Welcome

October 13, 2023

SCOR Sweden Re:s Nordic Life Insurance Conference

Svein Børre Solvang, CEO

Translation Service

SCOR
The Art & Science of Risk

FORWARD
2026
Driving
value creation.
Shaping
the reinsurer
of tomorrow.

Combining the art and science of risk to protect societies

Sustainability at the heart of SCOR's "Raison d'être"

Protecting societies from extreme events

by helping economic agents to mitigate and adapt to the effects of climate change

Supporting people's health and well-being

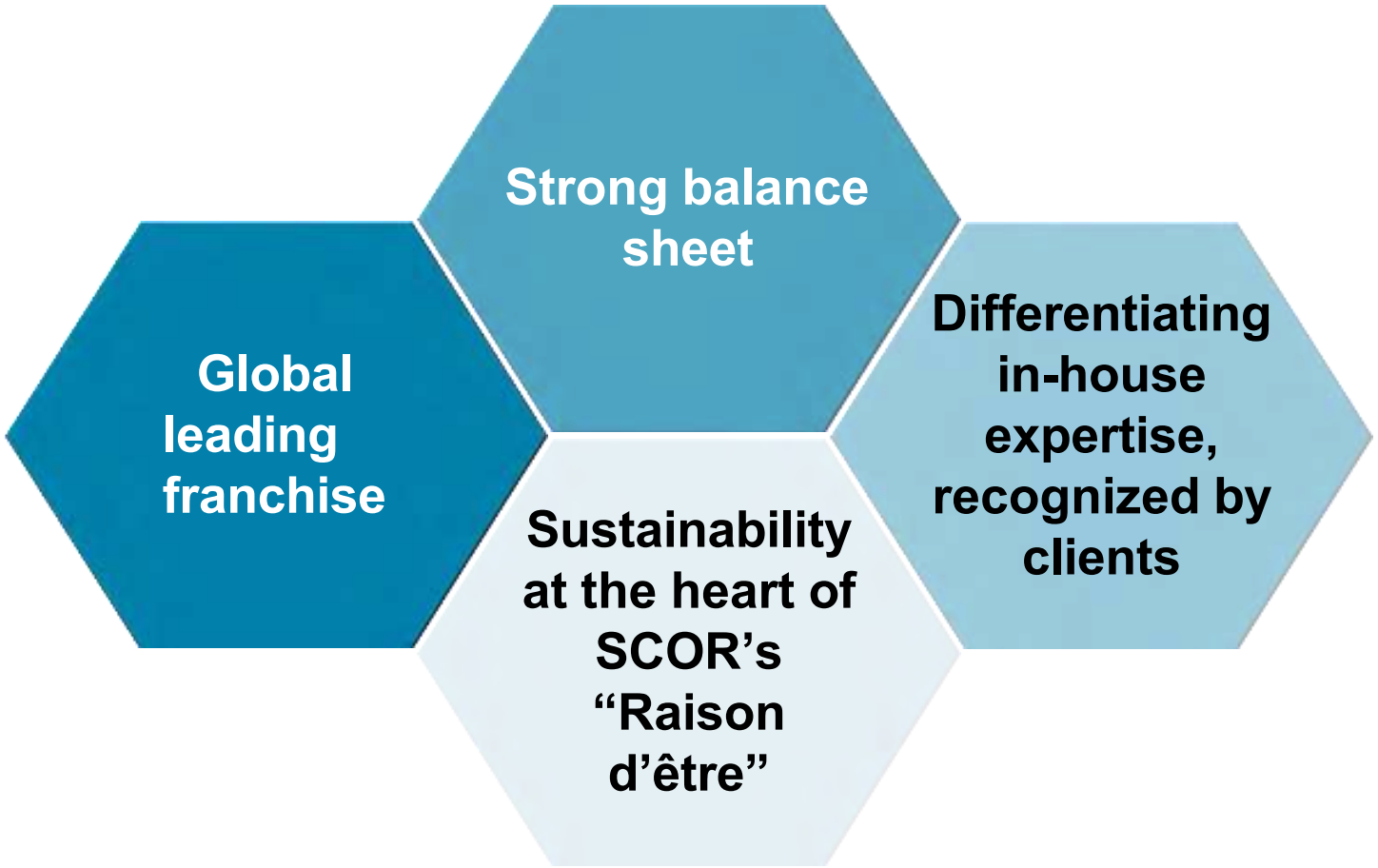
by developing accessible prevention and protection solutions

Nurturing clients

through a culture of trust and integrity

SCOR
The Art & Science of Risk

Four major competitive advantages to thrive

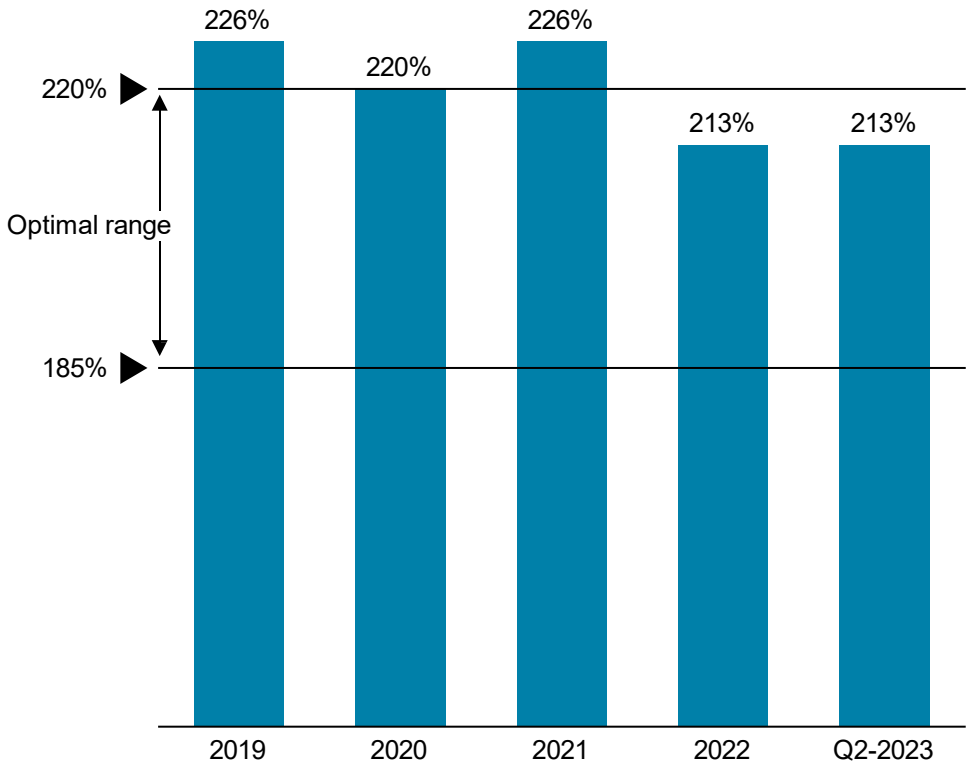


SCOR
The Art & Science of Risk

Strong balance sheet with a AA level of capital

Solvency ratio in optimal range

SII ratio, end of period 2019 to Q2-2023, *%*



S&P rating

A+
Stable outlook

Moody's rating

A1
Stable outlook

Fitch rating

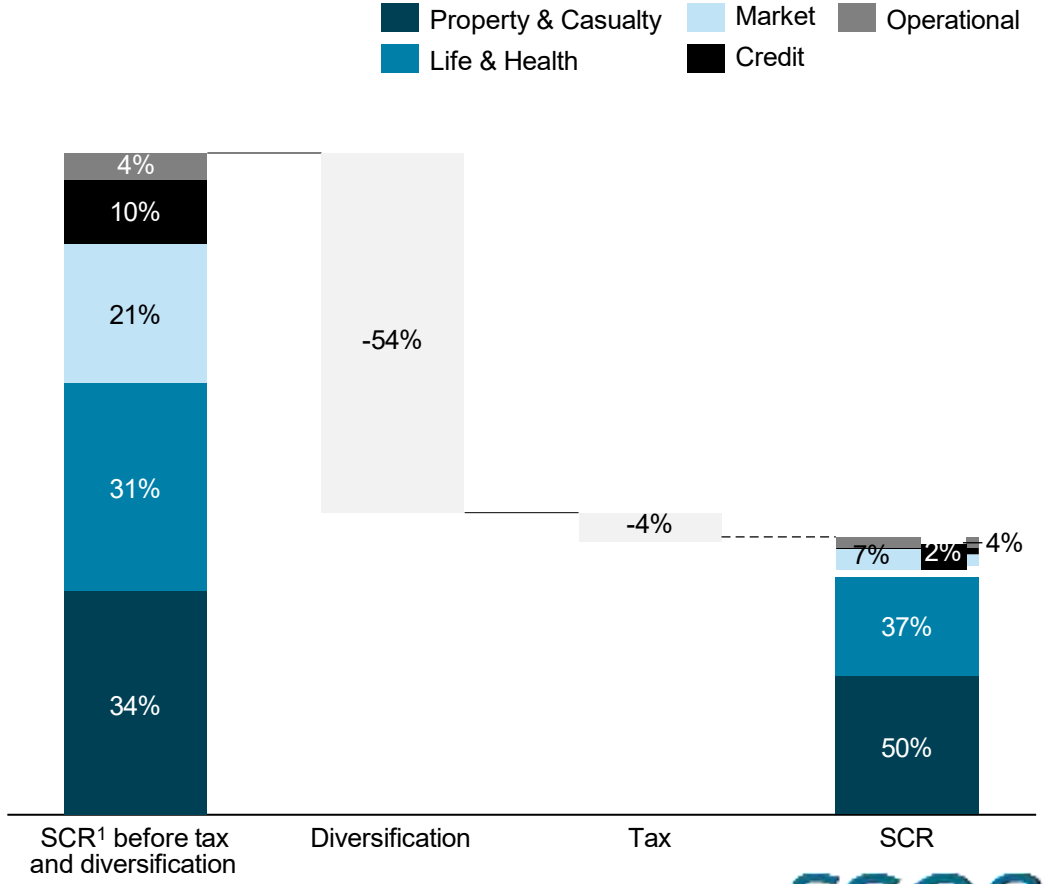
A+
Stable outlook

AM Best rating

A
Stable outlook

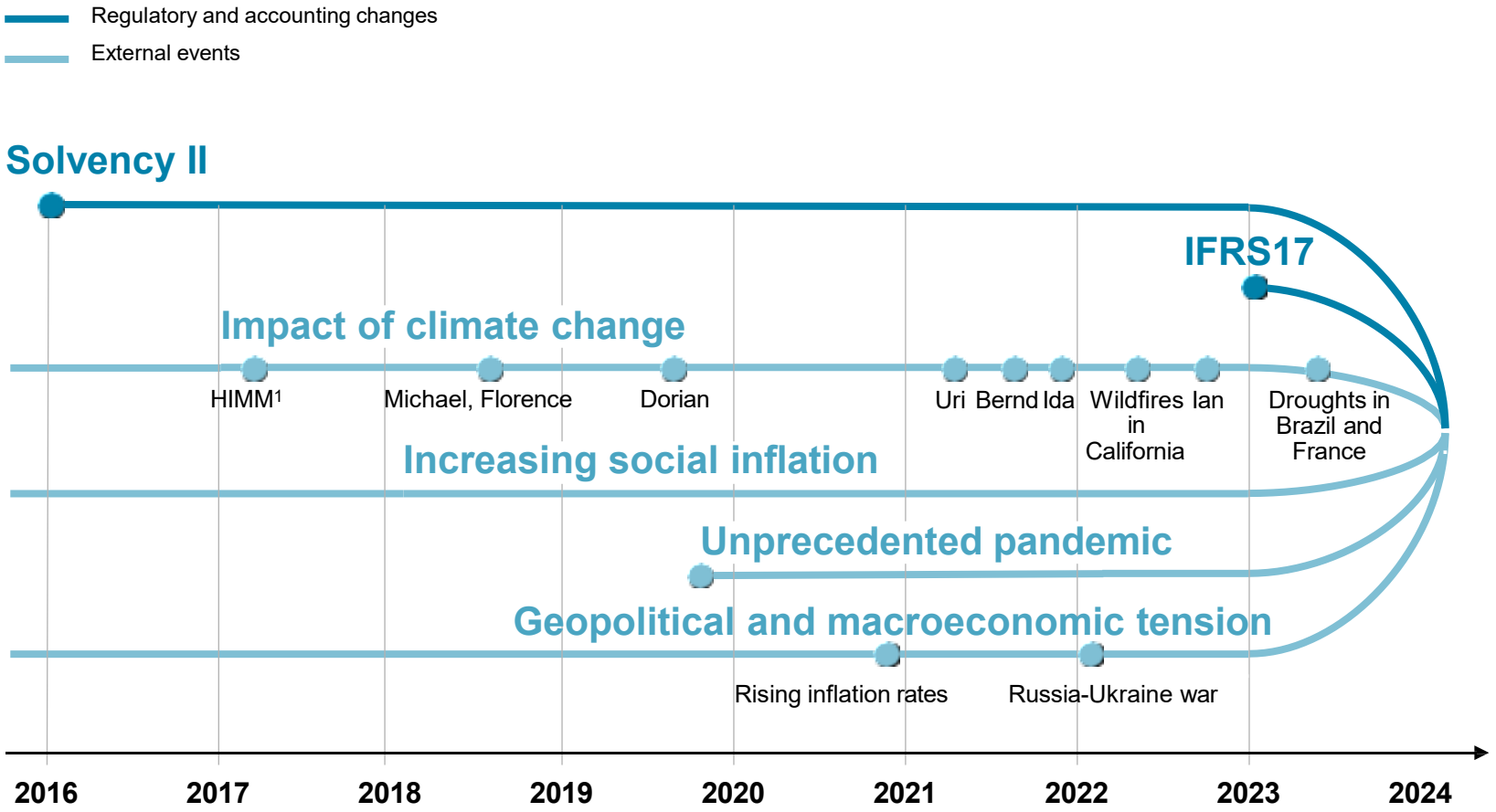
High diversification

SCR split per line of business as of 30/06/2023, *% of SCR*



1. Solvency capital requirement

Fundamental changes and uncertainty fuel Reinsurance demand



New opportunities: *Forward 2026*

Recognized **diversification benefits under Solvency II** and **Economic Value with IFRS 17**

Favorable market conditions with growing demand **for both L&H and P&C reinsurance, as well as increasing reinvestment rates**

1. Hurricanes Harvey, Irma, Maria and earthquakes in Mexico

Further deploy digital services to differentiate offering

10+ proprietary digital services covering the entire value chain

Differentiated offering: services co-developed with clients and creating shared-value

Supporting business generation: more than half of Protection GWP comes from clients we partner with to develop new services

Selected examples

Underwriting

Velogica Automated policy issuance process

- Approx. 90% of underwriting evaluations within 1 minute
- Deployed in the US, Europe and Asia

Claims management

VClaims Digital portal automating the claims assessment process

- 50% reduction in processing time
- Deployed in France, Australia and New Zealand

Data analytics

DASP Digital platform:

- Providing clients with distinctive experience analyses and benchmarking tools
- Leveraging AI to enhance SCOR's predictive models

SCOR Sweden Re Service & Toolkit

Medical Underwriting

We do everything from second opinion to full medical underwriting

- All products
- Medical Manuals & Tools

solem Velogica PRIO DIGIHEALTH Exigo Vitae

Market Analysis / Data Insights

Building and sharing market knowledge to the benefit of our clients

- Benchmark survey
- Solvency II QRT Overview
- Global Consumer Study
- Underwriting guidelines advising
- Data analyses & Data pooling

Product Development

Developing new as well as improve existing products

- Tariffs
- Terms and conditions wording
- Underwriting guidelines
- Medical UW guidance

SCOR Sweden Re Service & Toolkit

Actuarial Support

Sharing the workload to save our clients time and resources

- Actuarial analyses
  - Standardized and recurring
  - Ad hoc
- Reinsurance administration
- Pricing
- Reserving
- R-programming courses

Risk Transfer, Solvency & Balance Sheet Improvement

Bespoke financial solutions, in addition to traditional reinsurance protection

- Traditional reinsurance
- Loss portfolio transfer
- Mass Lapse cover
- Value-in-Force financing
- Outsourcing- & run off solutions

Education / Inspiration

We regularly share with our clients the knowledge of our multidisciplinary expert teams

- Medical Seminars
- Conference
- Workshops
- Trainings
- SCOR Campus
- Medical reports and research

Welcome

October 13, 2023

SCOR Sweden Re:s Nordic Life Insurance Conference

Svein Børre Solvang, CEO

David Stenholtz

Den gröna kostens potential

SCOR Sweden Re:s Nordic Life Insurance Conference

Den gröna kostens potential

David Stenholtz
Överläkare Onkologi
Ordförande Läkare för framtiden

Läkare för framtiden

HÄLSA, HÅLLBARHET, HELHET

Sök...

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Prenumerera på vårt nyhetsbrev

Exempel: namn@exempel.se

Prenumerera

ONSDAG 5 FEB 2014 KUNDSERVICE PRENUMERERA ANNONSERA SÖK JOBB DN-KORTET OM

DN.DEBATT

FORSTASIO#.N SIliL.M EJ<ONOMI SPORT I < I A . LEDAAE DE8An 80STAD MOTOR RE.SOR M

Dtbatl • htm

Passat
Anpass

"Dags att momsb efria mat som

Ta makten över din hälsa

Vad händer i kroppen när du övergår från blandkost till att äta hela vegetabilier?

Hjärt-kärlsjukdom, åderförkalkning, diabetes typ 2 och högt blodtryck är folksjukdomar som är möjliga att bromsa och till och med vända förloppet på med en långtgående koständring.

Kostens kraft är en ambitiös och pedagogisk genomgång av etablerad forskning och nya rön. Men den berör också på ett personligt plan genom intervjuer och berättelser av människor som ätit sig friska. ***Kostens kraft*** inspirerar även till nya matvanor med goda, spännande och lättlagade gröna recept och härliga bilder.

"David Stenholtz belyser med genuint intresse och gedigen kunskap hur du kan förbättra din hälsa genom ett sundare matval. Kosten som gagnar den individuella hälsan är oftast också fördelaktig ur ett planetärt perspektiv. Att matens sammansättning gör så stor skillnad behöver vi i sjukvården bli bättre på att föra fram."

Maria Wolodarski, MD, PhD, ordförande i Läkare för Miljön, ordförande i arbetsgruppen för klimat, hälsa och hållbar sjukvård i Svenska Läkaresällskapet

"Inspirerande, pedagogiskt och uppbackat av vetenskap om hur flera folksjukdomar kan bromsas och till och med reverseras genom hälsosammare kost. Det här är populärvetenskap när den är som bäst."

Anna Ottosson, grundare av Foodpower, vice ordförande i Dietisternas riksförbund 2007–2018 och författare.

LAVA

9 789189 741126

KOSTENS KRAFT David Stenholtz

Med inspirerande recept av Therése Lindgren, Lars Frölander och sju av Sveriges främsta matkreatörer

David Stenholtz

KOSTENS KRAFT

En vetenskaplig genomgång av matens potential

"Intressant, stimulerande och imponerande!"
PETER NYGREN, PROFESSOR I ONKOLOGI, AKADEMISKA SJUKHUSET, UPPSALA

Experterna är överens

”Att äta mer från växtriket och mindre från djurriket”

ÖKA	BYT UT		BEGRÄNSA
Grönsaker Baljväxter	Spannmåls-produkter av vitt/siktat mjöl	→ Spannmåls-produkter av fullkorn	Charkprodukter Rött kött
Frukt och bär	Smör, smör-baserade matfetter	→ Vegetabiliska oljor, oljebase-rade matfetter	Drycker och livsmedel med tillsatt socker
Fisk och skaldjur	Feta mejeri-produkter	→ Magra mejeri-produkter	Salt Alkohol
Nötter och frön			

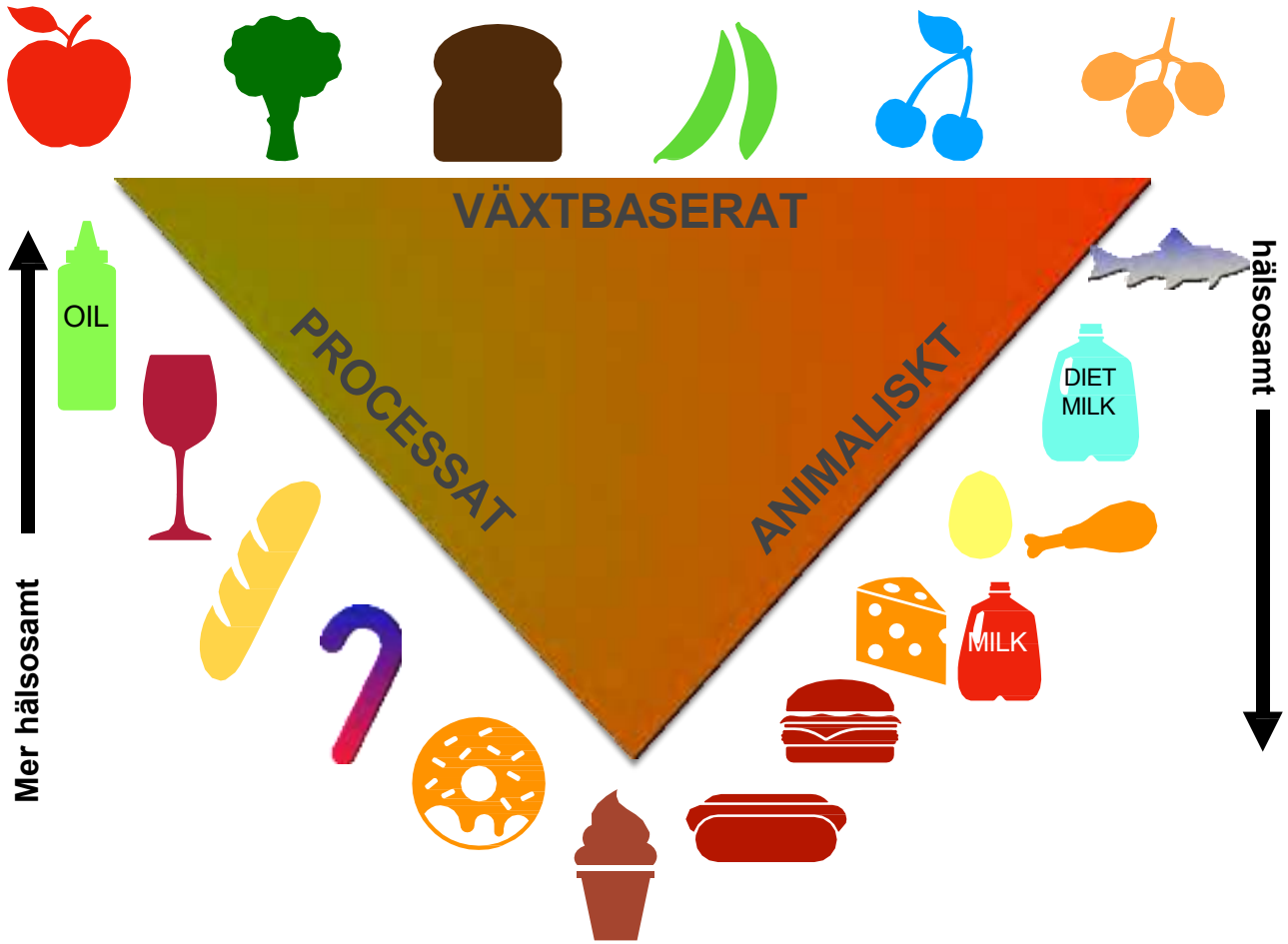
Källa: Livsmedelsverket

Växtbaserade ”mejeriprodukter”

Den grönare Matcirkeln

”För att vi ska kunna ställa om till ett mer hållbart sätt att leva är det bra att äta mer växtbaserat. Därför finns det numera växtbaserade alternativ i alla delar av Matcirkeln.”

Maten har en stor potential att gynna hälsan


VÄXTBASERAT
PROCESSAT
ANIMALISKT
OIL
DIET
MILK
MILK
Mer hälsosamt
hälsosamt

Visst borde vi informera om kostens betydelse för hälsa, men jag vet ju hur mycket mina patienter älskar ”god mat”.

Visst borde vi informera om motionens betydelse för hälsa, men jag vet ju hur mycket mina patienter älskar att sitta still.

Visst borde vi informera om rökningens betydelse för hälsa, men jag vet ju hur mycket mina patienter älskar att ta ett bloss.

HUR ÄTER VI I SVERIGE?

Känsliga tittare varnas!

