



Aging among adults in the context of HIV

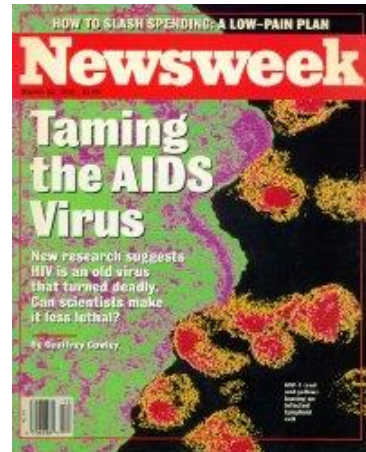
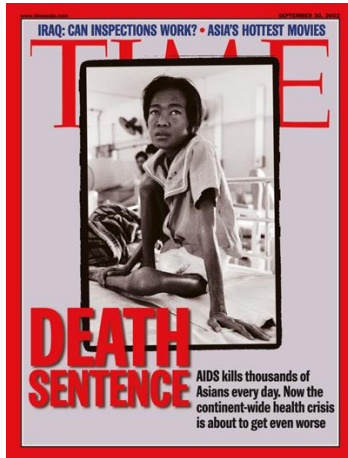
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University of Malaya



Outline

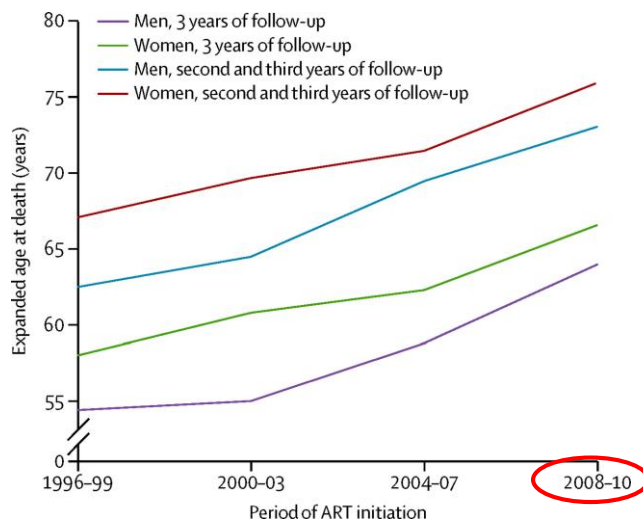
- The changing face of HIV disease
- Functional aging in HIV – transitioning from chronic diseases to geriatric syndromes
- Suggestions to improve understanding of issues related to aging in PLHIV

The success story: HIV treatment



Age of death with HIV treatment

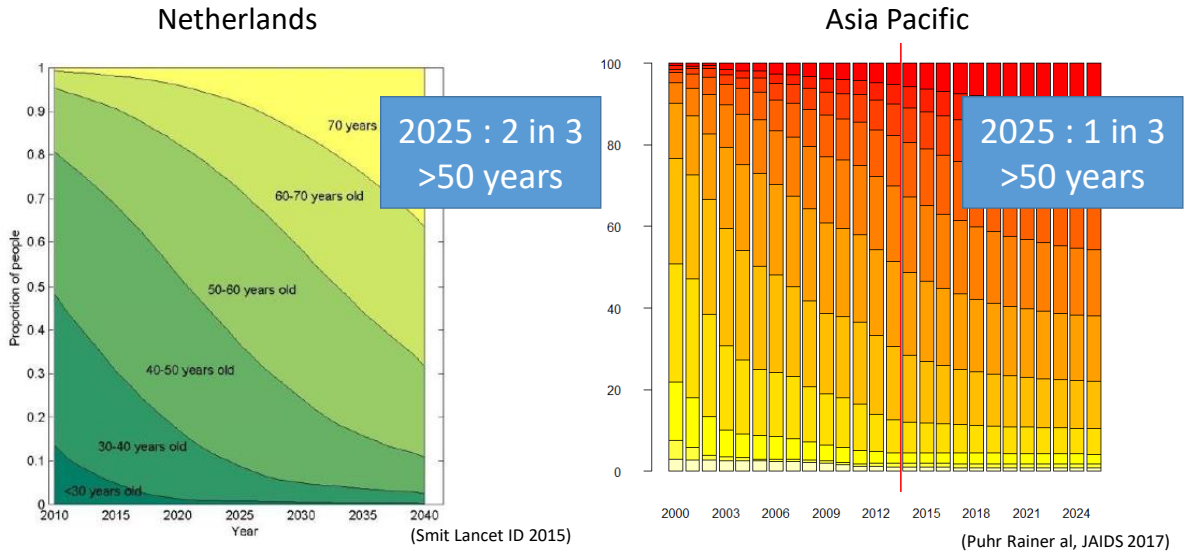
(N=88 504 receiving ART between 1996-2010, 18 European and North American HIV cohorts)



