Wie lässt sich das individuelle Risiko für Demenz reduzieren? Neue Erkenntnisse aus der Demenz-Präventionsforschung

Prof. Dr. Anja Leist, Universität Luxemburg

Konferenz „Demenzforschung & Preventioun"
association luxembourg alzheimer, 16. Juni 2023

Financial disclosures

I have received remuneration from Roche
for advisory and speaker activities.

Was ist Demenz?

Eine Bandbreite von Störungen, charakterisiert durch das Nachlassen des Gedächtnisses und anderer Denkfähigkeiten, die die Aktivitäten des täglichen Lebens beeinträchtigt

10 frühe Symptome

- Gedächtnisverlust, der das tägliche Leben beeinträchtigt
- Herausforderungen bei Planung und Lösung von Problemen
- Schwierigkeiten, gewohnte Aufgaben zu Hause, in der Arbeit oder in der Freizeit durchzuführen
- Verwirrung bei Zeit und Ort
- Probleme beim Verstehen von visuellen Eindrücken und räumlichen Zusammenhängen
- Neue Probleme beim Sprechen oder Schreiben von Wörtern
- Verlegen von Gegenständen und Verlust der Fähigkeit, Schritte nachzuvollziehen
- Vermindertes oder schlechtes Urteilsvermögen
- Rückzug von Arbeiten oder sozialen Aktivitäten
- Veränderungen der Stimmung und des Charakters

https://www.alz.org/de/was-ist-demenz.asp

Warum ist Demenz-Prävention wichtig?

Demenz geht mit großen Einschränkungen und hoher Belastung einher für Betroffene, deren Angehörige und Pflegende (Livingston et al., 2017)

Kognitive Beeinträchtigungen und Demenz sind eine der größten Herausforderungen alternder Gesellschaften: Schätzungen gehen von 14,3 Mio. Menschen mit Demenz aus im Jahr 2050 in Europa (Alzheimer Europe, 2019)

Es gibt keine Heilung von Demenz mittels medikamentöser Behandlung, auch wenn erste Medikamente kognitiven Abbau verlangsamen können (van Dyck et al., 2022)

Alzheimer Europe. (2019). Dementia in Europe Yearbook 2019: Estimating the prevalence of dementia in Europe. Alzheimer Europe.
van Dyck, C. H., Swanson, C. J., … & Iwatsubo, T. (2022). Lecanemab in Early Alzheimer's Disease. New England Journal of Medicine, NEJMoa2212948. https://doi.org/10.1056/NEJMoa2212948

# Was sind modifizierbare Risikofaktoren für Demenz?

Modifizierbare Risikofaktoren

Potentiell modifizierbare Risikofaktoren tragen bis zu 40% zu Demenz bei.

Im Vergleich liegt der Beitrag genetischer Belastung bei ≅7%.

➡️ Großes Potential für Prävention.

Livingston, G., Huntley, J., Sommerlad, A., Ames, D., Ballard, C., Banerjee, S., ... & Mukadam, N. (2020). Dementia prevention, intervention, and care: 2020 report of the Lancet Commission. *The Lancet*, 396(10248), 413-446.

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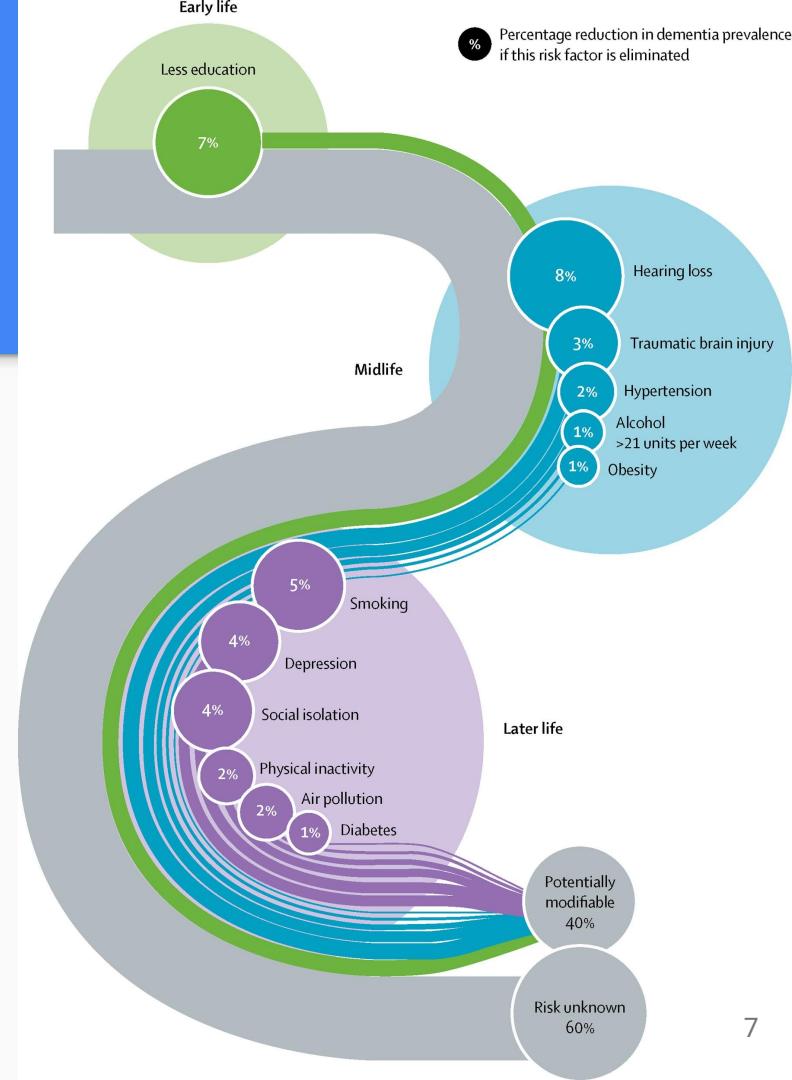
LIfestyle for Brain Health (LIBRA)

