

Statistika ja järeldused terviseuuringutes

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31.10.2019

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Psühholoog

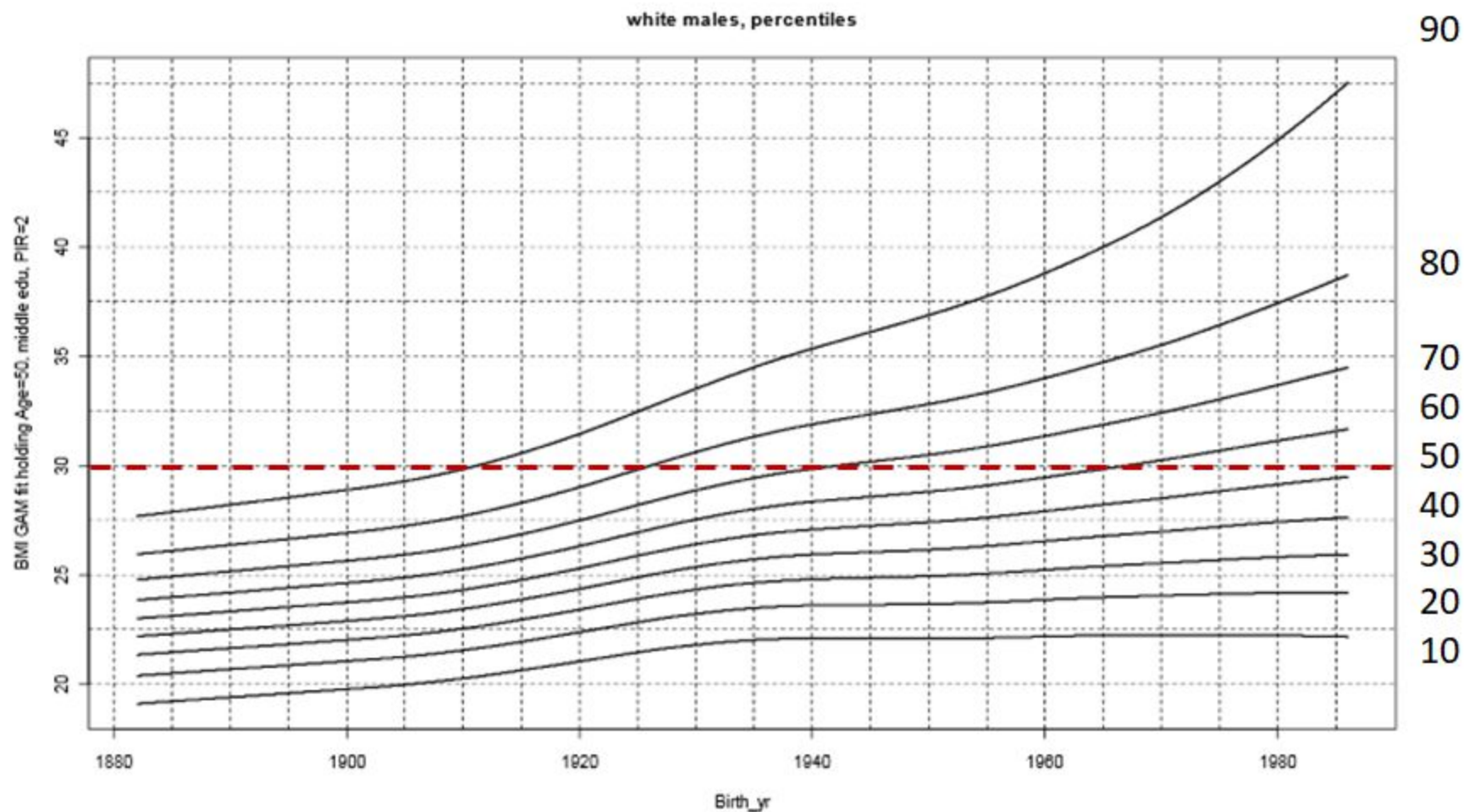
Rakendan käitumist, ajuteadusi, ja geneetikat, et mõista ülesöömise tausta

Õppinud Tartus

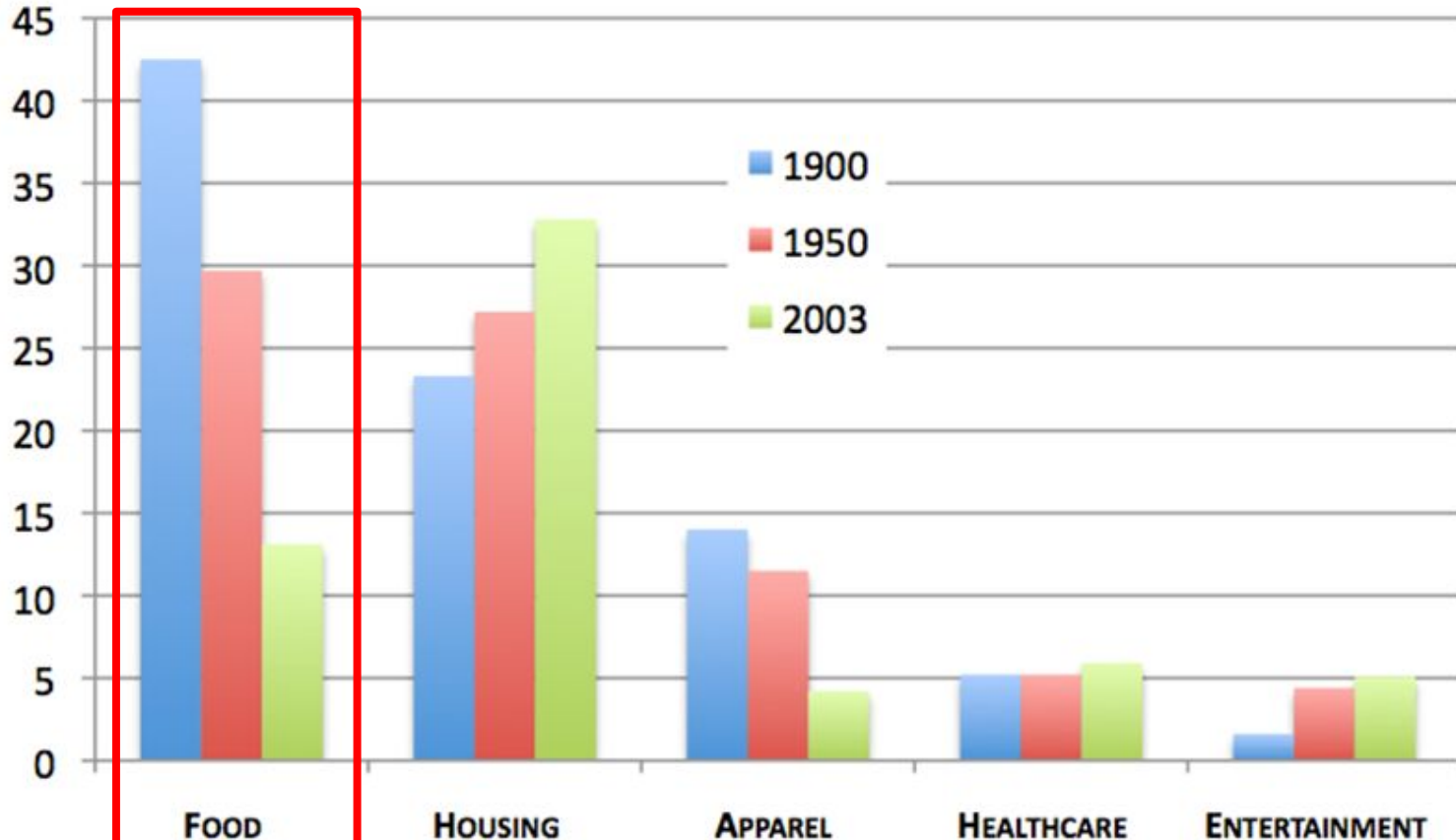
Külalisõpingud Konstanzis, Torontos, Montrealis



Figure 1. Trend of BMI centile curves of US-born White Men by birth cohorts

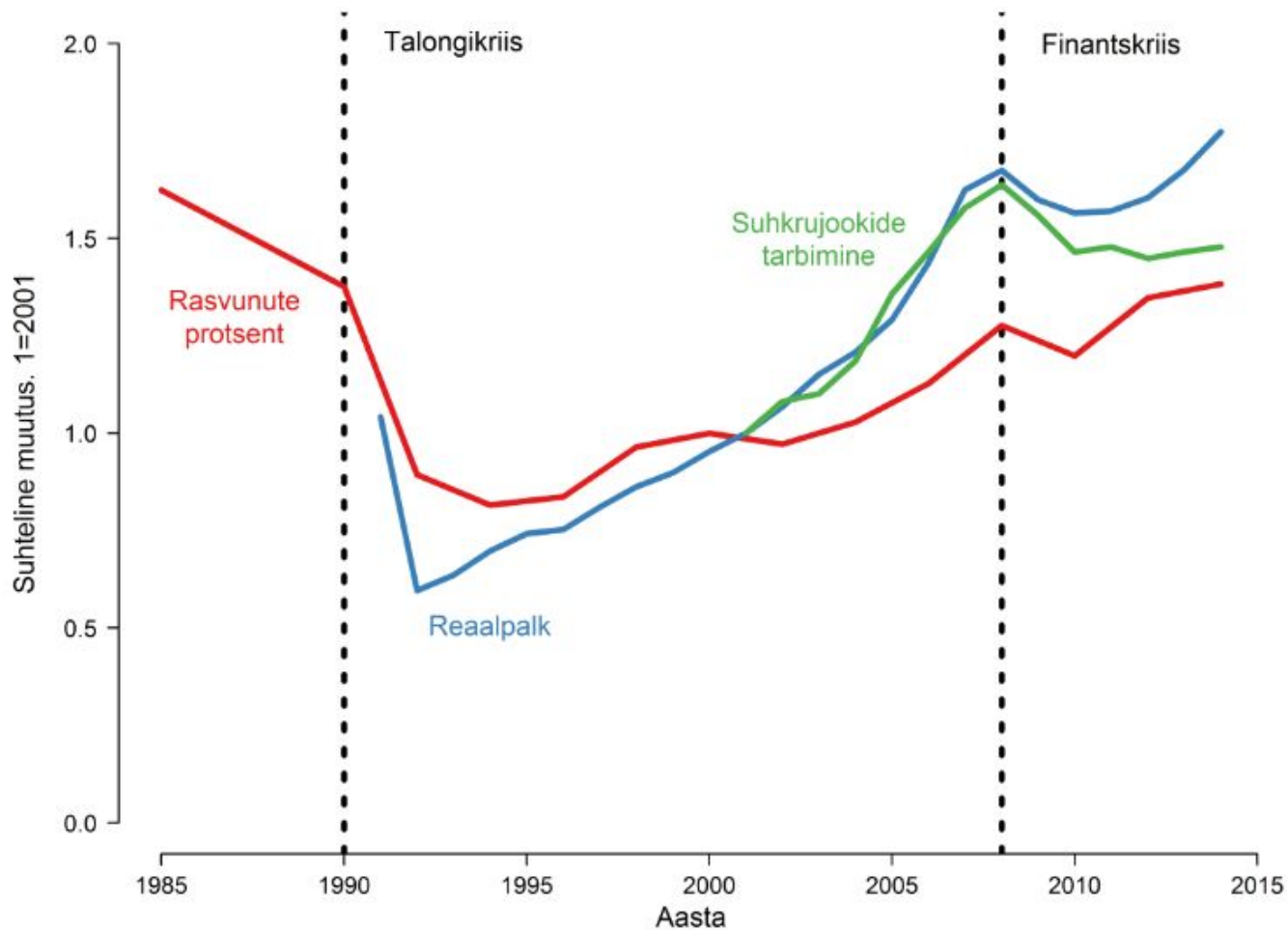


Toit 100 aastaga 3x odavam



www.theatlantic.com/business/archive/2012/04/how-america-spends-money-100-years-in-the-life-of-the-family-budget/255475/

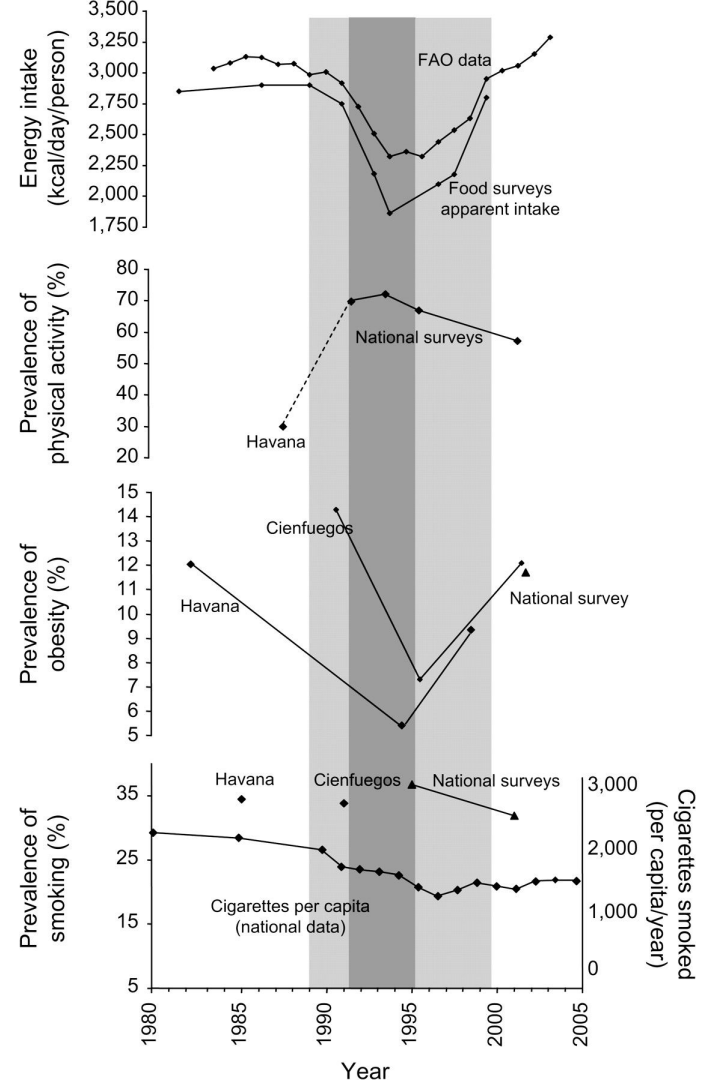
Ülekaal ja sissetulekud Eestis

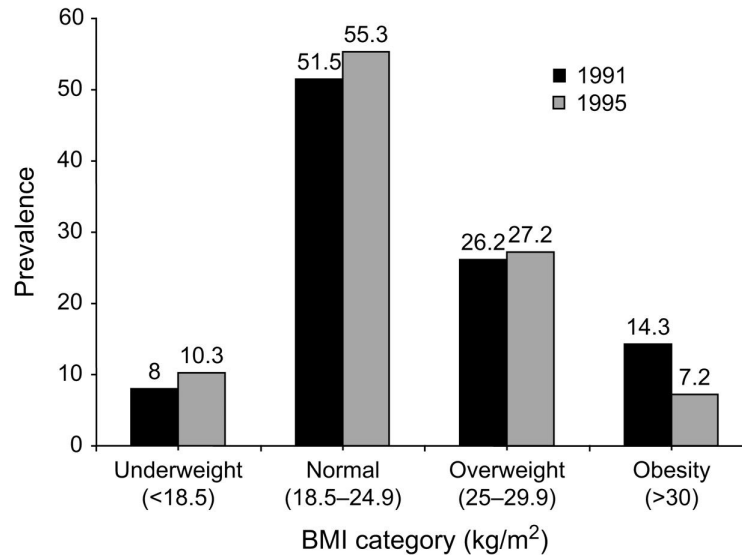
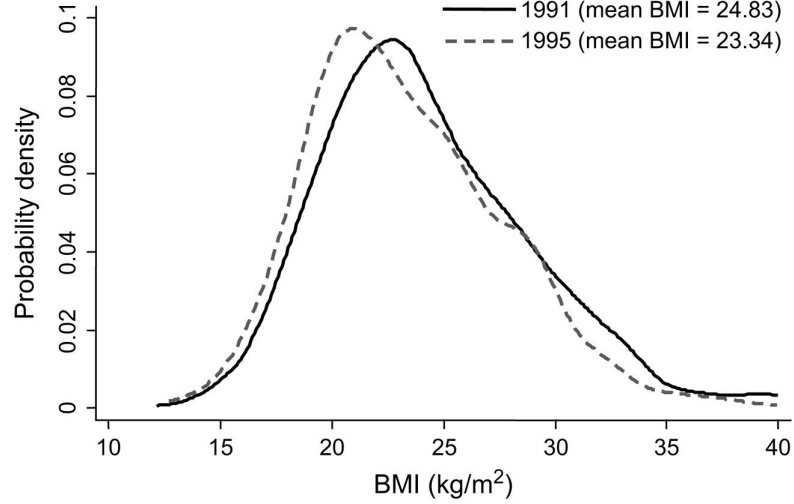