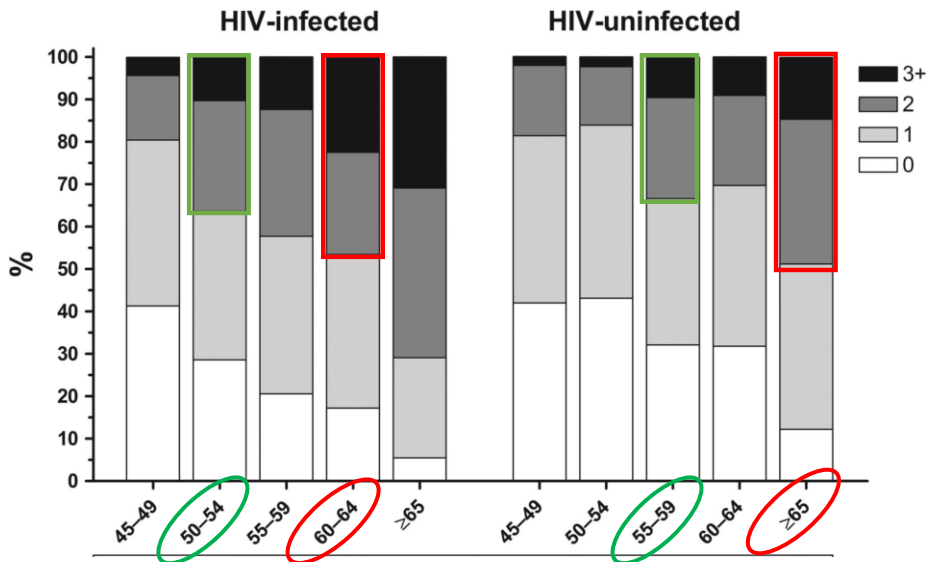
- Increased life-expectancy even in the late ART era
- However, survival remains **lower than the general population**

(Antiretroviral Therapy Cohort Collaboration, Lancet 2017)

Changing demographics of PLWH

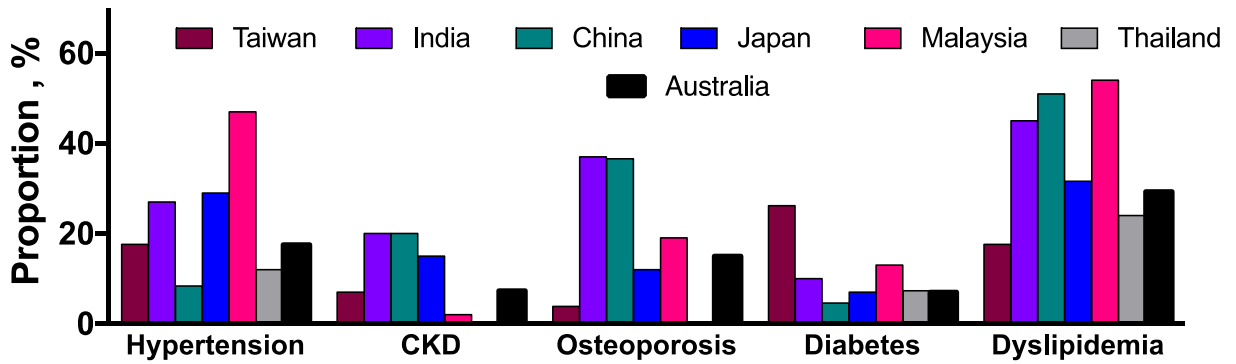


High burden of multimorbidity in HIV



(Schouten J et al CID 2014)