Schiepers, O. J., Köhler, S., Deckers, K., Irving, K., O'Donnell, C. A., van den Akker, M., ... & van Boxtel, M. P. (2018). Lifestyle for Brain Health (LIBRA): a new model for dementia prevention. *International journal of geriatric psychiatry*, *33*(1), 167-175.
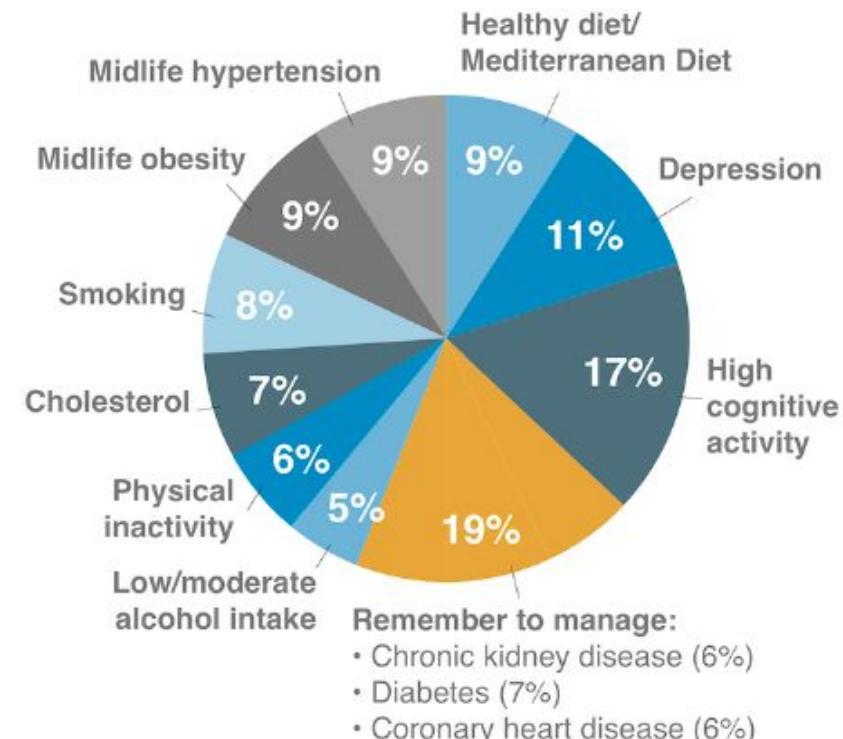
Sekundärprävention

Erste Evidenz dafür, dass kognitiver Abbau verlangsamt werden kann, indem vorhandene Risikofaktoren reduziert werden mittels "multi-domain" Lebensstil-Intervention.

Ngandu, T., Lehtisalo, J., Solomon, A., Levälahti, E., Ahtiluoto, S., Antikainen, R., ... & Kivipelto, M. (2015). A 2 year multidomain intervention of diet, exercise, cognitive training, and vascular risk monitoring versus control to prevent cognitive decline in at-risk elderly people (FINGER): a randomised controlled trial. *The Lancet*, *385*(9984), 2255-2263.
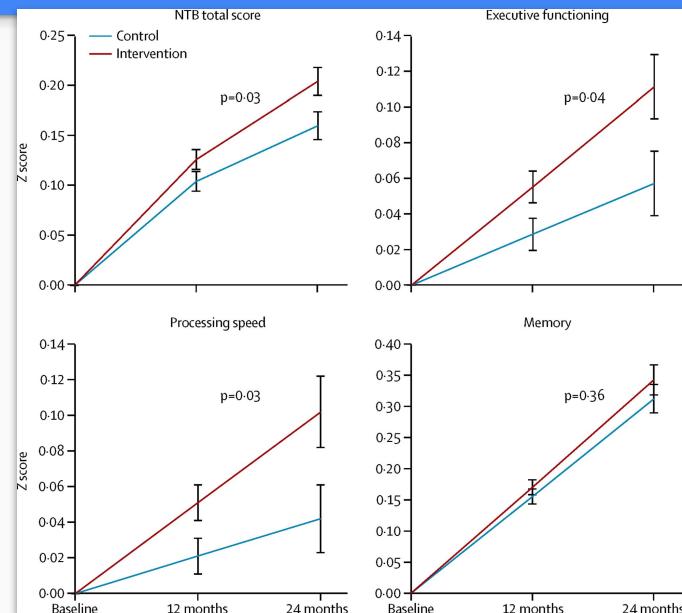
Williamson, J. D., Pajewski, N. M., Auchus, A. P., Bryan, R. N., Chelune, G., Cheung, A. K., ... & Sprint Mind Investigators for the SPRINT Research Group. (2019). Effect of intensive vs standard blood pressure control on probable dementia: a randomized

RISK REDUCTION OF COGNITIVE DECLINE AND DEMENTIA

WHO GUIDELINES

World Health Organization

PREVENTING COGNITIVE DECLINE AND DEMENTIA

A WAY FORWARD

Committee on Preventing Dementia and Cognitive Impairment

Alan I. Leshner, Story Landis, Clare Stroud, and Autumn Downey, Editors

Board on Health Sciences Policy

Health and Medicine Division

A Consensus Study Report of

The National Academies of
SCIENCES · ENGINEERING · MEDICINE

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Optimizing brain health across the life course:

WHO position paper

World Health Organization

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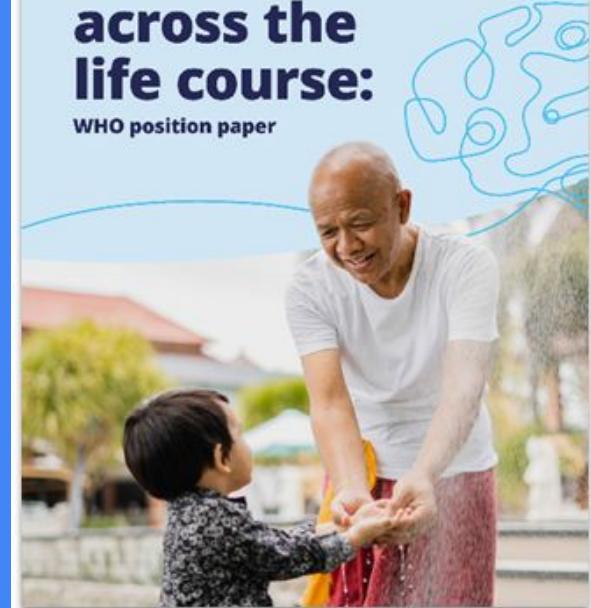
MEDITAGING Study: *Mindfulness training on aging: the effects of mindfulness based-stress reduction in older Portuguese-speaking migrants residing in Luxembourg (2021-23)*

Randomized controlled trial
8-week intervention

Mindfulness-Based Stress Reduction (N=45)

Health Promotion Program (N=45)

Cognition, emotional measures, mindfulness, sleep, cortisol and heart rate variability

Dr. Ana Carolina Teixeira Santos, University of Luxembourg and Zitha

Wie interagieren 'soziale Determinanten von Gesundheit' mit modifizierbaren Risikofaktoren für Demenz?

