Global patterns and trends in physiological risk factors for non-communicable diseases

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NCD Risk Factor Collaboration (NCD-RisC)

- Worldwide network of ~1,500 collaborators
- Pool and analyse comprehensive, population-based measurement data on cardio-metabolic risk factors
- Collaboration with the World Health Organization
- Country results and visualisations at www.ncdrisc.org

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NCD-RisC selected scientific outputs

Worldwide trends in body-mass index, underwei
overweight, and obesity from 1975 to 2016: a p
analysis of 2416 population-based measuremen
128·9 million children, adolescents, and adults

NCD Risk Factor Collaboration (NCD-RisC)*

LETTER OPEN

https://doi.org/10.1038/s41586-019-1171-x

Rising rural body–mass index is the main driver of the global obesity epidemic in adults

NCD Risk Factor Collaboration (NCD-RisC)*

Trends in adult body-mass index in 200 countries from 1975 to 2014: a pooled analysis of 1698 population-based measurement studies with 19·2 million participants

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eLIFE elifesciences.org

A century of trends in adult human height

NCD Risk Factor Collaboration (NCD-RisC)*

Height and body-mass index trajectories of school-aged children and adolescents from 1985 to 2019 in 200 countries and territories: a pooled analysis of 2181 population-based studies with 65 million participants

NCD Risk Factor Collaboration (NCD-RisC)*

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Article

Repositioning of the global epicentre of non-optimal cholesterol

https://doi.org/10.1038/s41586-020-2338-1 NCD Risk Factor Collaboration (NCD-RisC)*

Worldwide trends in blood pressure from 1975 to 2015: a pooled analysis of 1479 population-based measurement studies with 19·1 million participants

NCD Risk Factor Collaboration (NCD-RisC)*

Long-term and recent trends in hypertension awareness, treatment, and control in 12 high-income countries: an analysis of 123 nationally representative surveys

NCD Risk Factor Collaboration (NCD-RisC)*

Worldwide trends in diabetes since 1980: a pooled analysis of 751 population-based studies with 4·4 million participants

NCD Risk Factor Collaboration (NCD-RisC)*

Worldwide trends in hypertension prevalence and progress in treatment and control from 1990 to 2019: a pooled analysis of 1201 population-representative studies with 104 million participants

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Article

Diminishing benefits of urban living for children and adolescents' growth and development

Worldwide trends in underweight and obesity from 1990 to 2022: a pooled analysis of 3663 population-representative studies with 222 million children, adolescents, and adults

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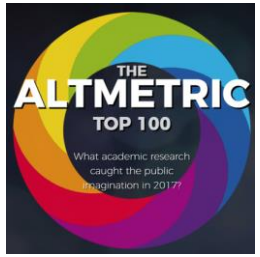

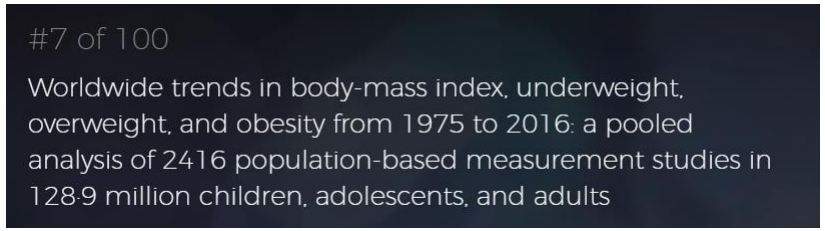

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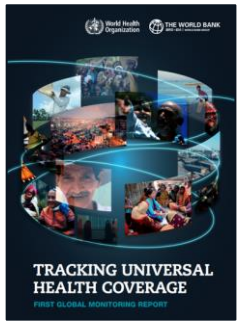
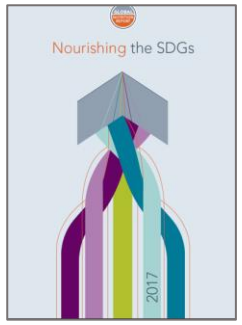
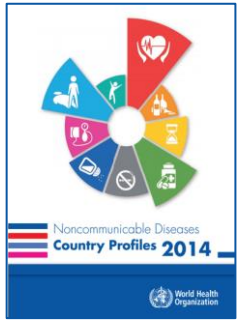
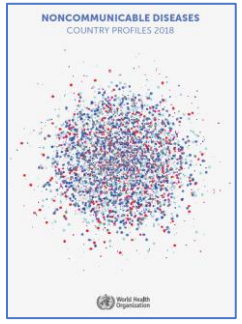
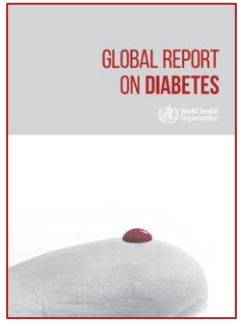
NCD-RisC policy and engagement outputs and outreach

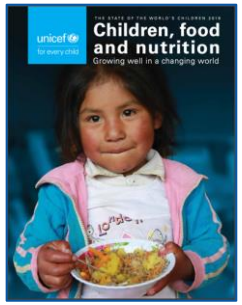


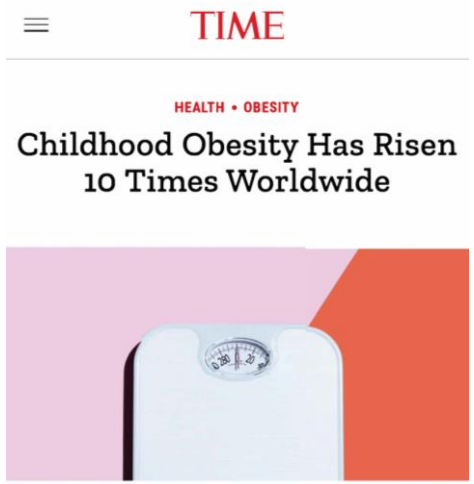












Since launch of www.ncdrisc.org in April 2016	
Total users	464,799
Total sessions	581,676
Total page views	1,758,956
Users (per day)	191
Sessions (per day)	239
Page views (per day)	723

63 countries have ≥1000 sessions
204 countries have ≥10 sessions
234 countries have at least 1 session

