



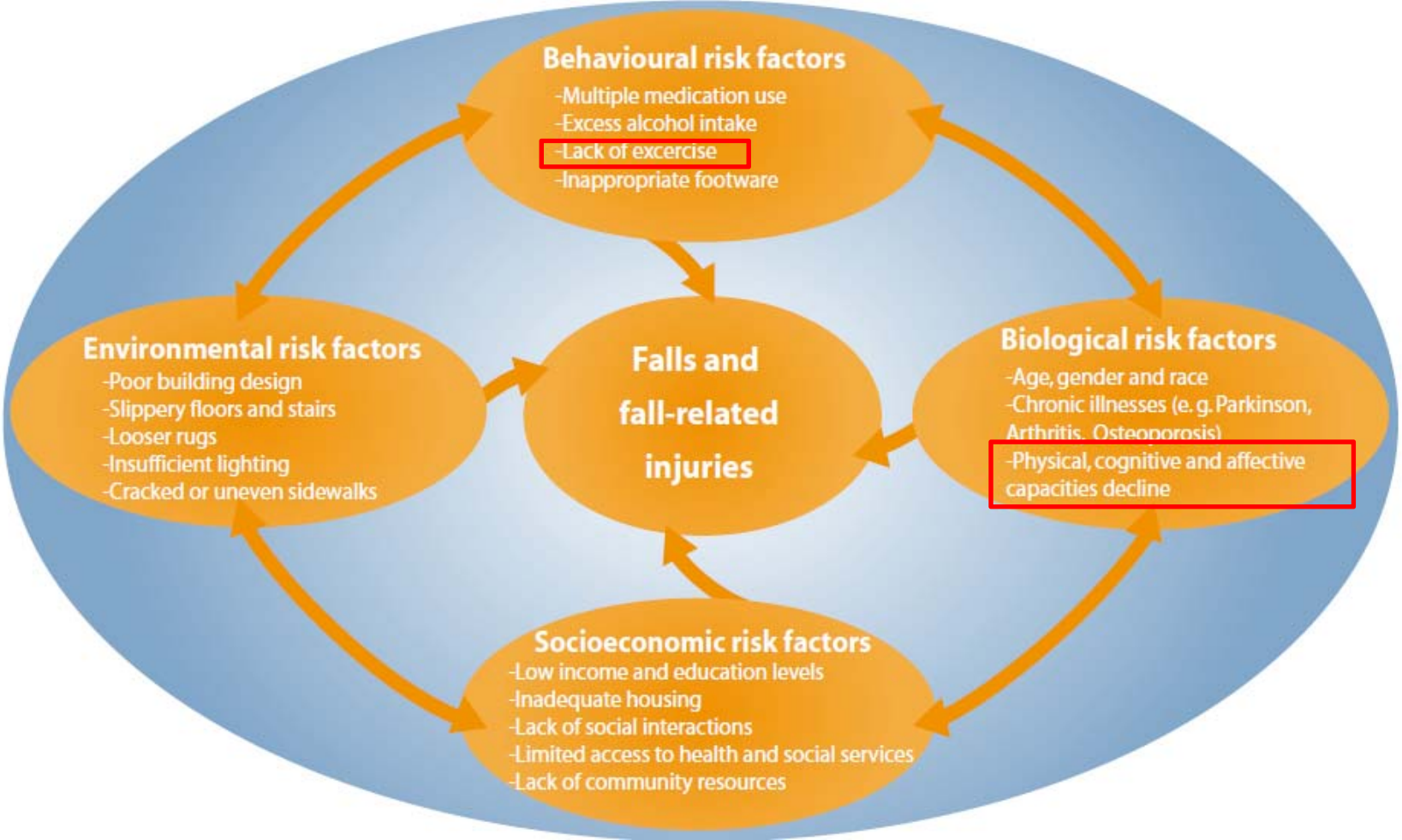
National Center for  
**Geriatrics & Gerontology**  
Section of Physical Functioning Actionvation