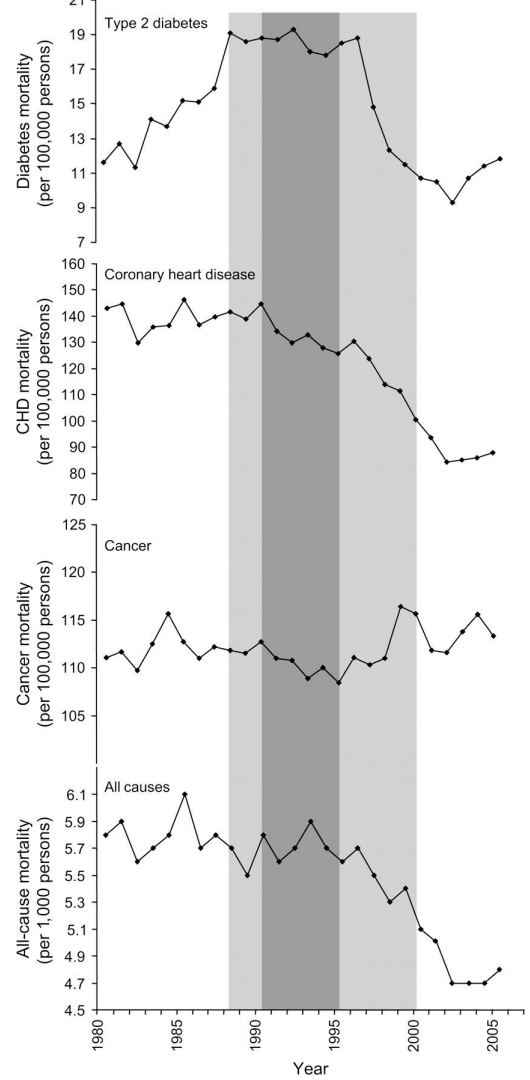
Cuban economic “crisis”?

2,899 kcal → 1,863 kcal

30% → 67% physical activity

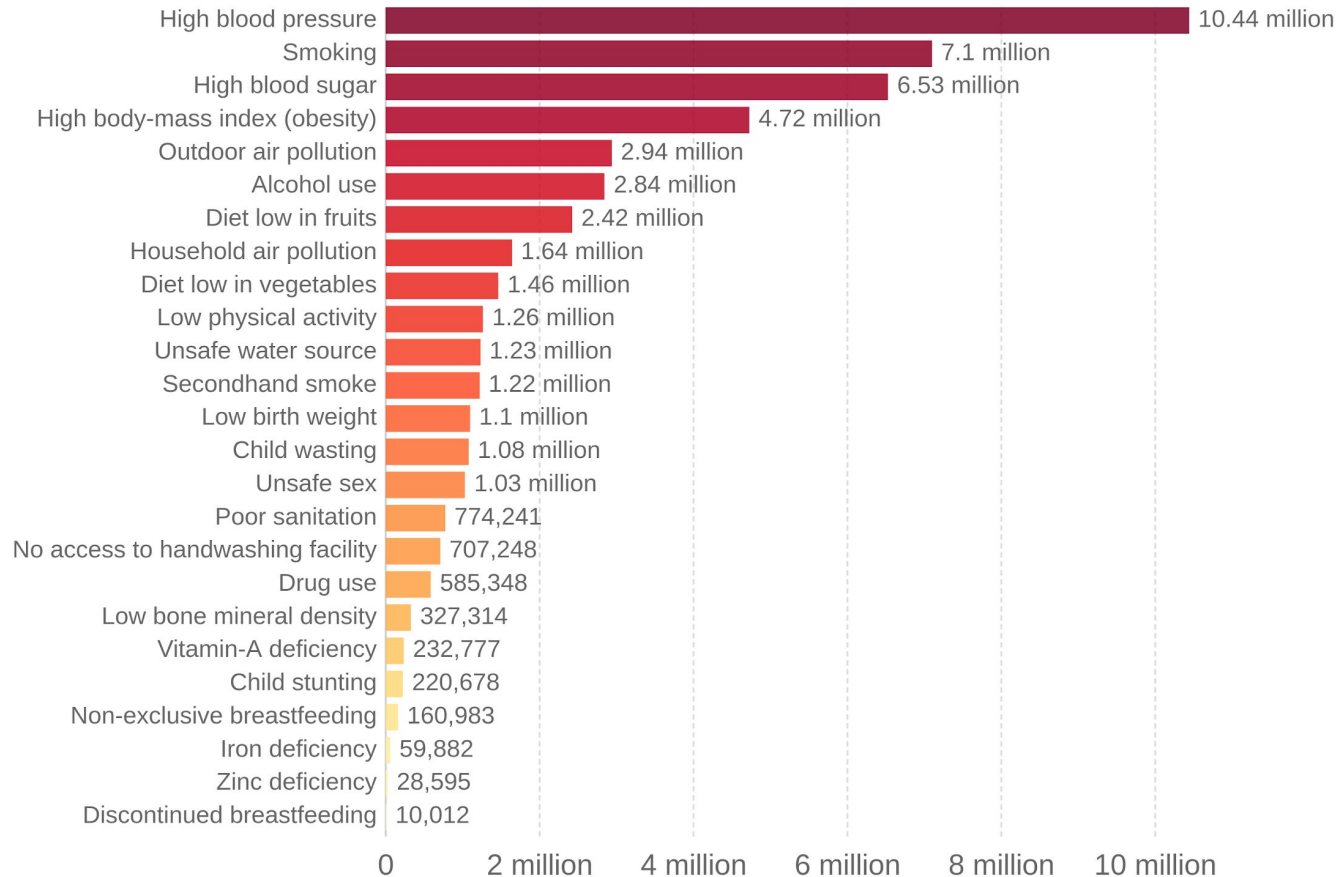






Number of deaths by risk factor, World, 2017

Total annual number of deaths by risk factor, measured across all age groups and both sexes.



Söömiskäitumise füsioloogia

Kas süüa? Inimese füsioloogia väldib inimese nälga jäämist

Metabolism ja rasvavaba mass ennustavad hästi söödud toidu hulka

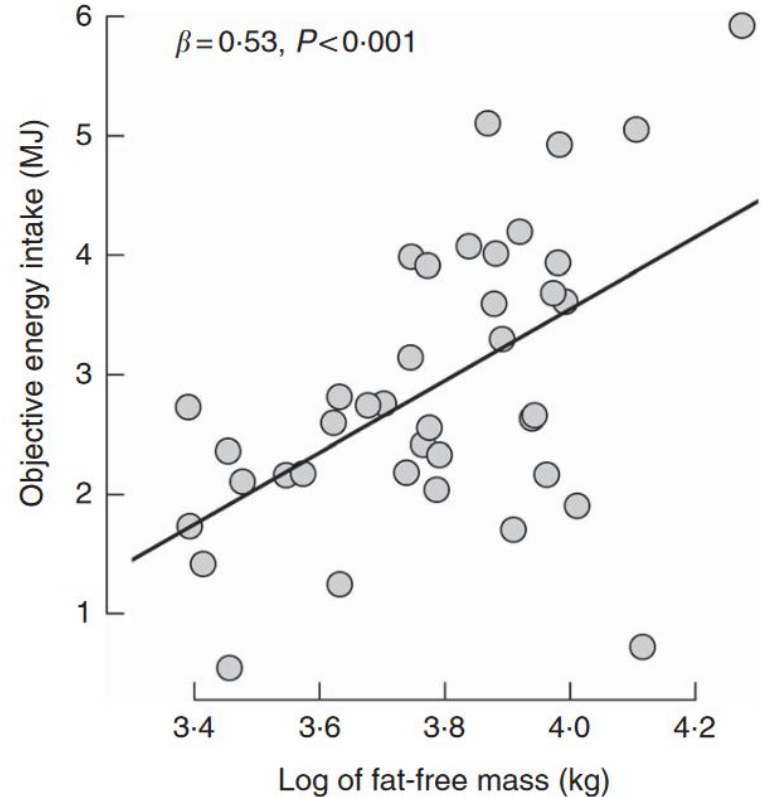
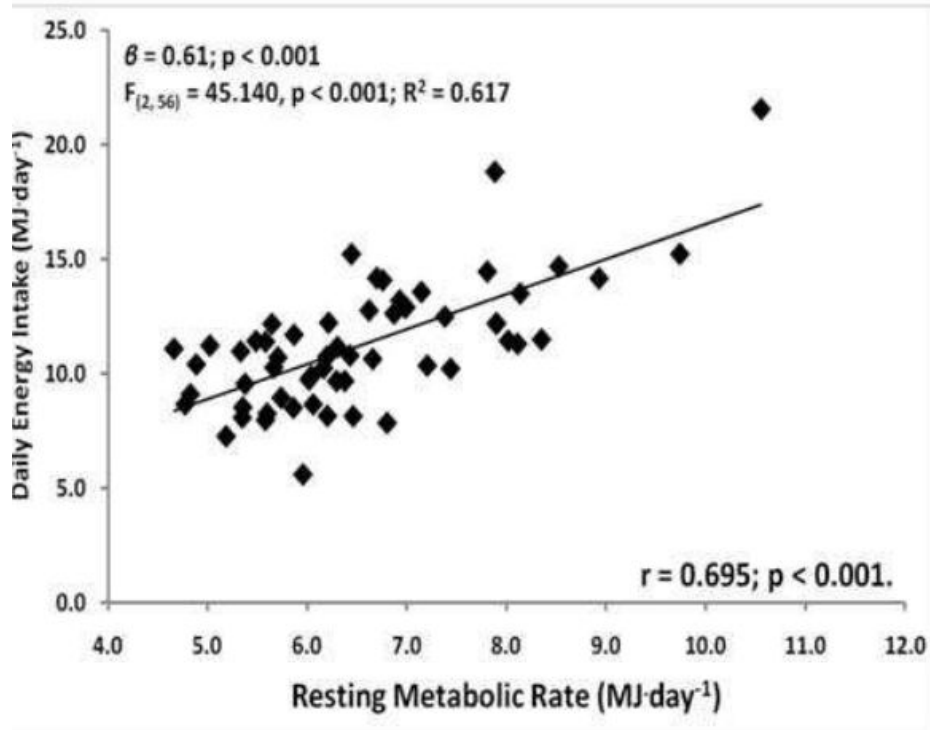
Mida süüa? Inimene on kõigesööja

Kultuur ja ühiskonna võimalused määravad toidu valiku ja koguse

Kapitalism tahab rohkem müüa, sealhulgas toitu

Ülekaal toob suurema metabolismi → rohkem söömist, kapitalism võidab

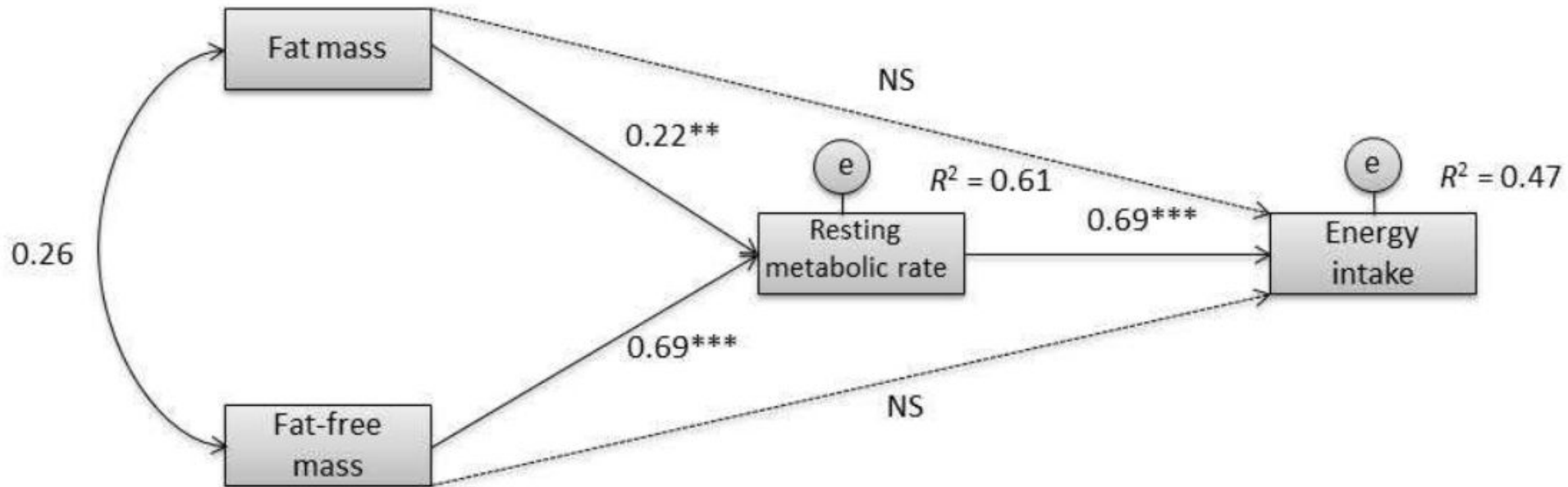
Metabolism, rasvavaba mass ja toidu kogus



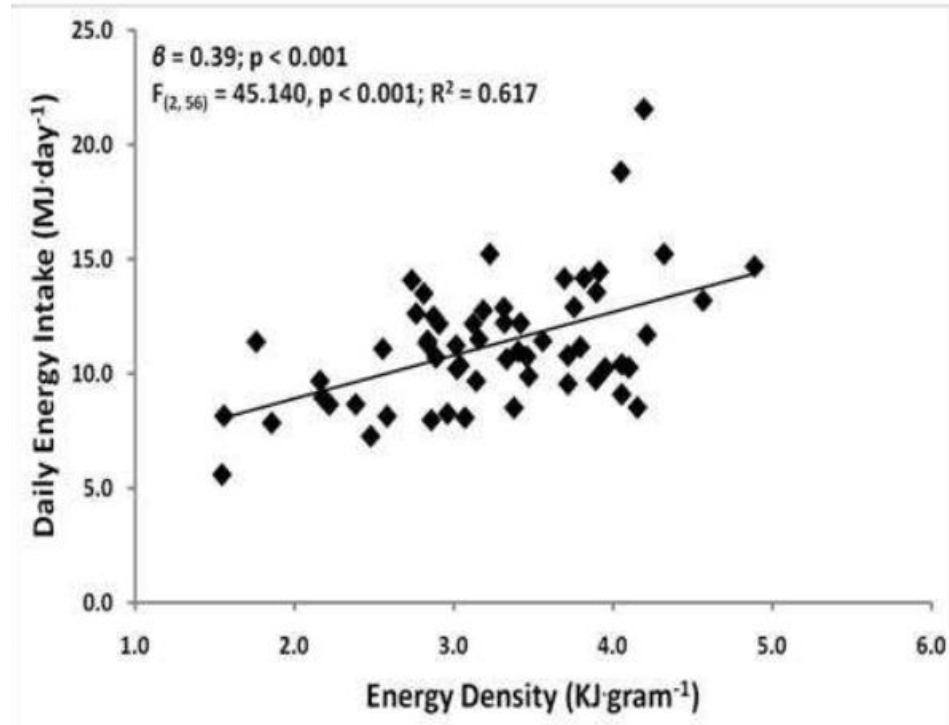
Hopkins et al., 2016 Int J Obes;
Vainik et al., 2016 Br J Nutr.