Soziale Determinanten von Gesundheit

Soziale Determinanten können auf individueller Ebene, aber auch auf Nachbarschafts-, Regions-, Länderebene gemessen werden.

Sehr schwierig, die Einflüsse einzelner Ebenen auseinanderzuhalten

Lebenslaufeinflüsse beachten

© Institute for Future Studies, Stockholm

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CRISP: Cognitive Aging: From Educational Opportunities to Individual Risk Profiles

- Panel *Social Sciences and Humanities* SH3: The Social World, Diversity, Population
- Analysis of panel datasets from large-scale cohort and ageing studies, specifically the family of *Health and Retirement Studies* (HRS, SHARE, ELSA, KLoSA, SABE), UK Biobank, and others
- 1.15 mio. EUR

Wichtigste Erkenntnisse

1. Großer Einfluss von sozioökonomischem Status auf Demenz, unabhängig von genetischer Vorbelastung

2. Großer Einfluss des 'westlichen Lebensstils' auf Gesundheit und auch Demenz

3. Die Rolle des Lebensstils gleichermaßen wichtig bei Männern und Frauen, und bei sozioökonomisch günstigen und weniger günstigen Lebensbedingungen

Do neighbourhood socioeconomic conditions interact with genetic risk for dementia?

Klee, M., Leist, A.K., Veldsman, M., Ranson, J.M., Llewellyn, D.J. (2023). Socioeconomic deprivation, genetic risk, and incident dementia. *American Journal of Preventive Medicine*. https://doi.org/10.1016/j.amepre.2023.01.012

Top decile, *Public Health, Environmental and Occupational Health* (Scopus)

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Neighbourhood deprivation x genetic dementia risk?

Neighborhood socioeconomic conditions (**Townsend Deprivation Index**)

Genetic risk

Physical/social activity, cognitive stimulation, noise, air pollution, …

Depression, **lifestyle**, **SES**, cardiovascular health, obesity,…

Risk of dementia

Neighbourhood deprivation x genetic risk

- UK Biobank: 196,368 participants 60+, European ancestry
- Time-to-event design: 2006-10 initial assessment, follow-up until 2016-17
- Dementia ascertained through hospital or death records
- Polygenic risk score for developing dementia: Quintiles 1 (low), 2-4 (moderate), 5 (high genetic risk)

Townsend Deprivation Index: Quintiles 1-4 (low) vs. quintile 5 (high deprivation)
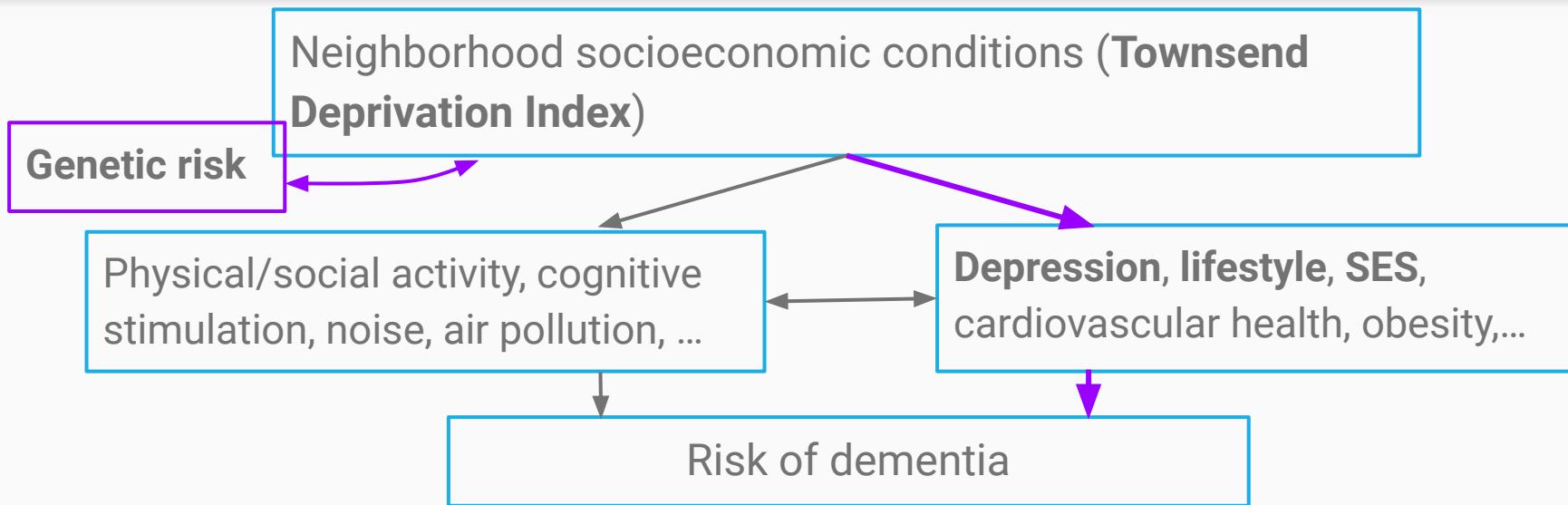Individual-level socioeconomic deprivation (income, home, car)

Klee, M., Leist, A.K., Veldsman, M., Ranson, J.M., Llewellyn, D.J. (2023). Socioeconomic deprivation, genetic risk, and incident dementia. *American Journal of Preventive Medicine*. https://doi.org/10.1016/j.amepre.2023.01.012

Neighbourhood deprivation x genetic risk

Figure 1. Risk of Incident Dementia for A Area-level and B Individual-level Socioeconomic Deprivation with Genetic Risk

A Area-level Socioeconomic Deprivation

Subgroup	Total No.[a]	No. Dementia Cases / Person-Years[a]	HR (95% CI)		P Value
Low Genetic Risk					
Low-to-Moderate Deprivation	31,648	177 / 249,647	1 [Reference]		
High Deprivation	7,626	70 / 59,124	1.30 (0.99-1.73)		.06
Intermediate Genetic Risk					
Low-to-Moderate Deprivation	94,316	744 / 744,724	1.39 (1.18-1.64)		<.001
High Deprivation	23,505	294 / 182,389	1.72 (1.41-2.08)		<.001
High Genetic Risk					
Low-to-Moderate Deprivation	31,131	345 / 246,144	1.96 (1.63-2.35)		<.001
High Deprivation	8,142	139 / 63,285	2.31 (1.84-2.91)		<.001

Hazard Ratio (95% CI)