# 健康な高齢化のために – 高齢者のための在宅型・地域密着型テクノロジー

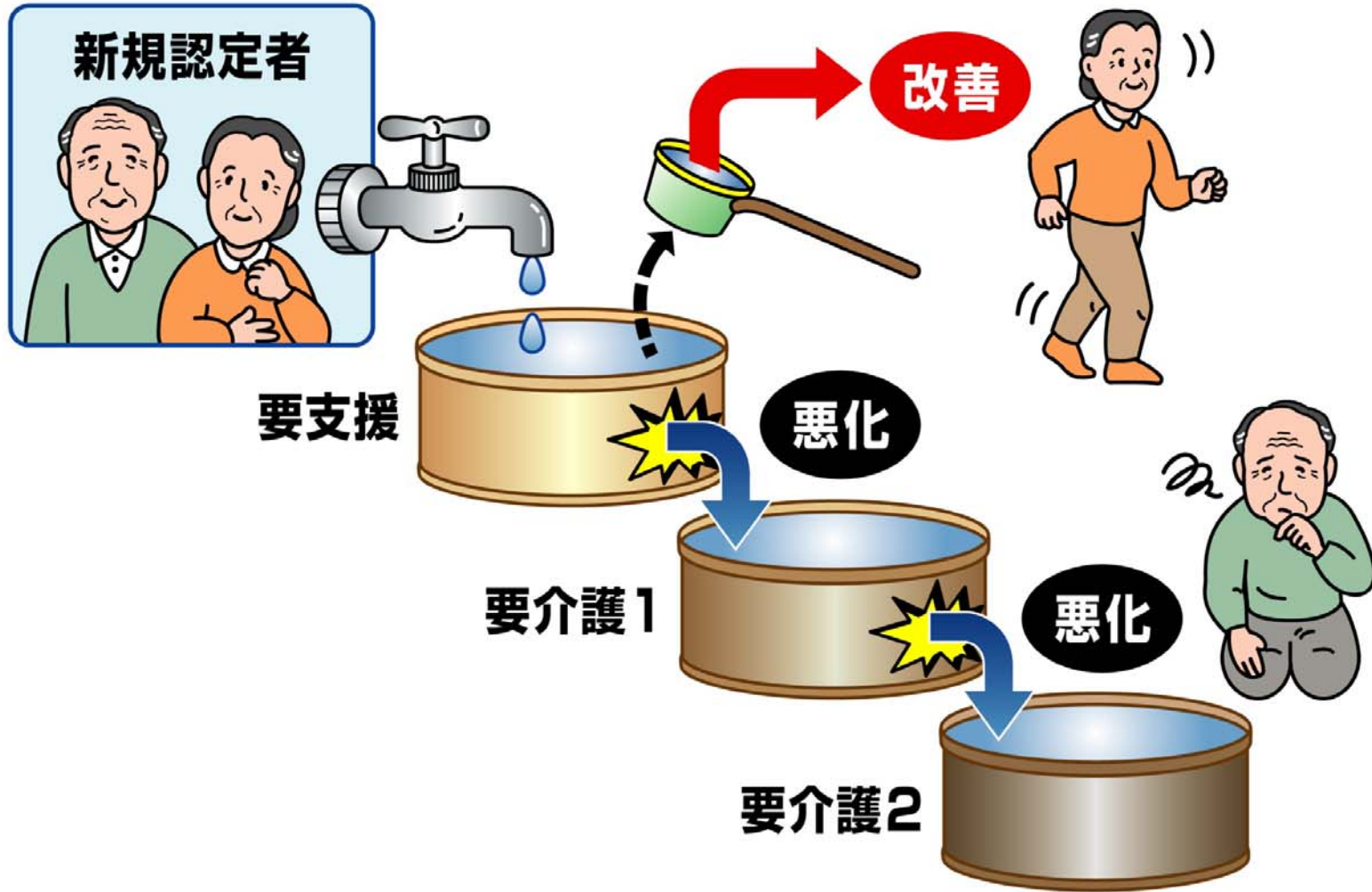
朴 眩泰、島田 裕之、鈴木隆雄  
国立長寿医療研究センター

**NCGG CGSS**

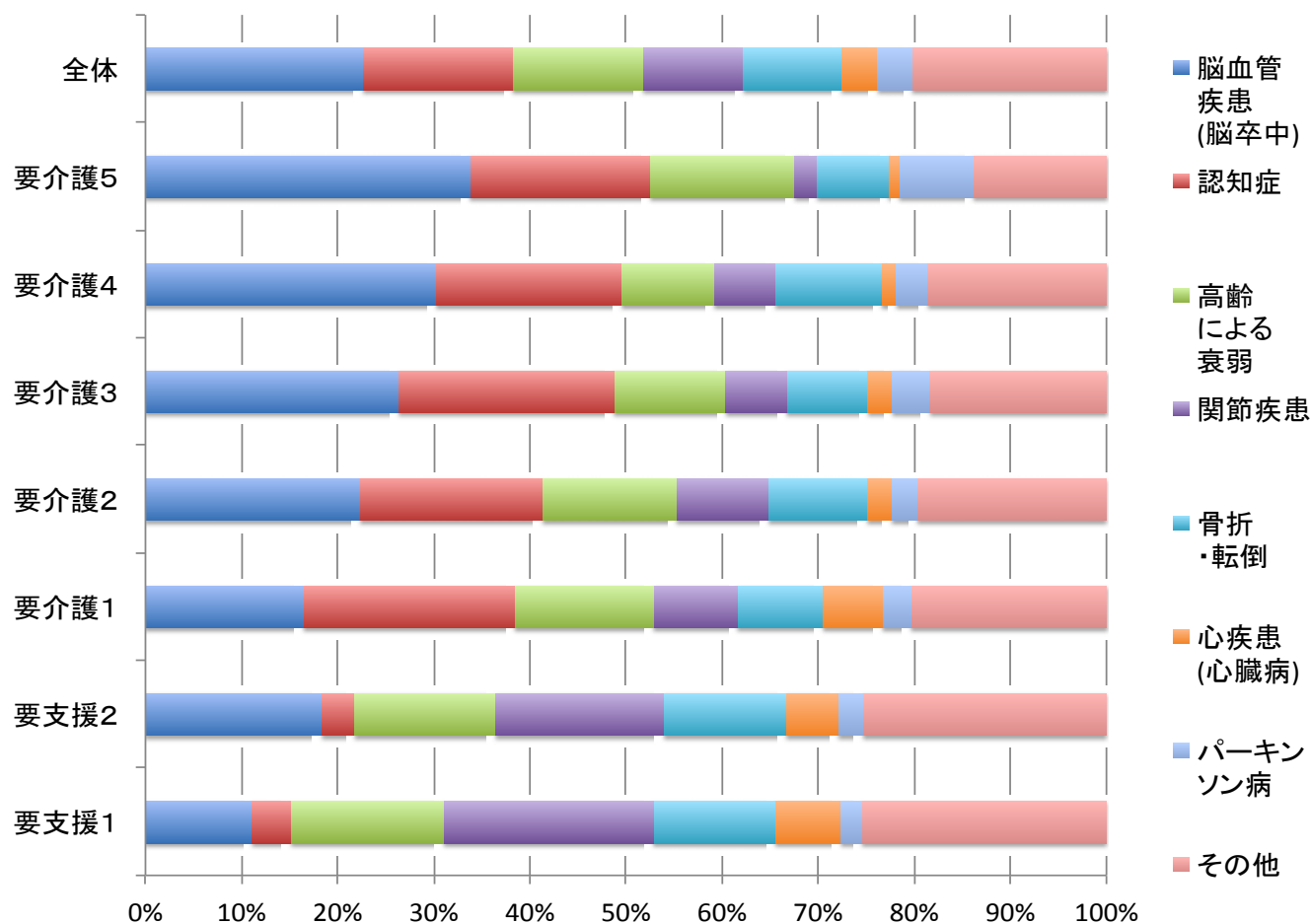
# Risk factor model for falls in older age



