

**Table S1.** Characteristics of the included studies.

Study (authors, year)	Participants				Reference Standard		Index Test (Digital Solution)		
	Target condition	Sample size	Age	Gender	Name	Name (description)	Domain	Type	Results
<b>Curriel et al. (2016)</b>	MCI	n = 98  CN (n = 64) MCI (n = 34)	CN - 74 (7) MCI - 78 (6)	F - 74 / M - 24	Clinical assessment protocol, CDR, MMSE, Neuropsychological test battery	MITSL-L (incorporate a novel paradigm that maximizes semantic interference effects by binding and unbinding semantic associations)	Semantic memory	Innovative digital solutions	Sensitivity 0.85 Specificity 0.84
<b>Alegret et al. (2020)</b>	MCI (naMCI; aMCI)	n = 276  CH (n = 154) MCI (naMCI / aMCI) (n = 122)	CH - 68 (8) naMCI - 66 (9) aMCI - 68 (8)	CH - 61 (39.61) M / naMCI - 19 (31.15) M / aMCI - 23 (37.70) M	NBACE, neurological history and examination, a semi-structured psychosocial interview, including assessment by the BDRS	FACEmemory® (self-administered computerized version of the FNAME-12, a validated paper and pencil test, with images, names, and occupations)	Memory	Paper-based digital solutions	Sensitivity 0.73 Specificity 0.72
<b>Kokubo et al. (2018)</b>	MCI & D	n = 53  HC (n = 29) MCI&D (n = 24)	HC - 56 (14) PD - 69 (7) MCI&D - 80 (8)	HC - 11M 18F / PD - 13M 15F / MCI&D - 13M 11F	Diagnostic by professionals	UX-TMT (modified trail making test, inspired by the Advanced Trail Making Test, Stroop test, and Reverse Stroop test)	Visuospatial working memory, executive function, interference inhibition quantitatively	Paper-based digital solutions	Sensitivity 0.83 Specificity 0.91
<b>Rhodius-Meester et al. (2020)</b>	MCI	n = 278  CN (n = 195) MCI (n = 83)	CN - 64 (9) MCI - 71(7)	CN - F66% M34% / MCI F37% M63%	Standard Neuropsychological tests (MMSE, RAVLT or CERAD word list memory task, TMT-A, TMT-B, categorical (animals) verbal fluency, and digit span test)	cCOG (developed based on traditional cognitive tests, based on the three classical cognitive tasks: a modification of wordlist test, simple reaction task, and Trail Making Test)	Episodic memory, attention, reaction, visuomotor speed, attention, and executive function	Paper-based digital solutions	Sensitivity 0.77 Specificity 0.77
<b>Ichii et al. (2019)</b>	MCI	n = 224  Normal (n = 121) MCI (n = 103)	Normal - 77 (7) MCI - 81 (6)	Normal F107  MCI F95	MMSE	CogEvo (newly developed computer-aided neuropsychiatric battery that uses a touch panel consisting of five basic tasks to evaluate the cognitive domains)	Orientation, visual attention, memory, executive function and spatial cognition	Innovative digital solutions	Sensitivity 0.78 Specificity 0.54
<b>Wong et al. (2017)</b>	CI	n = 160  CN (n = 101) CI (n = 59)	CN - 71 (9) CI - 78 (8)	CN - F78,2% 21,8%M CI - F76,3% 23,7%M	MoCA	CoCoSc (developed from inception by experts, it is a fully automated, self-administered test containing six subtests covering five cognitive domains)	Memory, executive function, orientation, attention, working memory and prospective memory	Innovative digital solutions	Sensitivity 0.78 Specificity 0.69

