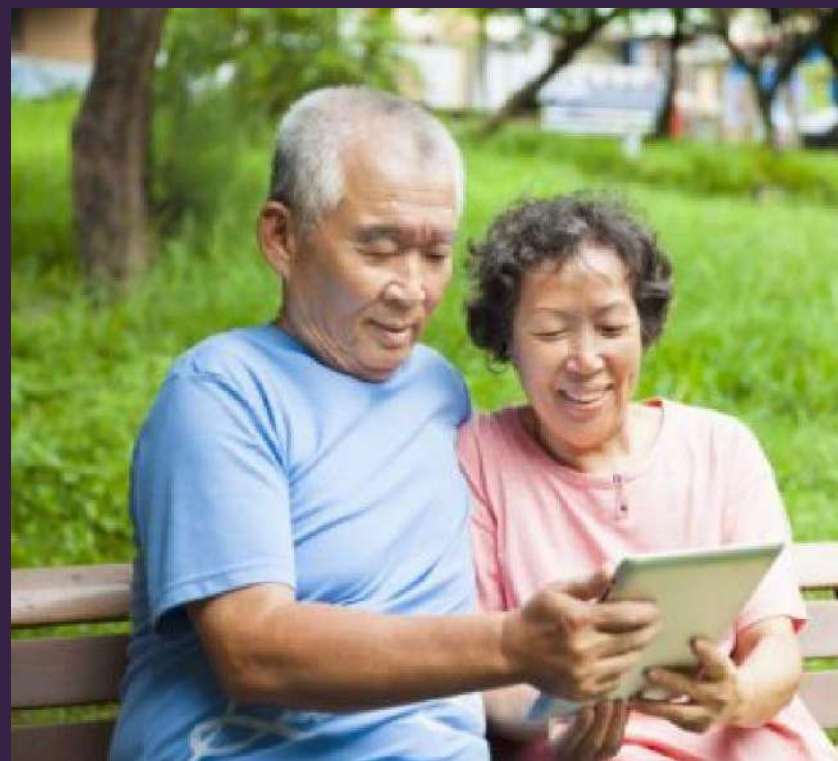


PMYP CONFERENCE 2020

Thai Brain Health Assessment (Thai BHA)

A Tablet-based Cognitive Testing Tool for Thai Older Adults



Suchanan Kanjanapong, MD

Prince Mahidol Youth Program Scholar 2017

Today's Overview



- Project Background
- Thai Brain Health Assessment:
A Tablet-based Cognitive Testing Tool
for Thai Older Adults
- Connecting The Neurons



2021

**Thailand will reach
'Aged Society'
where 20% of
population will be
over-60-year-old
adults**

Why do we need to take action on dementia?