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Toidu kogust ennustab rasvavaba mass

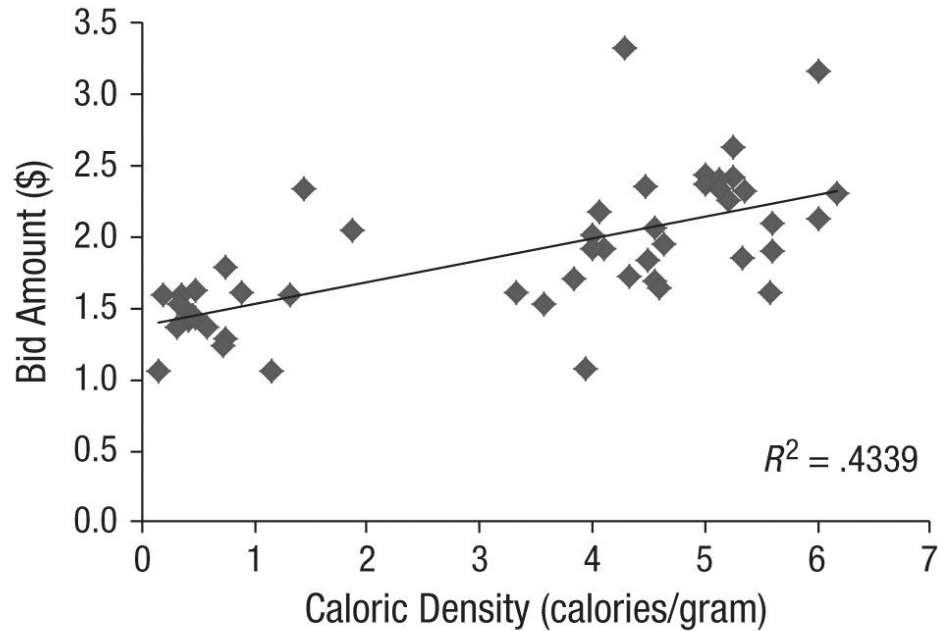


Energiatihedat toitu süüakse rohkem

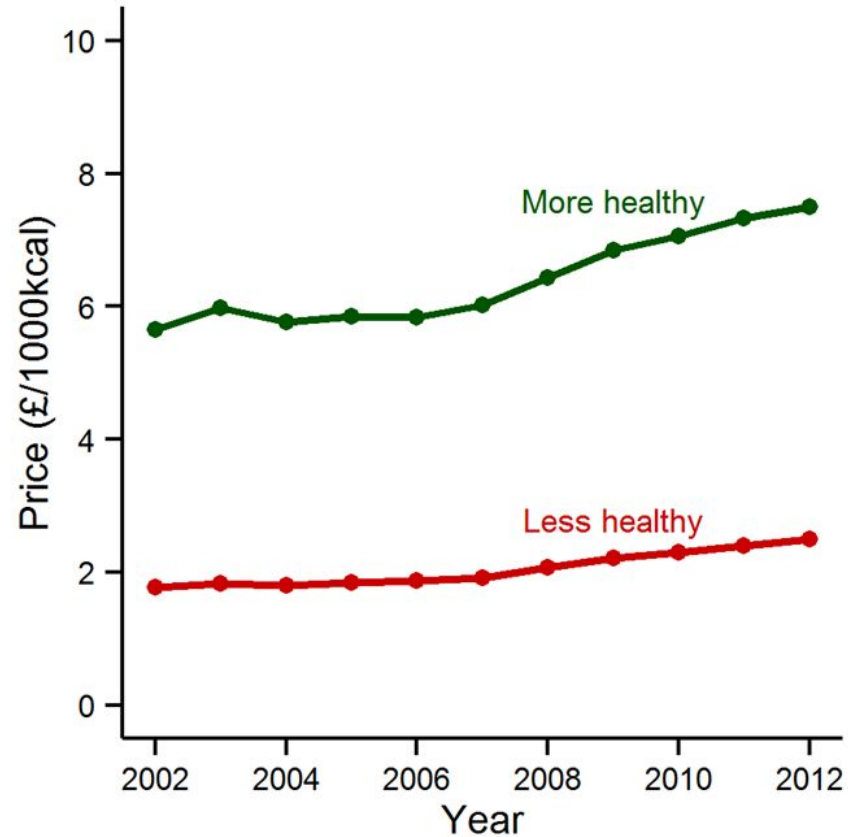


Energiatiheda toidu eest makstakse rohkem

a



Energiatihe toit on ka odavam



Töödeldud ja töötlemata toit

“Söö nii palju kui tahad”

Töödeldud toitu süüakse rohkem

Töödeldud toit viib kaalu tõusuni

Hall et al ., 2019, Cell Metab.

Hall et al., 2019, Cell Metab

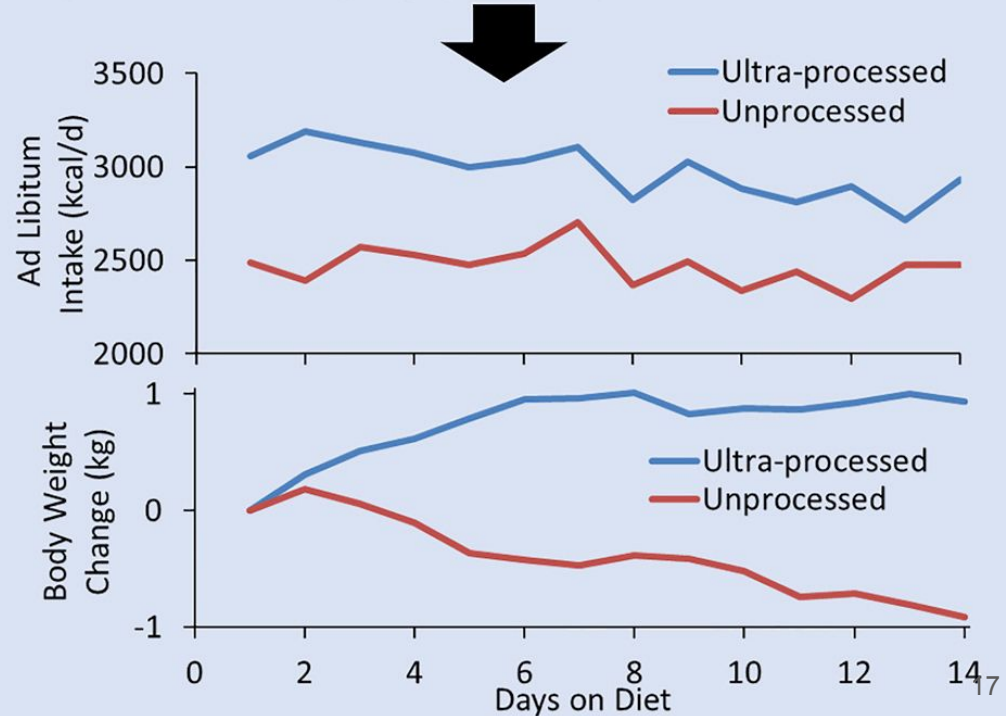
Ultra-processed Diet



Unprocessed Diet

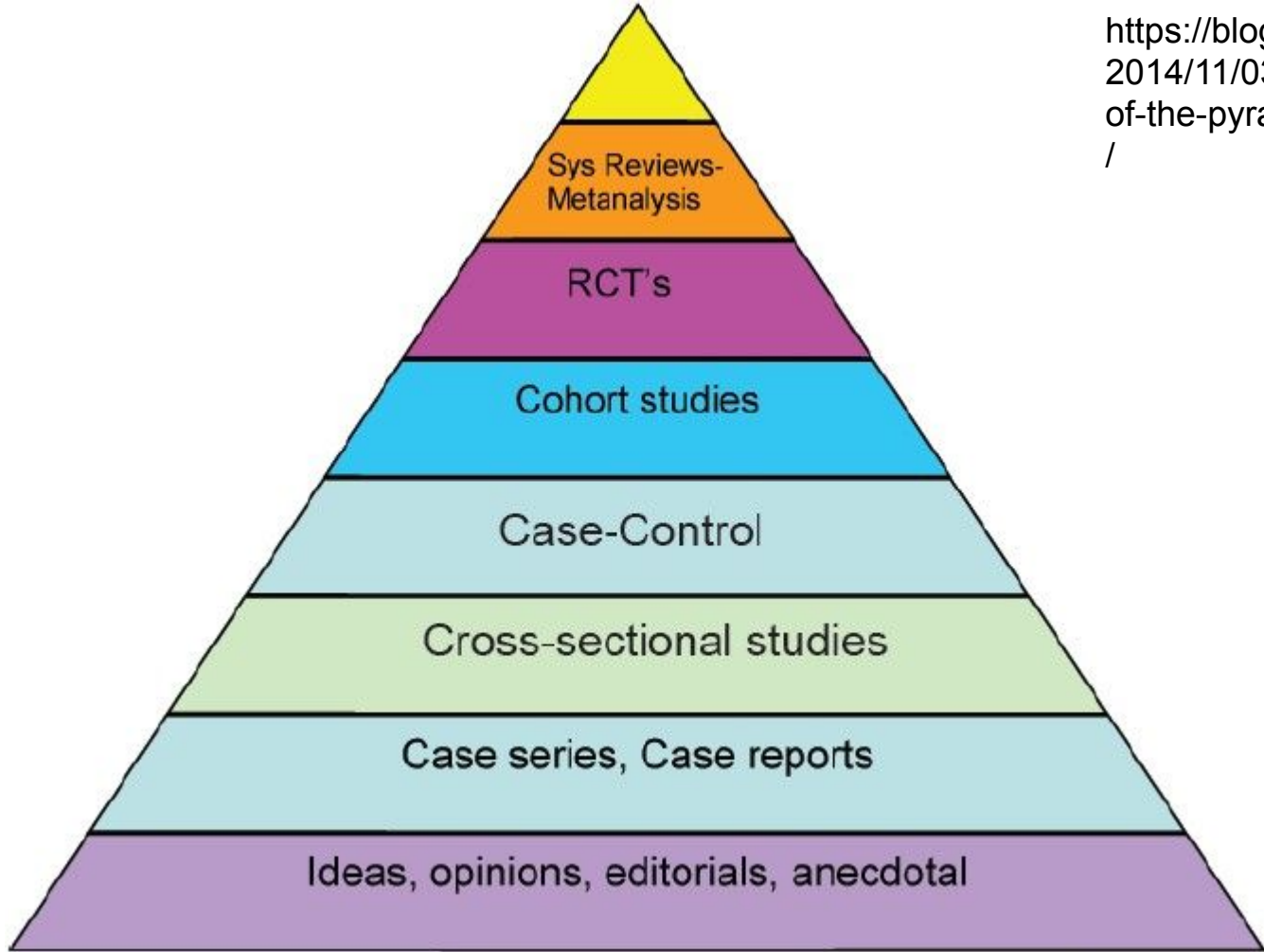


Diets were presented in random order and matched for provided calories, sugar, fat, fiber, and macronutrients

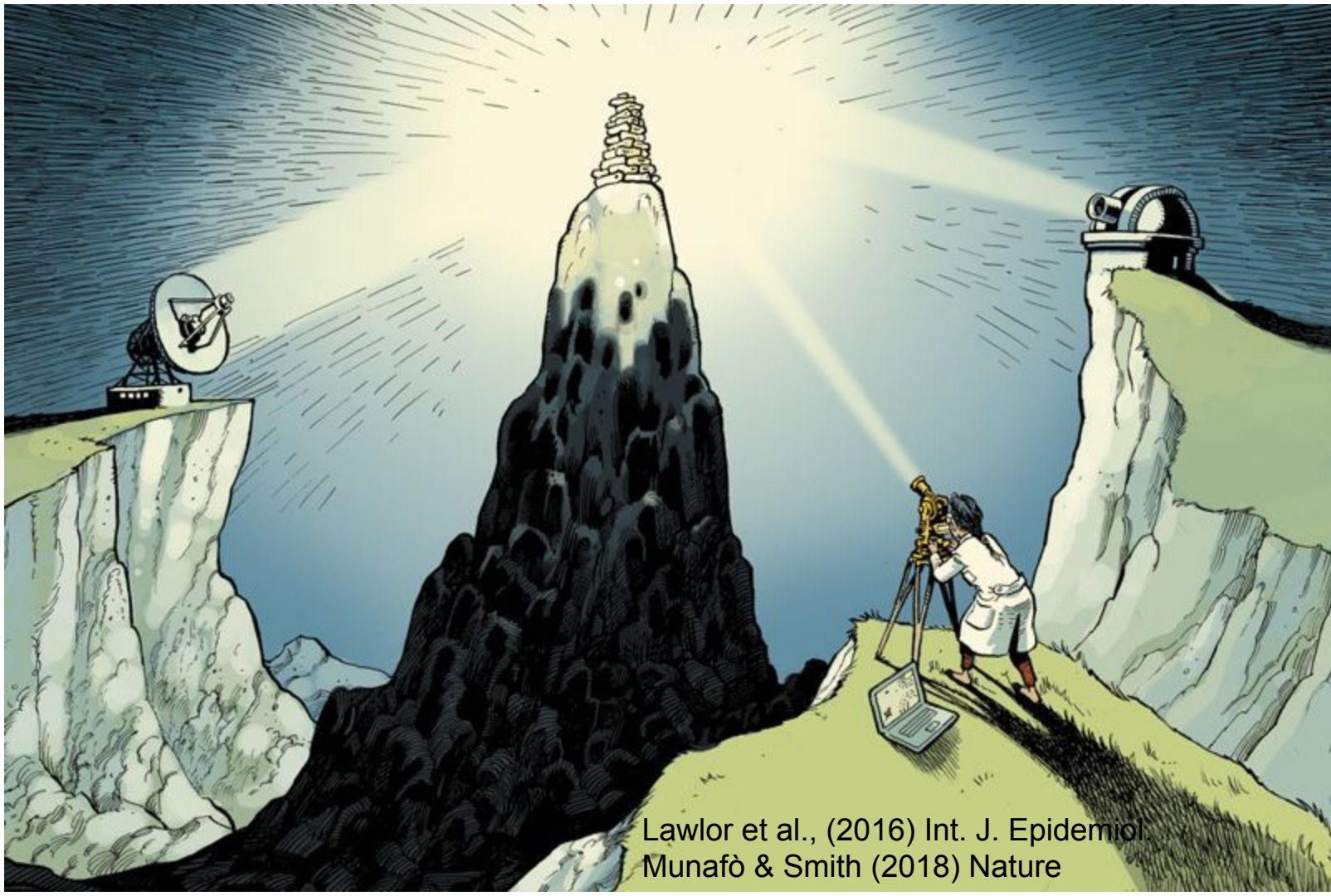


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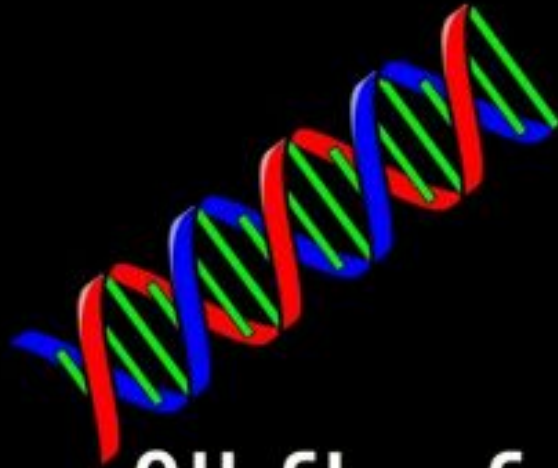
<https://blogs.bmj.com/adc/2014/11/03/the-crumbling-of-the-pyramid-of-evidence/>



