

Early Detection - EDoN

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Our Strategy

The next 10 years will see a revolution in:

TREATMENT

People will be able to access new life changing treatments for the diseases that cause dementia

DIAGNOSIS

Earlier and more accurate diagnosis and detection of the diseases that cause dementia, for improved access to research and treatments

PREVENTION

Fewer people will develop the diseases that cause dementia

Detection to Diagnosis

- Pathology Biomarkers

- Positron Emission Tomography (PET) Scans
- Cerebrospinal Fluid (CSF) Lumbar
- Blood & Plasma
- Retinal Imaging

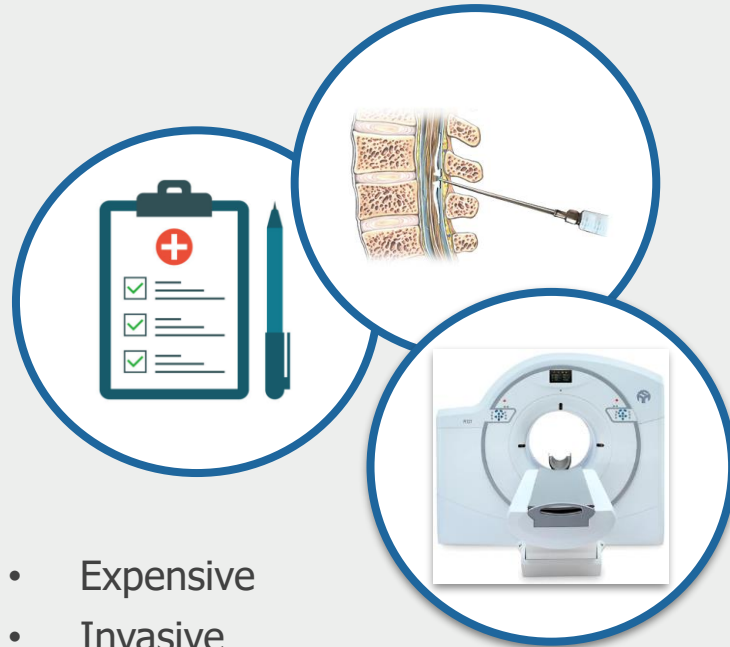
- Amyloid A β
- Tau
- Neurofilament Light (NfL)
- Glial Activation
- α -synuclein

- Cognitive Function
Digital Biomarkers

- Working Memory
- Episodic Memory
- Executive Function
- Information Processing
- Speech and Language