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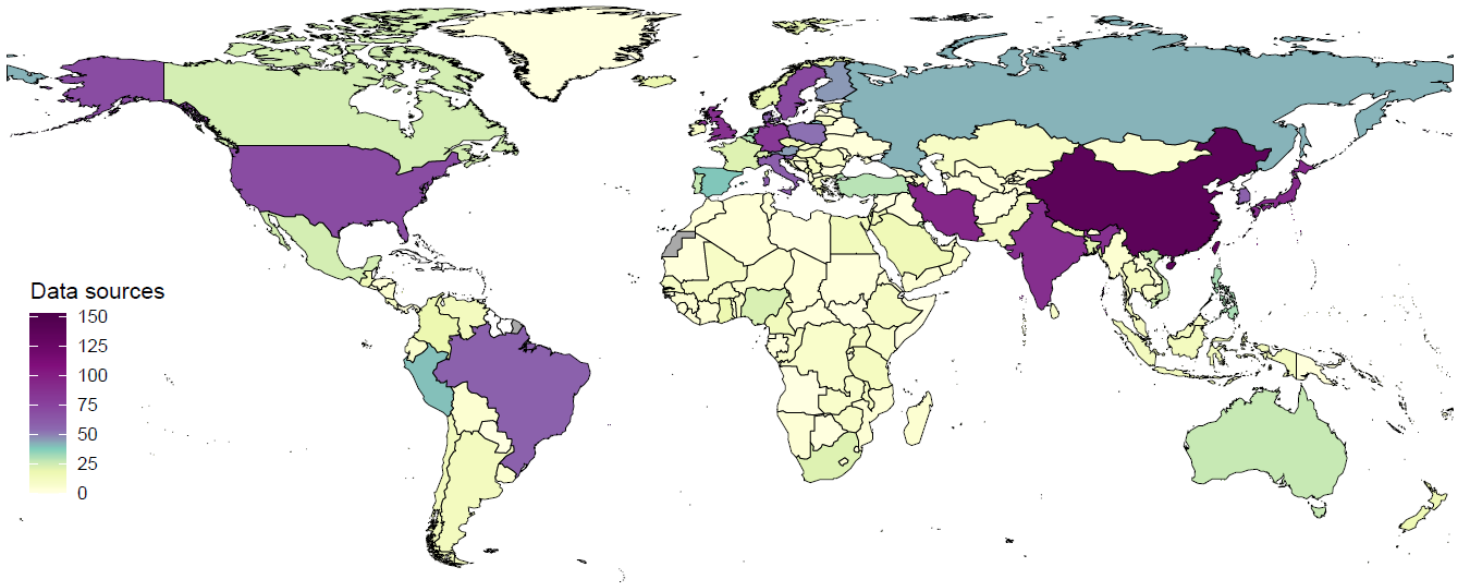
Collating worldwide data on cardiometabolic risk factors

- ~4,000 studies with measured height and weight on ~220 million people
- ~2,200 studies with measured blood pressure on ~120 million people
- ~1,300 studies with measured biomarker of diabetes/blood lipids on ~110 million people



Data on height and weight:

- 197 countries had at least 1 study
- 187 countries had at least 2 studies
- 142 countries had at least 5 studies
- Half are nationally representative studies

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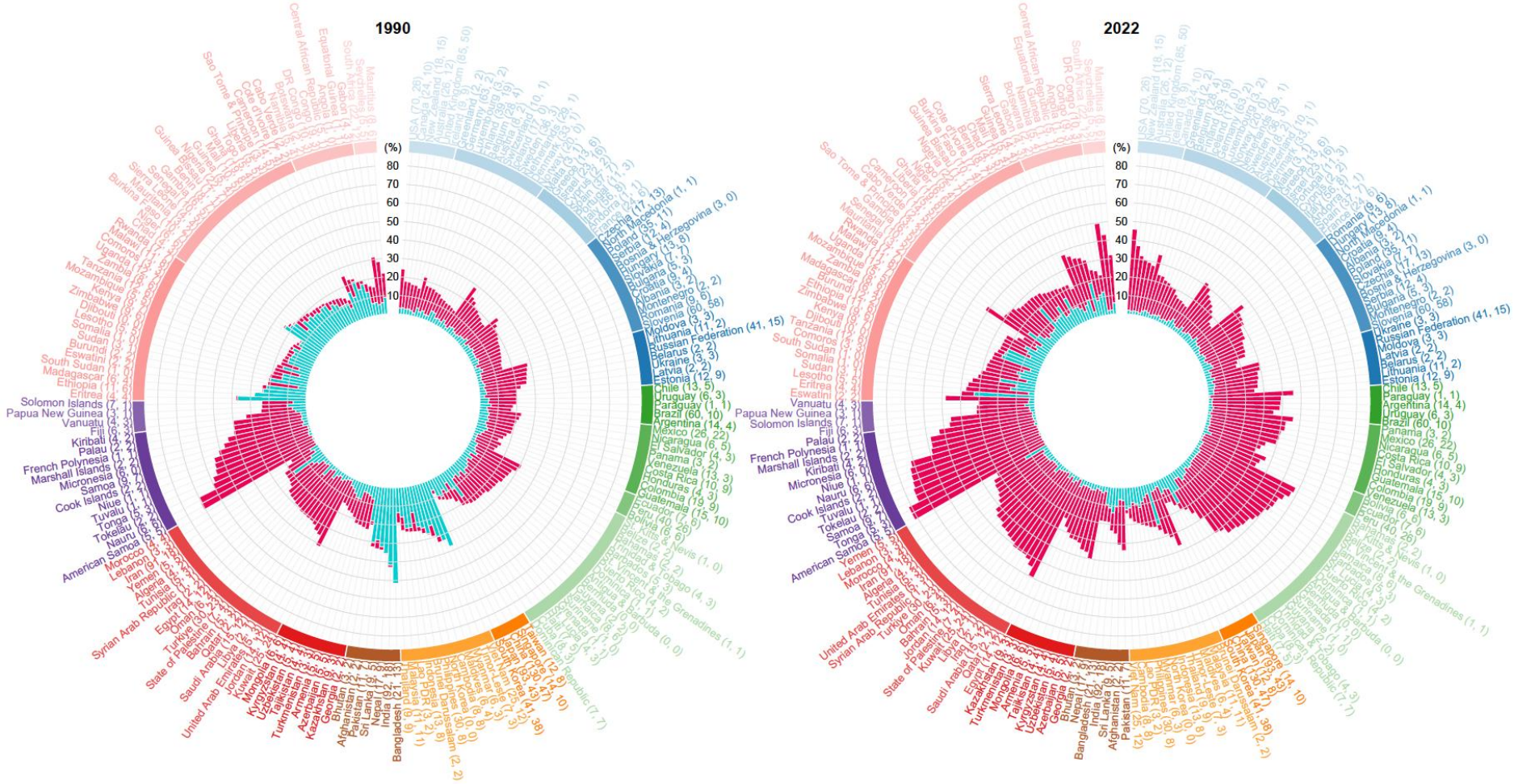
Underweight has decreased almost everywhere while obesity has risen