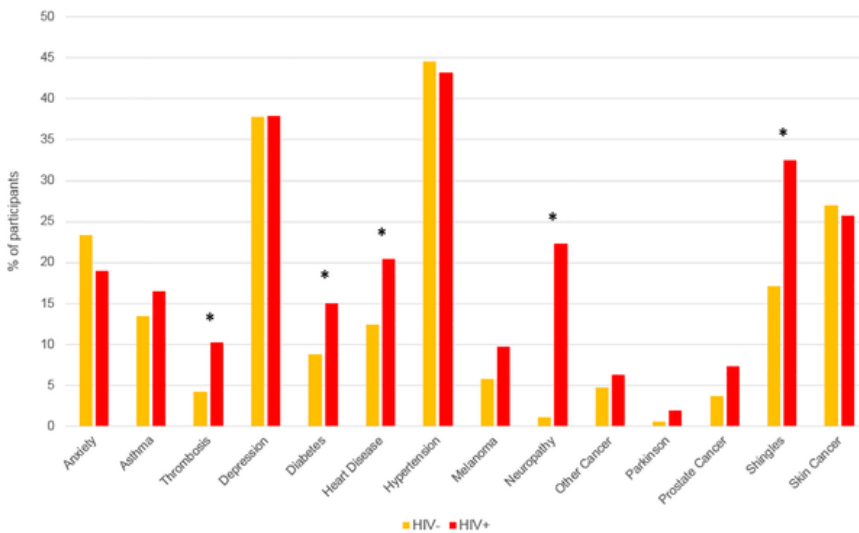
Prevalence of comorbidities in HIV in Asia Pacific



(1Wu PY et al PlosOne 2014; 2Wu PY et al, JAC 2012; 3Hsieh MH et al, J Microbiol Immunol Infect 2015; 4Cao Y et al, Nephrology 2013; 5Dravid A et al. JIAS 2014; 6Trevedi H et al Clin Kidney J 2016; 7Guo F et al, BMC Infect Dis 2017; 8SuYB et al, Zhonghua Yi 2012; 9Kim HS et al, J Korean Med Sci 2013; 10Yanagisawa N et al, Nephron Clin Prac 2011; 11Kinai et al AIDS Res Human Retroviruses 2014; 12TC DO et al, HIV Med 2016; 13Hejazi N Glob J Health Sci 2013; 14Hejazi N et al BMC Public Health 2013; 15Edwards-Jackson N HIV Med 2011; 16Bajaj S et al, Indian J Endocrinol Metab 2013, Furuya-Kanamori L PlosOne 2013, Yeoh HL Antiviral Ther 2017)

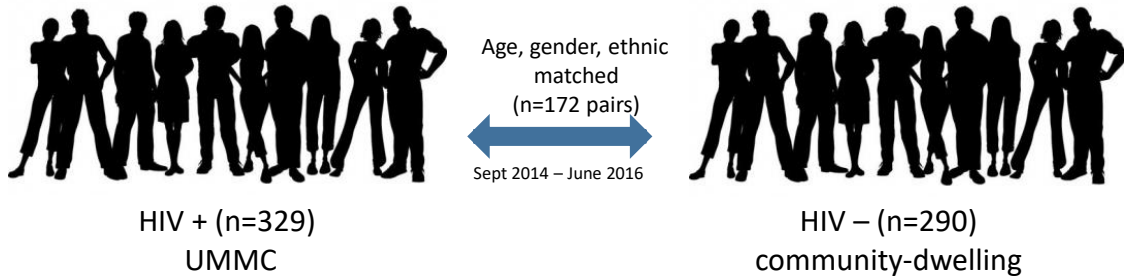
Self-reported co-morbidities in APPLES

(n=228 HIV+ve on ART and n=218 HIV-ve, age >55 years, median CD4 count = 619 cells/ul)