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Lawlor et al., (2016) *Int. J. Epidemiol.*
Munafò & Smith (2018) *Nature*



When All Else fails,
Blame Your Genes

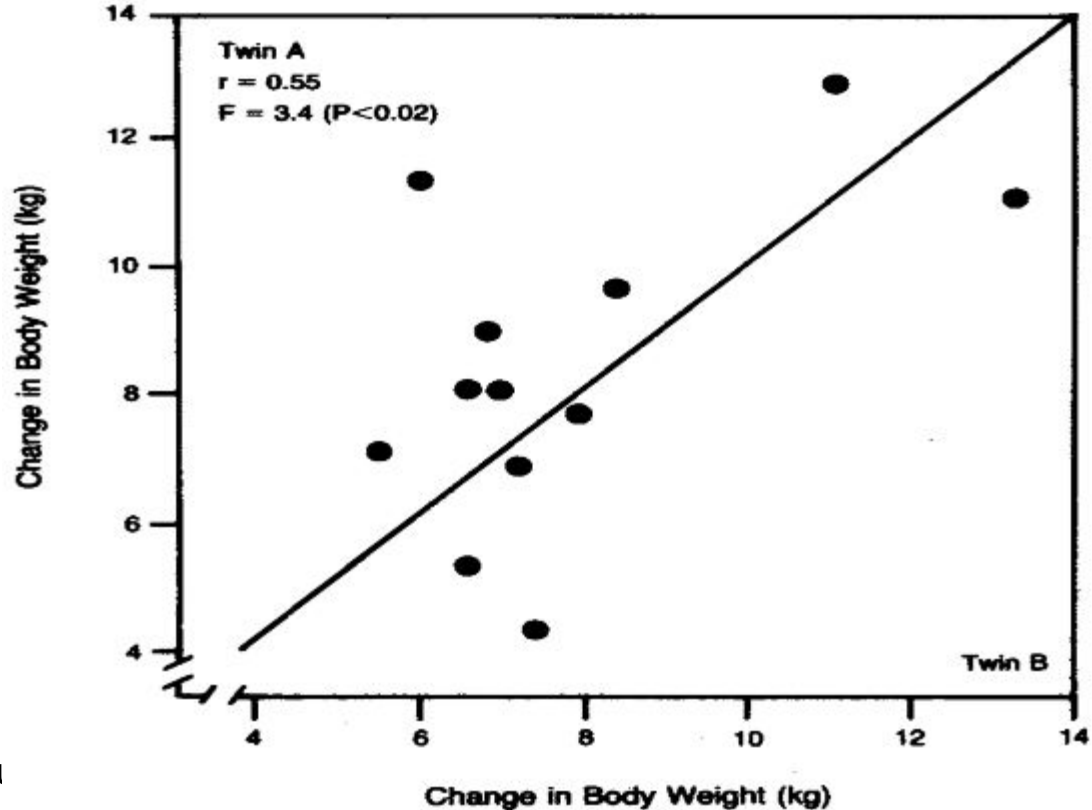
Monozygotic twins similarly gain weight

12 pairs of MZ twins

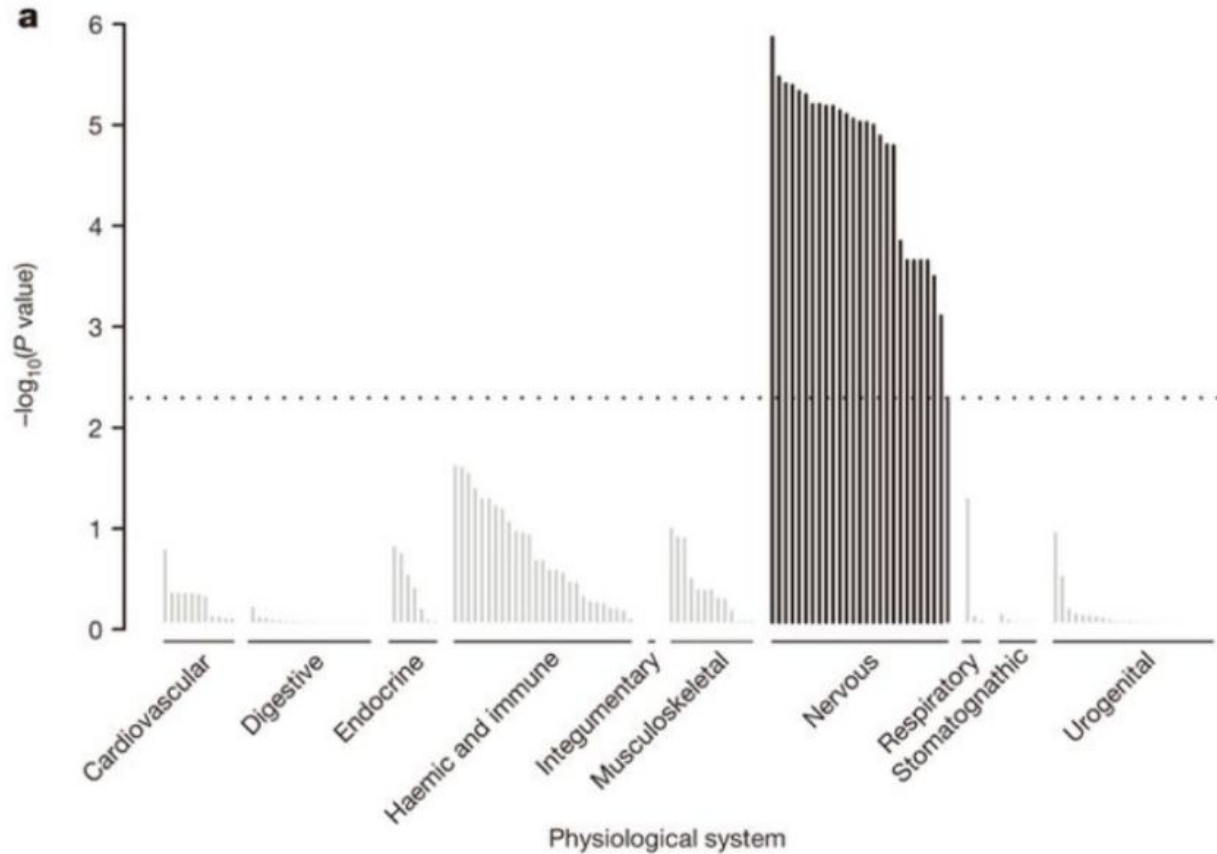
Overfed for 100 days

1000kcal more than needed

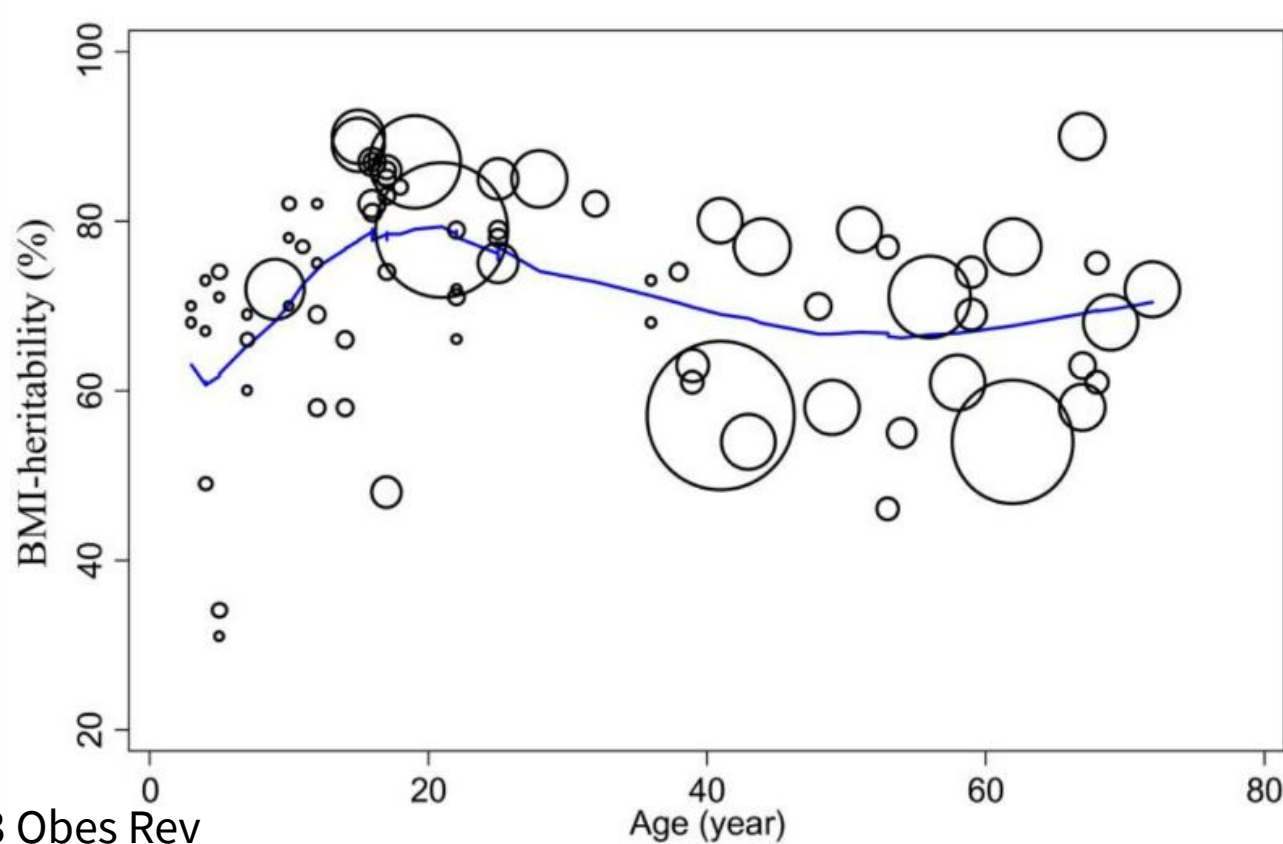
Weight gain 8.1 kg (4.3 – 13.3kg)