- Genetic Risks
e.g. APOE4 genotype

Unlocking Digital Detection



- Expensive
- Invasive
- Require Infrastructure



- Sensitive
- Inexpensive
- Non- Invasive
- Scalable

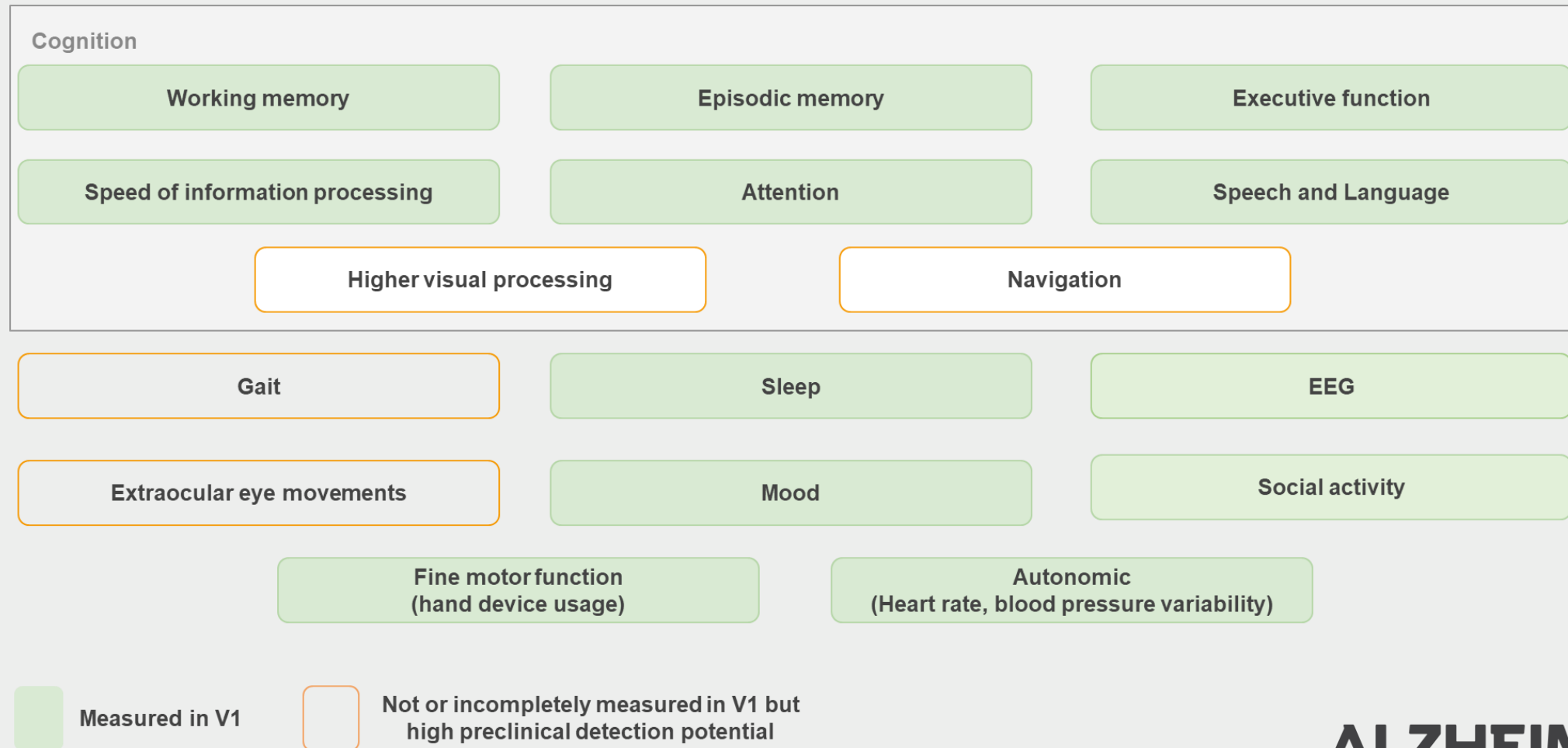
Paper to Digital to AI

- Digitisation of Paper & Pen Tests
- Facilitates greater sensitivity and specificity.
- Linus Health Clock Test:
"A digital upgrade to a long established standard"
- Enables Voice and Language Models
ADDF Speech Consortium.
- Cambridge Cognition & Winterlight Labs
"Monitoring cognitive impairment through speech"
- R&D and Clinical Trials as initial target markets

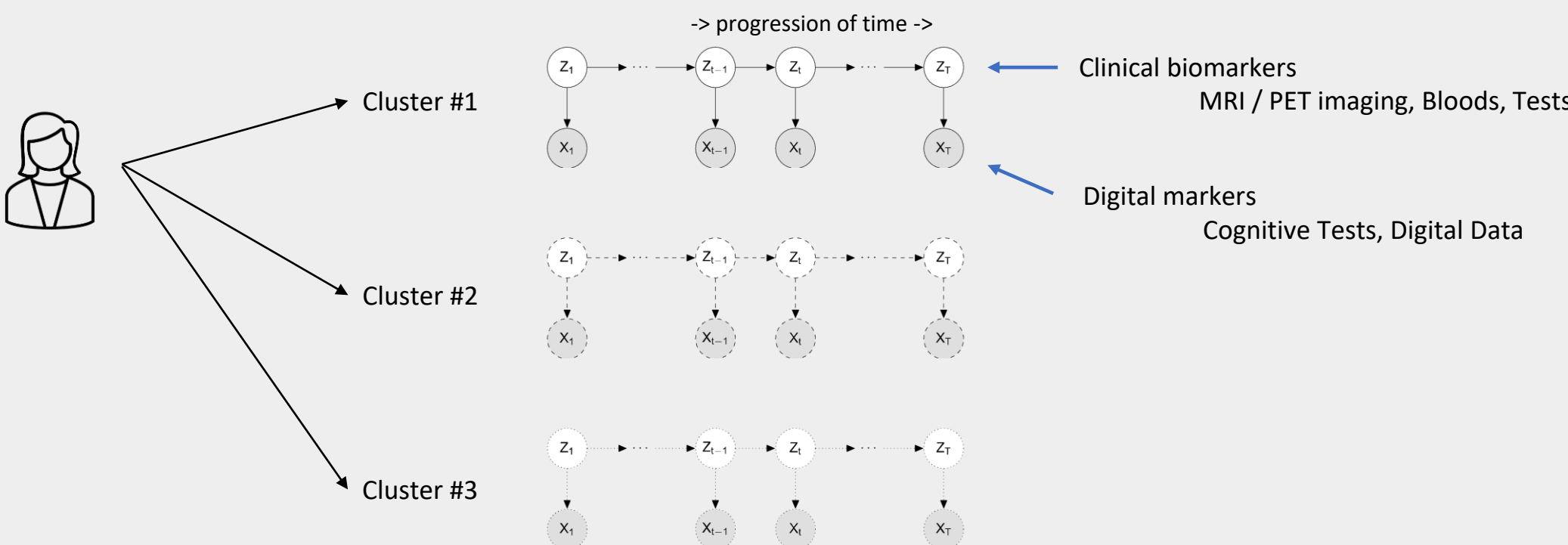


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Clinically Relevant Digital Data