Underweight

Obesity

High-income English-speaking countries
Northwestern Europe
Southwestern Europe
Central Europe
Eastern Europe
Southern Latin America
Central Latin America
Andean Latin America
The Caribbean
East Asia and the Pacific
Southeast Asia
South Asia
Central Asia
Middle East and north Africa
Polynesia and Micronesia
Melanesia
East Africa
West Africa
Central and southern Africa
Other sub-Saharan Africa

NCD Risk Factor Collaboration (NCD-RisC) *Lancet* 2024

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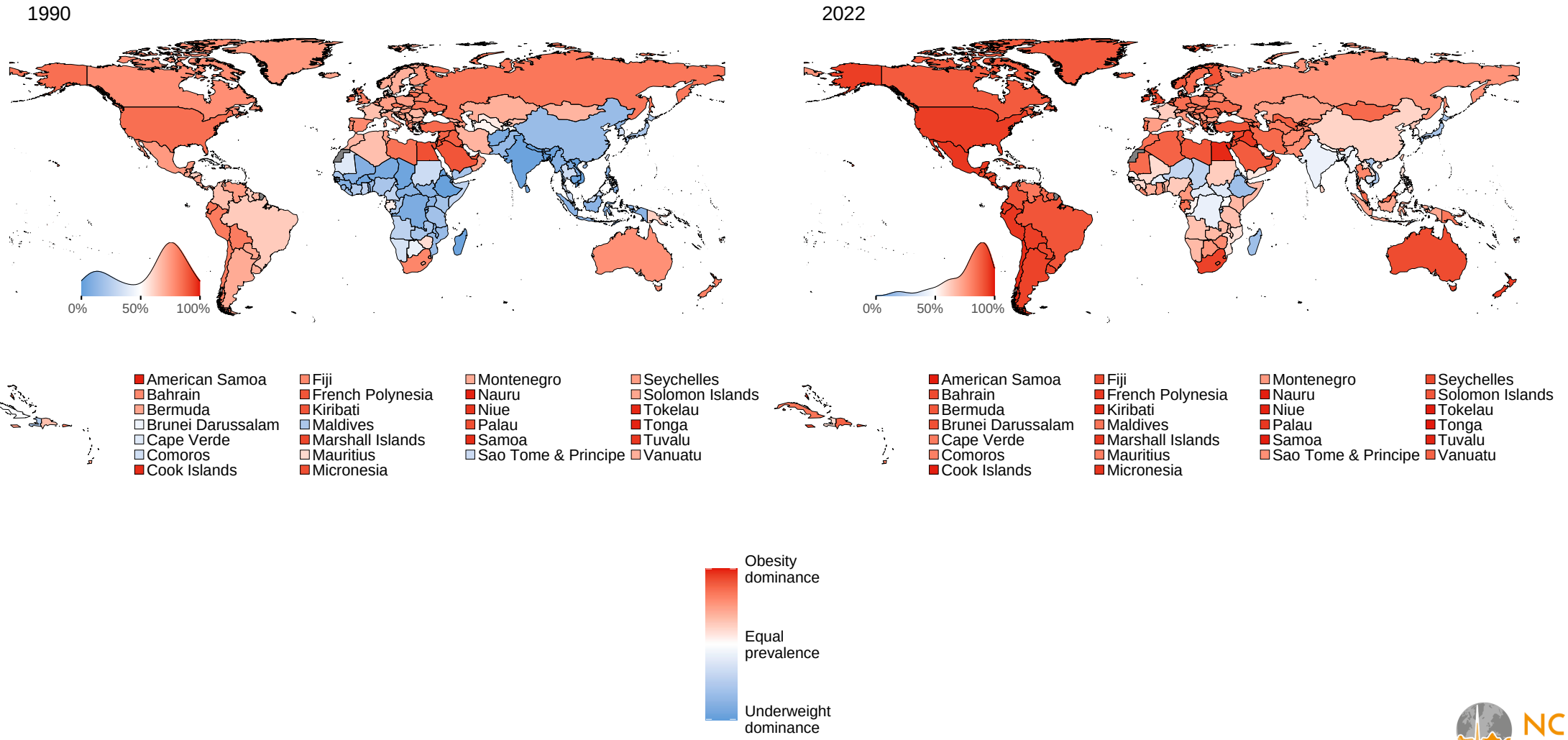
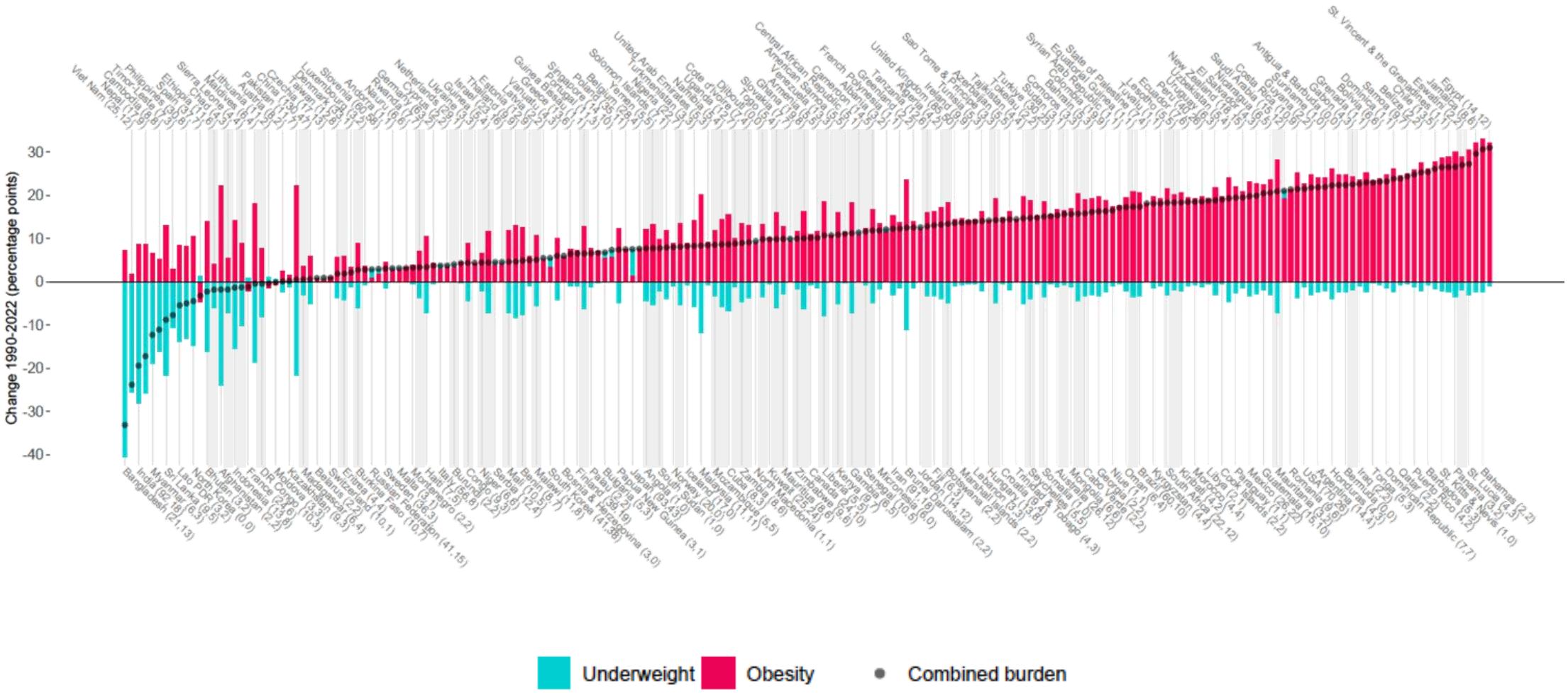
A transition from underweight dominance to obesity dominance