Obesity related genes express in the brain



Ülekaalu päritavus muutub vanusega

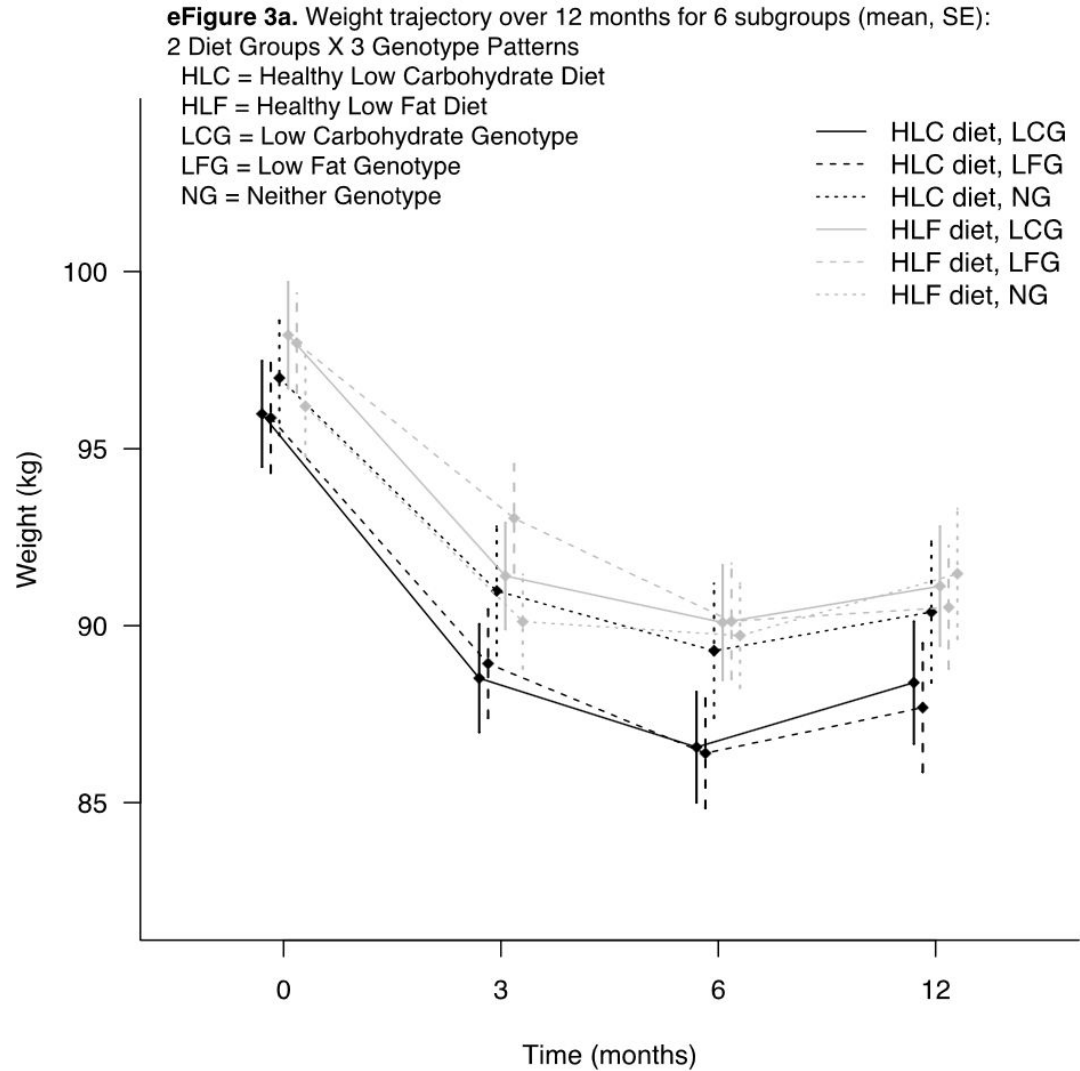


DIETFITS

N=609, BMI > 25

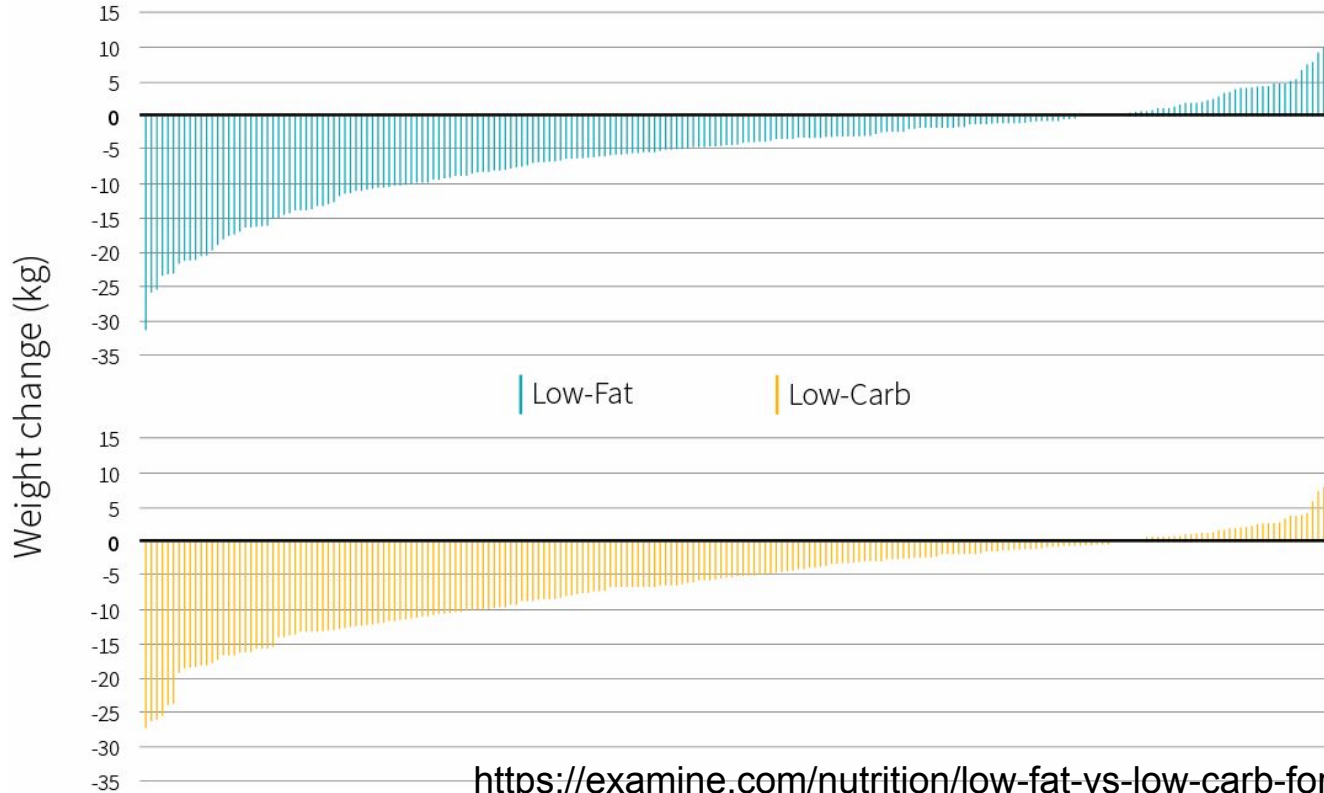
Madala süsivesiku vs madala
rasva dieet

Polnud vahet dieedil ega
genotüübil



DIETFITS: inimesed siiski reageerivad erinevalt

Figure 2: 12-month weight change for each participant



CALERIE

N=218, BMI<27

2467kcal → 2170kcal

12% langust toob kaasa
paremad veremarkerid

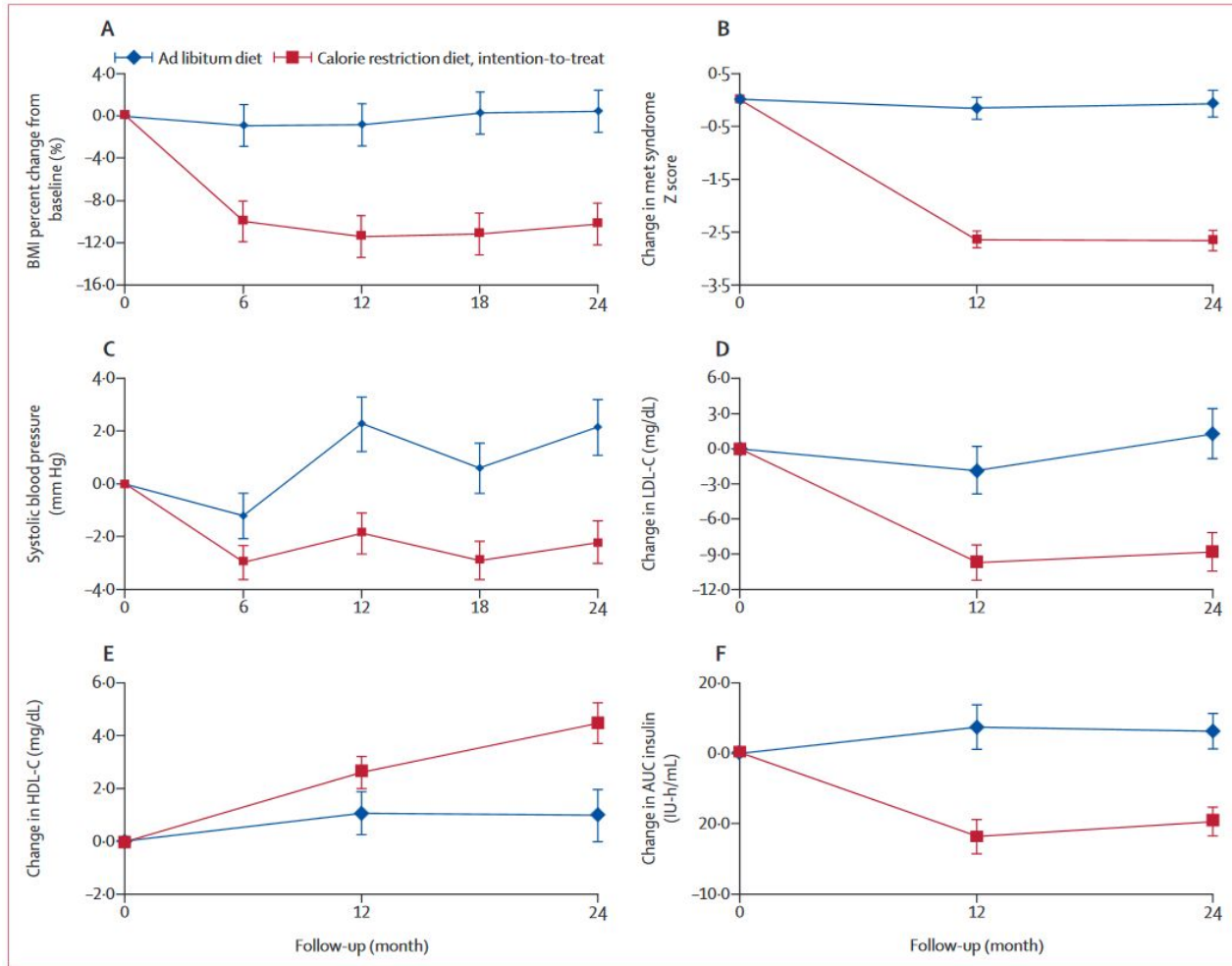


Figure 2: Changes in cardiometabolic parameters

The within group percent change values (mean, SE) by intervention group are shown for the cardiometabolic parameters of BMI (A), metabolic syndrome score (B), blood pressure (C), LDL-cholesterol (D), HDL-cholesterol (E), and area under the curve insulin (F).

AHEAD

N>5000

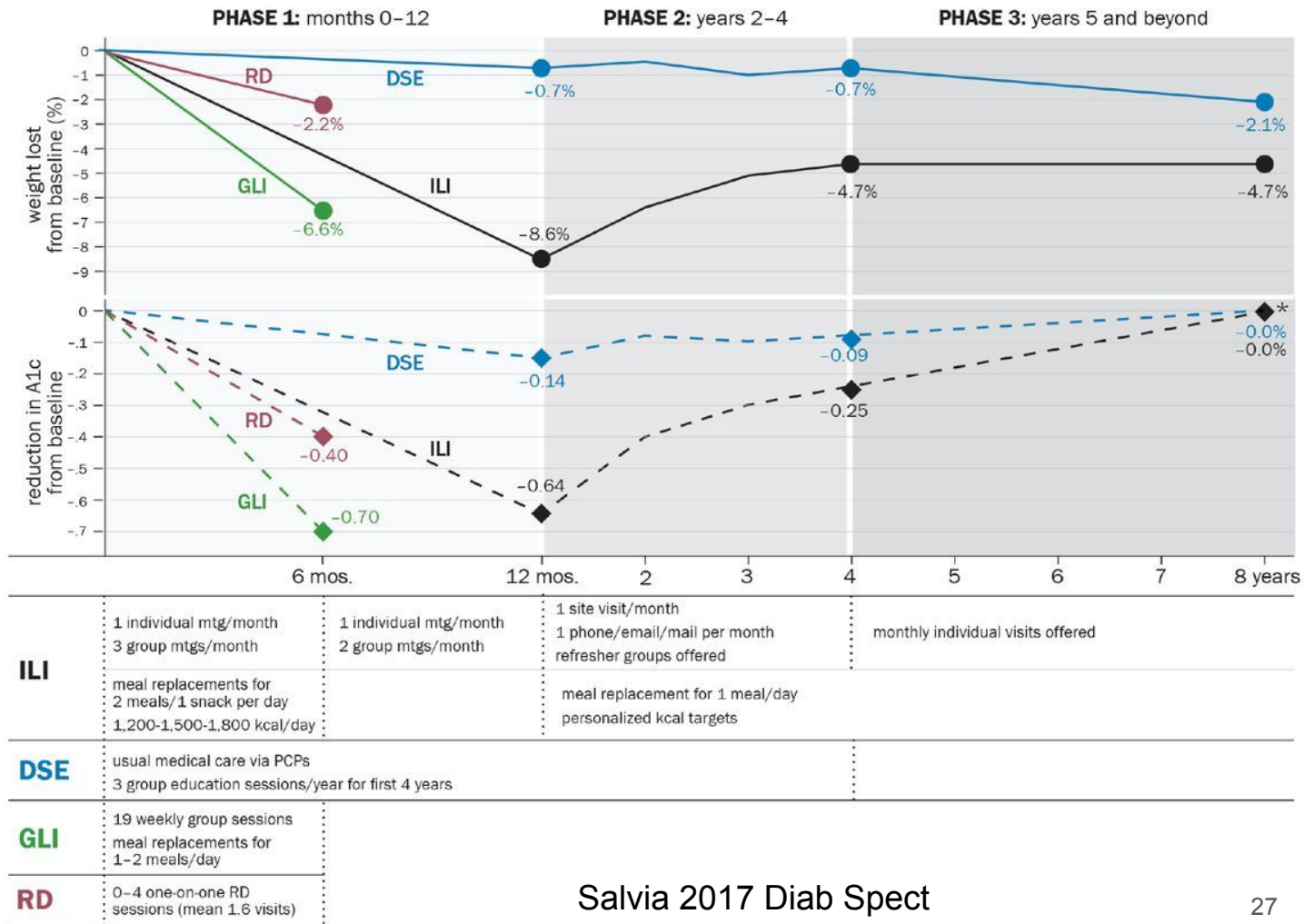
KMI>25+diabeet

Lõpetati vara

Kaal langes

Südamehaiguste risk vähenes

Haiguste juhud samad



Vähem söömine aitab

Kraus: 95% inimesi suudaks 300kcal vähem süüa, kui nad ei sööks pärast õhtusööki.
See võtab ainult natuke distsipliini”

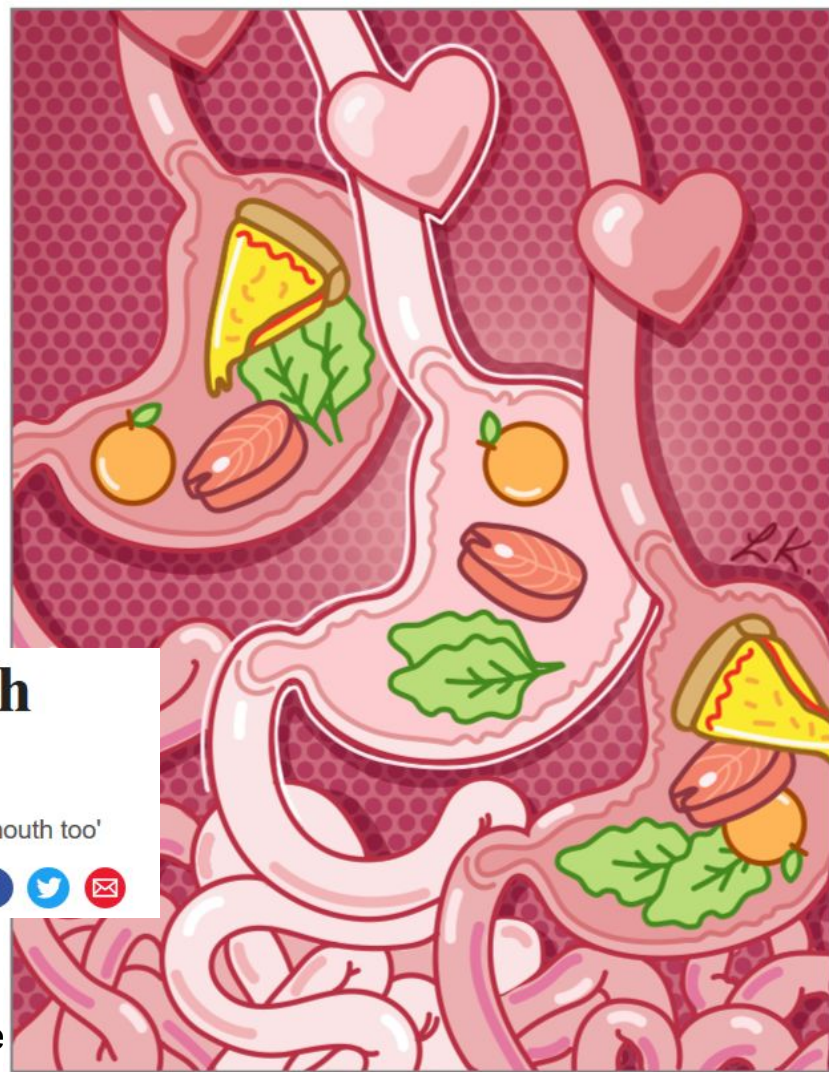
Nagu hambapesu?