(Petoumenos K et al PlosOne 2017)

Malaysian HIV & Aging Study



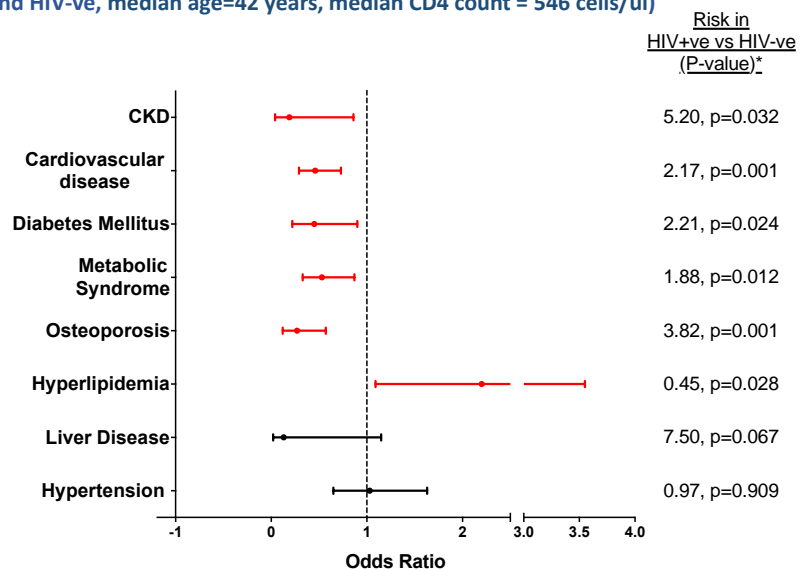
Inclusion criteria:

- Age ≥ 25 years
- On stable cART (HIV RNA < 50 copies/ml for at least 12 months)
- No reported acute illness at recruitment

MHIVA: Comorbidities in HIV+ vs HIV-ve

(N=172 HIV+ve on ART and HIV-ve, median age=42 years, median CD4 count = 546 cells/ul)

Presence of comorbidities
Comprehensive blood tests, ECG, BP and BMD \rightarrow doctors review
Self-reported medical history
Medication review
Medical chart review (HIV+ve)



(Rajasuriar, manuscript in preparation)

*Analysis performed using regression analysis and adjusted for age, gender, ethnicity, smoking, alcohol)

Extended lifespan \neq Healthspan



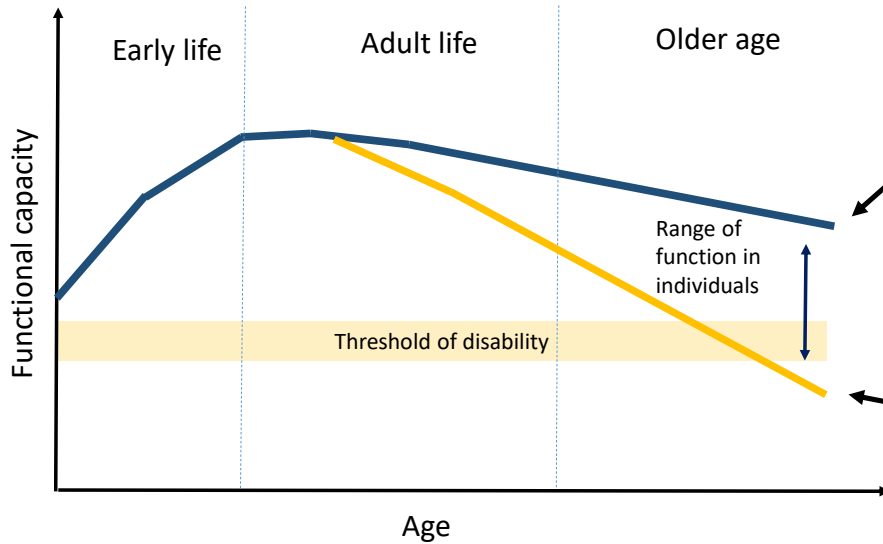
Healthspan \rightarrow ?