Share of double burden that is from obesity



NCD Risk Factor Collaboration (NCD-RisC) *Lancet* 2024

An increase in the combined burden of underweight and obesity



NCD Risk Factor Collaboration (NCD-RisC) *Lancet* 2024

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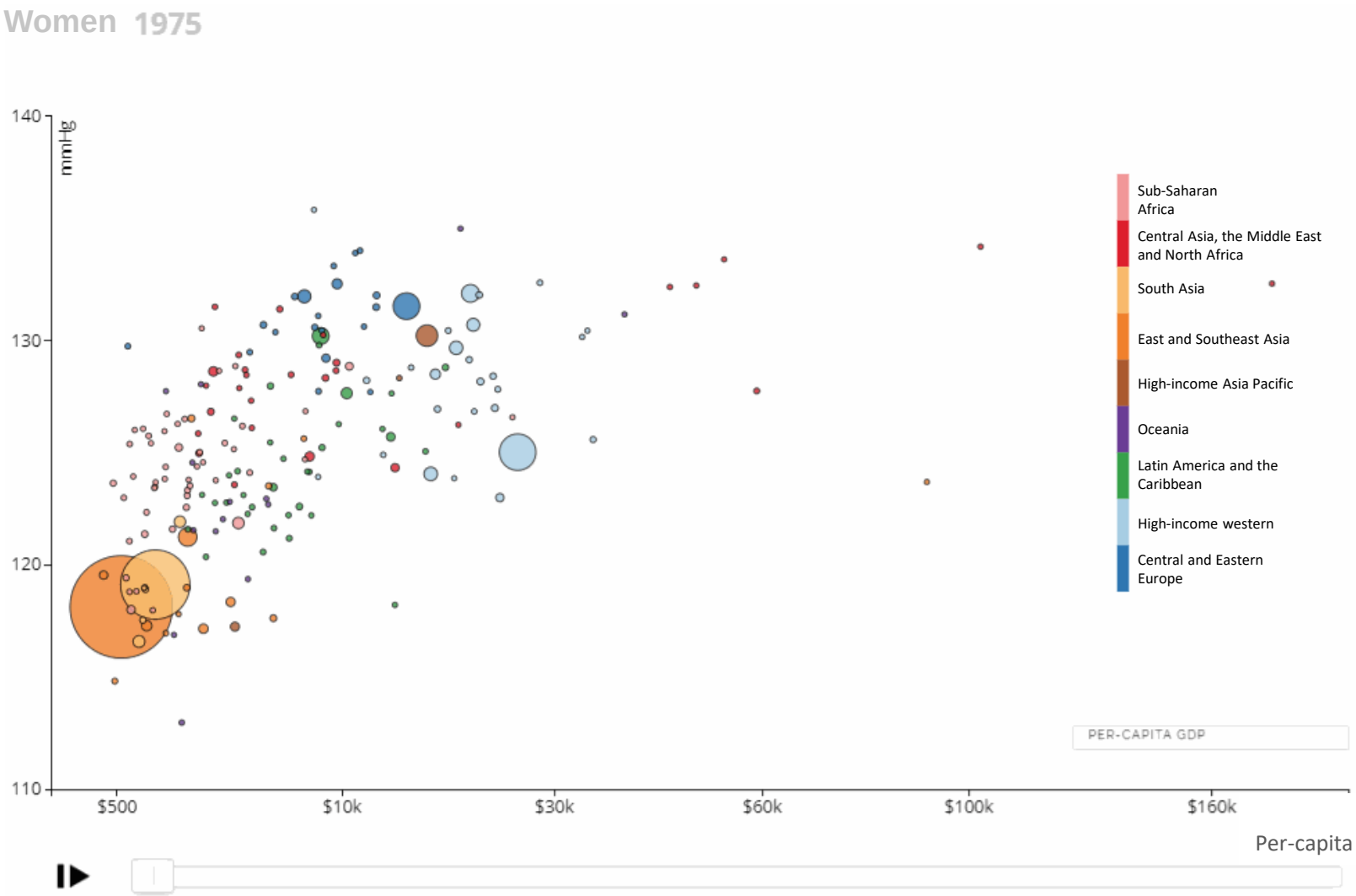
A repositioning of the epicentre of high blood pressure



Per-capita GDP (2011 international $)

NCD Risk Factor Collaboration (NCD-RisC) *Lancet* 2017; Zhou et al., *Nature Reviews Cardiology* 2021; www.ncdrisc.org