B Individual-level Socioeconomic Deprivation

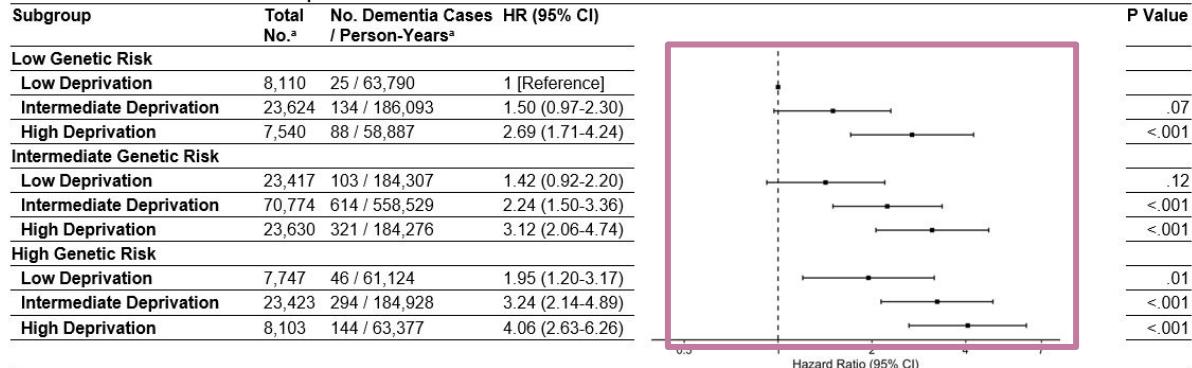| Subgroup	Total No.[a]	No. Dementia Cases / Person-Years[a]	HR (95% CI)		P Value
Low Genetic Risk					
Low Deprivation	8,110	25 / 63,790	1 [Reference]		
Intermediate Deprivation	23,624	134 / 186,093	1.50 (0.97-2.30)		.07
High Deprivation	7,540	88 / 58,887	2.69 (1.71-4.24)		<.001
Intermediate Genetic Risk					
Low Deprivation	23,417	103 / 184,307	1.42 (0.92-2.20)		.12
Intermediate Deprivation	70,774	614 / 558,529	2.24 (1.50-3.36)		<.001
High Deprivation	23,630	321 / 184,276	3.12 (2.06-4.74)		<.001
High Genetic Risk					
Low Deprivation	7,747	46 / 61,124	1.95 (1.20-3.17)		.01
Intermediate Deprivation	23,423	294 / 184,928	3.24 (2.14-4.89)		<.001
High Deprivation	8,103	144 / 63,377	4.06 (2.63-6.26)		<.001

Hazard Ratio (95% CI)

All Cox proportional-hazards regressions were adjusted for covariates relevant in polygenic risk analyses, age, sex, education, marital status, healthy lifestyle and depressive symptoms in last two weeks. Additionally, adjustments for individual-level (A) and area-level socioeconomic deprivation (B) were included.

Klee, M., Leist, A.K., Veldsman, M., Ranson, J.M., Llewellyn, D.J. (2023). Socioeconomic deprivation, genetic risk, and incident dementia. *American Journal of Preventive Medicine*.

Sex/gender and socioeconomic differences in modifiable risk factors for dementia

Dr. Anouk Geraets, IRSEI, UL

Sex/gender and socioeconomic differences in modifiable risk factors for dementia

Sex/gender and socioeconomic differences in dementia and modifiable risk factors for dementia

Different risk factor prevalence or different exposure-outcome relationships?

English Longitudinal Study of Ageing (2008/2009 to 2018/2019)
N = 8,941 individuals, mean age, 66.1 ± 9.8 years; n = 4,935 (55.2%) women
Modifiable risk factors according to the LIBRA score and Livingston.

Geraets, A. F. J., & Leist, A. K. (2023). Sex/gender and socioeconomic differences in modifiable risk factors for dementia. *Scientific Reports*. doi: 10.1038/s41598-022-27368-4

Sex/gender and socioeconomic differences in modifiable risk factors for dementia

- No overall sex/gender difference in dementia risk
- Dementia risk was higher among those with
  - Childhood deprivation [hazard ratio (HR) = 1.51 (1.17; 1.96)];
  - Lower occupational attainment [HR low versus high = 1.60 (1.23; 2.09) and HR medium versus high = 1.53 (1.15; 2.06)];
  - Low wealth [HR low versus high = 1.63 (1.26; 2.12)].

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Sex/gender and socioeconomic differences in modifiable risk factors for dementia
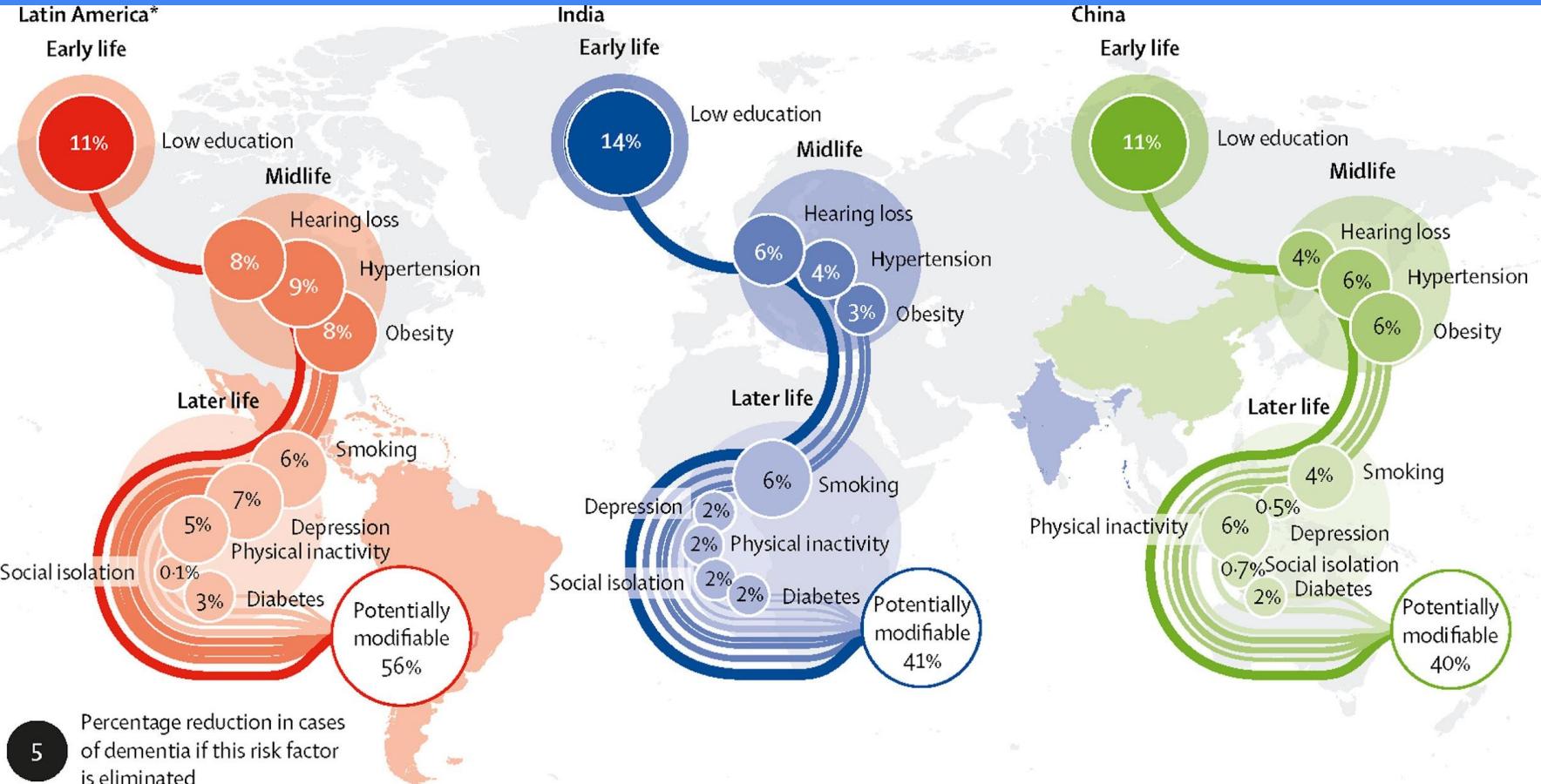
- Sex/gender differences in modifiable risk factors
  - Low cognitive activity was associated with a higher dementia risk for women [HR = 2.61 (1.89; 3.60)] compared to men [HR = 1.73 (1.20; 2.49)].
- No consistent socioeconomic differences in modifiable dementia risk factors.

