2. Determinants of People Nutrition

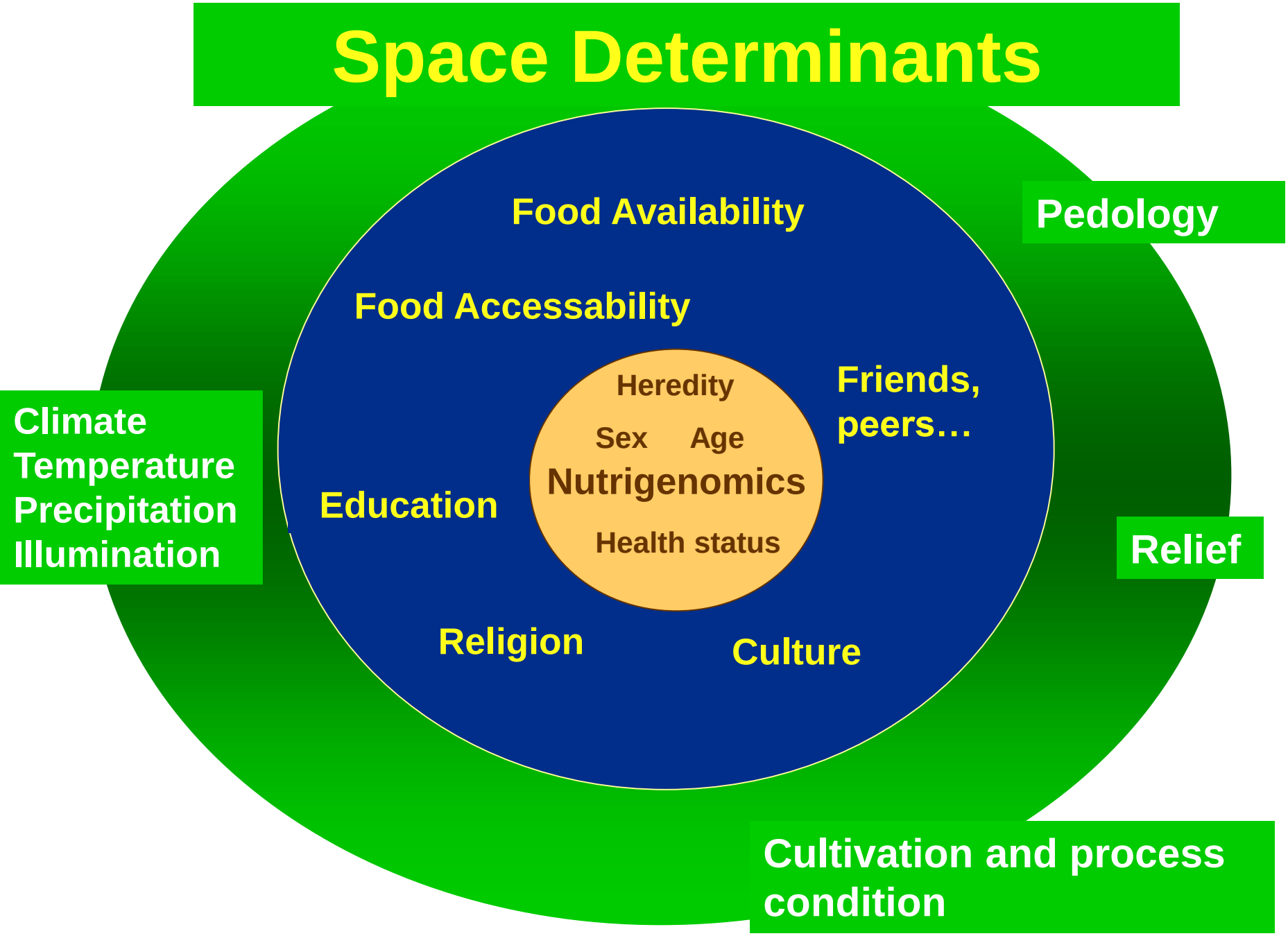
Your typical food

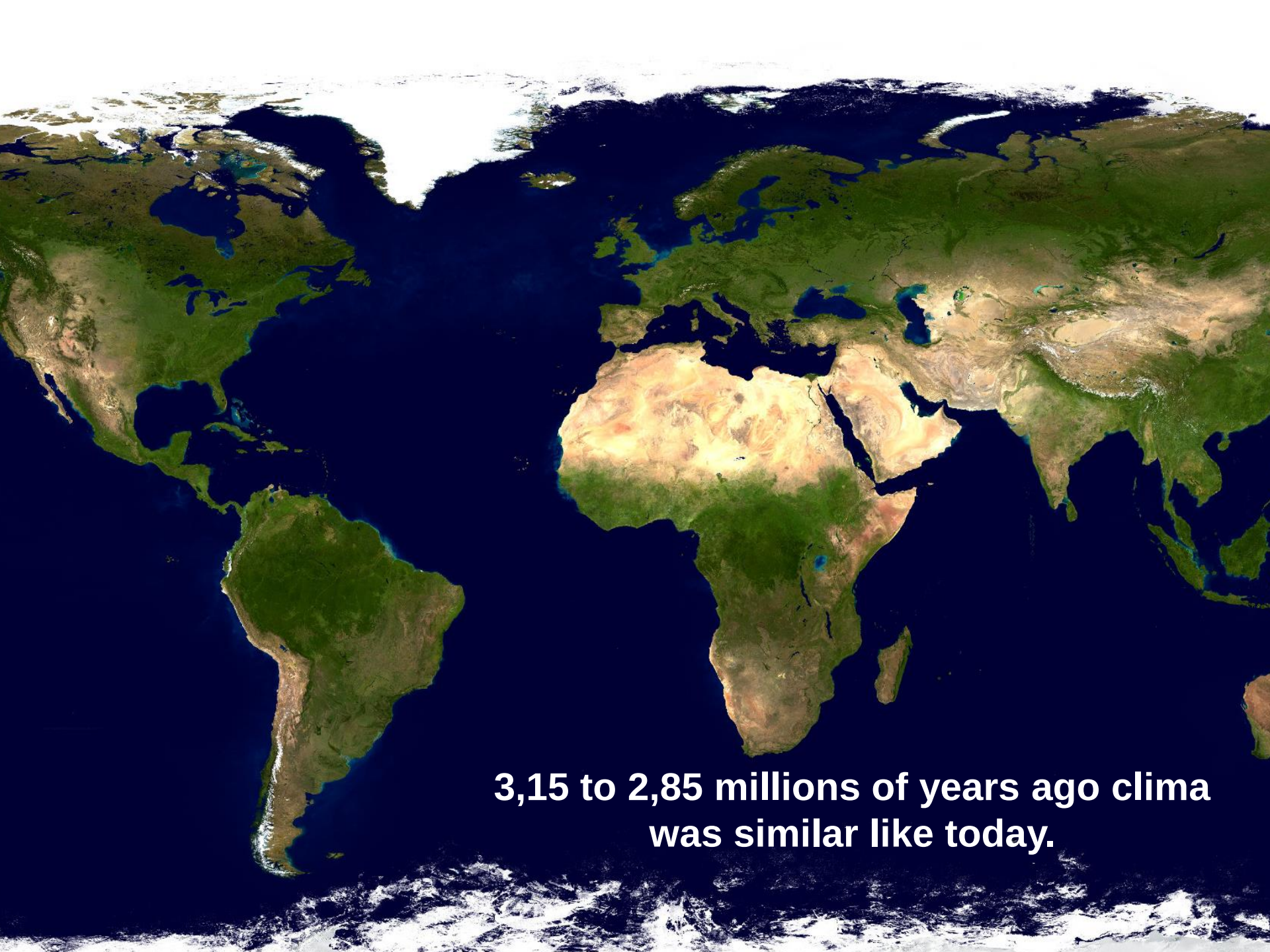
Contents

1. Nutrition in Time and Space

- PALEOLITHIC
- NEOLITHIC
- NUTRITION TODAY

  North and South Europe, Slovenia


Space Determinants
Food Availability
Food Accessability
Heredity
Sex
Age
Nutrigenomics
Health status
Education
Religion
Culture
Friends, peers…
Pedology
Relief
Climate
Temperature
Precipitation
Illumination
Cultivation and process condition


3,15 to 2,85 millions of years ago clima
was similar like today.

3 900 000 years





A. afarensis

2 500 000 years





Homo habilis

Homo erectus (1,6 million years)



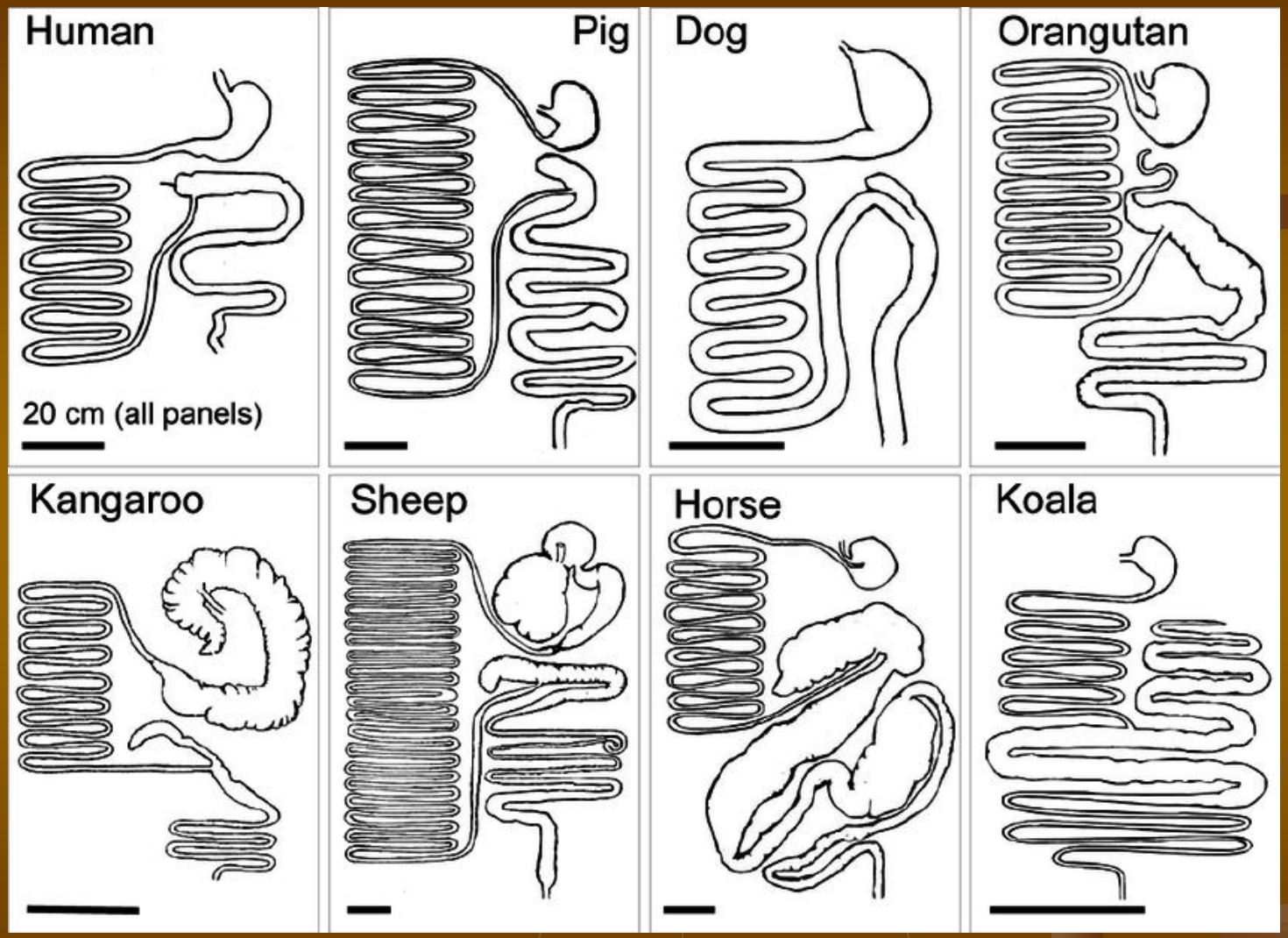


H. neandertalensis
350 000 to 30 000 years

Homo sapiens
250 000 years

Year 2022

Digestive tract



Vir: https://www.researchgate.net/figure/Comparisons-of-digestive-tract-anatomy-It-can-be-seen-that-the-human-digestive-tract-is_fig1_276660672

Paleolithic

- 1 000 000 to 8 000 BC
- Living place: caves
- Tools of stone, bone and wood
- Using fire, hunting and gatherer

Nutrition in Paleolithic

- Meat
- Fish, shell, snail, crab
- Insects
- Fruit
- Vegetables
- Nuts

Diabetologia (2007) 50:1795–1807
DOI 10.1007/s00125-007-0716-y

ARTICLE

A Palaeolithic diet improves glucose tolerance more than a Mediterranean-like diet in individuals with ischaemic heart disease