Public Health Nutrition: 14(5), 835–845 doi:10.1017/S1368980010003848

Development of a diet quality index assessing adherence to the Swedish nutrition recommendations and dietary guidelines in the Malmö Diet and Cancer cohort

Isabel Drake*†, Bo Gullberg, Ulrika Ericson, Emily Sonestedt, Jan Nilsson, Peter Wallström, Bo Hedblad and Elisabet Wirfält
Department of Clinical Sciences in Malmö, Lund University, Skåne University Hospital, Malmö, Sweden

Submitted 9 June 2010: Accepted 13 December 2010: First published online 7 February 2011

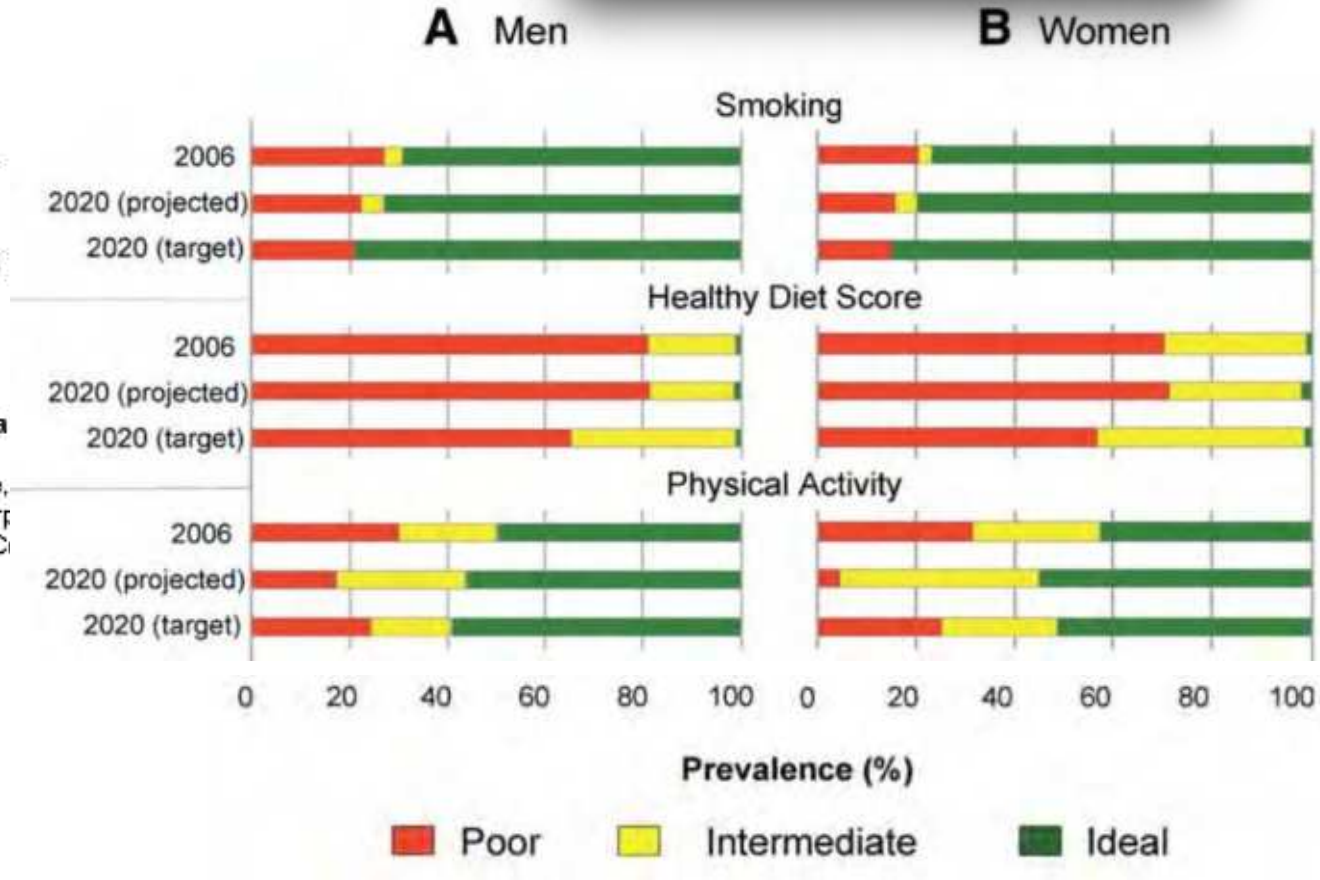
2%

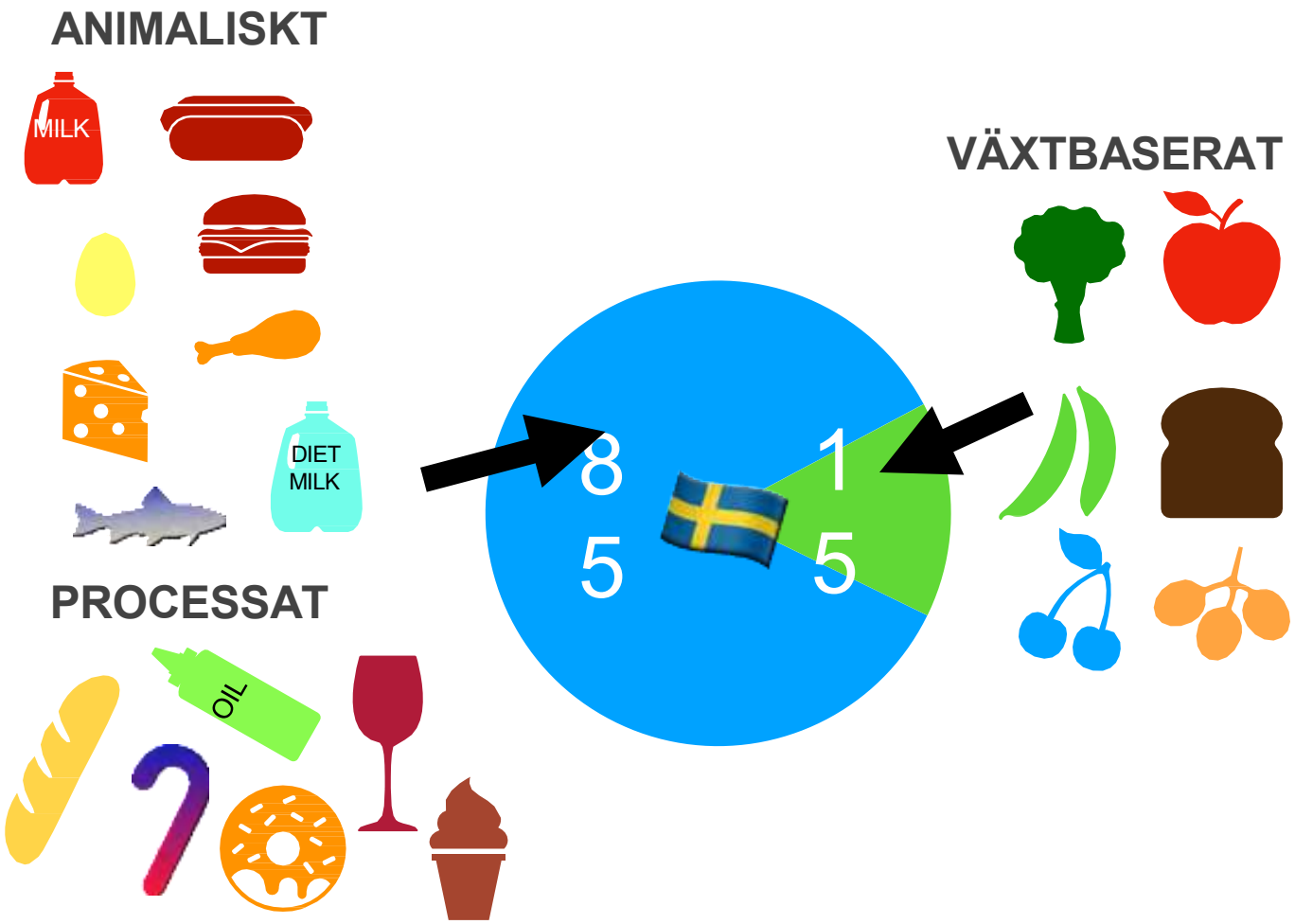
Published in final edited form as:
Circulation. 2012 May 29; 125(21): 2595–2602. doi:10.1161/CIRCULATIONAHA.111.070722.

Cardiovascular Health Behavior and Health Factor Changes (1988 –2008) and Projections to 2020:

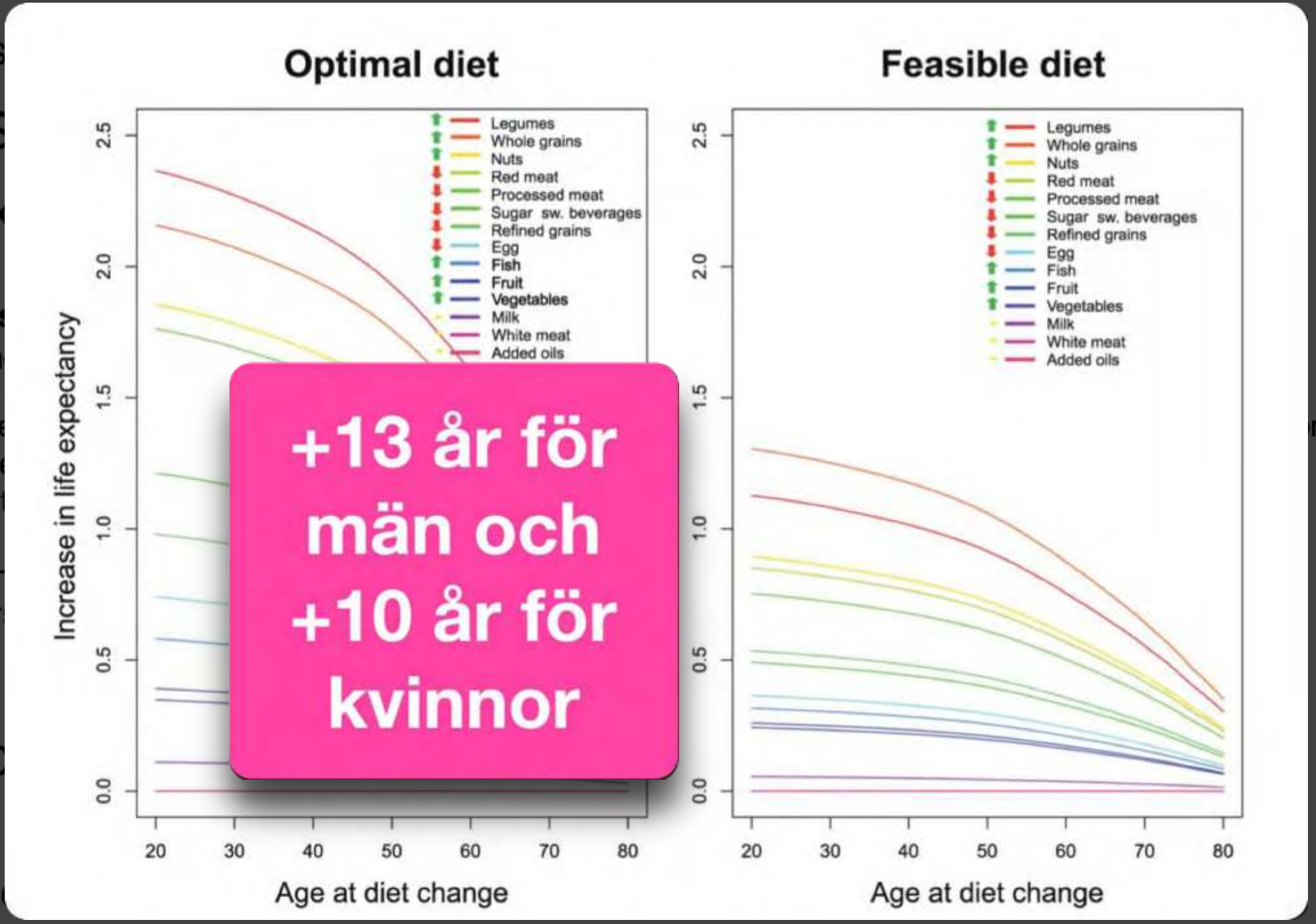
Results From the National Health and Nutrition Examination Surveys

Mark D. Huffman, MD, MPH, Simon Capewell, DSc, Hongyan Ning, MD, MS, Christina Shay, PhD, MA, Earl S. Ford, MD, MPH, and **Donald M. Lloyd-Jones, MD, ScM**
Department of Preventive Medicine, Northwestern University Feinberg School of Medicine, Chicago, IL (M.D.H., H.N., C.M.S., D.M.L.-J.); Division of Public Health, University of Liverp Liverpool, United Kingdom (S.C.); and Division of Adult and Community Health, National C for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA (E.S.F.).




ANIMALISKT
MILK
DIET
MILK
PROCESSAT
OIL
8
5
1
5
VÄXTBASERAT

Förlänga livet? Minska risk för att dö i förtid?


Optimal diet
Feasible diet
Increase in life expectancy
Age at diet change
Legumes
Whole grains
Nuts
Red meat
Processed meat
Sugar sw. beverages
Refined grains
Egg
Fish
Fruit
Vegetables
Milk
White meat
Added oils
0.0
0.5
1.0
1.5
2.0
2.5
20
30
40
50
60
70
80
+13 år för män och +10 år för kvinnor

Food groups and risk of all-cause mortality: a systematic review and meta-analysis of prospective studies[1,2]

Lukas Schwingshackl,[3] Carolina Schwedhelm,[3] Georg Hoffmann,[4] Anna-Maria Lampousi,[3] Sven Knüppel,[3] Khalid Iqbal,[3] Angela Bechthold,[5] Sabrina Schlesinger,[6,7] and Heiner Boeing[3]*

[3]German Institute
Austria; [5]German
London, United K
Dusseldorf, Germ
nces, University of Vienna, Vienna,
Health, Imperial College London,
nrich Heine University Düsseldorf,

Metaanalys av 103 studier

ABSTRACT

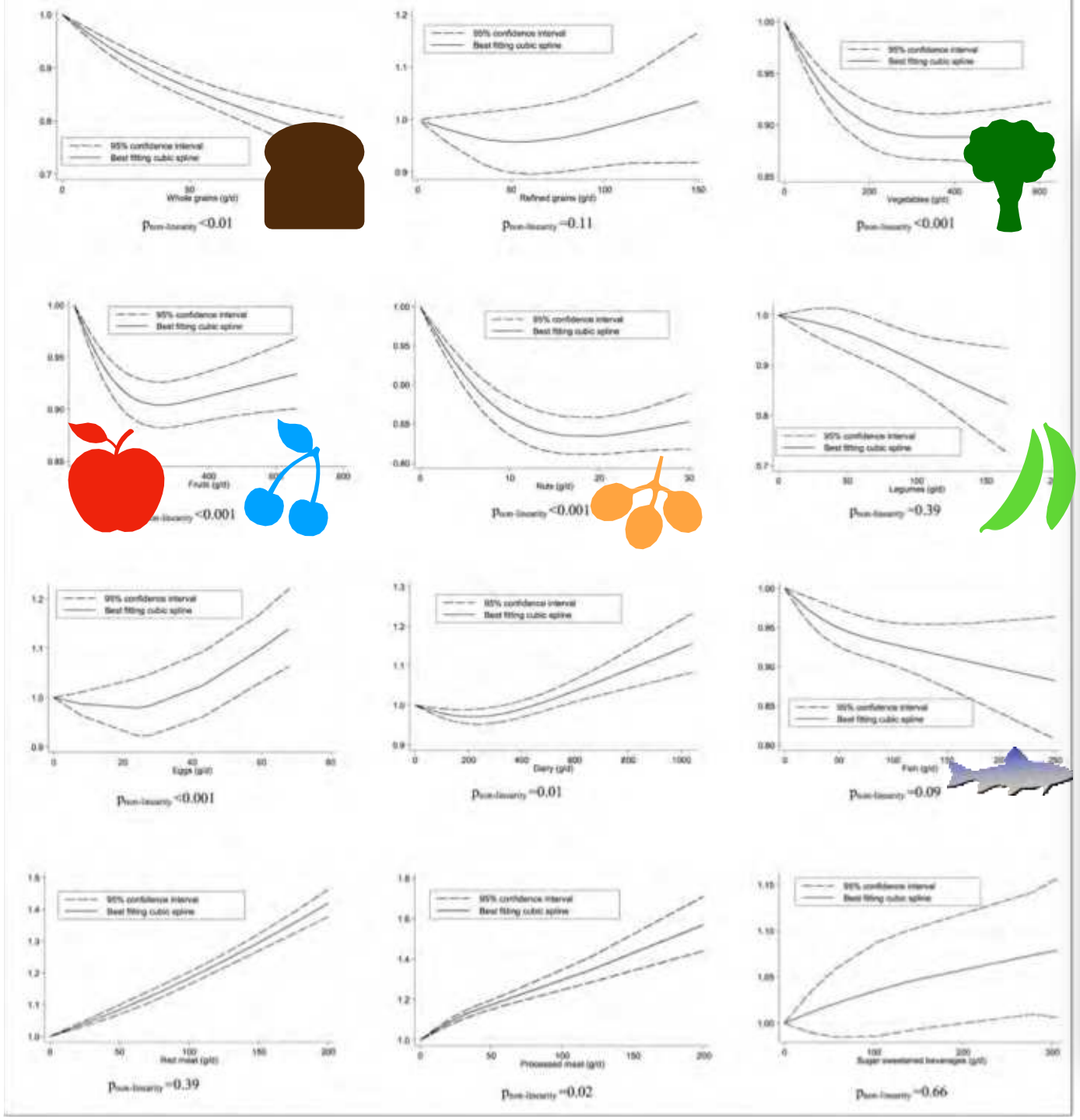
Background: S
in preventing early death and disability worldwide.

Objective: The aim of this meta-analysis was to synthesize the knowledge about the relation between intake of 12 major food groups, including whole grains, refined grains, vegetables, fruits, nuts, legumes, eggs, dairy, fish, red meat, processed meat, and sugar-sweetened beverages, with risk of all-cause mortality.

Design: We conducted a systematic search in PubMed, Embase, and Google Scholar for prospective studies investigating the association between these 12 food groups and risk of all-cause mortality. Summary RRs and 95% CIs were estimated with the use of a random effects model for high-intake compared with low-intake categories, as well as for linear and nonlinear relations. Moreover, the risk reduction potential of foods was calculated by multiplying the RR by optimal intake values (serving category with the strongest associ-

). One-third of these fatalities
disease (CVD), followed by cancer at 15% (1). A high-quality diet comprising abundant amounts of whole grains, fruits, vegetables, nuts, and fish is one of the most important factors in preventing early death and disability worldwide (2).

During the past 50 y, lifestyle factors have been identified as modifiable factors associated with death. Thus, despite often unclear direct biological mechanisms due to the many potential underlying disease mechanisms, epidemiologic risk factors that can change the probability of death are important public health indicators. Studies that were able to translate risk reduction into measures of life expectancy calculated that populations with a low-risk profile (no smoking, physically active, healthy dietary pattern) differ in 10–15 y from those with a high-risk profile (3).

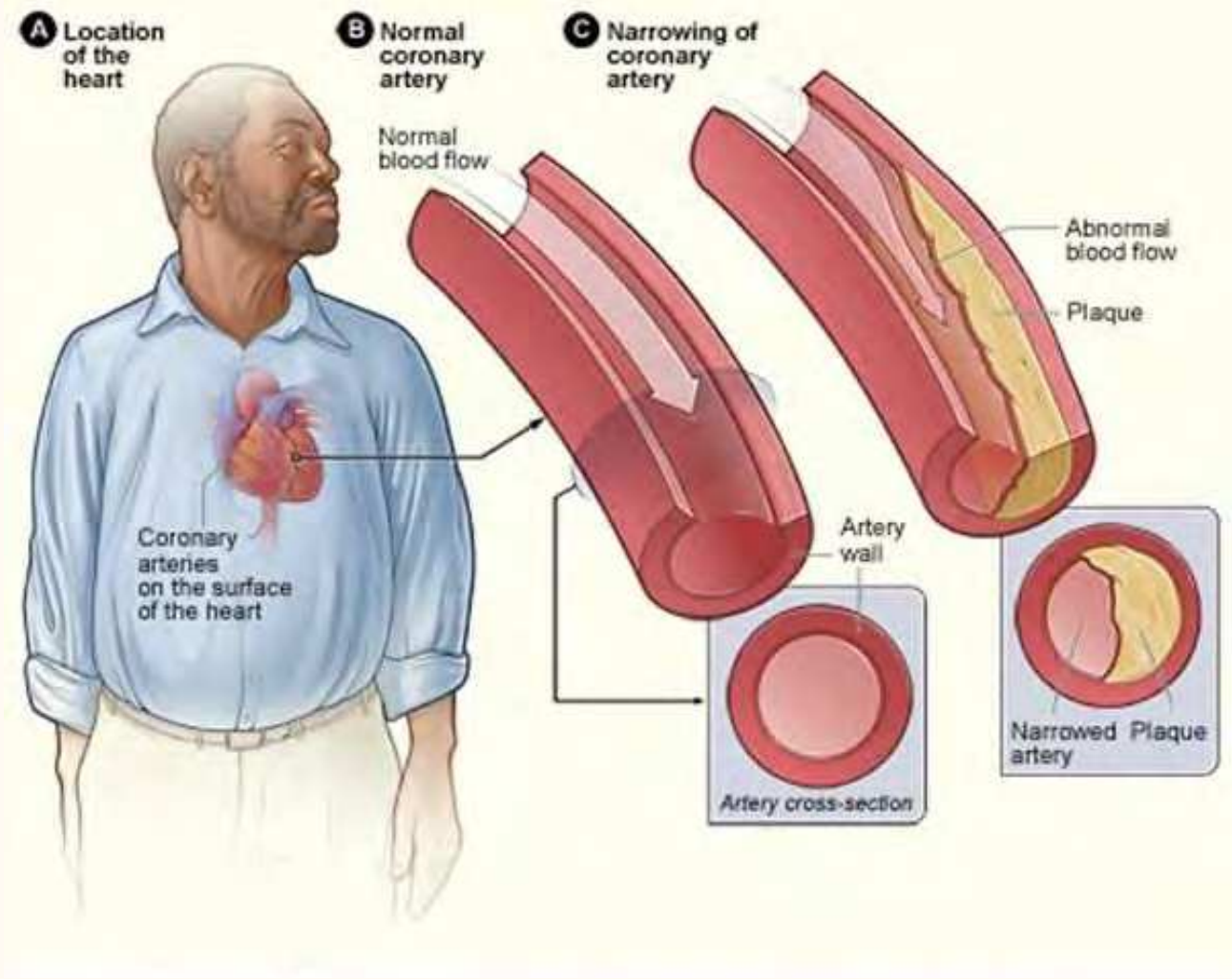


Optimalt intag av hälsosamma livsmedel: *56 procent* minskad risk att dö i förtid.

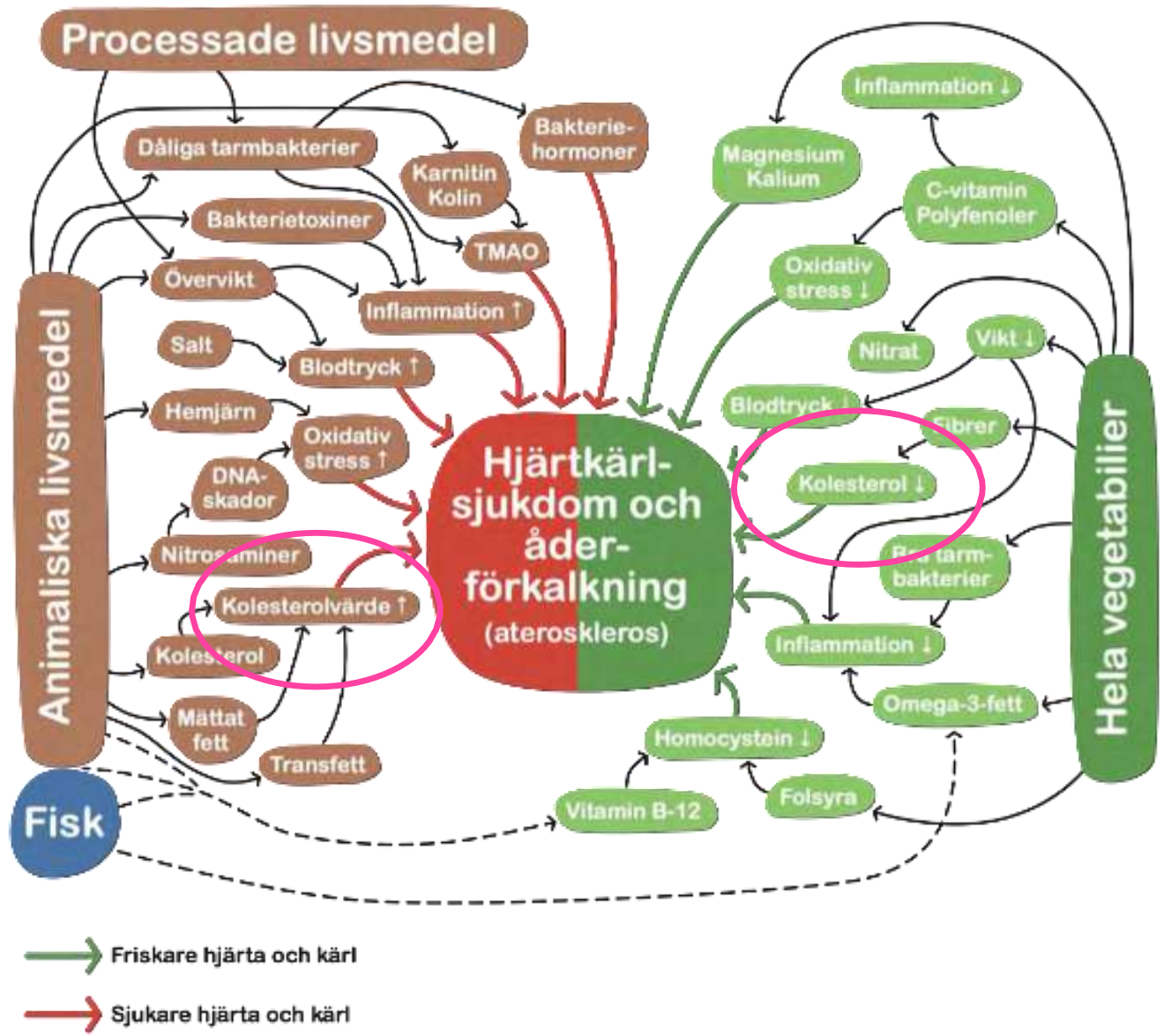
Suboptimalt intag av ohälsosamma livsmedel: *Dubblerad* risk att dö i förtid

Hjärt-kärlsjukdom

Hjärtkärlsjukdom



Verkningsmekanismer för hur olika livsmedel påverkar hjärta och kärl



Atherosclerotic Risk Factors

	Is this factor necessary to form plaques?
1. Genetic (1/500)	NO
2. Degenerative	
3. Inflammatory	
4. Cigarette smoking	
5. Systemic hypertension	
6. Diabetes mellitus	
7. Overweight	
8. Inactivity	
9. Stress	
10. Cholesterol problem	YES

Figure 1. The atherosclerotic risk factors showing that the only factor required to cause atherosclerosis is cholesterol.

William C. Roberts – American Journal of Cardiology

Science Times

Spread of Deserts Seen as a Catastrophe Underlying Famine

Heart Disease: Big Study Produces New Data

Framingham Study Shows How Added Factors Multiply Risk

Cholesterol Ratio Is Clue To Heart Disease

EDUCATION

Good Leadership in Boston

”Under de 34 år som Framinghamstudien pågått har vi inte sett en enda person med ett kolesterolvärde under 150 (mg/dL = 3,88 mmol/L) som utvecklat hjärtkärlsjukdom.”

	Kolesterolvärde 80-tal	Kolesterolvärde idag
Sverige	6	5
Kina	**3,28**	**4,6**

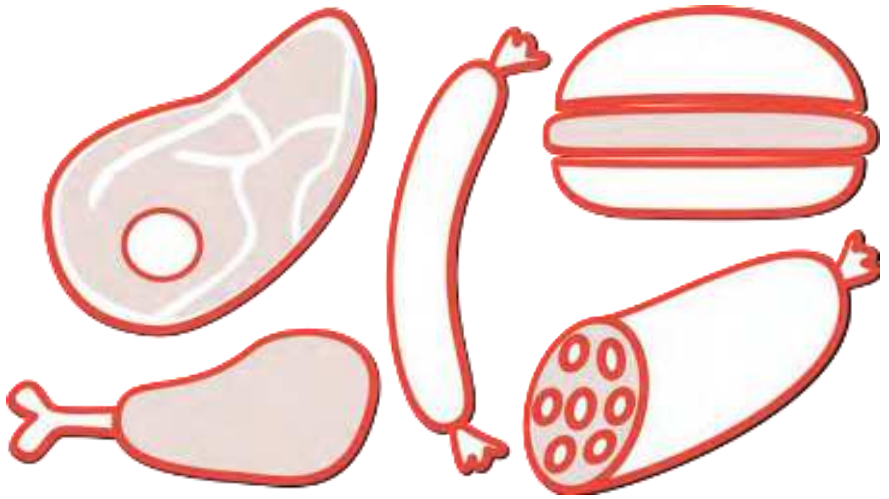
Comparative Study > Am J Cardiol. 1998 Nov 26;82(10B):18T-21T.
doi: 10.1016/s0002-9149(98)00718-8.

Diet, lifestyle, and the etiology of coronary artery disease: the Cornell China study

> Circulation. 2012 May 8;125(18):2212-21. doi: 10.1161/CIRCULATIONAHA.111.065904.
Epub 2012 Apr 9.

