

# HCAP U24 International Network Updates

**Ken Langa**

**HRS ATW  
Network Meeting**

August 2023  
Dublin, Ireland



**NIA Funding: U24 AG065182 (PIs: Langa and Weir)**



**HCAP  
NETWORK**

# Harmonized Cognitive Assessment Protocol (HCAP)

- One-hour of supplemental cognitive testing in a sub-sample of the full core survey sample
- Twenty-minute informant / friend / family interview
- Goals:
  - Provide more detailed information on cognitive function across different cognitive domains
  - Allow categorization of individuals into important diagnostic categories: **Normal, Mild Cognitive Impairment, Dementia**
  - Facilitate valid international comparisons of current and future trends in the incidence / prevalence / burden of MCI and dementia in low-, middle-, and high-income countries



# HRS HCAP Tests

**Table 2.** HRS HCAP tests

a Respondent test	Cognitive domains <sup>1</sup> assessed	Citation
MMSE	O, MemIE, MemDE, Vis, AS, LF	[37, 38]
HRS-TICS (3 items: Object naming; Naming President)	MemIE	[39]
CERAD Word List Learning and Recall – Immediate	MemIE	[40]
Semantic Fluency (Animal Naming Test)	LF	[40–43]
Letter Cancellation Test	AS	[44]
Timed Backward Counting Task (from MIDUS)	AS	[45]
Community Screening Instrument for Dementia (CSI-D; 4 items)	O, EF, LF	[46]
CERAD Word List Recall – Delayed	MemDE	[47, 48]
Story recall – Immediate	MemIE	[49]
CERAD Word List – Recognition	MemR	[40]
CERAD Constructional Praxis – Immediate	Vis	[40, 50]
SDMT	EF, AS	[51]
CERAD Constructional Praxis – Delayed	MemDE	[40, 50]
Story recall – delayed	MemDE	[49]
Story recall – recognition	MemR	[49]
HRS Number Series	EF	[52]
Raven’s Standard Progressive Matrices	EF	[53–55]
Trail Making Test (Part A and Part B)	EF, AS	[56, 57]



# Adaptations of HCAP Protocol

GATEWAY TO GLOBAL AGING DATA

SURVEYS AT A GLANCE | CONCORDANCE ACROSS SURVEYS | DOCUMENTATION AND PRESENTATIONS | GRAPHS AND TABLES | POLICY EXPLORER | PUBLICATIONS BASED ON SURVEYS | DOWNLOADS DATA AND LINKS | NEWS AND BLOGS | ABOUT OUR TEAM | HELP FAQ

Home » Concordance across Surveys » HCAP Comparison Table

## HCAP Comparison Table

HCAP Comparison

Download concordance table (Format: Excel)