S. Lindeberg · T. Jönsson · Y. Granfeldt ·
E. Borgstrand · J. Soffman · K. Sjöström · B. Ahrén

Received: 1 May 2007 / Accepted: 4 May 2007 / Published online: 22 June 2007

Neolithic or New Stone age
8 000 to 2 000 BC

- Metal tool (cooper, bronze, iron)
- Farming
- Agriculture

C. R. Biologies 334 (2011) 182–189

Contents lists available at ScienceDirect

Comptes Rendus Biologies

www.sciencedirect.com

Review/Revue

Last hunter-gatherers and first farmers of Europe

Les derniers chasseurs-cueilleurs et les premiers agriculteurs en Europe

Anne Tresset *, Jean-Denis Vigne

UMR 7209 CNRS, archéozoologie, archéobotanique, Muséum national d'histoire naturelle, 55, rue Buffon, 75005 Paris, France

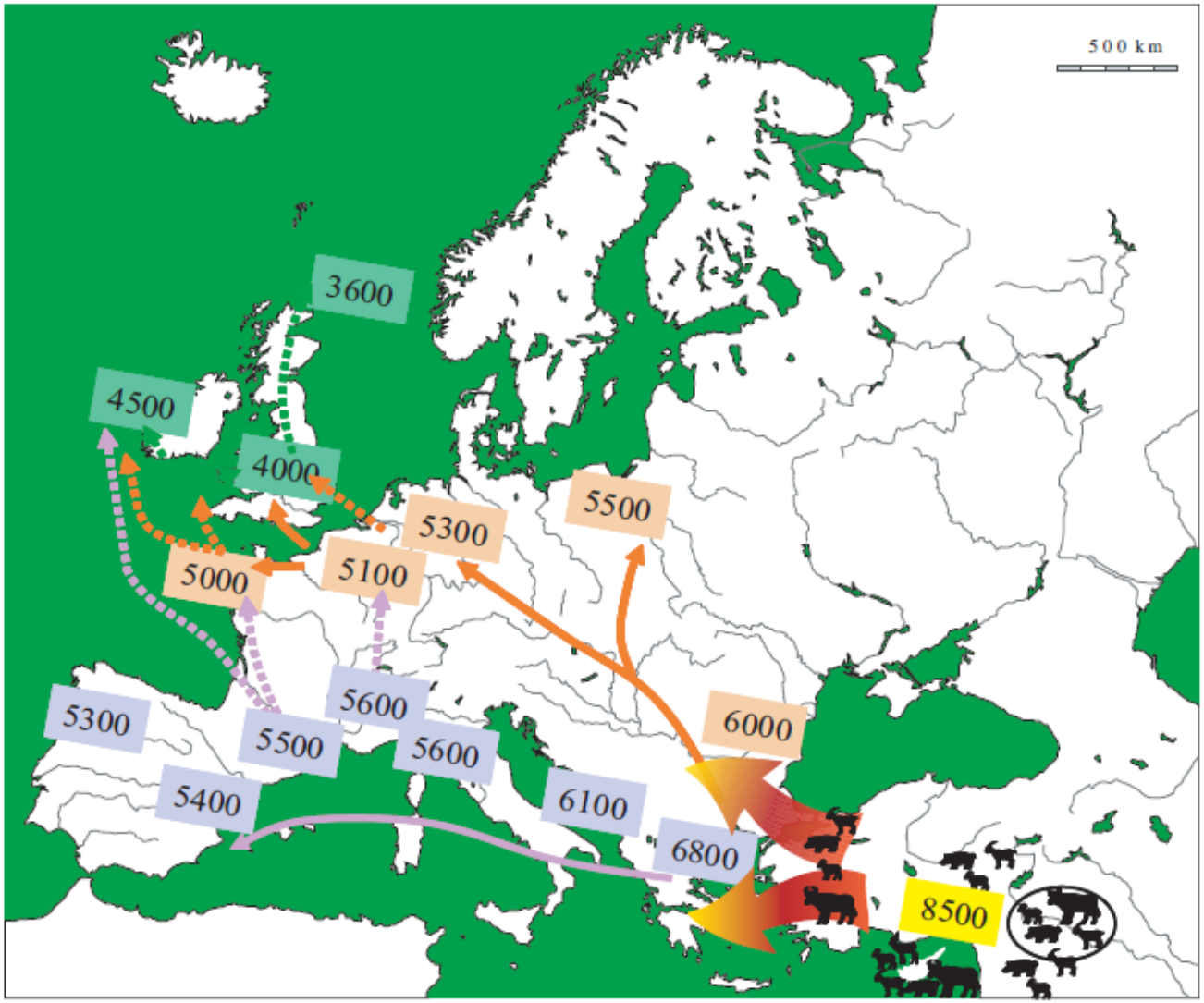
ARTICLE INFO

Keywords:
Neolithic
Europe
Domesticates

ABSTRACT

The Neolithisation of Europe has seen the transformation of hunting-gath
into farming communities. At least partly exogenous in its origins, this proce
transformations in many aspects of life-styles, such as social structures, lan
involved the arrival of new human populations and gave way to the
intentional or unwanted of many non-European animal and plant species. It

Chronology and main routes of dissemination of domesticates in Europe during the Neolithic



Source: *A. Tresset, J.-D. Vigne / C. R. Biologies 334 (2011) 182–189*

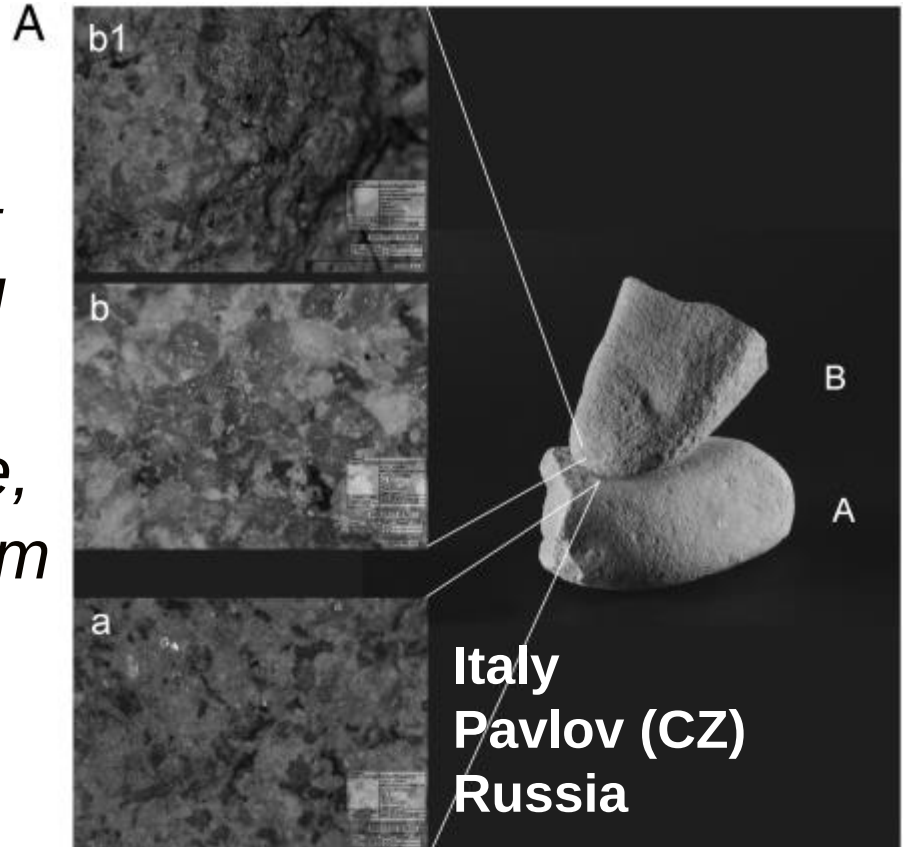
Proc Natl Acad Sci U S A. 2010 November 2; 107(44): 18815–18819.
Published online 2010 October 18. doi: 10.1073/pnas.1006993107
Anthropology
PMCID: PMC2973873

Thirty thousand-year-old evidence of plant food processing

Anna Revedin,[a,1] Biancamaria Aranguren,[b] Roberto Becattini,[a] Laura Longo,[c] Emanuele Marconi,[d] Marta Mariotti Lippi,[e] Natalia Skakun,[f] Andrey Sinitsyn,[f] Elena Spiridonova,[g] and Jiří Svoboda[h,i]

Author information ▶ Copyright and License information ▶

*"The three sites suggest that vegetal food processing, and possibly the **production of flour**, was a common practice, widespread across Europe from at least ~30,000 y ago."*



Picture A: Grindstone and pestle grinder

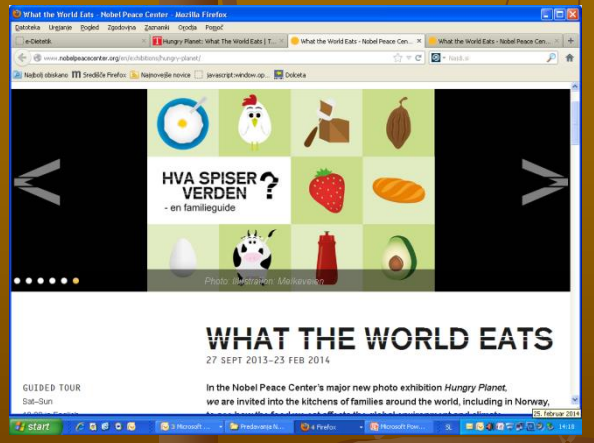
What we are eating today?

- Milk and dairy products
- Cereal and cereal product
- Oil, margarine
- Salt
- Sugar

… 70 % of all food in North Europe

What the World Eats

- *The first family visited by photographer Peter Menzel and journalist Faith D'Alusio was the Çelik family from Turkey in January 2000. Since then the pair have interviewed and photographed families from all over the world. The last family to be photographed were the Sturms in Germany in June 2013. Three Norwegian families have been portrayed for the exhibition at the Nobel Peace Center.*



- Source: http://www.nobelpeacecenter.org/en/exhibitions/hungry-planet/ (February, 2014)

Germany: 325.81 $

Norway: 379.41 $

Japan: 317.25 $

Chad: 1.23 $

Kuwait: 221.45 $

Mexico: 189.09 $

China: 155.06 $


RECYCLING CORP.
DOCUMENTS DESTRUCTION SPECIALIST
Driscoll's
Green Onions
VACUUM COOLED


兆昌
(洗淨)豬肚
Fresh Pork Stomach
2.59
LB
(新鮮)豬肚
Fresh Pork Sto


S & T Seafood

Italy: 260.11 $


FROSTIES
CHOCOS
DIANA
Il fumo uccide
DIANA
LEAGUE
ATHLETIC

Egypt: 68.53 $

Poland: 151.27 $

Mongolia: 40.02 $

Ecuador: 31.55 $

India: 39.27 $

Mali: $26.39

Greenland: 277.12 $

Turkey: 145.88 $

Australia: 376.45 $

USA: 159.18 $

USA: 341.98 $


QUIK SHADE


KDE TOČÍ STAROBRNO, NÁŠ SVĚT ZAČÍNÁ
Starobrno


FENDT

Brno, 2007

Joensuu, 2018


F A O Schweetz
Asst. Twistpops
$2.99
spaceforlease


I was told to come here and smile

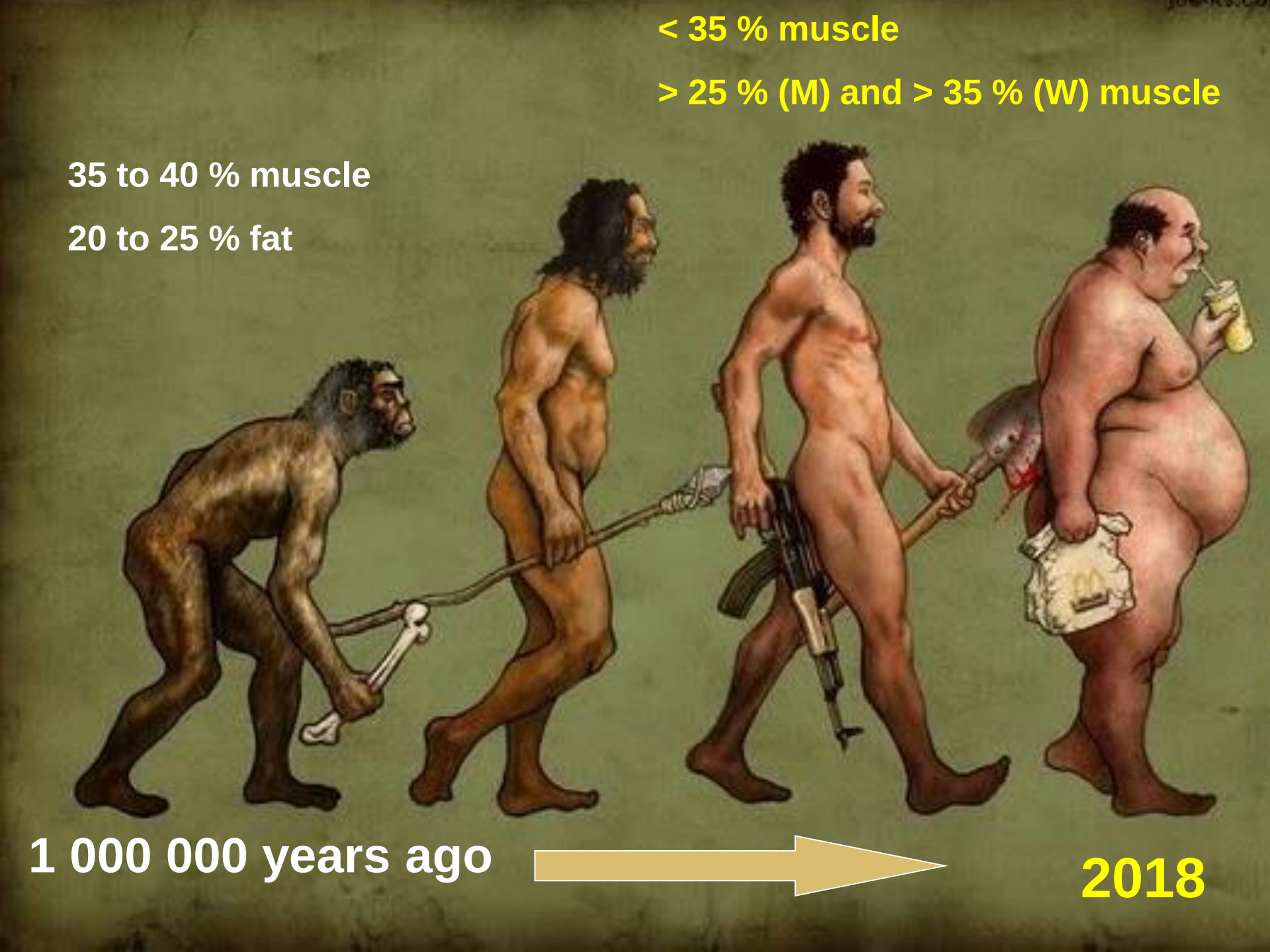

Why yes, I AM the Red M&M'S guy
Are all of you here to see me?