Serum lipids and lipoproteins in Chinese men and women

Wenying Yang [1], Jianzhong Xiao, Zhaojun Yang, Linong Ji, Weiping Jia, Jianping Weng, Juming Lu, Zhongyan Shan, Jie Liu, Haoming Tian, Qiuhe Ji, Dalong Zhu, Jiapu Ge, Lixiang Lin, Li Chen, Xiaohui Guo, Zhigang Zhao, Qiang Li, Zhiguang Zhou, Guangliang Shan, Jiang He; China National Diabetes and Metabolic Disorders Study Investigators



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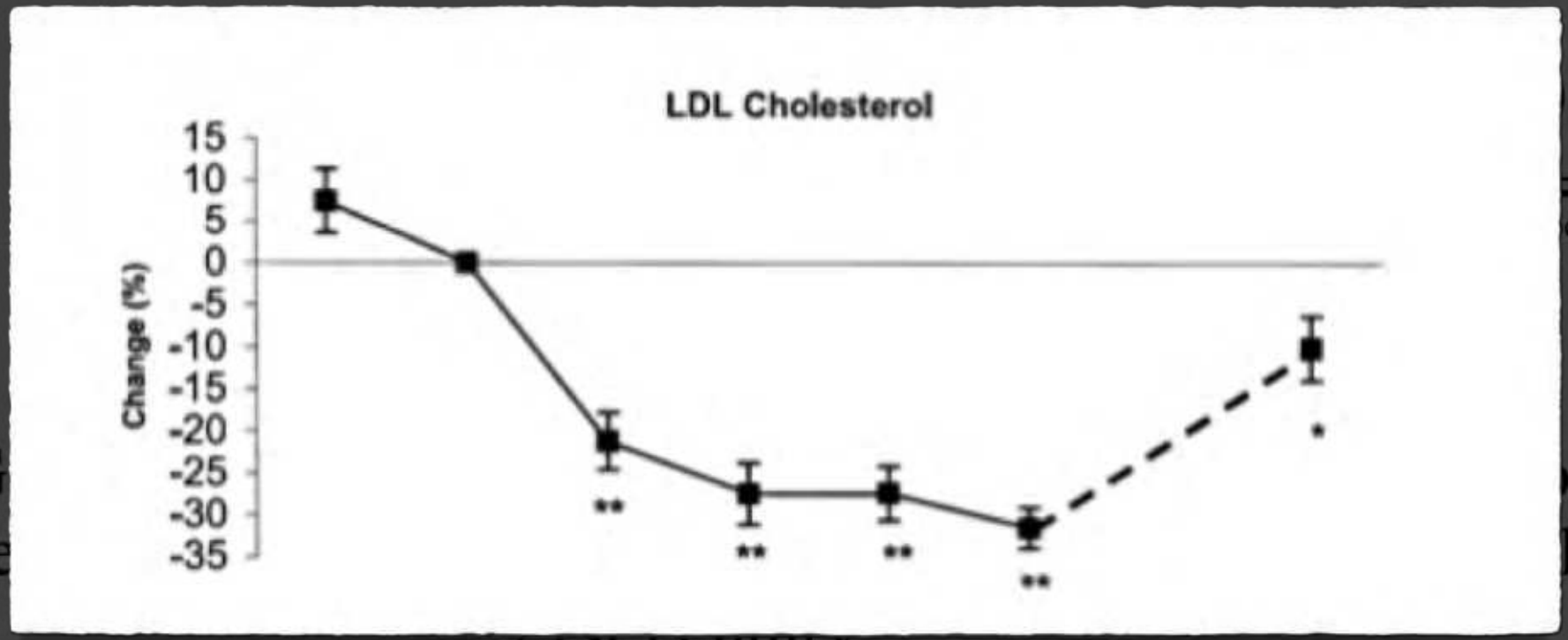


The G… conserve… …he 21st century

David J.A. Jenkins[a,b,c,*], Cyril W.C. Kendall[a,c], Augustine Marchie[a,c], Alexandra L. Jenkins[c], Philip W. Connelly[c], Peter J.H. Jones[d], Vladimir Vuksan[a,c]

[a]*Clinical Nutrition and Risk Factor Modification Center, St. Michael's Hospital, 61 Queen Street East, Toronto, Ont., Canada M5C 2T2*

[b]*Department of Medicine, St. Michael's Hospital, Toronto, Ont., Canada*

[c]*Department of Nutritional Sciences, Faculty of Medicine, University of Toronto, Toronto, Ont., Canada*

[d]*School of Dietetics and Human Nutrition, McGill University, Montreal, Canada*

Received 9 August 2002; received in revised form 26 November 2002; accepted 27 November 2002

Clinical Trial > JAMA. 1987 Jun 19;257(23):3233-40.

Beneficial effects of combined colestipol-niacin therapy on coronary atherosclerosis and coronary venous bypass grafts

D H Blankenhorn, S A Nessim, R L Johnson, M E Sanmarco, S P Azen, L Cashin-Hemphill

PMID: 3295315

Erratum in

JAMA 1988 May 13;259(18):2658

Abstract

The Cholesterol-Lowering Atherosclerosis Study (CLAS) was a randomized, placebo-controlled, angiographic trial testing combined colestipol hydrochloride and niacin therapy in 162 nonsmoking men aged 40 to 59 years with previous coronary bypass surgery. During two years of treatment there was a 26% reduction in total plasma cholesterol, a 43% reduction in low-density lipoprotein cholesterol, plus a simultaneous 37% elevation of high-density lipoprotein cholesterol. This resulted in a significant reduction in the average number of lesions per subject that progressed (P less than .03) and the percentage of subjects with new atheroma formation (P less than .03) in native coronary arteries. Also, the percentage of subjects with new lesions (P less than .04) or any adverse change in bypass grafts (P less than .03) was significantly reduced. Deterioration in overall coronary status was significantly less in drug-treated subjects than placebo-treated subjects (P less than .001). Atherosclerosis regression, as indicated by perceptible improvement in overall coronary status, occurred in 16.2% of colestipol-niacin treated vs 2.4% placebo treated (P = .002).

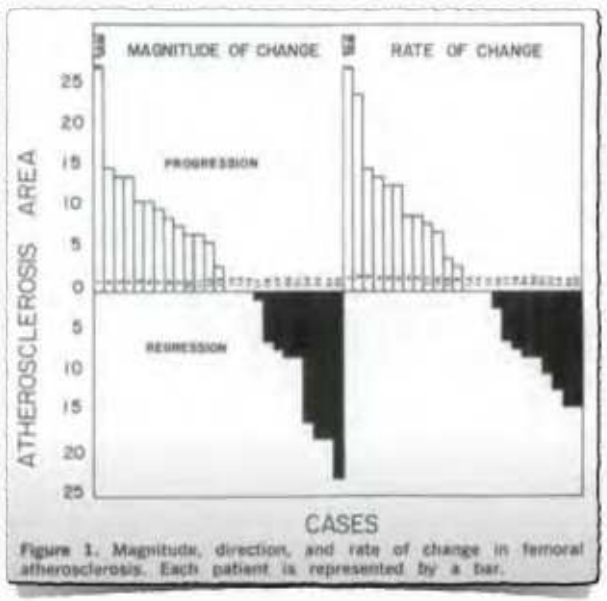


Figure 1. Magnitude, direction, and rate of change in femoral atherosclerosis. Each patient is represented by a bar.

> Ann Intern Med. 1977 Feb;86(2):139-46. doi: 10.7326/0003-4819-86-2-139.

Regression and progression of early femoral atherosclerosis in treated hyperlipoproteinemic patients

R Barndt Jr, D H Blankenhorn, D W Crawford, S H Brooks

PMID: 189658 DOI: 10.7326/0003-4819-86-2-139

Abstract

Femoral angiograms were done to evaluate change in early atherosclerosis in 12 patients with type IV hyperlipoproteinemia and 13 with type II hyperlipoproteinemia. The patients' average age was 48 years; only one had claudication. Elevated blood lipids and blood pressure were treated with drugs and diet. Repeat angiograms after an interval of 13 months showed regression of atherosclerosis in nine patients, no change in three, and progression in 13. Comparison of preangiogram levels with average levels between angiograms showed significant reduction in serum cholesterol, triglyceride, and blood pressure in the group with lesion improvement but not in the group with lesion progression. Sporadic examples of human atherosclerosis regression are known, but most other studies in man indicate only atherosclerosis progression. Our different result appears due to our selection of patients and radiographic method. We have studied patients with earlier atherosclerosis than previous workers, using a radiographic procedure more sensitive to small changes in lesions.

	Intervention	Kontroll
Progress	24 %	40 %
Regress	29 %	0 %

Regression of Coronary Atheromatosis in Rhesus Monkeys

By **Mark L. Armstrong, M.D., Emory D. Warner, M.D., and William E. Connor, M.D.**

ABSTRACT

Rhesus monkeys subjected to the atherogenic stimulus of a high-fat, high-cholesterol diet showed significant coronary atheromatosis at the end of 17 months. Smaller fibrotic lesions with scant stainable lipid were found in animals that were subsequently fed either of two cholesterol-free diets for 40 months. The average cross-sectional area of the lumen was more than 80% greater in regression animals than in monkeys with baseline atherosclerosis. The data support the hypothesis that uncomplicated coronary atheromas may regress in primates in appropriate dietary settings.

Comparative Study > J Intern Med. 1990 Jun;227(6):381-90.

doi: 10.1111/j.1365-2796.1990.tb00176.x.

The effect of serum lipid regulation on the development of femoral atherosclerosis in hyperlipidaemia: a non-randomized controlled study

A G Olsson †, G Rubin, U Eriksson

Affiliations + expand

PMID: 2351925 DOI: 10.1111/j.1365-2796.1990.tb00176.x

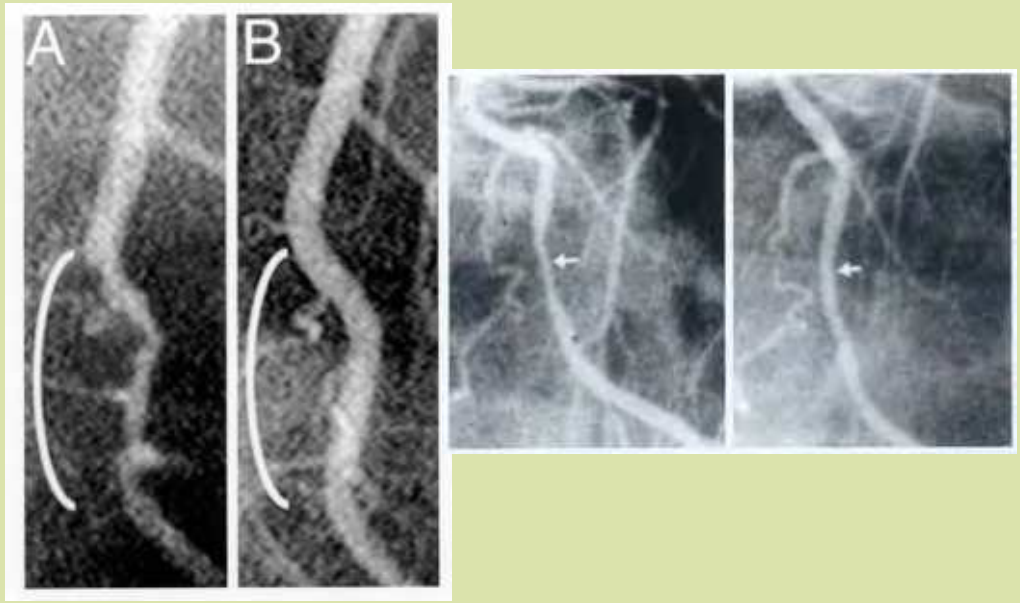
Abstract

The development of femoral atheroma after 1 year of treatment with diet and nicotinic acid plus fenofibrate was studied in 45 asymptomatic, hyperlipidaemic, middle-aged male subjects in a non-randomized controlled study. The median serum very low density lipoprotein (VLDL) cholesterol concentration and the low density lipoprotein (LDL) cholesterol concentration were lowered by 67% and 36%, respectively, in the treatment group. The median serum high density lipoprotein (HDL) cholesterol concentration was increased by 23%. Femoral atheroma was estimated by overall atherosclerosis score (OAS). Changes in femoral atherosclerosis were estimated by intrapair comparison of angiograms. Progression was found in 24% and 40% in the treatment and control groups, respectively. Regression occurred in 29% and 0%, respectively. The OAS decrease correlated with reductions in VLDL cholesterol and systolic blood pressure.

Dr. Caldwell Esselstyn

Ej randomiserad studie

Endast koständring



Dr. Dean Ornish

Randomiserad studie

30 min lågintensiv motion

Sexuell dysfunktion

ATEROSKLEROS – ÅDERFÖRKALKNING

Vaskulär demens
Stoke

Hjärt-kärlsjukdom

Hypertoni
Njursjukdom

Impotens
Sexual dysfunktion

Bensår
”Fönstertittarsjukan”

EXECUTIVE PRODUCERS
JAMES CAMERON
ARNOLD SCHWARZENEGGER
JACKIE CHAN
LEWIS HAMILTON
NOVAK DJOKOVIC
CHRIS PAUL
THE GAME CHANGERS
GET TICKETS NOW

VÄXT 477 % ÖKNING
PLANT
477%
INCREASE
MEAT

VÄXT 303 % ÖKNING
303%
INCREASE
MEAT

av hur många erektioner
du hade och hur länge de varade

International Journal of Impotence Research (2006) 18, 405–410
© 2006 Nature Publishing Group All rights reserved
0955-9930/06 $30.00
www.nature.com/ijir

ORIGINAL ARTICLE

Mediterranean diet improves erectile function in subjects with the metabolic syndrome

K Esposito[1], M Ciotola[1], F Giugliano[2], M De Sio[2], (

[1]Division of Metabolic Diseases, University of Naples SUN

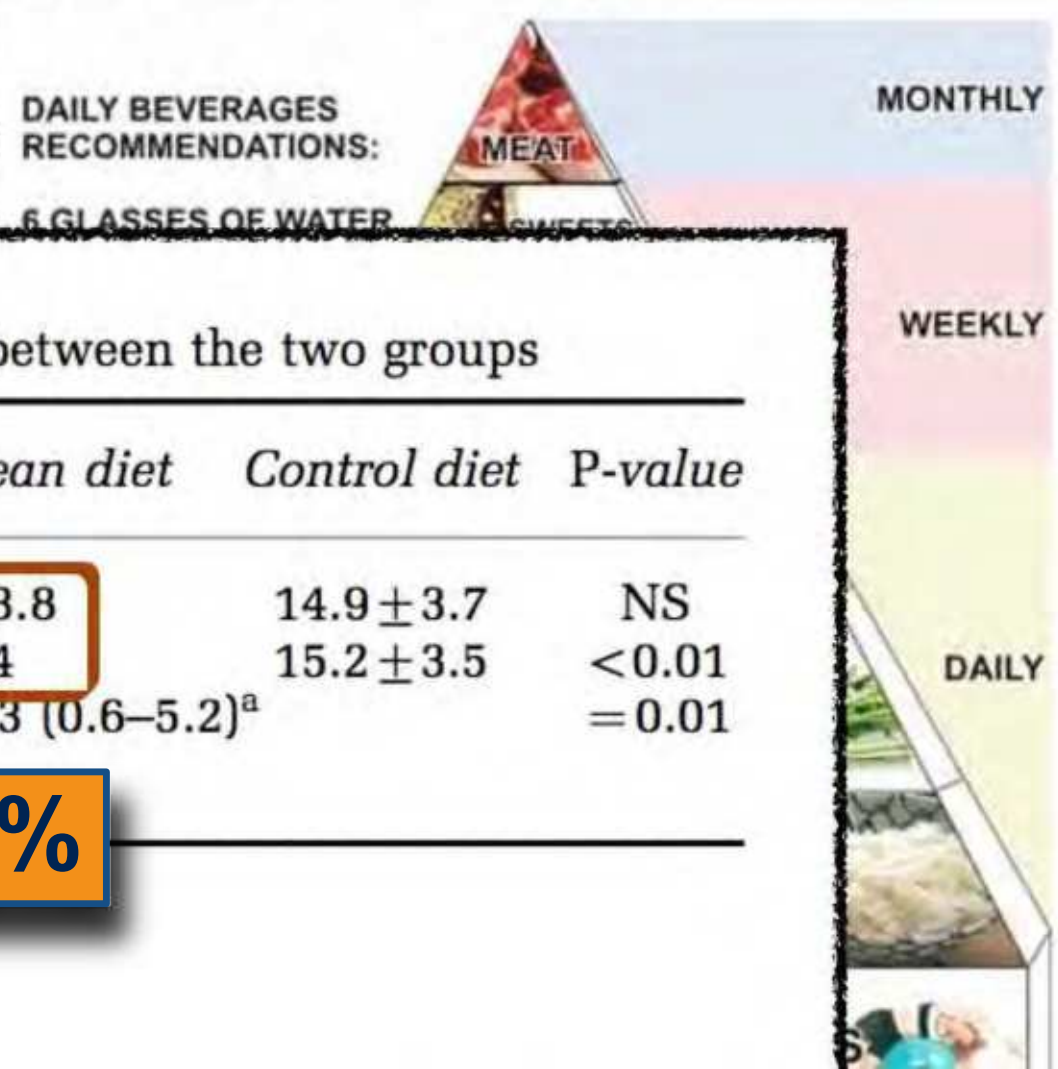


Table 4 Changes in IIEF score between the two groups

	Mediterranean diet	*Control diet*	*P-value*
Basal	14.4±3.8	14.9±3.7	NS
2 years	18.1±4	15.2±3.5	<0.01
Difference in mean change	3 (0.6–5.2)[a]		=0.01

[a]95% confidence intervals.
NS-Not Significant.

+ 26%

International Journal of Impotence Research (2007) 19, 486–491
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0955-9930/07 $30.00
www.nature.com/ijir

ORIGINAL ARTICLE

Mediterranean diet improves sexual function in women with the metabolic syndrome

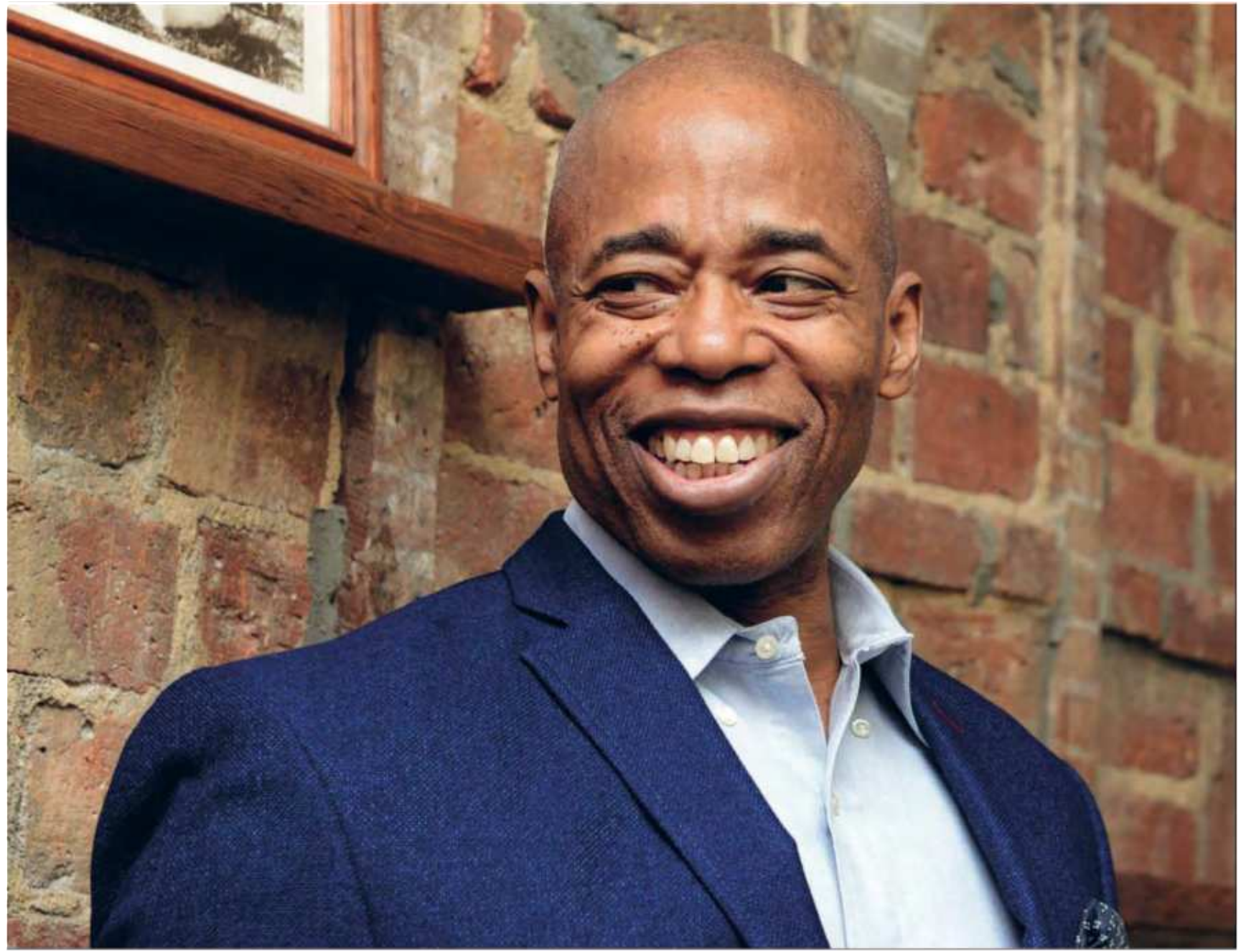
K Esposito[1], M Ciotola[1], F Giugliano[2], B Schisano[1], R Autorino[2], S Iuliano[1], MT Vietri[3], M Cioffi[3], M De

[1]*Divisi* *SUN, Naples, Italy;* [2] *y, University of Naples*

FSSI: +33% i MED-gruppen
Ingen förbättring i kontrollgruppen

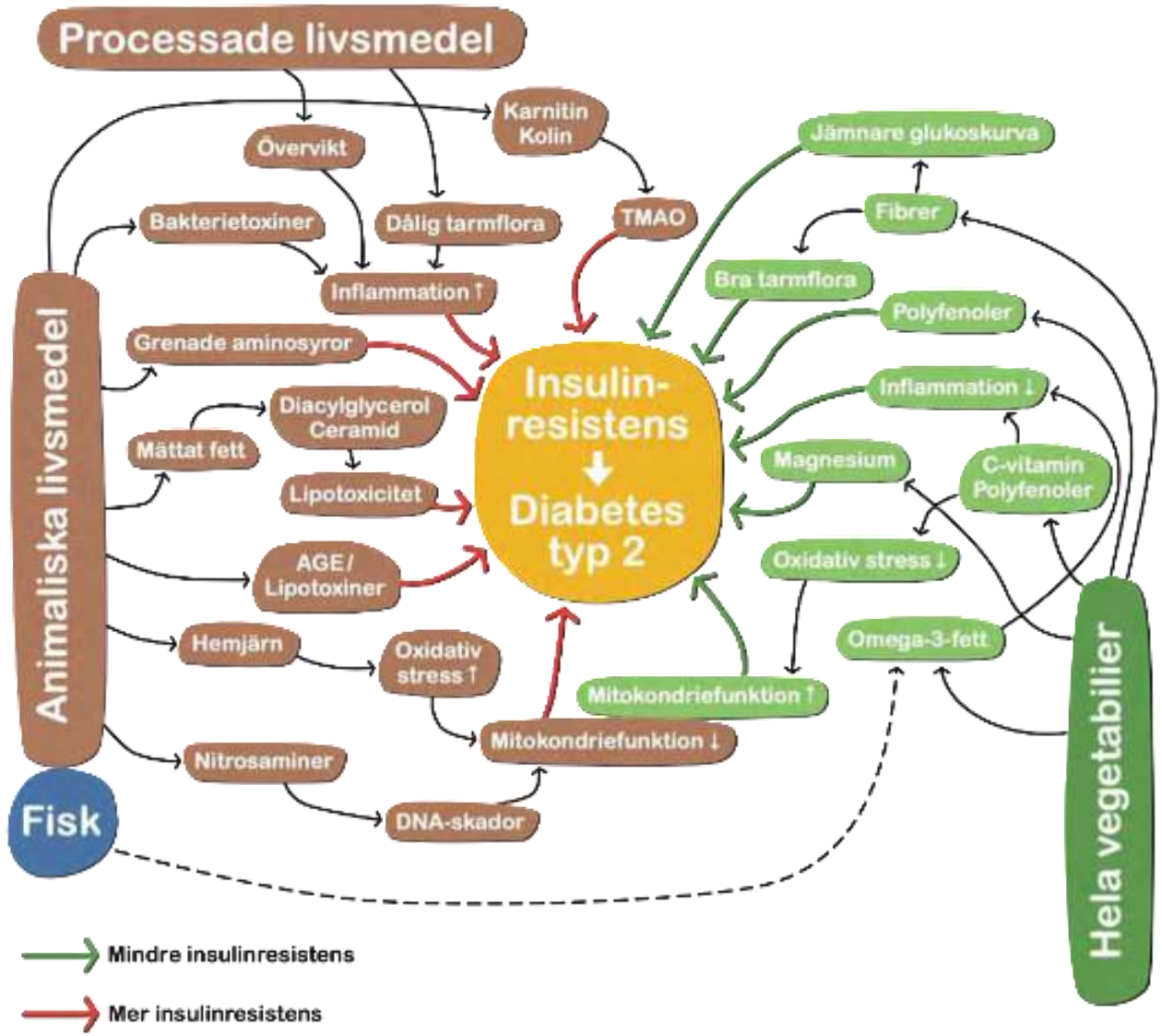
In the present study, we tested the effect of a Mediterranean-style diet on sexual function in women with the metabolic syndrome. Women were identified in our database of subjects participating in controlled trials evaluating the effect of lifestyle changes and were included if they had a diagnosis of female sexual dysfunction (FSD) associated with a diagnosis of metabolic syndrome, a complete follow-up in the study trial and an intervention focused mainly on dietary changes. Fifty-nine women met the inclusion/exclusion criteria; 31 out of them were assigned to the Mediterranean-style diet and 28 to the control diet. After 2 years, women on the Mediterranean diet consumed more fruits, vegetables, nuts, whole grain and olive oil as compared with the women on the control diet.

