LatAm FINGERS Multivariate Intervention in Latin America

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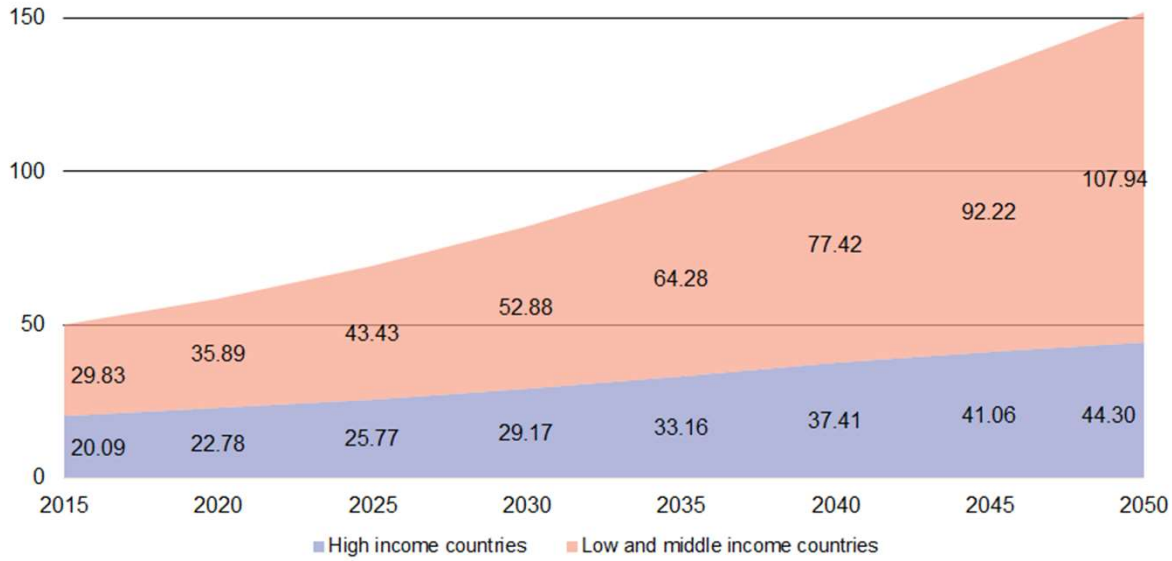
Number of people with dementia (millions) in low and middle income countries compared to high income countries



Alzheimer's disease International, Maelen Guerchet, Martin Prince, Matthew Prina. Number of people with dementia worldwide. From: www.alzint.org/resource/numbers-of-people-with-dementia-worldwide/c

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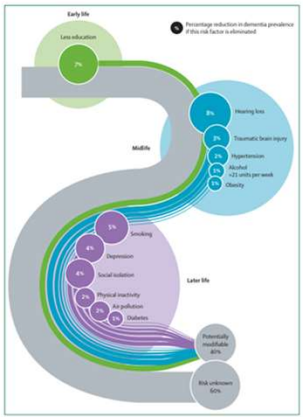
Dementia prevention, intervention, and care: 2020 report of the *Lancet* Commission

Gill Livingston, Jonathan Huntley, Andrew Sommerlad, David Ames, Clive Ballard, Sube Banerjee, Carol Brayne, Alistair Burns, Jiska Cohen-Mansfield, Claudia Cooper, Sergi G Costafreda, Amit Dias, Nick Fox, Laura N Gitlin, Robert Howard, Helen C Kales, Mika Kivimäki, Eric B Larson, Adesola Ogunniyi, Vasiliki Orgeta, Karen Ritchie, Kenneth Rockwood, Elizabeth L Sampson, Quincy Samus, Lon S Schneider, Geir Selbæk, Linda Teri, Naaheed Mukadam