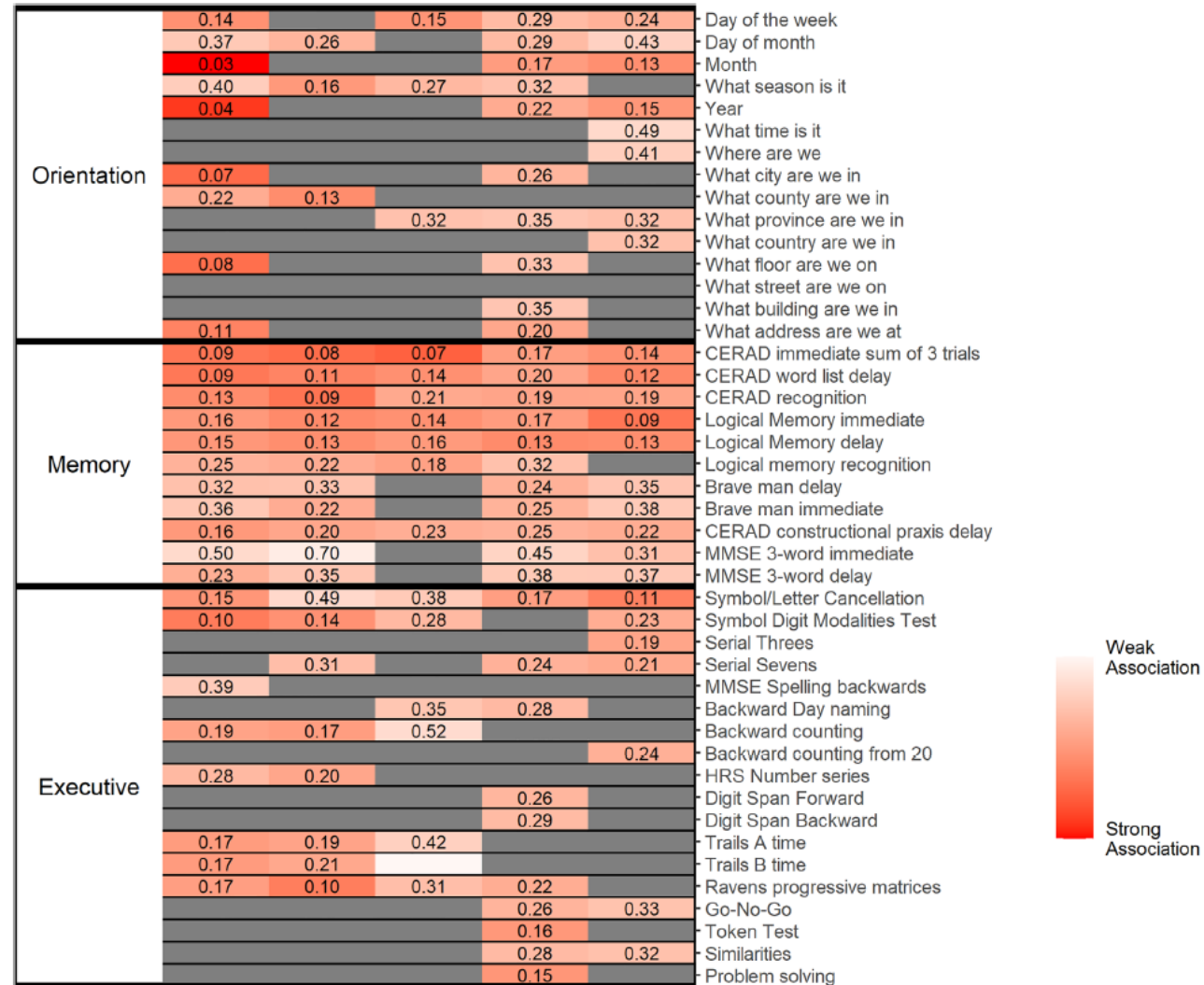
Test name	Test Description	Variable name	HRS-HCAP	LASI-DAD	ELSA-HCAP	MEX-COG	Chile-Cog	CHARLS-HCAP
Orientation-Time	Date naming (0-5), (0-4) LASI	r1orient_t5 / r1orient_t4; r1yr, r1date, r1dw, r1mo, r1season/r1time	year, date, DW, month, season (0-5)	year, date, DW, month, season (0-5)	year, date, DW, month, season (0-5)	year, date, DW, month, Time (no season) (0-5)	Year, date, DW, month, season (0-5)	Year, date, DW, month, season (0-5)  *Asked to all W4 CHARLS (aged <60 yrs included)
Orientation-Place	Place naming (0-5) or (0-3)	r1orient_p5 / r1orient_p4; r1state, r1county, r1city, r1floor, r1address, r1name, r1country, r1regcom	state, county, city, floor, address (0-5)	state, city, floor, address, name (0-5)	Country, county, city, building, street (0-5)	State, Country, Address (no city and name of place) (0-3)	Country, address, region/commune (combined), street, floor (0-5)	State (province), county, city (town/village), floor, address (0-5)
3-word recall	Imm word recall (0-3)	r1imrc3	first trial (total 3 trials)	first trial (total 3 trials)	1 trial	1 trial	first trial (total 5 trials)	first trial (total 5 trials)
	delayed word recall(0-3)	r1dlrc3	w1	w1	w1	w1	w1	w1
Backward spelling/naming/counting	backward spelling/ naming/ counting (0-5)	r1backward_s (HRS, ELSA) r1backward_d (DAD) r1ser7 (ELSA, Mex-Cog, Chile-Cog) r1backward_l (Chile-Cog)	Spell "WORLD" backward	List days of week backward	backward count (Serial 7s); if refused, spell "WORLD"backward	Two tasks: 1. Serial 3s; 2. Backward count (Serial 7s) NOTE: Only Serial 7s used for MMSE	Two tasks: 1. List numbers backward; 2. Serial 7's NOTE: Only Serial 7s used for MMSE	backward count (Serial 7s) *Asked to all W4 CHARLS (aged <60 yrs included)
Object naming	Naming two objects (0-2)	r1object	watch, pencil	watch, pencil	watch, pencil/pen	shoe, pencil	watch, pencil	watch, pencil
Repeat a phrase	repeat a phrase(0-1)	r1repeat	w1	w1	w1	w1	w1	w1
	able to read/follow and close		w1 (correct if R reads &					

