

# Correlation between HIV-Index (HIVI), Protective Index (PI) and frailty in an HIV ageing population.

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*Dr. Iacopo Franconi has no financial relationships with commercial entities to disclose*

# Disclosures

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# Background

*Lancet Infect Dis* 2015;  
15: 810-18

## Future challenges for clinical care of an ageing population infected with HIV: a modelling study

*Mikaela Smit, Kees Brinkman, Suzanne Geerlings, Colette Smit, Kalyani Thyagarajan, Ard van Sighem, Frank de Wolf, Timothy B Hallett, on behalf of the ATHENA observational cohort*



- Median age of 56.6 years in 2030
- 73% of PLWH will be over 50 years old
- 28.8% of PLWH will have 3 or more NICMs

## Geriatric Syndromes in Older HIV-Infected Adults

*Meredith Greene, MD,\*† Kenneth E. Covinsky, MD, MPH,\*† Victor Valcour, MD, PhD,\*‡  
Yinghui Miao, MD, MPH,\*† Joy Madamba, BS,§ Harry Lampiris, MD,#|| Irena Stijacic Cencer, MA,\*†  
Jeffrey Martin, MD, MPH,¶ and Steven G. Deeks, MD§*



*[...] We have found evidence of clinical ageing in HIV adults who were younger than the typical «geriatric» population[...]*

## From One Syndrome to Many: Incorporating Geriatric Consultation Into HIV Care

*Harjot K. Singh,<sup>1</sup> Tessa Del Carmen,<sup>2</sup> Ryann Freeman,<sup>2,3</sup> Marshall J. Glesby,<sup>1</sup> and Eugenia L. Siegler<sup>2</sup>*

*Divisions of <sup>1</sup>Infectious Diseases and <sup>2</sup>Geriatrics and Palliative Medicine, Weill Cornell Medical College; and <sup>3</sup>ACRIA, Center on HIV and Aging, New York*



*“Aging-related syndromes can be seen among HIV-infected adults before they are chronologically elderly”*

## Geriatric-HIV Medicine Is Born

*Giovanni Guaraldi<sup>1</sup> and Kenneth Rockwood<sup>2</sup>*

*<sup>1</sup>University of Modena and Reggio Emilia, Italy and <sup>2</sup>Dalhousie University, Halifax, Nova Scotia, Canada*



*«Research tools in HIV Geriatric Medicine are much needed»*

## Clinical implications of aging with HIV infection: perspectives and the future medical care agenda

*Giovanni Guaraldi<sup>a</sup> and Frank J. Palella Jr.<sup>b</sup>*



*«[...] Assessment of NICMs and MM alone does not reflect the complexity of Ageing [...] geriatric screening including assessment for Frailty and CGA are recommended[...]  
HIV and Ageing stigma [...] have been associated with inequalities in social, economic and political power»*

# Background-2

## A standard procedure for creating a frailty index

Samuel D Searle<sup>1</sup>, Arnold Mitnitski<sup>1,2,3</sup>, Evelyne A Gahbauer<sup>4</sup>,  
 Thomas M Gill<sup>4</sup> and Kenneth Rockwood<sup>\*1,2,5</sup>