	Relative risk for dementia (95% CI)	Risk factor prevalence	Communality	Unweighted PAF	Weighted PAF*
Early life (<45 years)					
Less education	1·6 (1·3–2·0)	40·0%	61·2%	19·4%	7·1%
Midlife (age 45–65 years)					
Hearing loss	1·9 (1·4–2·7)	31·7%	45·6%	22·2%	8·2%
TBI	1·8 (1·5–2·2)	12·1%	55·2%	9·2%	3·4%
Hypertension	1·6 (1·2–2·2)	8·9%	68·3%	5·1%	1·9%
Alcohol (>21 units/week)	1·2 (1·1–1·3)	11·8%	73·3%	2·1%	0·8%
Obesity (body-mass index ≥30)	1·6 (1·3–1·9)	3·4%	58·5%	2·0%	0·7%
Later life (age >65 years)					
Smoking	1·6 (1·2–2·2)	27·4%	62·3%	14·1%	5·2%
Depression	1·9 (1·6–2·3)	13·2%	69·8%	10·6%	3·9%
Social isolation	1·6 (1·3–1·9)	17·7%	55·2%	9·6%	3·5%
Physical inactivity	1·4 (1·2–1·7)	11·0%	28·1%	4·2%	1·6%
Diabetes	1·5 (1·3–1·8)	6·4%	71·4%	3·1%	1·1%
Air pollution	1·1 (1·1–1·1)	75·0%	13·3%	6·3%	2·3%

Data are relative risk (95% CI) or %. Overall weighted PAF=39·7%. PAF=population attributable fraction. TBI=traumatic brain injury. *Weighted PAF is the relative contribution of each risk factor to the overall PAF when adjusted for communality.

Table 1: PAF for 12 dementia risk factors



In 2020, LANCET indicates that education, hearing loss, TBI, hypertension, alcohol consumption, obesity, smoking, depression, social isolation, physical inactivity, diabetes and air pollution are main factors involved in dementia prevention.

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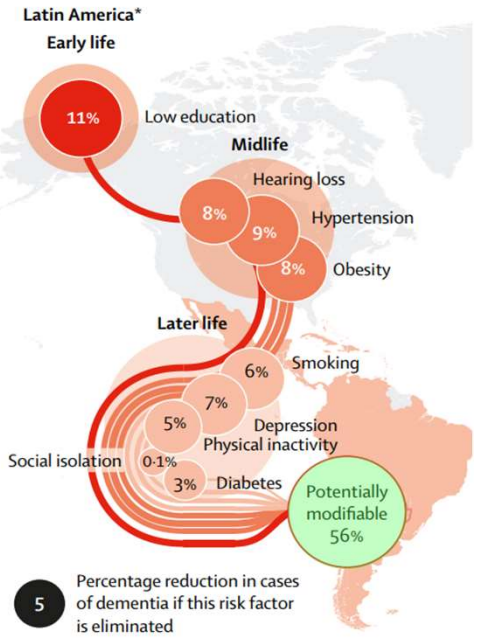
	RR for dementia (95% CI)	Risk factor prevalence	Communality	PAF	Weighted PAF*
Early life (<45 years)					
Low education	1·6 (1·3–2·0)	68·8%	36%	29·2% (28·4–30·0)	10·9% (10·4–11·5)
Midlife (45–64 years)					
Hearing loss	1·9 (1·4–2·7)	28·8%	48%	20·6% (19·9–21·3)	7·7% (7·3–8·2)
Hypertension	1·6 (1·2–2·2)	55·6%	59%	25·0% (24·3–25·8)	9·3% (8·8–9·8)
Obesity	1·6 (1·3–1·9)	44·8%	53%	21·2% (20·5–21·9)	7·9% (7·5–8·4)
Later life (≥65 years)					
Smoking	1·6 (1·2–2·2)	30·0%	60%	17·8% (17·2–18·5)	5·7% (5·3–6·1)
Depression	1·9 (1·6–2·3)	23·9%	55%	17·7% (17·1–18·4)	6·6% (6·2–7·0)
Physical inactivity	1·4 (1·2–1·7)	34·2%	37%	17·0% (16·4–17·7)	4·5% (4·2–4·9)
Low social contact	1·6 (1·3–1·9)	0·5%	69%	0·2% (0·1–0·3)	0·1% (0–0·2)
Diabetes	1·5 (1·3–1·8)	18·5%	35%	8·5% (8·0–8·9)	3·2% (2·9–3·5)
Overall weighted PAF	..	..	..	..	55·8% (54·9–56·7)

PAF=population attributable fraction. RR=relative risk. *Weighted PAF is the relative contribution of each risk factor to the overall PAF when adjusted for communality.