Study (authors, year)	Participants			Reference Standard		Index Test (Digital Solution)			
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<b>Buckley et al. (2017)</b>	SCI	n = 50  TP (n = 37) SCI (n = 13)	69 (8)	F:62%; M:38%	PACC	NIH Toolbox Cognition Battery / Cogstate-C3 (based on the NIH Toolbox Cognition Battery and on the original Cogstate Brief Battery)	Multidomain	Paper-based digital solutions	Sensitivity 0.62 Specificity 0.81
<b>Memória et al. (2014)</b>	MCI	n = 76  NC (n = 41) MCI (n = 35)	NC - 72 (5) MCI - 74 (6)	NC F 33/41 MCI F 27/35	Medical, neuropsychological, laboratorial, and neuroimaging data, MMSE, Peterson Criteria	CANS-MCI (including adaptation on traditional tests is a computer-based cognitive screening test that incorporates automated administration and scoring and immediate analyses of test sessions)	Executive function, language fluency and memory	Paper-based digital solutions	Sensitivity 0.80 Specificity 0.73
<b>Ke Yu et al. (2015)</b>	MCI	n = 118  NC (n = 55) MCI (n = 63)	NC - 72 (5) MCI - 74 (5)	NC F 13 (13/55) MCI F 18 (18/63)	Criteria established by Peterson	MoCA-CC computerized tool based on the Beijing version of MoCA (MoCA-BJ)	Attention and concentration, executive function, memory, language, visuoconstructional skills, conceptual thinking, calculation, and orientation.	Paper-based digital solutions	Sensitivity 0.95 Specificity 0.87
<b>Scharre et al. (2017)</b>	MCI	n = 45  Normal (n = 21) MCI (n = 24)	75 (7)	Total F= 67%	Standard clinical assessment and neuropsychological evaluation (MMSE, WCST, SAGE, MOCA, HVLTL, WAIS III subscales, Boston Naming Test, FAS verbal fluency test)	eSAGE (digital version of the original paper Self-Administered Gerocognitive Examination (SAGE))	Orientation, language, memory, executive function, abstraction, calculations and visuospatial abilities	Paper-based digital solutions	Sensitivity 0.62 Specificity 0.81
<b>Tierney et al. (2014)</b>	CI	n = 259  Normal (n = 204) CI (n = 55)	--	--	Battery of standardized neuropsychological tests to provide an independent reference Standard (subtests of HVLTL, TMT-A, TMT-B, Clock Drawing Test)	CAMCI (includes traditional paper and pencil tests modified to allow computer administration and response)	Attention, executive function, processing speed, verbal memory, nonverbal memory, functional memory, and incidental memory	Paper-based digital solutions	Sensitivity 0.80 Specificity 0.74
<b>Brandt et al. (2014)</b>	MCI	n = 24  Normal (n = 20) MCI (n = 4)	--	--	Complete histories, neurological and psychiatric examinations (including MMSE), blood laboratory studies, EEG, brain imaging, and comprehensive neuropsychological assessment	DRA (online tool, consists of questions about risk factors for dementia, a verbal memory test, and an informant report of cognitive decline.)	History of health risk factors (including 12 neurological conditions, and 2 psychological disorders); associative memory	Paper-based digital solutions	Sensitivity 0.80 Specificity 0.75