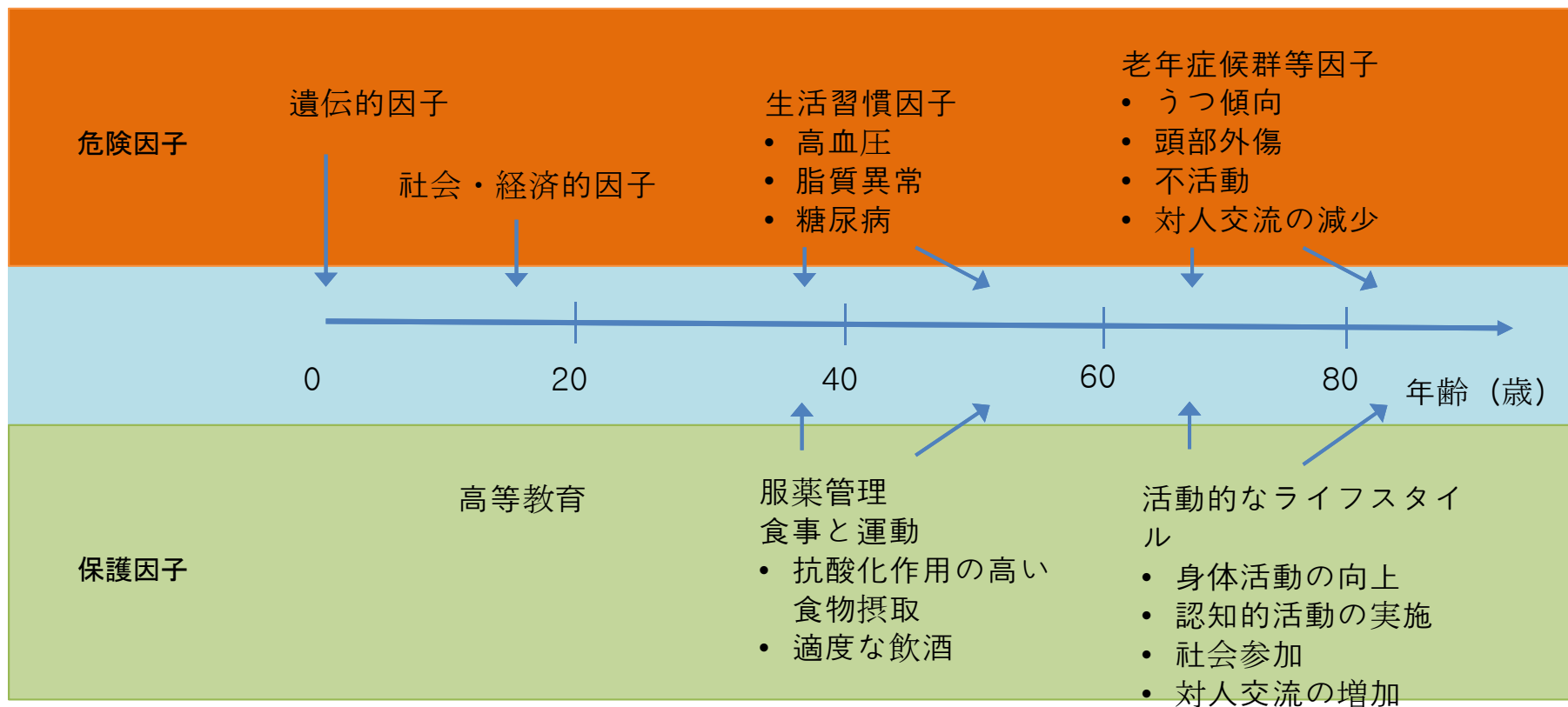
# 効果的な介護予防のためのポイント



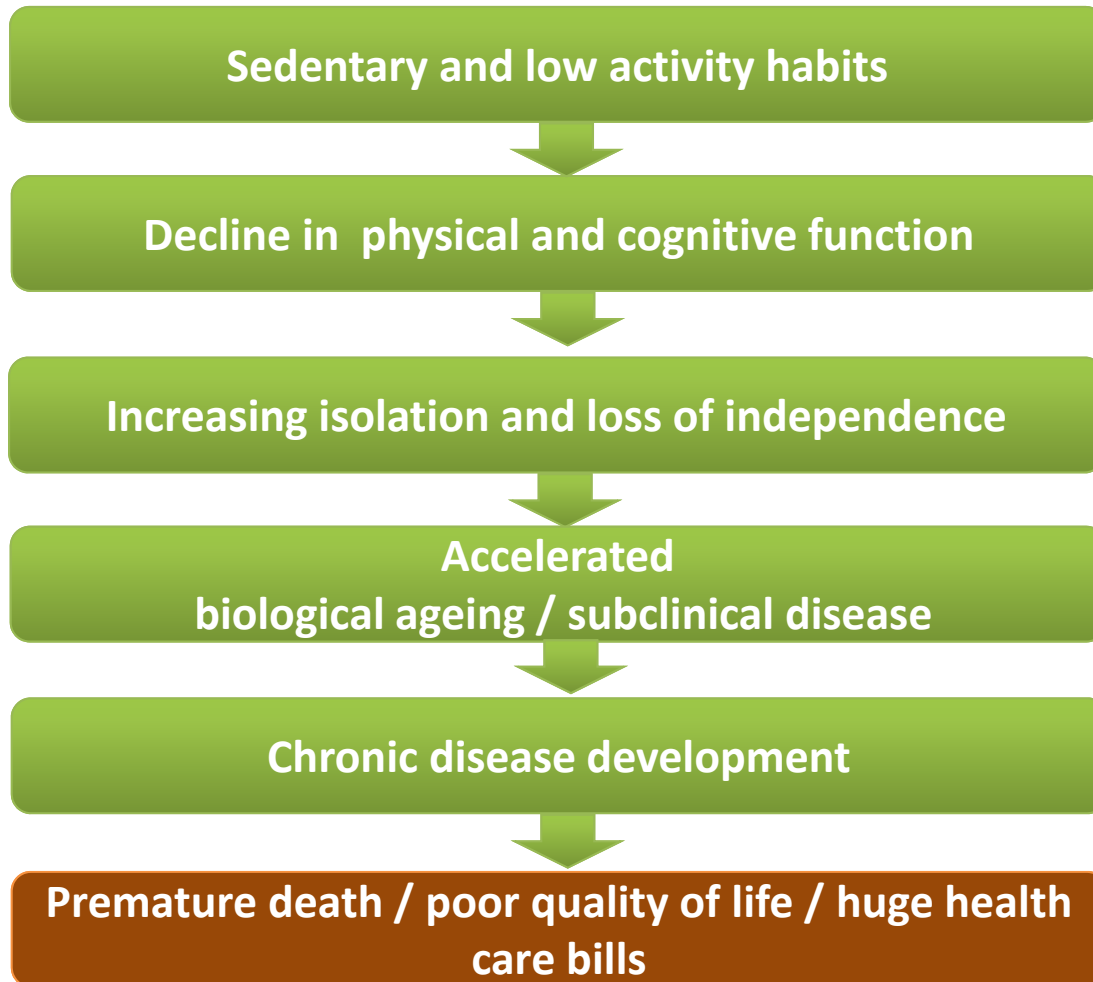
# 要介護認定の要因と重症度



# 認知症の危険因子と保護因子

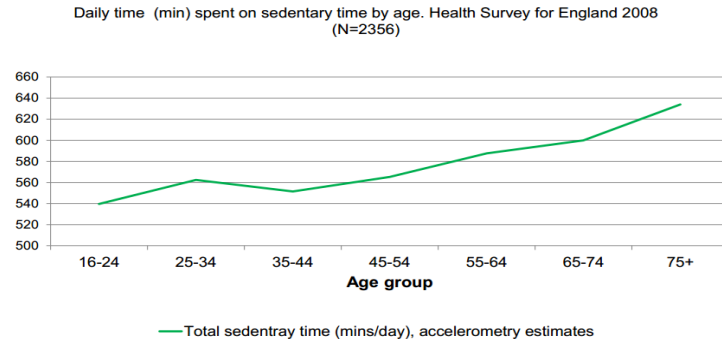


# 加齢による機能低下

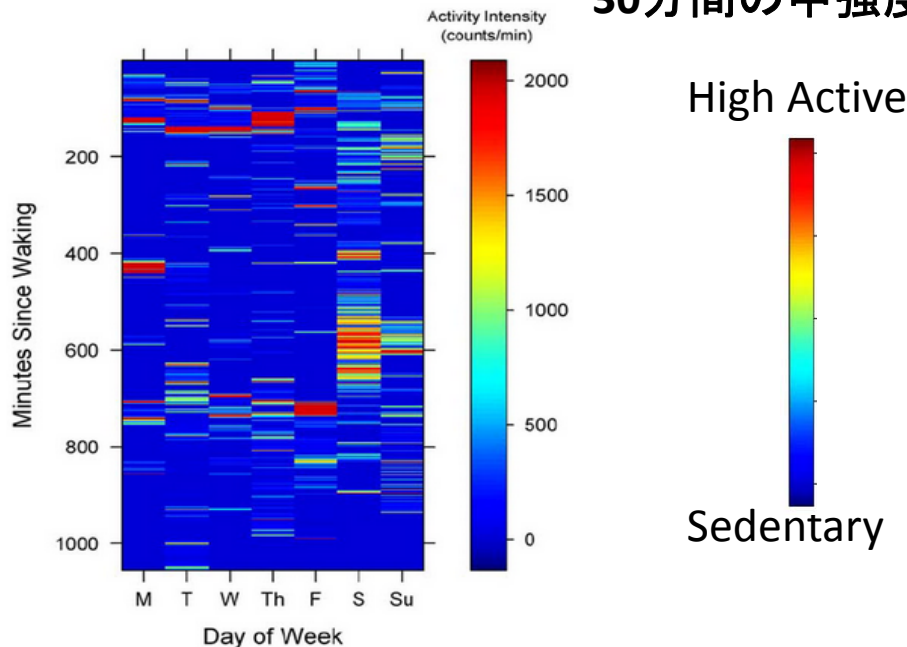


# 身体活動と座業時間

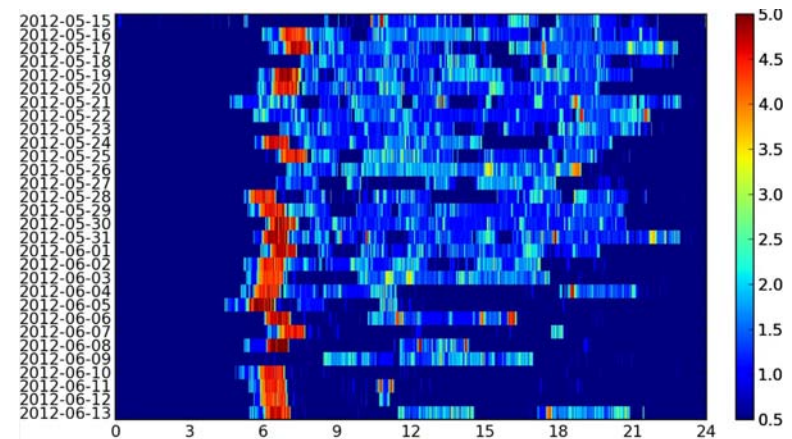
Physical activity expended at the workplace has dropped dramatically Sedentary behaviour (sitting time) increases with age



## 30分の中強度活動+70%の座業時間



## The spectrum of the monthly activity



Unpublished data

# 心身の機能評価システム

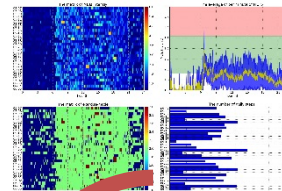
日常身体活動評価



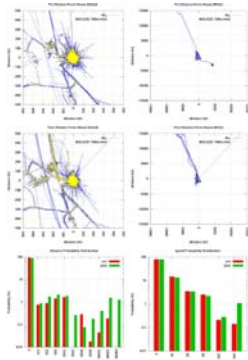
国立長寿医療研究センター



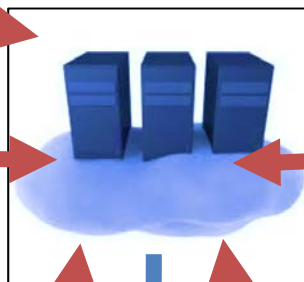
24時間身体活動パターン



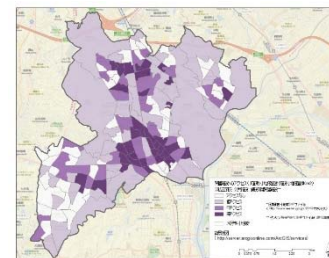
位置情報解析システム



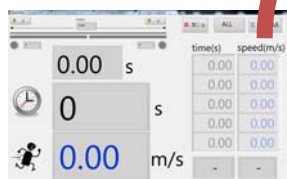
インハウ解析システム  
+  
クラウドシステム



地理情報解析システム



赤外線歩行速度評価システム



地域全体での認知症予防  
の取り組み

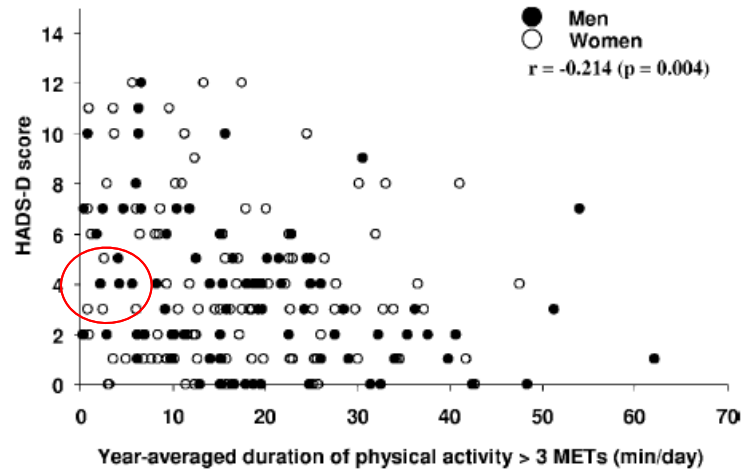
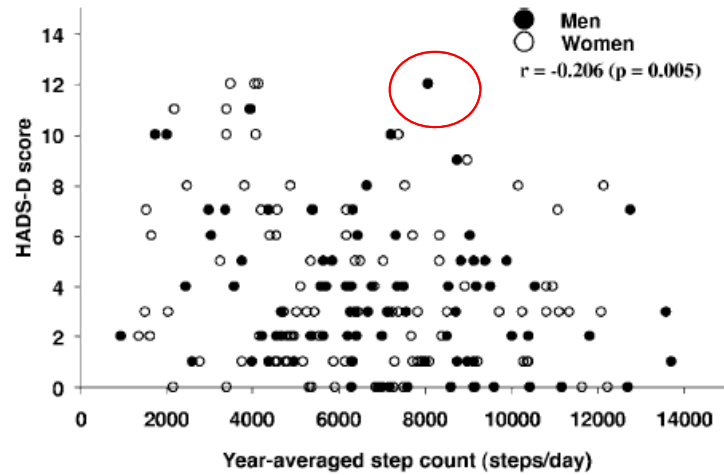


