Bedside Dashboard Select Patient Select Normative Sample For Comparison Enter PIDN Age Range Education Range Gender ÷ 200 combined Select Date male only 5/21/04 (1) female only Age: 70 Education: 20 Sample size: 153 Gender: Male Attn/Executive Memory Language Visuospatial Oth # Animals/min # D-words/min # Designs/min Trails speed (lines/min) 8.63417530059

NACC Data Visualization and Analytic Tools

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ADC Panel Draft Recommendations

"Modernize and expand the computer and data analytics systems required to facilitate interactions among the ADCs and broader research community."

- "Leverage existing data and computer systems to streamline discovery and access rich ADC and related resources for samples and data"
- "Incentivize both data producers and consumers to align with the federated system"

Patient Dashboards and Structural MRI Analytics @ UCSF



DASH: Single subject cross-sectional data

Investigators can see individual patients' NACC data (cognitive, functional, neuropsychiatry, etc.) against a normative reference set

system accommodates "live" and static (published) norms sets

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DASH Enter Su	bject ID 1055	Select Date 7/16/2	015 • Age: 61 Ed	ucation: 12	Gender:	Male					
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Age Range	Educati	on Range	Gender Combined Male Only Female Only								
Sample Size: See 'N' Below *results in italics are derived from static published norms rather than from dynamic control data											
Language Learning/Memor	y Attention/Executiv	e Socioemotional									
RSMS Sensit. to Expressiv.					28	55 %ile	normal	59	Legend		
RSMS Modify Self-Pres.					34	58 %ile	normal	59			
IRI Empathic Concern					35	93 %ile	optimal	230	Impaired		
IRI Perspective Taking					15	5 %ile	impaired	230	Normal		
Behavioral Inhibition Scale					12	86 %ile	normal	50			
Social Norms: Overadhere					3	4 %ile	impaired	34	Optimal		
Social Norms: Break					4	< 1%ile	impaired	20			
Label	0% 2	5% 50%	75%	100%	score	percentile	status	N			
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Data from UDS FTLD Module (Forms C1-6F)

DASH: Single subject time-series data

Provides longitudinal patient data against backdrop of calculated "normative reference range" from control data over age span



DASH: Single subject structural MRI calculation

W-maps of atrophy compared to healthy controls matched for age/sex

Single Subject	Atrophy IL ×	the second s			Kate		x
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		-12.0662	Right Caudate	14 17	-3 -	6.73123	
		-11.1595	Right Accumbens Area	11 17	-6 -	5.19597	
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		-9.59286	Right Putamen	23 9	-2 -	4.23268	
		-9.44585	Right Ent entorhinal area	21 -2	-35 -	5.35585	
	CON MARK TON	-9.17576	Right TMP temporal pole	26 8	-42 -	4.54806	
		-8.78098	Right Amygdala	29 -5	-23 -	5.17217	
	2 4 2 3	-8.77631	Right MTG middle temporal gyrus	56 2	-26 -	2.52946	
		-8.2213	Right SMC supplementary motor cortex	8 20	56 -	2.98162	
		-8.18323	Right	29 -8	-23 -	2.85124	

DASH: Single subject diagnostic dashboards based on key ROIs from structural MRI

Alzheimer's bvFTD i	nfvPPA PSP	svPPA													
·											_				
L angular gyrus						1.39	40 %ile	normal	281	Legen	d				
L Hippocampus						0.59	32 %ile	normal	281						
L middle temporal gyrus						2.45	41 %ile	normal	281	Impaired	1				
L posterior cingulate gyrus						0.83	64 %ile	normal	281						
L precuneus						2.13	65 %ile	normal	281	Normal					
R angular gyrus						1.51	19 %ile	normal	281	Optimal					
R Hippocampus									1	1 .	-				
R middle temporal gyrus			Alzheimer's	bvFTD n	ifvPPA PS	P svF	PPA								
R posterior cingulate gyrus															
R precuneus			L anterior cin	igulate gyrus								0.65	2 %ile	impaired	
Labol	0%	25%	L anterior ins	ula								0.61	5 %ile	impaired	
Luber	070	2370	L Caudate									0.19	< 1%ile	impaired	
			L orbital infer	ior frontal gyrus								0.16	23 %ile	normal	
			L temporal p	ole								1.23	29 %ile	normal	
			Directories ei									0.44	40/3-	increased	
			R anterior cli	ngulate gyrus								0.41	< 1%ile	impaired	
			R anterior ins	sula								0.47	< 1%ile	impaired	
			R Caudate									0.15	< 1%ile	impaired	
			R orbital infe	rior frontal gyrus								0.11	< 1%ile	impaired	
			R temporal p	ole								0.90	< 1%ile	impaired	
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Brainman: Structural MRI analysis

A. Established library of preprocessed brain images



B. Scripted analytic utilities create new data set linking images with investigator's data



C. Investigator identifies variables in their dataset they want to analyze, script automatically generates voxel-based morphometry results



selected by investigator

Brainman: Data upload/linking to MRI data

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Brainman: Group-based quantitative MRI analysis

Test Variable : RSMS_Tot2 Controls : tiv, ageAtScan, MagnetStrength, MMSETot, SEX

Original VLSM2 Output

Linux :/mnt/macdata/projects/knect/images/jobs/vlsm/Kate_Rankin/July2_RSMStot/RSMS_Tot2_1047 Windows :R:\projects\knect\images\jobs\vlsm\Kate_Rankin\July2_RSMStot\RSMS_Tot2_1047 Template Location:Template Download

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10.1354	Right Putamen		18	13	-12
9.74951	Right Inf Lat Vent		28	-8	-18
9.72692	Right Basal Forebrain		21	7	-16
9.69325	Right Ent entorhinal area		21	1	-16
9.68184	Right Amygdala		28	-5	-21
9.58119	Right Hippocampus		28	-7	-21
9.55557	Right POrG posterior orbita	al	24	9	-16



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Questions

- Should the NACC provide services like this?
 - to ADCs to view their own UDS data?
 - to investigators who make data requests of the NACC to view and analyze UDS data?
- How would the costs of setting up/maintaining such tools be covered?
- Are there other existing visualization or analytic tools like this that should be considered and could be adapted to use NACC data?

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