Retrospective Analysis



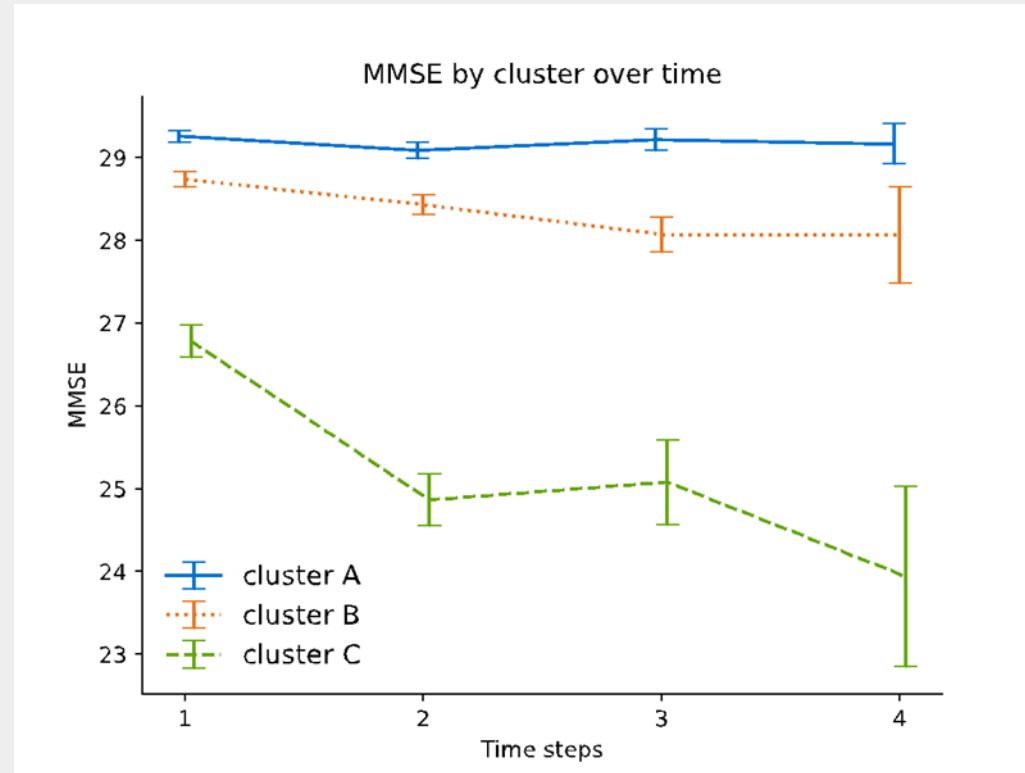
1. Cluster selection
(using mixture)