Study (authors, year)	Participants			Reference Standard		Index Test (Digital Solution)			
	Target condition	Sample size	Age	Gender	Name	Name (description)	Domain	Type	Results
<b>Van Mierlo et al. (2017)</b>	MCI	n = 61	SCD - 62 (7)	SCD - F16 (47%)	Clinical history, medical and neurological examination, screening laboratory tests, MRI, EEG, neuropsychological assessment (MMSE, WAIS-III, TMT, Stroop test, Visual association test, Auditory Verbal Learning Test), GDS	Online and telephone-based automated self-tests of cognitive function (based on the Telephonic Remote Evaluation of Neuropsychological Deficits (TREND), the content was expanded by incorporating visual and visuospatial tasks)	Cognitive function - screening for MCI and dementia	Paper-based digital solutions	Sensitivity 0.75 Specificity 0.79
		SCD (n = 33) MCI (n = 28)	MCI - 66 (8)	M18 (53%) MCI - F9 (30%) M21 (70%)					
<b>Dougherty Jr. et al. (2010)</b>	CI (include severe)	n = 215	Control - 75 (7)	Control - M41	Diagnoses are based on a composite of measures: MMSE, test of executive functions, test of verbal fluency, Mini-Cog, MoCA, GDS, caregiver/family member interview, and clinical examination	CST (adapted from a paper and pencil Self-Test used in the memory disorders clinic)	Verbal fluency, visual-spatial functions, memory, attention, executive functions, and perceptual/processing speed	Paper-based digital solutions	Sensitivity 0.99 Specificity 0.95
		Control (n = 104) MCI (n = 27) Early AD (n = 22) Mild to Moderate (n = 33) Moderate to Severe (n = 24) Severe (n = 5)	MCI - 67 (6) Early AD - 77 (5) Mild to Moderate - 75 (9) Moderate to Severe - 78 (7) Severe - 75 (4)	F63 / MCI - M24 F3 / Early AD - M6 F16 / Mild to Mod. - M14 F19 / Mod. to Sev. - M14 F10 / Sev. - M1 F4					
<b>Van der Hoek et al. (2019)</b>	MCI	n = 82	84 (5)	F55(67%)	MoCA	MTX (adaptation of a continuous recognition task paradigm (CRT), CRT-based test)	Cognitive function, memory	Paper-based digital solutions	Sensitivity 0.49 Specificity 0.78
		Normal (n = 45) MCI (n = 37)	NC - 83 (5) MCI - 85 (5)	M27(33%) NC - F27(60%) M18(40%) MCI - F28(76%) M9(24%)					
<b>Scanlon et al. (2015)</b>	MCD	n = 60	Normal - 73 (12)	F31(51.7%) M29 (48.3%); Normal - F8 M12 / D* - F23 M17	DSM-IV criteria by professional	CCS - three tasks, from Rosetta Stone (consists of three touch-screen CCS tasks, computer applications from Rosetta Stone)	Concentration, memory, visuospatial functioning	Innovative digital solutions	Sensitivity 0.94 Specificity 0.60
<b>Fung et al. (2020)</b>	MCI	n = 606	70 (7)	F53.3% M46.7%	Combined clinical and cognitive criteria (including CMMSE, CVFT, ADAS-Cog Subscale)	HK-VMT (contains three newly developed subtests such as 16-word list learning, attention tests, and delayed matching tests)	Episodic memory, attention, and visuospatial ability	Innovative digital solutions	Sensitivity 0.87 Specificity 0.75
		HC (n = 509) MCI (n = 97)	HC - 69 (6) MCI - 73 (7)	; HC - F54.8% M45.2% / MDI - F45.4% 54.6%					
<b>Cahn-Hidalgo et al. (2020)</b>	MD+I	n = 92	--	--	SLUMS	Cognivue® (computerized tool for the automated cognitive assessment that is not dependent on traditional question-and-answer testing)	Visuomotor ability (to calibrate the tests based on visual and motor abilities), perceptual processing, and memory processing	Innovative digital solutions	Sensitivity 0.78 Specificity 0.50
		unI (n = 46) MD+I (n = 46)							

Study (authors, year)	Participants				Reference Standard		Index Test (Digital Solution)		
	Target condition	Sample size	Age	Gender	Name	Name (description)	Domain	Type	Results
Kalafatis et al. (2021)	CI (MCI + Mild AD)	n = 230	HV - 67 (8)	HV	Diagnoses made by a professional according to diagnostic criteria	ICA (self-administered, computerized cognitive assessment tool based on a rapid categorization task independent of language uses artificial intelligence to detect cognitive impairment)	Information processing speed, semantic processing and translating this into a motor response	Innovative digital solutions	Sensitivity 0.79 Specificity 0.75
		HV (n = 95) MCI (n = 80) mild AD (n = 55)	MCI - 70 (8) Mild AD - 71 (8)	F 55.8% MCI F 47.5% Mild AD F 49.1%					
Rodríguez- Salgado et al. (2021)	MCI	n = 99	Controls - 70 (6)	Controls	Multidisciplinary consensus conference by professionals based on published criteria using clinical assessments and structural neuroimaging, clinical history, physical and neurological examination, a functional interview including CDR and a neuropsychological assessment	BHA Cuban version (includes four subtests based on existing clinical and experimental tasks and the Brain Health Survey (BHS) self-administered by an informant; the Cuban version of the BHA test appropriately reflects cultural and linguistic difference)	Associative memory, processing speed and executive function, visuospatial skills, and language	Paper-based digital solutions	Sensitivity 0.87 Specificity 0.85
		CH (n = 53) MCI (n = 46)	MCI - 72 (8)	F 39 (74%) MCI F 24 (52%)					
Liu et al. (2021)	MCI due to AD	n = 100	CON - 68 (8)	CON	Based on the guideline in DSM-5	MTX (adaptation of a continuous recognition task paradigm (CRT), CRT-based test)	Episodic memory, attention and processing speed	Paper-based digital solutions	Sensitivity 0.72 Specificity 0.84
		CON (n = 50) MCI-AD (n = 50)	MCI-AD - 68 (11)	M 30 (60%) MCI-AD M 24 (48%)					
Yan et al. (2021)	MCI	n = 126	HC - 74 (16)	HC	Petersen criteria Montreal Cognitive e CDR, MMSE, GDS-15, ADL, and MoCA	VSP (developed in line with the population's cultural habits using the virtual supermarket and designed the test with virtual reality technology were shopping- related tasks were used for cognitive assessment)	Learning and memory, executive functions, language, time orientation, and complex attention	Innovative digital solutions	Sensitivity 0.85 Specificity 0.80
		HC (n = 64) MCI (n = 62)	MCI - 82 (16)	F 13.0 (20.3) M51.0 (79.7) MCI F22.0 (35.5) M40.0 (64.5)					
Ye et al. (2022)	MCI	n = 57	NC - 68 (10)	NC	Primary cognitive diagnosis within the registry (participants were placed into the diagnostic groups based on their most recent clinical diagnosis available in their electronic health record, or based on their report of no cognitive symptoms or diagnosis of cognitive impairment)	BrainCheck battery (tablet-based version of pre- existing neurocognitive tests such as the Digit Symbol Substitution Task, Stroop Task, and Trail Making Test)	Memory, executive function, alertness, spatial awareness, visual attention, cognitive flexibility	Paper-based digital solutions	Sensitivity 0.86 Specificity 0.83
		NC (n = 35) MCI (n = 22)	MCI - 74 (6)	F 25 (71%) M 10 (29%) MCI F 8 (36%) M 14 (64%)					