Diabetes typ 2

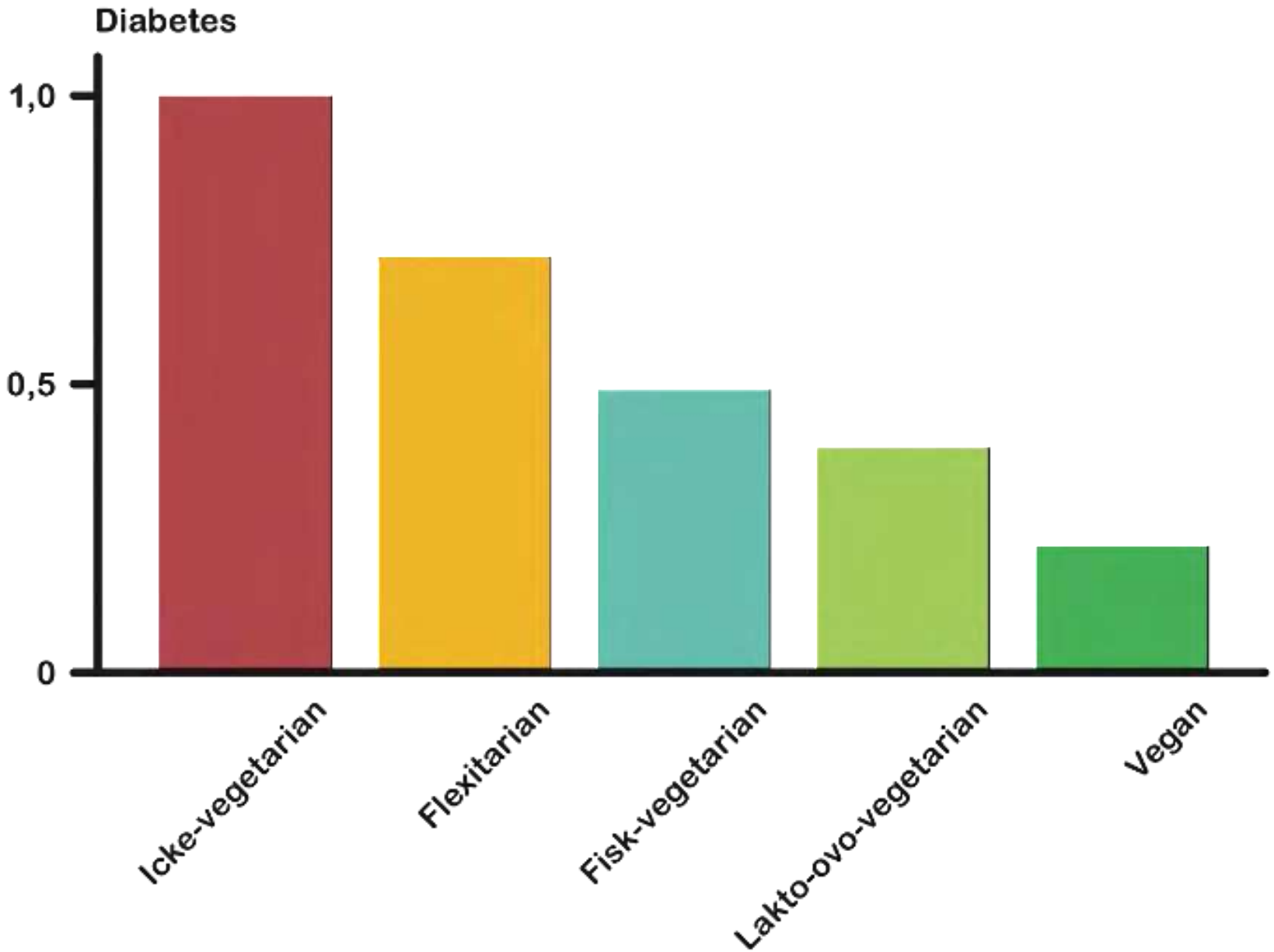


Eric Adams, borgmästare i New York, led av diabetes typ 2 tills han ändrade sin kost: ”Jag

Verkningsmekanismer för hur olika livsmedel påverkar insulinresistens som kan leda till diabetes typ 2



Relativ förekomst av diabetes hos olika typer av vegetarianer jämfört med icke-vegetarianer hos sjundedagsadventister.



Vad händer när patienter vistas 26 dagar på ett hälsohem och äter stort sett bara oprocessade vegetabiliska livsmedel?

Table 1—*Effects of diet and exercise on CHD risk factors in NIDDM patients according to medication status*

	Insulin (n = 212)		Oral medication (n = 197)	
	Before	After	Before	After
Fasting glucose (mmol/l)	10.9 ± 0.3	10.2 ± 0.3	10.3 ± 0.3	8.5 ± 0.2
Patients taking medication	212	129	197	57
Total cholesterol (mmol/l)				
LDL cholesterol (mmol/l)				
HDL cholesterol (mmol/l)				
Total cholesterol: HDL cholesterol				
Triglycerides (mmol/l)				
Systolic blood pressure (mmHg)	131.7 ± 1.4	122.0 ± 1.3	130.7 ± 1.4	122.3 ± 1.3
Diastolic blood pressure (mmHg)	77.3 ± 0.7	72.2 ± 0.6	78.1 ± 0.8	73.9 ± 0.8
Body weight (kg)	86.2 ± 1.4	81.9 ± 1.3	87.3 ± 1.4	82.8 ± 1.2

39%

71%

Data are means ± SE. Before, values before the program; after, values after the program. All values before the program were s
it ($P < 0.001$).

BARNARD ET AL, DIABETES CARE, VOLUME 17, NUMBER 12, DECEMBER 1994

Journal of Nutritional Medicine (1994) 4, 431–439

SHORT REPORT

Regression of Diabetic Neuropathy with Total Vegetarian (Vegan) Diet

This study reports alleviation of the sharp, burning pains characteristic of systemic distal polyneuropathy (SDPN) patients with adult-onset (Type II) diabetes mellitus (AODM).

Loma Linda, CA, USA

Complete relief of the SDPN pain occurred in 17 of the 21 patients in 4 to 16 days.

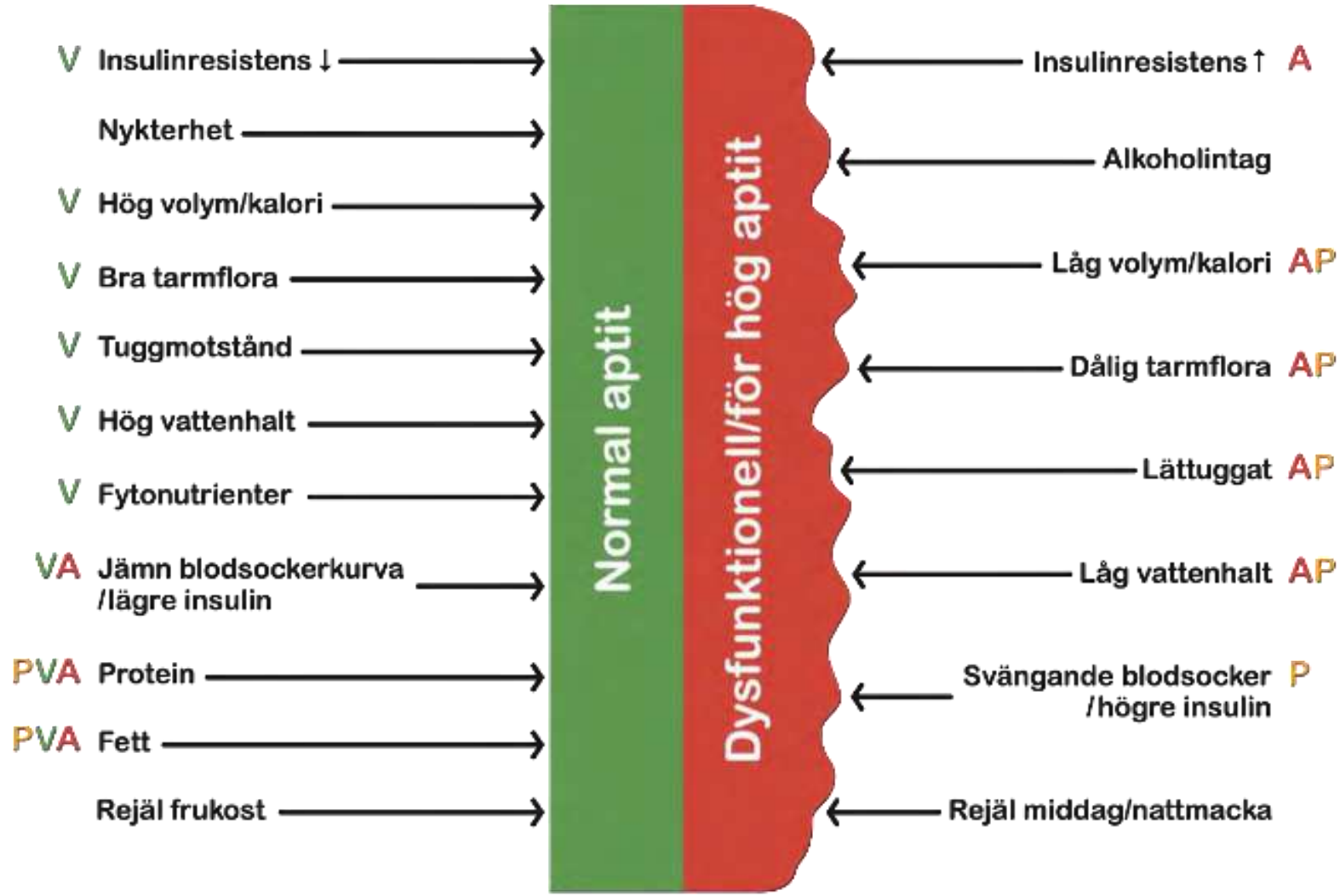
This study reports alleviation of the sharp, burning pains characteristic of systemic distal polyneuropathy (SDPN) patients with adult-onset (Type II) diabetes mellitus (AODM).

Twenty-one patients with known AODM and SDPN, average age 64, were trained in a low fat (10–15% of cals), high fiber, total vegetarian diet (TVD) of unrefined foods and conditioning exercise in a 25-day in-residence life-style program.

Complete relief of the SDPN pain occurred in 17 of the 21 patients in 4 to 16 days. The

Hälsosam vikt och normal aptit

Faktorer som påverkar aptiten



V = Växtbaserat/Hela vegetabilier

A = Animaliska livsmedel

P = Processade livsmedel

Svensk gräddglass
Med svenska jordgubbar
SIA
SVÖRD
Jordgubb
Svensk gräddglass
Med svenska jordgubbar
SIA
SVÖRD
Jordgubb

SVENSKA
JORDGUBBAR

ELSEVIER

CBP

locate/cbpa

”Deltagarna behövde utsättas för avsevärda påtryckningar för att försäkra att de åt upp all mat och inte gick ner i vikt.”

The
conser
o
the

David J.A. Jenkins[a,b,*], Cyril W.C. Kendall[a,c], Augustine Marchie[a,c], Alexandra L. Jenkins[c], Philip W. Connelly[c], Peter J.H. Jones[d], Vladimir Vuksan[a,c]

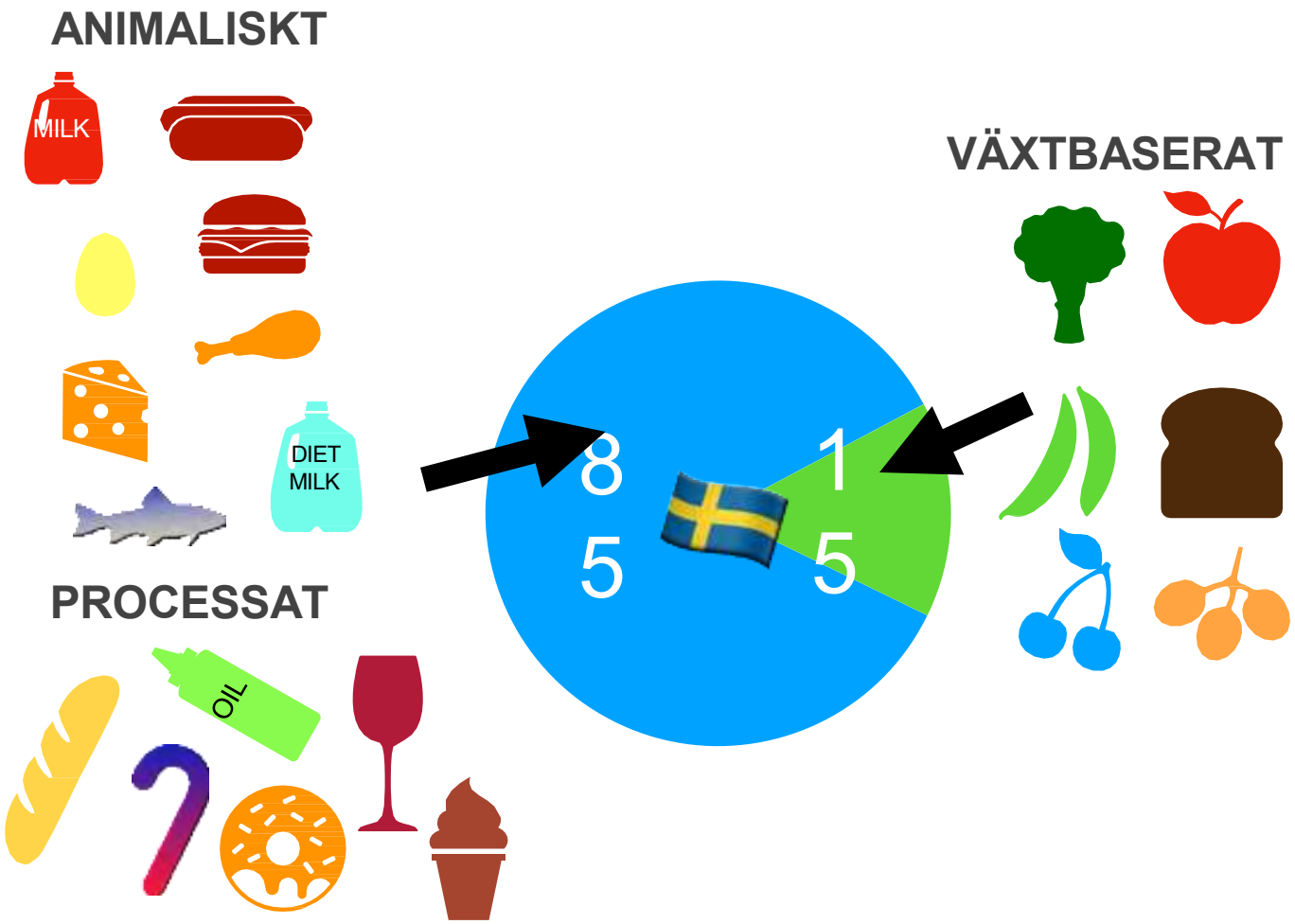
[a]*Clinical Nutrition and Risk Factor Modification Center, St. Michael's Hospital, 61 Queen Street East, Toronto, Ont., Canada M5C 2T2*

[b]*Department of Medicine, St. Michael's Hospital, Toronto, Ont., Canada*

[c]*Department of Nutritional Sciences, Faculty of Medicine, University of Toronto, Toronto, Ont., Canada*

[d]*School of Dietetics and Human Nutrition, McGill University, Montreal, Canada*

Received 9 August 2002; received in revised form 26 November 2002; accepted 27 November 2002


ANIMALISKT
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VÄXTBASERAT

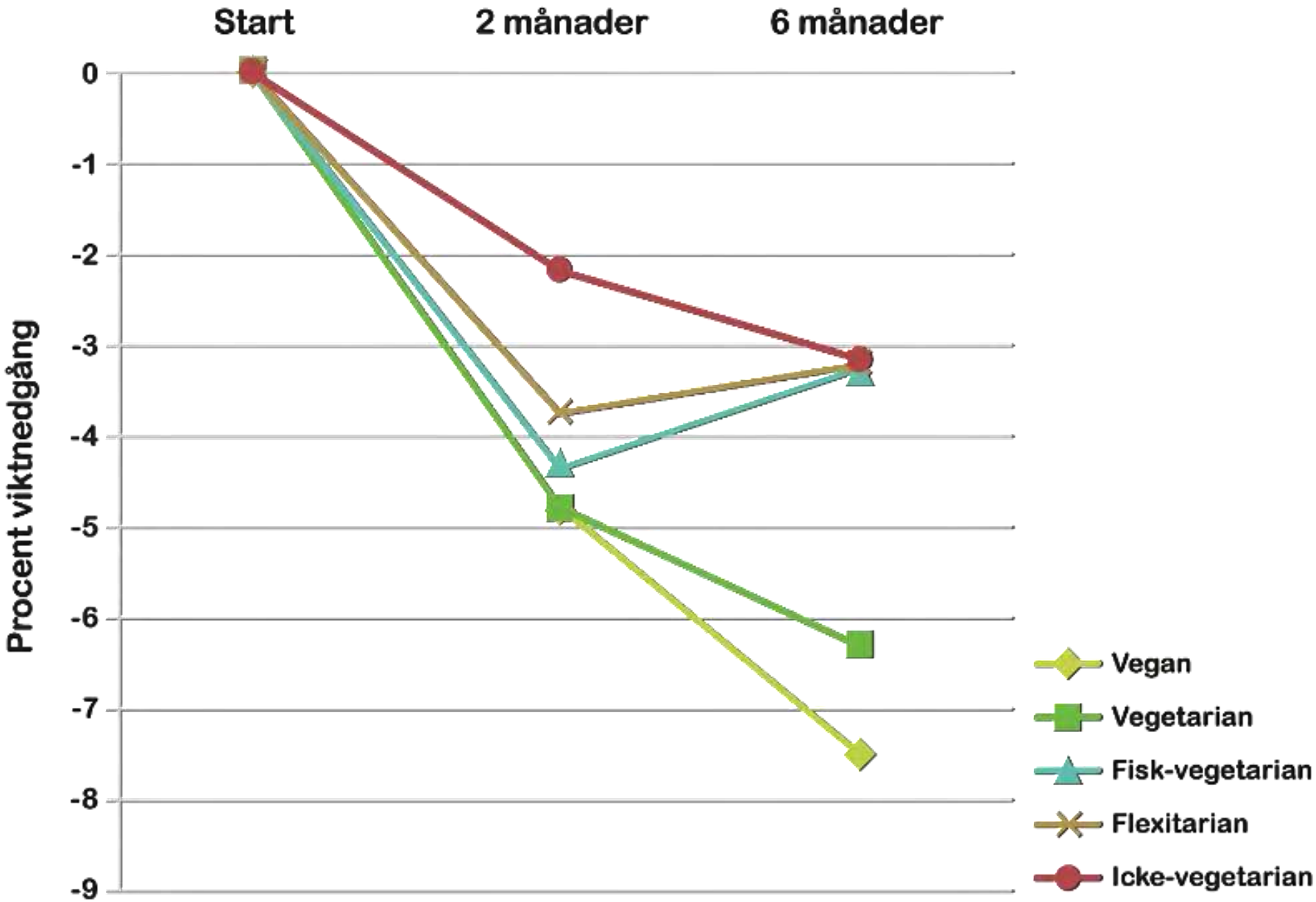
INSIDAN

Mer än hälften av alla svenskar bär på övervikt

UPPDATERAD 2019-10-22 PUBLICERAD 2019-10-21

Illustration: Elin Lindwall Foto: Shutterstock Illustration: Elin Lindwall, Foto: Shutterstock

Drygt hälften av Sveriges befolkning är överviktig – och i vissa grupper är det ännu fler.



Anpassat från Turner-McGrievy et al, *Nutrition*, Vol 31, Issue 2, Feb 2015.

OPEN

Citation: Nutrition & Diabetes (2017) 7, e256; doi:10.1038/nutd.2017.3

www.nature.com/nutd

ORIGINAL ARTICLE

The BROAD study: A randomised controlled trial using a whole food plant-based diet in the community for obesity, ischaemic heart disease or diabetes

N Wright[1], L Wilson[2], M Smith[3], B Duncan[4] and P McHugh[5]

group were 4.2 (±0.6) kg m^{-2} BMI points and 0.59 (±0.54, $P = 0.03$) mmol l^{-1} total cholesterol. No serious harms were reported.

CONCLUSIONS: This programme led to significant improvements in BMI, cholesterol and other risk factors. To the best of our knowledge, this research has achieved greater weight loss at 6 and 12 months than any other trial that does not limit energy intake or mandate regular exercise.

Nutrition & Diabetes (2017) 7, e256; doi:10.1038/nutd.2017.3; published online 20 March 2017

one of type 2 diabetes, ischaemic heart disease, hypertension or hypercholesterolaemia. Of 65 subjects randomised (control $n = 32$, intervention $n = 33$), 49 (75.4%) completed the study to 6 months. Twenty-three (70%) intervention participants were followed up at 12 months.

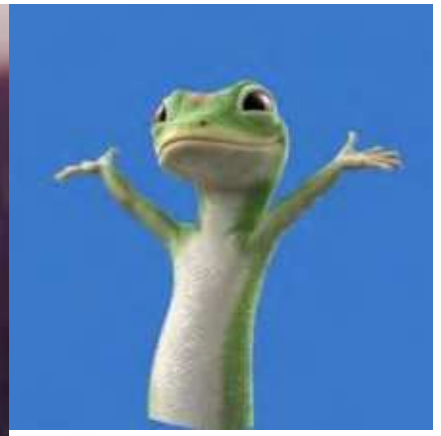
METHODS: All participants received normal care. Intervention participants attended facilitated meetings twice-weekly for 12 weeks, and followed a non-energy-restricted WFPB diet with vitamin B_{12} supplementation.

RESULTS: At 6 months, mean BMI reduction was greater with the WFPB diet compared with normal care (4.4 vs 0.4, difference: 3.9 kg m^{-2} (95% confidence interval (CI) ± 1), $P < 0.0001$). Mean cholesterol reduction was greater with the WFPB diet, but the difference was not significant compared with normal care (0.71 vs 0.26, difference: 0.45 mmol l^{-1} (95% CI ± 0.54), $P = 0.1$), unless

Psykisk hälsa och arbetsförmåga

A Multicenter Randomized Controlled Trial of a Nutrition Intervention Program in a Multiethnic Adult Population in the Corporate Setting Reduces Depression and Anxiety and Improves Quality of Life: The GEICO Study

Ulka Agarwal, MD; Suruchi Mishra, PhD; Jia Xu, PhD; Susan Levin, MS, RD; Joseph Gonzales, RD; Neal D. Barnard, MD



FÖRBÄTTRINGAR I GEICOSTUDIEN

Föreställningen att hälsosammare ätande är en uppoffring som leder till minskad livskvalitet har inget stöd i den vetenskapliga litteraturen – Det är tvärt om!

Men! En så extrem kost som helt växtbaserat kommer ingen att följa! Det är lönlöst att ge sådana kostråd!

Vad visar studier som jämför följsamhet till växtbaserade kostregimer med sådana som innehåller kött?

Genomsnittliga data från 11 studier	Följsamhet
Växtbaserat	
Blandkost	

Turner-McGrievy G, Mandes T, Crimarco A. A plant-based diet for overweight and obesity prevention and treatment. J Geriatr Cardiol. 2017 May;14(5):369-374.

Huang R-Y, Huang C-C, Hu F, et al. Vegetarian Diets and Weight Reduction: a Meta-Analysis of Randomized Controlled Trials. *J Gen Intern Med.* 2015

Barnard ND, Levin SM, Yokoyama Y. A systematic review and meta-analysis of changes in body weight in clinical trials of vegetarian diets. *J Acad Nutr Diet.* 2015;115:954–969

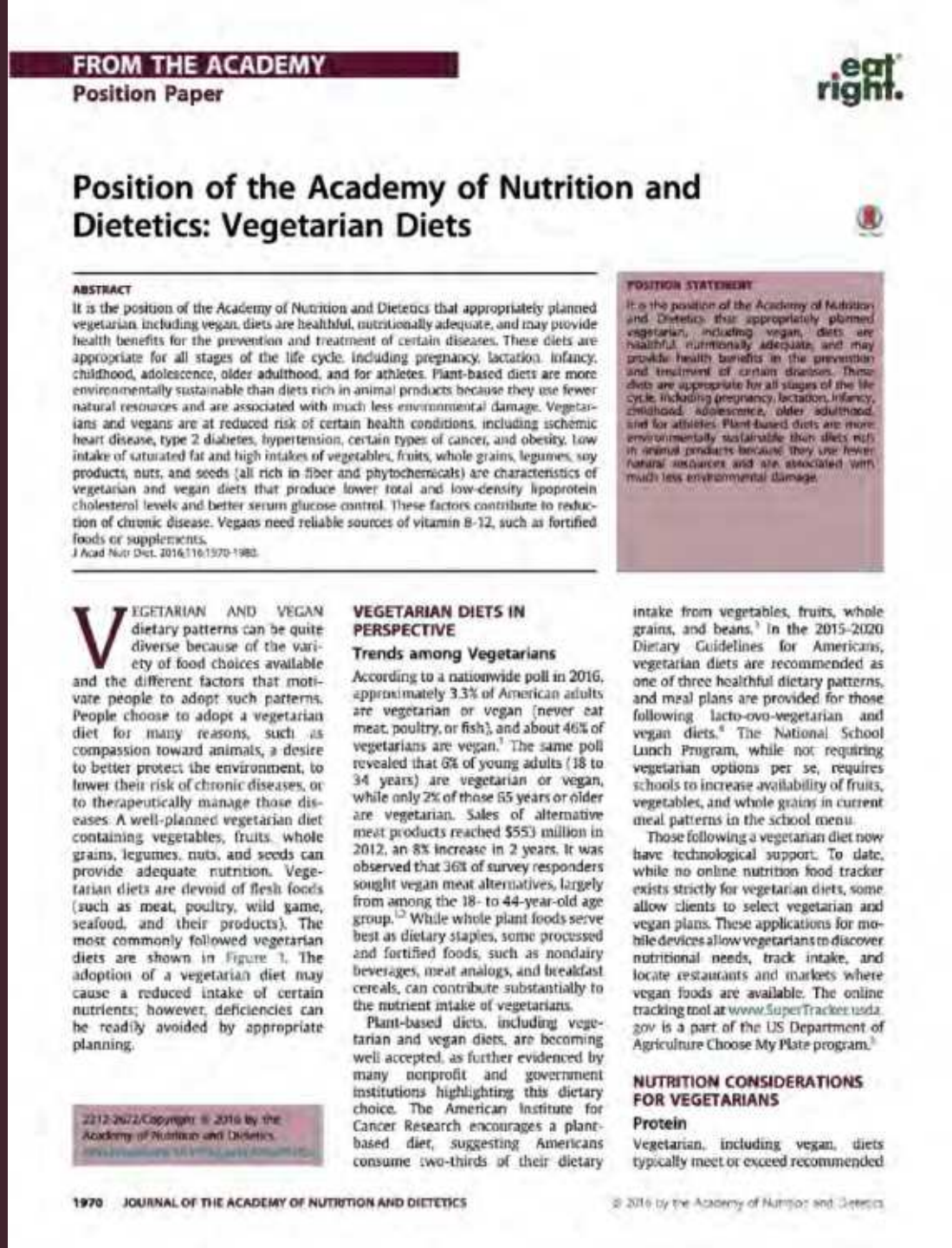
Får vi
i oss allt?

Brister?

HÄLSOSAM
NÄRINGSMÄSSIGT TILLRÄCKLIG
LÄMPLIG I ALLA LIVETS SKEDEN

ALLA LIVETS SKEDEN

Graviditet
Ammning
Spädbarnsår
Barndom
Tonår
Äldre
Idrottare



FROM THE ACADEMY
Position Paper

eat right.

Position of the Academy of Nutrition and Dietetics: Vegetarian Diets

ABSTRACT

It is the position of the Academy of Nutrition and Dietetics that appropriately planned vegetarian, including vegan, diets are healthful, nutritionally adequate, and may provide health benefits for the prevention and treatment of certain diseases. These diets are appropriate for all stages of the life cycle, including pregnancy, lactation, infancy, childhood, adolescence, older adulthood, and for athletes. Plant-based diets are more environmentally sustainable than diets rich in animal products because they use fewer natural resources and are associated with much less environmental damage. Vegetarians and vegans are at reduced risk of certain health conditions, including ischemic heart disease, type 2 diabetes, hypertension, certain types of cancer, and obesity. Low intake of saturated fat and high intakes of vegetables, fruits, whole grains, legumes, soy products, nuts, and seeds (all rich in fiber and phytochemicals) are characteristics of vegetarian and vegan diets that produce lower total and low-density lipoprotein cholesterol levels and better serum glucose control. These factors contribute to reduction of chronic disease. Vegans need reliable sources of vitamin B-12, such as fortified foods or supplements.