One in three regularly forget to brush their teeth, survey claims

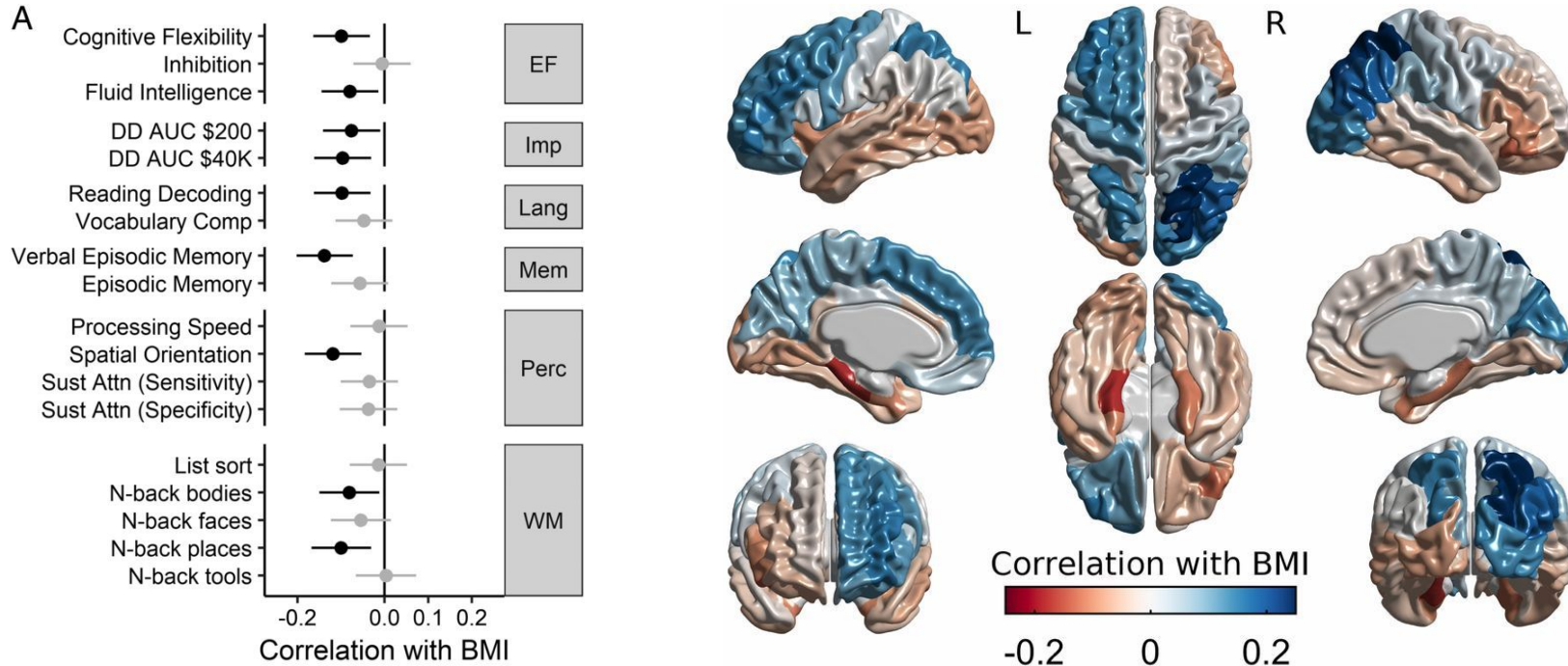
'Overall wellness is important to everyone, and total self-care means caring for the whole mouth too'

Rob Knight | Friday 22 February 2019 14:00 |

 INDEPENDENT



Ülekaalu seosed enesekontrolli ja toidutungiga

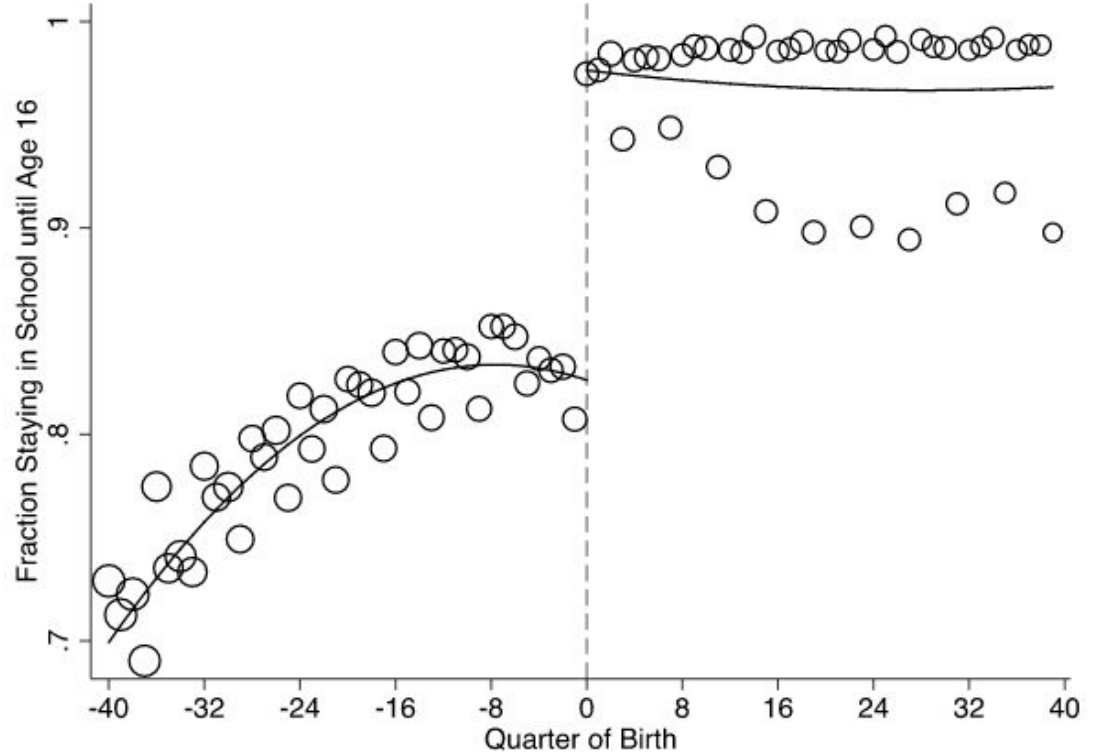


+ ülesöömine, emotsionaalne söömine, kontrollikadu (Vainik et al., 2019 EJP)

Oh ahvatlust!

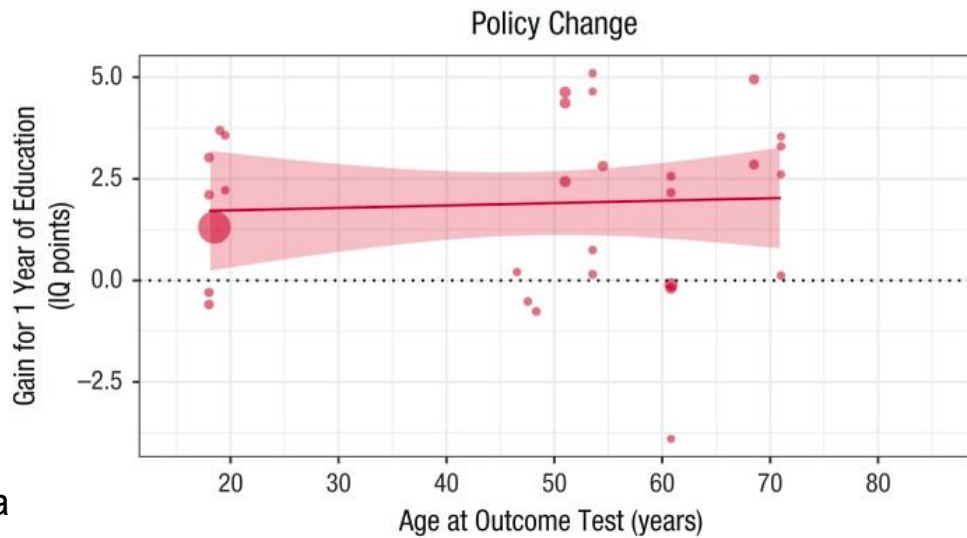
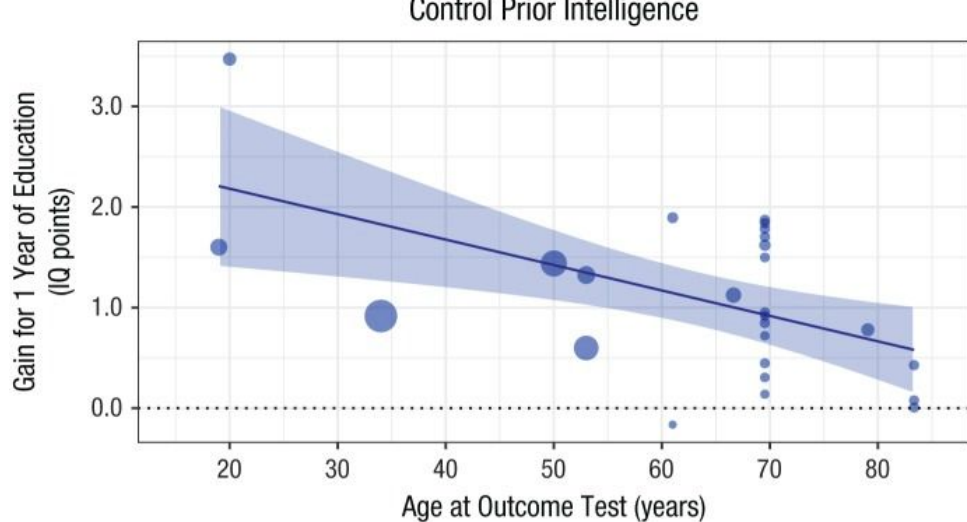
Poliitika muutus tõstab haridust

Figure 1: Fraction Staying in School until Age 16 by Quarter of Birth

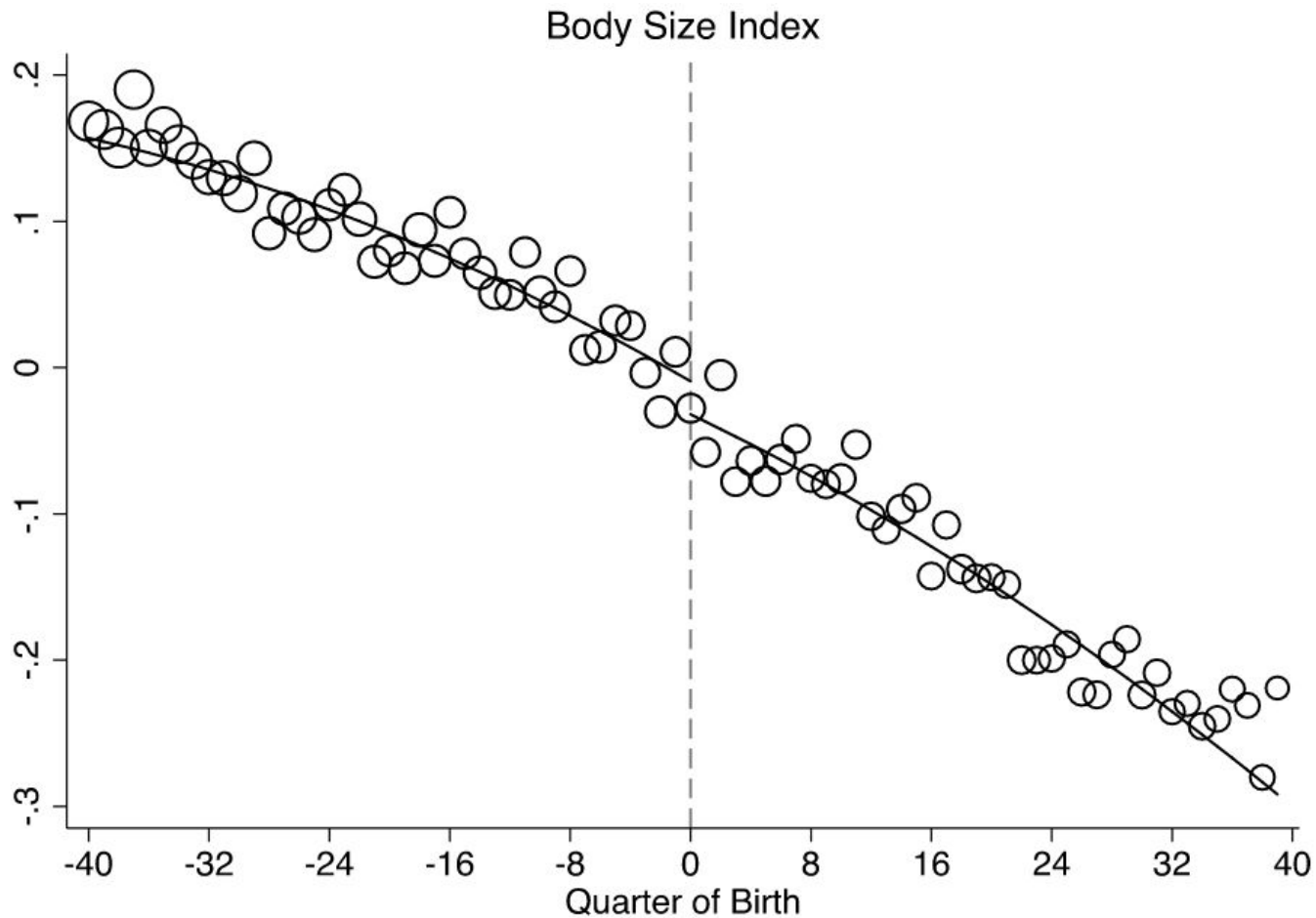


Notes: The figure shows the fraction of study participants who stayed in school until age 16 by quarter of birth. The dashed vertical line marks the first birth cohort affected by the 1972 school-leaving age reform. Cohorts born to the right of the line had to stay in school until age 16 while cohorts born before could leave at age 15. The curves show quadratic polynomials in quarter of birth that capture birth cohort trends. The circumference of each circle reflects the number of participants born in that quarter. $N = 271,082$.

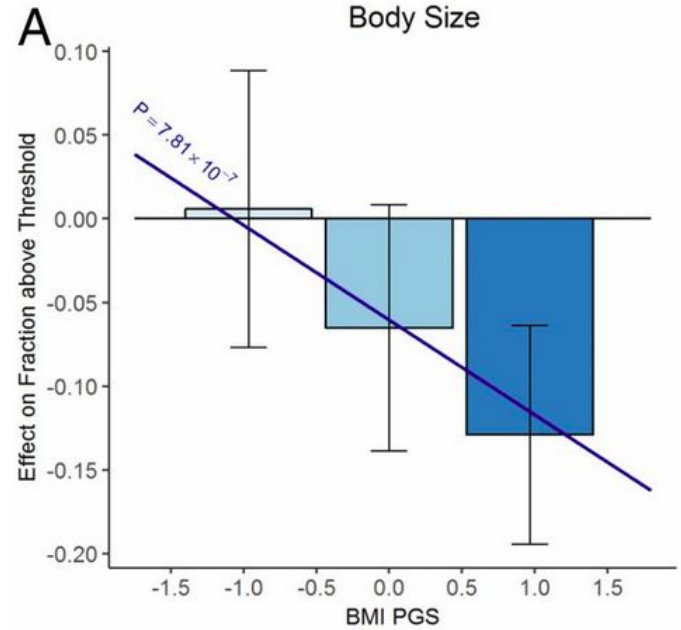
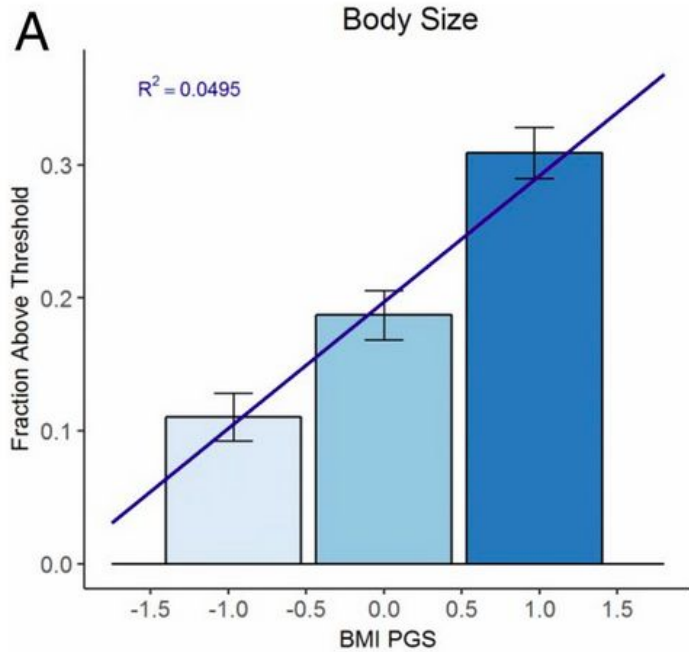
Hariduse pikendamise tõstab IQ-d