### FI 72 items:

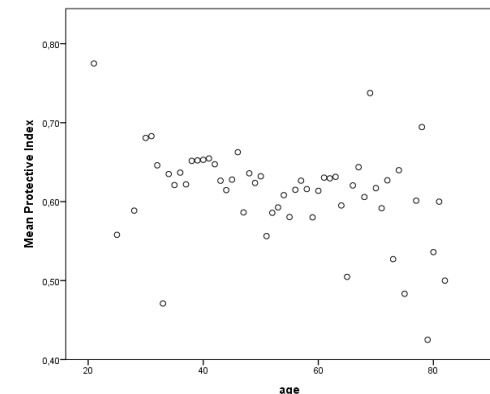
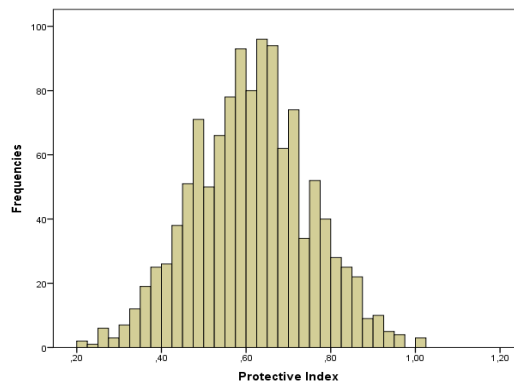
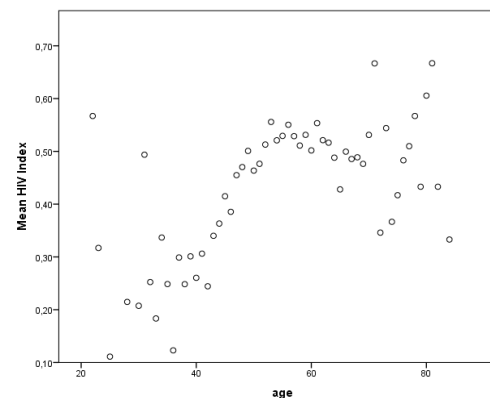
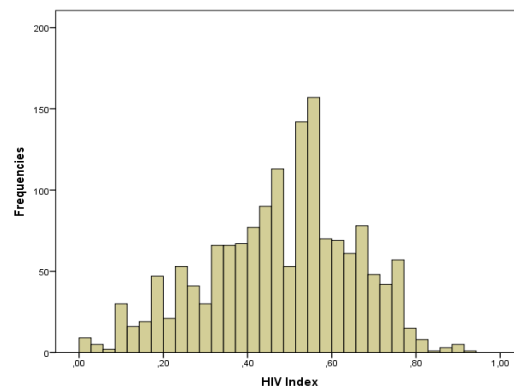
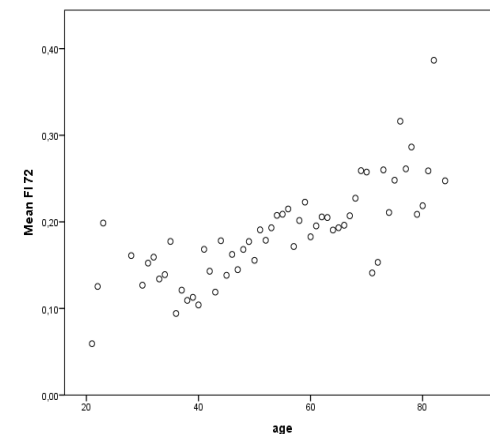
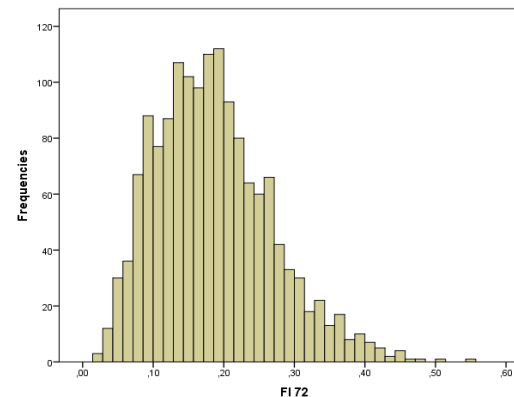
- ✓ Blood tests
- ✓ 8 NICMs
- ✓ BMI
- ✓ CES-D
- ✓ ADL
- ✓ IADL
- ✓ ASMi  
(Sarcopenia)
- ✓ Nutrition
- ✓ EQ5D5L
- ✓ Geriatric syndromes

### HIV-Index (HIVI)

- CDC Classification
- CD4+ Nadir
- Duration of HIV
- time between diagnosis and ARV start
- 3<sup>rd</sup> line of ARV or more HIV/AIDS related cancers
- lipodystrophy
- current CD4+cell count
- HIV Viral load
- CD4-CD8 ratio

### Protective Index (PI)

- ethnicity
- level of education
- profession
- income
- physical activity
- injection drug use (past or current)
- marital status
- Domestic partnership
- alcohol use
- smoking habit



# Objective

Evaluate correlations between HIV-Index (HIVI), Protective Index (PI) and frailty in an HIV ageing population

# Methods-1

Cross sectional study

From September 20<sup>th</sup> 2016 to 17<sup>th</sup> November 2017

Modena HIV Metabolic Clinic (MHMC)

Data are collected from blood tests, nuclear medicine DXA scan, self-reported surveys, face-to-face interviews and clinical evaluation by physicians, occupational therapists, dieticians and psychologists.