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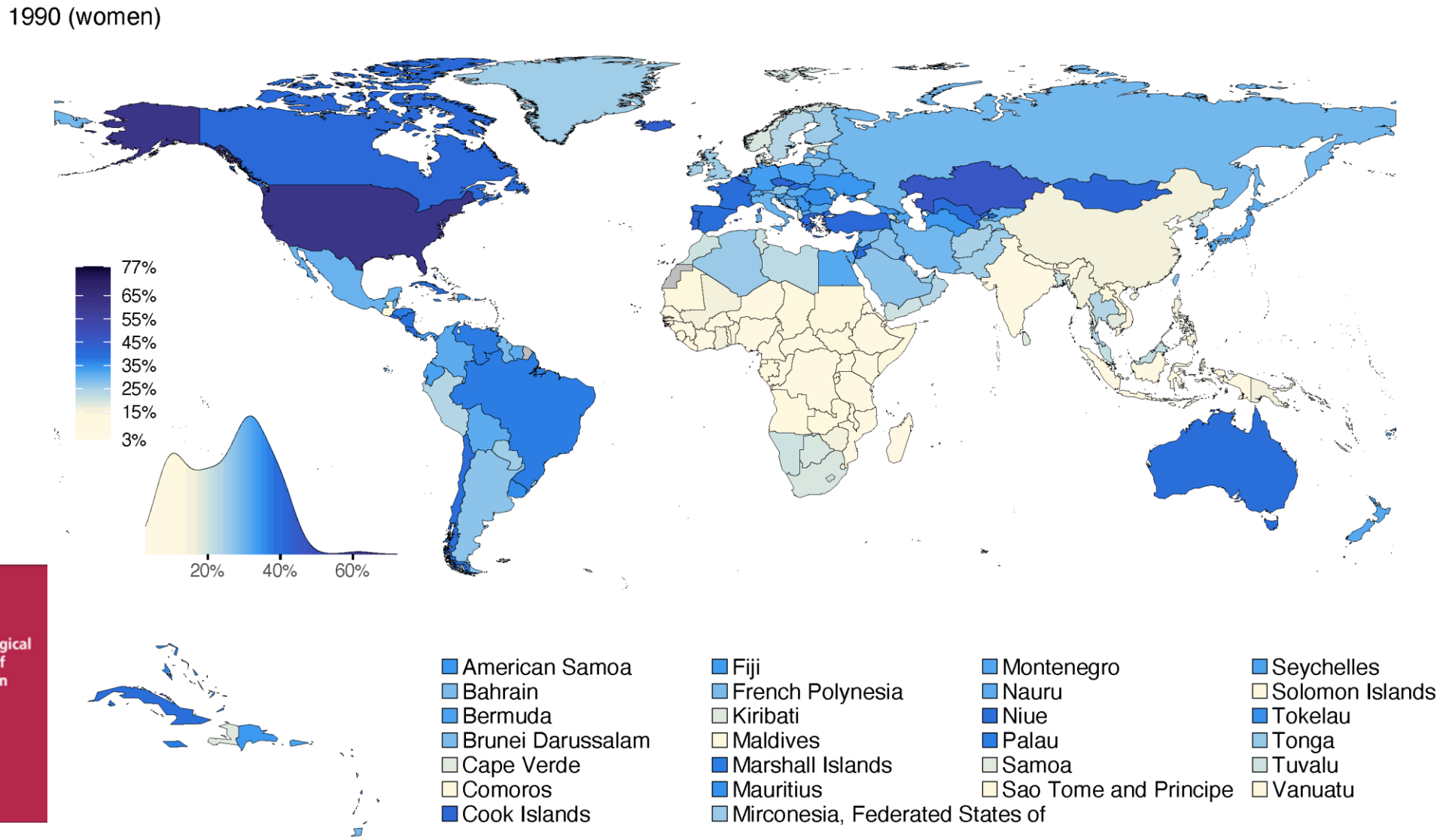
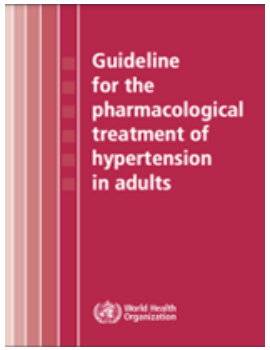
Highly variable rates of hypertension treatment across the world





NCD Risk Factor Collaboration (NCD-RisC) *Lancet* 2021

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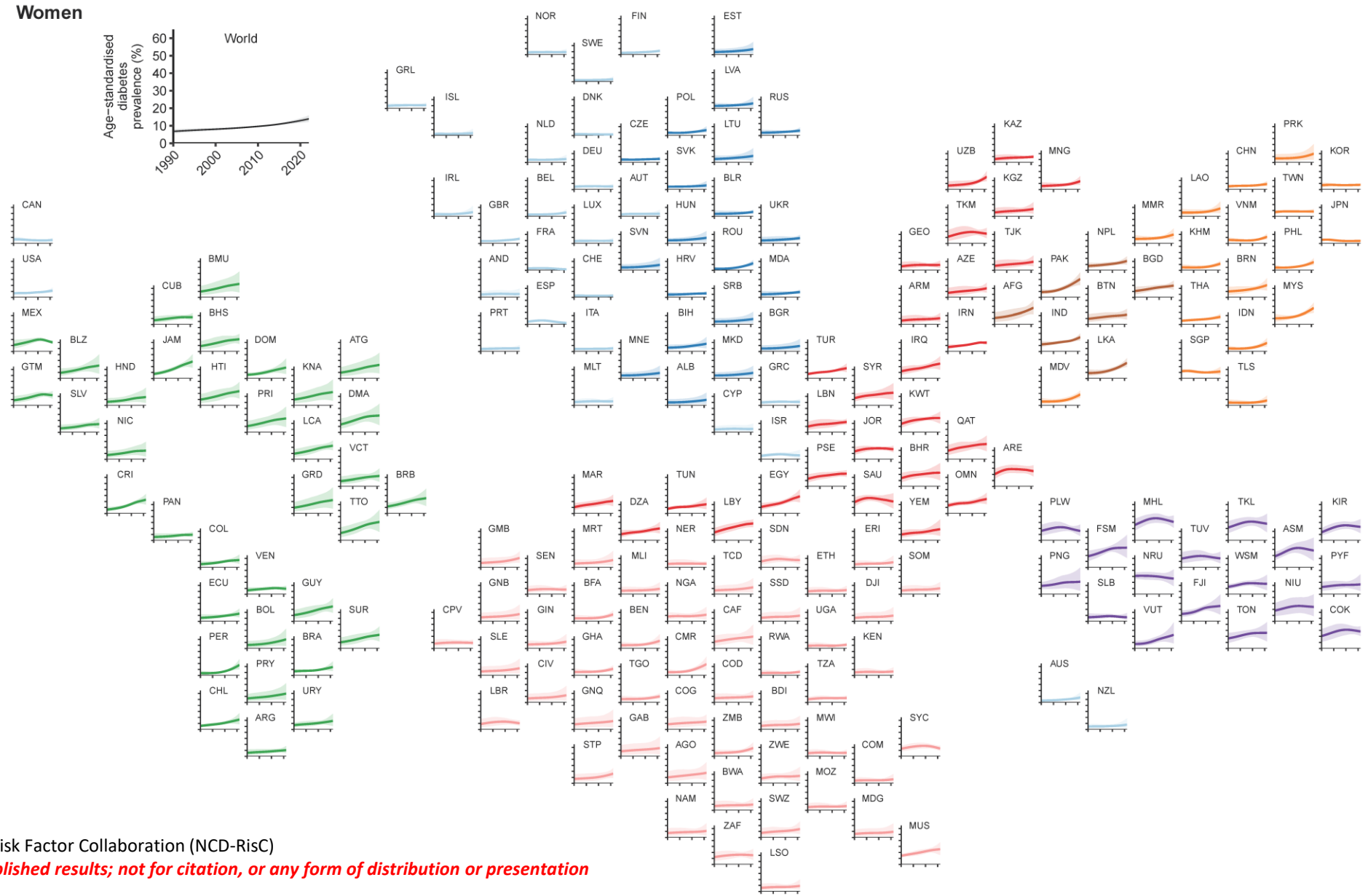
A global diabetes epidemic that not necessarily tracks BMI