Source: Gateway to Global Aging Data website, g2aging.org



**HCAP**  
NETWORK

# Comparison of Test Items across Countries

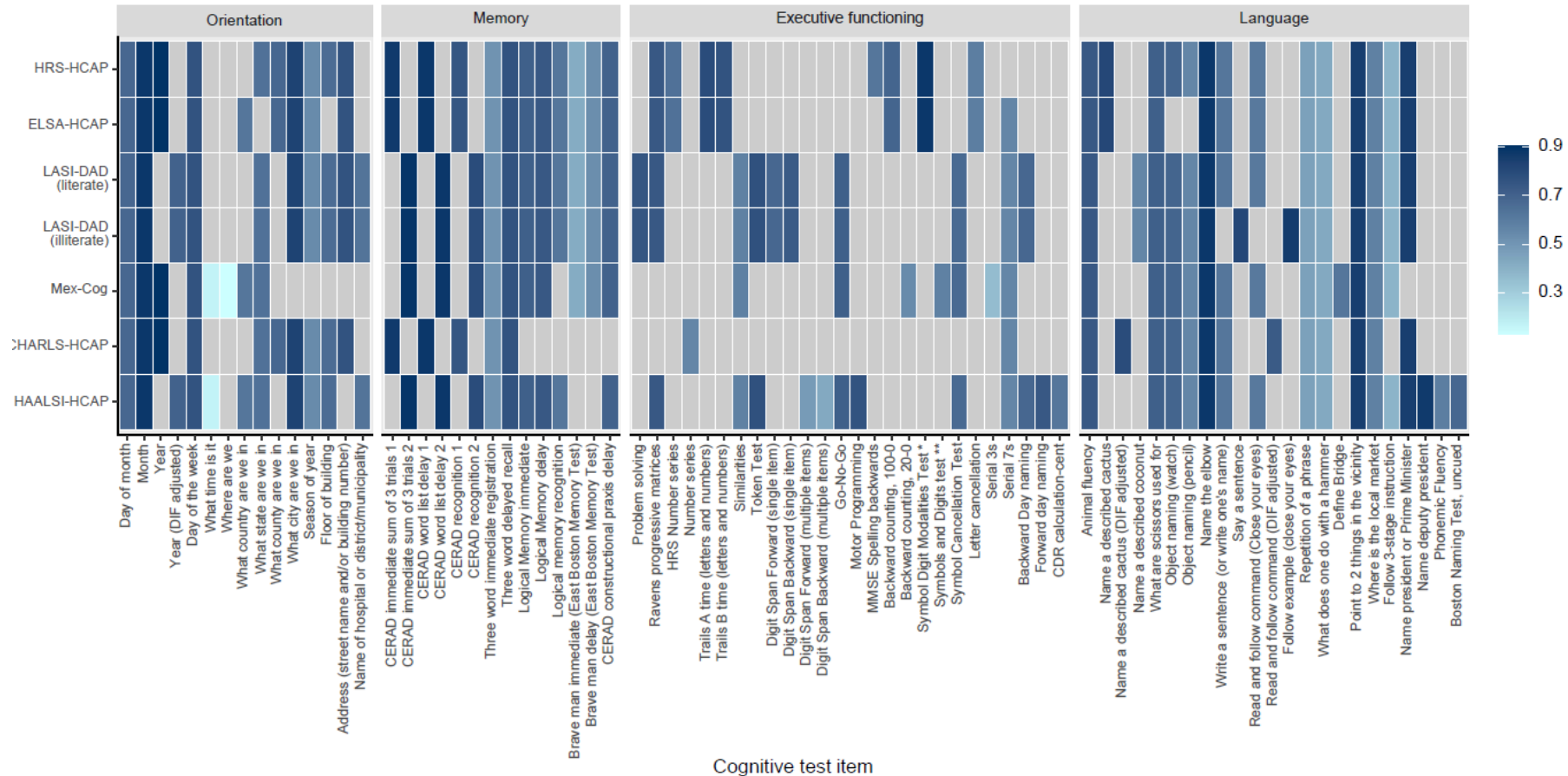


Source: Nichols et al, *Alzheimer's and Dementia*, 2022.



**HCAP**  
NETWORK

# Correlations Between Test Items and Factor Loadings across Countries



Source: Gross et al, *Lancet Healthy Longevity*, in press.



**HCAP**  
NETWORK

# HCAP International Network Wave 1 Status

Country	Study	Applied	Funded	Begun	Completed	Data Released
USA	HRS	✓	✓	✓	✓	✓
Mexico	MHAS	✓	✓	✓	✓	✓
England	ELSA	✓	✓	✓	✓	✓
S. Africa	HAALSI	✓	✓	✓	✓	✓
China	CHARLS	✓	✓	✓	✓	✓
India	LASI	✓	✓	✓	✓	✓
Chile	ESPS	✓	✓	✓	✓	✓
S. Korea	KLOSA	✓	✓	✓	✓	✓
EU	SHARE	✓	✓	✓	✓	
Ireland	TILDA	✓	✓	✓		
N. Ireland	NICOLA	✓	✓	✓		
Caribbean	CADAS	✓	✓	✓		
Lebanon	LSAHA	✓	✓			
Kenya	KLPS	✓	✓		*LOSHAK, also	
Nepal	NSDA	✓	✓			
Egypt	AL-SEHA	✓				

Pilot studies funded for **Brazil, Ghana, Egypt**;  
Pilot application submitted for **Malawi**