At least one clinical evaluation, able to express written consensus

Approved by Ethical Committee

## Methods-2

Frailty :  $FI > 0.25$

Univariate and multivariate linear regression models were performed using both FI and natural logarithm of FI as dependent variables, and HIVI and PI as independent variables individually, to demonstrate increase of FI score with increase in HIVI and decrease in PI.

Univariate and multivariate logistic regression models, adjusted for age and sex were, run to evaluate association and predictors of frailty among HIV and PI variables and HIVI and PI scores.

SPSS 24 (IBM Corp, Armonk, NY, USA) was used to run all analyses.

# Results-1

- 1565 subjects were included. Mean age  $53.15 \pm 8.03$ , 73.9% males.
- Mean FI was  $0.19 \pm 0.08$ . Median FI 0.18 (range 0.02-0.55).
- Mean HIVI and PI were  $0.48 \pm 0.17$  and  $0.63 \pm 0.14$  respectively.
- Median HIVI 0.500 (range 0.00-0.92)
- Median PI 0.611 (range 0.22-1.00)
- Multivariate Linear regression analysis HIVI and FI
  - B-non standardized ( $0.068 \pm 0.014$ ,  $p < 0.001$ )
- Multivariate Linear regression analysis PI and FI
  - B-non standardized ( $-0.136 \pm 0.016$ ,  $p < 0.001$ )
- HIVI and PI are predictors of Frailty at multivariate logistic regressions (age/sex adjusted):
  - ❖ HIVI Odds Ratio: 1.020  $p < 0.001$  [IC(1.010;1.031)]
  - ❖ PI OR 0.974,  $p < 0.001$  [IC(0.963;0.986)]