Table 3: PAF for dementia risk factors in the Latin American sample (n=12 865)



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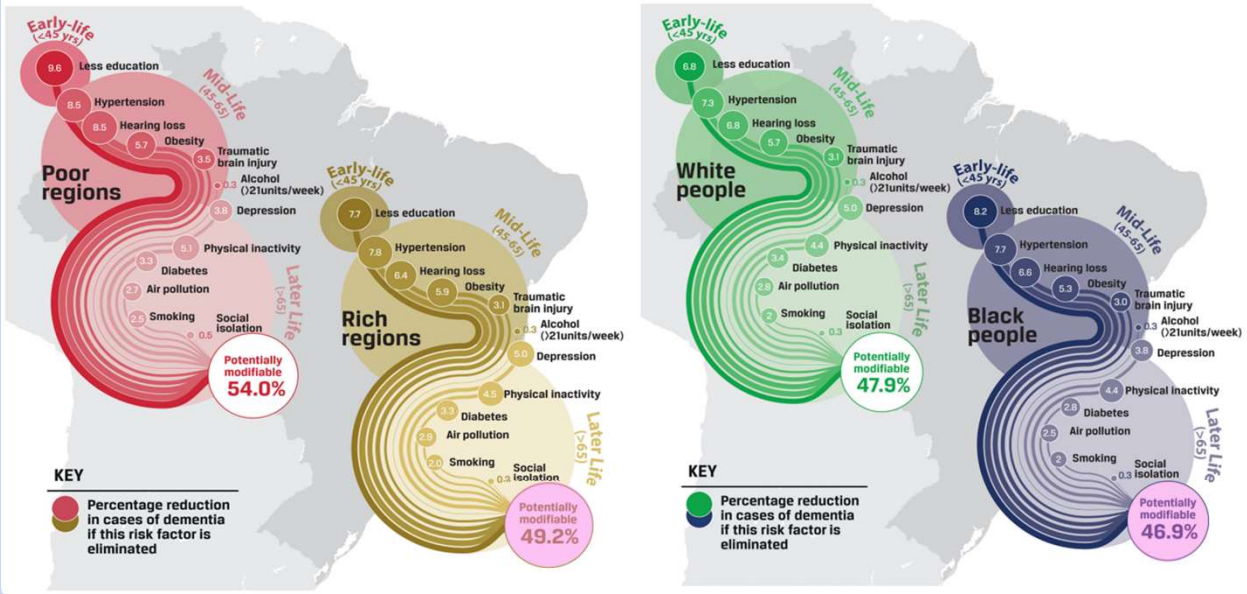
Risk factors according region and race in Brazil.



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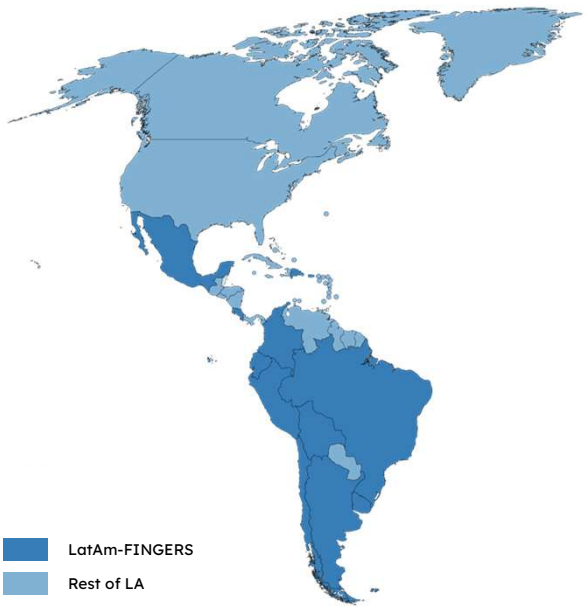

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Acosta D, Allegri RF, Brucki S, Calandri IL, Caramelli P, Charamelo AM, Crivelli L, Cusicanqui M, Custodio Capuñay NS, Delgado Derio C, Duque ML, Jiménez Velazquez IZ, Lopera F, Nitrini R, Rodríguez JJ, León-Salas JM, Salinas RM, Sevlever GE, Sosa AL, Suemoto C, Velilla Jiménez LM, Yassuda M.