J Acad Nutr Diet. 2016;116:1970-1980.

POSITION STATEMENT

It is the position of the Academy of Nutrition and Dietetics that appropriately planned vegetarian, including vegan, diets are healthful, nutritionally adequate, and may provide health benefits in the prevention and treatment of certain diseases. These diets are appropriate for all stages of the life cycle, including pregnancy, lactation, infancy, childhood, adolescence, older adulthood, and for athletes. Plant-based diets are more environmentally sustainable than diets rich in animal products because they use fewer natural resources and are associated with much less environmental damage.

VEGETARIAN AND VEGAN dietary patterns can be quite diverse because of the variety of food choices available and the different factors that motivate people to adopt such patterns. People choose to adopt a vegetarian diet for many reasons, such as compassion toward animals, a desire to better protect the environment, to lower their risk of chronic diseases, or to therapeutically manage those diseases. A well-planned vegetarian diet containing vegetables, fruits, whole grains, legumes, nuts, and seeds can provide adequate nutrition. Vegetarian diets are devoid of flesh foods (such as meat, poultry, wild game, seafood, and their products). The most commonly followed vegetarian diets are shown in Figure 1. The adoption of a vegetarian diet may cause a reduced intake of certain nutrients; however, deficiencies can be readily avoided by appropriate planning.

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VEGETARIAN DIETS IN PERSPECTIVE

Trends among Vegetarians

According to a nationwide poll in 2016, approximately 3.3% of American adults are vegetarian or vegan (never eat meat, poultry, or fish), and about 46% of vegetarians are vegan.[1] The same poll revealed that 6% of young adults (18 to 34 years) are vegetarian or vegan, while only 2% of those 65 years or older are vegetarian. Sales of alternative meat products reached $553 million in 2012, an 8% increase in 2 years. It was observed that 36% of survey responders sought vegan meat alternatives, largely from among the 18- to 44-year-old age group.[1,2] While whole plant foods serve best as dietary staples, some processed and fortified foods, such as nondairy beverages, meat analogs, and breakfast cereals, can contribute substantially to the nutrient intake of vegetarians.

Plant-based diets, including vegetarian and vegan diets, are becoming well accepted, as further evidenced by many nonprofit and government institutions highlighting this dietary choice. The American Institute for Cancer Research encourages a plant-based diet, suggesting Americans consume two-thirds of their dietary intake from vegetables, fruits, whole grains, and beans.[3] In the 2015-2020 Dietary Guidelines for Americans, vegetarian diets are recommended as one of three healthful dietary patterns, and meal plans are provided for those following lacto-ovo-vegetarian and vegan diets.[4] The National School Lunch Program, while not requiring vegetarian options per se, requires schools to increase availability of fruits, vegetables, and whole grains in current meal patterns in the school menu.

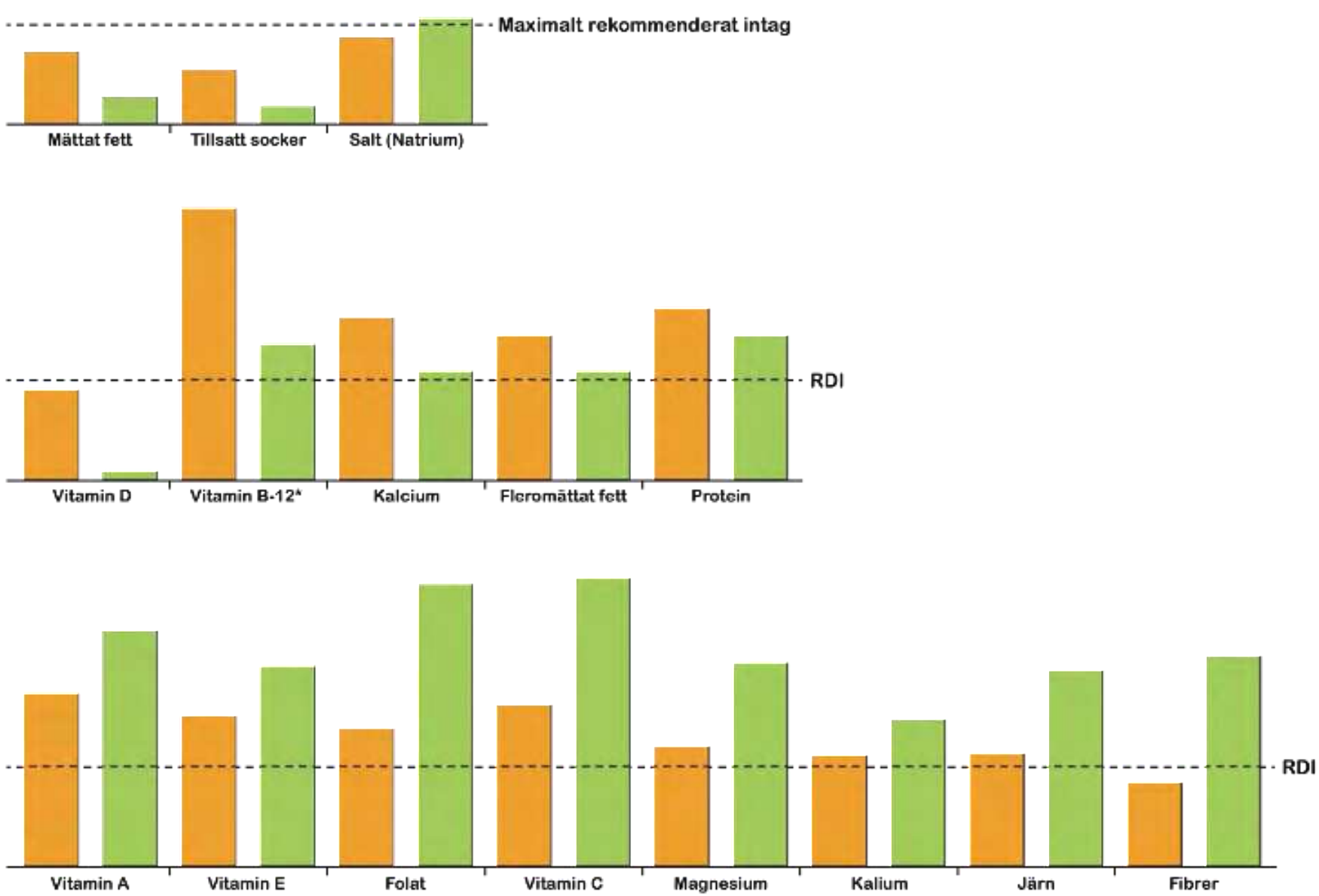
Those following a vegetarian diet now have technological support. To date, while no online nutrition food tracker exists strictly for vegetarian diets, some allow clients to select vegetarian and vegan plans. These applications for mobile devices allow vegetarians to discover nutritional needs, track intake, and locate restaurants and markets where vegan foods are available. The online tracking tool at www.SuperTracker.usda.gov is a part of the US Department of Agriculture Choose My Plate program.[5]

NUTRITION CONSIDERATIONS FOR VEGETARIANS

Protein

Vegetarian, including vegan, diets typically meet or exceed recommended

© 2016 by the Academy of Nutrition and Dietetics

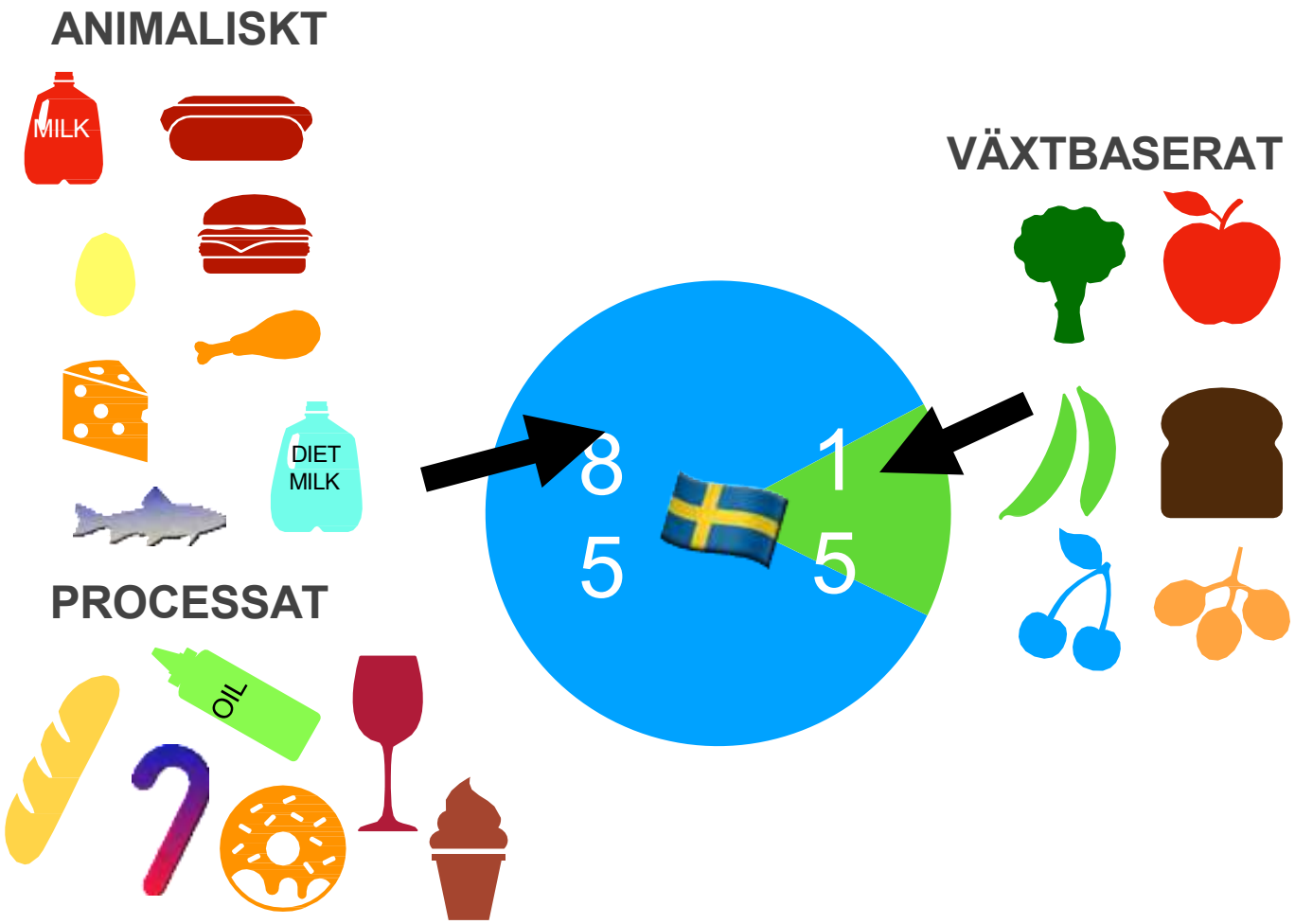


MyPlate

WFPB

RDI = Rekommenderat dagligt intag enligt Livsmedelsverket – gäller vuxna

* Inkluderar intag via berikade livsmedel enligt amerikanska data – OBS att berikningsgrad skiljer sig mellan olika länder. Den som äter en växtbaserad kost bör alltid komplettera med tillskott av vitamin B-12.


ANIMALISKT
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VÄXTBASERAT

Ta makten över din hälsa

Vad händer i kroppen när du övergår från blandkost till att äta hela vegetabilier?

Hjärt-kärlsjukdom, åderförkalkning, diabetes typ 2 och högt blodtryck är folksjukdomar som är möjliga att bromsa och till och med vända förloppet på med en långtgående koständring.

Kostens kraft är en ambitiös och pedagogisk genomgång av etablerad forskning och nya rön. Men den berör också på ett personligt plan genom intervjuer och berättelser av människor som ätit sig friska. ***Kostens kraft*** inspirerar även till nya matvanor med goda, spännande och lättlagade gröna recept och härliga bilder.

"David Stenholtz belyser med genuint intresse och gedigen kunskap hur du kan förbättra din hälsa genom ett sundare matval. Kosten som gagnar den individuella hälsan är oftast också fördelaktig ur ett planetärt perspektiv. Att matens sammansättning gör så stor skillnad behöver vi i sjukvården bli bättre på att föra fram."

Maria Wolodarski, MD, PhD, ordförande i Läkare för Miljön, ordförande i arbetsgruppen för klimat, hälsa och hållbar sjukvård i Svenska Läkaresällskapet

"Inspirerande, pedagogiskt och uppbackat av vetenskap om hur flera folksjukdomar kan bromsas och till och med reverseras genom hälsosammare kost. Det här är populärvetenskap när den är som bäst."

Anna Ottosson, grundare av Foodpower, vice ordförande i Dietisternas riksförbund 2007–2018 och författare.

LAVA

9 789189 741126

KOSTENS KRAFT David Stenholtz

Med inspirerande recept av Therése Lindgren, Lars Frölander och sju av Sveriges främsta matkreatörer

David Stenholtz

KOSTENS KRAFT

En vetenskaplig genomgång av matens potential

"Intressant, stimulerande och imponerande!"
PETER NYGREN, PROFESSOR I ONKOLOGI, AKADEMISKA SJUKHUSET, UPPSALA

David Stenholtz recept

Davids sallad

Det här är en av mina absoluta favoriträtter som jag äter flera gånger i veckan. Färgerna är en fröjd för ögat. Kombinationen av sötma från russin, morot och fänkål, sälta från jordnötter, krämigheten från dressingen och den fräscha smaken av gurka gifter sig perfekt. Och det är svårt att få till något nyttigare!

Bas

morötter, rödkål, gurka

Valfria ingredienser

Fänkål, selleri, grönkål, vitkål, tomat, paprika

Topping

Jordnötter, russin, färska kryddor som basilika och/eller koriander

Dressing för en person

2 msk tahini (sesampasta)
1 tsk dijonsenap
1–2 dl sojamjölk
peppar

Gör så här:

Hacka alla grönsaker, lägg i en skål och strö över topping.

Rör ihop tahini, senap och peppar. Strila ner ett par matskedar sojamjölk och rör till en jämn smet. Upprepa tills du tillsatt all sojamjölk. Häll över salladen. Klart!

Tack!

Rishi Behl

Marketing Director på Remark
SCOR Digital Solutions

Global Consumer Study 2023

SCOR Sweden Re:s Nordic Life Insurance Conference

Reimagine Life

ReMark and the Global Consumer Study

ReMark.
SCOR Digital Solutions

Agenda

1

Background

Who are we?

2

Our Solutions

Solutions Overview

Velogica

BAM

VClaims

3

Consumer Research

Global Consumer Study

ReMark.

ReMark: Who are we?

ReMark is a global provider of insurance solutions and services that help clients gain, retain and engage policyholders by delivering the best consumer experience — from quote to claim.

Insights

Marketing

Digital Solutions

33
Nationalities

5
Languages

220
Staff

15
Offices

ReMark: the creative force of SCOR.

Since 2007, we've worked together with our parent company.

- A leading global reinsurer
- Thousands of satisfied clients
- A+ rated
- Operations in more than 160 countries
- 29 underwriting centres
- €9.2 billion in gross written premiums (Life, 2022)

ReMark's solutions and services

Our objective: to create the best possible customer experience.

Sales

Customer Engagement & Loyalty

Claims Management

Customer Experience

Velogica

Automated medical underwriting

X HUMANOO

Health & Wellness application powered by SCOR's BAM algorithm

Claims

Optimised claims declaration platform

Data Analytics

Global Consumer Study

2023–24

A DECADE IN REVIEW: PAVING THE FUTURE OF INSURANCE

ReMark.
SCOR Digital Solutions

About the GCS

What is it?

- Published since 2014
- One of the largest global surveys on insurance customers
- Read by insurance executives and the wider public
- Examines consumer attitudes towards insurance, health & wellness, P&C, tech and more

Why do we need it?

- To be people centric
- To help insurers listen to consumer voices and design products/solutions for the people
- To bring unique value: other insurers don't do this
- To close the protection gap by connecting insurers and consumers

What's new in our 10th edition?

7
insights across three themes: consumer journey, L&H and P&C

22
markets

12,563
young people

INSIGHTS ON THE CONSUMER JOURNEY

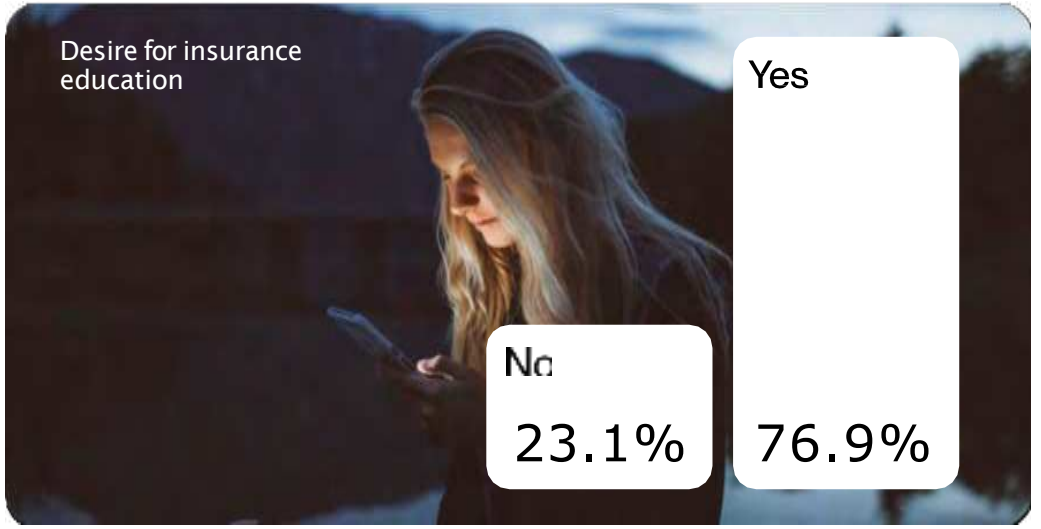
01

Insight 1:
Decoding the Future of Insurance

This year's Global Insurance Literacy score

Respondents had the greatest confidence in their knowledge of Savings (69.3%) and Banking (62.6%), with Life & Health Insurance (58.9%) and Home & Motor Insurance (57.3%) next down the list.

Whilst both Millennials and Gen Z have similar have broadly similar self-assessments of their knowledge, upon testing we saw that the elder age group have a considerably higher average insurance literacy score (6.1 vs 5.45).



Q / Do you feel you need additional education about insurance?

Q / What would be your ideal way to learn more about insurance?

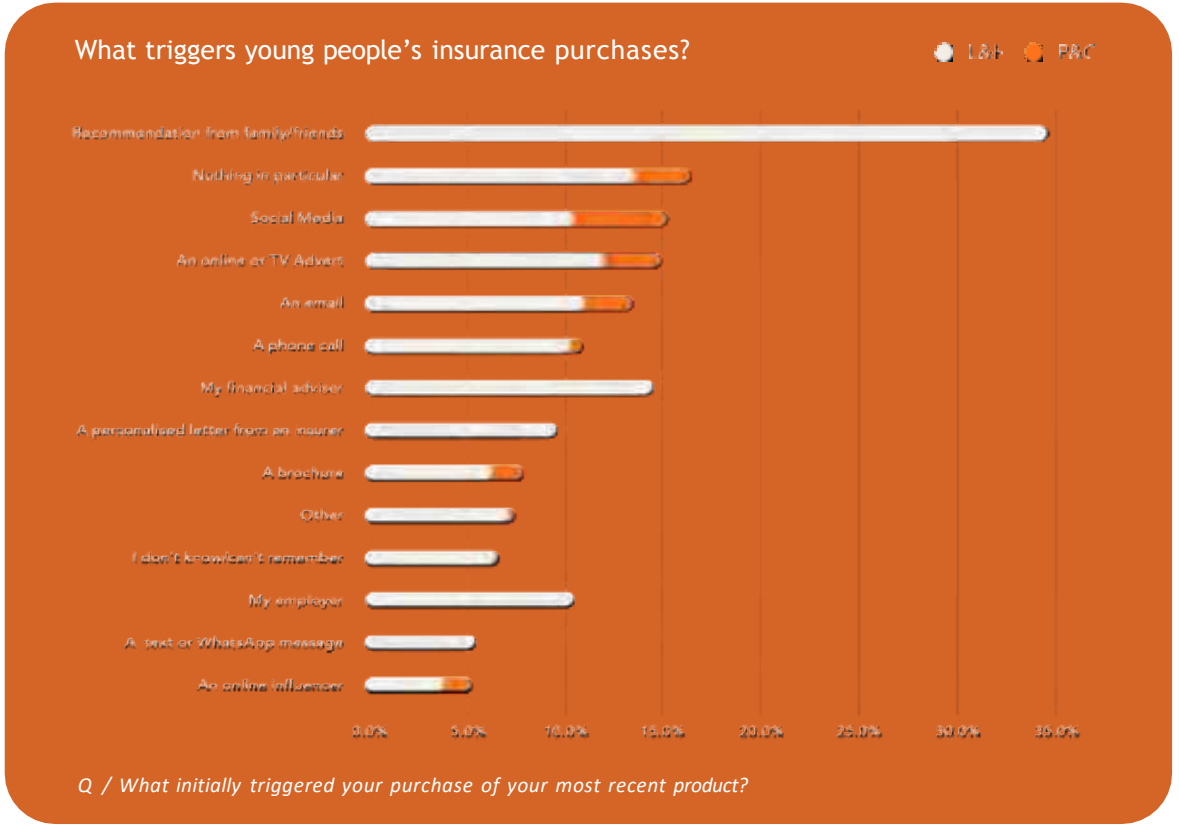
Insight 2:
Mapping out the consumer journey

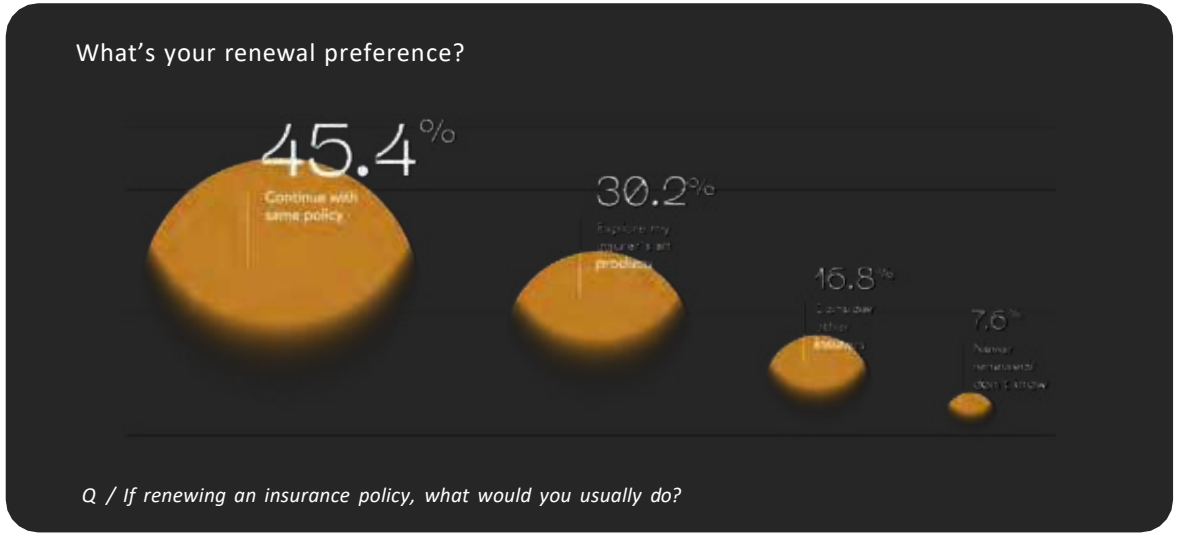
#1 consideration during the purchase process is “good online reviews”

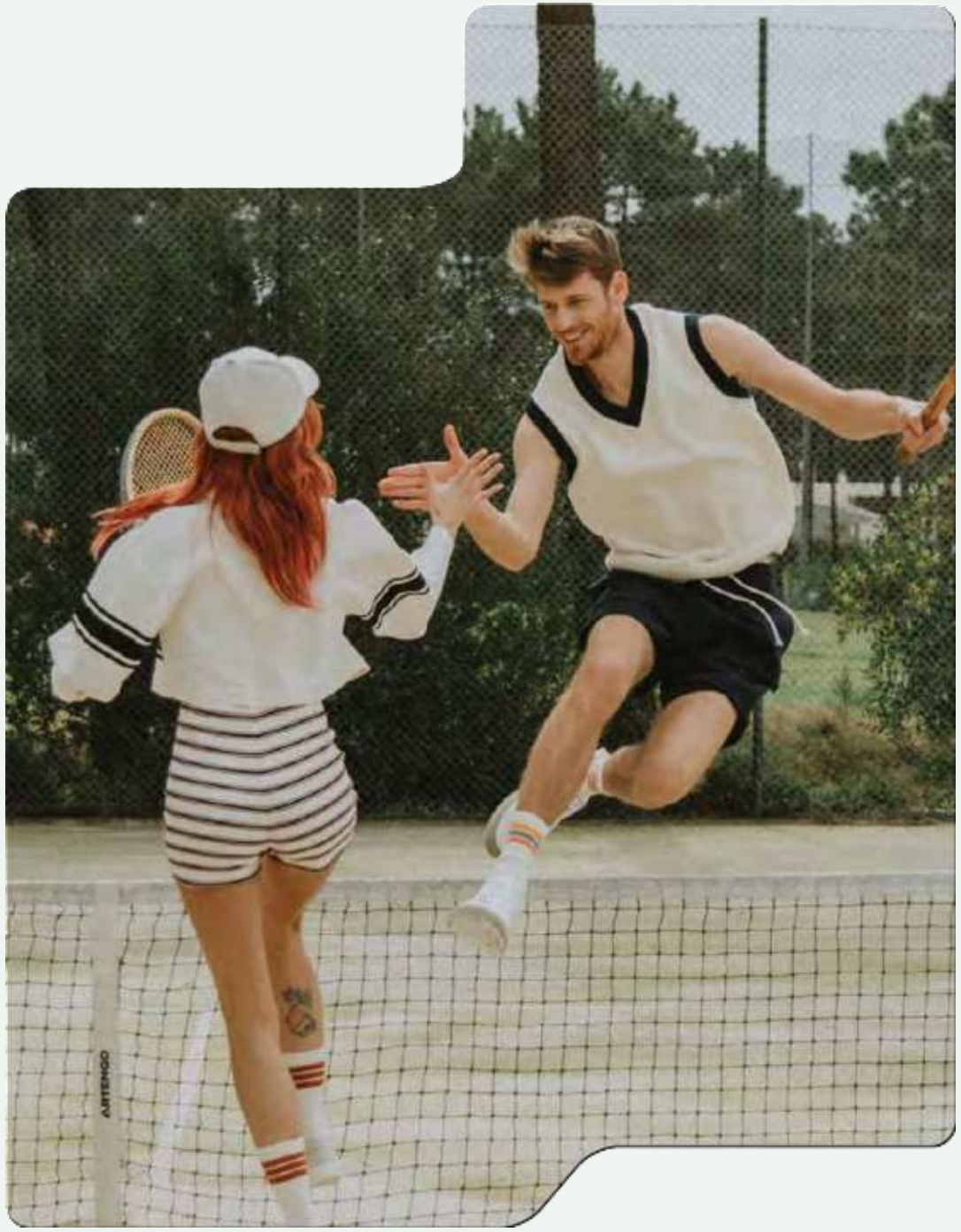
(In Sweden, the #1 consideration is “price”)

For the first time this year, ”Good Online Reviews” are more important than price for young people considering their next insurance purchase, with a quarter choosing this as their priority (26.2%).