- **Dementia**

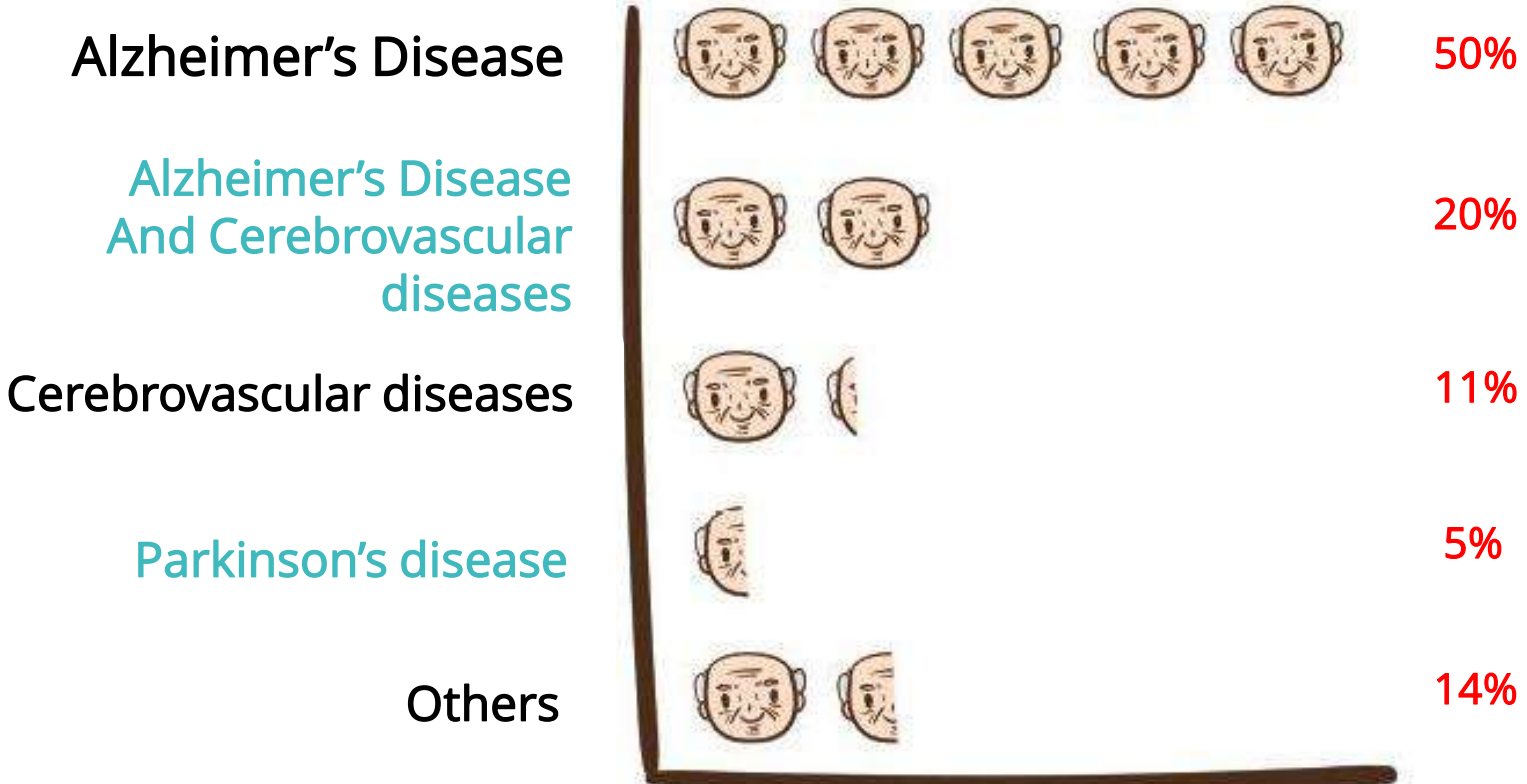
A syndrome due to disease of the brain in which there is disturbance of multiple higher cortical functions, including memory, thinking, orientation, comprehension, calculation, learning capacity, language, and judgement. **These changes were severe to affect a person's function in daily life.**