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Key features of LatAm-FINGERS trial

Multicenter structure
The following countries are participating in the protocol: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Mexico, Peru, Puerto Rico and Uruguay.
Sample characteristics
The target population is **persons-at-risk-of-dementia**. The expected sample is 1200 participants (100 for each center). We divided the sample into two groups: a systematic group (guided intervention) and a flexible group (sporadic intervention and coaching).
Measures
We designed the LatAm-NTB, a cognitive and functional assessment battery. We also collected sociodemographic, laboratory, physical examination, MRI, and family history data. We are collecting and storing serum, plasma, and DNA samples. Each measurement is collected every 6 months.
Harmonization procedures
We carry out external (U.S. POINTER) and internal harmonization procedures (MIND diet adaptation, protocol language, intervention settings).

Main objectives

1. To investigate the feasibility of the FINGER multi-domain lifestyle intervention in the Latin American context.
2. To investigate the efficacy of a regimented multidomain lifestyle intervention compared to a more flexible lifestyle intervention on global cognition.

Project summary

LatAm-FINGERS is the first non-pharmacological multicenter randomized clinical trial to prevent cognitive impairment in Latin America. It aims to study the feasibility and efficacy of lifestyle changes over two years in a population at risk of dementia.

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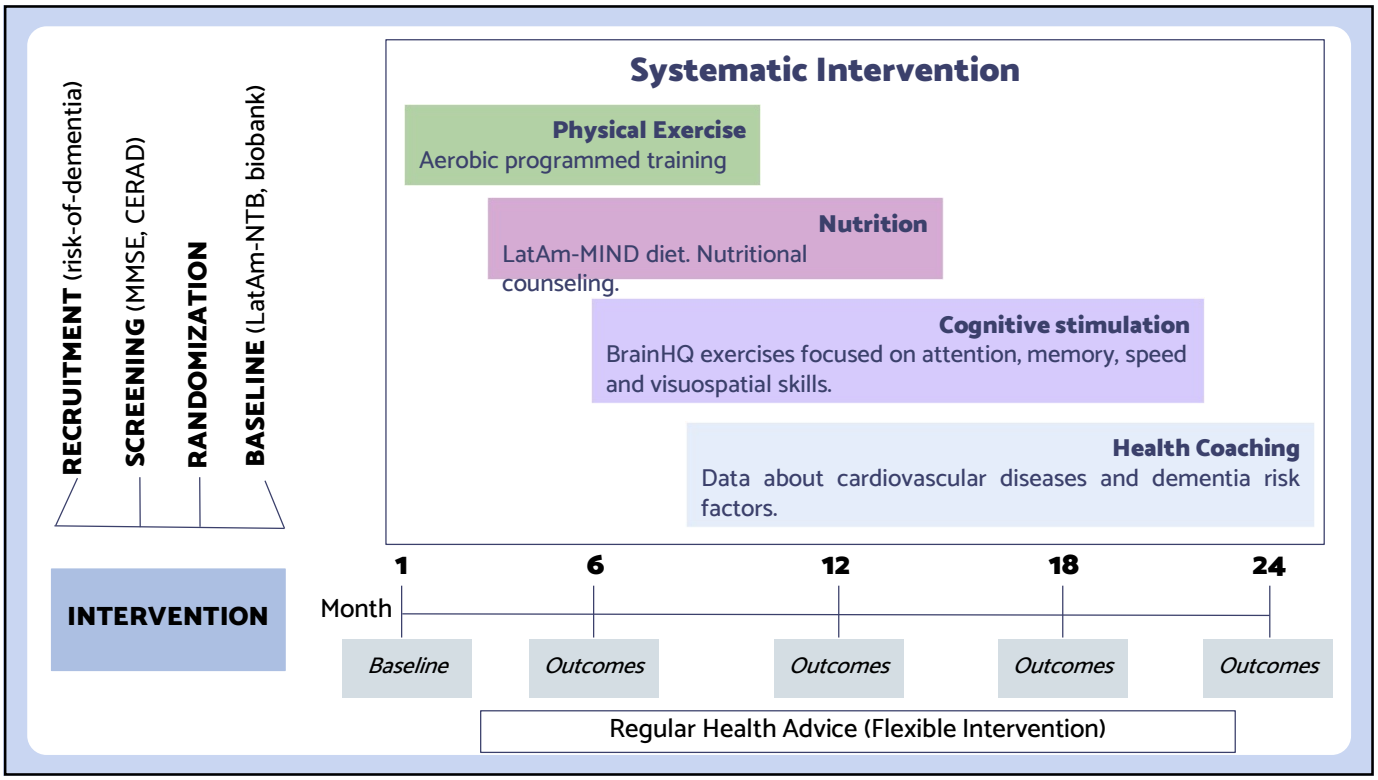
RECRUITMENT (risk-of-dementia)
SCREENING (MMSE, CERAD)
RANDOMIZATION
BASELINE (LatAm-NTB, biobank)
INTERVENTION
Systematic Intervention
Physical Exercise
Aerobic programmed training
Nutrition
LatAm-MIND diet. Nutritional counseling.
Cognitive stimulation
BrainHQ exercises focused on attention, memory, speed and visuospatial skills.
Health Coaching
Data about cardiovascular diseases and dementia risk factors.
Month
1
6
12
18
24
Baseline
Outcomes
Outcomes
Outcomes
Outcomes
Regular Health Advice (Flexible Intervention)