認知機能評価システム



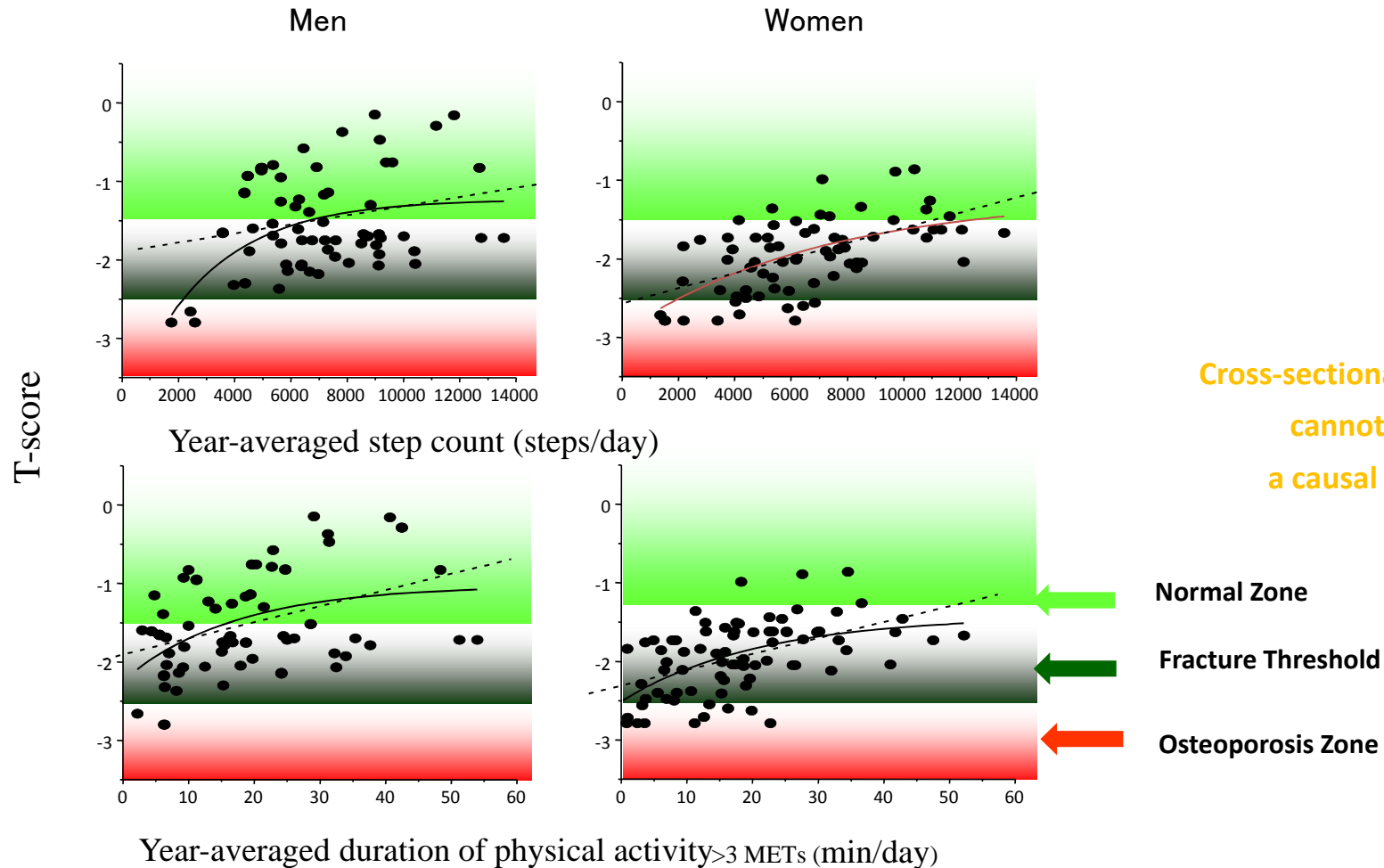


# 身体活動とうつ

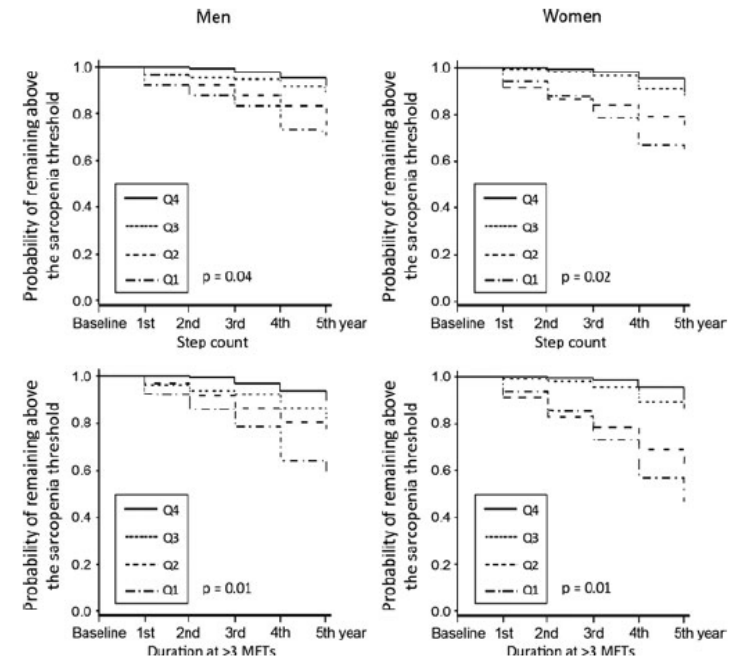
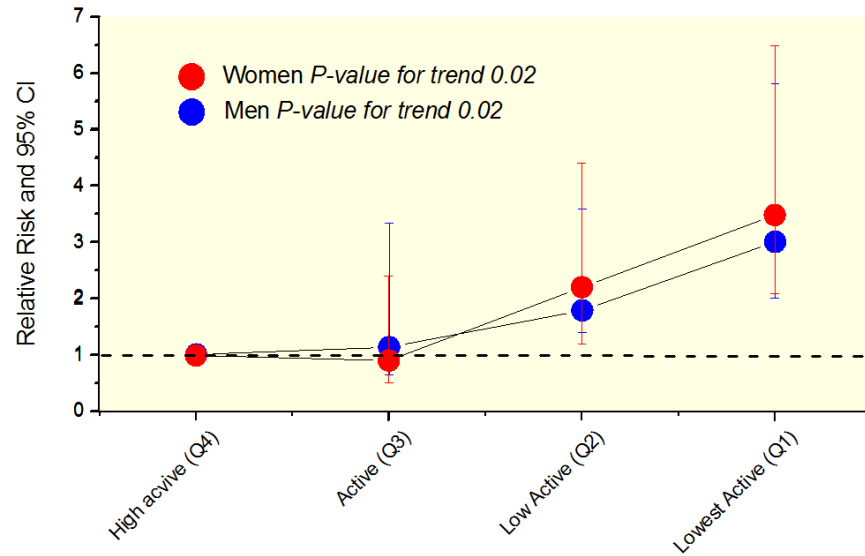


# 身体活動と骨粗しょう症

The minimum physical activity criteria for better bone health for older adults:  
>7,000 steps/day and/or >15 min/day at an intensity >3 METs