- **Mild Cognitive Impairment**

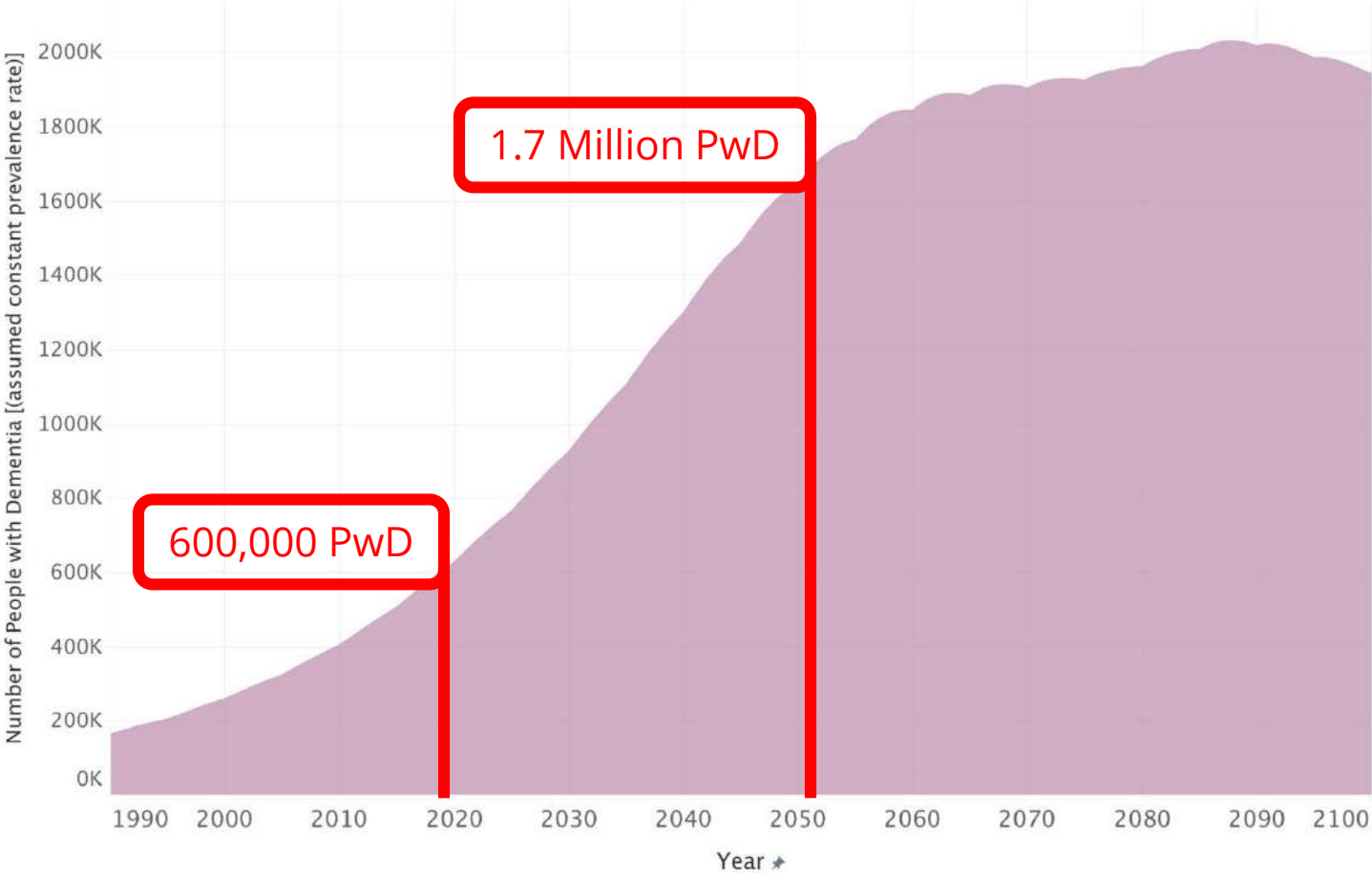
These changes do not affect a person's function in daily life.

Why do we need to take action on dementia?