< 35 % muscle

> 25 % (M) and > 35 % (W) muscle

35 to 40 % muscle

20 to 25 % fat



1 000 000 years ago

2018

Parents may soon outlive obese children

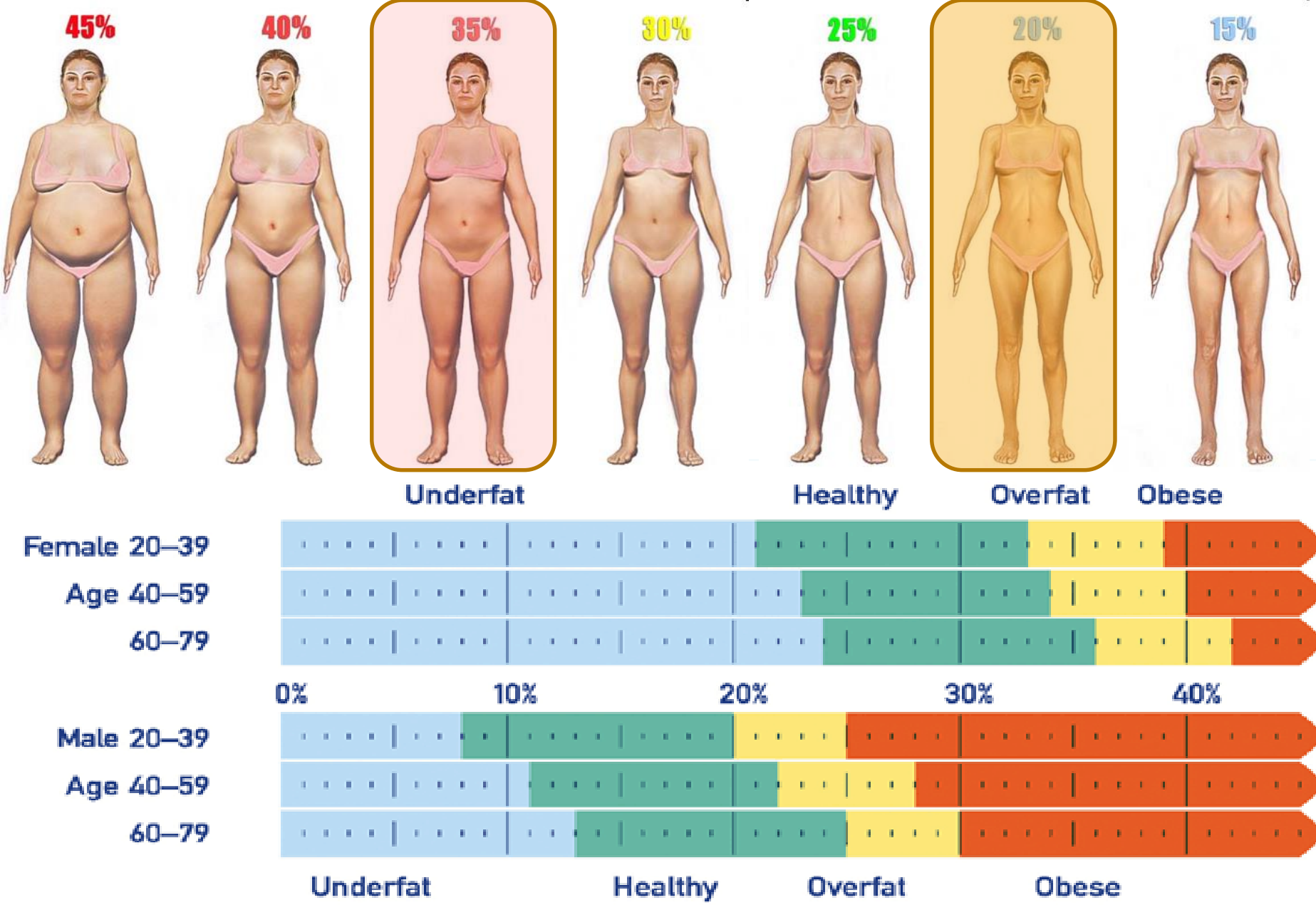
by JAMES CHAPMAN and TIM UTTON, Daily Mail

Parents could soon begin to outlive their children because of an epidemic of obesity afflicting the younger generation.

Many youngsters are now so grossly overweight they face premature death caused by a heart attack or stroke.

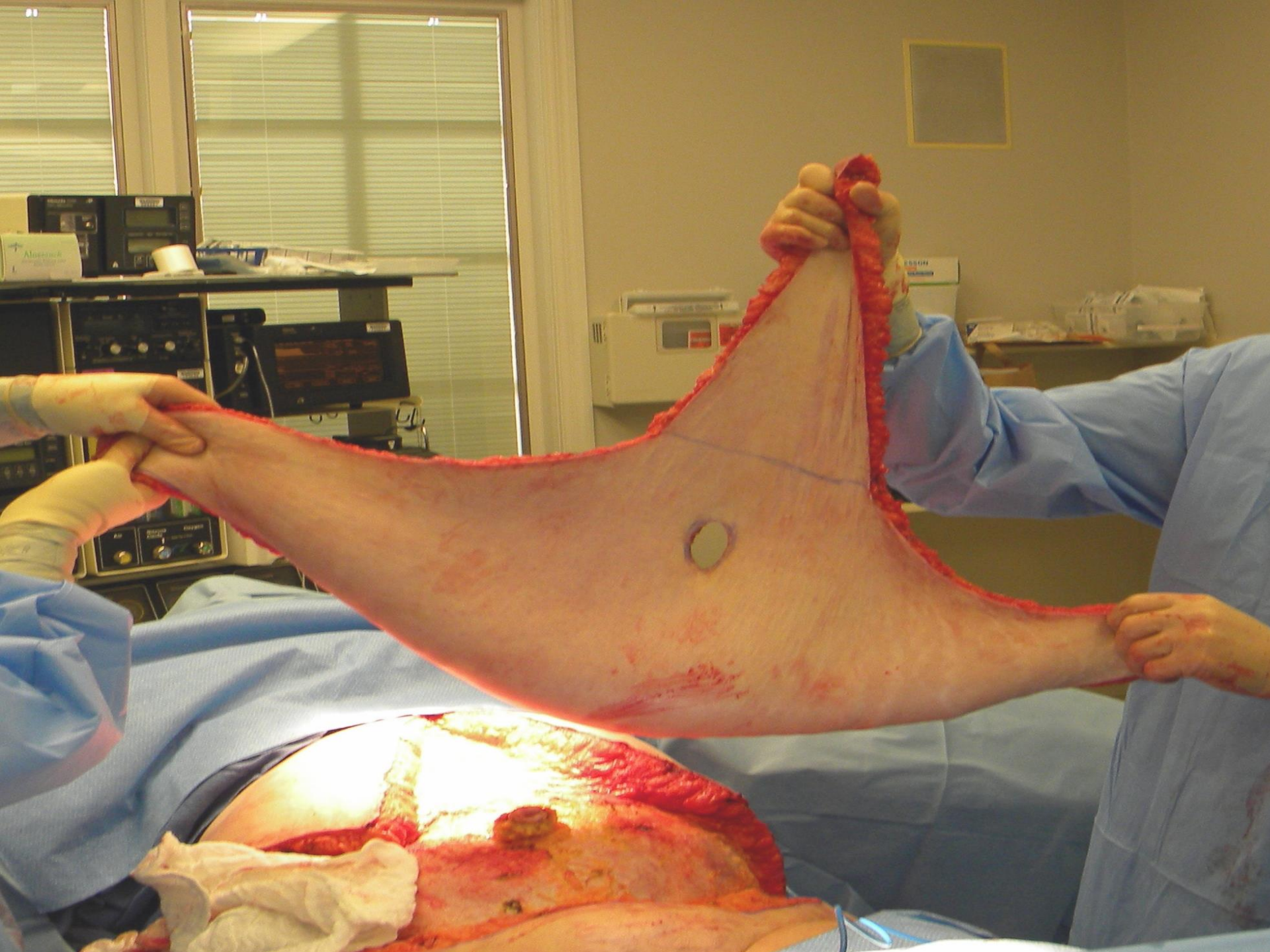
The impending health disaster is blamed on the rise of aggressively-marketed, fat-laden fast food and couch potato lifestyles.

© Retna



Healthy body fat percentage for standard adults [1,2]

1. Based on NIH/WHO BMI Guidelines.
2. As reported by Gallagher et al at NY Obesity Research Centre.



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

NCD Risk Factor Collaboration (NCD-RisC)*

Summary

Background Underweight and severe and morbid obesity are associated with highly elevated risks of adverse health outcomes. We estimated trends in mean body-mass index (BMI), which characterises its population distribution, and in the prevalences of a complete set of BMI categories for adults in all countries.

Methods We analysed, with use of a consistent protocol, population-based studies that had measured height and weight in adults aged 18 years and older. We applied a Bayesian hierarchical model to these data to estimate trends from 1975 to 2014 in mean BMI and in the prevalences of BMI categories (<18·5 kg/m² [underweight], 18·5 kg/m² to <20 kg/m², 20 kg/m² to <25 kg/m², 25 kg/m² to <30 kg/m², 30 kg/m² to <35 kg/m², 35 kg/m² to <40 kg/m², ≥40 kg/m² [morbid obesity]), by sex in 200 countries and territories, organised in 21 regions. We calculated the posterior

Interpretation If post-2000 trends continue, the probability of meeting the global obesity target is virtually zero. Rather, if these trends continue, by 2025, global obesity prevalence will reach 18% in men and surpass 21% in women; severe obesity will surpass 6% in men and 9% in women. Nonetheless, underweight remains prevalent in the world's poorest regions, especially in south Asia.

Interpretation If post-2000 trends continue, the probability of meeting the global obesity target is virtually zero. Rather, if these trends continue, by 2025, global obesity prevalence will reach 18% in men and surpass 21% in women; severe obesity will surpass 6% in men and 9% in women. Nonetheless, underweight remains prevalent in the world's poorest regions, especially in south Asia.