Study (authors, year)	Participants				Reference Standard		Index Test (Digital Solution)		
	Target condition	Sample size	Age	Gender	Name	Name (description)	Domain	Type	Results
Paterson et al. (2022)	aMCI	n = 91	NC - 74 (7)	NC	Neuropsychological assessments (including interview) included standardized cognitive tasks examining intellectual ability, attention, processing speed, language, visuospatial abilities, memory, and executive function	BHA (includes four subtests based on existing clinical and experimental tasks and a demographic and health questionnaire)	Memory and executive attention	Paper-based digital solutions	Sensitivity 0.57 Specificity 0.82
		NC (n = 40) aMCI (n = 51)	aMCI - 75 (6)	F 53% aMCI F 49%					
Cheah et al. (2022)	MCI	n = 118	MCI - 68 (6) HC - 63 (6)	MCI F 31 (53%) M 28 (47%) HC F 33 (56%) M 26 (44%)	Comprehensive neuropsychological assessment, including measurements	Digital Screening System for Alzheimer Disease Based on a Neuropsychological Test and a Convolutional Neural Network (proposes a data-driven convolutional neural network architecture through transfer learning and deep learning methods for participants' cognitive screening)	Visuospatial constructional capabilities and visual memory function; cognitive functions, such as visuospatial abilities, visual episodic memory, organization skills, attention, and visuomotor coordination	Innovative digital solutions	Sensitivity 0.85 Specificity 0.90