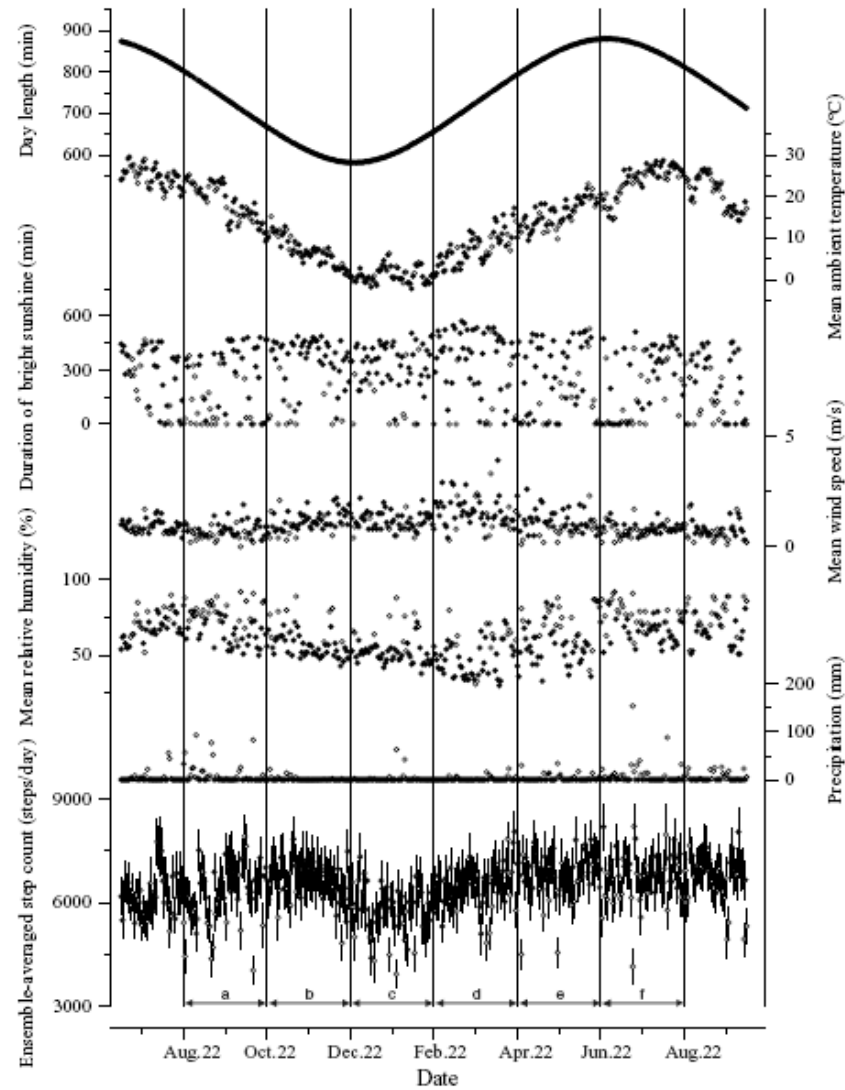
# 身体活動とサルコペニア



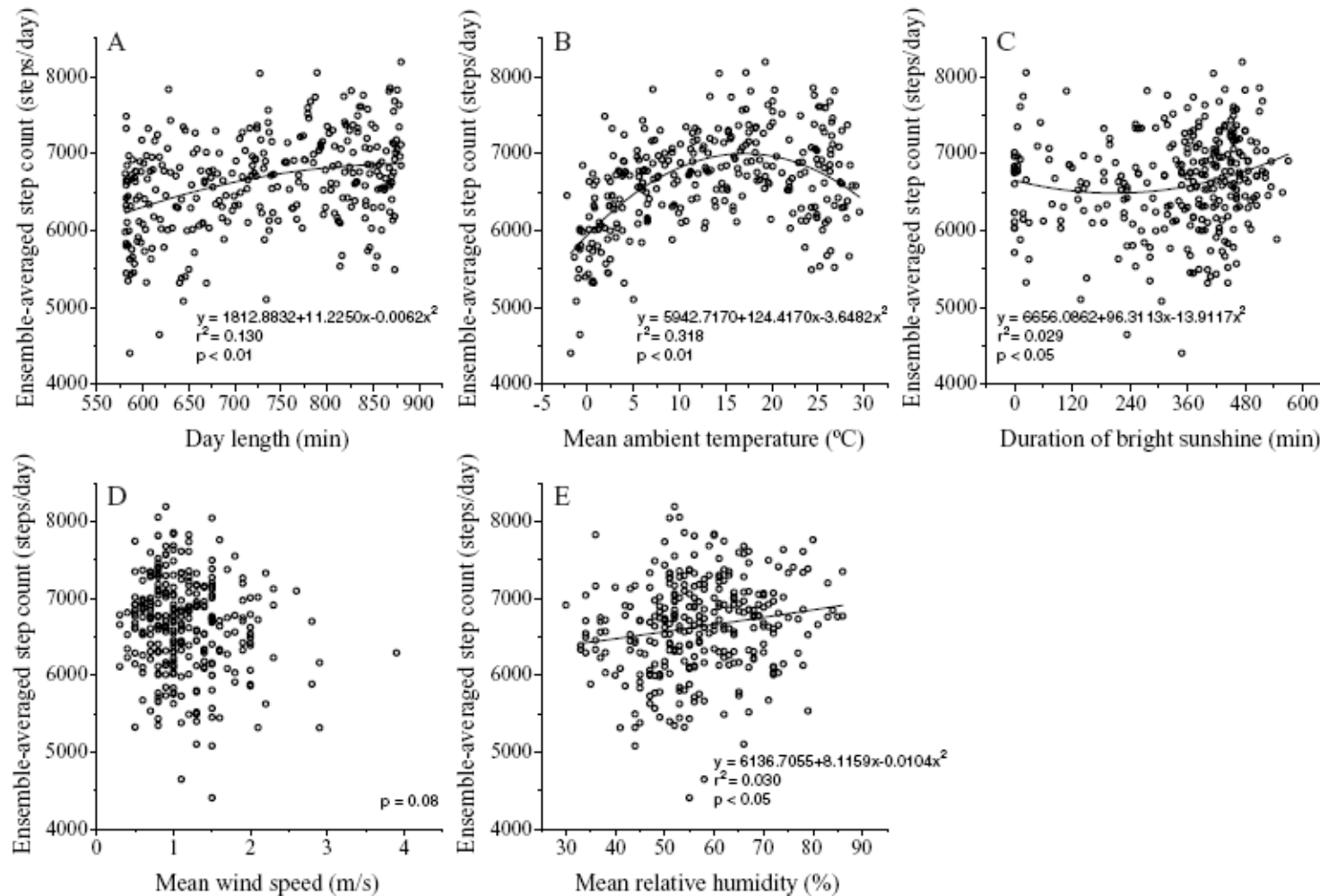
Risk of Appendicular Lean Tissue Mass Index Falling Below the Arbitrary Sarcopenia Threshold over the 5-Year Study, Classified According to Quartile (Q1–Q4) of Habitual Physical Activity

Probabilities that elderly subjects initially in good muscle health will remain above our arbitrary sarcopenia threshold over a 5-year follow-up, classified by quartile (Q1–Q4) of habitual physical activity.

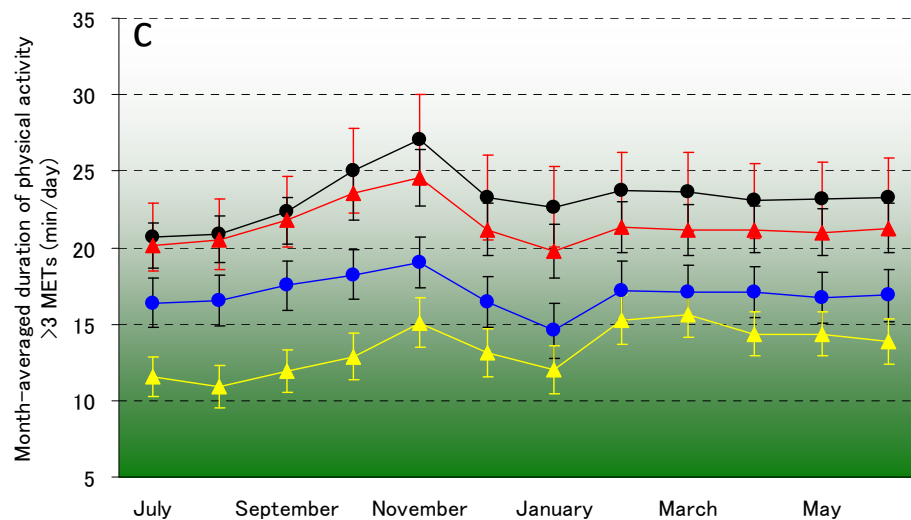
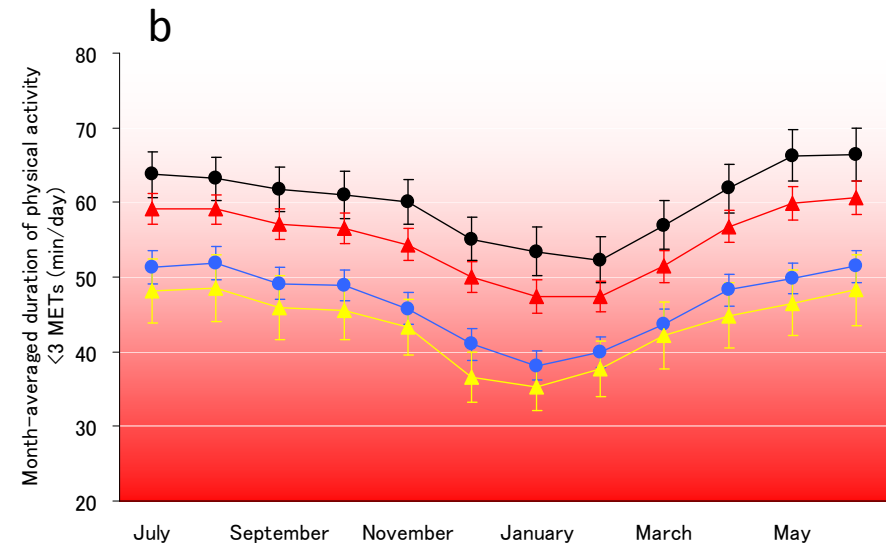
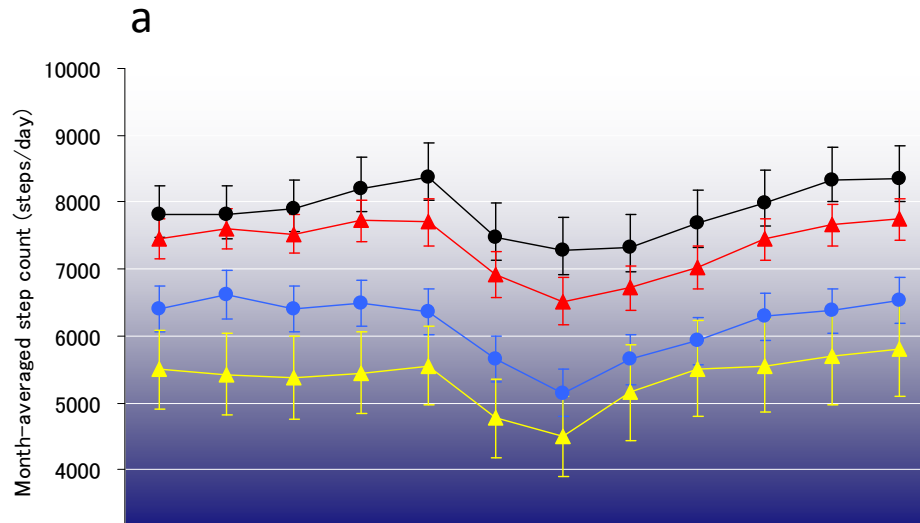
# 身体活動と環境要因