However, price is still a crucial factor, with over 50% of respondents willing to forsake brand reputation if the new online competition were cheaper or more convenient.





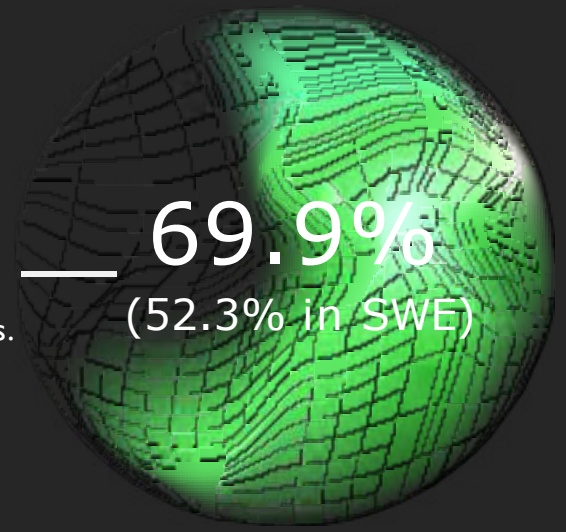


INSIGHTS ON LIFE & HEALTH INSURANCE

02

Insight 3:
Living well in a connected world

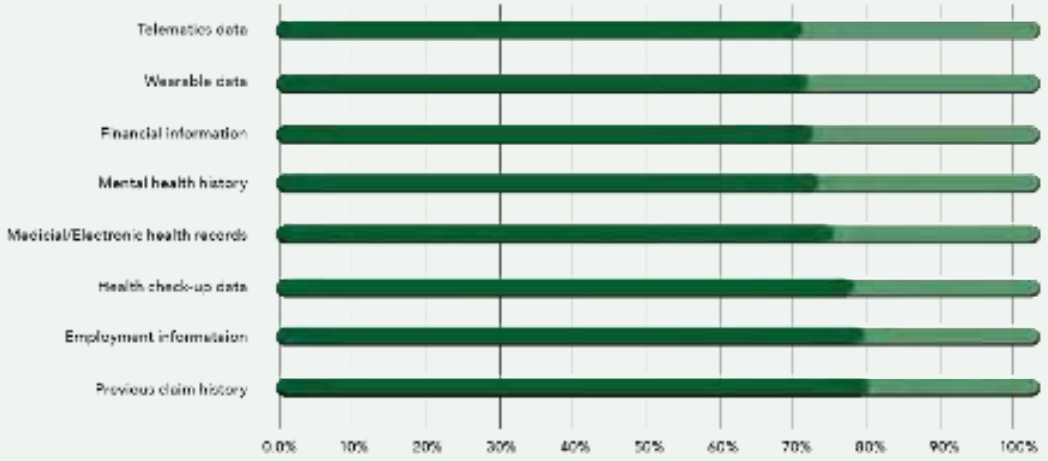
69.9% of Gen Z and Millennials regularly use, or are interested in using, health apps.



This year, respondents from China (92%), Mexico (88.3%) and Chile (82.5%) attribute the most importance to healthy living. Encouragingly, young people appear very aware of the utility of health & wellness apps to improve fitness.

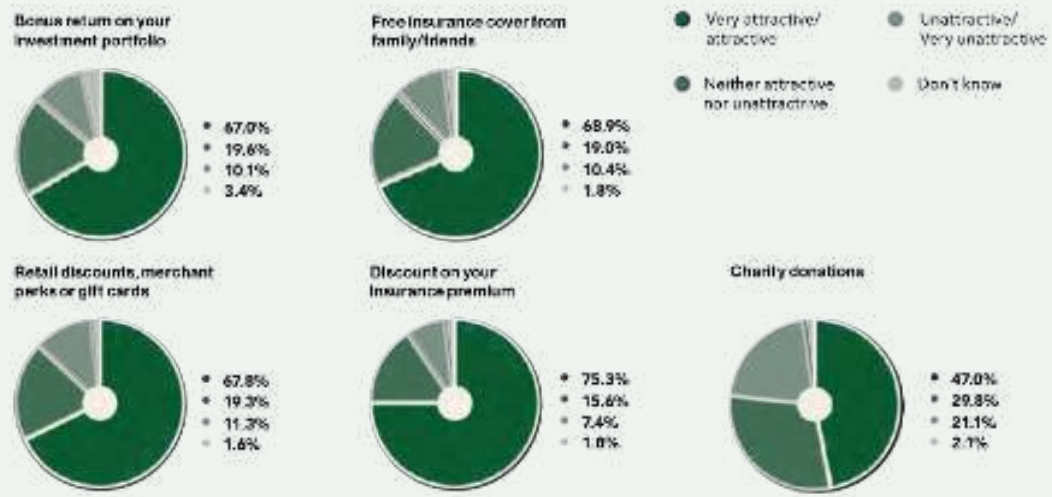
Importantly for insurers, there is enthusiasm among policyholders for the prospect of sharing optional data in exchange for insurance discounts.

Propensity to share data with insurers



Q / Would you consent to sharing optional data with your insurer, such as from a car analytics device or smart watch, if they were able to offer you a customised insurance plan?

Potential rewards for sharing data

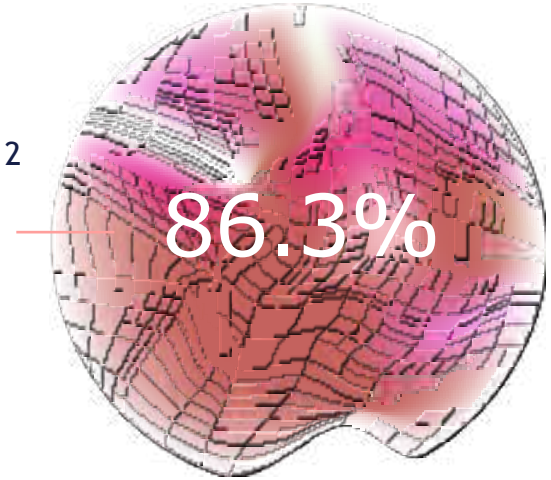


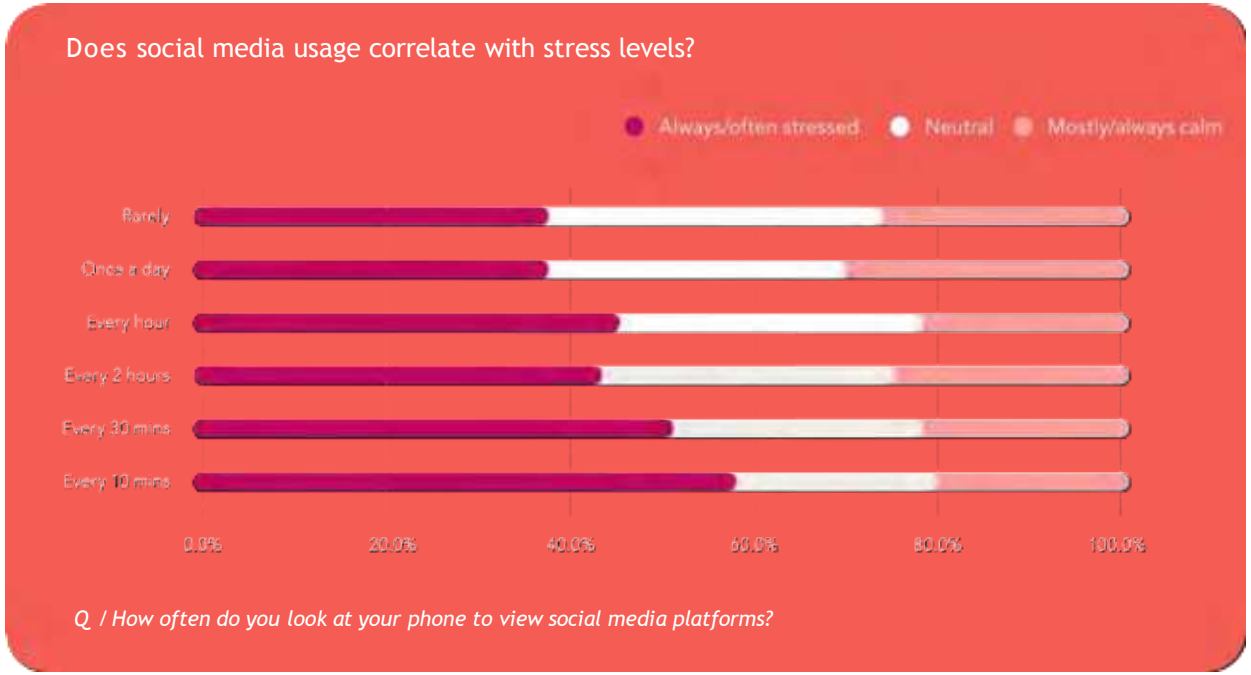
Q / How appealing are the following as potential rewards from your insurer for sharing such data?

Insight 4:

Virtual lives: curse or cure?

86.3% of young people check social media at least every 2 hours.





46.7% of our Millennials and Gen Zs reported feeling often or always stressed, a rise of more than 6% on the previous year (40.2%).

The largest cause of stress is financial issues.

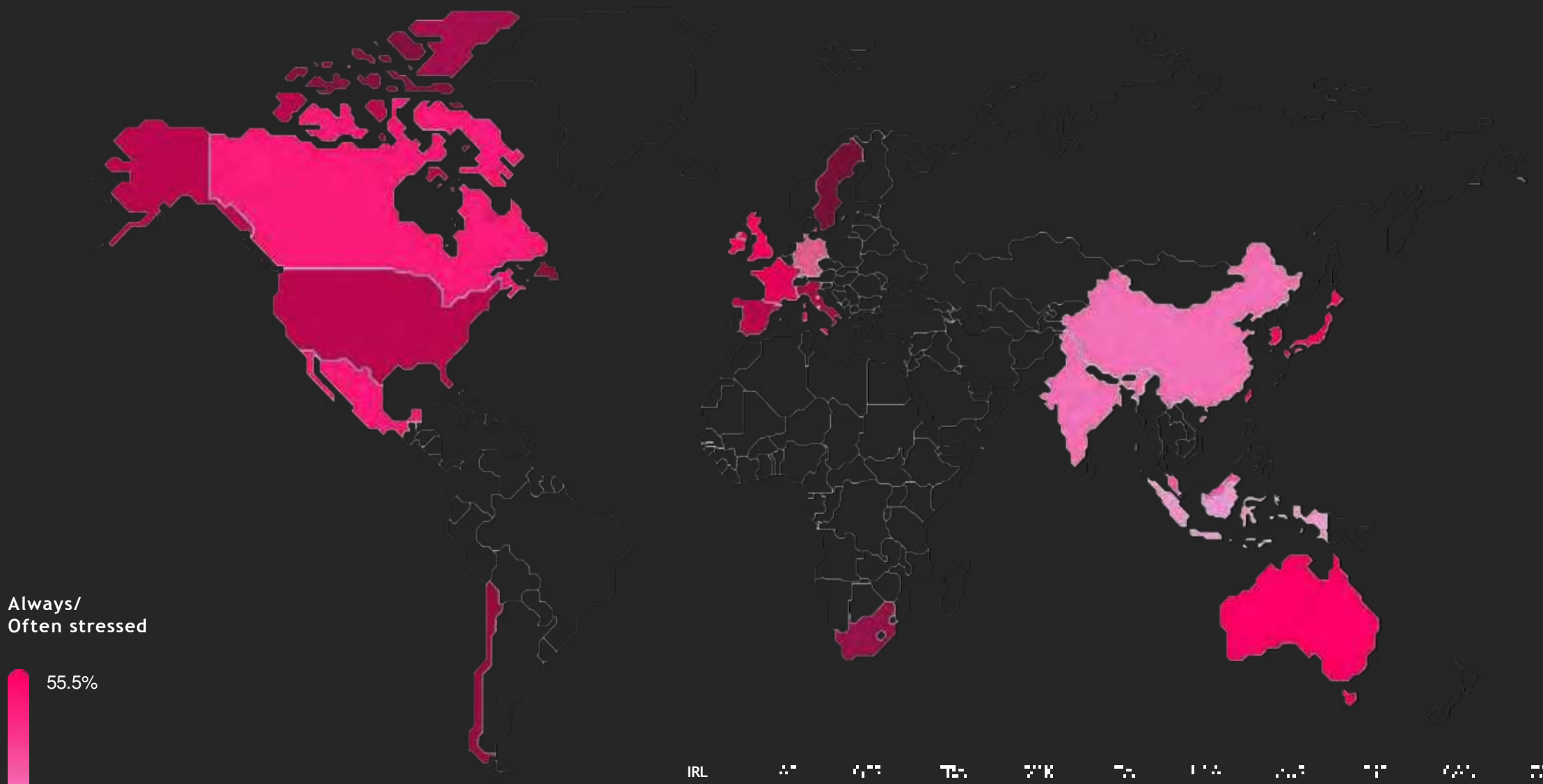
Despite 86.3% of respondents checking social media at least once every 2 hours, only 24.3% of users say it negatively affects their mental health.

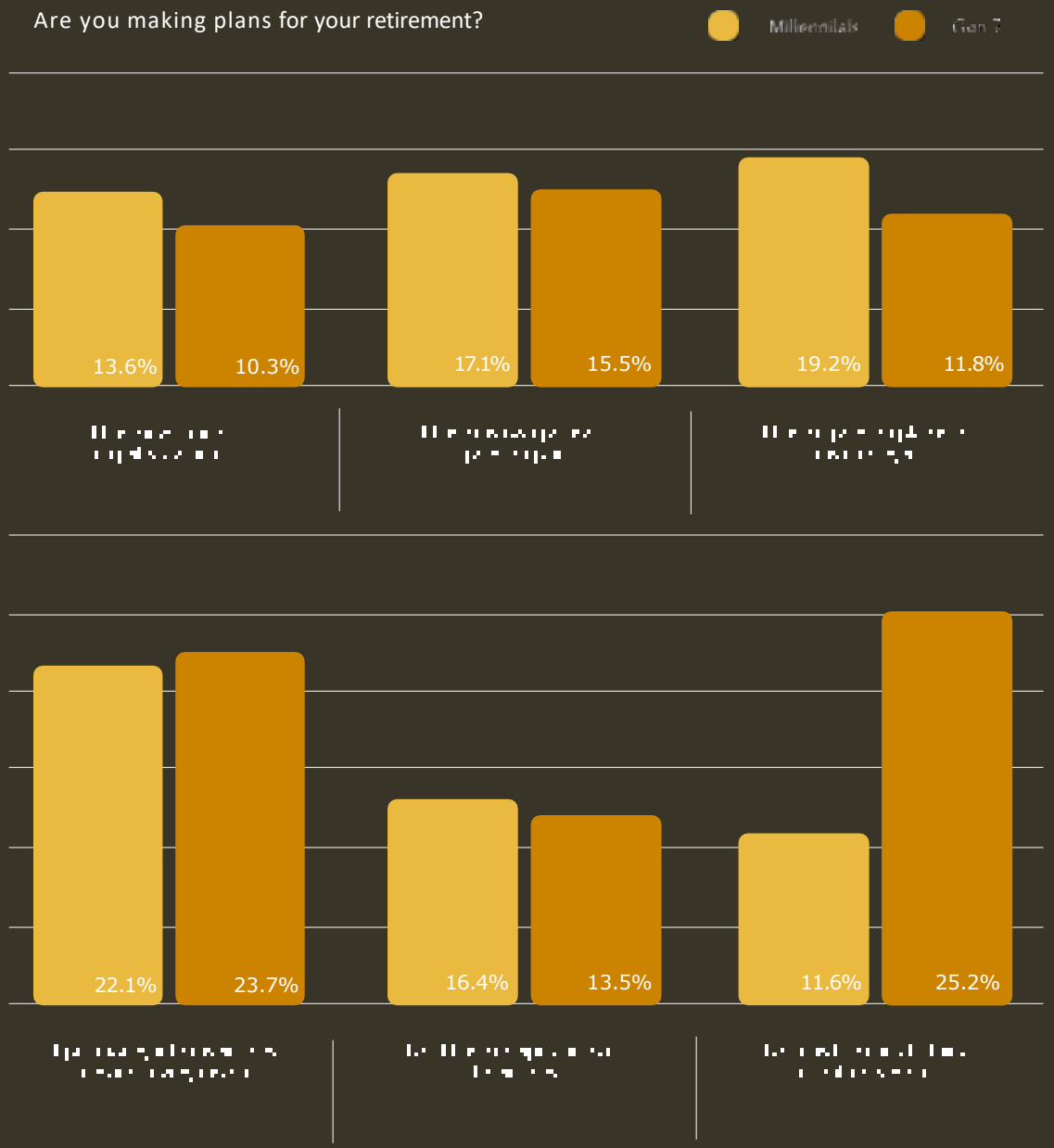
But when cross-referencing, a greater correlation appears between stress and social media usage.

In Sweden, 67.2% of those who check social media every 10 minutes state they are always/often stressed.

Where is the most stressed?

Q / Generally speaking, how do you feel?





Q / Are you taking any steps to prepare for your retirement?

Insight 5:

Retirement planning

61.3%

(59.4% in SWE)

61.3% of Gen Z are taking steps to financially secure their future

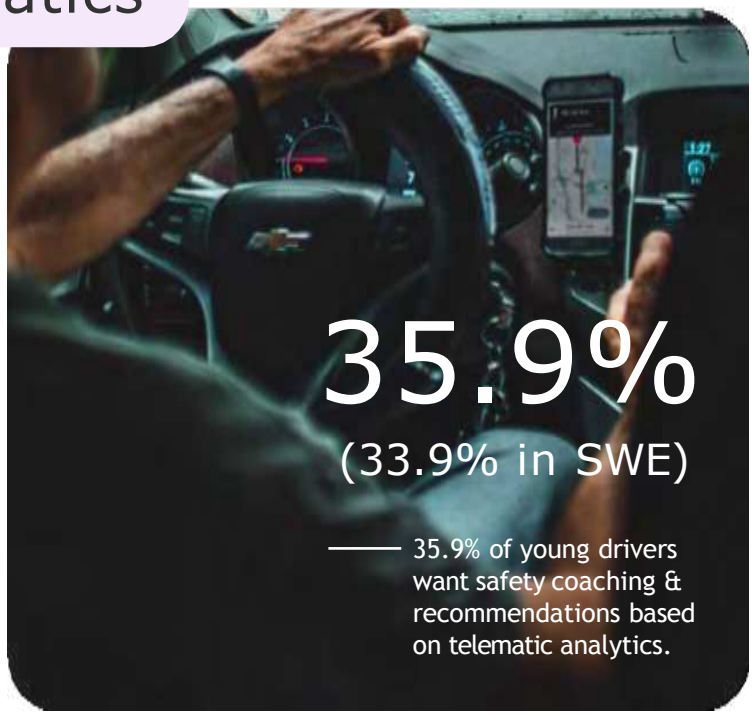
Savings accounts (22.6%) are the most popular ways young people are financially preparing for their future, followed by employer (16.6%) and personal (16.5%) pension plans.

But confidence in savings products far exceeds that of pension products – a potential opportunity for providers.

INSIGHTS ON PROPERTY & CASUALTY INSURANCE

03

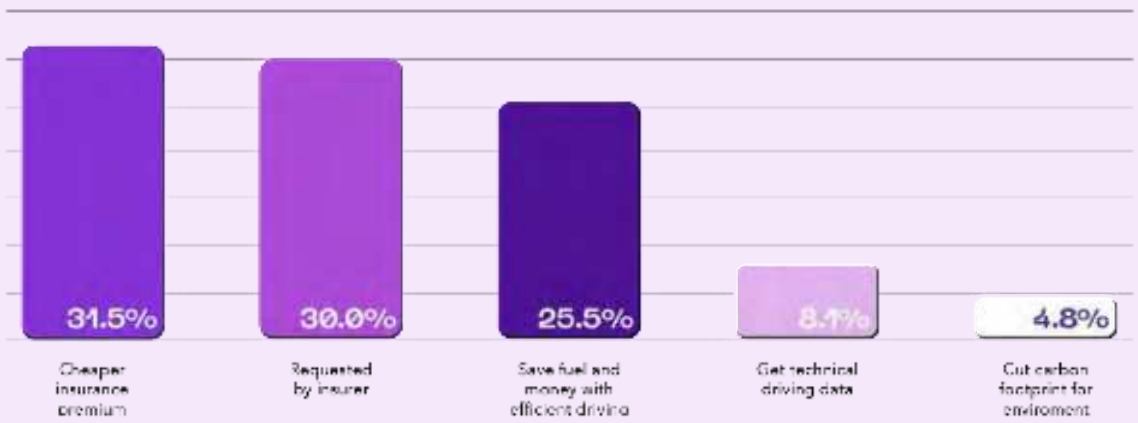
Insight 6:
Telematics



More than a third of Gen Z drivers around the world have a telematics device fitted in their car (35%), with the highest adoption in Hong Kong and China.

The leading trigger for getting a device fitted is the attraction of cheaper car insurance premiums (31.5%), with many also keen to take advantage of the driving insights telematics generates.

What motivated you to get a telematics device?



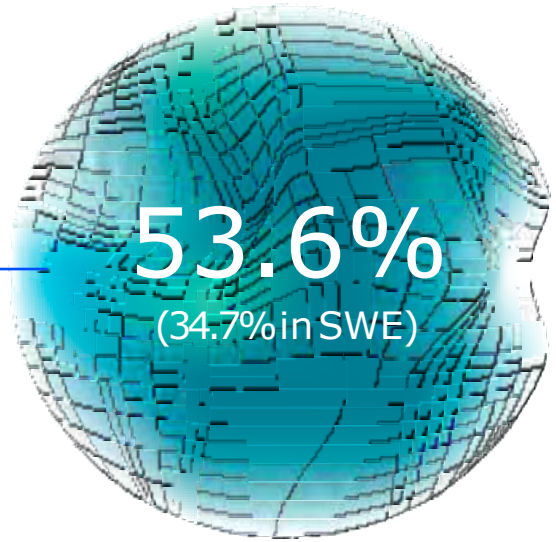
Q / What motivated you to get a telematics device on your vehicle?

What are your preferred rewards for good driving behaviour?

Q / What type of vouchers or rewards would you like to receive in exchange for good driving behaviour?

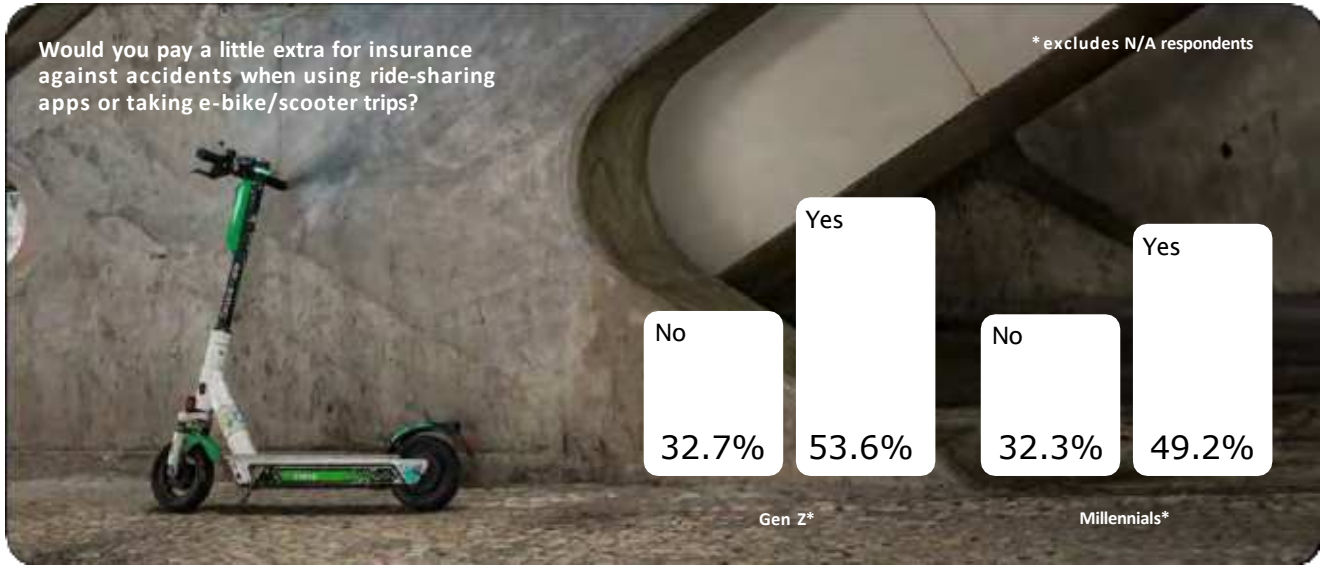
Insight 7:
Convenience **vs** value: a balancing act

53.6% of Gen Z respondents are happy to add insurance cover to their bookings when using ride sharing apps.