2. Cluster-dependent dynamics
(using linear Gaussian state space models)



Predicting Trajectories

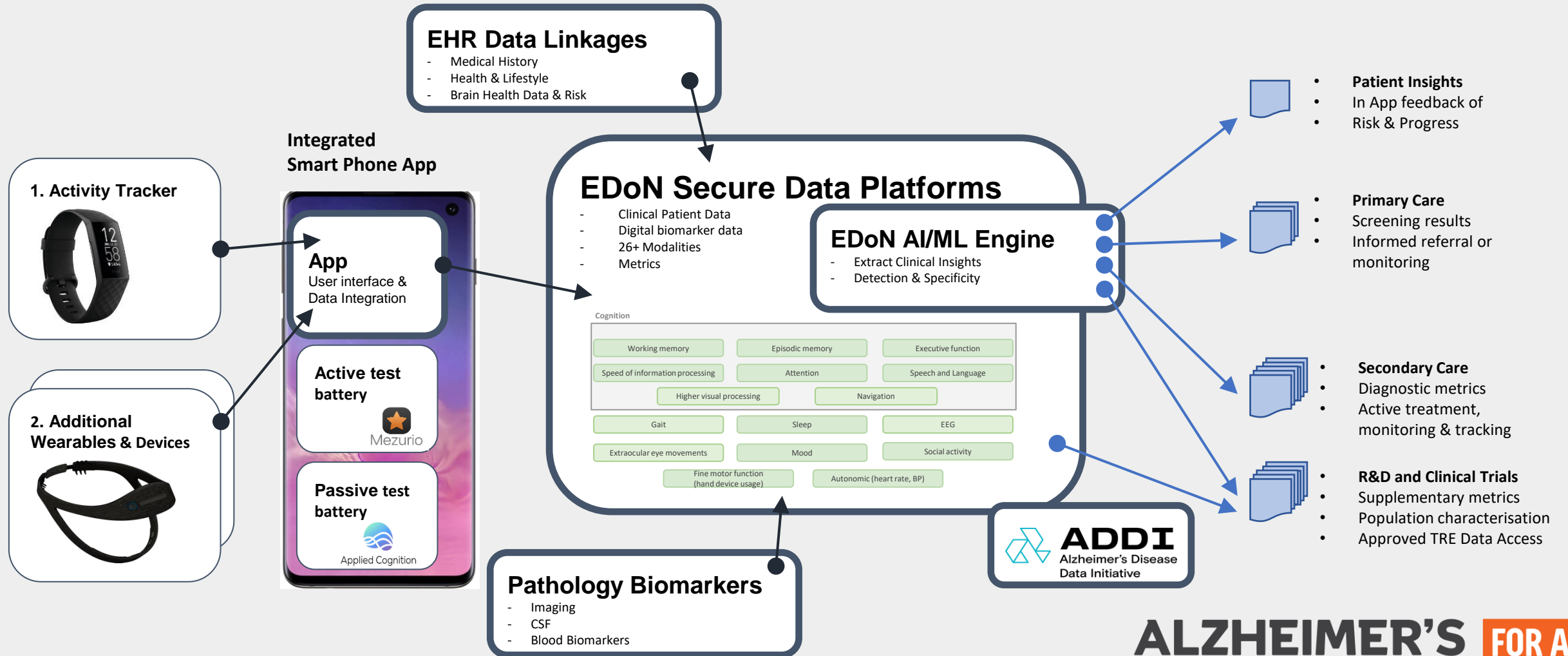
cluster	diagnosis	training coverage	testing coverage
A	CN	58%	58%
	sMCI	40%	40%
	MCI_tbd	0%	0%
	pMCI	1%	1%
	AD	1%	1%
B	CN	41%	38%
	sMCI	47%	49%
	MCI_tbd	2%	3%
	pMCI	2%	2%
	AD	9%	8%
C	CN	18%	21%
	sMCI	26%	26%
	MCI_tbd	3%	2%
	pMCI	2%	3%
	AD	51%	48%



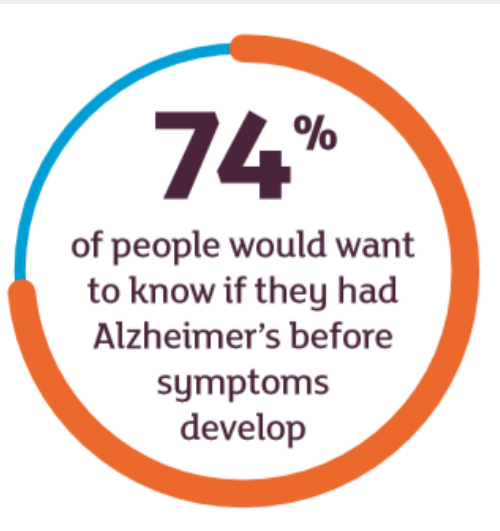
Legend:

CN = cognitively normal, **sMCI** = stable MCI, **MCI_tbd** = MCI with <3 years follow-up, **pMCI** = progressive MCI (converts to AD w/in 3 years), **AD** = Alzheimer's

Data Management



People do want to know...



Almost $\frac{3}{4}$ of the public want early diagnosis.

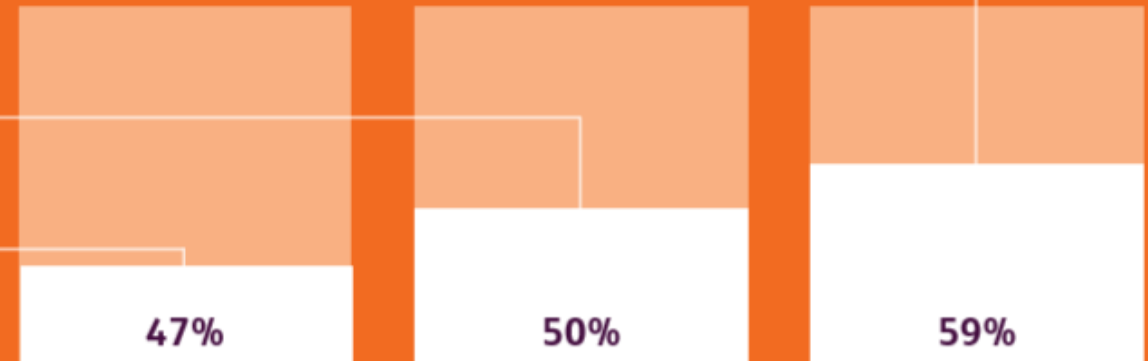
38% said they would want to know 15 years before.

Reasons why people agree (%)

It allows people to plan for their future

It can allow people to access treatments that could help

It can allow people to access care services that could help



These details are from ARUK Dementia Attitudes Monitor



THANK YOU

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