# HCAP International Network Wave 2 Status

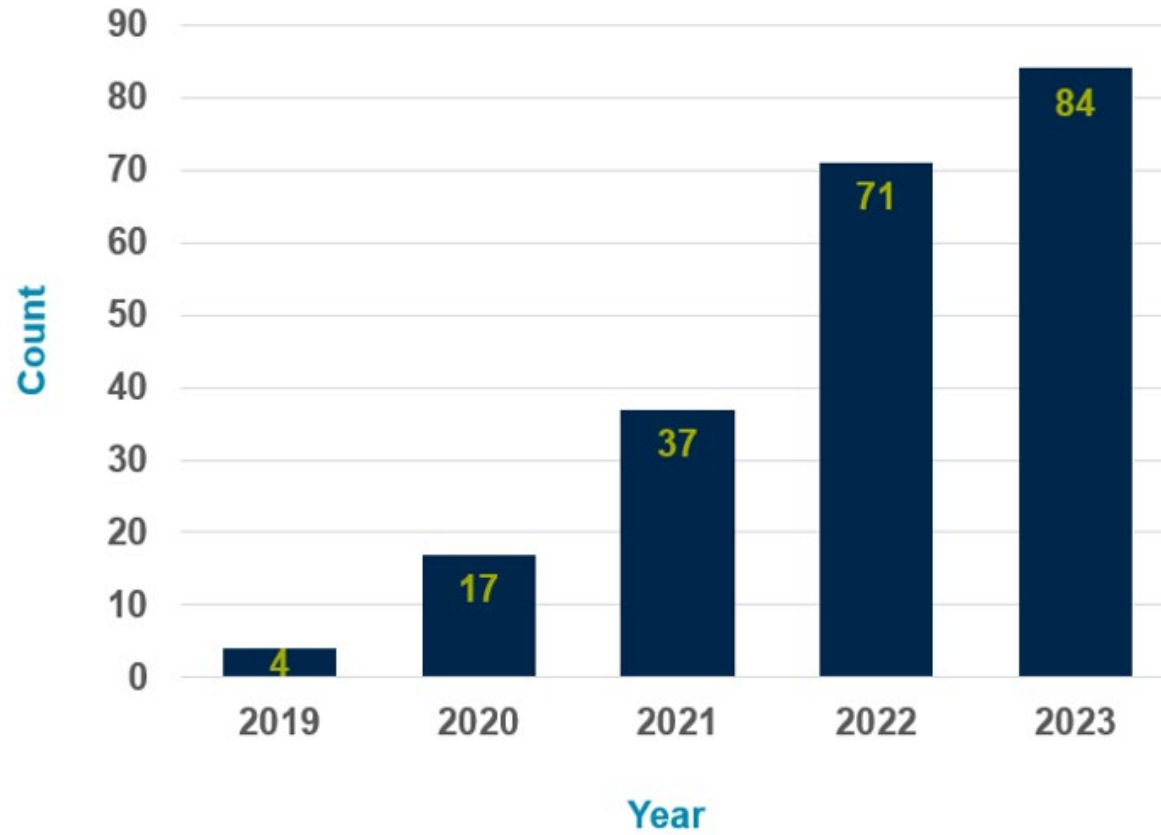
Country	Study	Applied	Funded	Begun	Completed	Data Released
Mexico	MHAS	✓	✓	✓	✓	
USA	HRS	✓	✓	✓		
India	LASI	✓	✓	✓		
England	ELSA	✓	✓	✓		
S. Africa	HAALSI	✓	✓			