NCD Risk Factor Collaboration (NCD-RisC)

Unpublished results; not for citation, or any form of distribution or presentation

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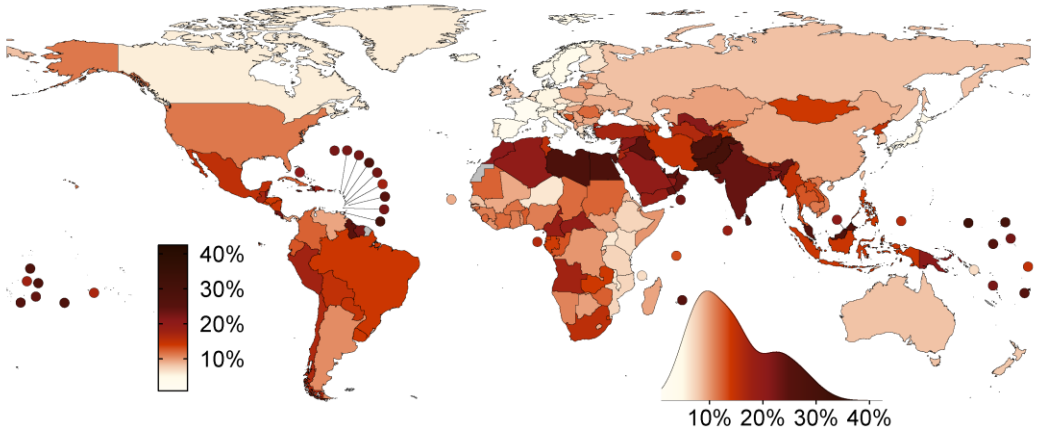
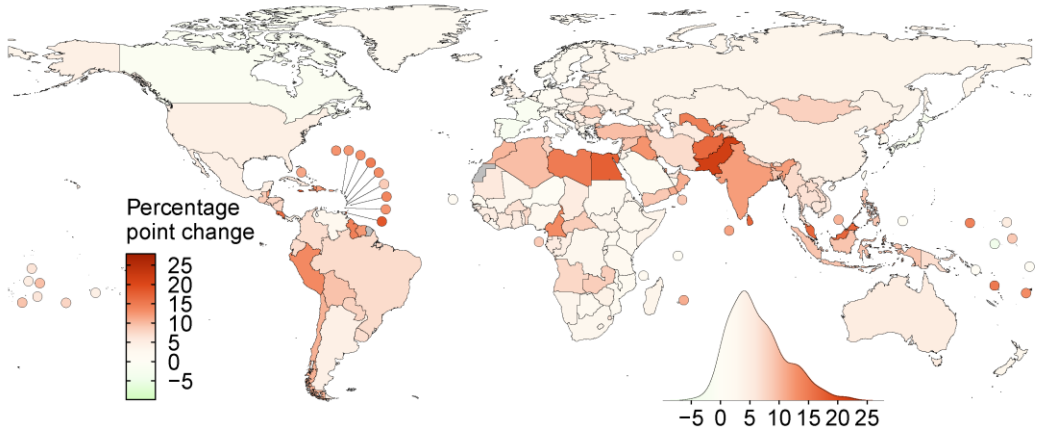
A global diabetes epidemic that disproportionately affects low- and middle-income countries

Diabetes prevalence (women 18+ years)

