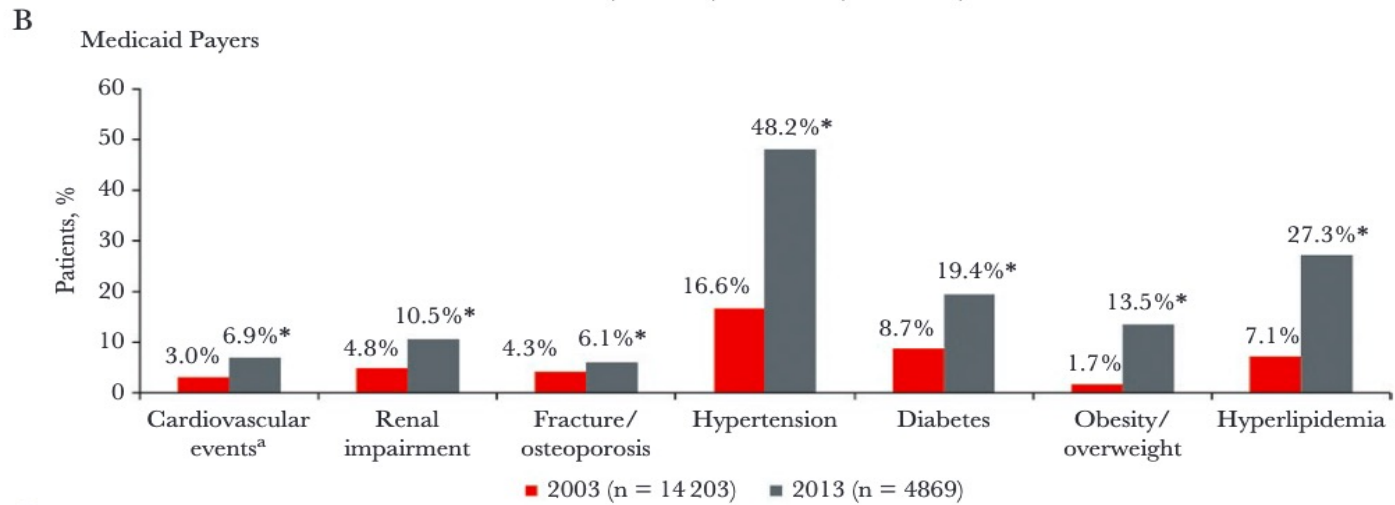
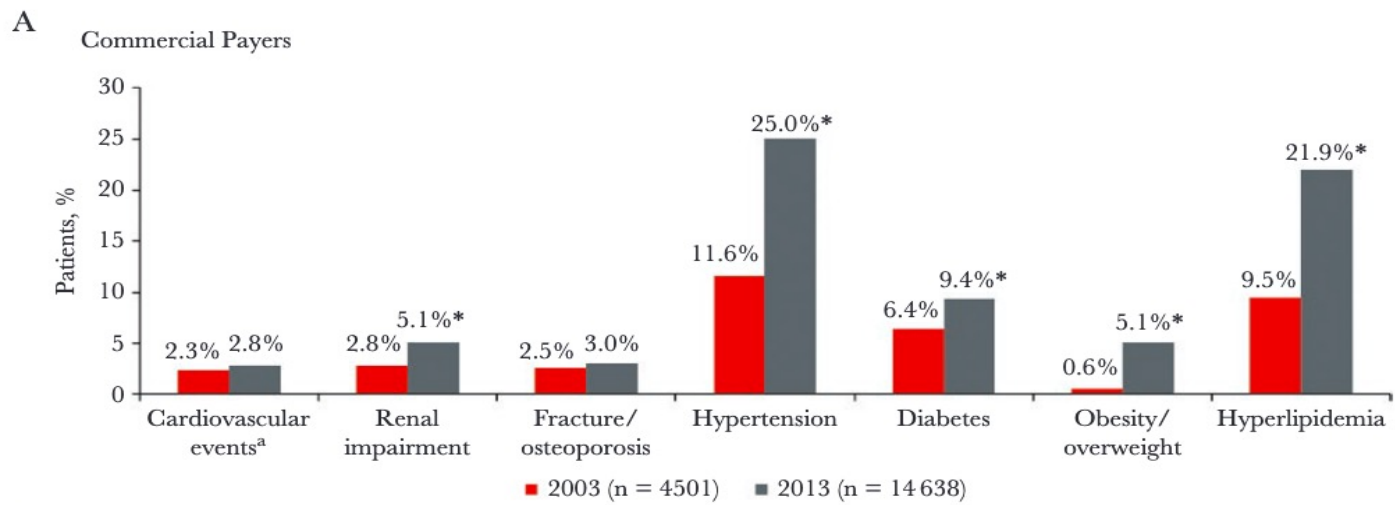
Table 2. Prevalence and unadjusted odds ratios for each of the five chronic conditions and for the number of chronic conditions as an index in Medicare beneficiaries at least 65 years old, with and without HIV infection^a.

Chronic condition ^b (N = 29 060 418)	HIV– number (%)	HIV+ number (%)	HIV+ vs. HIV– OR (95% CI)
Hypertension	21 460 895 (73.9%)	21 146 (85.5%)	2.08 (2.00, 2.15)
Hyperlipidemia	17 039 249 (58.7%)	17 759 (71.8%)	1.79 (1.74, 1.84)
Ischemic heart disease	13 476 065 (46.4%)	15 190 (601.4%)	1.84 (1.79, 1.89)
Rheumatoid/osteoarthritis	12 310 604 (42.4%)	14 277 (57.7%)	1.86 (1.81, 1.90)
Diabetes	9 249 614 (31.9%)	12 181 (49.3%)	2.08 (2.02, 2.13)
Number of chronic conditions ^c			
0	3 646 397 (12.6%)	1 030 (4.2%)	Reference
1	3 803 118 (13.1%)	2 241 (9.1%)	2.09 (1.93, 2.25)
2	5 883 662 (20.3%)	3 760 (15.2%)	2.26 (2.11, 2.42)
3	7 282 313 (25.1%)	5 493 (22.2%)	2.67 (2.50, 2.85)
4	5 981 919 (20.6%)	6 742 (27.3%)	3.99 (3.74, 4.26)
5	2 438 274 (8.4%)	5 469 (22.1%)	7.94 (7.43, 8.49)

10 years earlier onset for comorbidities

- The mean and median number of conditions for **PLWH aged 65–69** was similar to those **HIV-negative individuals aged 75–79** [PLWH mean=4.02 (median=4) vs. HIV-negative=4.21 (4)] whereas **PLWH 70–74 years old were similar to HIV-negative individuals ‡ 85 years** [PLWH mean=4.69 (median=4) vs. HIV-negative=4.70 (4)].
- Trends were similar when evaluating daily non-ART medications (**polypharmacy**) with PLWH 65–69 years old resembling HIV-negative individuals 70–74 years old [PLWH mean=3.58 (median=2.92) vs. HIV-negative=3.62 (3.21)] and PLWH 70–74 years old resembling HIV-negative individuals aged 80–84 [PLWH mean=3.88 (median=3.18) vs. HIV-negative=3.83 (3.48)].