⇨ Suggests that population-based approaches that tackle inequalities and modifiable risk factor burden directly will be successful.

What is the prevalence of cognitive impairment in Latin America and the Caribbean, and what are the secular trends?

Dr. Fabiana Ribeiro, IRSEI, UL

Latin America*

Early life
11% — Low education

Midlife
8% — Hearing loss
9% — Hypertension
8% — Obesity

Later life
6% — Smoking
7% — Depression
5% — Physical inactivity
0.1% — Social isolation
3% — Diabetes

Potentially modifiable 56%

India

Early life
14% — Low education

Midlife
6% — Hearing loss
4% — Hypertension
3% — Obesity

Later life
6% — Smoking
2% — Depression
2% — Physical inactivity
2% — Social isolation
2% — Diabetes

Potentially modifiable 41%

China

Early life
11% — Low education

Midlife
4% — Hearing loss
6% — Hypertension
6% — Obesity

Later life
4% — Smoking
0.5% — Depression
6% — Physical inactivity
0.7% — Social isolation
2% — Diabetes

Potentially modifiable 40%

5 — Percentage reduction in cases of dementia if this risk factor is eliminated

Mukadam, N., Sommerlad, A., Huntley, J., & Livingston, G. (2019). Population attributable fractions for risk factors for dementia in low-income and middle-income countries: an analysis using cross-sectional survey data. *The Lancet Global Health*, 7(5), e596-e603.

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Motivation

- Estimate dementia prevalence in lower-resource settings
- Investigate secular trends in prevalence of cognitive impairment in lower-resource settings
- Investigate secular trends in risk factor burden

Prevalence of cognitive impairment by age group, São Paulo, 2000-2015
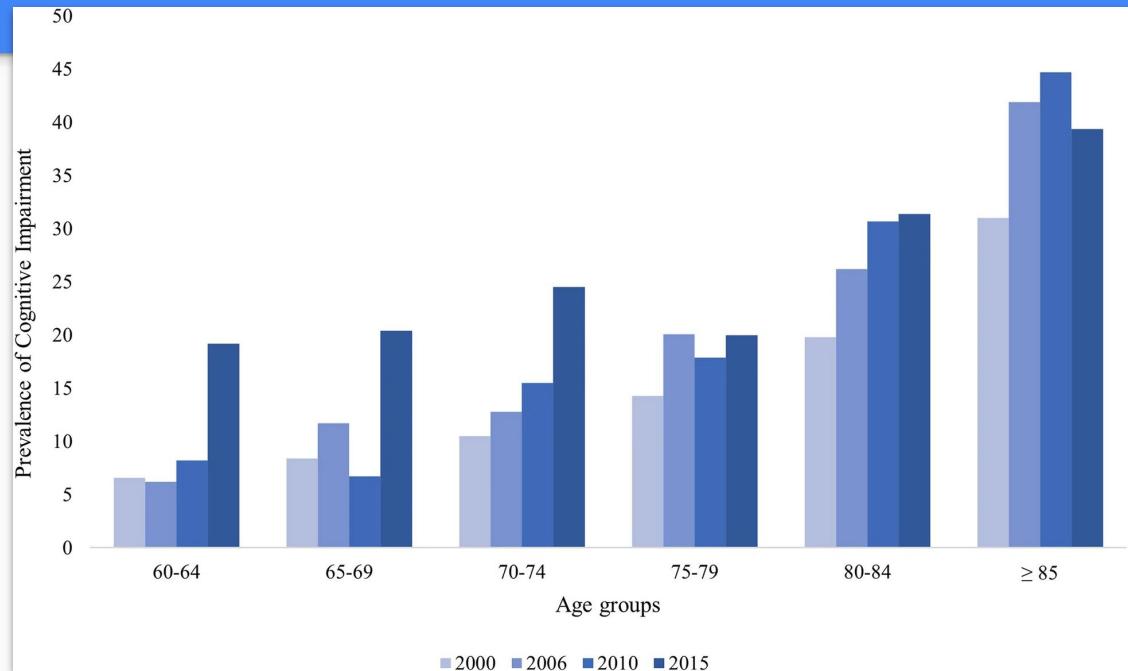
Increases in prevalence of cognitive impairment, specifically 60-79 years, 2000-2015

Increases in formal education and income, 2000-2015

Increases in prevalence of diabetes, hypertension, overweight/obesity, 2000-2015

Ribeiro, F. S., de Oliveira Duarte, Y. A., Santos, J. L. F., & Leist, A. K. (2021). Changes in prevalence of cognitive impairment and associated risk factors 2000–2015 in São Paulo, Brazil. *BMC geriatrics*, 21(1), 1-10.