Prevalence in 2022

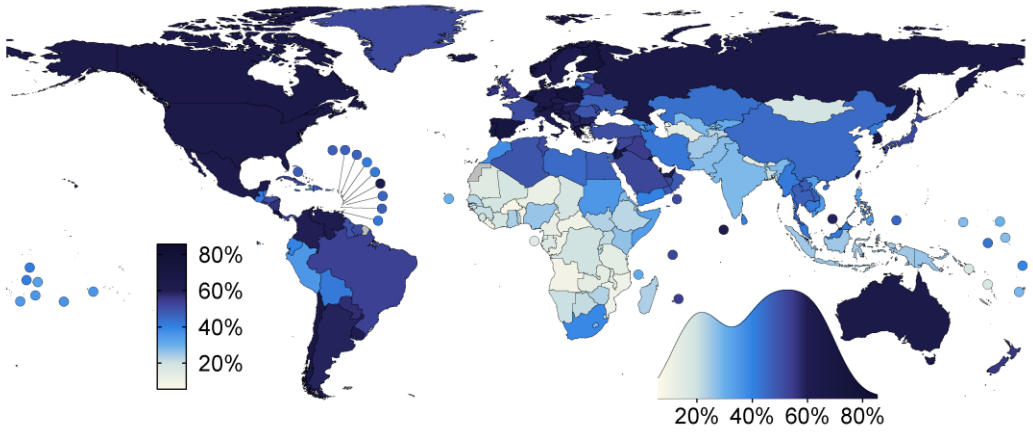


Change in prevalence from 1990 to 2022

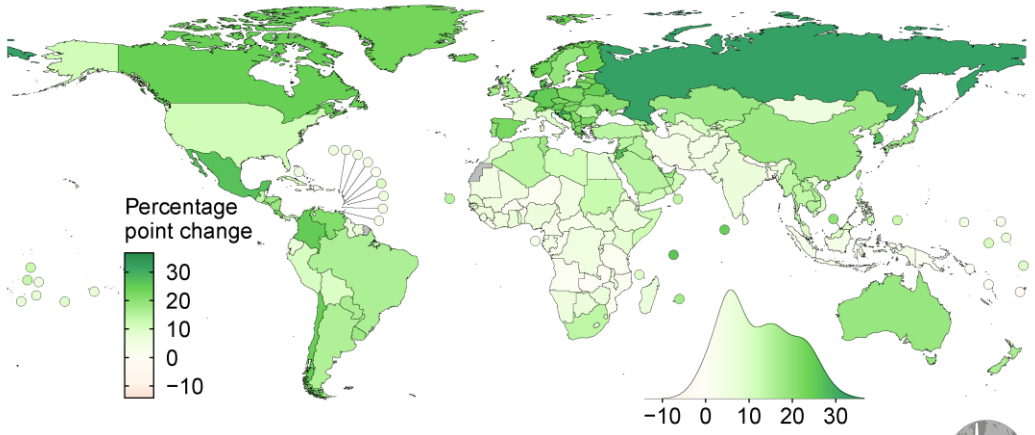


Diabetes treatment (women 30+ years)

Treatment in 2022



Change in treatment from 1990 to 2022



NCD Risk Factor Collaboration (NCD-RisC)

Unpublished results; not for citation, or any form of distribution or presentation

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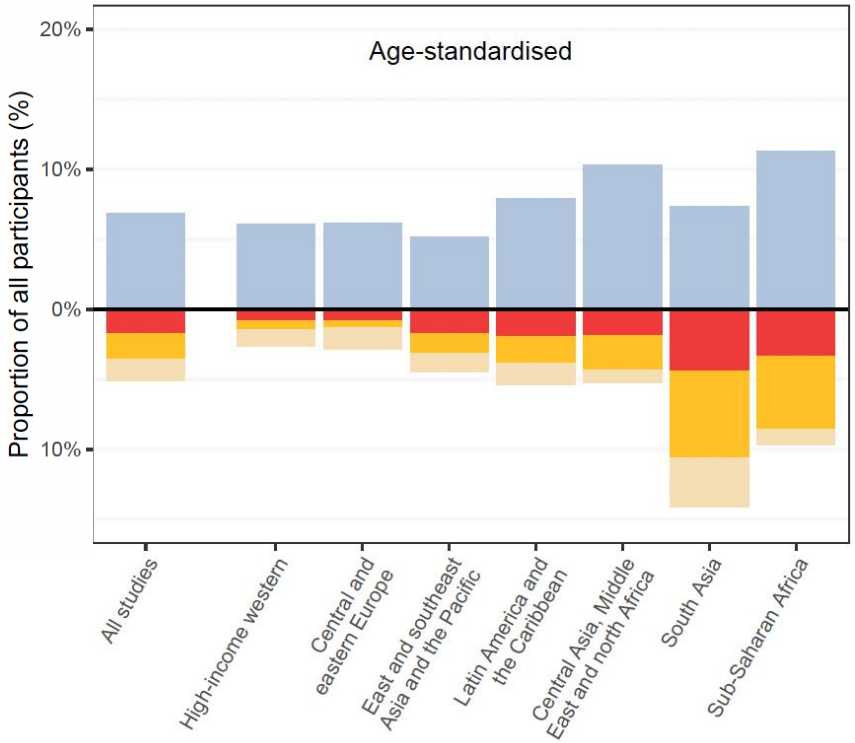
Regional variation in diagnosed and “screen-detected” diabetes by biomarker type



Diagnosed diabetes

Elevated levels of both FPG and HbA1c

Isolated elevated HbA1c

Isolated elevated FPG

NCD Risk Factor Collaboration (NCD-RisC) *Nature Medicine 2023*

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No increase in the prevalence of known diabetes between 1986 and 1999 in subjects 25–64 years of age in northern Sweden

Results Over the time period 1986–1999 there was no increase in the prevalence of known diabetes. No trends were noted in the finding of previously undiagnosed diabetes or impaired glucose tolerance over the period 1986–1994, although the confidence intervals are wide. Fasting, but not post-load, glucose

Diabetes prevalence and association with social status—Widening of a social gradient? German national health surveys 1990–1992 and 1998

Results: Diabetes prevalences in 1990–1992 and 1998 were 5.1% (95% CI 4.1–6.0) and 4.3% (3.5–5.1) in men, and 4.7% (4.0–5.4) and 3.8% (3.0–4.6) in women. It was significantly higher in older subjects and in obese subjects, and tended to be higher in lower educated subjects. Overall, prevalence tended to be lower in 1998 compared to 1990–1992, however, not statistically significant after adjustment for education and BMI (odds ratio, 95% CI: men 0.73; 0.39–1.37; women 0.41; 0.17–1.03). On a descriptive level,

Eliasson et al., *Diabetes Medicine* 2002; Icks et al., *Diabetes Research and Clinical Practice* 2007