Wave 2 applications planned: SHARE, TILDA, NICOLA





# HCAP Cumulative Publications



JAMA Neurology | **Original Investigation**

## Estimating the Prevalence of Dementia and Mild Cognitive Impairment in the US

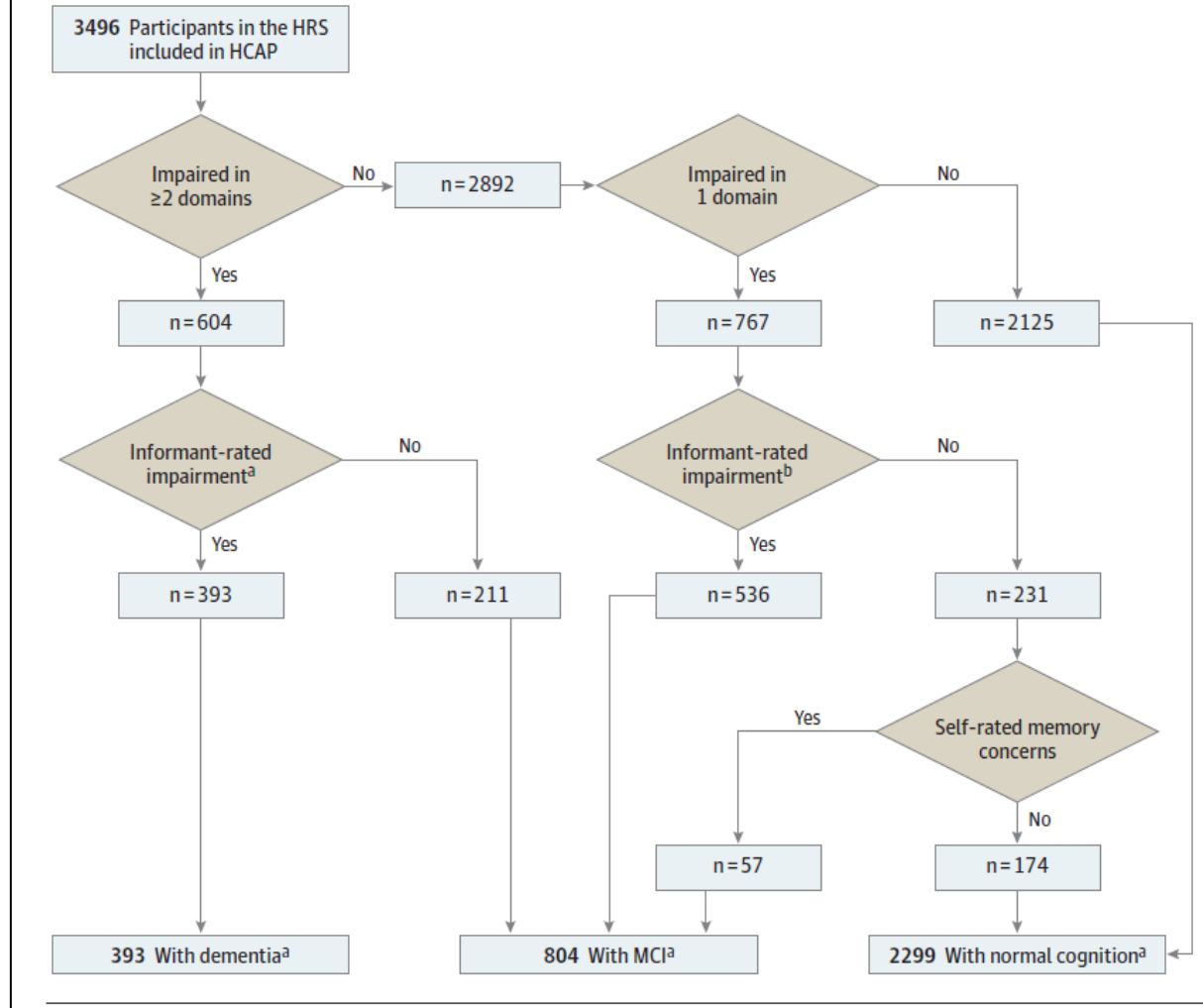
### The 2016 Health and Retirement Study Harmonized Cognitive Assessment Protocol Project

Jennifer J. Manly, PhD; Richard N. Jones, ScD; Kenneth M. Langa, MD, PhD; Lindsay H. Ryan, PhD;  
Deborah A. Levine, MD, MPH; Ryan McCammon, MS; Steven G. Heeringa, PhD; David Weir, PhD

Source: Manly et al., *JAMA Neurology*, 2022.



Figure. Flow Diagram Showing the Harmonized Cognitive Assessment Protocol (HCAP) Classification Algorithm for Dementia and Mild Cognitive Impairment (MCI)



Source: Manly et al.,  
*JAMA Neurology*,  
2022.



**Table 2. Group Differences in Prevalence of Dementia and Mild Cognitive Impairment (MCI) Among Harmonized Cognitive Assessment Protocol (HCAP) Participants**