- Causes of Dementia



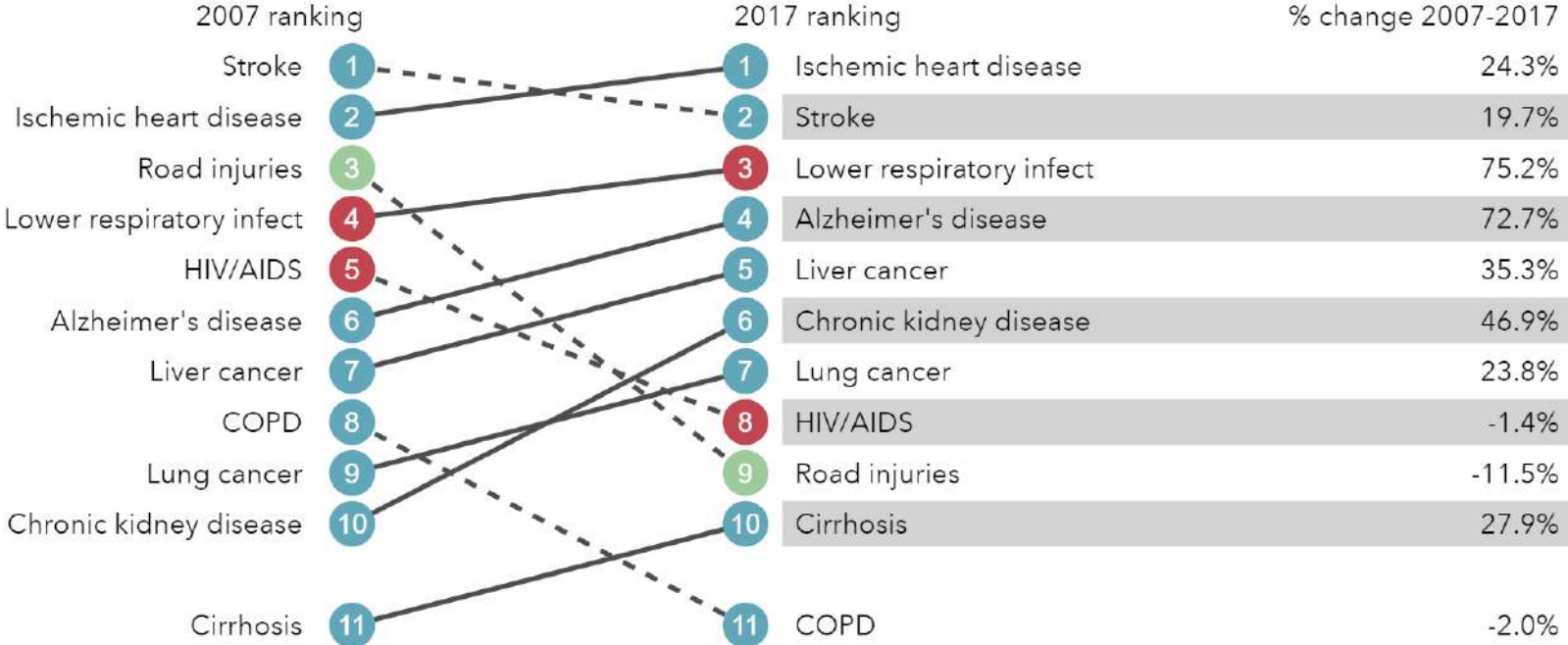
Predicted numbers of People with Dementia (PwD) in Thailand



Why do we need to take action on dementia?