# 身体活動と環境要因



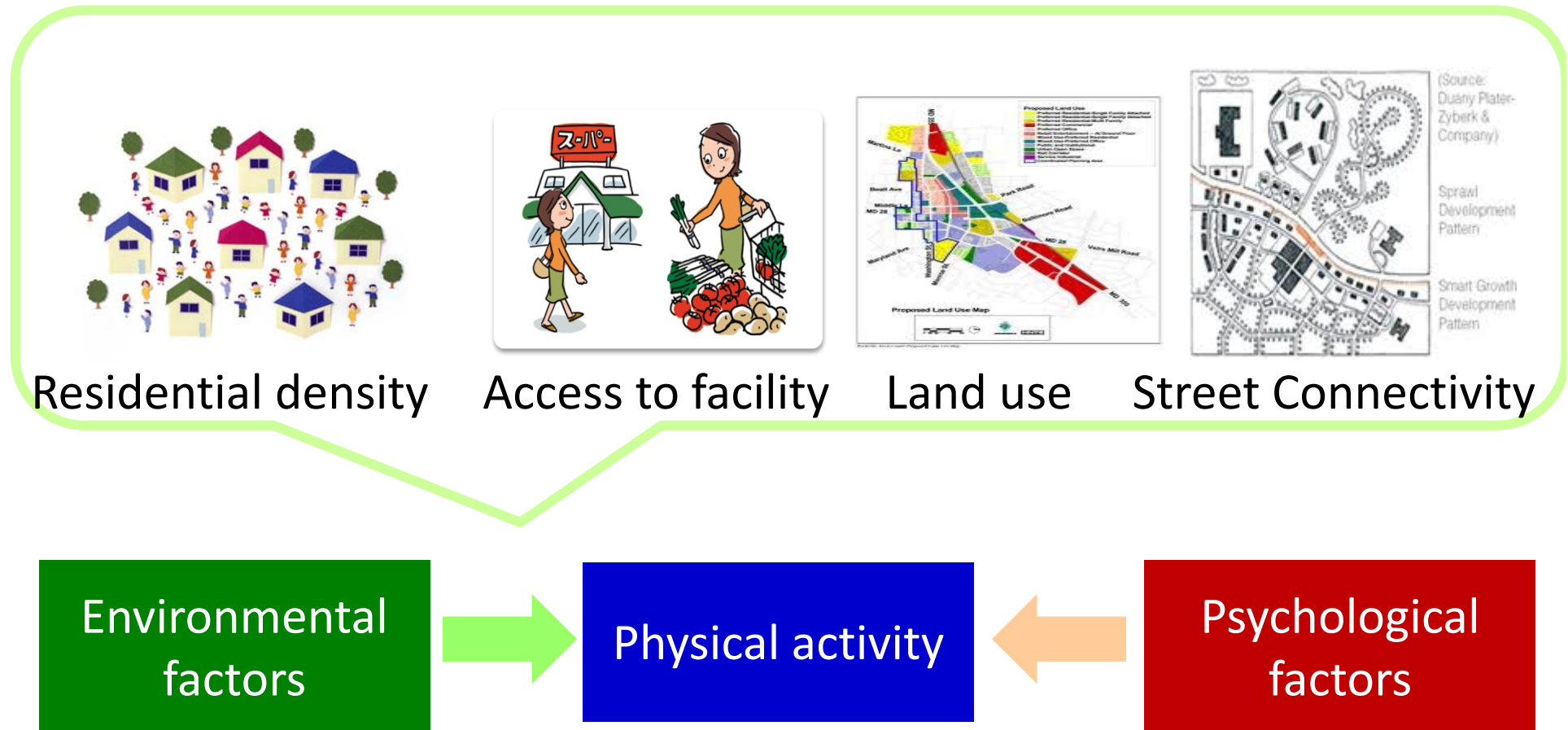
# 身体活動と環境要因



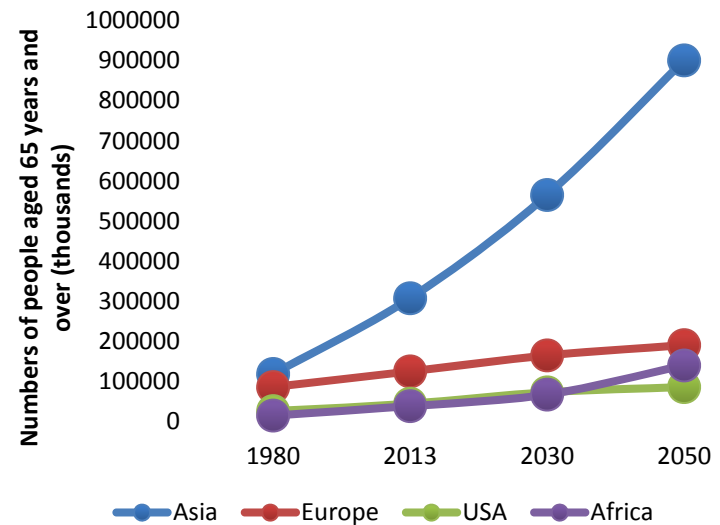
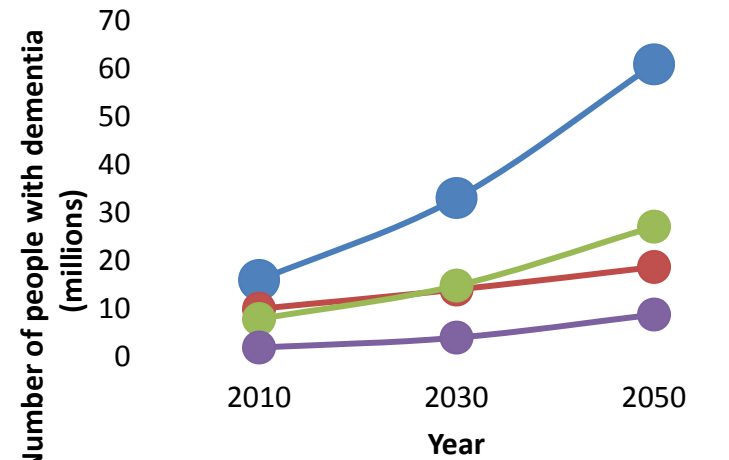
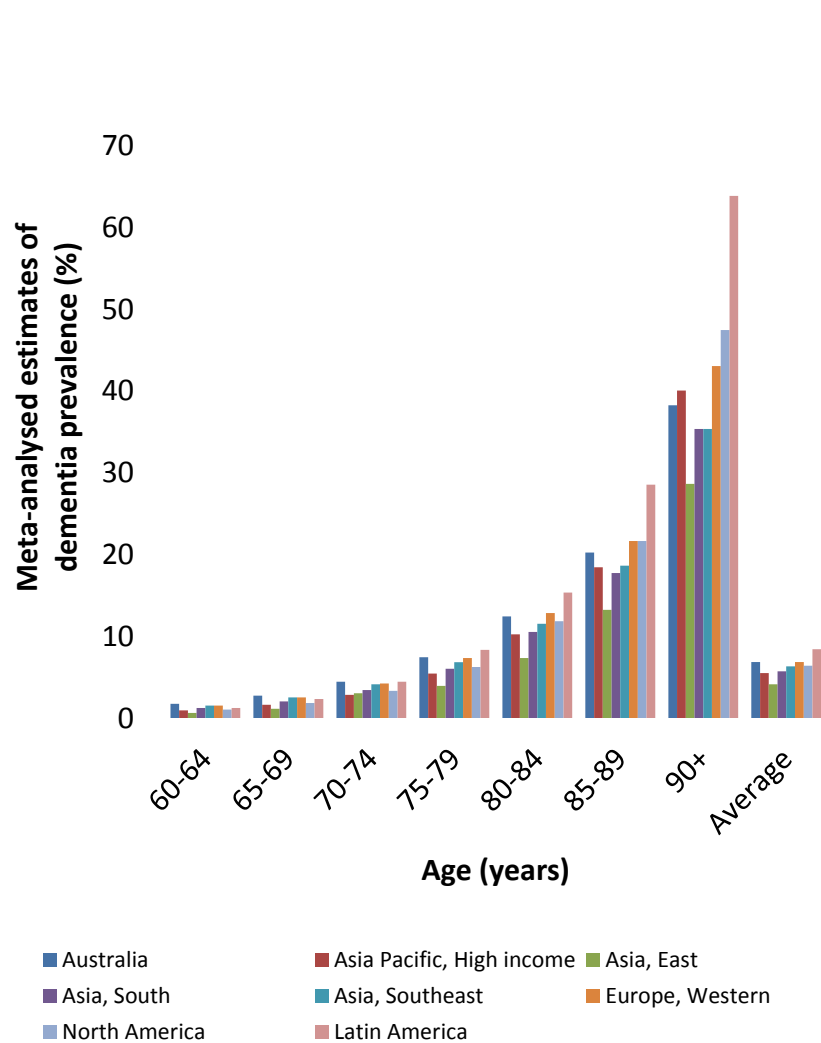
Yasunaga et al. J Aging Phys Act. 2008 Jan;16(1):3-13, Modified diagram.