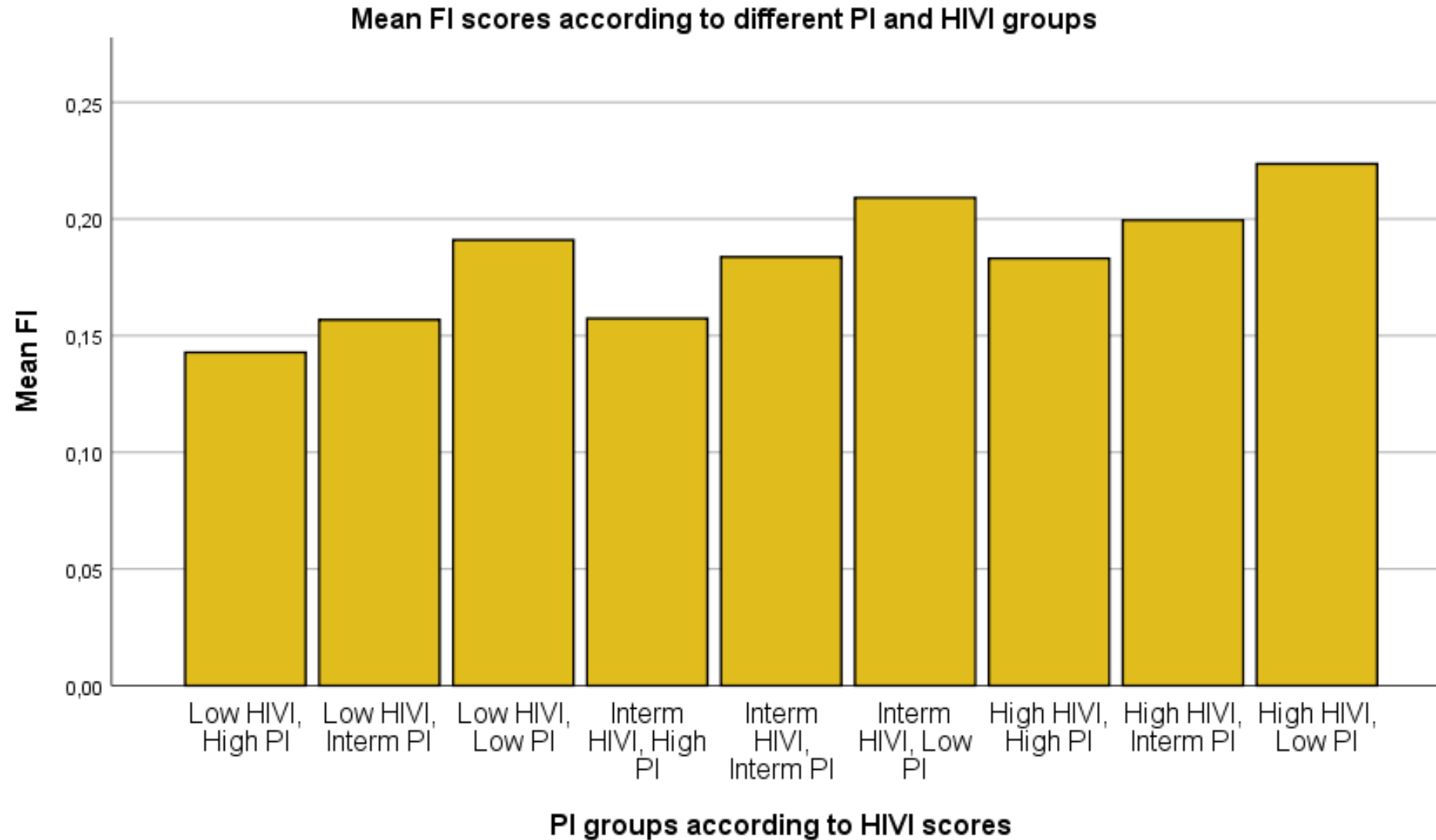
# Results-2

## Predictors of Frailty among HIVI and PI Variables

HIV Variables	OR	significance	CI 95%
<b>CDC-classification*</b>	2.20	p < 0.001	[1.58; 3.05]
<b>CD4 Nadir</b>	1.26	P=0.201	[0.884; 1.80]
<b>Duration of HIV (years)*</b>	3.86	p < 0.001	[2.39; 6.24]
<b>Time from diagnosis to ART*</b>	1.65	p = 0.002	[1.21; 2.25]
<b>AIDS malignancy</b>	0.69	p=0.238	[0.38 ; 1.27]
<b>Lipodystrophy*</b>	1.86	P=0.001	[1.30 ; 2.65]
<b>3<sup>rd</sup> line of ART or more*</b>	1.47	P=0.035	[1.03; 2.10]
<b>CD4+absolute count*</b>	1.66	P=0.001	[1.24; 2.30]
<b>HIV-VL undetectability</b>	1.10	p=0.711	[0.67,1.79]
<b>CD4/CD8</b>	1.24	p=0.15	[0.93;1.66]
<b>HIVI*</b>	1.025	p<0.001	[1.02,1.03]

PI variables	OR	P value	CI 95%
<b>Ethnicity</b>	1.17	p=0.780	[0.38; 3.63]
<b>Education year*</b>	0.24	p<0.001	[0.13;0.46]
<b>Profession*</b>	0.41	p<0.001	[0.28;0.61]
<b>Risk IDU*</b>	0.49	p<0.001	[0.37;0.65]
<b>Marital status</b>	1.14	p=0.427	[0.83,1.55]
<b>Domestic partnerhip</b>	1.10	p=0.557	[0.802;1.51]
<b>Income*</b>	0.26	p<0.05	[0.11;0.62]
<b>Alcohol</b>	1.65	p=0.077	[0.95;2.81]
<b>Smoking*</b>	0.44	p<0.001	[0.32;0.61]
<b>Gym*</b>	2.94	p<0.001	[2.22; 3.90]
<b>PI*</b>	0.972	P<0.001	[0.961;0.983]

# Results-3



# Discussion

Higher HIVI and Lower PI are associated with Frailty

HIVI and PI can predict Frailty

## **Study limitations:**

- Cross sectional
- No cut-off points for HIVI and PI
- Few variables for HIVI and PI
- Validation with other clinical outcomes (deaths, Hospital admissions institutionalization, disability etc.)

# Acknowledgements



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