36,000 HIV+ Insurance Payers
Database: comorbidities common &
increasing over time



Multimorbidity Increases Death Rates -

ATHENA ATHENA Cohort Glasgow 2018 – AthenaCohort/Glasgow

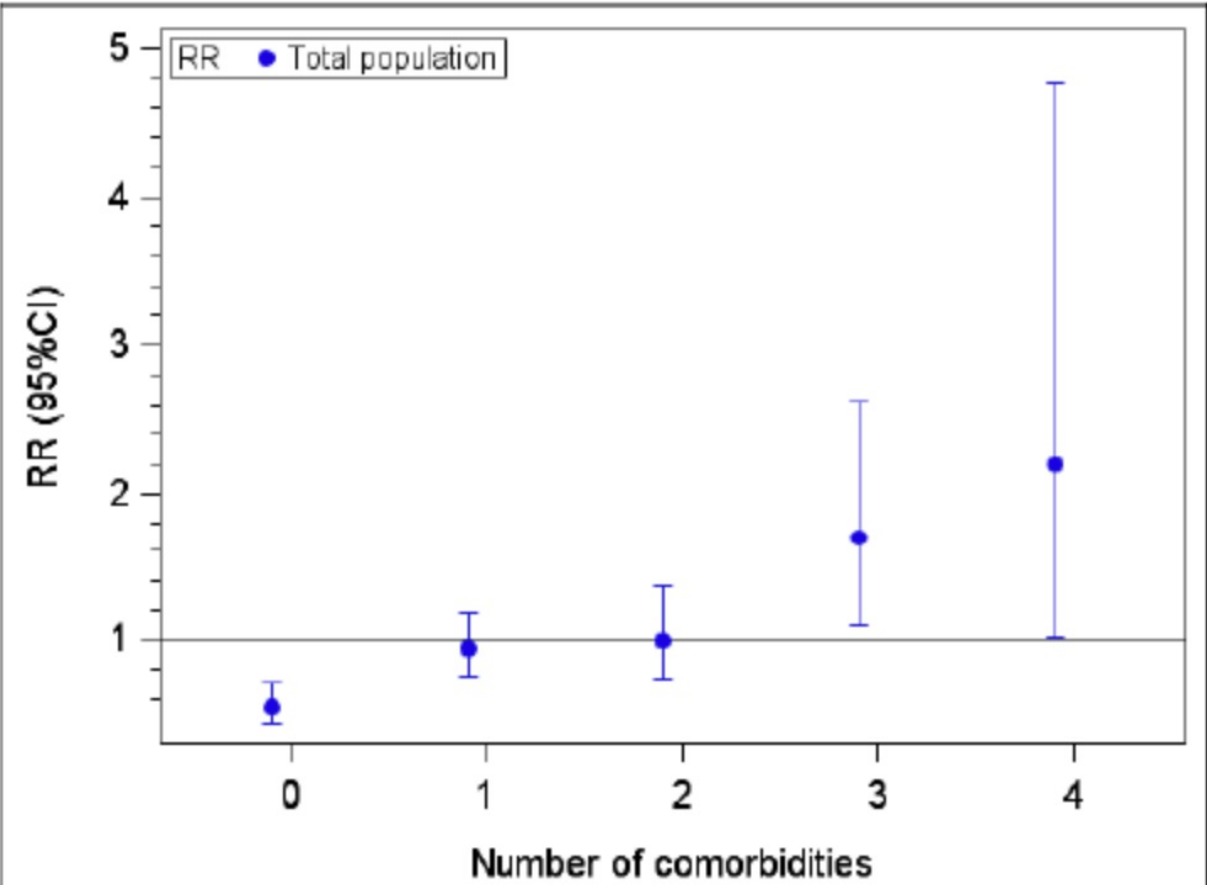
Multimorbidity and mortality

- 30% >70 have 3-4+ comorbidities.
- HIV+ Women have higher multi-comorbidity rates at younger ages than men. Death rates higher in women. Menopause?

Crude mortality rates

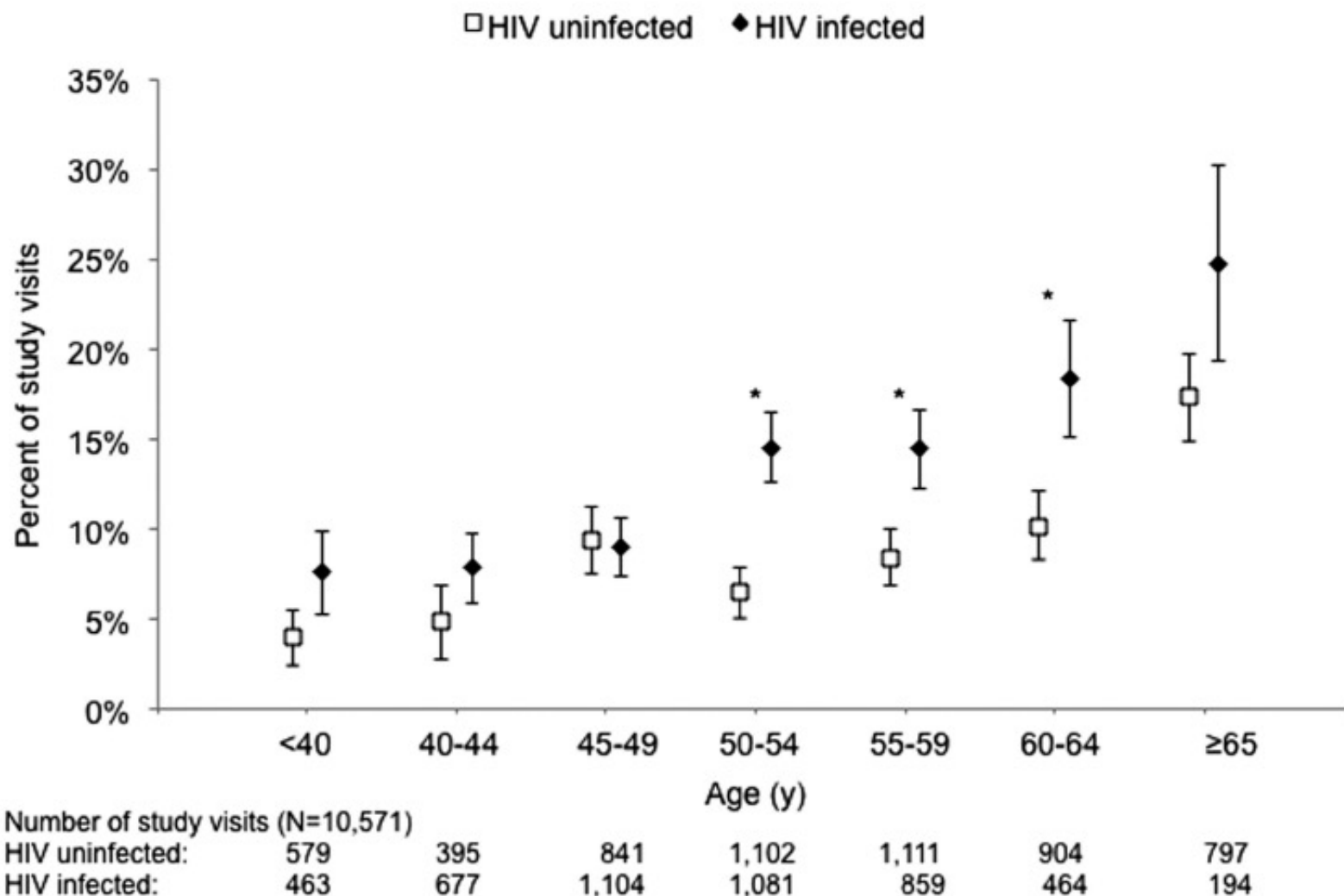
Multimorbidity	PYFU	Deaths	Rate /1000 PYFU
0	152,088	899	5.9 (5.5-6.3)
1	38,361	805	21.0 (19.6-22.5)
2	11,476	404	35.2 (31.9-38.8)
3	2,025	164	81.0 (69.1-94.4)
4+	306	53	173 (130-226)