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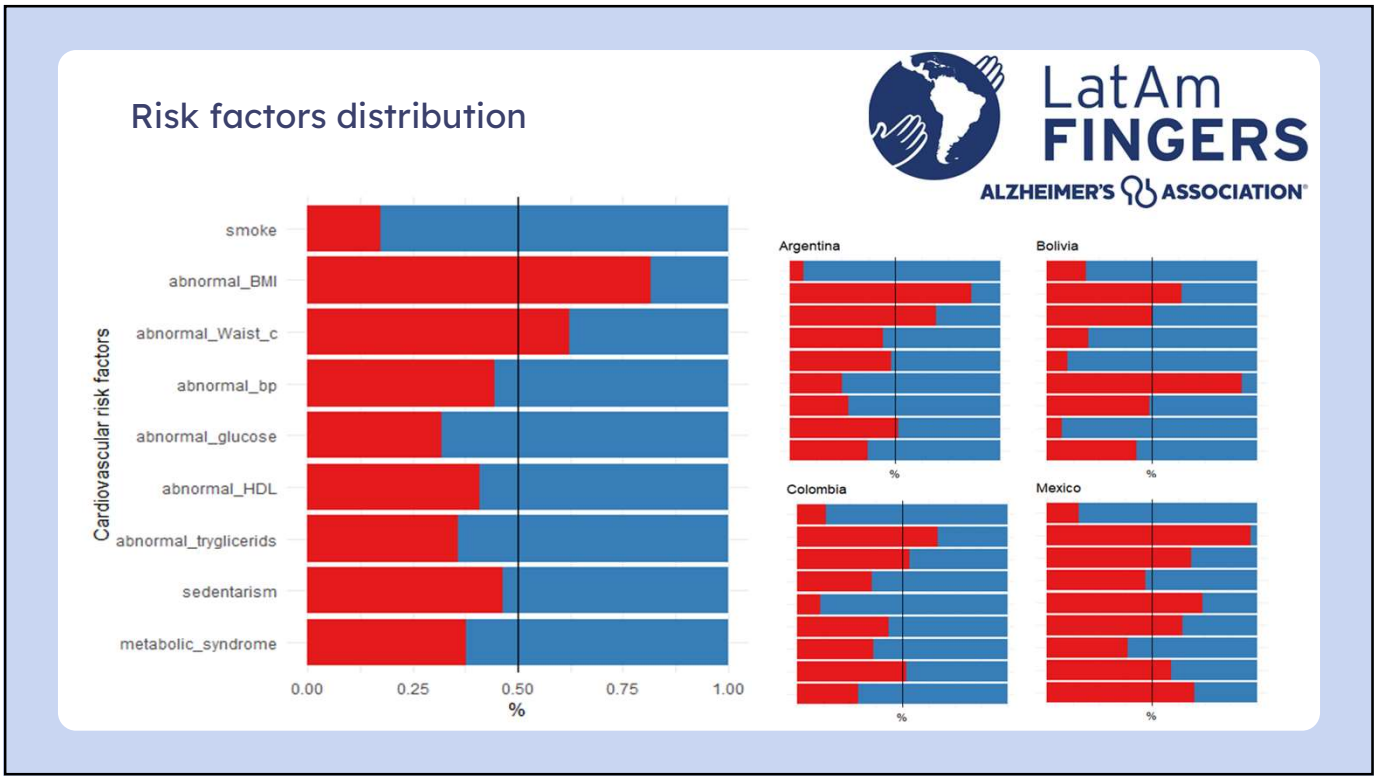
Risk factors distribution
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smoke
abnormal_BMI
abnormal_Waist_c
abnormal_bp
abnormal_glucose
abnormal_HDL
abnormal_tryglicerids
sedentarism
metabolic_syndrome
Cardiovascular risk factors
0.00
0.25
0.50
0.75
1.00
%
Argentina
Bolivia
Colombia
Mexico