Lancet 2016; 387: 1377–96

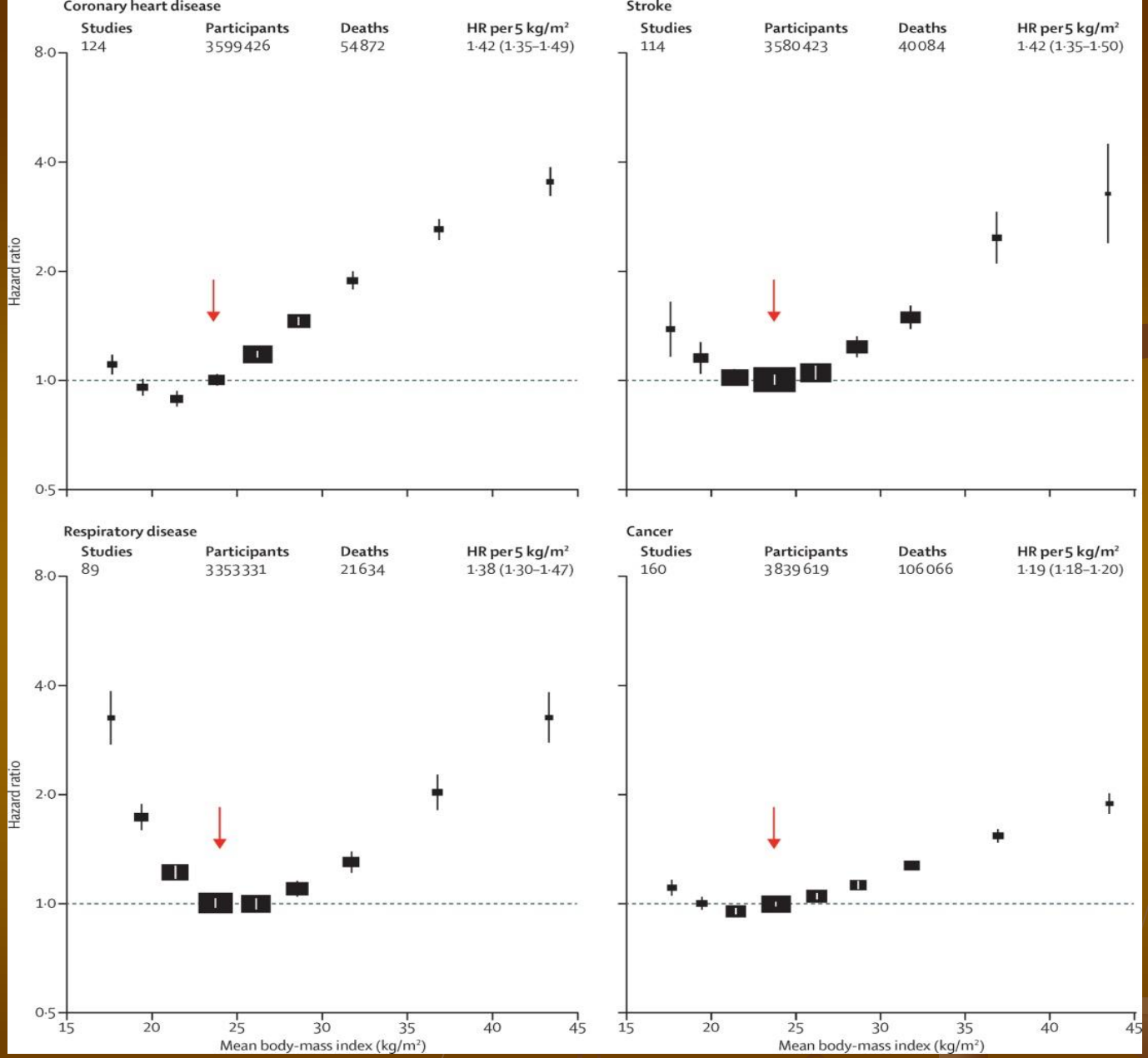
See Comment page 1349

*NCD Risk Factor Collaboration members are listed at the end of the paper

Correspondence to: Prof Majid Ezzati, School of Public Health, Imperial College London, London W2 1PG, UK majid.ezzati1@imperial.ac.uk

Body-mass index and all-cause mortality: individual-participant-data meta-analysis of 239 prospective studies in four continents

The Lancet
Volume 388, Issue 10046, Pages 776-786 (August 2016)
DOI: 10.1016/S0140-6736(16)30175-1



The Lancet 2016 388, 776-786DOI: (10.1016/S0140-6736(16)30175-1)

Cell Metabolism
Article

DEPTOR Cell-Autonomously Promotes Adipogenesis, and Its Expression Is Associated with Obesity

Mathieu Laplante,[1,2] Simon Horvat,[4,5] William T. Festuccia,[6] Kivanç Birsoy,[1,2] Zala Prevorsek,[4] Alejo Efeyan,[1,2] and David M. Sabatini[1,2,3,*]

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[4]Department of Animal Science, Biotechnical Faculty, University of Ljubljana, Groblje 3, 1230, Domzale, Slovenia
[5]National Institute of Chemistry, Hajdrihova 19, SI-1001 Ljubljana, Slovenia
[6]Department of Physiology and Biophysics, Institute of Biomedical Sciences, University of São Paulo, 1524 Avenue Prof. Lineu Prestes, São Paulo 05508-900, Brazil
*Correspondence: sabatini@wi.mit.edu
http://dx.doi.org/10.1016/j.cmet.2012.07.008

Source: *Cell Metabolism 16, 202–212, August 8, 2012*

Published in final edited form as:

Nat Med. 2016 July ; 22(7): 771–779. doi:10.1038/nm.4115.

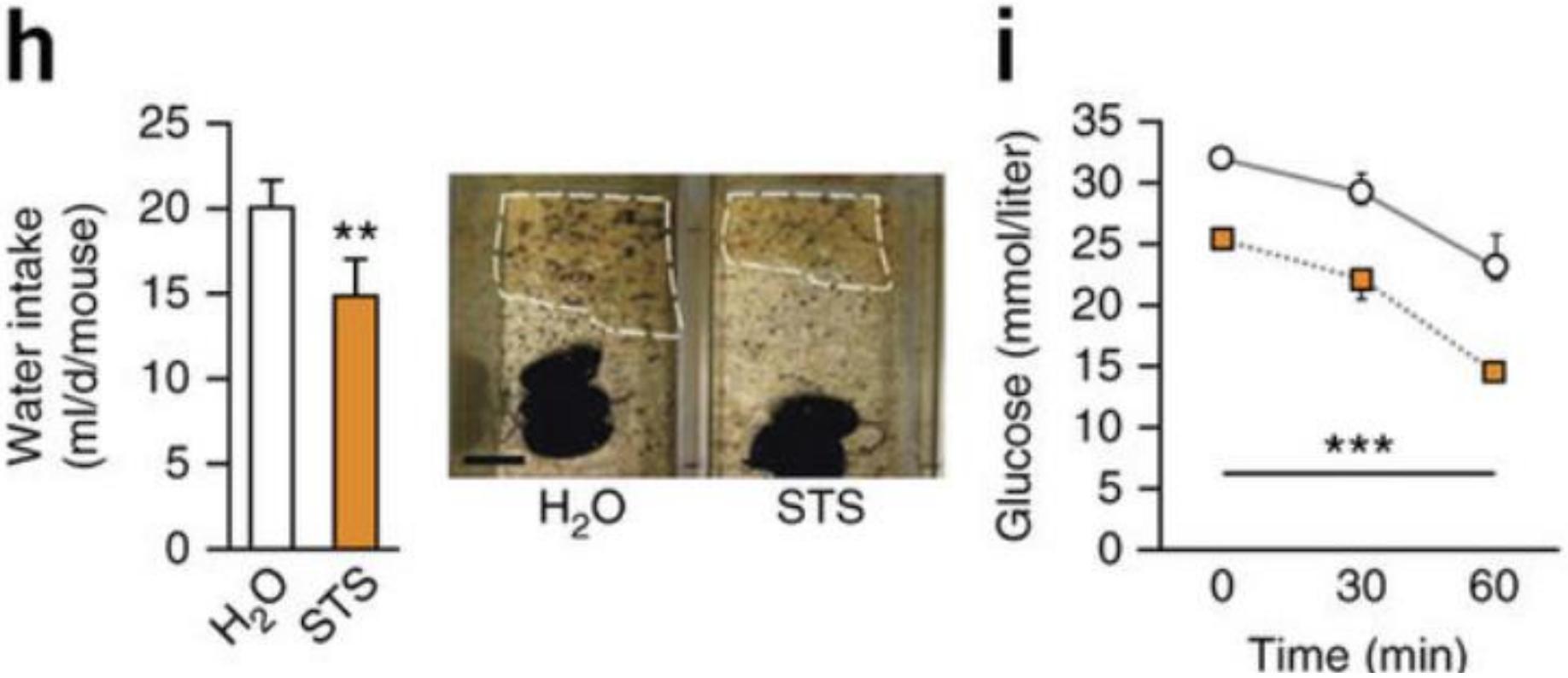
Genetic identification of thiosulfate sulfurtransferase as an adipocyte-expressed anti-diabetic target in mice selected for leanness

Nicholas M. Morton[1,*], **Jasmina Beltram**[2], **Roderick N. Carter**[1], **Zoi Michailidou**[1], **Gregor Gorjanc**[2], **Clare Mc Fadden**[1], **Martin E. Barrios-Llerena**[1], **Sergio Rodriguez-Cuenca**[3], **Matthew T. G. Gibbins**[1], **Rhona E. Aird**[1], **José Maria Moreno-Navarrete**[4,5], **Steven C. Munger**[6], **Karen L. Svenson**[6], **Annalisa Gastaldello**[1], **Lynne Ramage**[1], **Gregorio Naredo**[1], **Maximilian Zeyda**[7], **Zhao V. Wang**[8], **Alexander F. Howie**[9], **Aila Saari**[10], **Petra Sipilä**[11], **Thomas M. Stulnig**[7], **Vilmundur Gudnason**[12], **Christopher J. Kenyon**[1], **Jonathan R. Seckl**[1], **Brian R. Walker**[1], **Scott P. Webster**[1], **Donald R. Dunbar**[1], **Gary A. Churchill**[6], **Antonio Vidal-Puig**[3], **José Manuel Fernandez-Real**[4,5], **Valur Emilsson**[12,13], and **Simon Horvat**[2,14]

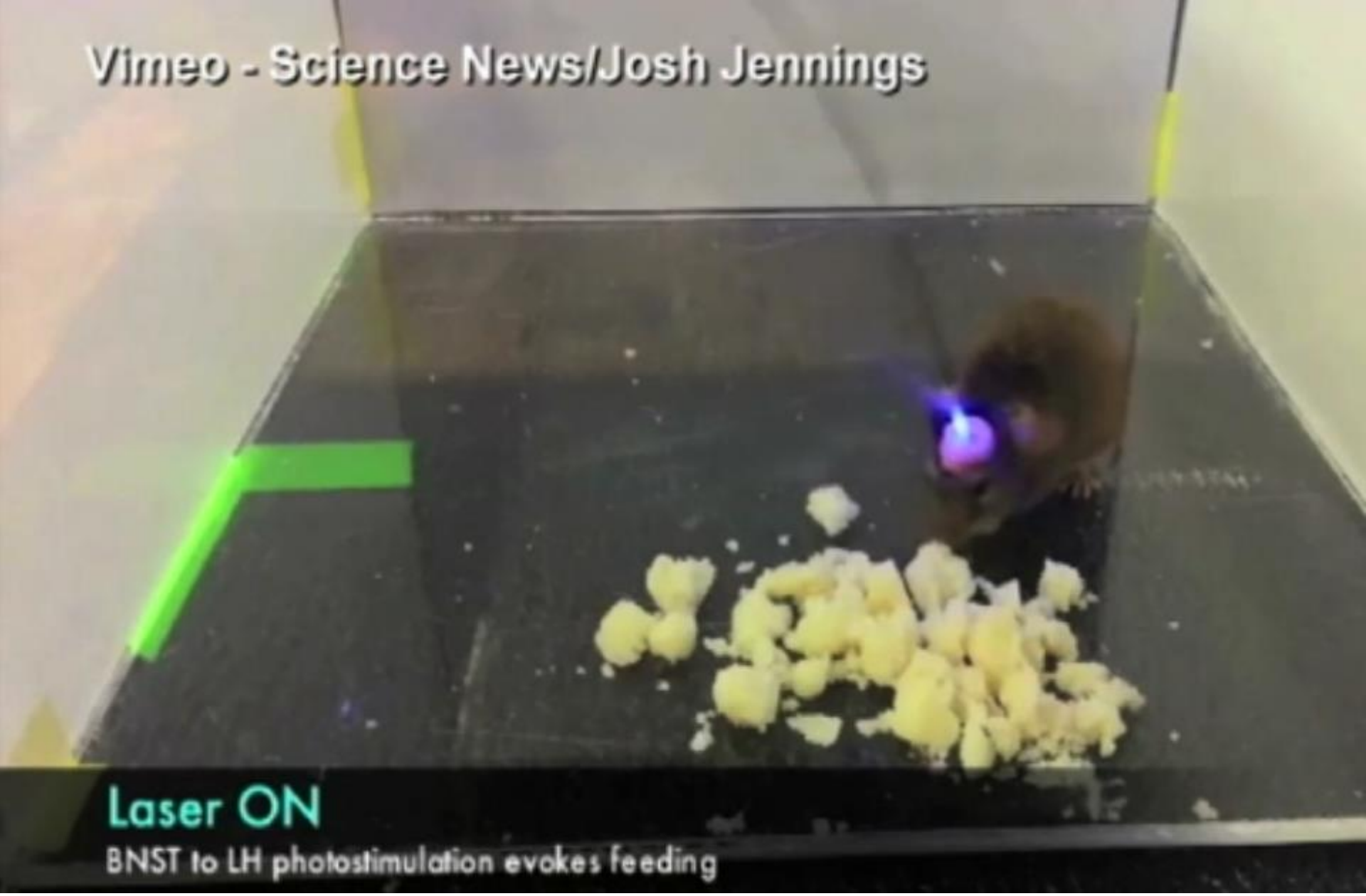
Nicholas M. Morton … Simon Horvat

Genetic identification of thiosulfate sulfurtransferase as an adipocyte-expressed anti-diabetic target in mice selected for leanness