Hariduse tõus
vähendab
KMI-d

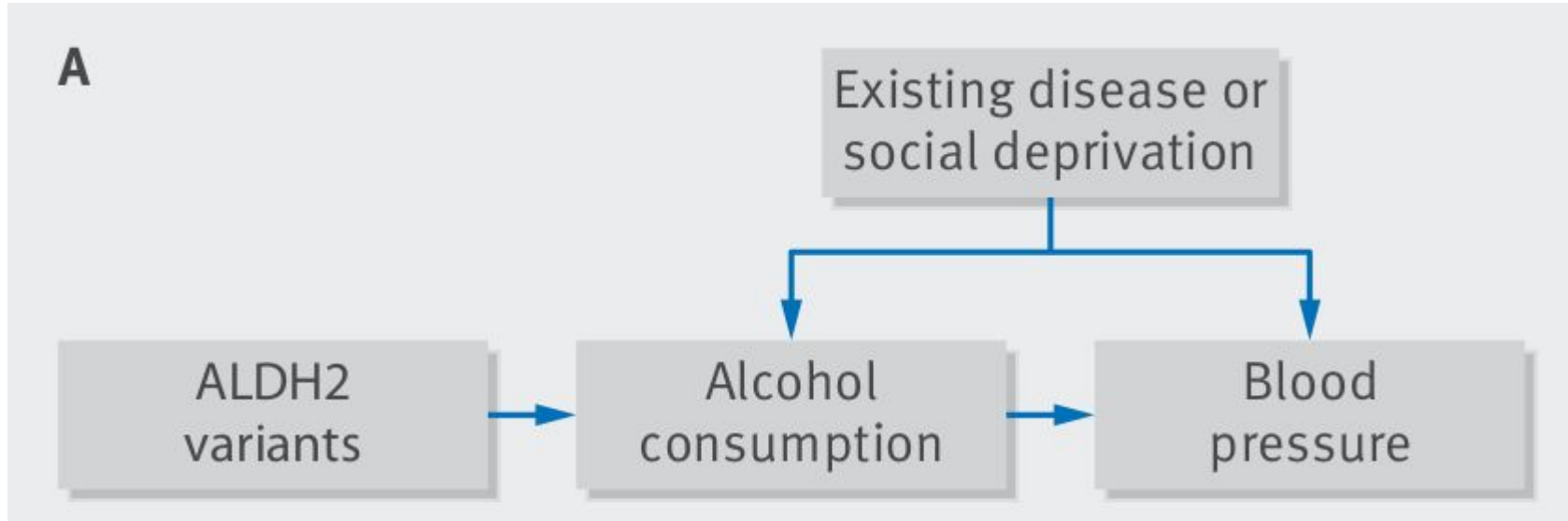


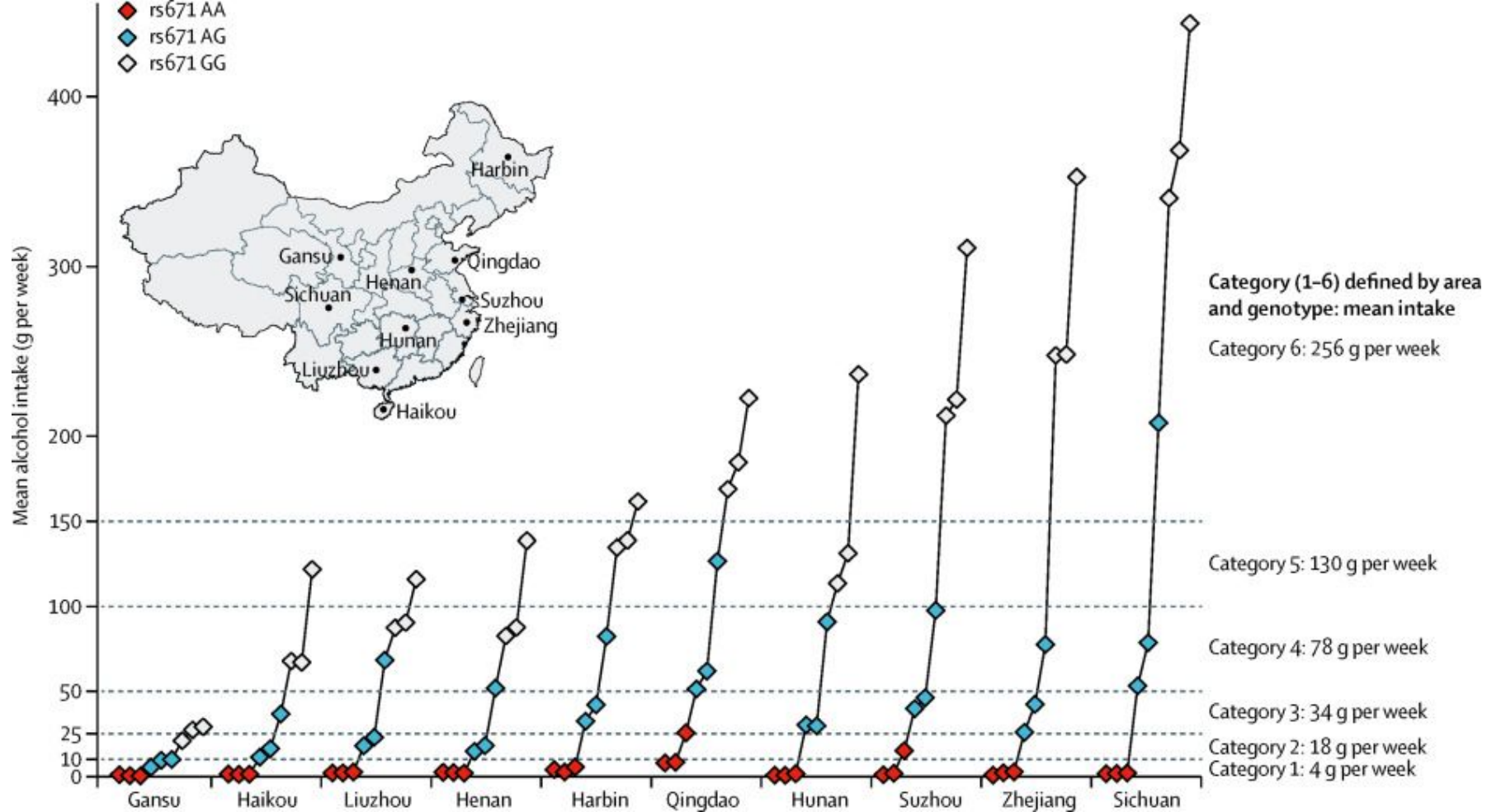
Hariduse tõus vähendab geneetika rolli



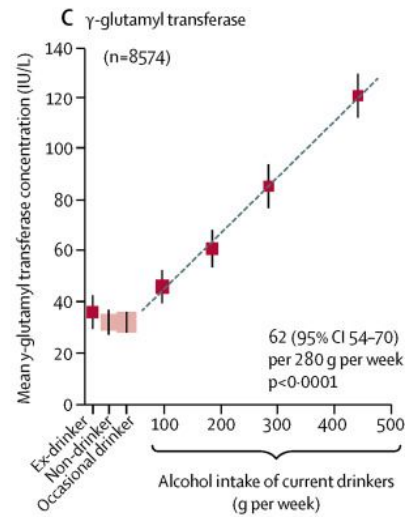
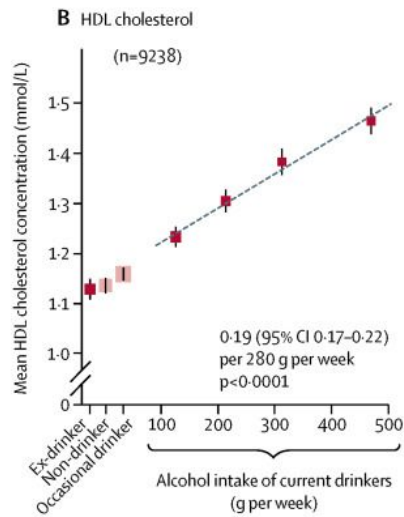
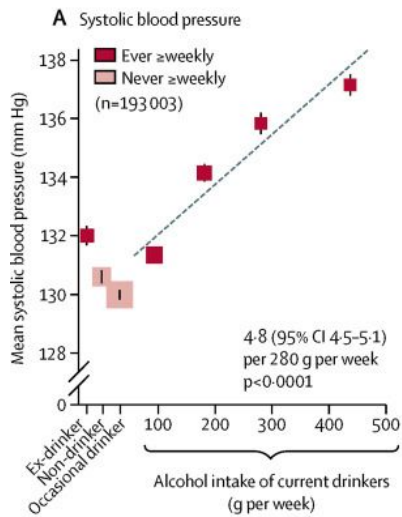
Geneetika kui naturaalne loterii

Mendelian randomisation (MR) - genomic RCT

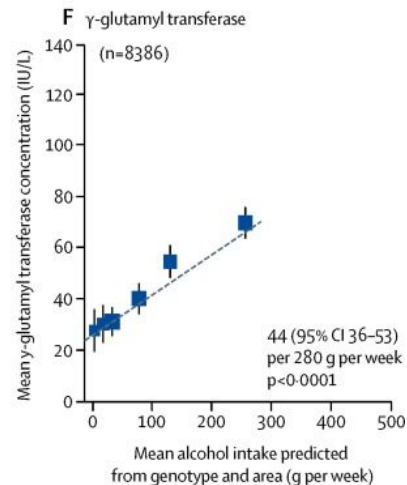
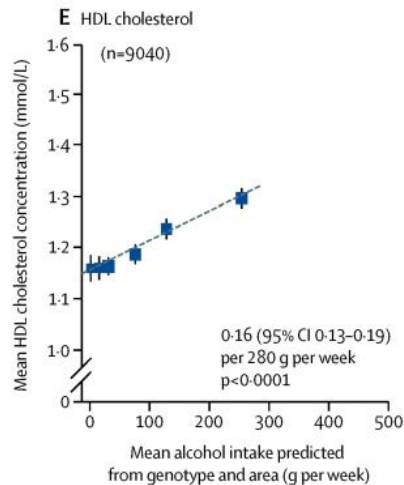
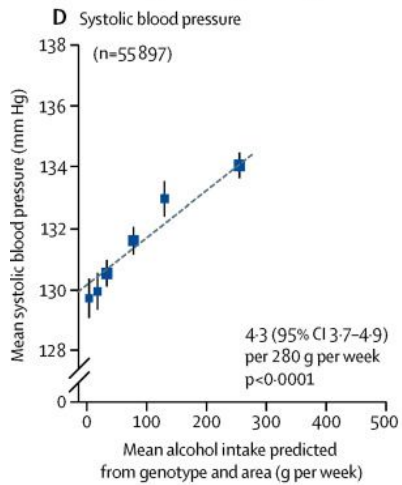




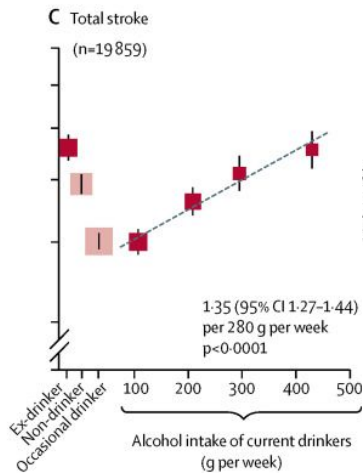
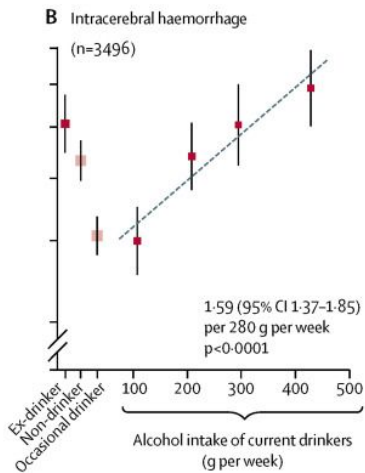
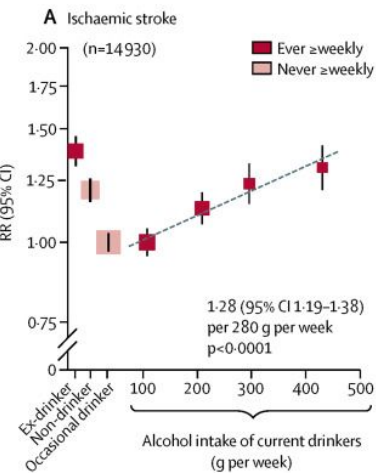
Conventional epidemiological analyses



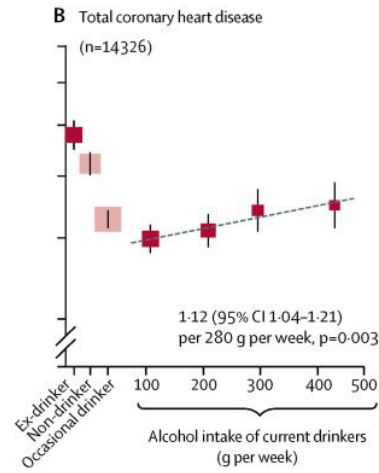
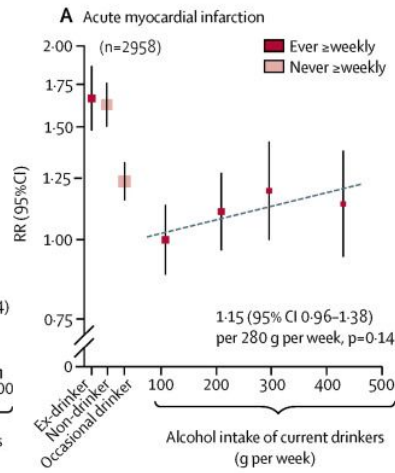
Genetic epidemiological analyses



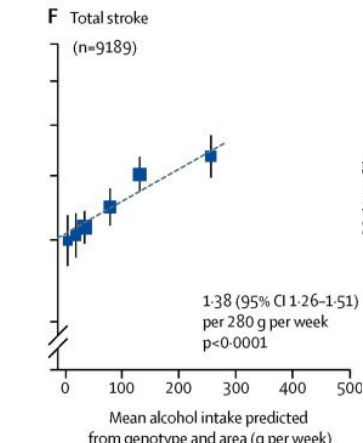
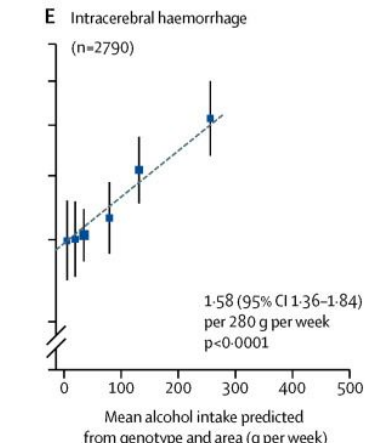
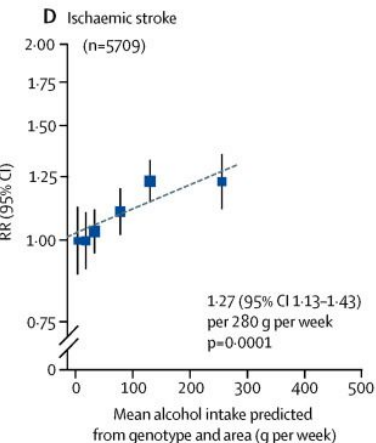
Conventional epidemiological analyses