Multimorbidity and mortality: women relative to men

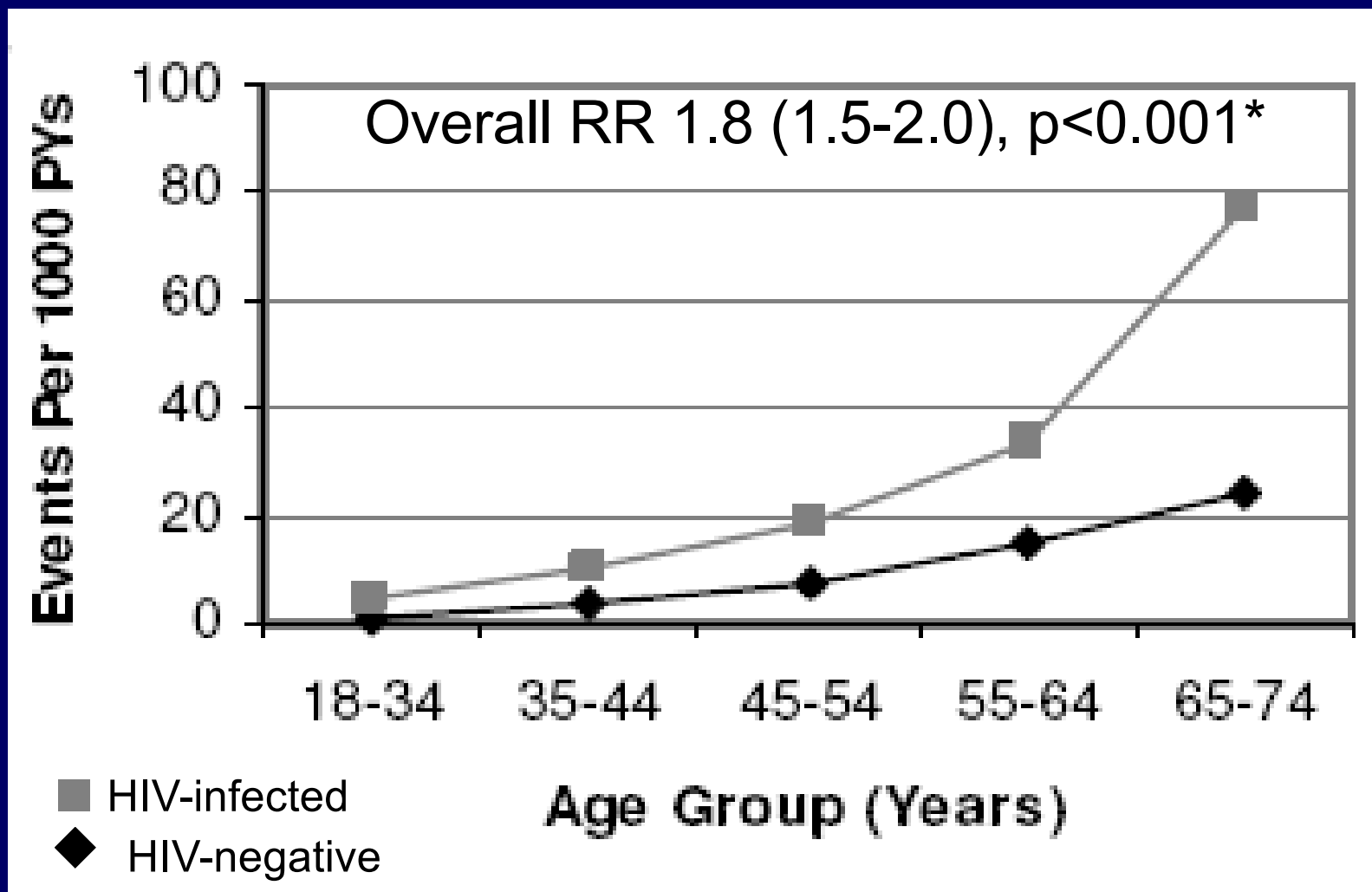


	Total population
0	0.55 (0.43-0.70)
1	0.94 (0.76-1.18)
2	1.00 (0.73-1.36)
3	1.69 (1.09-2.61)
4	2.21 (1.02-4.77)