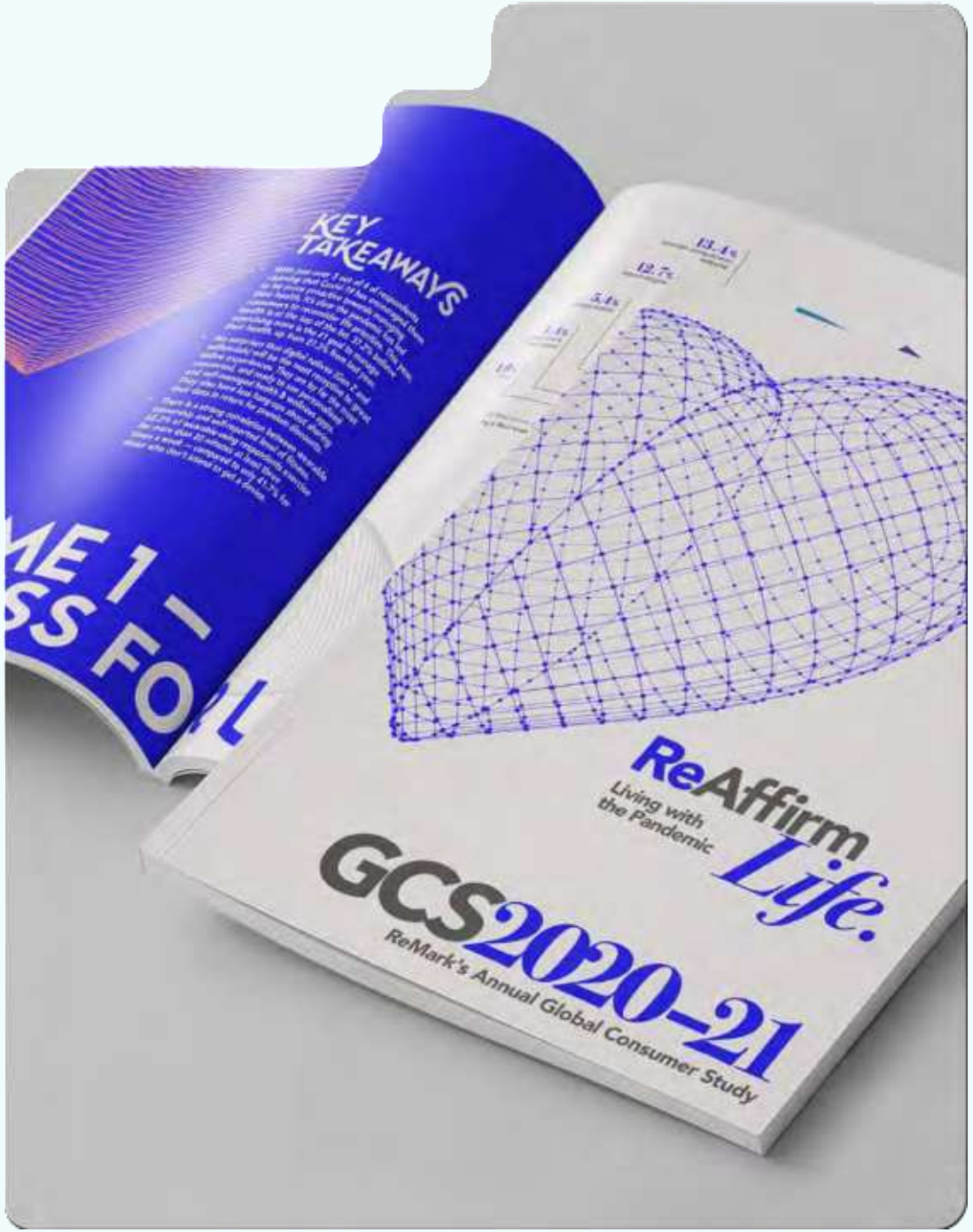
Awareness of embedded insurance is highest in Taiwan (83.2%) and lowest in Japan (51%). But for those who are aware, price is the main barrier when it comes to adding this onto their purchases.

When it comes to short-term, stackable insurance, there is broad interest in this as a concept (63.3%).



Q / Would you be interested in the type of product described below?

There are new types of insurance products that allow individuals to make small and regular contributions to an insurance policy, by dedicating a portion of their daily or monthly spending to the policy. For example, if you buy a coffee priced at $2.70, the transaction would automatically be rounded up to $3.00, and the 30 cents difference would go towards increasing your protection cover for a life/health/property insurance you had pre-selected.



10 Years of the GCS

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Purchase evolution -

the changing landscape

Changing trends:

- Socioeconomic factors dominated insurance purchases in 2014.
- Health and tech indicators surged from 2017 to 2020.

2021 shift:

- Financial and demographic factors returned as drivers.
- Homeownership, parenthood and age gained prominence.

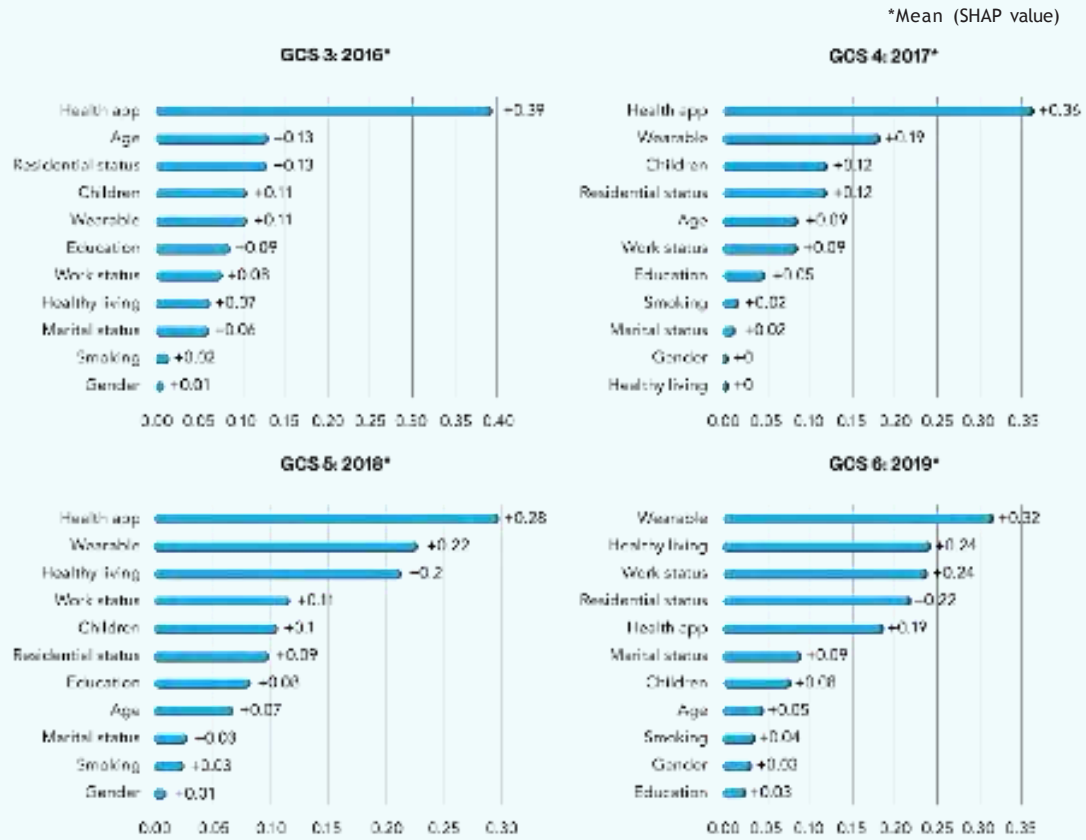
Rebalancing in 2022-2023:

- Health/tech indicators regained importance.
- Strong correlation with health metrics emerged.

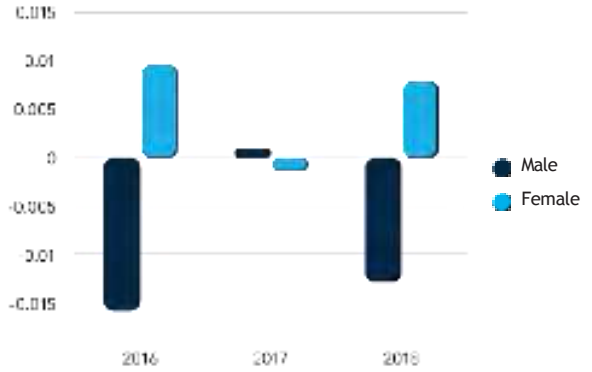
Gender influence:

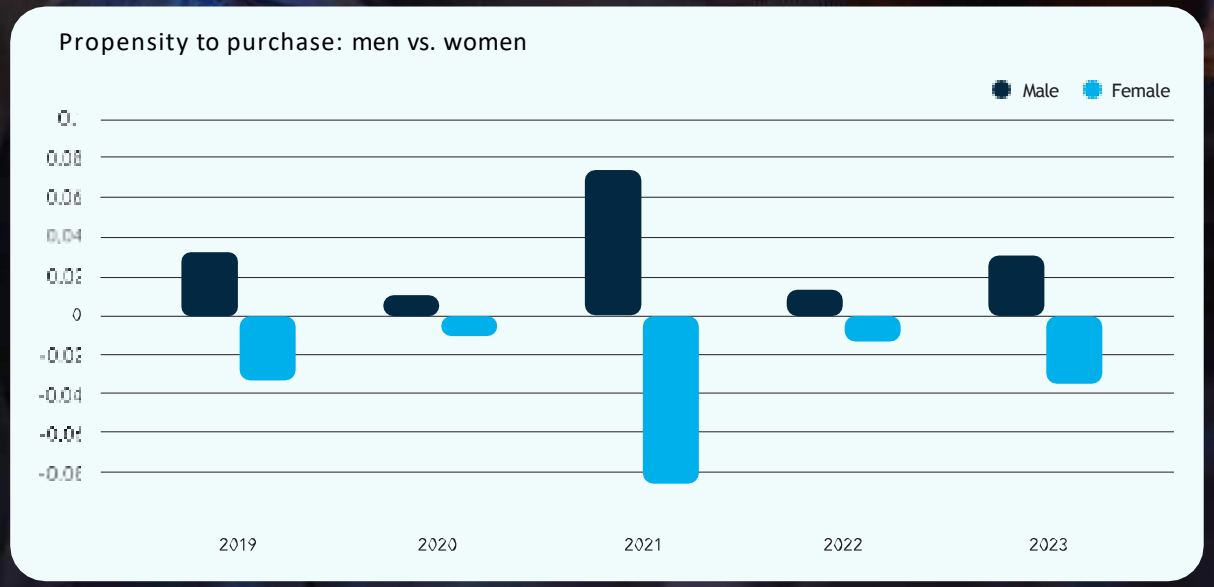
- Women played a key role in shaping decisions during 2016-2018.
- Coincided with the rise of health and tech indicators.

2017-2020 top predictive variables: health apps and wearable ownership



2016- 2018: women close the gender gap in propensity to buy





The shock of a pandemic

Pandemic-driven shift (pre-pandemic to 2023):

- Initial shift away from health-related technologies.
- More male purchasers, less health-focused, less educated and lower employment.

2023: Re-emerging health correlation:

- Health-related metrics regaining importance in insurance purchases.
- Financial/demographic variables still most prominent

Pandemic's ongoing impact:

- Coexistence of pre-pandemic and post-pandemic mindsets.
- Consumer behaviours still influenced by post-pandemic insecurity and uncertainty.
- Pandemic's influence on financial decisions remains significant.

Knowledge = Sales, the winning equation

Insurance literacy is a key predictor:

- Insurance literacy scores strongly predict consumer purchase behaviour, especially among younger demographics.

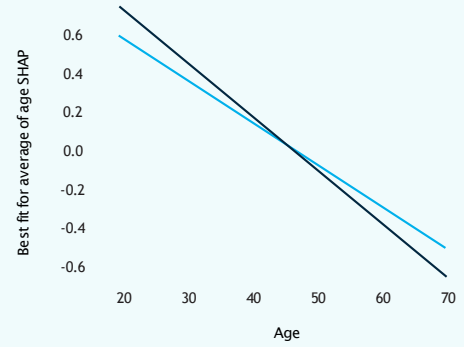
Age and insurance literacy impact purchasing behaviour:

- Ages 20-40: Higher literacy correlates with higher purchase likelihood.
- Ages 40 and above: Lower literacy linked to increased recent purchases, possibly due to financial security concerns.

Implications for insurance providers and future insights:

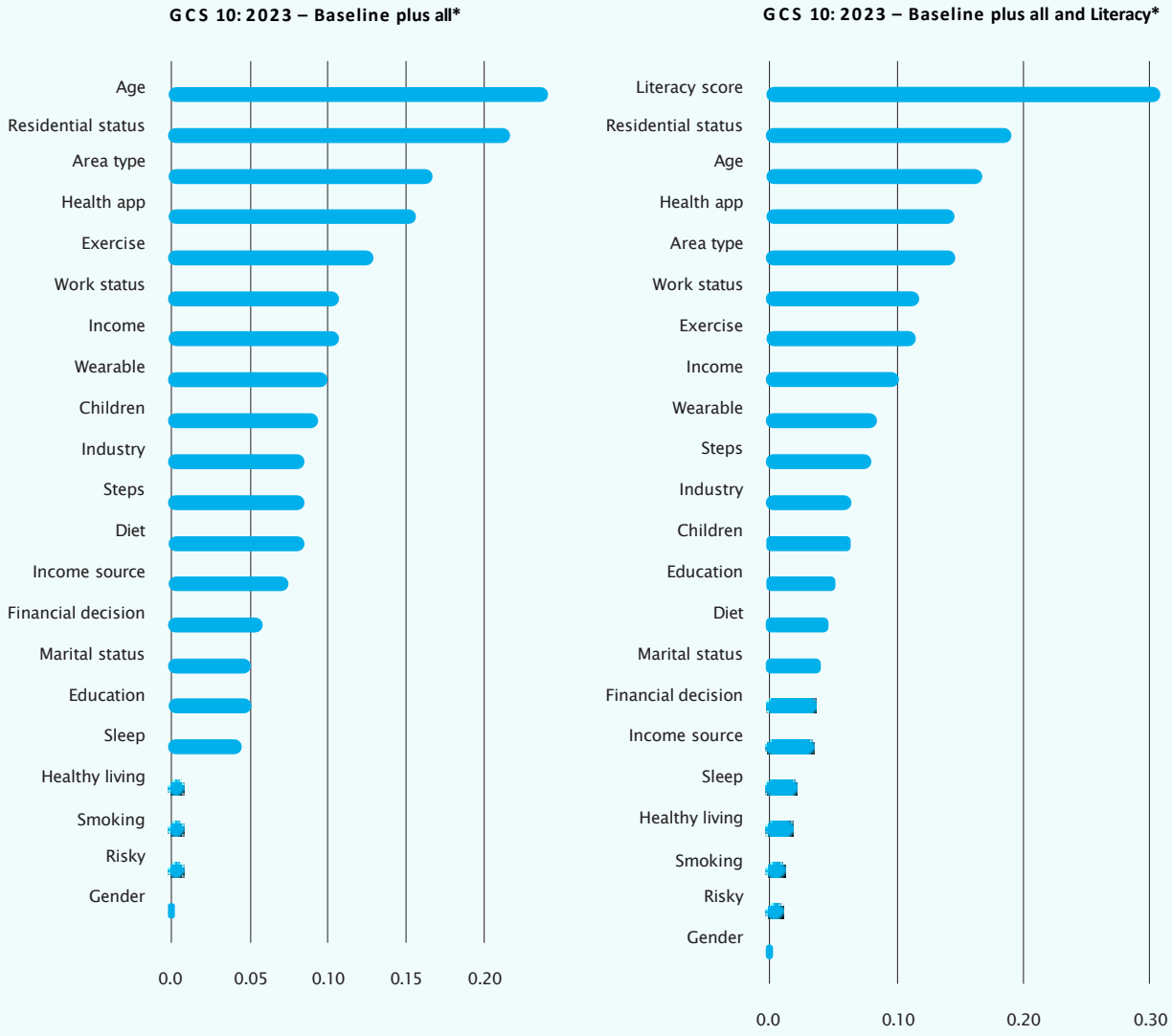
- Prioritise customer education for all age groups.
- Explore non-traditional data sources to enhance understanding of insurance purchasing behaviour.

2022: relationship between insurance literacy, age and propensity to purchase



2023: Insurance literacy dominates predictive performance

*Mean (SHAP value)



A focus on Gen Z & Millennials

1

Reviews & price

Insight:

Good online reviews, not price, drive insurance purchases among Gen Z and Millennials.

Potential:

Enhance online reputation and maintain brand image to attract younger customers.

2

Embedding insurance

Insight:

54% of Gen Z are happy to consider embedding insurance in their ride-share app.

Potential:

Offer embedded cover, tapping into evolving preferences of the younger demographic.

3

Health & purchasing

Insight:

Health-conscious living trumps income in predicting insurance adoption.

Potential:

Insurers providing a more holistic experience are more likely to attract and retain policyholders.

Q &A

Data Dashboard

About the Study

Australia | Canada | Chile | China | France | Germany | Hong Kong | India | Indonesia | Ireland | Italy
Japan | Malaysia | Mexico | Singapore | South Africa | South Korea | Spain | Sweden | Taiwan | UK | USA

This year's Global Consumer Study is based on a survey of 12,563 consumers drawn from 22 key insurance markets around the world.

Fieldwork was conducted in April 2023.

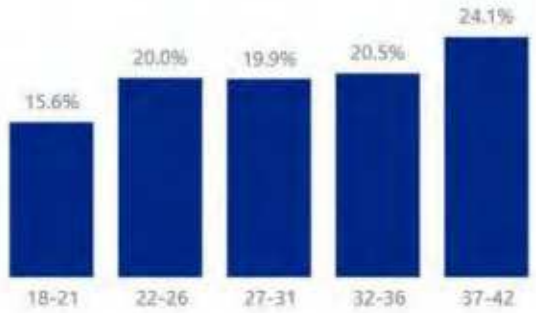
The generation groups in this dashboard are based on the definition used by the Pew Research Center:

Generation	Age range
Gen Z	Born after 1996 | Ages 18-26
Millennials	Born 1981-96 | Ages 27-42

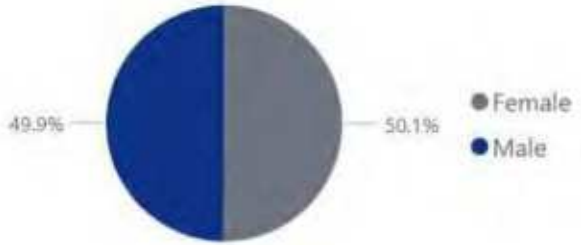
Select Insurance Market

Established | Growth

Age

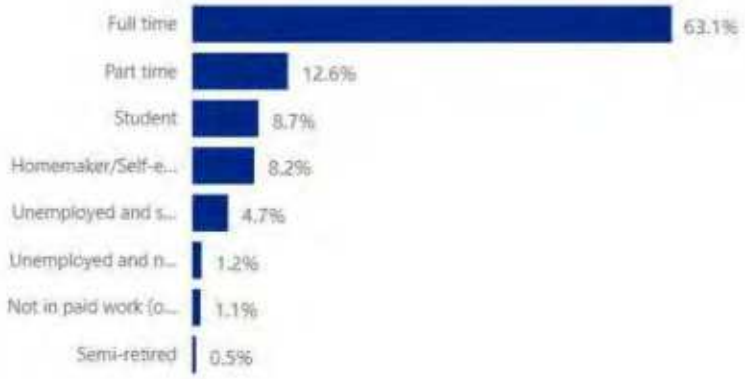


Gender



Education status

Working status



Global Consumer Study

2023–24

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SCOR Sweden Re:s Nordic Life Insurance Conference

Stockholm 13 okt 2023

Aktuariepriset

Asmir Prepic
Actuary/Data & Analytics @ EY

Application and Comparison of Machine Learning and Traditional Methods to Insurance Pricing in Scarce Data Environments

Asmir Prepic

Actuary/Data & Analytics @ EY

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5 Going Forward

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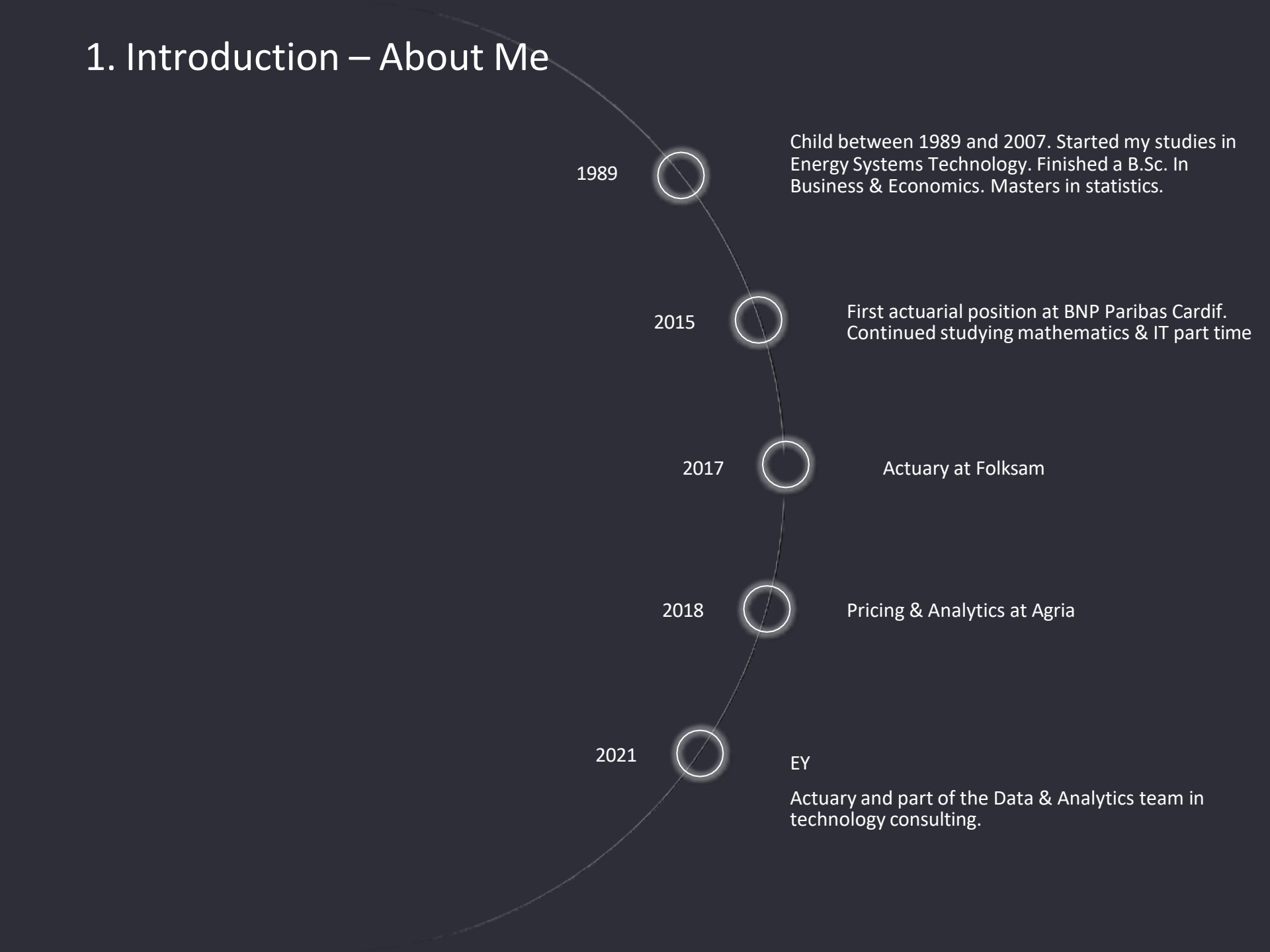
1. Introduction – About Me



1989

Child between 1989 and 2007. Started my studies in Energy Systems Technology. Finished a B.Sc. In Business & Economics. Masters in statistics.

2015

First actuarial position at BNP Paribas Cardif. Continued studying mathematics & IT part time

2017

Actuary at Folksam

2018

Pricing & Analytics at Agria

2021

EY

Actuary and part of the Data & Analytics team in technology consulting.

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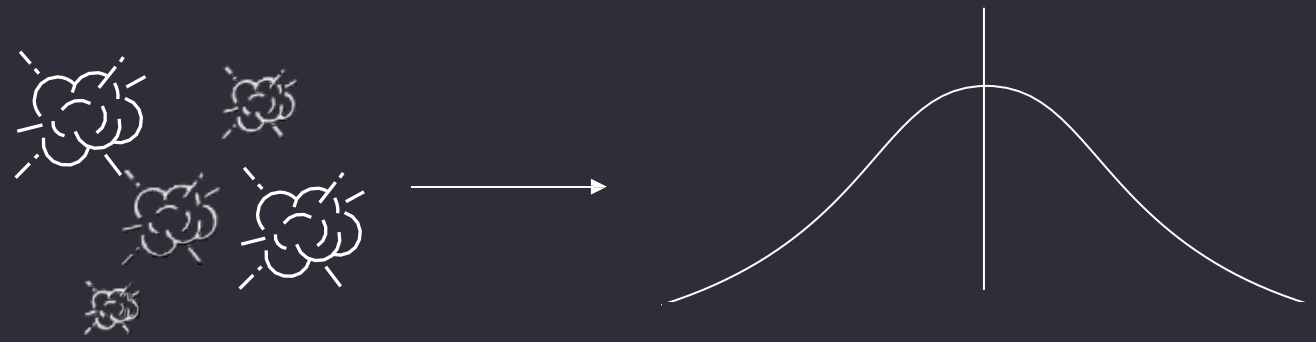
2. Background



Objective

Transfer of economic risk from the policyholder to the insurance company. In exchange for an insurance premium.

Statistical Properties

Loss of the insurance company is a sum of a large number of comparatively small independent losses. More predictable than individual losses.

Methods

Statistical models are needed since expected losses vary between types of policyholders and the insured objects.