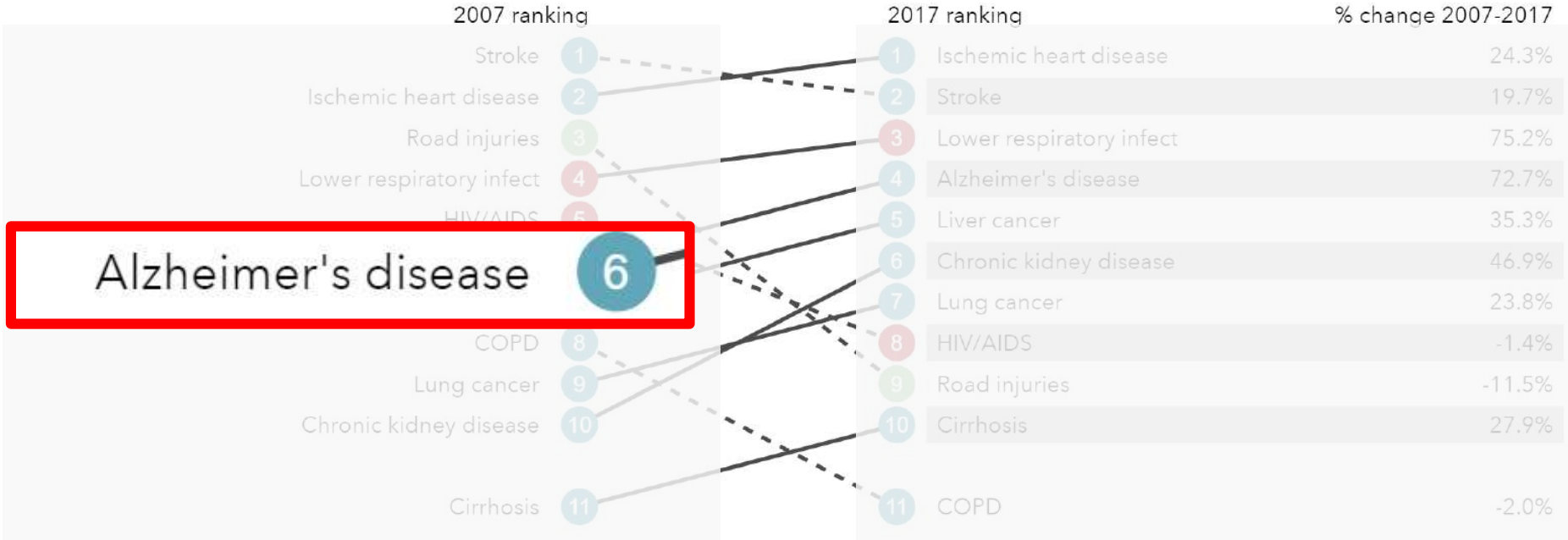


What causes the most deaths?



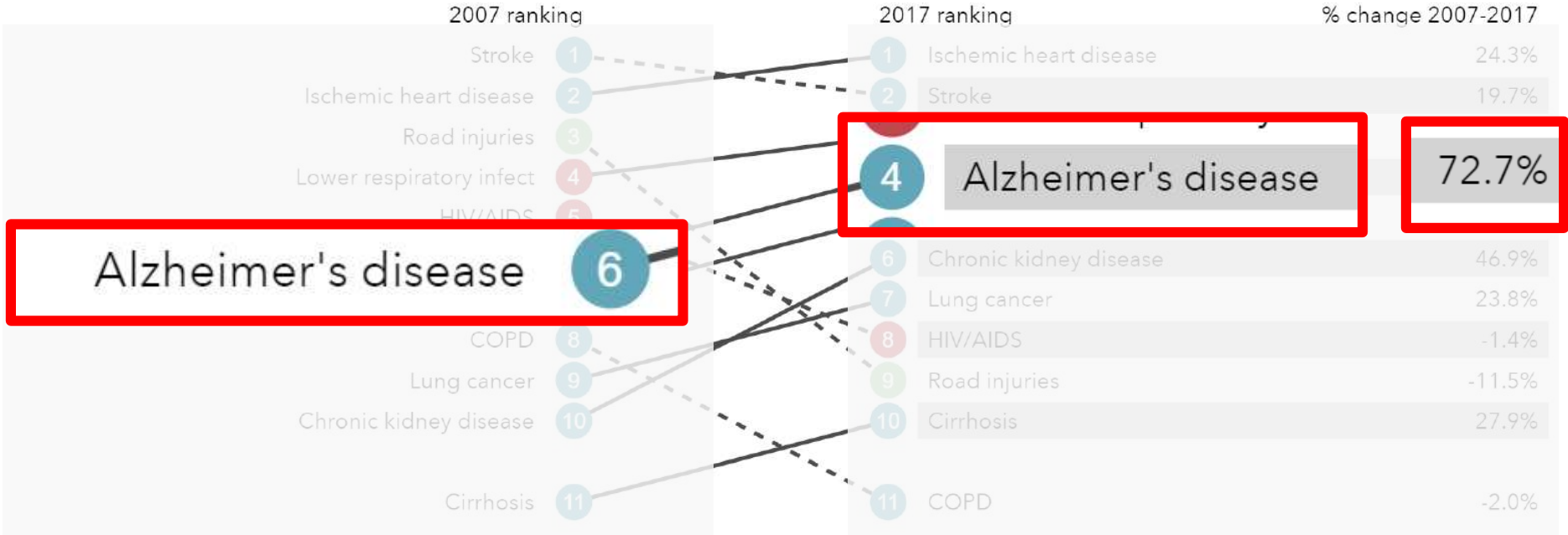
Why do we need to take action on dementia?

What causes the most deaths?



Why do we need to take action on dementia?

What causes the most deaths?



600,000

Thai people affected by dementia

~10%

*Thai people with Dementia received
proper diagnosed*

Behind Dementia Diagnostic Gap



- Public awareness on dementia
- Limited numbers of available experts
- The suitable tools for cognitive testing

**Dementia is not part of
normal aging.**

Status of Cognitive Testing in Thailand



- Over 40 cognitive tests were developed and studied in Thai population.
- Many widely-used tests have been licensed and need permission to administrate.
- There has not been a validation on novel computerized cognitive testing tool in Thai population.