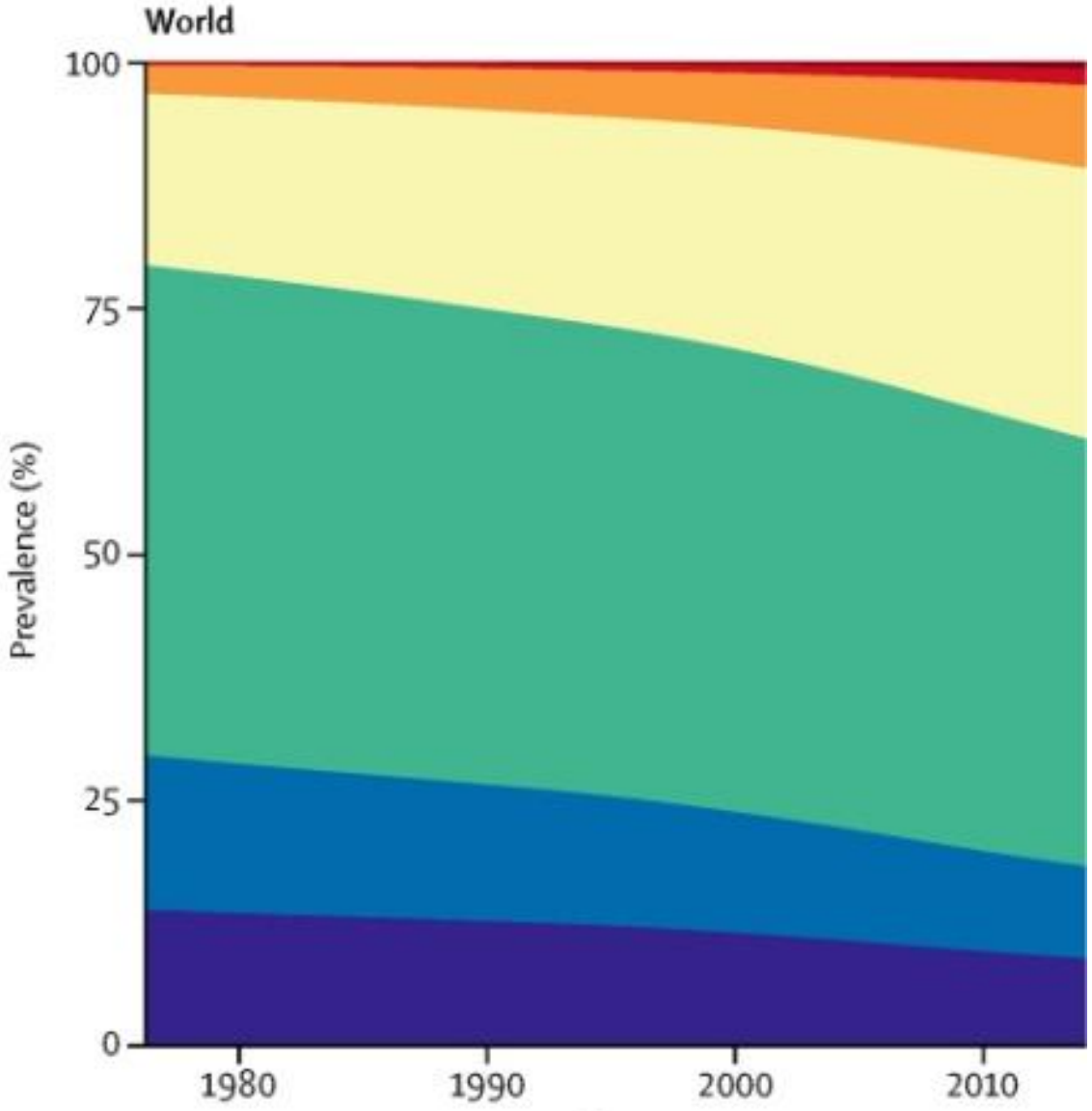
Nat Med. 2016 Jul; 22(7): 771–779



administration (n = 6 mice per group). ††$P < 0.01$ and *$P < 0.05$ by two-way ANOVA. (**h**) Quantification of water intake (left) and illustrative images of urine output in the cages (right) of C57BL/KsJ-*Lepr*$^{db/db}$ mice administered water (H_2O; n = 5) or thiosulfate (STS; n = 6). Scale bar, 5 cm. (**i**,**j**) insulin tolerance (**i**) and

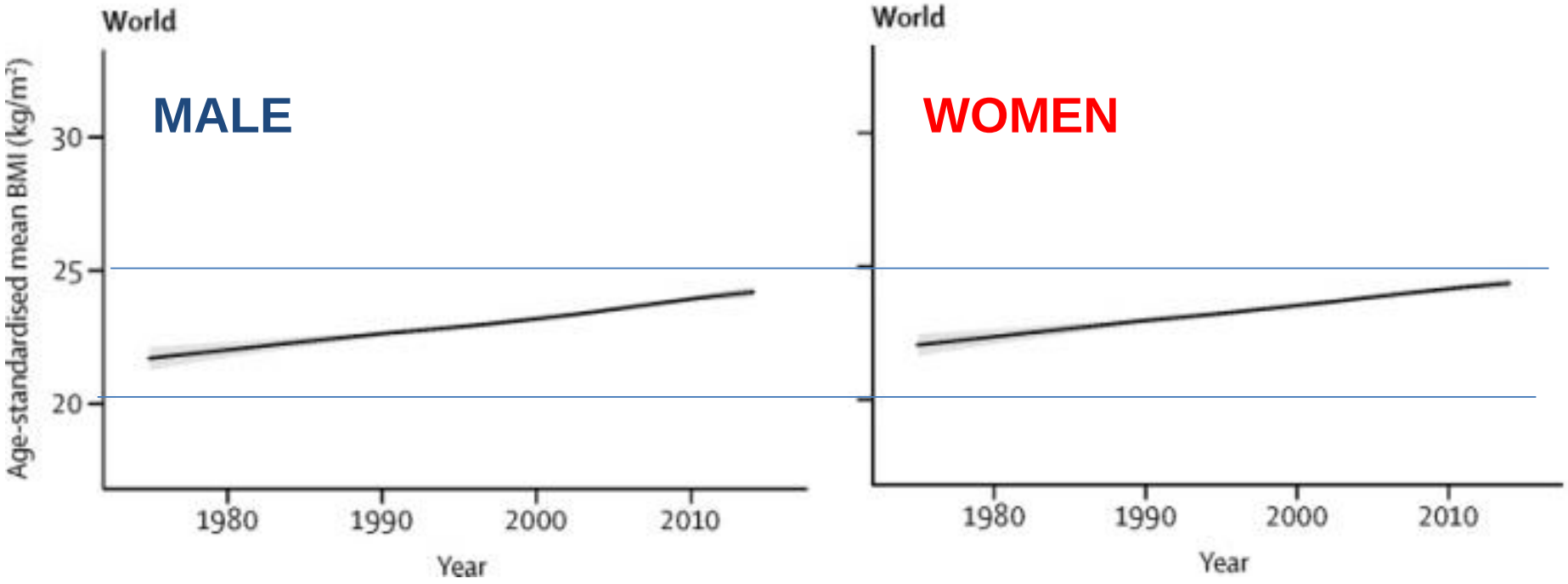


Source: *http://www.dailymail.co.uk/video/sciencetech/video-1042557/Scientists-control-hunger-mice-using-LASERS.html*



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

The Lancet
Volume 387, Issue 10026, Pages 1377-1396 (April 2016)



The Lancet, Volume 387, Issue 10026, Pages 1377-1396 (April 2016)

The prevalence of excess weight and obesity in Slovenian children and adolescents from 1991 to 2011

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Gregor Jurak
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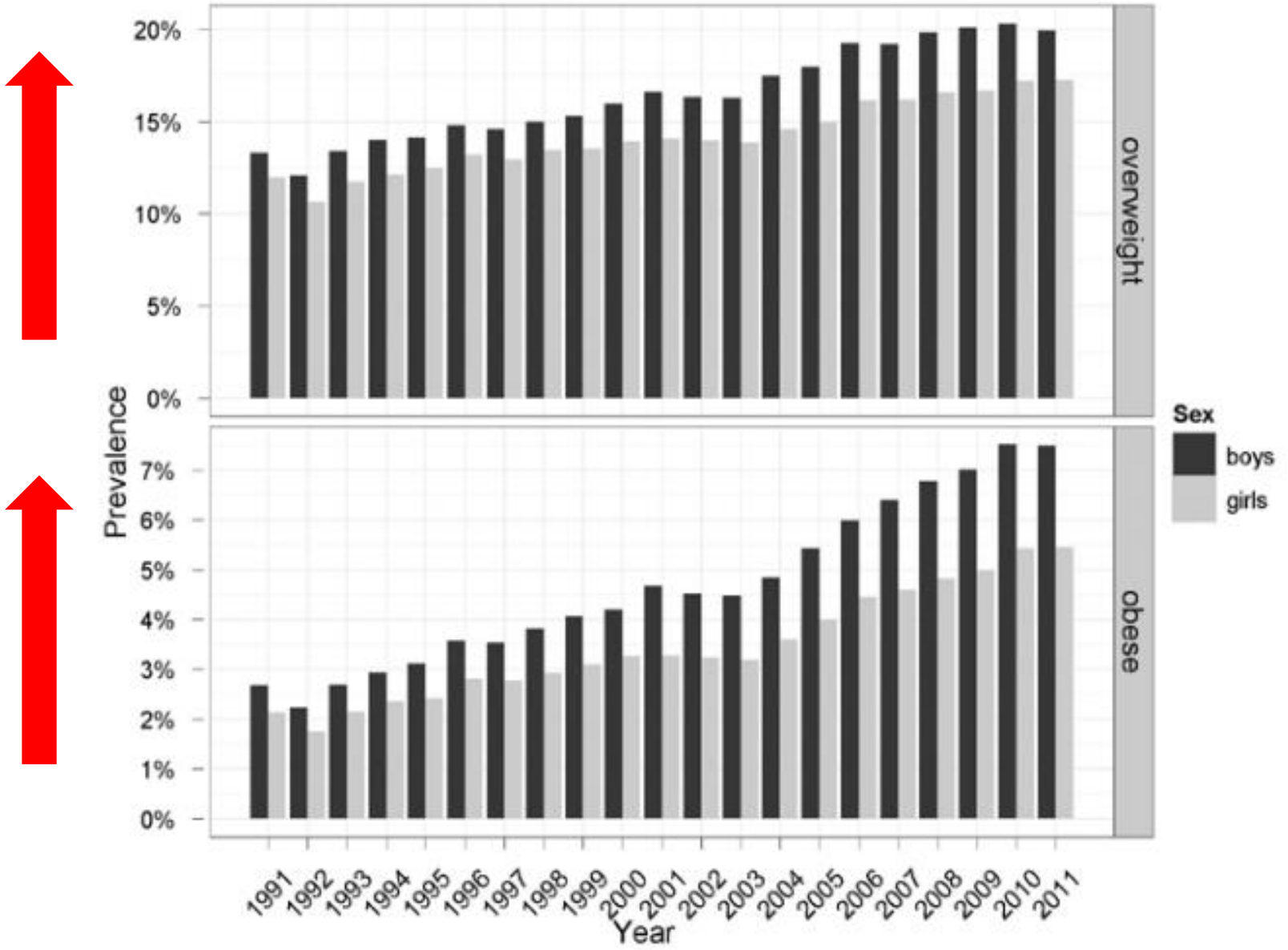
Bojan Lesko ek
University of Ljubljana, bojan.leskosek@fsp.uni-lj.si

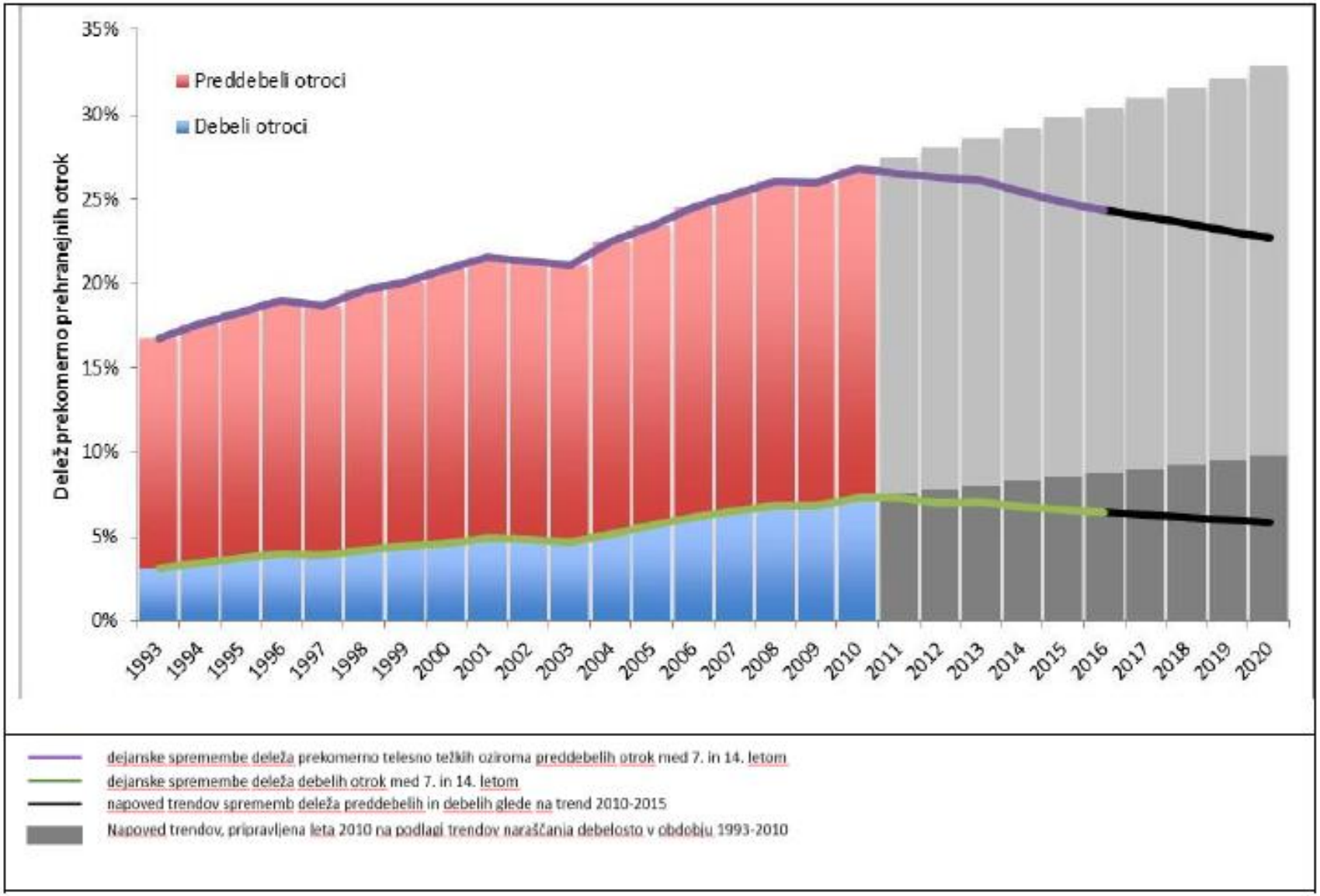
Abstract

The proportion of overweight children and adults has been growing rapidly in recent years in many European and other countries. The survey examined excess weight and obesity in a population of Slovenian boys and girls aged seven through eighteen from 1991 to 2011 with the use of an annually repeated cross-sectional study of data from the SLOFIT fitness evaluation system. The BMI cut-off points of the International Obesity Taskforce were used to identify excess weight and obesity. During 1991–2011 period, excess weight and obesity have become clearly more prevalent in Slovenian children. The proportion of excess weight and obesity is more obvious in boys than in girls, especially among adolescents.