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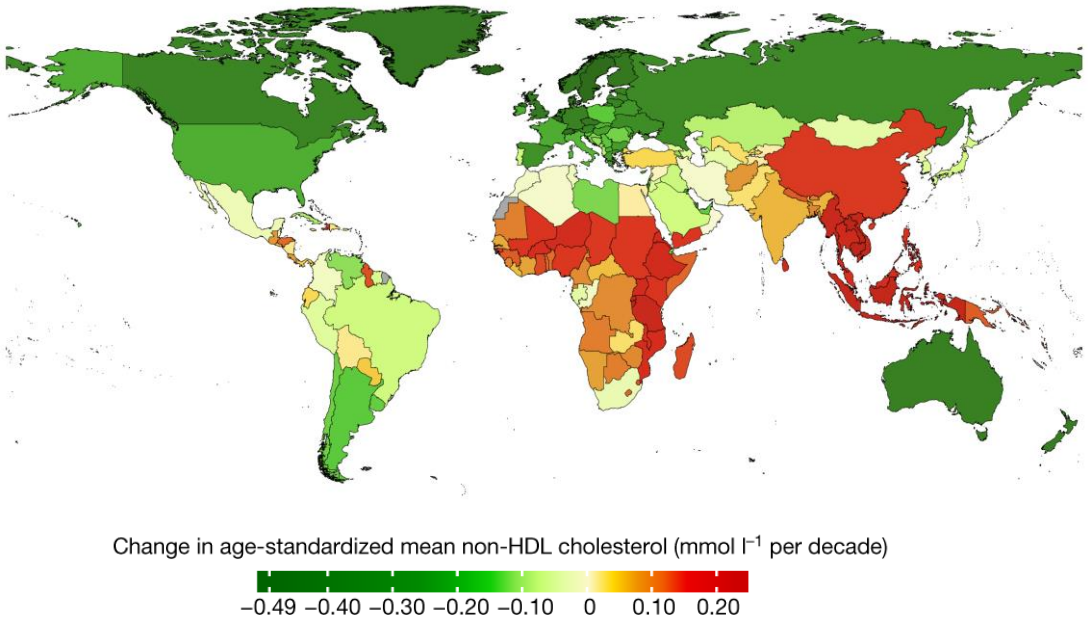
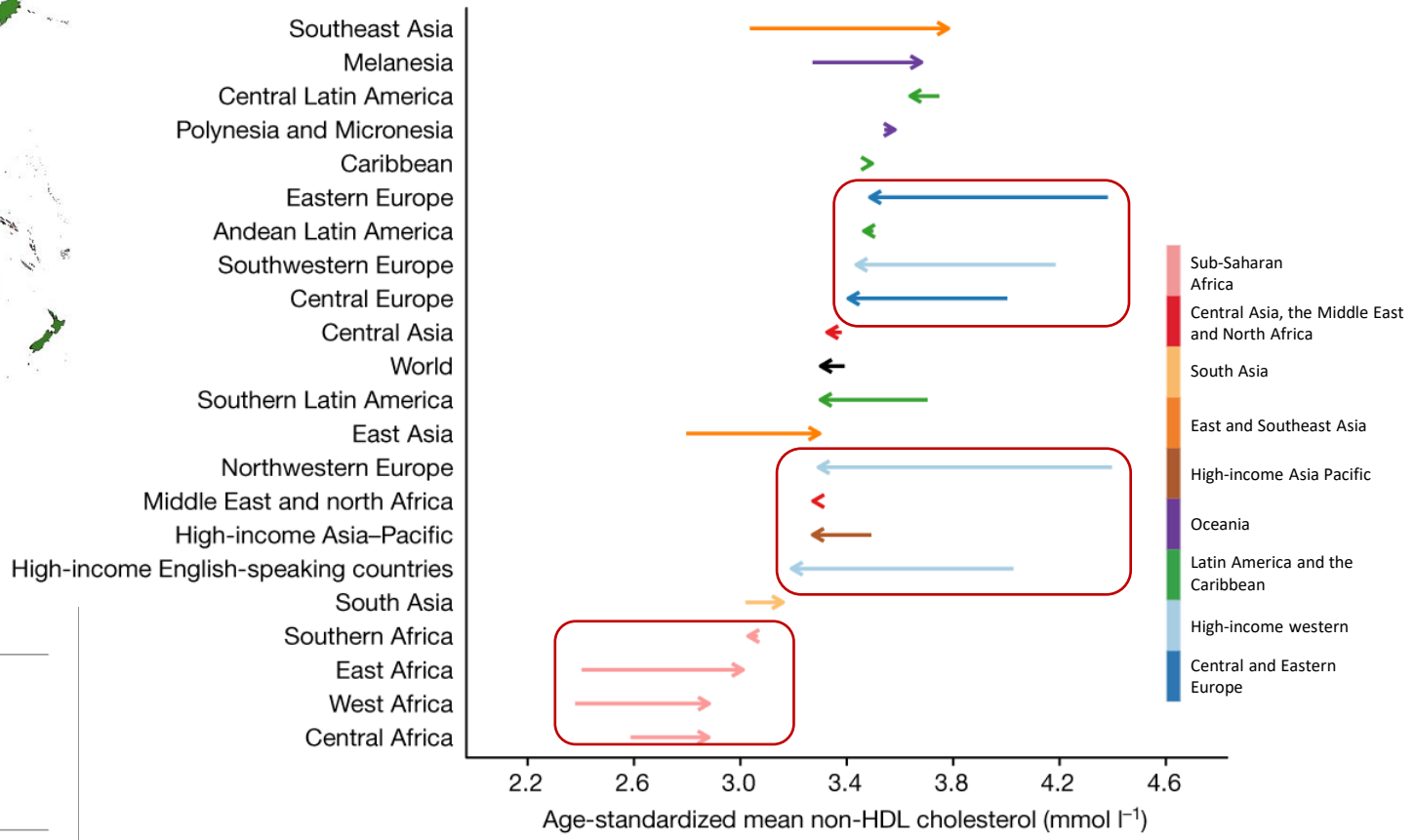
A global convergence, and increasingly repositioning, of non-optimal cholesterol



Women (1980-2018)



Article

Repositioning of the global epicentre of non-optimal cholesterol

https://doi.org/10.1038/s41586-020-2338-1 NCD Risk Factor Collaboration (NCD-RisC)*

NCD Risk Factor Collaboration (NCD-RisC) *Nature* 2020

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Summary

- A consistent analysis of global data on cardio-metabolic risk factors that leverages a large amount of epidemiological data and statistical method

NCD-RisC is continuously expanding the database and updating the scientific analyses. Any studies with population-based data on weight, height, waist and hip circumference, diabetes, blood pressure, lipids, or markers for kidney/liver function and inflammation are invited to join NCD-RisC. Please talk to me or email ncdrisc@imperial.ac.uk

- Repositioning of global burden of cardiometabolic risk factors to low- and middle-income countries
- Variable trends and levels in subpopulations of countries
- Drivers behind the observed trends in risk factors are largely unknown

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Acknowledgements

Worldwide collaborators of NCD-RisC

NCD-RisC core team

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