Computerized Cognitive Testing Tool



- Cover a wide range of cognitive domain
- Minimize the ceiling and floor effects
- Precisely record accuracy and speed of response which bring higher sensitivity in detecting subtle changes in cognition
- Standardized delivery and test administration

Suitable cognitive screening tool



- Cover different cognitive domains enough to detect impairment
- Balance with the time of administration and expertise needed for administration process
- User friendly

Today's Overview



- Project Background:
- Thai Brain Health Assessment:
A Tablet-based Cognitive Testing Tool
for Thai Older Adults
- Life at Memory and Aging Center

Thai Brain Health Assessment



UCSF

Brain Health Assessment

- A tablet-based cognitive testing tool which shows high accuracy in detecting neurocognitive disorders.
- Works well in older adults
- Accuracy shows:
 - 100% Sensitivity to dementia
 - 84% Sensitivity to Mild Cognitive Impairment (MCI)

JAG 2018. Possin et. al.

The Brain Health Assessment for Detecting and Diagnosing Neurocognitive Disorders.

BRIEF METHODOLOGICAL REPORTS

The Brain Health Assessment for Detecting and Diagnosing Neurocognitive Disorders

Katherine L. Possin, PhD, Tacie Moskowicz, BA,* Sabrina J. Erlhoff, BA,* Kirsten M. Rogers, BA,* Erica T. Johnson, BA,* Natasha Z. R. Steele, MPH,* Joseph J. Higgins, MD,† Jordan Stiver, BA,* Andrea G. Alioto, MS,* Sarah T. Farias, PhD,‡ Bruce L. Miller, MD,* and Katherine P. Rankin, PhD**

BACKGROUND/OBJECTIVES: Brief cognitive screens lack the sensitivity to detect mild cognitive impairment (MCI) or support differential diagnoses. The objective of this study was to validate the 10-minute, tablet-based University of California, San Francisco (UCSF) Brain Health Assessment (BHA) to overcome these limitations.

DESIGN: Cross-sectional.

SETTING: UCSF Memory and Aging Center.

PARTICIPANTS: Older adults (N = 347) (neurologically healthy controls (n = 185), and individuals diagnosed with MCI (n = 99), dementia (n = 42), and as normal with concerns (n = 21)).

MEASUREMENTS: The BHA includes subtests of memory, executive function and speed, visuospatial skills, and language and an optional informant survey. Participants completed the Montreal Cognitive Assessment (MoCA) and criterion-standard neuropsychological tests. Standardized structural 3T brain magnetic resonance imaging was performed in 145 participants.

RESULTS: At a fixed 85% specificity rate, the BHA had 100% sensitivity to dementia and 84% to MCI; the MoCA had 75% sensitivity to dementia and 25% to MCI. The BHA had 83% sensitivity to MCI likely due to AD and 88% to MCI unlikely due to AD, and the MoCA had 58% sensitivity to MCI likely AD and 24% to MCI unlikely AD. The BHA subtests demonstrated moderate to high correlations with the criterion-standard tests from their respective cognitive domains. Memory test performance correlated with medial temporal lobe volumes; executive and speed with frontal, parietal, and basal ganglia volumes; and visuospatial with right parietal volumes.

CONCLUSION: The BHA had excellent combined sensitivity and specificity to detect dementia and MCI, including MCI due to diverse etiologies. The subtests provide efficient, valid measures of neurocognition that are critical in making a differential diagnosis. *J Am Geriatr Soc* 66:150–156, 2018.

Key words: mild cognitive impairment; cognitive screening; primary care

Early, accurate diagnosis of neurocognitive disorders benefits individuals with the disorders and their families and is recommended as part of high-quality health care.¹ A diagnosis prompts an evaluation for reversible causes, guides the selection of appropriate symptomatic treatments, allows individuals and families to access supportive interventions and focuses plans for future care needs. The diagnostic process typically starts in primary care with a concern that the individual, a family member, or a clinician expresses or with a positive cognitive screen² and is completed in primary care or with a specialist.