Source: ANTHROPOLOGICAL NOTEBOOKS, 18 (1): 91–103.

Prevalence of excess weight and obesity in Slovenia Youth (7 to 18 year old) from 1991 to 2011 by sex





Slika 5: Napovedi trendov za zmanjšanje prekomerne telesne teže oziroma preddebelost in debelosti pri otrocih v Sloveniji, na podlagi podatkov SLOFIT. Vir: Starc G, Kovač M, Jurak G, Strel J (2016). The outcomes of the Healthy Lifestyle intervention on children's physical fitness: A case of Slovenia.Launch Conference of the EU Strategy for the Alpine region. Ljubljana: Fakulteta za šport

Source:

North and South Europe…


Finland
Crete
Iceland
Norwegian Sea
Sweden
Scandinavian Mountains
Norway
Atlantic Ocean
North Sea
Baltic Sea
Den-mark
Ireland
United Kingdom
Nether-lands
Belgium
Germany
Poland
Luxembourg
Czech Republic
Slovakia
Ukraine
Mol-dova
France
Switzer-land
Liecht.
Alps
Austria
Hungary
Slove-nia
Croatia
Black
Monaco
San Marino
Bosnia and Herzego-vina
Serbia
Pyrenees
Andorra
Portugal
Spain
Italy
Apennines
Vatican City
Monte-negro
Balkan M
Mace-donia
Al-ba-nia
Pindus
Greece
Rif
Tell Atlas
Morocco
Algeria
Tunisia
Saharan Atlas
Malta
Mediterranean Sea

NORTH EUROPE

- **forests, mountains, humidity**
- **meat, animal fats**
- **"Barbarian culture”**

SOUTH EVROPE

- sea, Mediterranean climate
- vegetables, fruits, fish, olive oil
- vegetarian-oriented diet

Finland 1960

- **Fat in diet**
- **High level of holesterol and high blood pressure**
- **High risk for CVD**
- **The highest rate of heart disease in the world**

Public Health Medicine 2002; 4(1):5-7

Successful prevention of non-communicable diseases: 25 year experiences with North Karelia Project in Finland

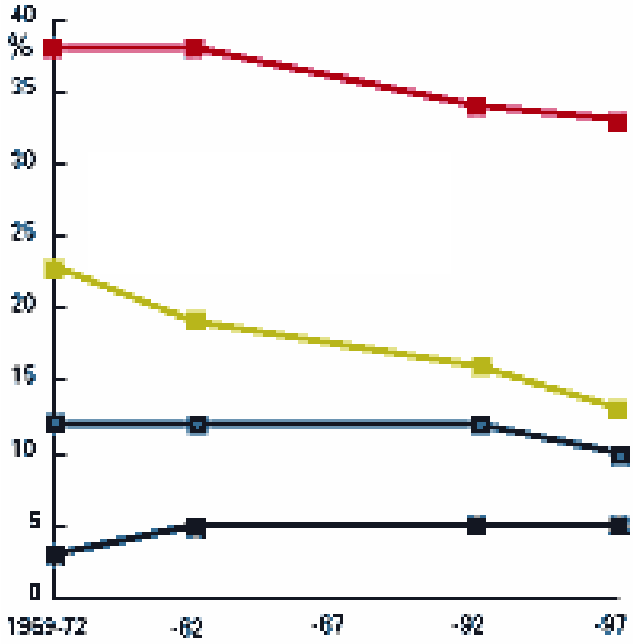
Pekka Puska

Abstracts

The paper describes the experiences and results of 25 years of noncommunicable disease prevention in Finland in framework of the North Karelia Project: from demonstration project to national activity. The successful experiences emphasize the need for theory based sustained activity, within a national policy framework. The paper discusses, n only the marked changes in target risk factors and reduction in NCD rates in the population, but also the general experiences: constraints and keys for success. Some general recommendations and conclusions are drawn.

Keywords

noncommunicable diseases, coronary heart disease, lifestyle, community based prevention, national activity.



Total fat

SFA

MUFA

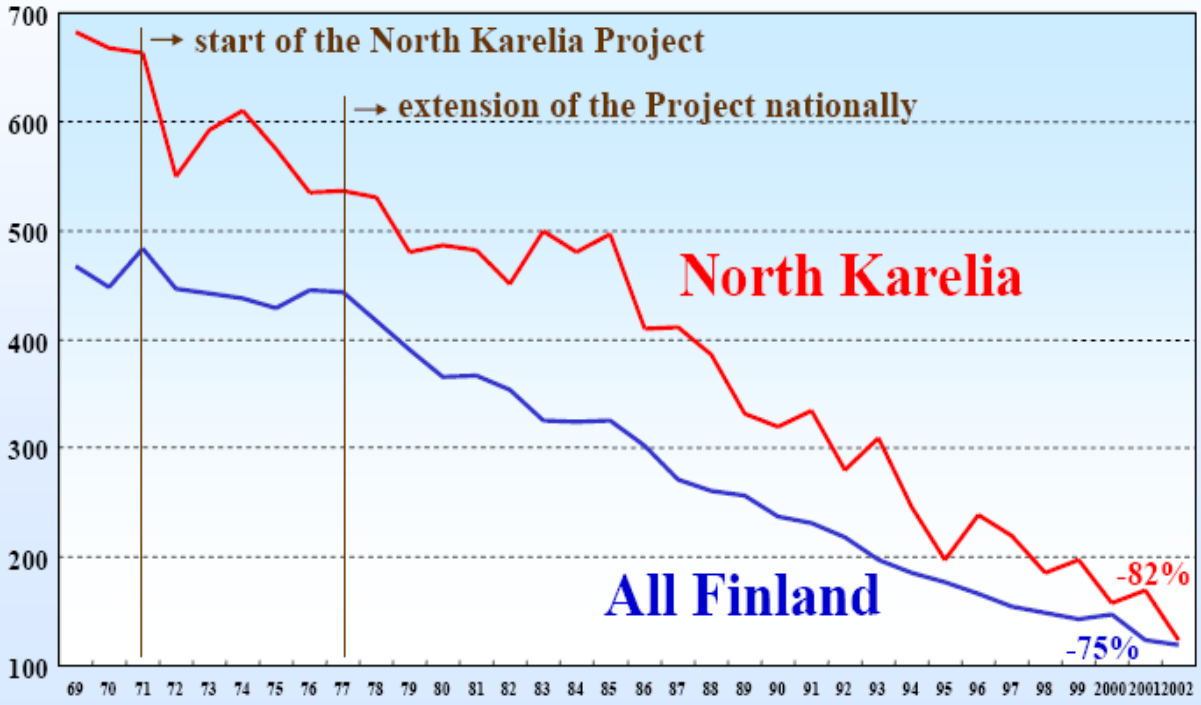
PUFA

Figure 6: Intake of total fat, and saturated (SFA), monounsaturated (MUFA) nad polyunsaturated (PUFA) fatty acids. Source: National Public Health Institute and Social Insurance Institution

Source: _

http://www.ktl.fi/portal/english/public_health_monitoring___promotion/monitoring___interventions/nutrition_in_finland/nutrition

CHD MORTALITY IN ALL FINLAND AND IN NORTH KARELIA 35-64 YEAR OLD MEN



26.1.2006

The Journal of Nutrition
Nutritional Epidemiology

Healthy Aspects of the Nordic Diet Are Related to Lower Total Mortality[1,2]

Anja Olsen,[3]* Rikke Egeberg,[3] Jytte Halkjær,[3] Jane Christensen,[3] Kim Overvad,[4,5] and Anne Tjønneland[3]

[3]Institute of Cancer Epidemiology, Danish Cancer Society, Copenhagen 2100, Denmark; [4]Department of Epidemiology, School of Public Health, Aarhus University, Aarhus 8000, Denmark; and [5]Department of Cardiology, Aalborg Hospital, Aarhus University Hospital, Aalborg 9000, Denmark

... fish, cabbages, rye bread, oatmeal, apples, pears, root vegetables.

Abstract

Health-promo…ven to existing healthy dietary habits …cultures. The aim of the study was to develop a food index based on traditional Nordic food items with e…-promoting effects and relate this to all-cause mortality in a cohort of Danes. Detailed information about diet, …e, and anthropometry was provided by 57,053 Danes aged 50–64 y. During 12 y of follow-up, 4126 of the cohort participants died. A healthy Nordic food index, consisting of traditional Nordic food items with expected health-promoting effects (fish, cabbages, rye bread, oatmeal, apples and pears, and root vegetables), was extracted and associated with mortality by Cox proportional hazard models. Mortality rate ratios (MRR) with 95% CI were used to associate the index to mortality. In an adjusted model, a 1-point higher index score was associated with a significantly lower MRR for both men [0.96 (0.92–0.99)] and women [0.96 (0.92–1.00)] (P = 0.03). When the index components were evaluated separately, whole grain rye bread intake was the factor most consistently associated with lower mortality in men. In conclusion, an index based on traditional healthy Nordic foods was found to be related to lower mortality among middle-aged Danes, in particular among men. This study indicates that traditional, healthy food items should be considered before public recommendations for major dietary changes are made. J. Nutr. 141: 639–644, 2011.

Crete 1960

- **40 % of fat in diet, olive oil!**

- **High monousaturated fatty acids (25 %), low saturated fatty acids**

- **Omega-3 fatty acids (1 % energy)**

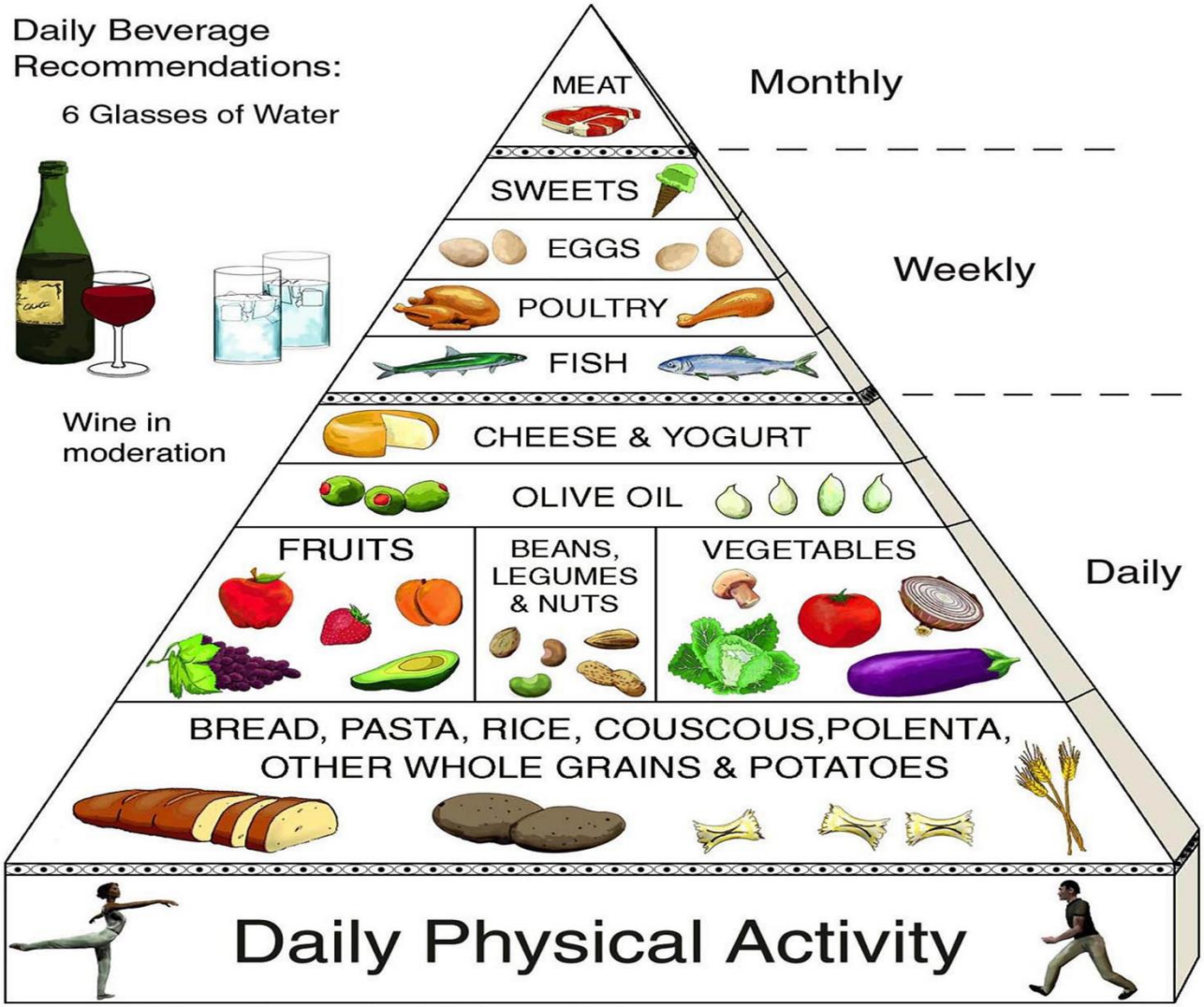
- **Low prevalence of CVD**

- **High life expectancy**

- PLANT FOOD!