Frailty Phenotype in MACS



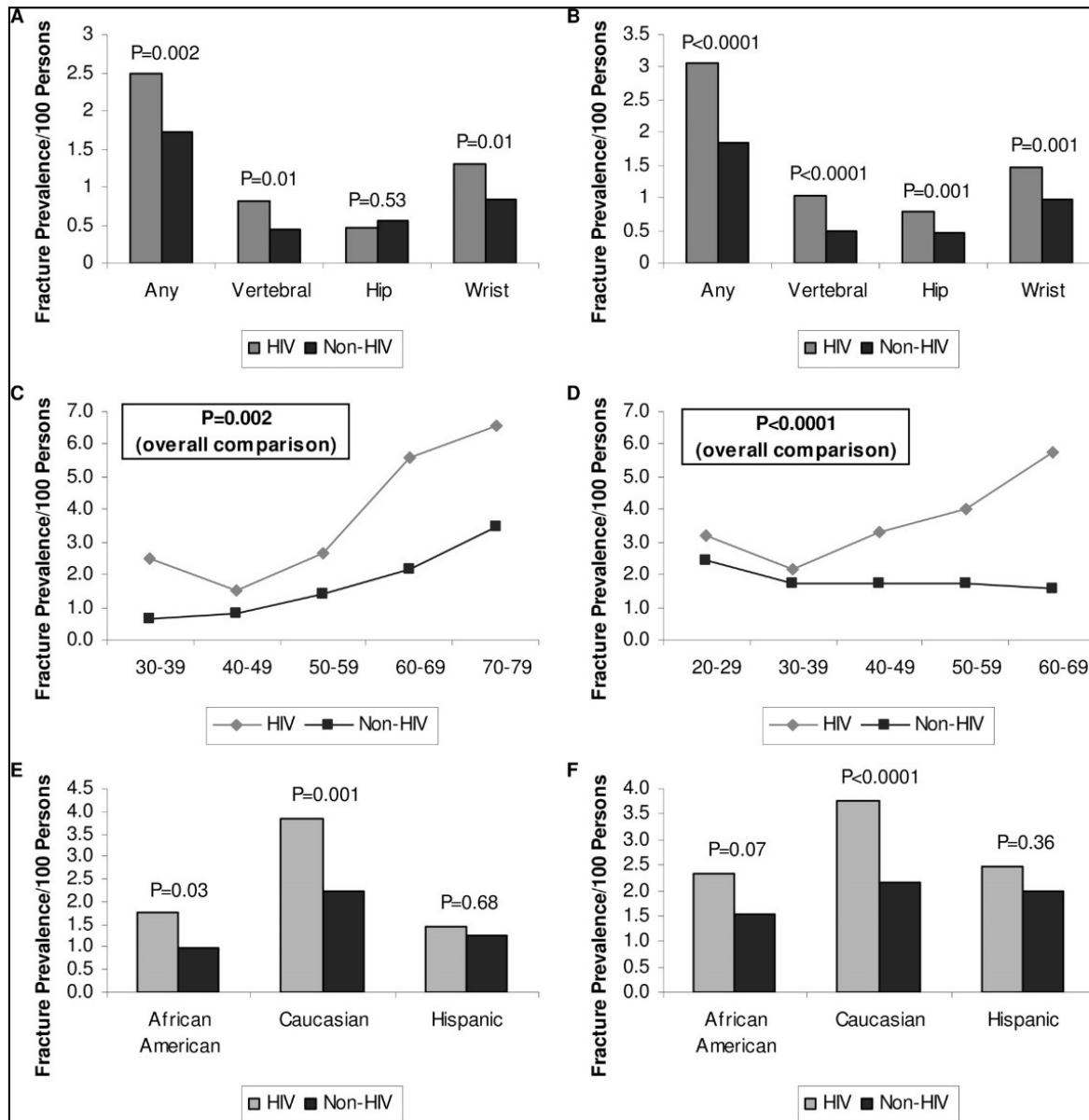
Myocardial Infarction in HIV-infected and uninfected Patients: MGH Study



*adjusted for age, gender, race, HTN, DM, dyslipidemia

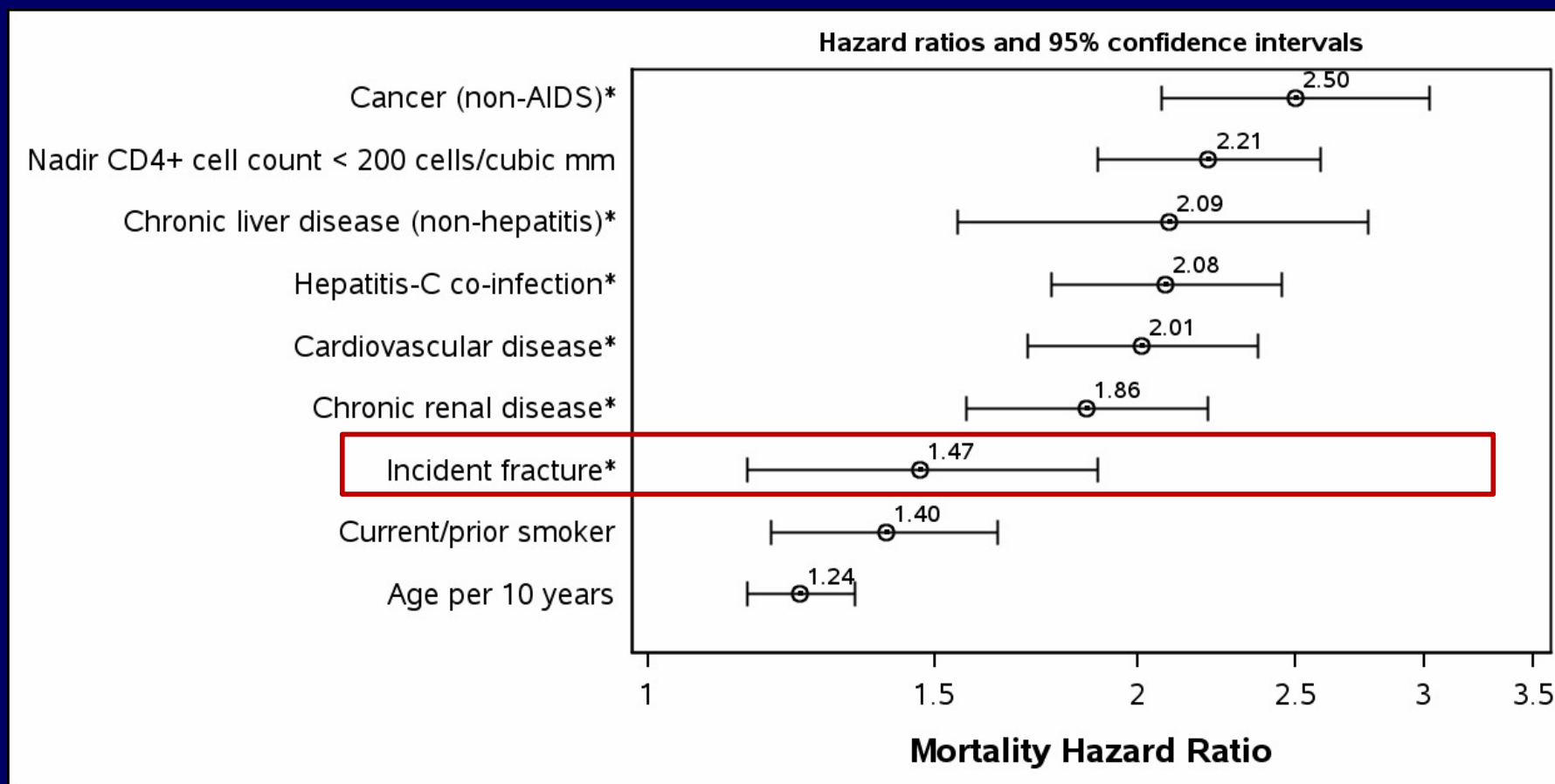
Triant, JCEM, 2007

Fracture prevalence comparing HIV-infected and non-HIV-infected patients by gender and site of fracture, age group, and race



**Fractures
1.5-2 times
higher in
PLWH.**

Multivariable analysis of factors associated with all-cause mortality, the HIV Outpatient Study, 2000-2017 (N=6,853, deaths=732).