Wie können wir das Demenzrisiko durch einen gesunden Lebensstil verringern?

Wie entsteht das Demenzrisiko?

Mögliche Pfade:

- Kognitive Stimulation
- Chronischer Stress
- Entzündungen
- Soziale Stimulation/Unterstützung
- Mikrobiom?
- Umwelt(neuro)toxine
- Resilienz/Widerstandsfähigkeit gegenüber Stressoren
- ...

Wichtigste zu empfehlende Verhaltensweisen für Erwachsene mittleren Alters

- Körperliche Aktivität steigern, insbesondere Ausdauertraining
- Alkoholkonsum einschränken (v.a. weniger als 21 Einheiten/Woche)
- Überwachung des kardiovaskulären und Diabetes-Risikos, falls erforderlich: Behandlung
- Kalorienaufnahme angepasst an das Verhaltensprofil
- Mit dem Rauchen aufhören
- Schlafqualität verbessern, insb. Schlafdauer

Erwägungen zu Geschlechtsunterschieden

- Zeitverwendung zwischen den Geschlechtern (Fürsorgearbeit)

- Hormonelle/biologische Überlegungen bei der Ausübung von Sport, Kalorienaufnahme

- Unterschiede zwischen den Geschlechtern hinsichtlich der Schwellenwerte für Alkoholkonsum

- …

Wichtigste *zusätzliche* Verhaltensweisen für ältere Erwachsene (60+ Jahre)

- Hinreichende Flüssigkeitsaufnahme

- Körperliche Aktivität steigern durch Kraft-/Widerstandstraining

- Wenn das Gehör beeinträchtigt ist, das Hörgerät regelmäßig tragen

- Kognitiv und sozial aktiv bleiben

Neue Gewohnheiten zu etablieren ('habit formation') ist kein triviales Vorhaben…

Die Psychologie der Verhaltensänderung

- Formulieren Sie ein Ziel
- Visualisieren Sie sich selbst in der Zukunft, wenn Sie Ihr Ziel erreicht haben
- Verantwortlichkeit (Rechenschaft) erhöhen
- Umstrukturierung negativer Erlebnisse bei den neuen Verhaltensweisen

Die Psychologie der Verhaltensänderung

Erkenntnisse über die Bildung und Aufrechterhaltung von Gewohnheiten nutzen:

- <u>Eine </u>neue Gewohnheit nach der anderen
- Klein anfangen
- Verbinden Sie neue mit bestehenden Gewohnheiten
- Wenn die neue Gewohnheit bedeutet, mit etwas "aufzuhören", diese durch eine (harmlose) angenehme Alternative ersetzen

Selbsthilfegruppen, Wettbewerbe, Coaching nutzen...

Integrierte Versorgung bei milder kognitiver Beeinträchtigung

Programme for Dementia Prevention (pdp)

Concept

Livingston et al., The Lancet Comission, 2020
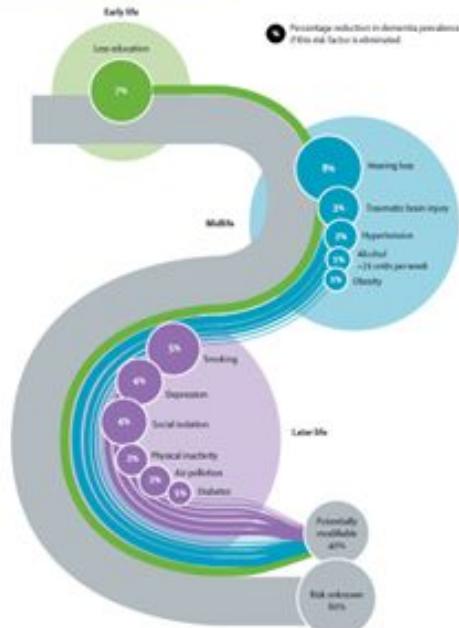
Risk factors for dementia

Hypertension
Cardiovascular diseases
Hypercholesterolemia
Physical inactivity
Cognitive inactivity
Diabetes
Obesity
Non-mediterranean diet
Excessive alcohol consumption
Smoking
Depression
Social isolation
Kidney disfunction
Hearing loss
Traumatic brain injury
Air pollution

www.pdp.lu / info@pdp.lu

Bitte mitmachen!
Ein neues Forschungsprojekt in Luxemburg:
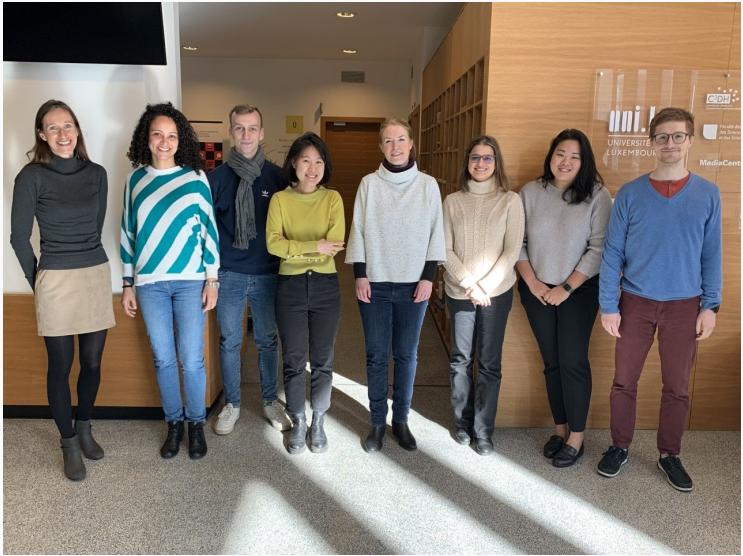
Schléisst lech eiser Fuerschung un,

fir Gehierkrankheeten ze vermeiden.

www.heba.lu

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Anouk Geraets
Ana Carolina Teixeira Santos
Jung Hyun Kim
Melissa Chan
Matthias Klee
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All study participants

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https://cognitiveageing.uni.lu