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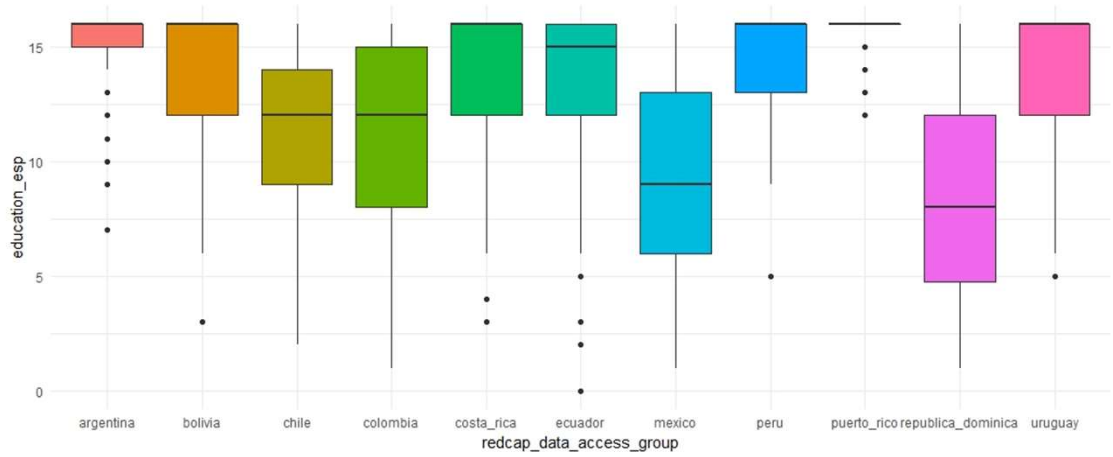
Education



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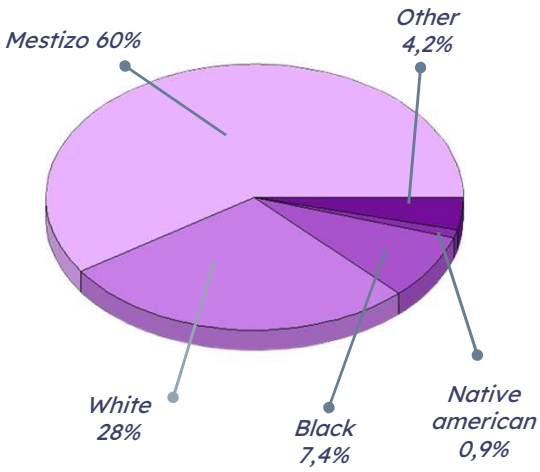
Ethnicity



Languages

In addition to the official languages such as Spanish and Portuguese, **our inhabitants speak** Aymara, Creole, Guarani, Mapuche, Mayan, Quechua, Sranan, among others.

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External harmonization procedures

Inclusion criteria
Participants at risk of dementia were included follwing U.S. POINTER and FINGERS criteria

Outcomes
The selection of outcomes was intended to reproduce the significant results of FINGER and U.S. POINTER outcomes were also included.

Interventions
Based on the U.S. POINTER and the FINGER interventions, each center contributed with feasible alternatives that were culturally friendly and feasible as public health policy.

U.S. POINTER ALZHEIMER'S ASSOCIATION

WORLD WIDE FINGERS ALZHEIMER'S ASSOCIATION

Adaptations were made to accommodate differences in race, culture, socio-economic status, language, lifestyle, and baseline medical conditions between the LA, Finnish, and US populations.

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Internal harmonization procedures

The process of finding the main differences to take into account in the analysis of the data and its interpretability.