#### Target condition and participants

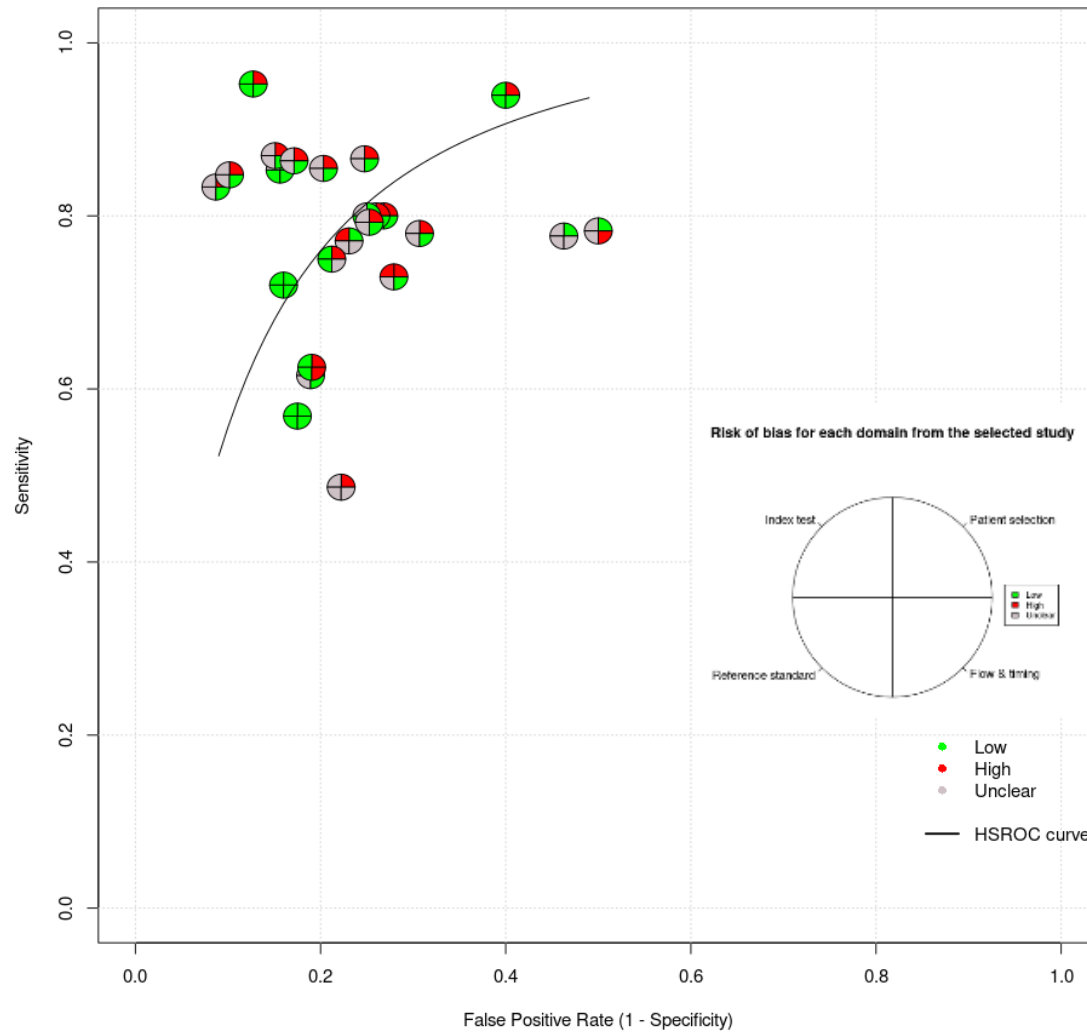
AD: Alzheimer's Disease; aMCI: amnesic Mild Cognitive Impairment; CH: Cognitively Healthy; CI: Cognitive Impairment; CN: Cognitively Normal; CON: Normal Control Subjects; D: Dementia; HC: Healthy Control; HV: Healthy Volunteers; I: Impairment; MCD: Mild Cognitive Dementia; MCI: Mild Cognitive Impairment; MI: Mildly Impaired; naMCI: non-amnesic Mild Cognitive Impairment; NC: Normal Controls / Normal Cognition; SCD: Subjective Cognitive Decline; SCI: Subtle Cognitive Impairment; TP: Typical Performance; unI: Unimpaired.