# 近隣環境と身体活動？

-Research trends in physical activity studies-



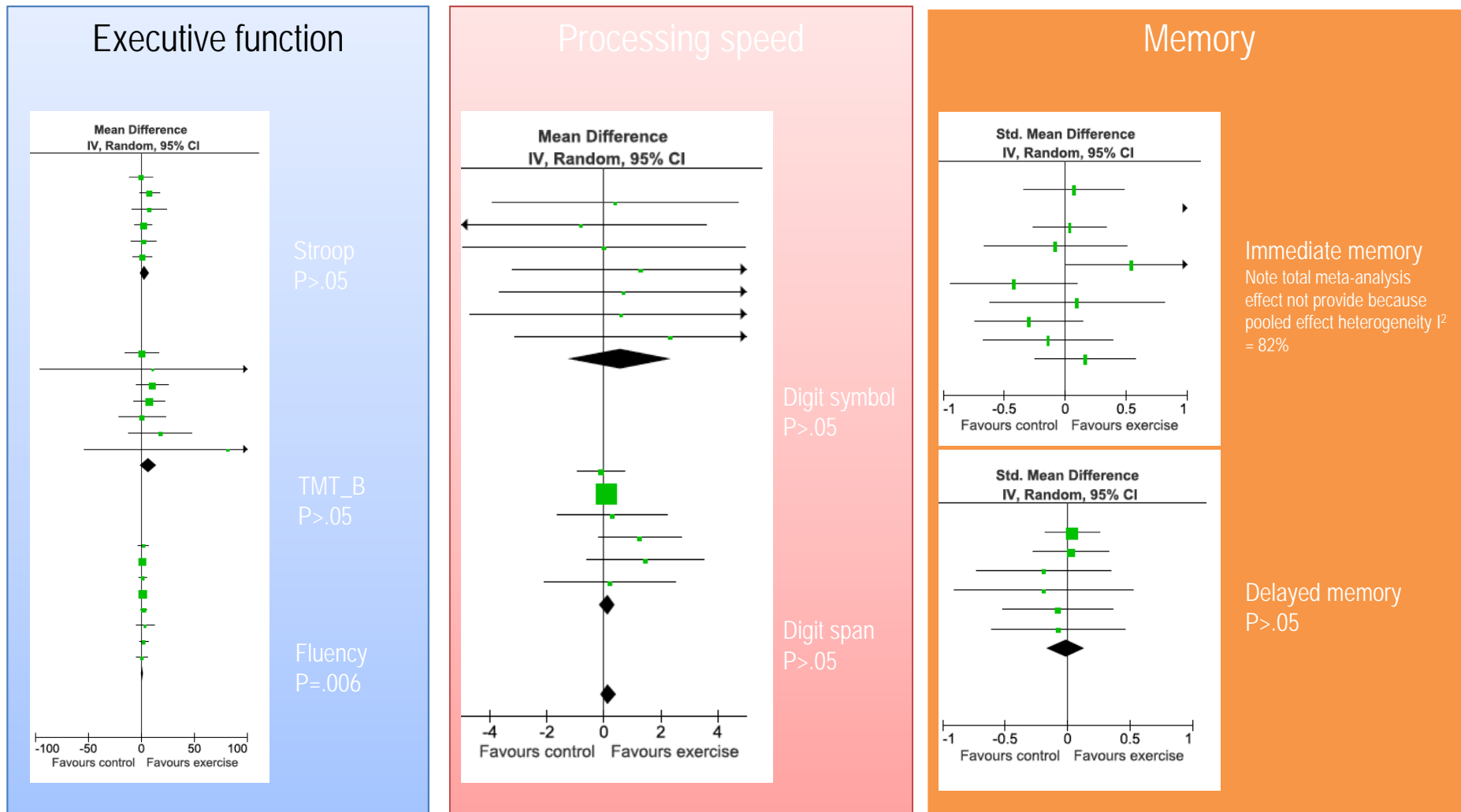
# 高齢者人口と認知症の増加





# The Effect of physical activity on Cognitive Function in Older Adults with Mild Cognitive Impairment: A Meta-analysis of Randomized Controlled Trials

Gates N. Am J Geriatr Psychiatry 2013.



# 地域における認知症予防モデルの開発

## Three Steps of Preventing Dementia

### 1 Health Check



Cognitive Assessments

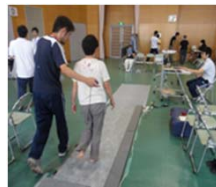


Cognitive Assessment Tool

NCGG-FAT



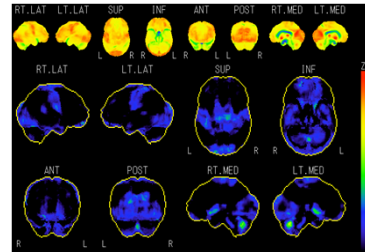
Questionnaire



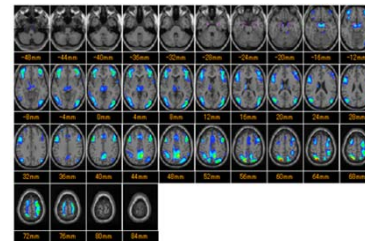
Physical Assessments

### 2 Neuroimaging for MCI

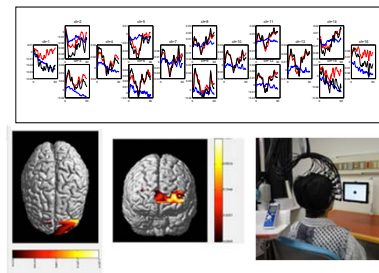
FDG PET



MRI



NIRS



### 3 Intervention

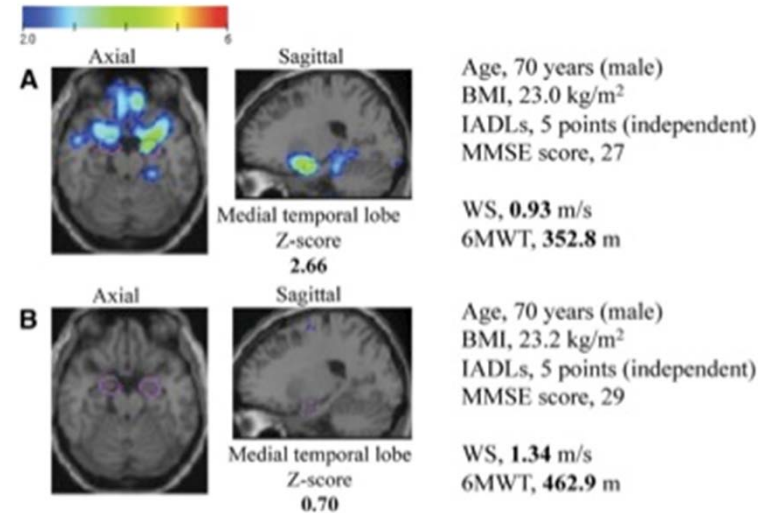
Exercise or Education Classes



# Brain structure and fitness

Relationships Between Physical Performance Scores and Atrophy of Medial Temporal Areas

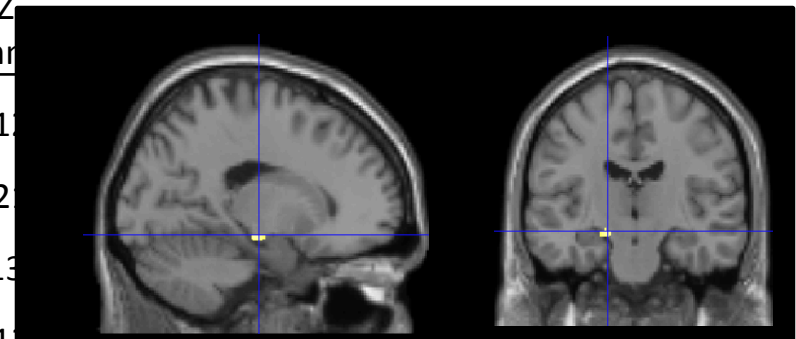
	aMCI (n = 34)	
	<i>r</i>	$\beta$
Knee extension strength	-.10	.13
OLS	-.35*	-.05
WS	-.46**	-.30
6MWT	-.58**	-.46*