- **Green vegetables (360g/day; 2-3 cups/day)**
- **Legumes (30 g/day)**
- **Nut (30 g/day)**
- **Fruit (460 g/day)**
- **Whole wheat (450 g/day)**
- **Low animal fat and saturated fatty acids**

The Traditional Healthy Mediterranean Diet Pyramid



www.oldwayspt.org

Am J Clin Nutr. 1997 Jun;65(6):1882-6.

Heart disease risk-factor status and dietary changes in the Cretan population over the past 30 y: the Seven Countries Study.

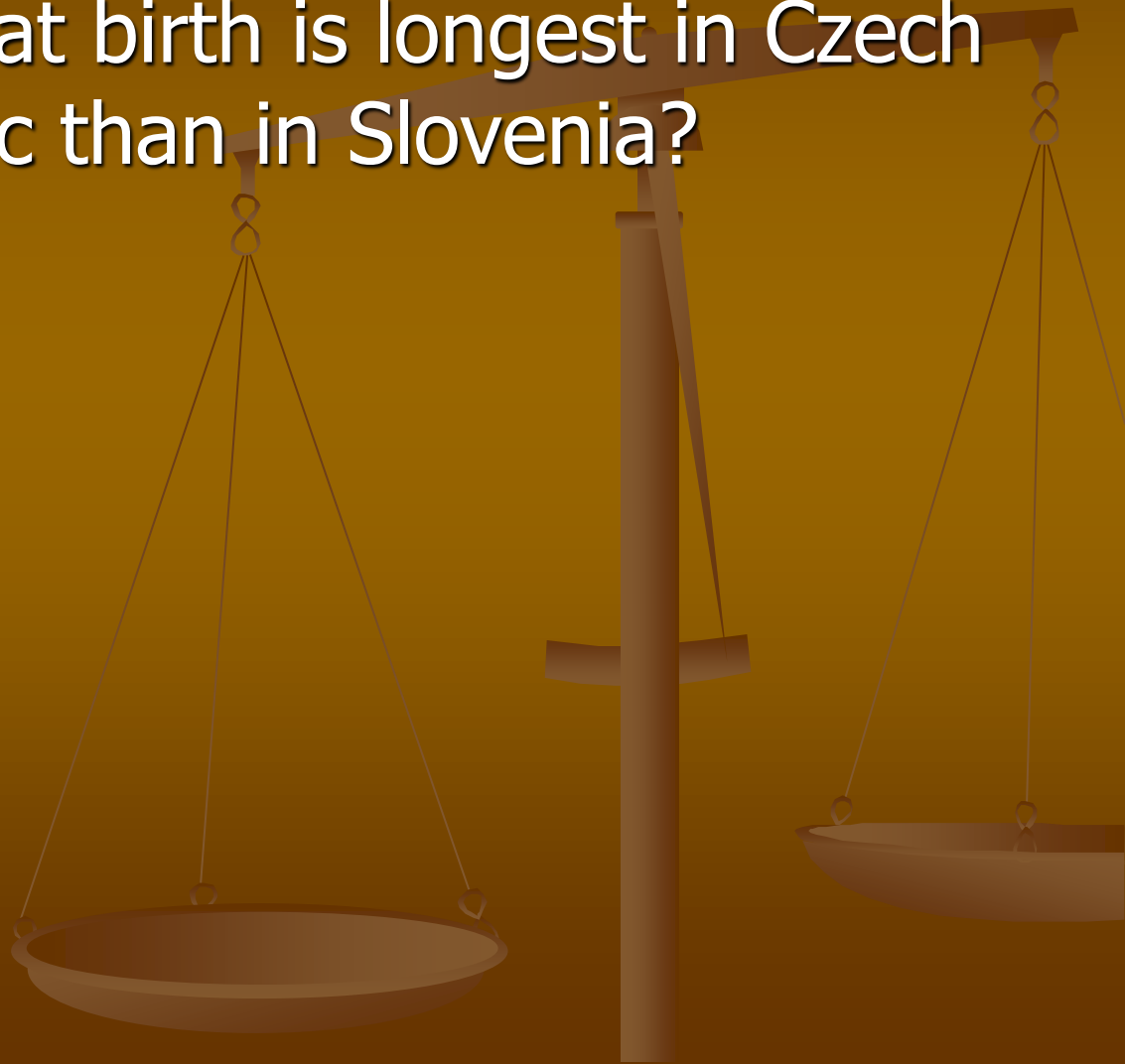
Kafatos A, Diacatou A, Voukiklaris G, Nikolakakis N, Vlachonikolis J, Kounali D, Mamalakis G, Dontas AS.
Department of Social Medicine, University of Crete School of Medicine, Iraklion, Greece. Kafatos@med.uch.gr

Abstract

A follow-up study was conducted to identify the heart disease risk-factor status and dietary changes of surviving elderly subjects in Crete who took part in the Seven Countries Study in 1960. In 1991, data were obtained from 245 of the 686 original male participants (169 of the original 40-49-y age group and 76 men 50-59 y age group). In 1991, the men were 70-79 and 80-89 y old. There was a significant (11.5%) increase in serum total cholesterol concentrations between 1960 and 1991. Body mass index and systolic and diastolic blood pressures also increased significantly, and all age groups were characterized by central obesity. A representative subsample of 21 men took part in a 3-d weighed food record study. Dietary data indicated increases in the intake of saturated fat and decreases in monounsaturated fat over the 30-y period. Comparison with a 1962 representative Cretan sample indicated a significantly increased concentration of adipose palmitic acid (16:0) in our surviving sample. The observed changes occurred during a period when many developed countries were observing a decline in most heart disease risk factors.

Life expectancy at birth is longest in Czech Republic than in Slovenia?

A. YES
B. NO



Country comparison
Slovenia ↔ Czech Republic

	Slovenia	Czech Republic
Life expectancy 2018 (year)	80.92 World Rank: 27	79.17 World Rank: 31

Japan	84.17	World Rank:	1
Saudi Arabia	74.75	World Rank:	84
Central Africa	53.04	World Rank:	182

Source: *http://www.worldlifeexpectancy.com/world-life-expectancy-map*

Death Rate Per 100 000 (2018)

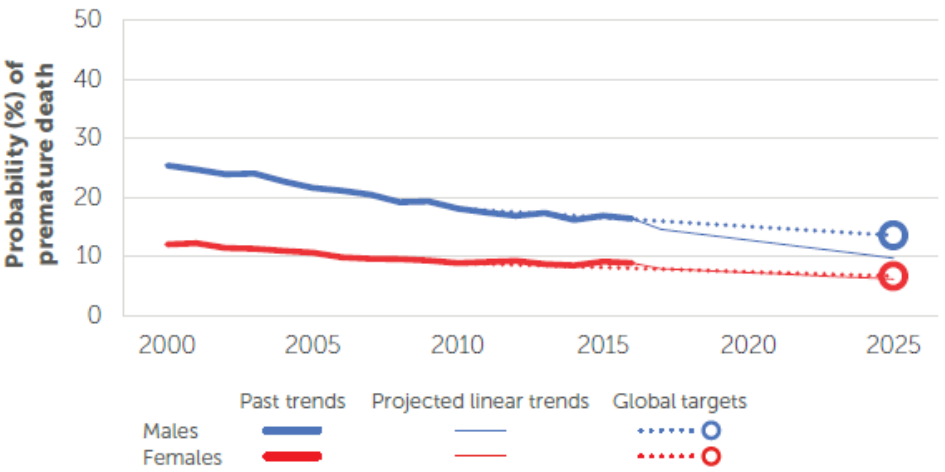
		All Cancers	Coronary Heart Disease	Diabetes Mellitus
SI		150.61	85.67	7.34
CZ		134.31	152.37	17.14

Source: www.worldlifeexpectancy.com

SLOVENIA

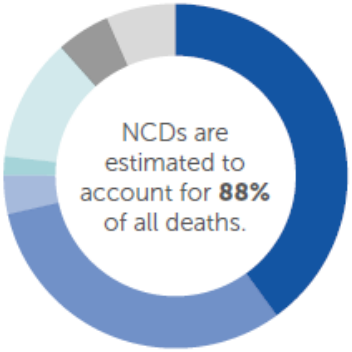
2016 TOTAL POPULATION: 2 078 000
2016 TOTAL DEATHS: 20 000

RISK OF PREMATURE DEATH DUE TO NCDS (%)



PROPORTIONAL MORTALITY

- 40% Cardiovascular diseases
- 31% Cancers
- 4% Chronic respiratory diseases
- 2% Diabetes
- 12% Other NCDs
- 5% Communicable, maternal, perinatal and nutritional conditions
- 7% Injuries



300 LIVES CAN BE SAVED BY 2025 BY IMPLEMENTING ALL OF THE WHO "BEST BUYS"

Link

Food and population

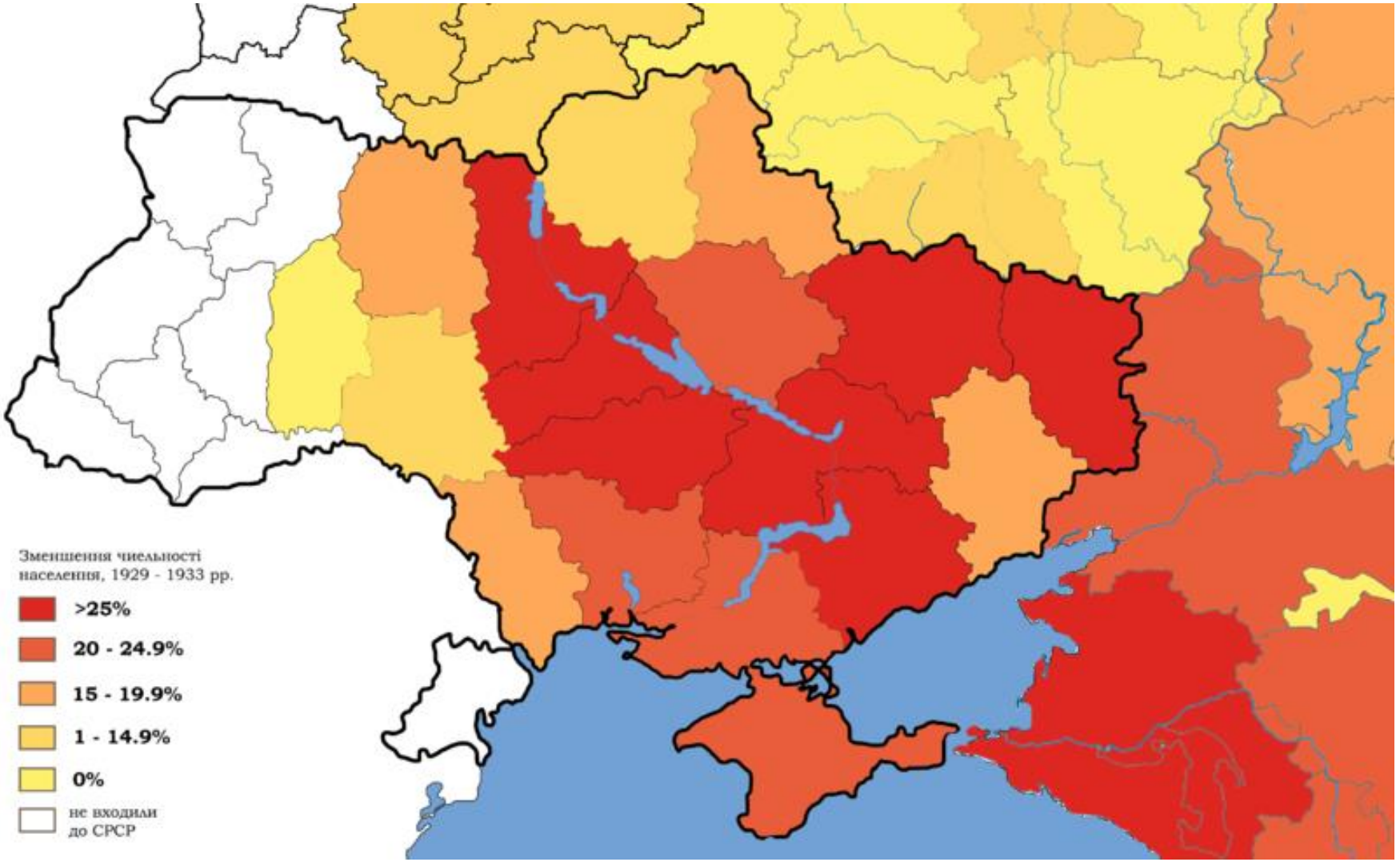
Holodomor in Ukraine

- **морити голодом**, "to kill by starvation" (1932-1933)
- killed about three million people (?)