Lifespan \dashrightarrow

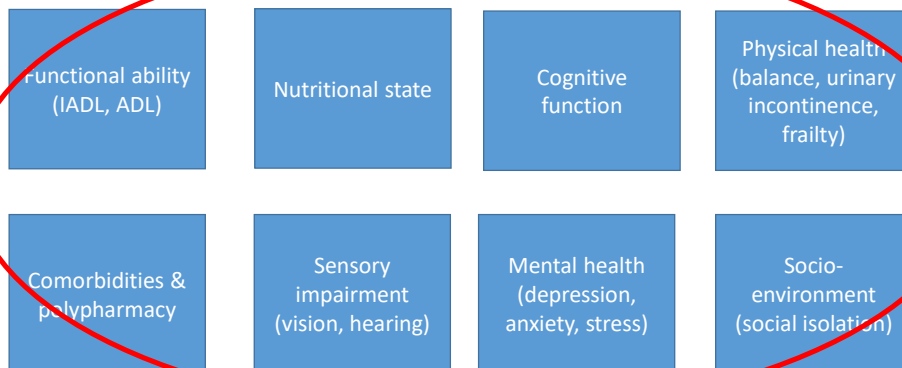
How should we measure health in the setting of HIV?

Functional age vs chronological age



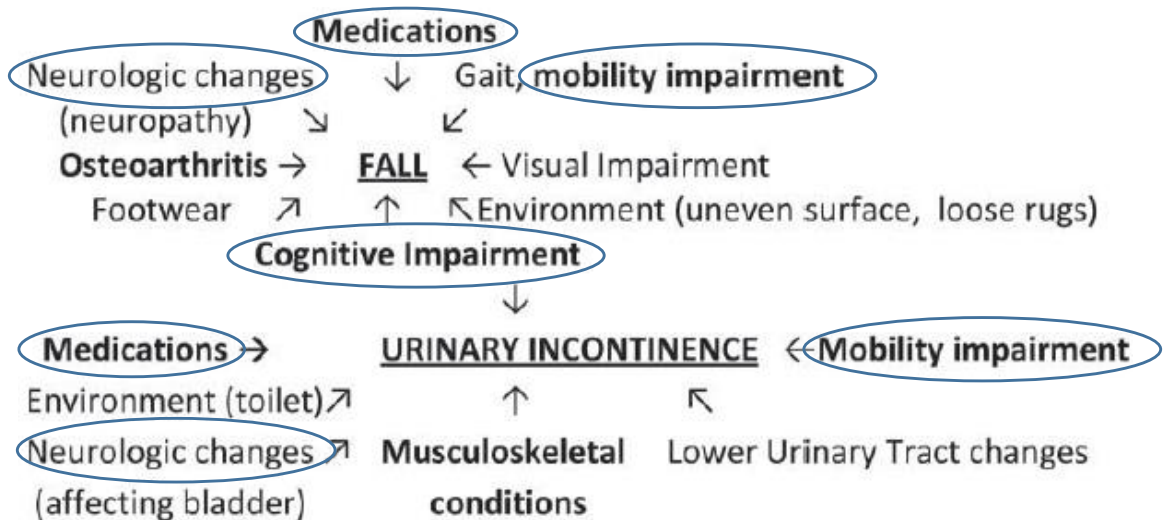
Geriatric (aging-related) syndromes

Occurs as a result of accumulated **deficits** in multiple organ systems that renders an (older) individual **vulnerable to situational challenges**.