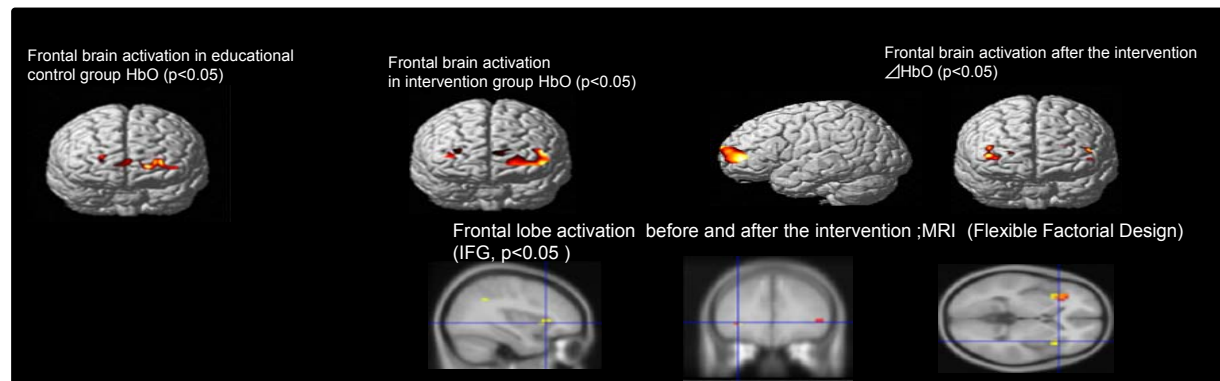
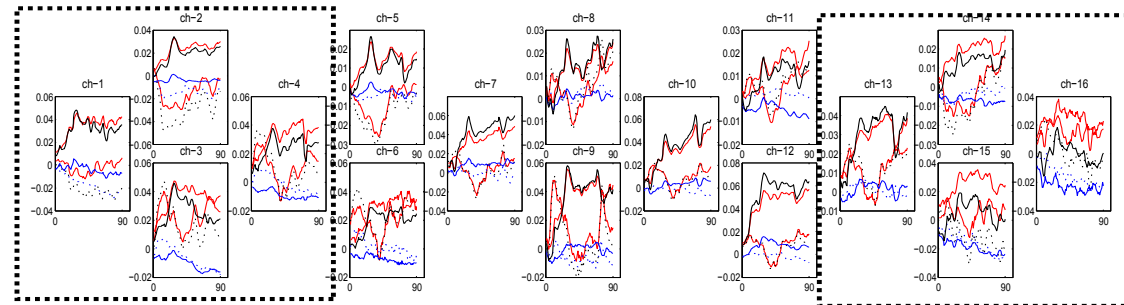
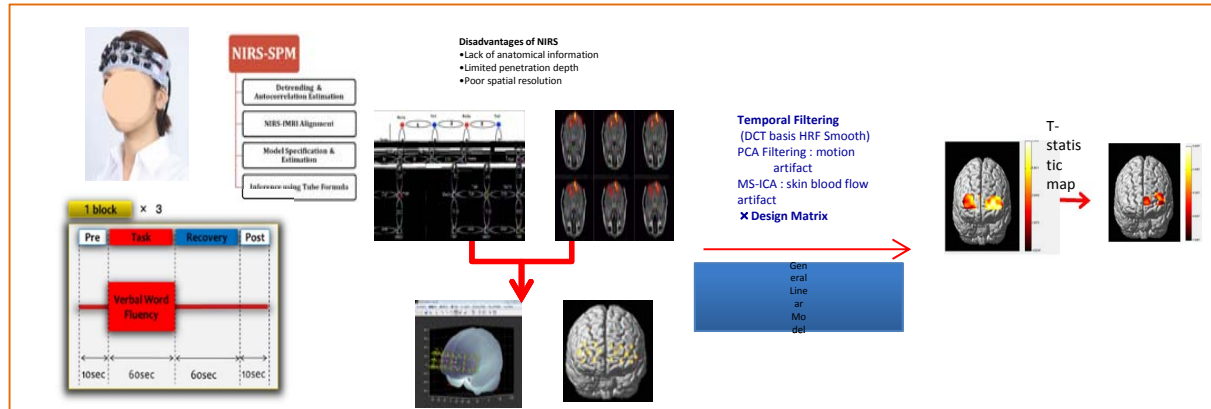
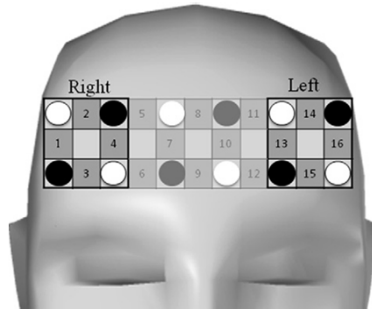
VBM results between six-minute walking distance and volume regions of interest adjusting for age and sex (n = 91)

Location	Cluster size (K)	Peak F	Z score	P (FWE)	MNI coordinates		
					X (mm)	Y (mm)	Z (mm)
Left Middle Temporal Gyrus	79	32.81	5.13	0.004	-59	-6	-12
	27	27.58	4.74	0.024	-54	5	-21
Left Middle Occipital Gyrus	105	28.87	4.84	0.016	-44	-85	13
Left hippocampus	46	29.54	4.89	0.013	-17	-16	-12

Left hippocampus [X = -17, Y = -16, Z = -12]

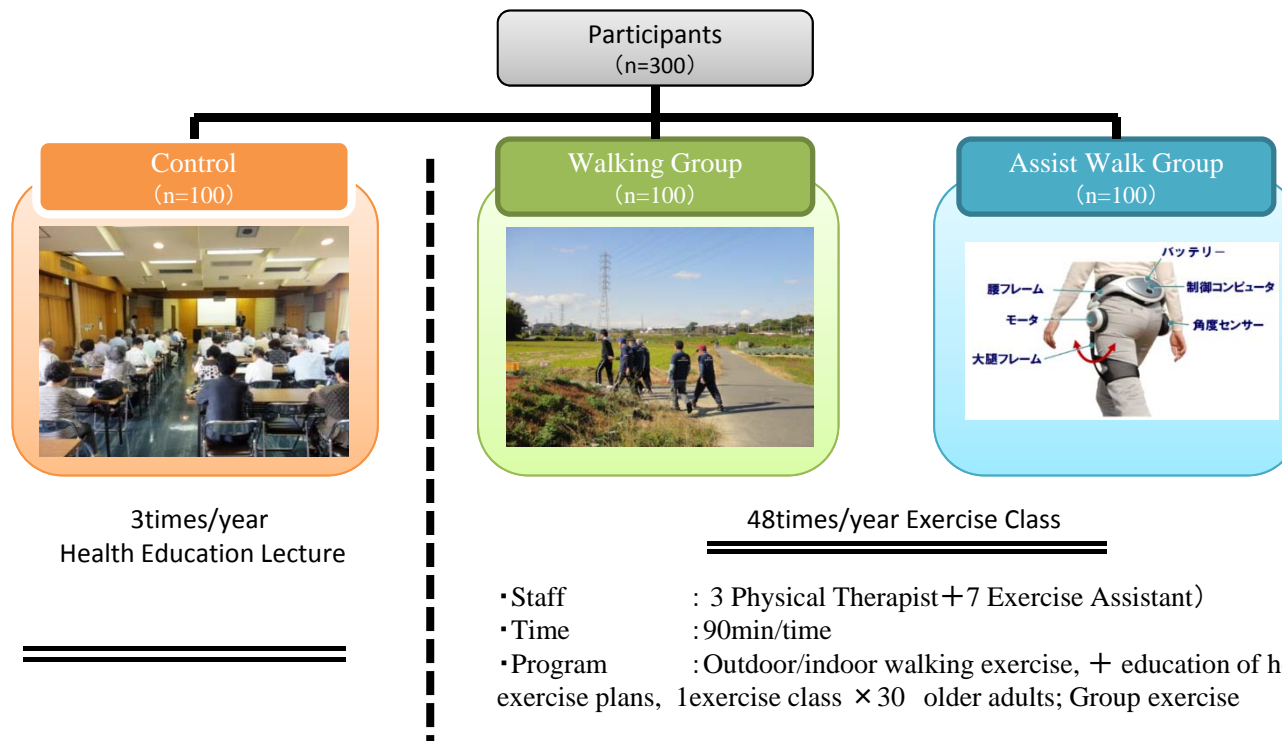


# EFFECTS OF MULTICOMPONENT EXERCISE ON CEREBRAL HEMOGLOBIN OXYGENATION IN OLDER ADULTS WITH AMNESTIC MILD COGNITIVE IMPAIRMENT: FUNCTIONAL MONITORING USING NIR SPECTROSCOPY





# Robot Intervention



# 心身の機能評価システム

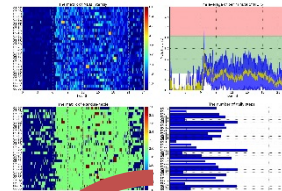
日常身体活動評価



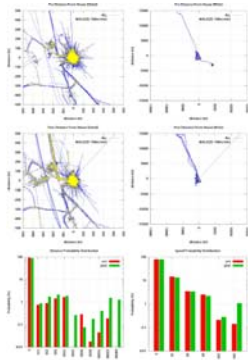
国立長寿医療研究センター



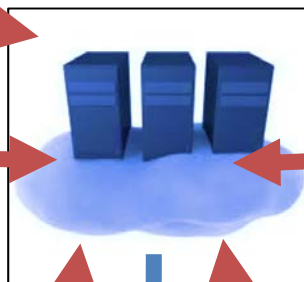
24時間身体活動パターン



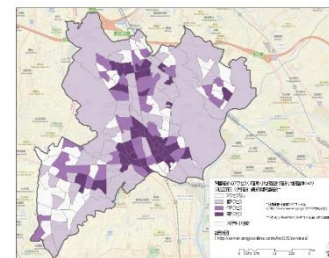
位置情報解析システム



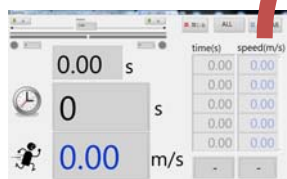
インハウ解析システム  
+  
クラウドシステム



地理情報解析システム



赤外線歩行速度評価システム



地域全体での認知症予防  
の取り組み



認知機能評価システム