Cognitive impairment and dementia are not diagnosed in more than half of cases. One barrier is the precision of brief cognitive screens used in primary care settings; although usually adequate for detecting dementia, they often fail to detect mild cognitive impairment (MCI) with high specificity.^{3,4} Most screens emphasize the detection of memory dysfunction, a hallmark of Alzheimer's disease (AD), but neglect other domains such as visuospatial and executive functions.⁵ Non-AD diseases, most commonly Lewy body disease, frontotemporal lobar degeneration,

Thai Brain Health Assessment



- Consist of 4 subtests
- Take 10 minutes to administrate
- Delivers the test in standardized manner
- Offer alternative forms to reduce practice effects

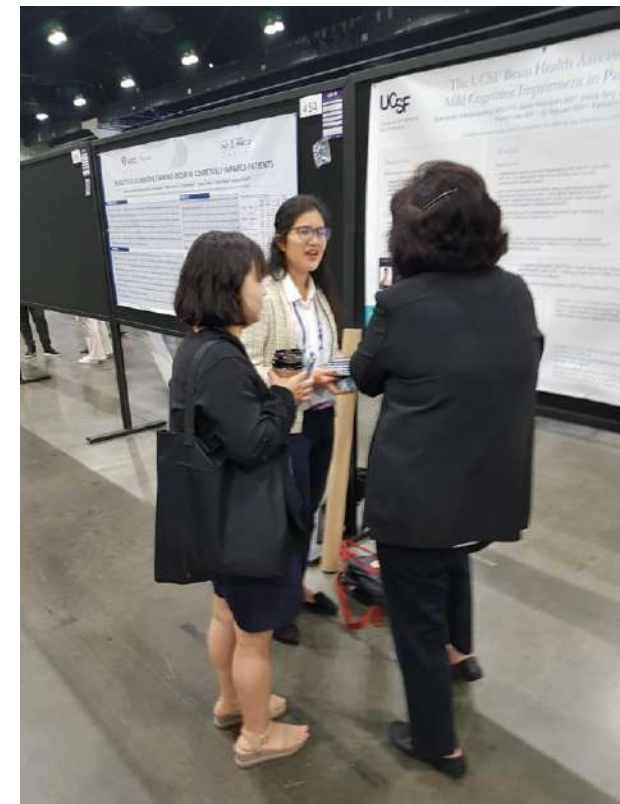
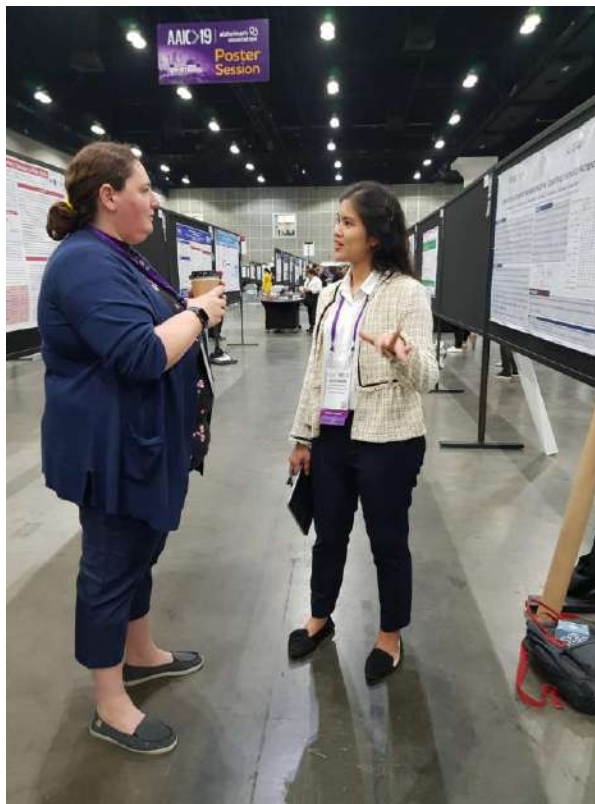
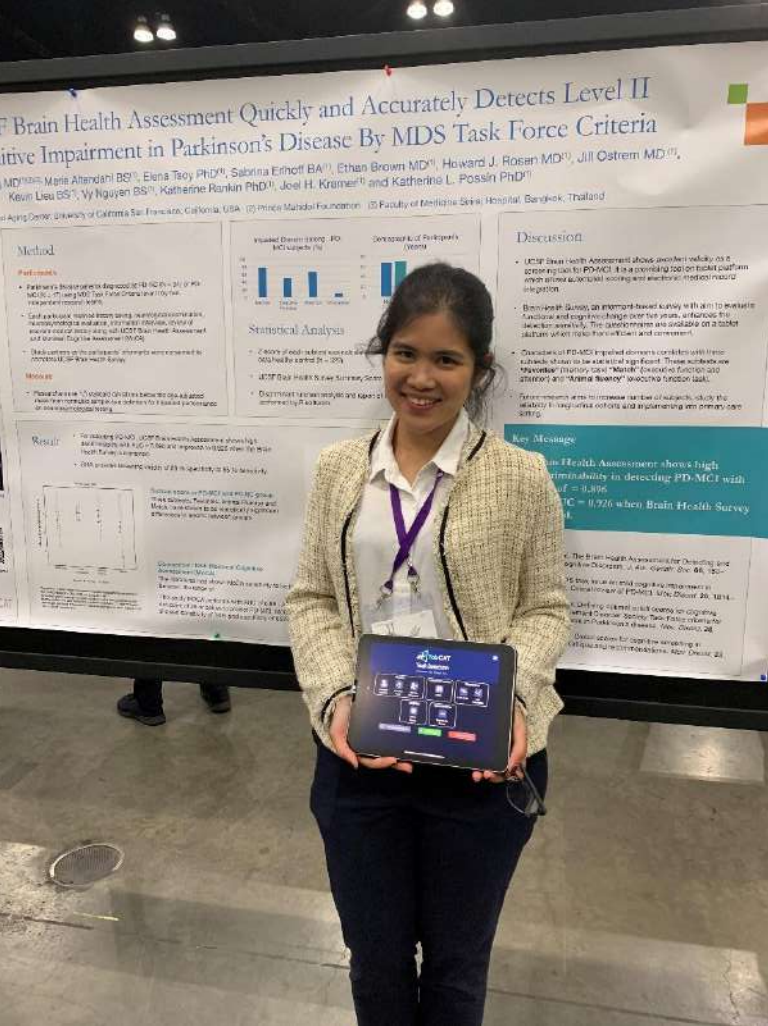
Thai Brain Health Assessment