#### Reference Standard

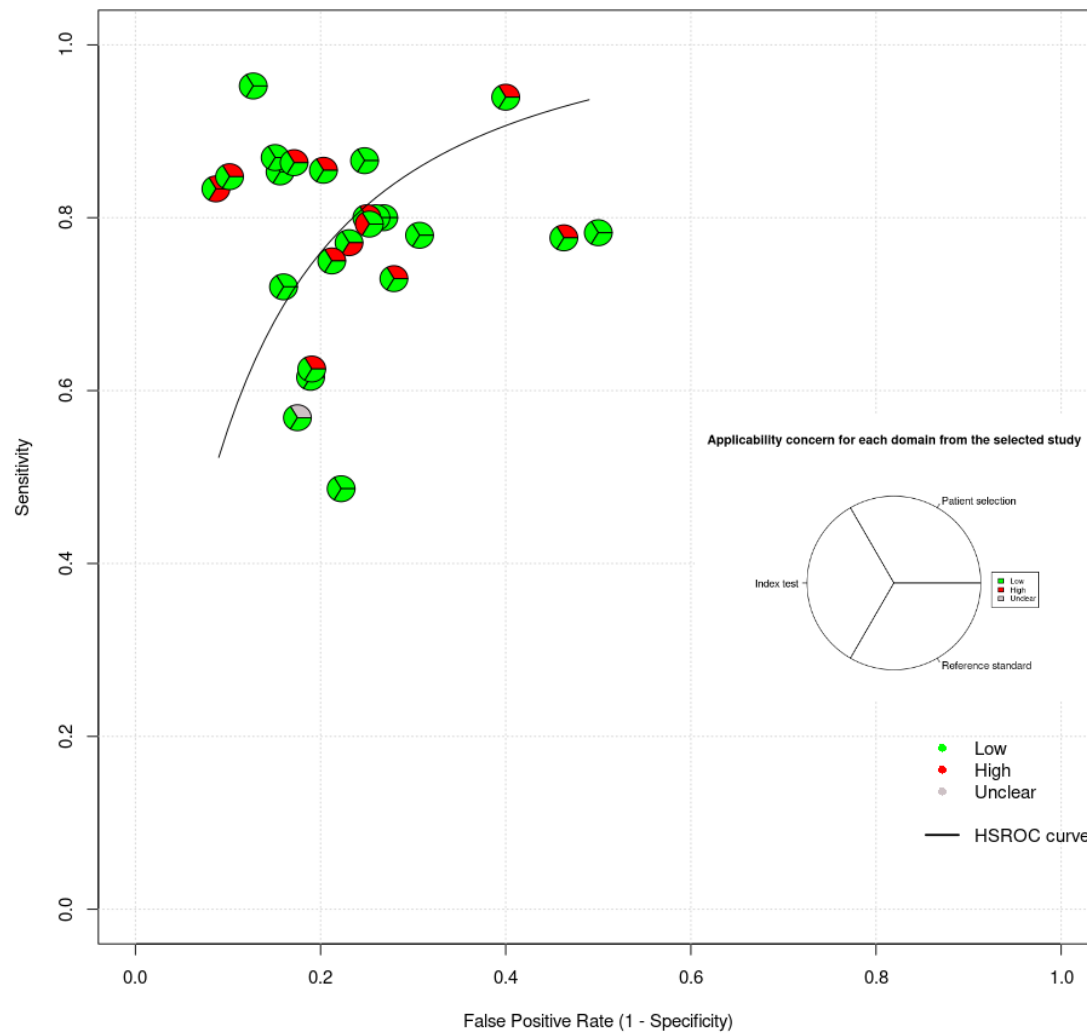
ADAS-Cog: Alzheimer's Disease Assessment Scale Cognitive; ADL: Activities of Daily Living; BDRS: Blessed Dementia Rating Scale; CDR: Clinical Dementia Rating Scale; CERAD: Consortium to Establish a Registry for Alzheimer's Disease; CMMSE: Cantonese version of the mini-mental state examination; CVFT: Category Verbal Fluency Test; DSM: Diagnostic and Statistical Manual of Mental Disorders; EEG: Electroencephalogram; GDS: Geriatric Depression Scale; HVL: Hopkins Verbal Learning Test; MMSE: Mini Mental State Examination; MoCA: Montreal Cognitive Assessment; MRI: Magnetic resonance imaging; NBACE: Neuropsychological Battery of Fundació ACE; PACC: Preclinical Alzheimer Cognitive Composite; RAVLT: Rey Auditory Verbal Learning Task; SAGE: Self-Administered Gerocognitive Examination; TMT: Trail Making Test; WAIS: Wechsler Adult Intelligence Scale; WCST: Wisconsin Card Sort Test; SLUMS: St. Louis University Mental Status.

#### Index Test

BHA: Brian Health Assessment; CAMCI: Computerized Assessment of Mild Cognitive Impairment; CANS-MCI: Computer-Administered Neuropsychological Screen for Mild Cognitive Impairment; cCOG: Computerized Cognitive Test; CCS: Battery of Computerised Cognitive Screening; CoCoSc: Computerized Cognitive Screen; CST: The Computerized Self Test; DRA: Dementia Risk Assessment; eSAGE: Digitally translated Self-Administered Gerocognitive Examination; FACEmemory®: Face-Name Associative Memory Exam; HK-VMT: Hong Kong – Vigilance and Memory Test; ICA: Integrated Cognitive Assessment; MITS-L: Miami Test of Semantic Interference and Learning; MoCA-CC: Computerized tool for the Chinese version of the MoCA; MTX: MemTrax test; UX-TMT: User Experience-Trail Making Test; VSP: VR game-based test: Virtual Supermarket Program.



**Figure S1.** Random-effects meta-analysis - summary ROC (SROC) curve with quality assessment obtained by the QUADAS-2 tool (risk of bias).



**Figure S2.** Random-effects meta-analysis - summary ROC (SROC) curve with Quality Assessment obtained by the QUADAS-2 tool (applicability concerns).