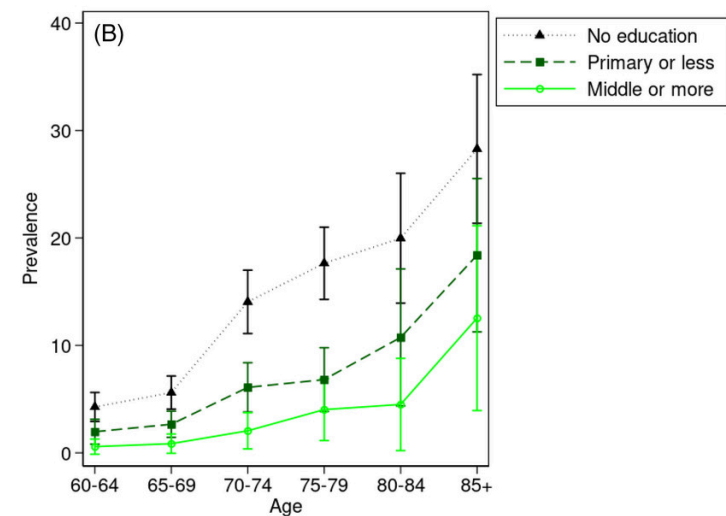
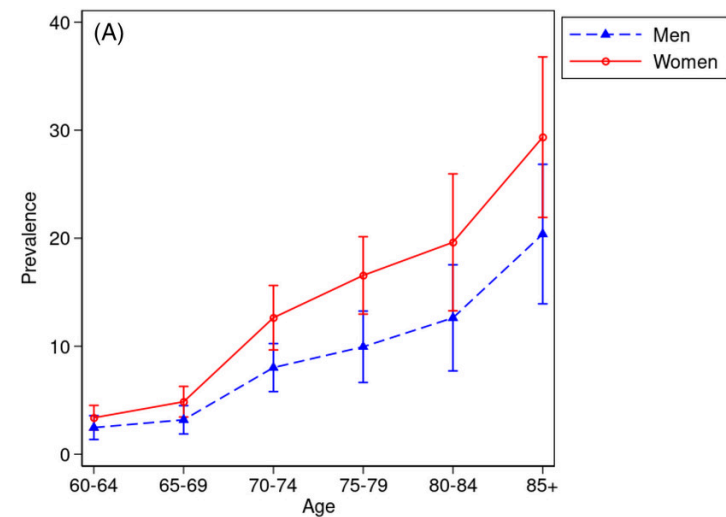
Variable	Total	Dementia			MCI		
		Observed No.	% <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)	Observed No.	% <sup>a</sup> (95% CI)	OR <sup>b</sup> (95% CI)
Overall	3496	393	10 (9-11)	NA	804	22 (20-24)	NA
<b>Age group, y</b>							
65-69	821	25	3 (1-4)	1 [Reference]	186	22 (18-25)	1 [Reference]
70-74	667	31	4 (2-6)	1.4 (0.8-2.7)	138	20 (17-24)	0.9 (0.7-1.3)
75-79	844	76	9 (6-11)	3.3 (1.8-5.8)	194	21 (18-24)	1.0 (0.7-1.3)
80-84	611	105	18 (14-22)	7.6 (4.3-13.3)	156	25 (21-29)	1.2 (0.9-1.7)
85-89	345	84	26 (20-31)	11.9 (6.7-21.2)	78	22 (17-27)	1.0 (0.7-1.5)
≥90	208	72	35 (28-43)	18.8 (10.3-34.4)	52	27 (20-35)	1.4 (0.9-2.1)
<b>Sex<sup>c</sup></b>							
Female	2095	243	10 (9-11)	1.1 (0.8-1.4)	474	22 (19-24)	0.9 (0.8-1.2)
Male	1401	150	10 (8-11)	1 [Reference]	330	22 (20-25)	1 [Reference]
<b>Race and ethnicity<sup>c,d</sup></b>							
Black	551	63	15 (10-19)	1.8 (1.2-2.7)	126	22 (17-27)	1.0 (0.8-1.4)
Hispanic	382	43	10 (7-13)	1.1 (0.7-1.7)	112	28 (22-34)	1.4 (1.0-2.0)
White	2484	264	11 (10-13)	1 [Reference]	566	23 (21-25)	1 [Reference]
Other <sup>e</sup>	79	12	26 (13-39)	3.3 (1.4-7.6)	26	45 (30-59)	2.7 (1.5-5.1)
<b>Educational attainment<sup>c</sup></b>							
<High school	715	111	13 (10-16)	1.6 (1.1-2.3)	214	30 (25-34)	1.6 (1.2-2.2)
High school	1166	128	9 (7-11)	1.0 (0.7-1.4)	234	19 (16-21)	0.9 (0.7-1.2)
Some college	764	65	9 (6-11)	0.9 (0.6-1.4)	170	23 (19-26)	1.1 (0.8-1.5)
≥College degree	851	89	9 (7-11)	1 [Reference]	186	21 (17-24)	1 [Reference]

Source: Manly et al., *JAMA Neurology*, 2022.



# Dementia Prevalence in India, 2020

	LASI ages 60+		Dementia prevalence <sup>c</sup>
	N <sup>a</sup>	% <sup>b</sup>	Population-representative
ALL	31,477	100.0	7.43
Age			
60-64	10,134	32.4	2.94
65-69	8845	29.4	4.01
70-74	5746	17.6	10.30
75-79	3362	10.3	13.34
80-84	1942	5.8	16.25
85+	1448	4.6	25.41



Source: Lee et al., *Alzheimer's and Dementia*, 2023.



**HCAP**  
NETWORK

# HCAP Network Pilot Studies

- Arce Rentería and Briceño:
  - Harmonization of cognitive performance and informant-rated decline across older adults living in the US, Mexico, and Chile
- Ehrlich and Ngugi
  - Expanding cognitive measurement in the Longitudinal Study of Health and Ageing in Kenya (LOSHAK)
- Zhang and Cantu
  - Comparing informant measures of functioning and cognitive decline in HCAP studies (HRS, CHARLS, Mex-COG)
- Llibre-Guerra
  - Cross-national harmonization of cognitive measures and cognitive impairment in 10/66 sister studies, MHAS, and ELSI
- Salama and Boersch-Supan
  - Supporting the development of the Longitudinal Study of Healthy Aging in Egypt (AL-SEHA)



# HCAP Network Pilot Studies

- DeLooze and McGarrigle
  - Activity measures in HCAP informant interviews: an adjunct to HCAP dementia tool (TILDA, HRS, ELSA)
- Elo and Wong
  - Education, Social Protection, and Cognition in Chile and Mexico
- Feeney
  - Effect of informant cognition and relationship quality on HCAP informant ratings (TILDA, HRS, ELSA)
- Hayat
  - Building toward better harmonization of HCAP (TILDA, NICOLA, HRS, ELSA)
- McGarrigle
  - Development of weighting methods to account for selective attrition within the HCAP study (TILDA)