Extra slides
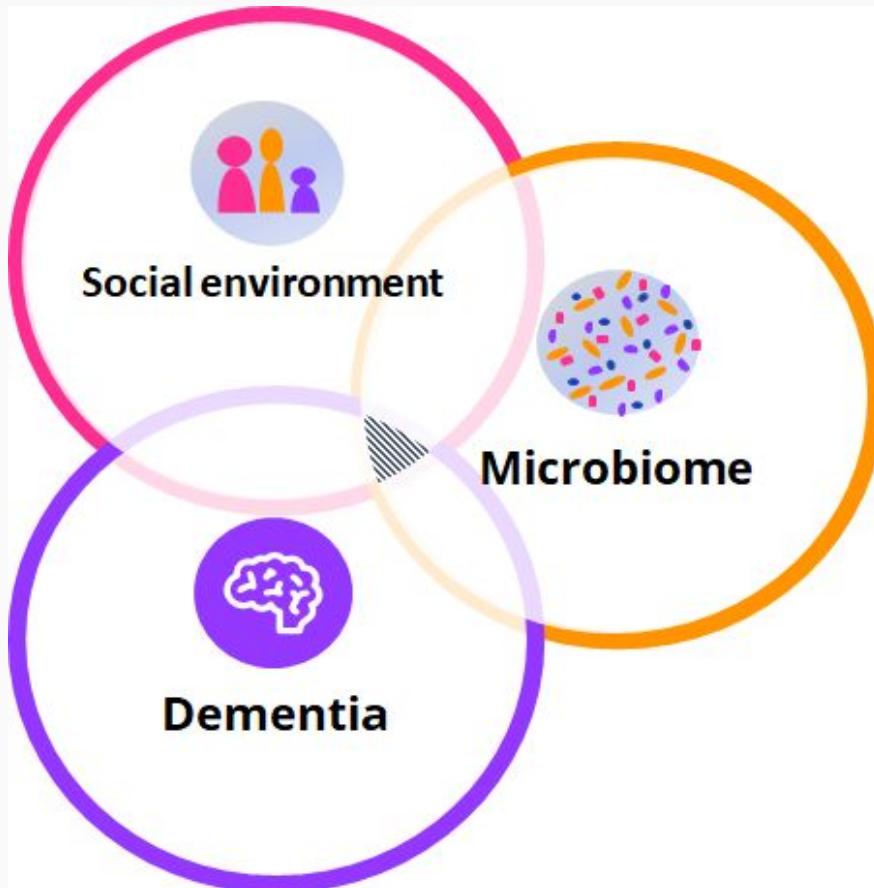
MCI-BIOME
Relationship between socioeconomic status and the gut microbiome as a risk of dementia

co-PIs: Profs. Anja Leist, Paul Wilmes, Rejko Krüger

2019-23

Current status: Analysis of n=256 healthy controls with and without MCI of the NCER Parkinson cohort.

Submitted to the Alzheimer Association International Conference (AAIC), Amsterdam, July 2023
Presented at the Precision Medicine congress, Luxembourg, January 2023

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OXFORD

Research Article

Partnership and Cognitive Aging in Europe: Mediating Factors and Social Stratification

Ariane Bertogg, PhD[1,*] and Anja K. Leist, PhD[2]

[1]Department of
University of Lu

*Address corresp
Universitätsstrass

Received: August
Decision Editor: D

Abstract

Objectives: Liv
impairment. Few
to their impact
cial integration
Methods: Data
panel for the po
sample includes
individuals were
layed recall an
variation in mer
Results: Partne
controlling for
layed recall. Ex
Additional anal
Discussion: Pa
less favorable o

Keywords: Bere

INTRODUCTION

Compared to wo
availability of large da
sciences, machine learn
siderably improve ana
advances in prediction
in detecting methods
exposures and confoun
However, uptake of M
spanning from sociolo
clinical epidemiology a
remains fragmented to
corporating of domain
social and health scien
approaches fitting the r

The aims of this pap
toolbox of ML app
research goals in the s
methods explain contr
solutions to common p
on research questions p
as research units and
reported variables. In t
using ML, we present b
that is, models are not e
finite datasets from co
collection and cleaning

Family ties, an
portant resour
societies, partn
portant tie of c
2009). Being m
if unmarried, h
(Johnson et al.,
cognitive funct
or partner as o
highly protective

[1]Department of Social
(IRSEI), University of Luxem
Epidemiology and Populati
[2]Centre for Dementia Prev
University, Athens, OH, US
Edinburgh, UK.
*Corresponding author.

Leist et al., Sci Adv. 8. eabk1

SSM - Population Health 15 (2021) 100837

Contents lists available at ScienceDirect

SSM - Population Health

journal homepage: www.elsevier.com/locate/ssmph

ELSEVIER

Inequality of educational opportunity at time of schooling predicts cognitive functioning in later adulthood

Anja K. Leist[a,*], Eyal Bar-Haim[b], Louis Chauvel[b]

[a] University of Luxembourg, Department of Social Sciences, Institute for Research on Socio-Economic Inequality (IRSEI), Esch-sur-Alzette
[b] Ben-Gurion University of the Negev, Department of Education, Beersheba, Israel

ABSTRACT

Objectives: Our understanding
ment across the life course is li
(IEO), the country- and cohort-
systematically different opportun
abilities up to older ages.
Methods: A total of 46,972 ind
provided up to six cognitive
individual-level data were link
development, provided by Wou
Results: In multilevel (mixed-ef
a large set of confounders, hig
women. Interaction analyses r
higher IEO contexts and that lo
tioning were present only in w
window of observation. Result
and in a subsample with child
Discussion: Findings suggest th
impacts. Especially low-educate
high-inequality wom

SCIENCE ADVANCES | REVIEW

RESEARCH METHODS

Mapping of machine learning approaches for description, prediction, and causal inference in the social and health sciences

Anja K. Leist[1*], Matthias Klee[1], Jung Hyun Kim[1], David H. Rehkopf[2], Stéphane P. A. Bordas[3], Graciela Muniz-Terrera[4,5], Sara Wade[6]

Machine learning (ML
purposes and opportunit
of research questions f
sary requirements to s
tion, prediction, coun
estimating prevalence
factors or causes of and
layed recall an
fully exploit the benefi
and hopefully contribu
social and health scien

Health & Place 68 (2021) 102510

Contents lists available at ScienceDirect

Health and Place

journal homepage: http://www.elsevier.com/locate/healthplace

HEALTH & PLACE

ELSEVIER

Changes in neighborhood-level socioeconomic disadvantage and older Americans' cognitive functioning

Jason Settels[*], Anja K. Leist

University of Luxembourg, Department of Social Sciences, Institute for Research on Socio-Economic Inequality, 11, Porte des Scien
Luxembourg