*Indicates time-updated variables. Note: Model also controls for calendar period, employment status, and HOPS city.



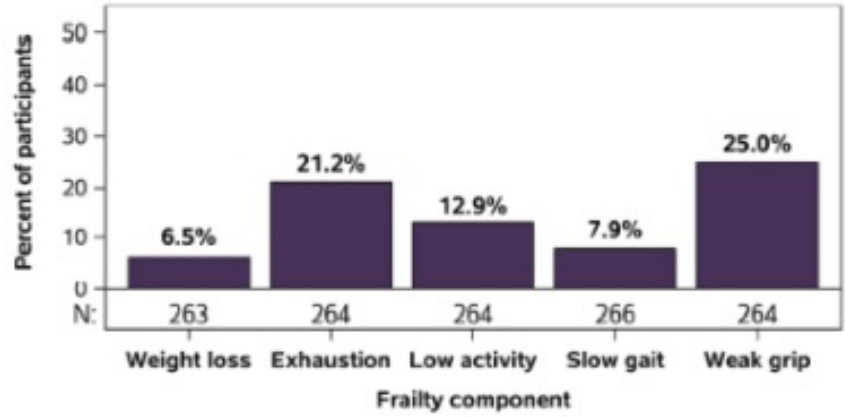
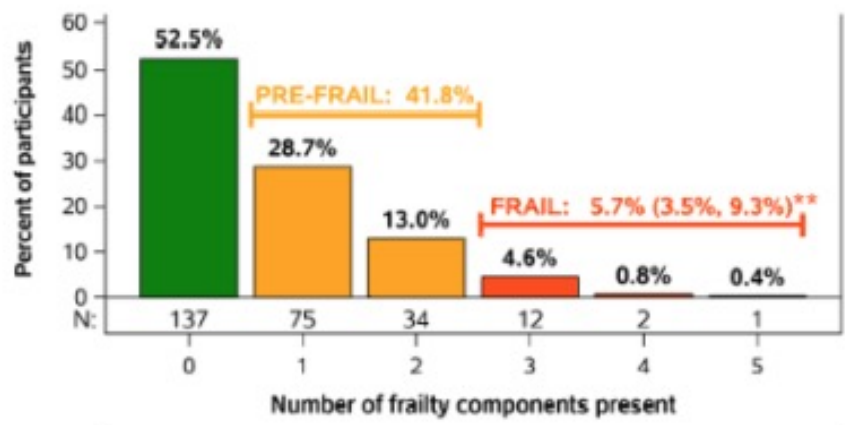
Frailty

Study of 266 PLWH in US in the REPRIEVE Trial

Baseline Characteristics		N=266
Age (years)		51 (46, 55)
Natal male		216 (81%)
Black race		121 (45%)
Hispanic or Latino		49 (18%)
Physically not active (REAP) ^A		237 (89%)
History of hypertension		74 (28%)
BMI (kg/m ²)	25 to <30	101 (38%)
	≥30	80 (30%)
Waist circumference high ^B		85 (33%)
CD4 count (cells/mm ³)		610 (437, 840)
HIV-1 RNA <50 copies/mL		235 (93%)
Total ART use (years)		11 (6, 16)
Thymidine exposure (ever)		91 (34%)
Unable to perform ≥1 IADL (DASI) ^C		85 (32%)

Frequency (%) for categorical, median with 1st and 3rd quartiles for continuous measures. Missing data: Physical Activity (n=1), Waist circumference (n=10), HIV-1 RNA (n=12). ^ARapid Eating Assessment for Patients (REAP); ^BWaist circumference >102 cm in men, >88 cm in women classified as high; ^CInstrumental Activities of Daily Living (IADL) by Duke Activity Status Index (DASI).

Prevalence of Frailty



Updated Care Infrastructure Needed

- Despite RWCA services many are NOT getting needs met.
- **We need to structure Care in the clinic and community in the USA to meet the changing & modern needs of the HIV patient population in care who are aging, since the HIV/aged population IS the majority Now & more so in future.**

Proposed Services for Aging Older PWLH

New Care Model

- Longer visit time with doctor: NY from 20 to 40 minutes;
- reimbursement capacity needed for doctor/clinic
- Geriatric care in clinic
- IT/telemedicine visits to patients; aging IT social networking
- Home monitoring
- Better care coordination - Better communications between PCP, specialist & PLWH
- Dedicated aging nurses, staff with low case load
- **Education** for older PLWH regarding their conditions: prevention, care, treatment
- Include CAB with PLWH >60 who represent this group “suffering” with needs, unmet needs

New Model: services, care

- The types of services & goals of the use to virtual & IT to provide care & services like to address isolation, loneliness, depression.
 - better access to physical therapy
 - healthy foods, better nutritional support for elderly PLWH
 - exercise programs
 - routine and regular mental health evaluations & for physical impairment
 - making sure elderly PLWH get culturally sensitive services to meet their IADLs needs. – daily activities of life: home, shopping, food prep, isolation, medical care/home monitoring-visits

New Aging/HIV Research NYC

NY Research Studies:

- how many have fractures, osteoporosis; getting bone DXAs, starting treatment
- On dialysis, advanced kidney disease
- depression,
- need PT,
- Heart disease, events
- substance abuse,
- how many are physically impaired-unable to perform daily activities,
- how many have cognitive impairment,
- how many are socially isolated, alone,
- how many homebound