In Harkov 1933

Source: https://en.wikipedia.org/wiki/Holodomor

Map of depopulation of Ukraine and southern Russia, 1929–33.



Source: https://en.wikipedia.org/wiki/Holodomor

CHICAGO AMERICAN

SECOND SECTION
NEWS, FEATURES

SIX MILLION PERISH IN SOVIET FAMINE

Peasants' Crops Seized, They and Their Animals Starve

Reporter Risks Life to Get Photographs Showing Starvation

By THOMAS WALKER.

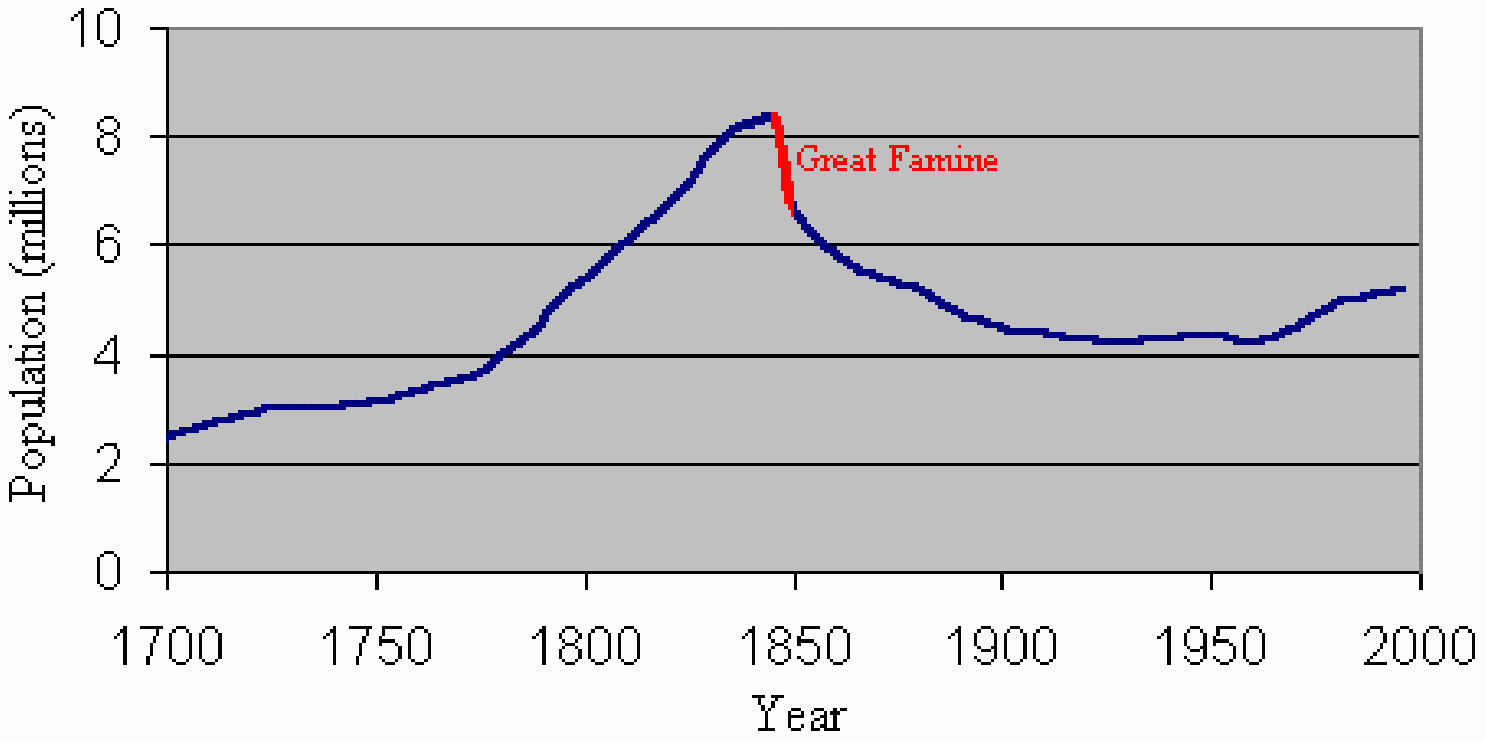
26

FORUM NO. 54 - SPRING, 1983

https://upload.wikimedia.org/wikipedia/commons/4/4f/Holodomor-Chicago.jpg

Great Famine - Ireland (1845)

Population of Ireland 1700 to 2000

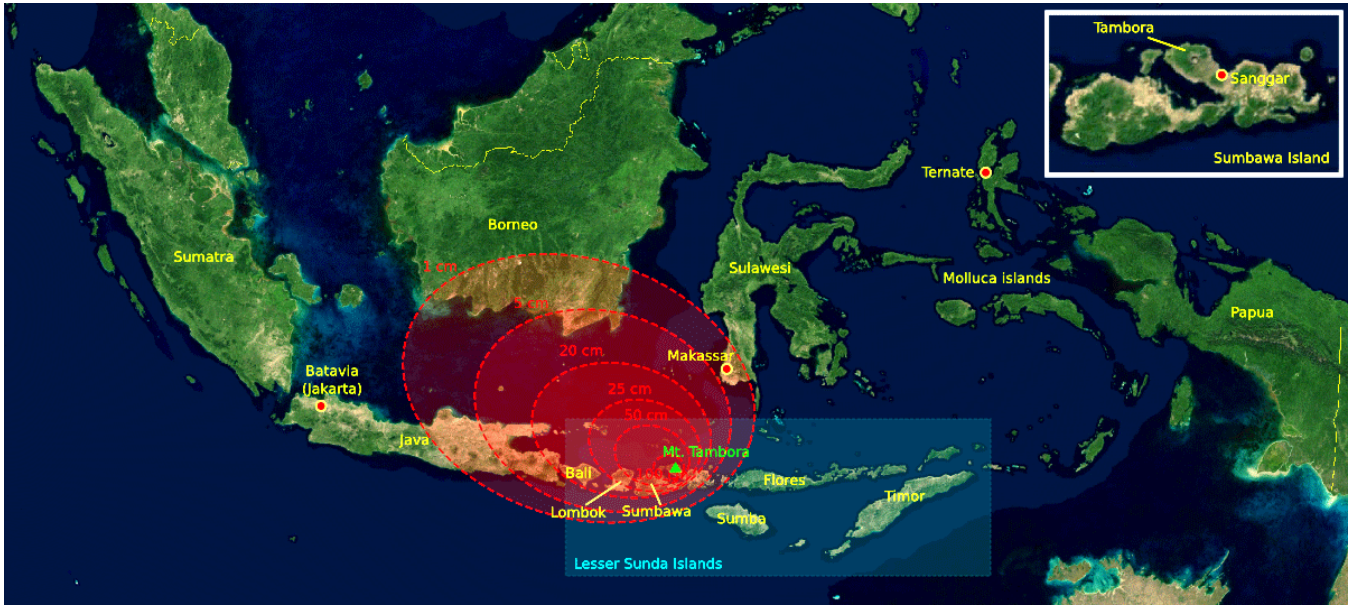


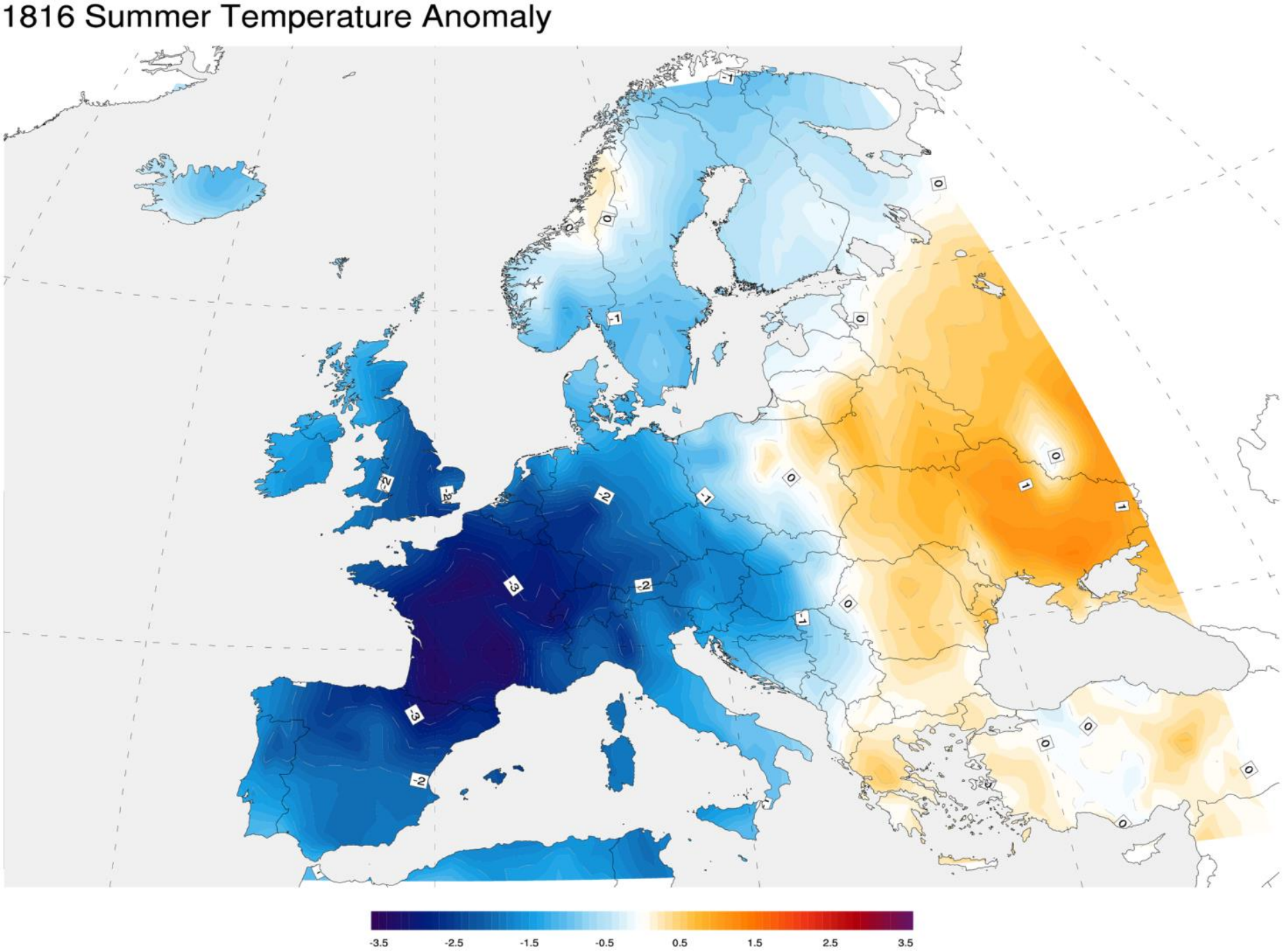
Unlike the rest of this site, this chart is declared to be in the public domain.

Vir: http://www.bbc.com/news/uk-northern-ireland-34369080

Year Without a Summer (1816)

- The massive eruption of Mount Tambora in the Dutch East Indies (Indonezija), April 1815
- Temperatures fell worldwide bec
- ause less sunlight passed through the stratosphere.
- In the Earth's average land temperature of about 1 °C.





Vir: https://commons.wikimedia.org/wiki/File:1816_summer.png

The Year Without a Summer.

In the year 1816 there was a sharp frost in every month. It was known as the "year without a summer." The farmers used to refer to it as "eighteen hundred and starve to death." In May ice formed half an inch thick, buds and flowers were frozen and corn killed. Frost, ice and snow were common in June. Almost every green thing was killed, and the fruit was nearly all destroyed. Snow fell to the depth of three inches in New York and Massachusetts, and ten inches in Maine. July was accompanied with frost and ice. On the fifth ice was formed of the thickness of window glass in New York, New England and Pennsylvania, and corn was nearly all destroyed in certain sections. In August ice formed half an inch thick. A cold northern wind prevailed nearly all summer. Corn was so frozen that a great deal was cut down and dried for fodder. Very little ripened in New England, and scarcely any even in the Middle States. Farmers were obliged to pay four or five dollars a bushel for corn of 1815, for seed for the next spring's planting.

Vir: http://oldnews.aadl.org/node/169151

INTERNATIONAL JOURNAL OF CLIMATOLOGY
RMetS Royal Meteorological Society
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Research Article

Iberia in 1816, the year without a summer

Ricardo M. Trigo ✉, José M. Vaquero, Maria-João Alcoforado, Mariano Barriendos, João Taborda, Ricardo García-Herrera, Juerg Luterbacher

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"The decade from 1811 to 1820 was marked by serious **socioeconomic impacts** resulting from this **poor agricultural production**, with **malnutrition** and the increase of epidemics in Europe and Mediterranean countries. Low temperatures, freezing temperatures in Spring and heavy precipitation between 1816 and 1817 affected the growth of many crops very badly."