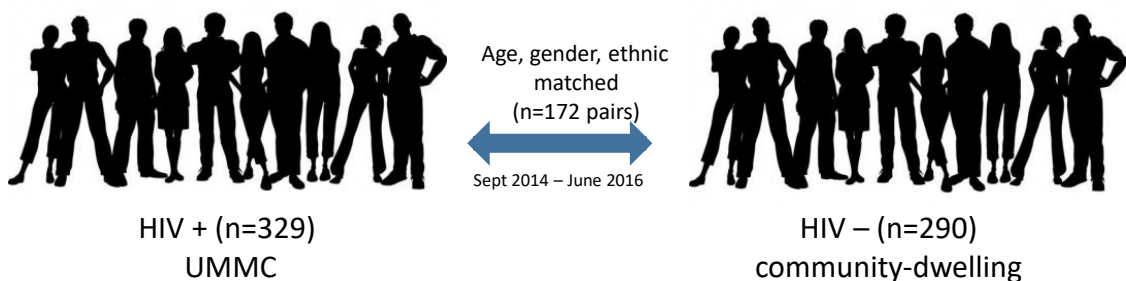
Comprehensive geriatric assessment (CGA)

Geriatric syndromes: multifactorial and co-occur



(Greene M et al, Virulence 2017)

Malaysian HIV & Aging Study

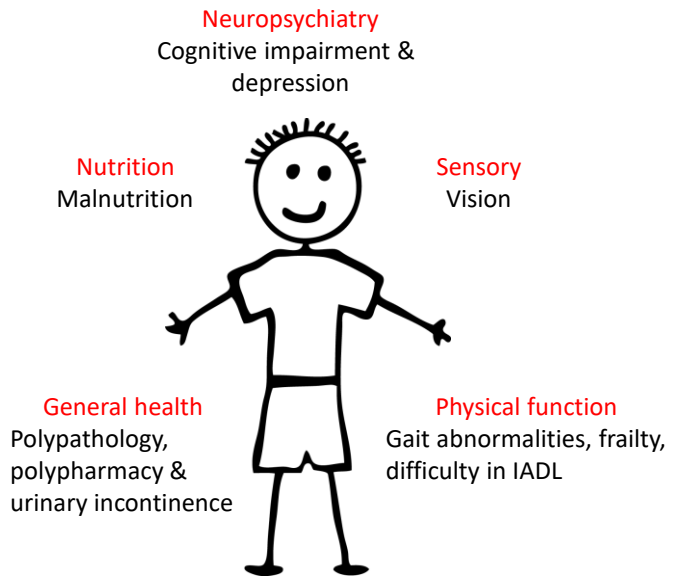


Inclusion criteria:

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Measurements

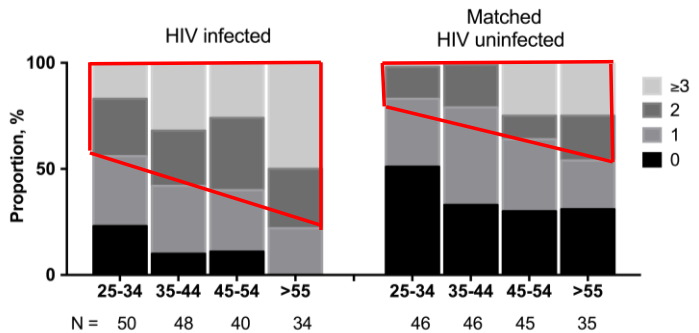
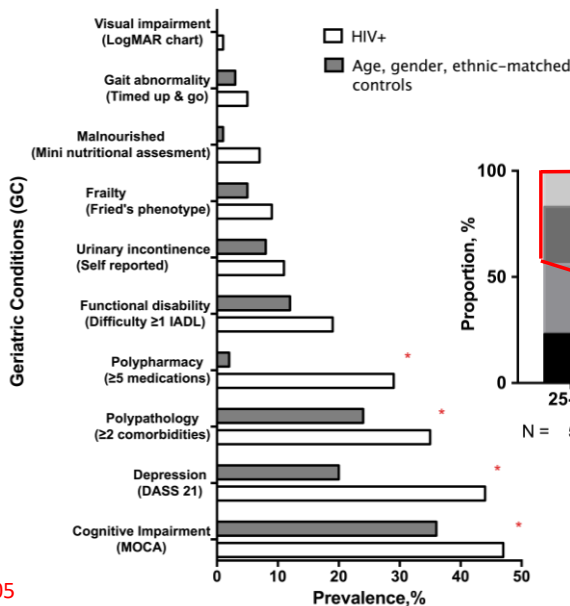
- Burden of geriatric conditions (GC) = composite of GCs (score 0-10)¹
- Health outcomes :
 - VACS index (mortality risk),
 - healthcare utilization (healthcare visits past 12 months),
 - quality of life (CASP-12)