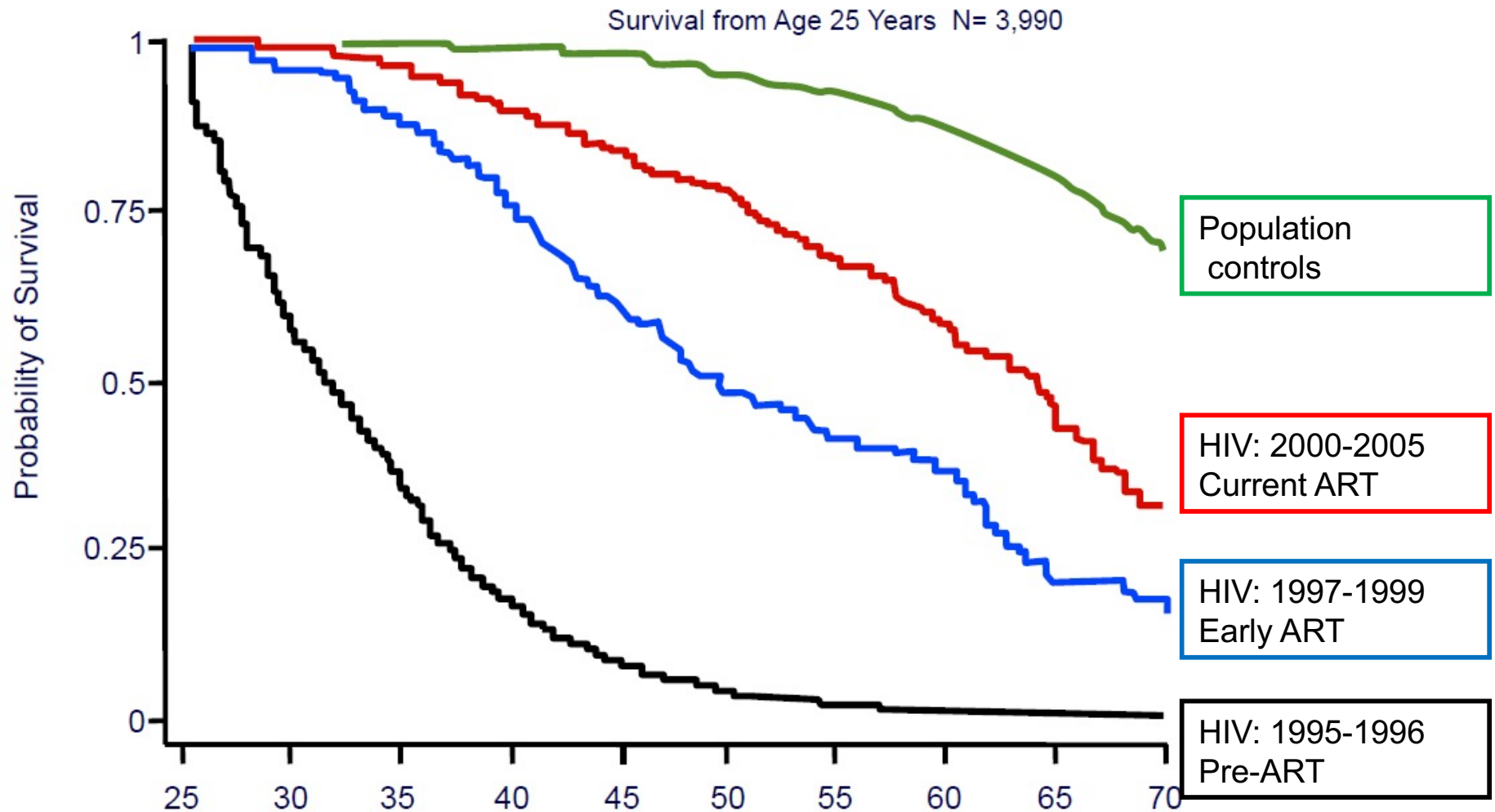
Does IT, telemedicine & other care/service components provided through this study improve outcomes QOL, compliance, adherence

Themes from Focus Groups

- Four overarching themes:
 - 1) Knowledge of HIV and aging topics
 - 2) Health/aging needs for Older HIV+ adults
 - 3) Importance of Social Networks
 - 4) Need for integrated services
 - consultative services
- **Program name:** theme of navigation healthcare systems; “golden years” acceptable term for aging

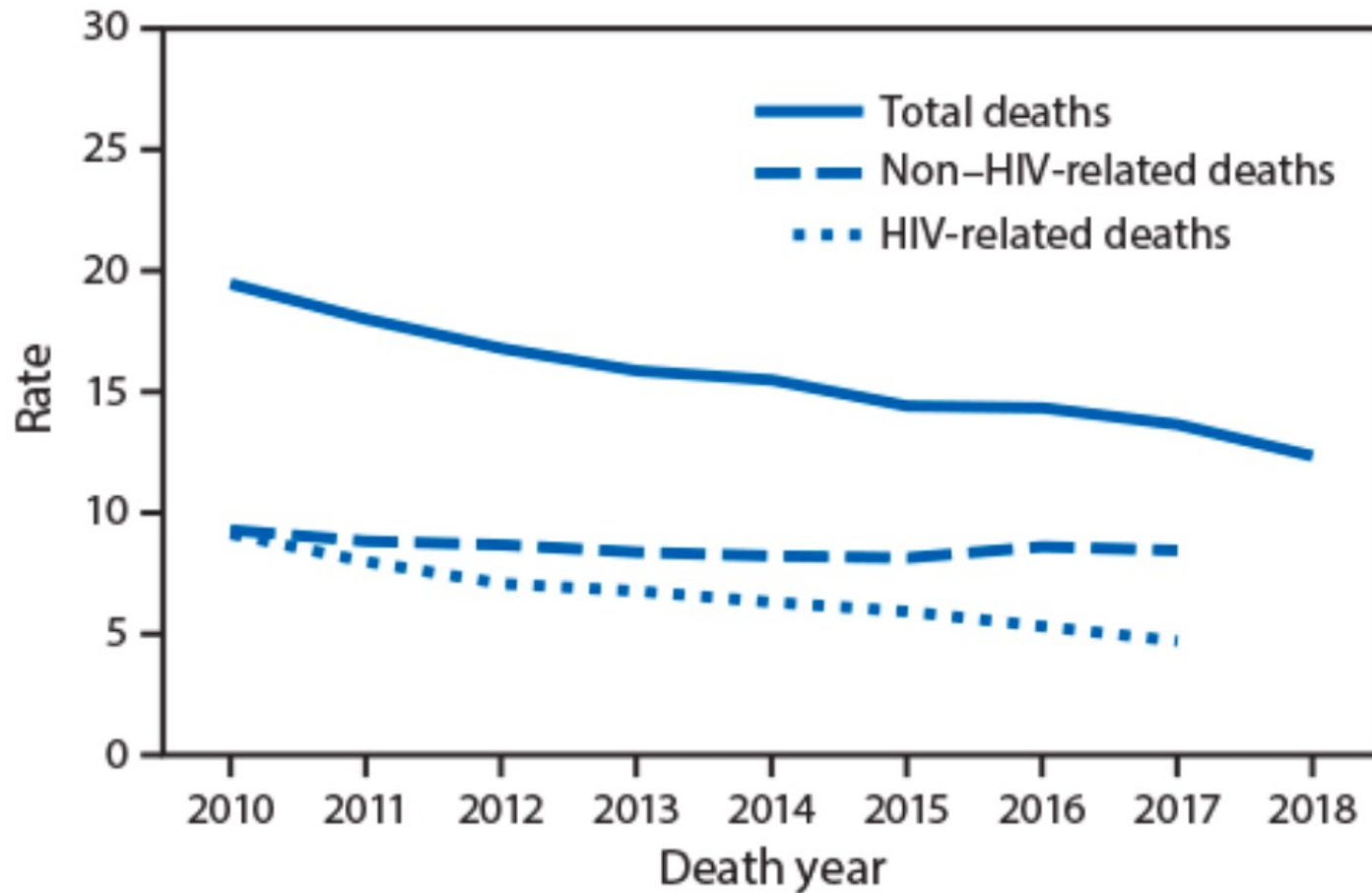
Improving Survival

But Still Below General Population



During 2010–2017, HIV-related death rates decreased 48.4% (from 9.1 to 4.7)