# HCAP Network Pilot Studies and Meeting Support

- Ferri
  - Piloting the HCAP in ELSI-Brazil
- Elo and Kohler
  - Cognitive Aging in Ghana: Implementing HCAP in an African Low-Middle Income Country

## Meetings

- Cairo, Egypt; February 2023 (AL-SEHA team)
- University of Pennsylvania; October 2023 (Sub-Saharan Africa)
- Kenya 2024 (Planned follow-up with SSA teams)







**HCAP Network Consultation  
Meetings: Egypt, February 2023**



**HCAP  
NETWORK**



**HCAP Network Consultation  
Meetings: Scotland, May 2023**



**HCAP  
NETWORK**

# RESEARCH RESOURCES

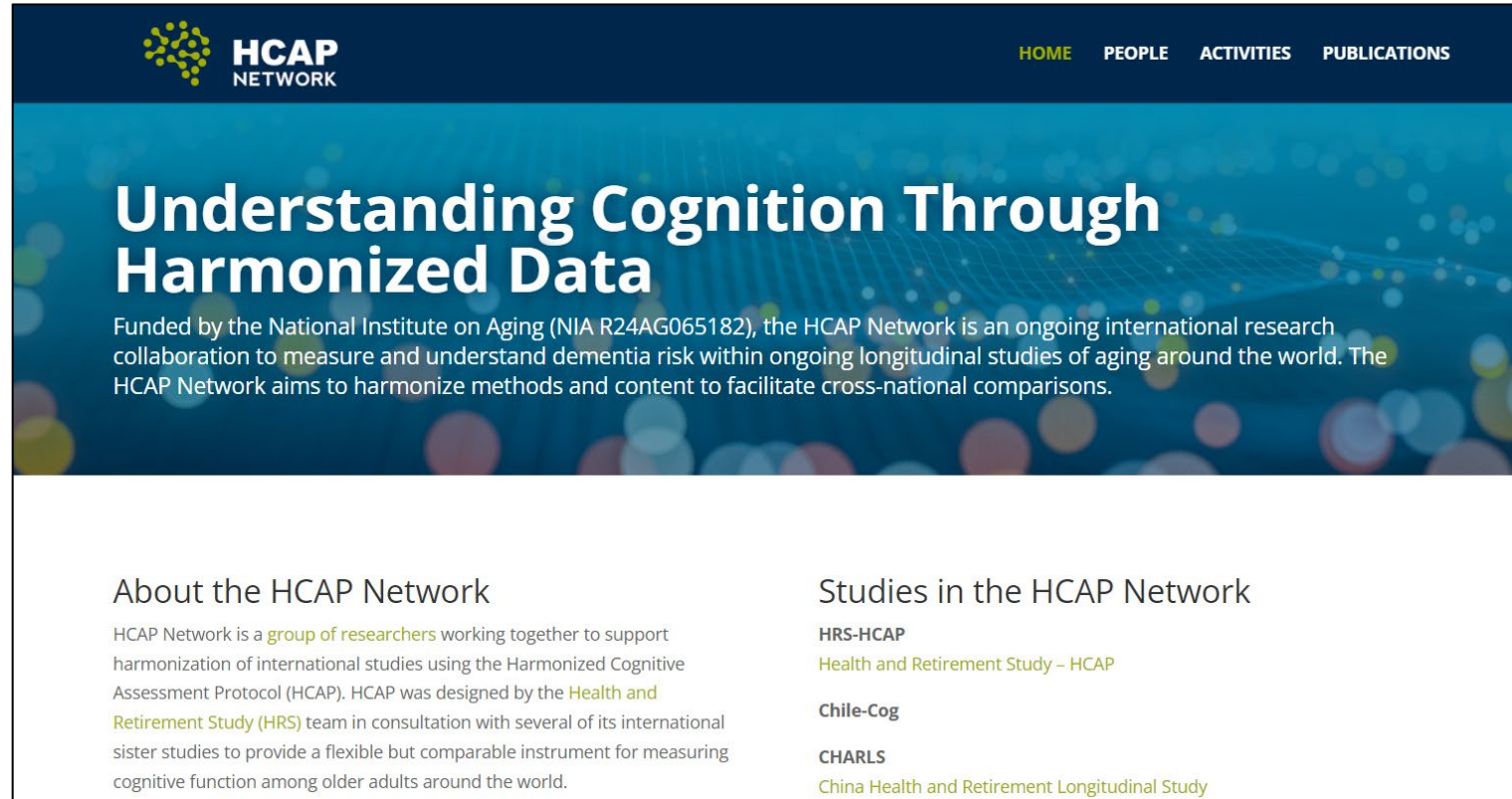
# HCAP Funding Opportunity



[RFA-AG-24-032 Enhancing Use of  
Harmonized Cognitive Assessment Protocol  
Data \(R01 Clinical Trial Not Allowed\)](#)

Applications due **Monday, October 2, 2023**

# Resources: HCAP Network Website



**HCAP NETWORK** HOME PEOPLE ACTIVITIES PUBLICATIONS

## Understanding Cognition Through Harmonized Data

Funded by the National Institute on Aging (NIA R24AG065182), the HCAP Network is an ongoing international research collaboration to measure and understand dementia risk within ongoing longitudinal studies of aging around the world. The HCAP Network aims to harmonize methods and content to facilitate cross-national comparisons.