Culinary Customs	Cultural heritage, availability of ingredients, climate and geography, and social and economic factors influence culinary customs and practices in LA.
Neuropsychology instruments and normative data availability	Neuropsychological tests require internal adaptation and validation procedures for the target population. Likewise, the normative data need to be carefully selected.

Each region, depending on its geography and availability of ingredients use
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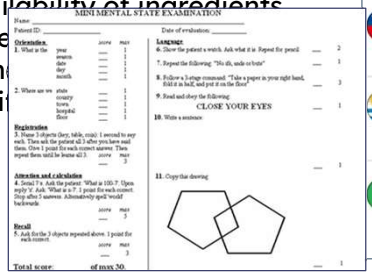

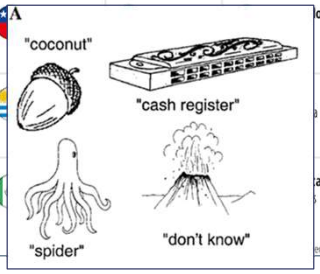

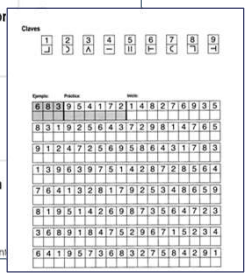

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Specific components of the harmonization of interventions

Physical intervention
Is the most challenging aspect of the multidomain intervention in terms of adherence due to the intensity with which this intervention is proposed in the FINGER and U.S. POINTER trials.
Places Without restrictions: we use gyms, clubs, downtown facilities, municipal and neighborhood squares.
Description includes five phases: warm-up; exercises for coordination, stretching, and balance; resistance and muscle strength training; aerobic exercise; and relaxation activities

Uruguay

Mexico

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Specific components of the harmonization of interventions

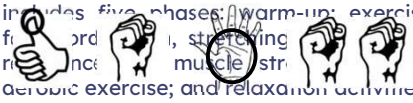
Include

- Green vegetables.
- Dry fruits.
- Frijoles.
- Grains.
- Fish (not fried).
- Olive oil (extra virgin).

Exclude

- Red and processed meats
- Butter, margarine, cream.
- Cheese.
- Fast-food.
- Caramel bars.

Physical intervention	Nutritional intervention
Is the most challenging aspect of the multidomain intervention in terms of adherence due to the intensity with which the intervention is proposed in the FINGER and U.S. POINTER trials.	Diet has a robust idiosyncratic component and is associated with local factors, such as the availability of ingredients, cost, and cooking habits in a region.
Places Without restrictions: we use gyms, clubs, downtown facilities, municipal and neighborhood squares.	**Based on** MIND) diet, which is a hybrid between the Mediterranean and the DASH diets that show beneficial effects in cognition.
Description includes five phases: warm-up; exercises f… ord… l, str… ing …e; r… nc… muscle str… g; aerobic exercise; and relaxation activities	**Description** We designate a team of interventionists, an interventionist leader, and a person in charge of each intervention to align and replace foods based on their nutrients.



Adaptation Examples

Pumpkin seeds → nuts

Watermelon → red fruits

Olive oil → canola oil

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Specific components of the harmonization of interventions

Include

- Green vegetables.
- Dry fruits.
- Frijoles.
- Grains.
- Fish (not fried).
- Olive oil (extra virgin).

Exclude

- Red and processed meats
- Butter, margarine, cream.
- Cheese.
- Fast-food.
- Caramel bars.

Nutritional intervention
Diet has a robust idiosyncratic component and is associated with local factors, such as the availability of ingredients, cost, and cooking habits in a region.
Based on MIND) diet, which is a hybrid between the Mediterranean and the DASH diets that show beneficial effects in cognition.
Description We designate a team of interventionists, an interventionist leader, and a person in charge of each intervention to align and replace foods based on their nutrients.

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Adaptation Examples

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Olive oil → canola oil

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Some conclusions

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Latin America is Multicultural
Latin Americans in the US come from different cultures and do not fit into a unique categorization

Culturally Tailored Interventions
In order to be effective, risk reduction strategies for Latinos in the U.S. should truly respect the idiosyncrasies of each Latin American culture.

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¡Muchas gracias!
Thank you!

Contact
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www.fleni.org.ar/fingers/

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