FIGURE 1. Age-adjusted rates* of total deaths,† human immunodeficiency virus (HIV)–related deaths,§ and non–HIV-related deaths among persons aged ≥13 years with diagnosed HIV infection — United States, 2010–2018¶



Kaiser: Life Expectancy of People with/without HIV

Cohort of adults with HIV in care 2000-2016 (N=39,000)

Matched 1:10 with uninfected (N=387,767)

Study population:

Avg 41 yo, Asian 5%/Black 25%/Latinx 24%/white 45%, MSM 70%, HS 20%, IDU 8%

Results: Narrowing of the survival gap – now **9 years shorter with HIV** vs no HIV

- **Gap = 6.8 years if ART initiated before CD4 < 500**
- No improvement in **years without comorbidities** (cancer, DM, CV, liver, kidney, or lung disease)

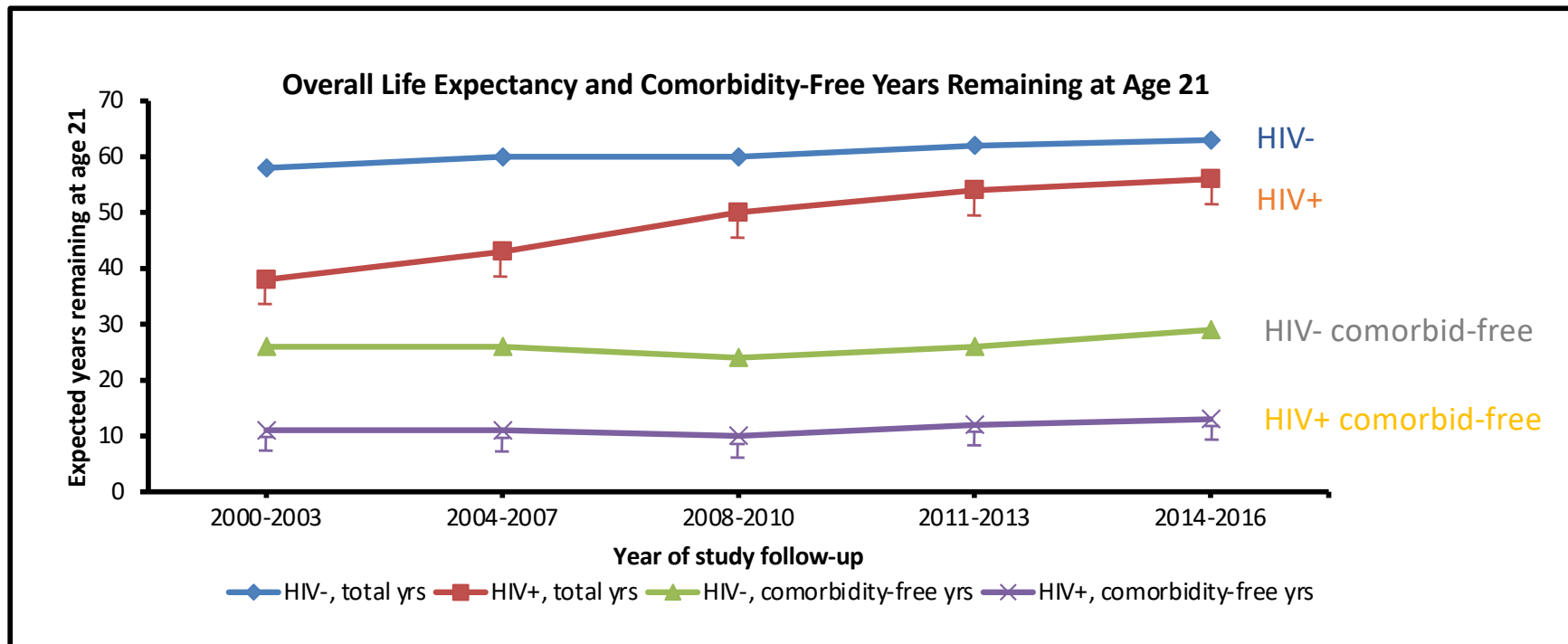


Table 2. Mortality and Incidence of Common Comorbidities Among Individuals With and Without HIV Infection, Kaiser Permanente, 2000-2016

Outcome	Individuals with HIV infection		Individuals without HIV infection	
	Events	Incidence, per 100 person-years (95% CI)	Events	Incidence, per 100 person-years (95% CI)
Mortality	2661	1.3 (1.3-1.4)	9147	0.4 (0.4-0.4)
Any comorbidity	11 366	10.0 (9.8-10.2)	60 707	3.8 (3.7-3.8)
Chronic disease				
Liver	4768	2.7 (2.6-2.8)	10 569	0.5 (0.5-0.5)
Kidney	3146	1.7 (1.6-1.8)	10 257	0.5 (0.4-0.5)
Lung	5457	3.5 (3.4-3.6)	35 776	1.9 (1.9-1.9)
Diabetes	2456	1.3 (1.3-1.4)	21 339	1.0 (1.0-1.0)
Cancer	1922	1.0 (1.0-1.0)	10 619	0.5 (0.5-0.5)
Cardiovascular disease	813	0.4 (0.4-0.4)	6296	0.3 (0.3-0.3)