N=172 HIV+ & matched HIV-ve
(median age 42 years)

¹Greene M et al JAIDS 2015; Brown RT et al J Health Care Poor Underserved 2013

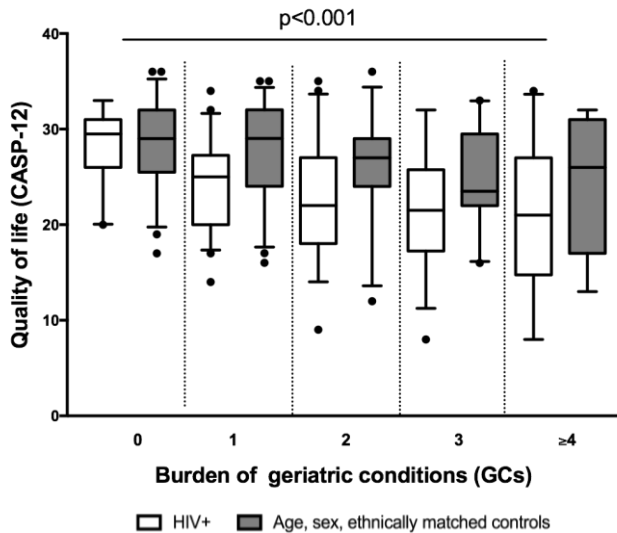
Burden of geriatric conditions higher in HIV+ vs HIV-ve



* p<0.05

(Rajasuriar R et al, AIDS 2017)

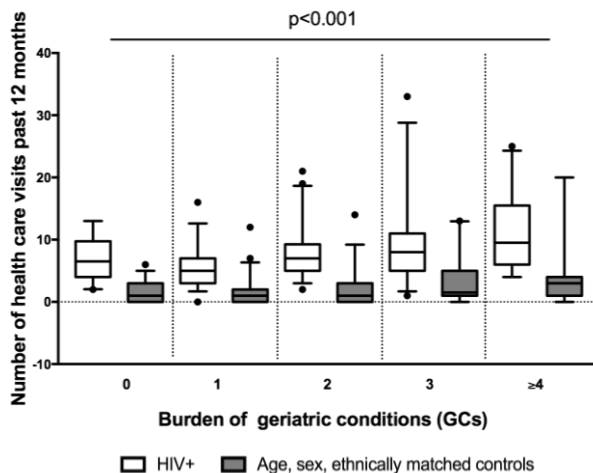
Geriatric conditions impact quality of life



QoL scores **2.5X lower**
in HIV+ vs HIV-ve

(Rajasuriar R et al, AIDS 2017)

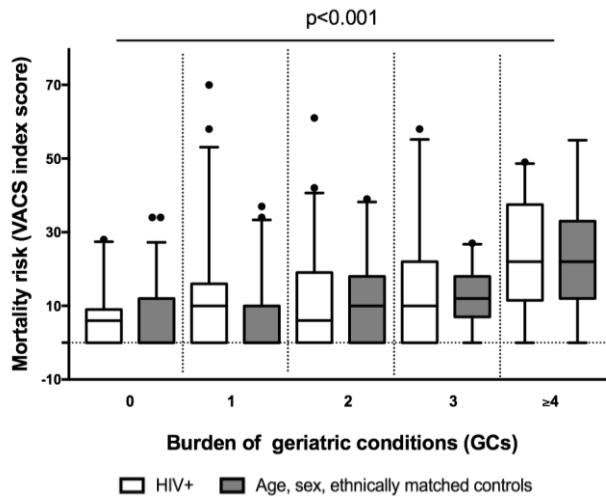
Geriatric conditions impact healthcare utilization