- Support the use in area where experts are limited
- Offer automatic scoring system
- Support the integrating with EMR, large cohort database domestically and internationally

Thai BHA Project Process

- *Context Adaptation
and Tool Development*
- *Accuracy validation
and Quality Assessment*
- *Community
and Cohort Validation*
- *Implementation
in Clinical Practice*



Poster Presentation on

'UCSF Brain Health Assessment Quickly and Accurately Detects Level II Mild Cognitive Impairment in Parkinson's Disease By MDS Task Force Criteria'

Preliminary Results



- Brain Health Assessment shows high accuracy in detecting mild cognitive impairment among patients with Parkinson's disease
- Most impairment was shown on executive function task "Match" which is supported by literature on cognition deficit found in people with Parkinson's disease
- This shows that tablet-based test performed well in patients with motor symptoms

Connecting the Neurons



“Cognitive Assessment in Diverse Population”

- 12 Countries
- Learn from each other through the global dementia experts who kindly share their experience on cognitive assessment



People live for many years after the onset of symptoms of dementia. With appropriate support, many can and should be enabled to continue to engage and contribute within society and have a good quality of life

Time to act is NOW.

**DEMENTIA IS
A PUBLIC
HEALTH
PRIORITY**



World Health Organization, 2012

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- Computerized Cognitive Testing Tool aims to overcome the diagnostic gap and large data collection.
- It increases accuracy and sensitivity in testing.
- Promising result in determining cognitive impairment in Thai population.



Thank you for your attention!



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