ABSTRACT

Background: While associations between neighborhood condition
established, few studies have investigated with a dynamic
conditions affect older adults' cognitive declines, and w
Method: Using data from waves 2 (2010–2011) and 3 (201
Project (NSHAP) survey (n = 1837), ordinary least squares
adjusting for multiple confounders and testing eight potent
Results: Worsening neighborhood socioeconomic circumsta
in depressive symptoms, sizes of close social networks
relationship.
Discussion: While 18.10% of the total effect occurred thr
through contextual- and individual-level variables not ass

BMC Geriatrics

RESEARCH   Open Access

Changes in prevalence of cognitive impairment and associated risk factors 2000–2015 in São Paulo, Brazil

Fabiana Silva Ribeiro[1*], Yeda Aparecida de Oliveira Duarte[2], Jair Lício Ferreira Santos[3] and Anja K. Leist[1]

A preliminary version of this work was presented at the Alzheimer's Association International Conference,

dementia over the last two decades have been
dy aimed to assess the cognitive impairment
living in São Paulo, Brazil.

ing survey conducted in 2000, 2006, 2010, and
al-Mental State Exam corrected for formal educa-
ses.

nce, cardiovascular risk factors, and depression
5 and 2000, respondents were more likely to
sity. Moreover, the weighted analyses showed

AGING & MENTAL HEALTH
https://doi.org/10.1080/13607863.2021.2003297

Routledge
Taylor & Francis Group

REVIEW

The prevalence of mild cognitive impairment in Latin America and the Caribbean: a systematic review and meta-analysis

Fabiana Silva Ribeiro, Ana Carolina Teixeira-Santos and Anja K. Leist

Department of Social Sciences, University of Luxembourg, Esch-sur-Alzette, Luxembourg

ABSTRACT

Objectives: The population of Latin America and Caribbean
highest prevalence rates of dementia in the world. Mild cog
condition between normal and
Alzheimer's disease, and
thematic review to evaluate the prevalence of MCI in LAC coun
MCI (i.e. age, sex/gender, and education).
Method: A database search was conducted in September 202
Lilacs, SciELO, EMBASE, and medRxiv for population- or co
English, Spanish, and Portuguese.
Results: From 2,155 screened studies, we selected reports in
of MCI. A total of 11 studies met the inclusion criteria, addin
tries: Brazil, Mexico, Argentina, Colombia, Peru, Cuba, Domin
Estimates for all-type MCI prevalence ranged from 6.8% to
and 10.5%. Estimates differed by age and education, with ol

Ageing Research Reviews 81 (2022) 101703

Contents lists available at ScienceDirect

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Review

Prevalence of dementia in Latin America and Caribbean countries: Systematic review and meta-analyses exploring age, sex, rurality, and education as possible determinants

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ABSTRACT

Background: Studies have shown that the prevalence of dementia in Latin America and the Caribbean (LAC) may
be higher than in high-income countries. Thus, we sought to systematically analyse the prevalence of dementia
and explore possible drivers that lead to this disparity in LAC countries.
Method: We searched Pubmed, Web of Knowledge, Scopus, Lilacs, and SciELO for studies on dementia in LAC
countries published in English, Spanish, and Portuguese. Random-effects model was applied.
Results: Thirty-one studies from 17 LAC countries were included. Pooled prevalence of all-cause dementia was
10.66%. Further analyses with studies providing raw prevalence by sex, area, and educational level showed a
higher prevalence for women (8.97%) than for men (7.26%). Also, dementia prevalence was higher for those in
urban residents (7.71% vs 8.68%, respectively). Participants without formal education presented more than
double the prevalence of dementia (21.37%) compared to those with at least one year of formal education
(9.88%). Studies with more recent data collection showed higher dementia prevalence.
Conclusion: Our findings suggest a high global dementia prevalence in LAC countries and an unequal burden of
dementia for women, lower-educated, and rural residents. Secular increases in dementia prevalence call for
greater public health efforts for preventative actions.

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Sex/gender and socioeconomic differences in modifiable risk factors for dementia

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Both sex/gender and socioeconomic differences have been reported in the prevalence of modifiable
risk factors for dementia. However, it remains unclear whether the associations between modifiable
risk factors for dementia and incident dementia differ by sex/gender or socioeconomic status. This
study aimed to investigate sex/gender and socioeconomic differences in the associations of modifiable
risk factors with incident dementia using a life-course perspective. We used data from the English
Longitudinal Study of Ageing (2008/2009 to 2018/2019). A total of 8,941 individuals were included
[mean (standard deviation) age, 66.1 ± 9.8 years; 4,935 (55.2%) were women]. No overall sex/gender
difference in dementia risk was found. Dementia risk was higher among those who experienced
childhood deprivation [hazard ratio (HR) = 1.51 (1.17; 1.96)], lower occupational attainment [HR low
versus high = 1.60 (1.23; 2.09) and HR medium versus high = 1.53 (1.15; 2.06)], and low wealth [HR
low versus high = 1.63 (1.26; 2.12)]. Though different associations were found among the subgroups,
there might be a sex/gender difference in dementia risk only for low cognitive activity, suggesting a
higher risk for women [HR = 2.61 (1.89; 3.60)] compared to men [HR = 1.73 (1.20; 2.49)]. No consistent
socioeconomic differences in modifiable dementia risk were found. A population-based approach that
tackles inequalities in dementia risk profiles directly may be more effective than individual approaches
in dementia prevention.

1. Introduction

The population living in Latin America and the Caribbean (LAC)
countries was estimated to be around 653,962,000 people in 2020
(United Nations Data Retrieval System (n.d.)), accounting for 8.4% of
the world population. Population ageing is one of the most crucial global
transformations. In 1990, the world's population aged 65 and over was
6%, being 5% in LAC, while by 2019, this number achieved 9% both
worldwide and in LAC. Moreover, the proportion of older people is ex-
pected to continue increasing, so that one in six people worldwide will
be 65 years or older in 2050. Consequently, more cases of dementia are
expected to emerge (Custodio et al., 2017).

frontotemporal dementia, and Alzheimer's disease; the latter corre-
sponds to 60–70% of cases (World Health Organization, 2020). The
Global Burden of Disease Study, using 2016 global data, found that the
number of individuals living with Alzheimer's disease and other de-
mentias increased 117% from 1990 to 2016, with a higher prevalence
among women than men. Additionally, dementia was the fifth leading
cause of death worldwide and consistently ranked among the top three
causes of disability in most countries (GBD, Dementia Collaborators,
2016, 2019). In this sense, it is essential to provide robust and accurate
figures on the prevalence of dementia since it is indispensable in terms of
prognosis for treatment and public policy making. Dementia is one of the
most significant causes of dependence among older adults, causing