Healthcare utilisation
5X higher in HIV+ vs
HIV-ve

(Rajasuriar R et al, AIDS 2017)

Geriatric conditions impact mortality risks



Mortality risks **4X**
higher in HIV+ vs HIV-ve

(Rajasuriar R et al, AIDS 2017)

Risk factors associated with increasing burden of GCs

Characteristics	Risk factors
Demographic factors	Age
	Ethnicity
Clinical factors	Low CD4:CD8 ratio
	History of AIDS defining illness
Socio-behavioral/lifestyle factors	Education level
	Employment
	Alcohol consumption
	Low physical activity
	Increased abdominal obesity
	Social isolation

(Rajasuriar R et al, AIDS 2017)

Summary

- Increased life-expectancy in HIV is accompanied by a high burden of functional aging even in young treated HIV infected individuals
- The increased burden of geriatric conditions have significant impact on health outcomes including mortality risks
- Both socio-behavioral and HIV-related risk factors contribute to an increased burden of functional aging
- Significant implications on routine management of HIV: need for **multidisciplinary team approach**

Where do we go from here?

Geriatric syndromes often assessed as a single entity in HIV studies

Cohorts (non-exhaustive list)	Poly-	Physical	Frailty	Falls	Cognitive	Depression	Sensory	CGA
MAC	<ul style="list-style-type: none"> • More studies which assess multidimensional aspects of aging (vs single domains) in younger age groups (<50 years) • Include health outcomes in end-point assessments • Harmonization of definitions for geriatric conditions • Increased focus on the influence of socio-behavioral factors 							
ALIVE								
VACS								
Modi								
WIHS								
AGEF								
APPL								
UCSF								√6
MHIV	√13							

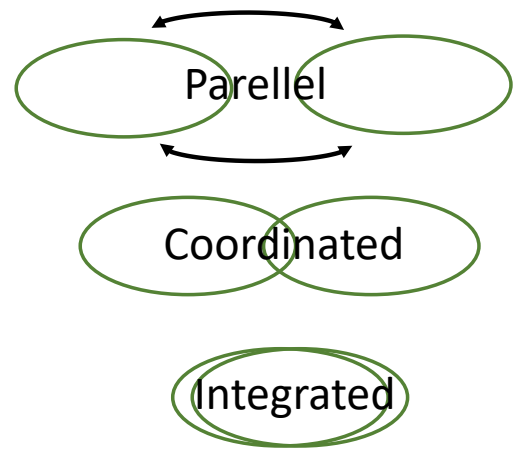
(1Desquilbert L J Gerontol A Biol Sci Med Sci 2007; 2Piggott DA PlosOne 2013;3Terzian AS J Womens Health 2009; 4Akgun KM JAIDS 2014; 5Guaraldi G AIDS 2015; 6Greene M JAIDS 2015;7Erlandson KM HIV Med 2016; 8Greene M AIDS 2014; 9Guaraldi G CID 2011; 10 Schouten CID 2014; 11Althoff K CID 2015; 12Schrack JA JAIDS 2015; 13 Rajasuriar AIDS 2017; 14 Duong N J AIDS Clin Red 2016; 15Sacktor N Neurology 2016; 16 Dickey WC Soc Psychiatry Epidemiol 1999; 17Sueoka K AIDS Behav 2010; 18 Justice AC AIDS 2004; 19Schouten AIDS 2016; 20Kooij KW AIDS 2016;21 Langebeek N 2017, 21 Petoumenos K PlosOne 2017; 22Demirkaya N Invest Ophthalmol Vis Sci 2016)

Transitions in HIV care

Services needed



Models of care



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