Considerations

- Poverty, income
- substance use history
- Smoking
- African-American

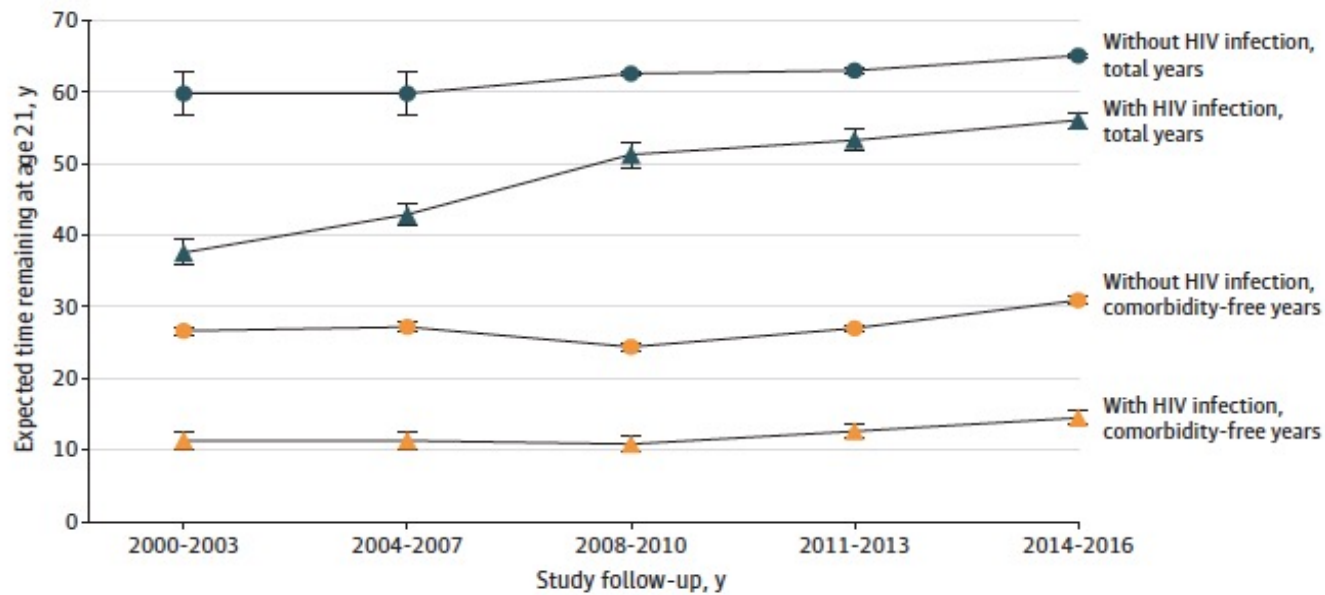


Original Investigation | Infectious Diseases

Comparison of Overall and Comorbidity-Free Life Expectancy Between Insured Adults With and Without HIV Infection, 2000-2016

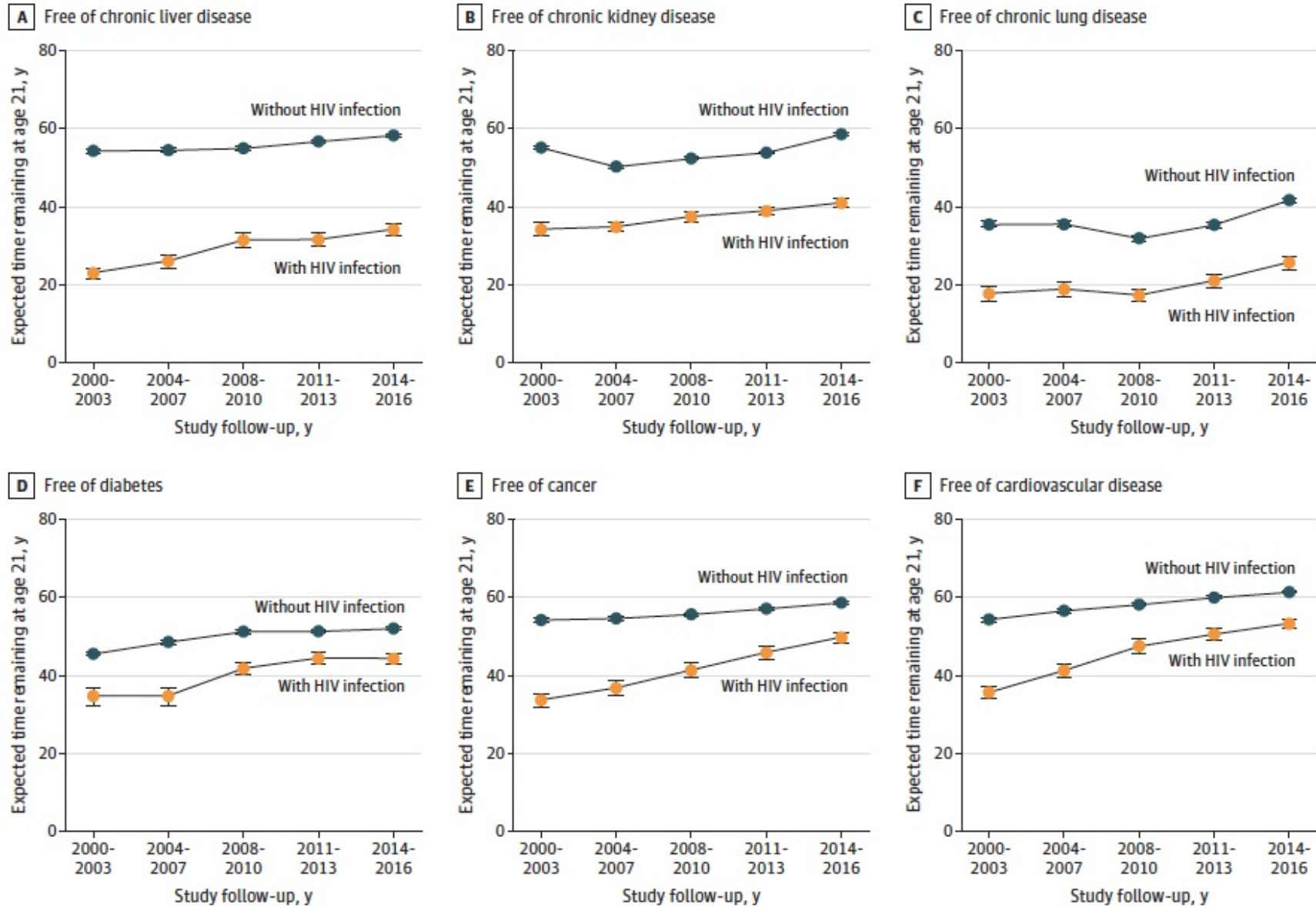
Julia L. Marcus, PhD, MPH; Wendy A. Leyden, MPH; Stacey E. Alexeeff, PhD; Alexandra N. Anderson, MPH; Rulin C. Hechter, PhD; Haihong Hu, MPH; Jennifer O. Lam, PhD; William J. Towner, MD; Qing Yuan, MPH; Michael A. Horberg, MD; Michael J. Silverberg, PhD

Figure 1. Overall and Comorbidity-Free Life Expectancy at Age 21 Years for Individuals With and Without HIV Infection, Kaiser Permanente, 2000-2016



Comorbidity-free years were those lived before incident diagnosis of any of 6 common comorbidities: chronic liver disease, chronic kidney disease, chronic lung disease, diabetes, cancer, or cardiovascular disease. Error bars indicate 95% CIs.

Figure 2. Comorbidity-Free Life Expectancy at Age 21 Years for Individuals With and Without HIV Infection Stratified by Comorbidity, Kaiser Permanente, 2000-2016



Error bars indicate 95% CIs.