### About the HCAP Network

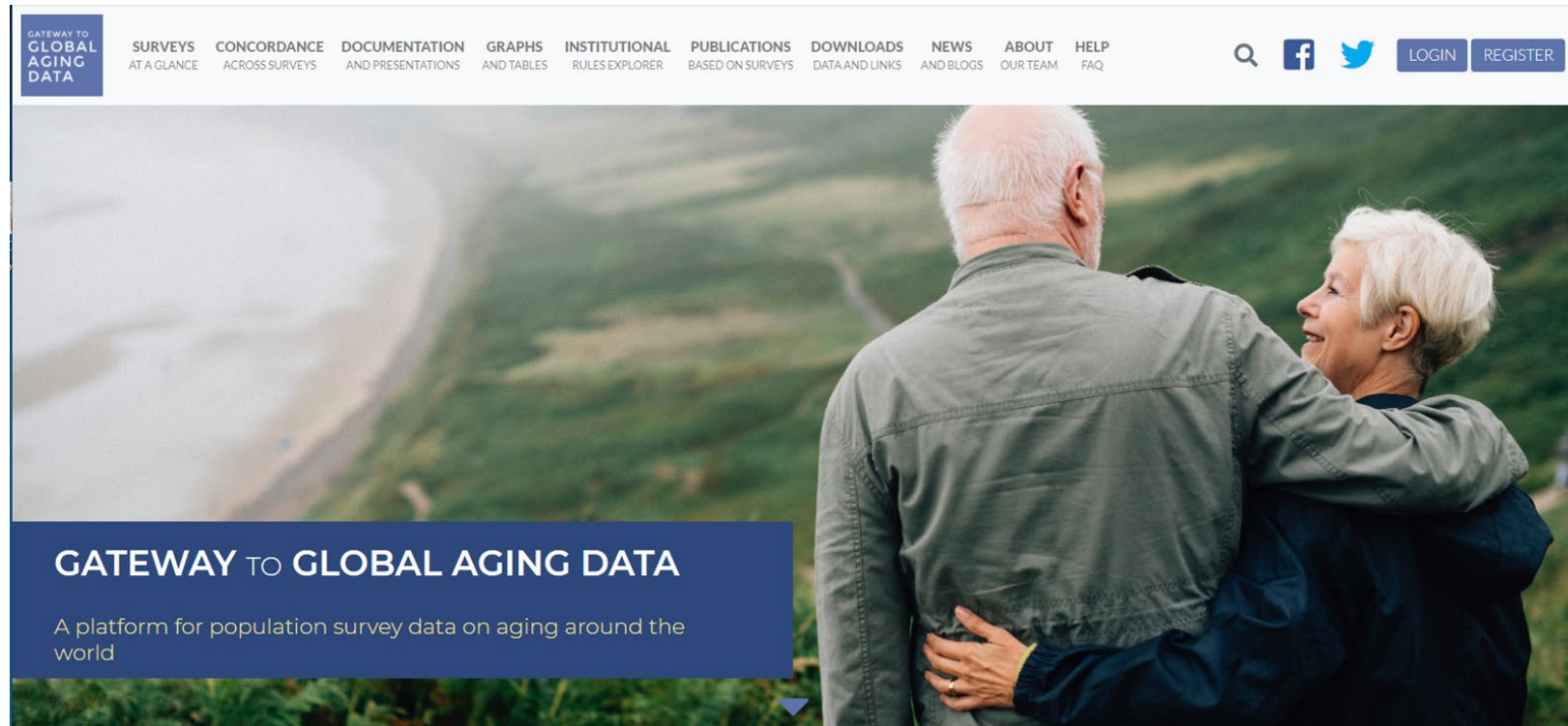
HCAP Network is a group of researchers working together to support harmonization of international studies using the Harmonized Cognitive Assessment Protocol (HCAP). HCAP was designed by the Health and Retirement Study (HRS) team in consultation with several of its international sister studies to provide a flexible but comparable instrument for measuring cognitive function among older adults around the world.

### Studies in the HCAP Network

- HRS-HCAP  
Health and Retirement Study – HCAP
- Chile-Cog
- CHARLS  
China Health and Retirement Longitudinal Study

Available from:  
<https://hcap.isr.umich.edu>

# Resources: Global HCAP data and documentation



Available from:  
<https://g2aging.org>



## Funding

- National Institute on Aging

THANK YOU