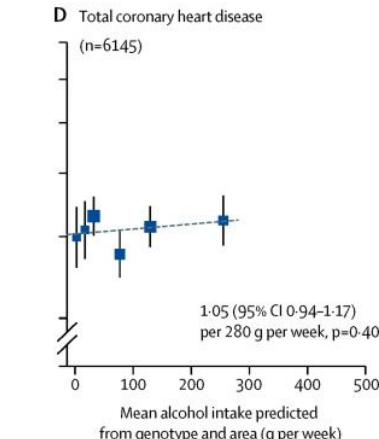
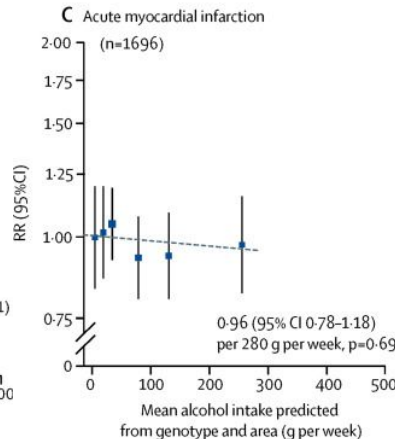
Conventional epidemiological analyses



Genetic epidemiological analyses



Genetic epidemiological analyses



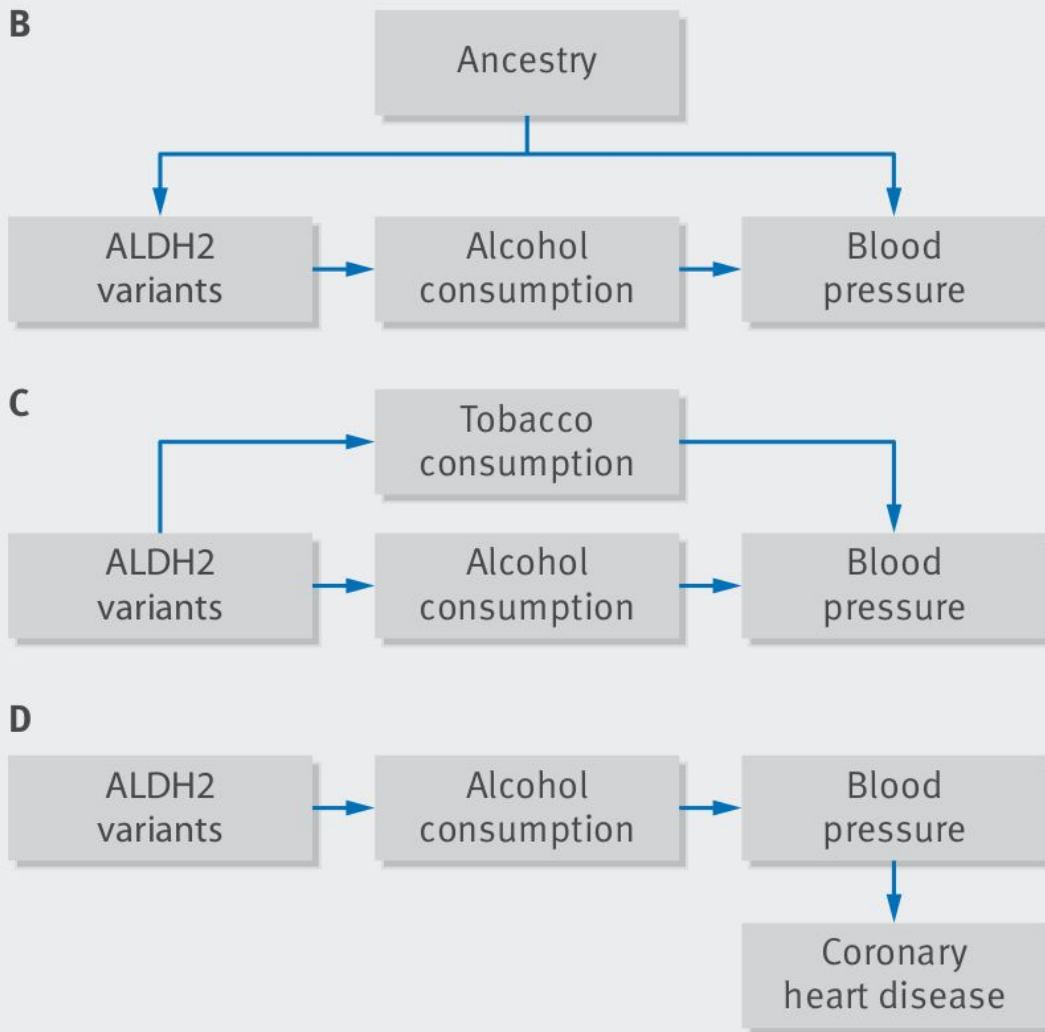
Biases in MR

B Prevalence of variants or culture

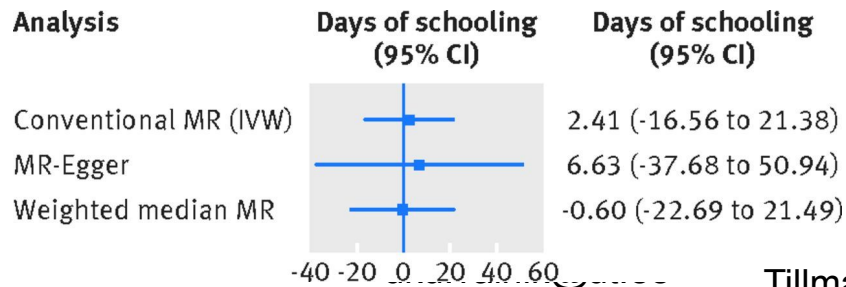
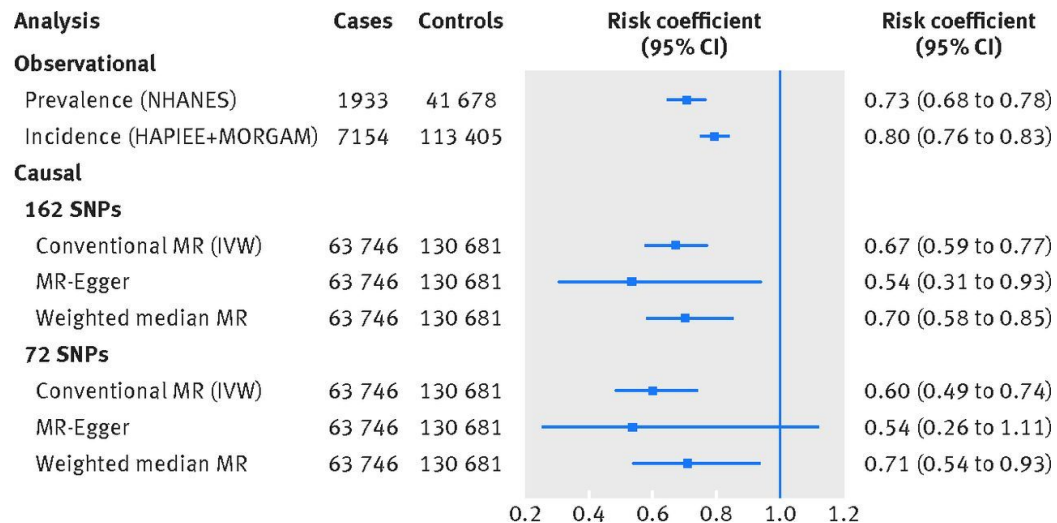
C Effect of genes through alternative pathways (horizontal pleiotropy)

D Downstream effects (vertical pleiotropy) - not an issue

E. Null effects from weak instruments



Low education causes cardiovascular disease





Laurie Voss

@seldo

Follow



I have spoken to a really surprising number of companies large and small who realized they had data problems, hired somebody with a PhD called a data scientist, and then discovered that it's no use having a data scientist if you don't know what questions you should be asking.

6:12 PM - 21 Oct 2019

432 Retweets 2,235 Likes



57 432 2.2K



Tweet your reply



Laurie Voss @seldo · Oct 21

Everyone keeps sheepishly admitting this mistake but apparently it's an industry-standard practice.

6 12 172



Laurie Voss @seldo · Oct 21

And now my mentions are full of:

- a) data scientists angry that they have been hired into jobs they do not know how to do
- b) researchers who do know how to do the job angry that they have not been hired

6 21 294

Google ennustab grippi

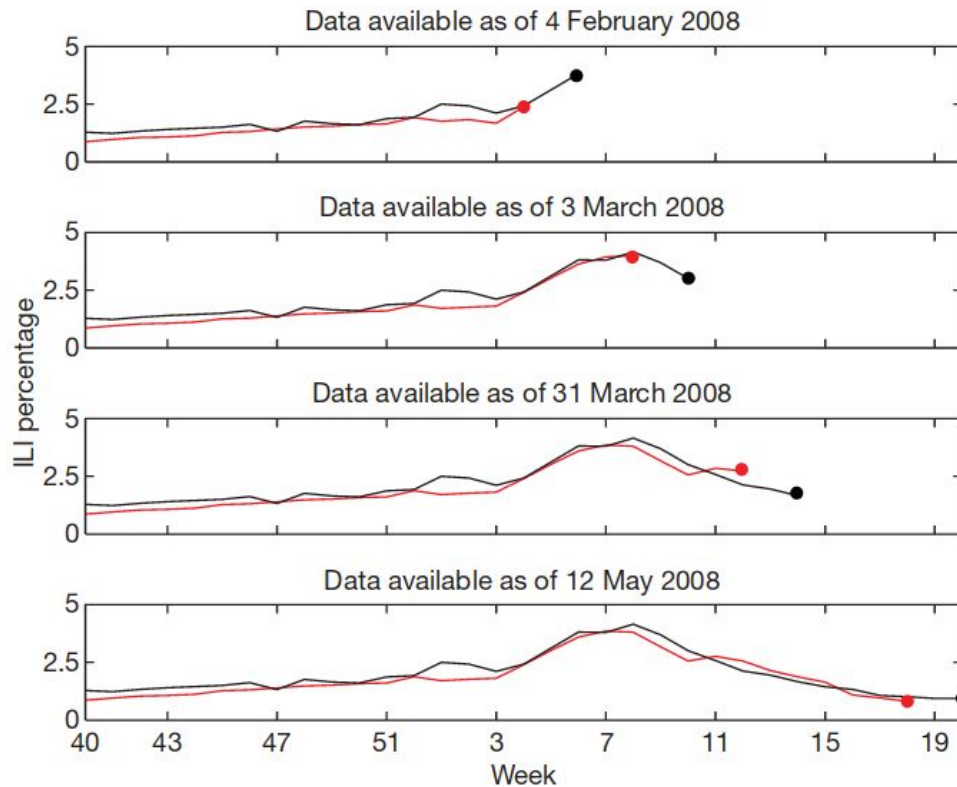
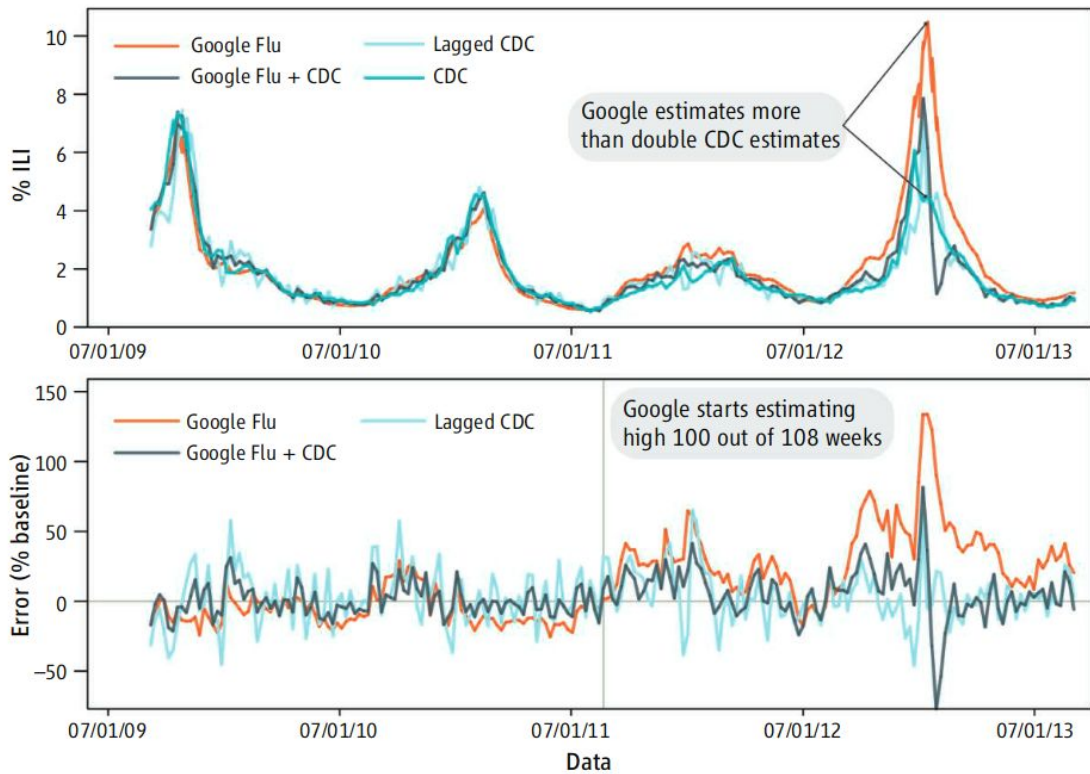


Figure 3 | ILI percentages estimated by our model (black) and provided by the CDC (red) in the mid-Atlantic region, showing data available at four points in the 2007-2008 influenza season. During week 5 we detected a sharply increasing ILI percentage in the mid-Atlantic region; similarly, on 3 March our model indicated that the peak ILI percentage had been reached during week 8, with sharp declines in weeks 9 and 10. Both results were later confirmed by CDC ILI data.

Või siiski mitte?



GFT overestimation. GFT overestimated the prevalence of flu in the 2012–2013 season and overshot the actual level in 2011–2012 by more than 50%. From 21 August 2011 to 1 September 2013, GFT reported overly high flu prevalence 100 out of 108 weeks. **(Top)** Estimates of doctor visits for ILI. “Lagged CDC” incorporates 52-week seasonality variables with lagged CDC data. “Google Flu + CDC” combines GFT, lagged CDC estimates, and 52-week seasonality variables. **(Bottom)** Error [as a percentage $[(\text{Non-CDC estimate}) - (\text{CDC estimate})]/(\text{CDC estimate})$]. Both alternative models have much less error than GFT alone. Mean absolute error (MAE) during the out-of-sample period is 0.486 for GFT, 0.311 for lagged CDC, and 0.232 for combined GFT and CDC. All of these differences are statistically significant at $P < 0.05$. See SM.

Lihtsamad ülesanded töötavad hästi

<https://www.theguardian.com/technology/2014/feb/05/why-google-engineers-designers>

Why Google has 200m reasons to put engineers over designers

Google's engineer-led approach has sparked criticism of the company from designers, but it appears to be paying off



▲ Google's HQ in California. Photograph: Paul Sakuma/AP

Switching the shade of blue used on advertising links in Gmail and Google search earned the company an extra \$200m a year in revenue, a [Google](#) executive has said.

Google's commitment to data-driven decisions is well reported, and the company has been ridiculed for the "50 shades of blue" episode, when then Google executive Marissa Meyer led a project testing the impact of using different coloured links in ads.

But a new insight proves that the company significantly benefitted from the experiment, to the tune of \$200m.

Kokkuvõte

Tervis on oluline aga raskesti analüüsitav ala - inimesi kallis või võimatu randomiseerida

Vaja kombinatsiooni teoreetilistest teadmistest ja andmeanalüüsi oskustest

Meetodid uuenevad vastavalt uutele tehnoloogilistele võimalustele

Mõistlik lahendus on töötada tiimides

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