2. Background – Challenges in Insurance Pricing

Data

Quality and Accuracy
Volume management
Dimensionality

Modelling

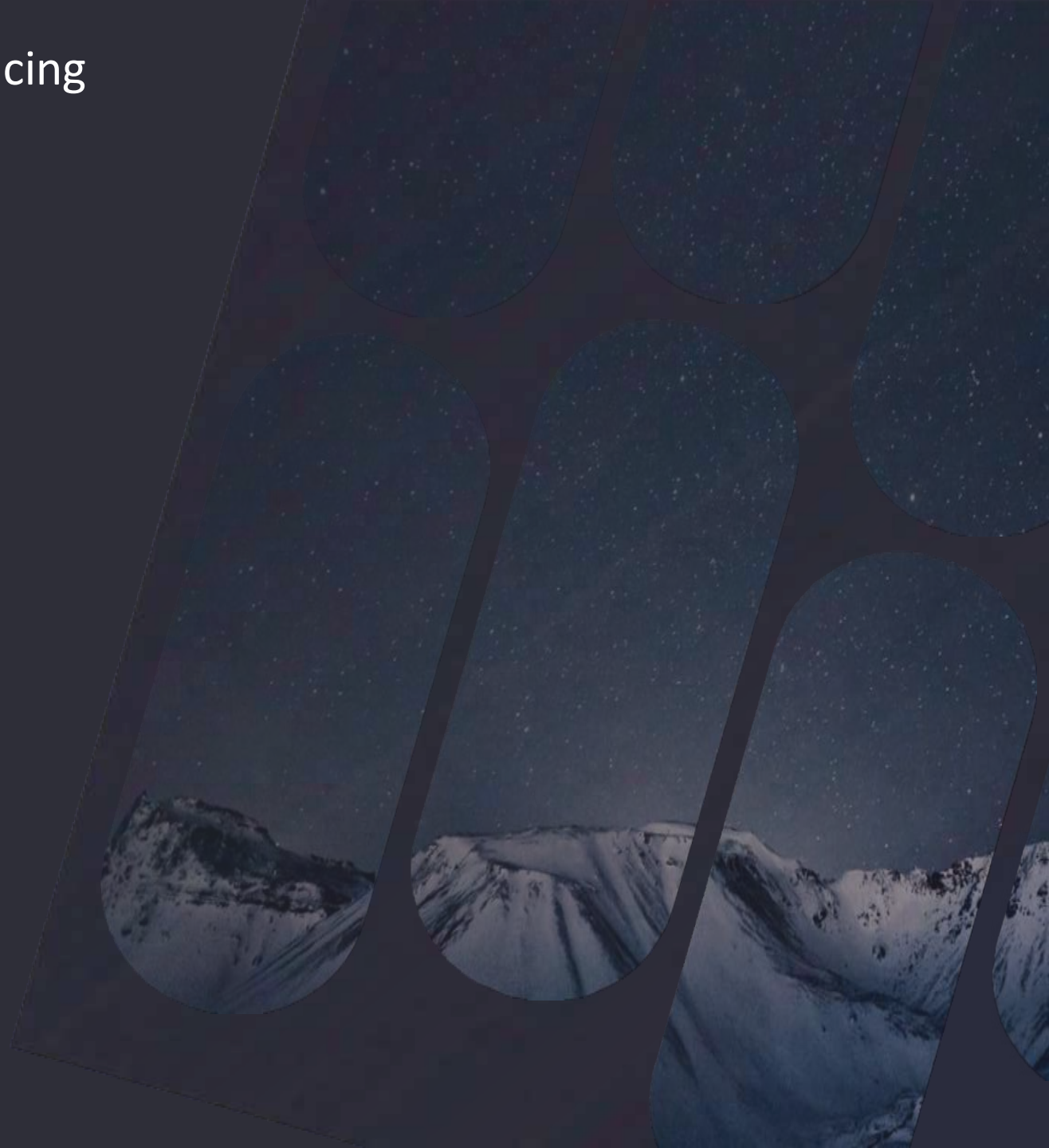
Complexity
Calibration
Dimensionality

Market

Customer Expectations
Regulatory changes

Environment

Interest rates
Emerging risks
Environment



2. Background – Challenges in Insurance Pricing

Modelling

$$Y = f(\boldsymbol{X}; \boldsymbol{\theta}) + \boldsymbol{\epsilon}$$

2. Background – Challenges in Insurance Pricing

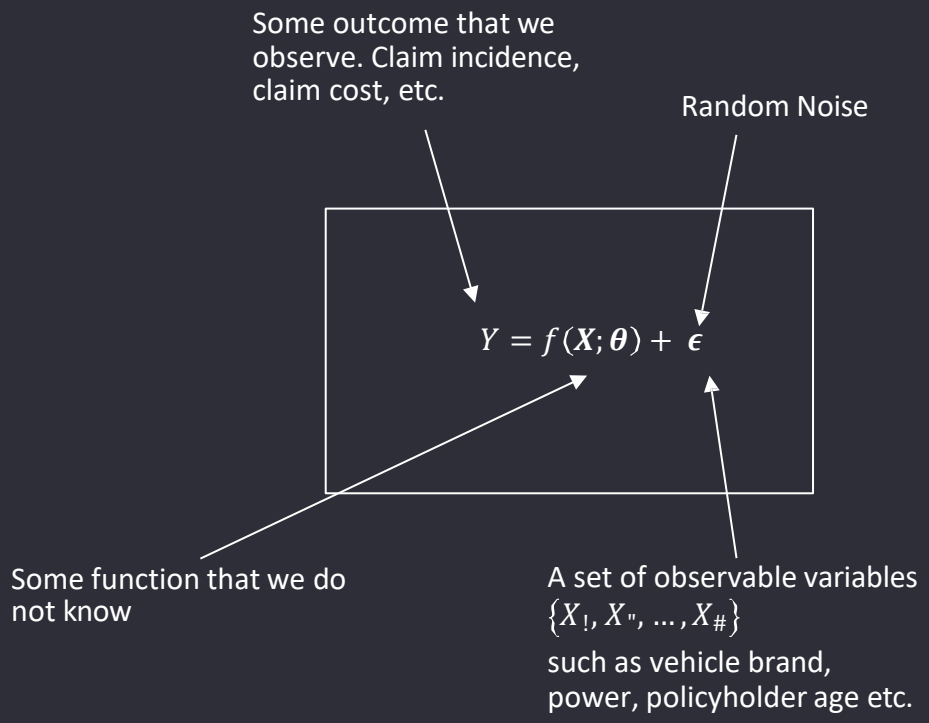
Modelling

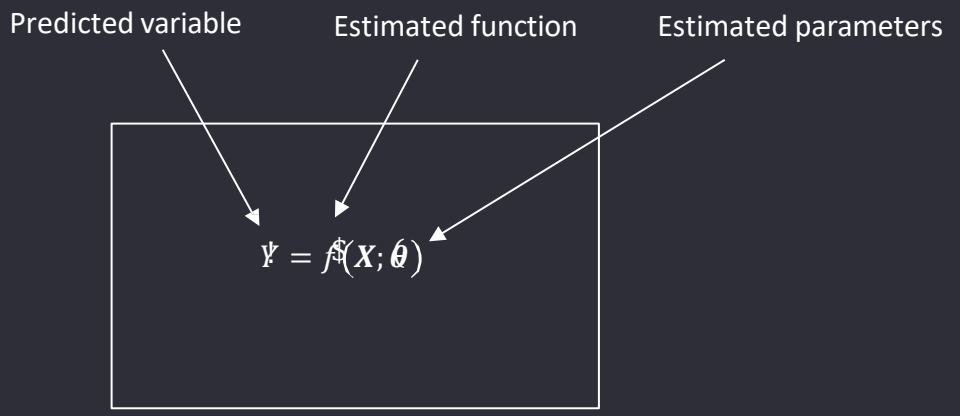
$$Y = f(\boldsymbol{X}; \boldsymbol{\theta}) + \boldsymbol{\epsilon}$$

$$\hat{Y} = \hat{f}(\boldsymbol{X}; \hat{\boldsymbol{\theta}})$$

2. Background – Challenges in Insurance Pricing

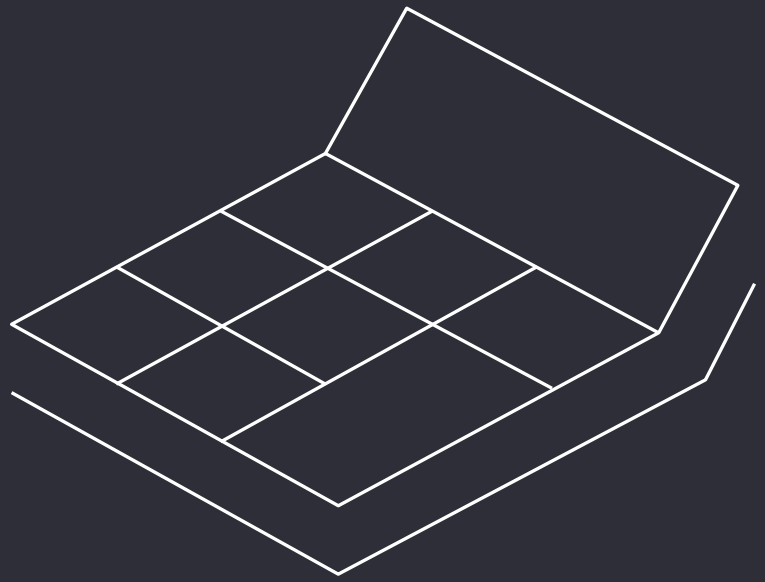
Modelling





2. Background – Traditional vs. “New” models

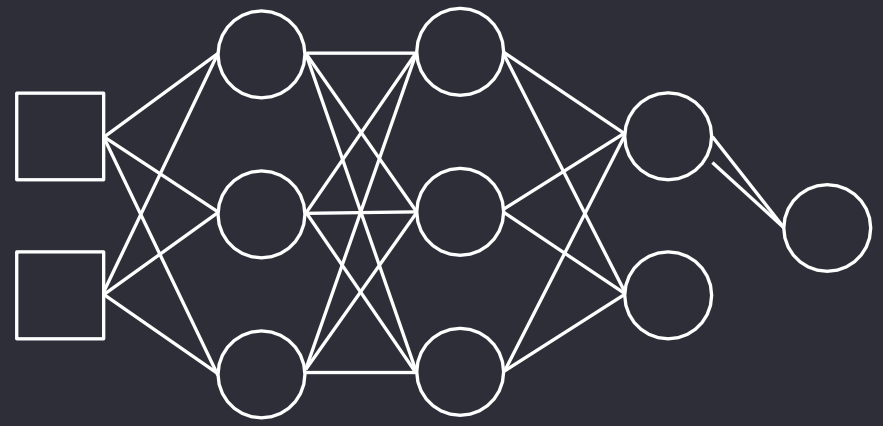
Historically the Generalized Linear Model has been the backbone of insurance pricing. GLM offers simplicity and predictability making it the go-to-choice for years.



Pros:
- Well established
- Simplicity
- Consistency
- Assumptions of distributions
- Provides confidence intervals.

Cons:
- May not capture intricate patters in risk
- Less flexible in adapting to data trends

Advancements in technology and especially increased computer power, complex models such as neural networks and random forests emerged. These promise better accuracy and insight.



Pros:
- Higher Accuracy
- Flexibility
- Rich insights

Cons:
- Requires larger dataset for optimized performance
- Difficult interpretability
- Risk of loosing generalization

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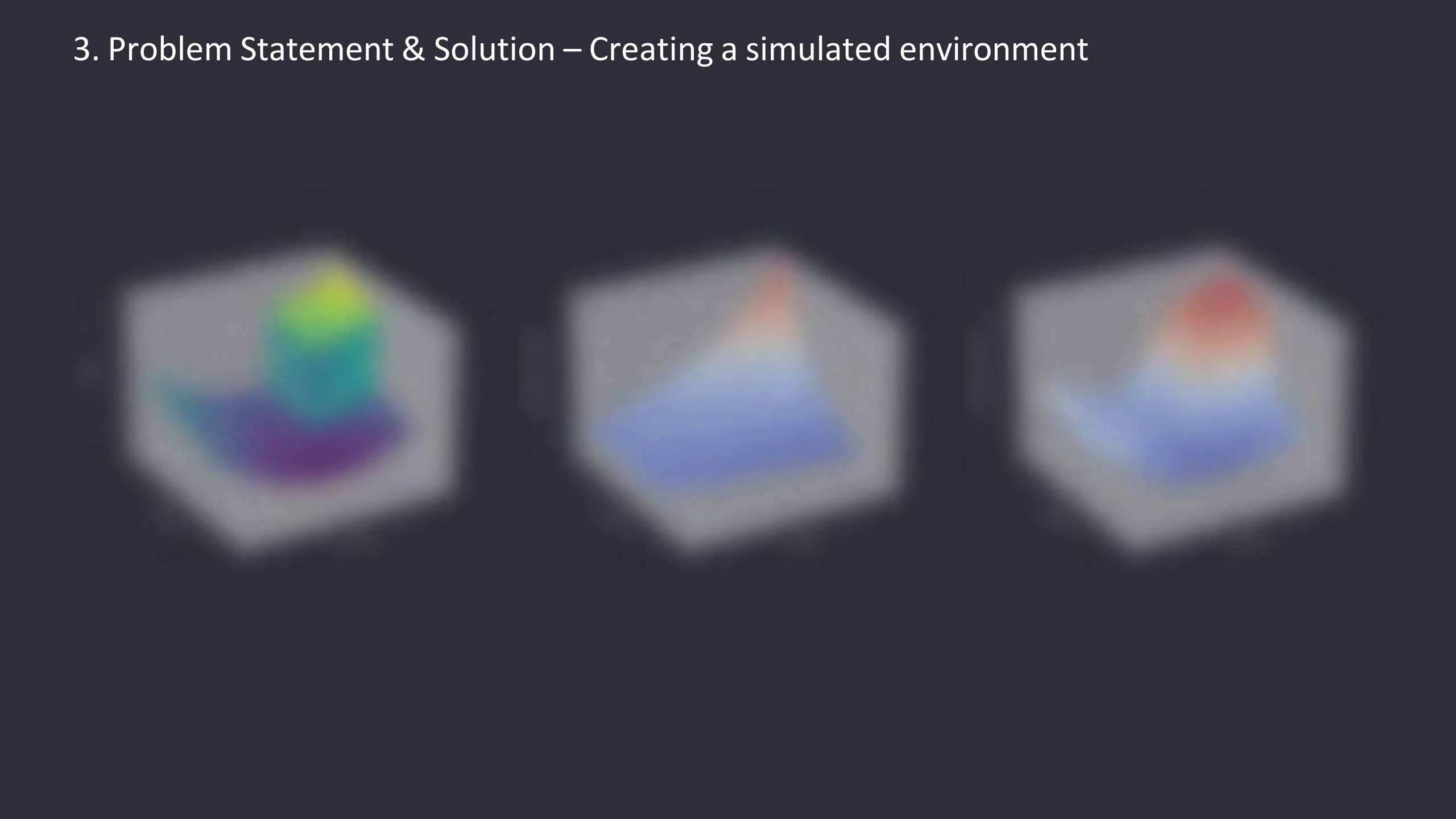
3. Problem Statement

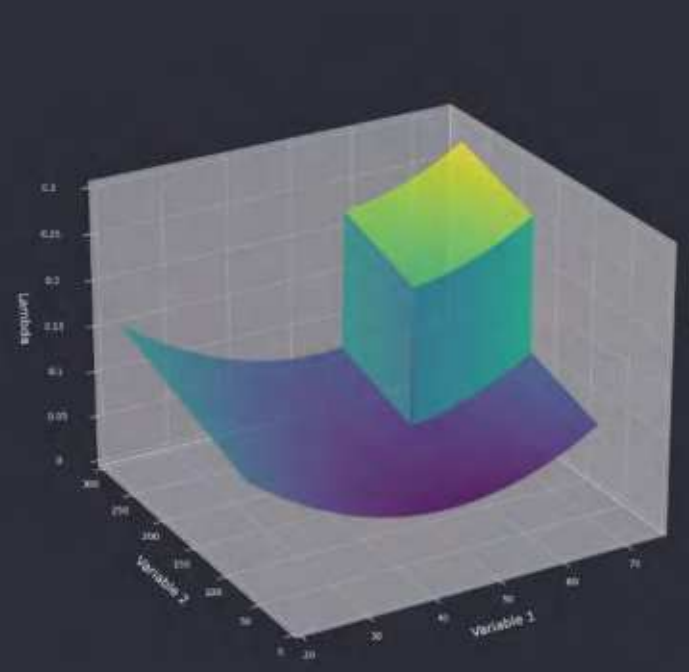
How do Machine Learning methods compare to GLM’s when data is limited in insurance pricing, and can we do something to improve the estimations?

3. Problem Statement & Solution – Creating a simulated environment



3. Problem Statement & Solution – Creating a simulated environment

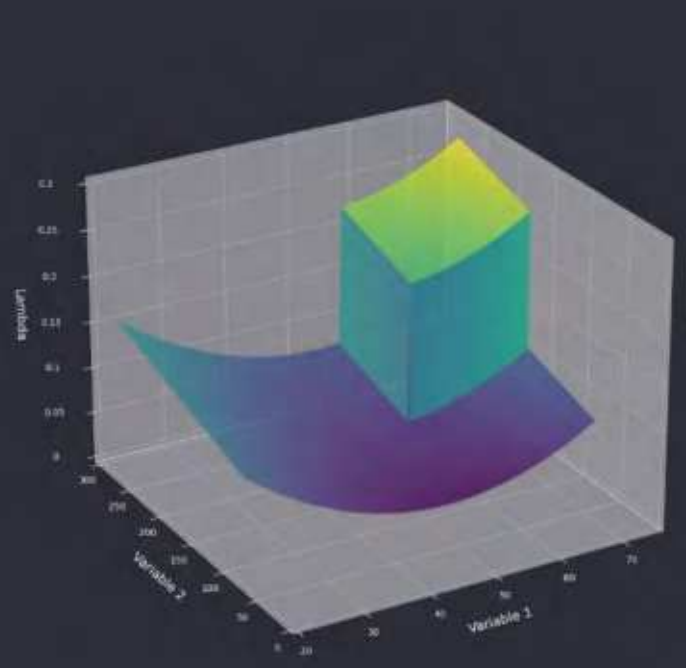
Underlying lambda function (incidence rate of insurance claims)



Incidence rate is simulated in a setting where we have full knowledge of the underlying data generating process. One risk factor is linearly increasing, and the other risk factor is linearly increasing

3. Problem Statement & Solution – Creating a simulated environment

Underlying lambda function (incidence rate of insurance claims)



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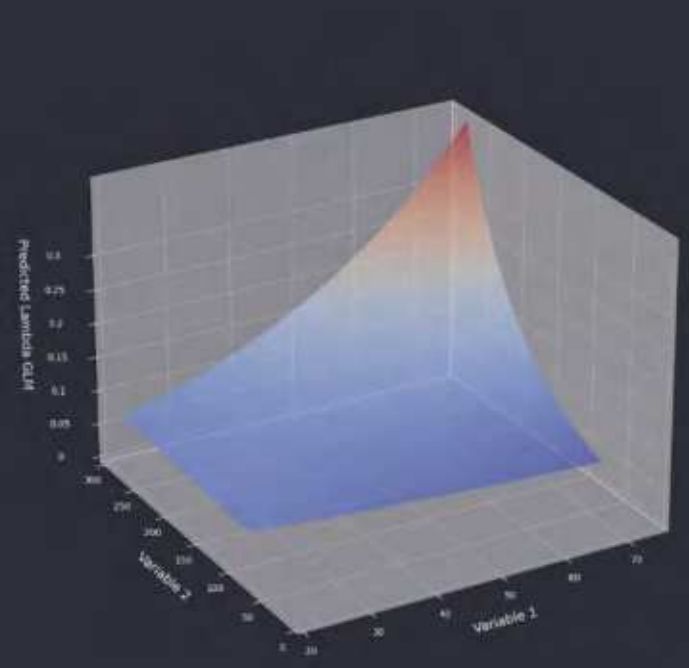
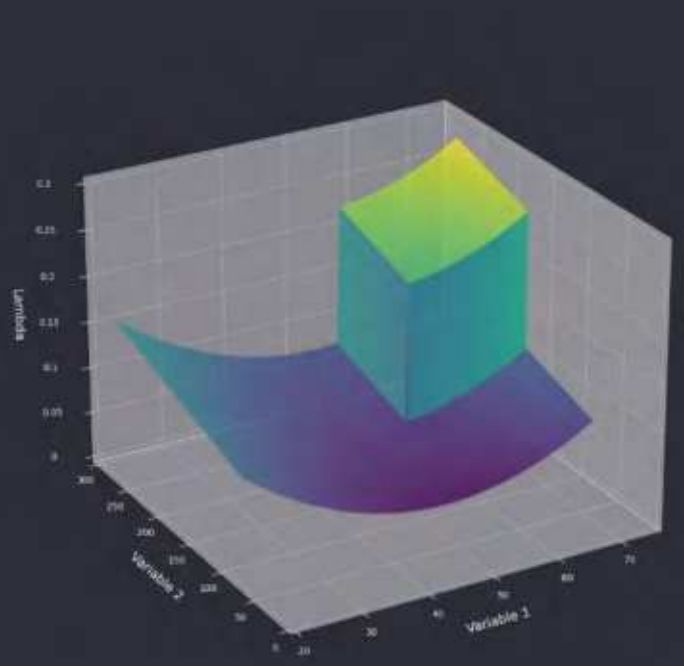
Conventional Generalized Linear Model



GLM fails to capture the full relationship between the variables in a simple setting

3. Problem Statement & Solution – Creating a simulated environment

Underlying lambda function (incidence rate of insurance claims)



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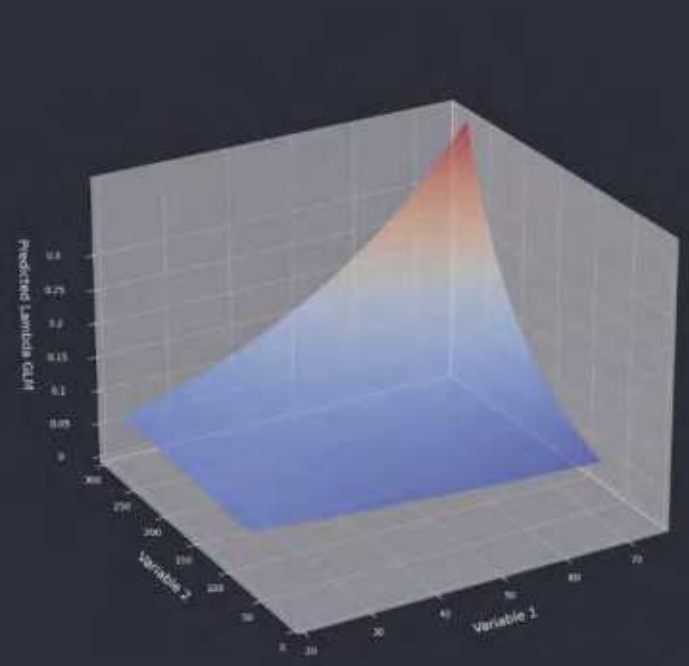
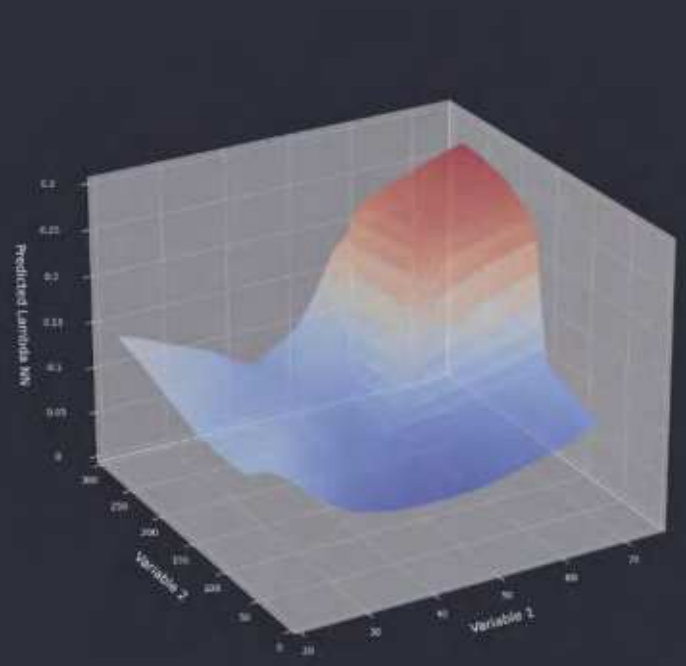


GLM fails to capture the full relationship between the variables in a simple setting

"Simple" Machine Learning Model



Improved fit to the function surface

3. Problem Statement & Solution – Approach in a known environment

1

Simulate data according to a distribution where the proportion of observations where risk is higher. Policyholders with ages < 25 and > 65 are small.

2

Simulate claims according the risk function surface where the data generating process is known.

3

Estimate the risk function without oversampling with different specifications of GLM's and Machine Learning algorithms.

4

Apply an oversampling technique to generate more observations where the risk is high, and exposure is low.
In this case SMOTE is applied.

5

Estimate the risk function with additional synthetic data and evaluate the performance of the models.

3. Problem Statement & Solution – Approach in a known environment

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3. Problem Statement & Solution – Approach in a known environment

1

Simulate data according to a distribution where the proportion of observations where risk is higher. Policyholders with ages < 25 and > 65 are small.

2

Simulate claims according the risk function surface where the data generating process is known.

3

Estimate the risk function without oversampling with different specifications of GLM's and Machine Learning algorithms.

4

Apply an oversampling technique to generate more observations where the risk is high, and exposure is low.
In this case SMOTE (oversampling) is applied.

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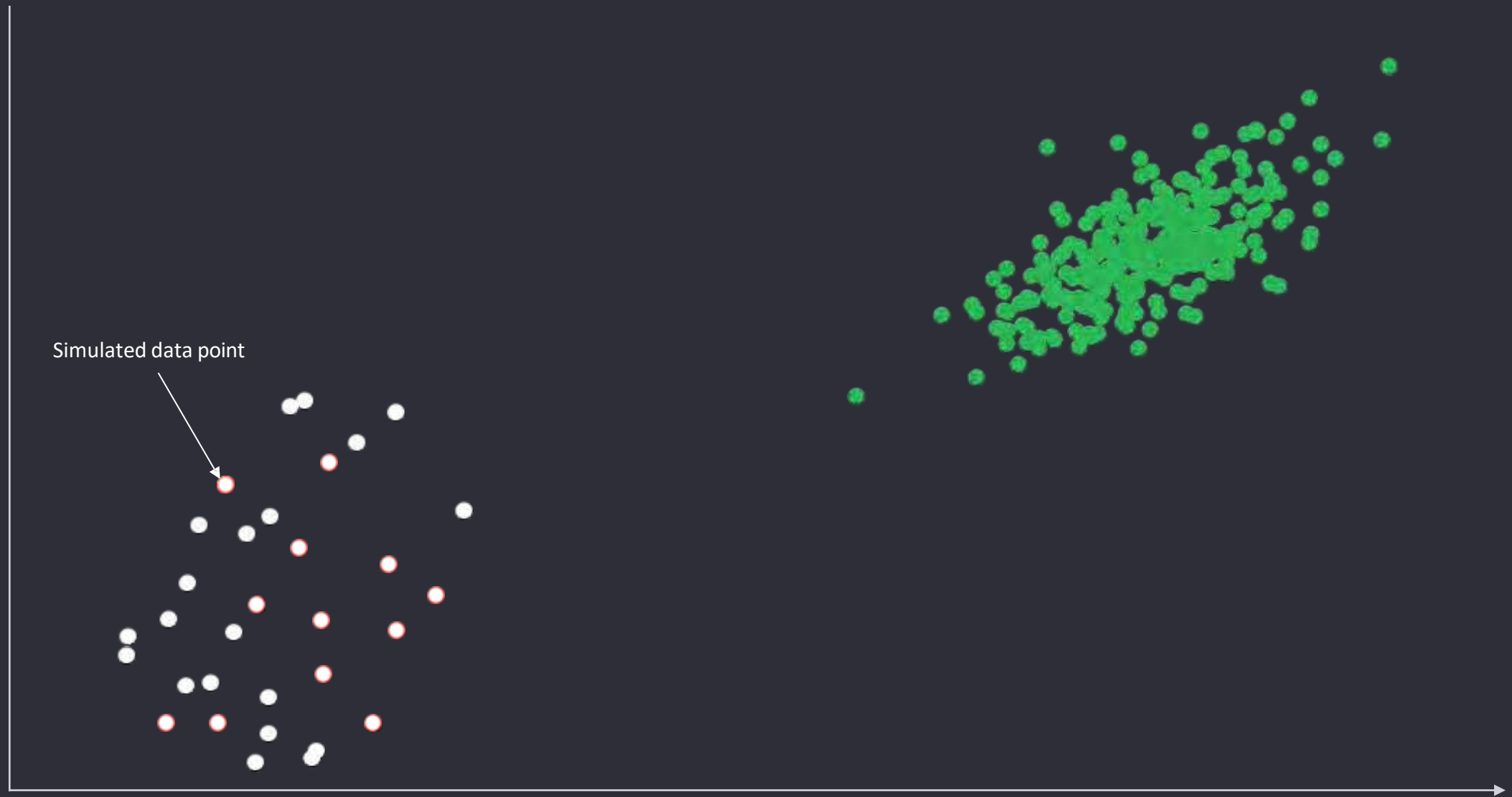
3. Problem Statement & Solution – Approach in a known environment

Synthetic Minority Oversampling Technique - SMOTE

3. Problem Statement & Solution – Approach in a known environment

SMOTE



3. Problem Statement & Solution – Approach in a known environment

SMOTE

One of many algorithms to simulate new data points based on data from observed data

Algorithm 5 SMOTE Algorithm

Define $D = (\boldsymbol{X}_i, Y_i)$ as the training sample for observation $i = 1, \ldots, n$ in the data set. Define for example extreme high cases of the response as $Y > t$ where t is for example the number of claims observed or a observed level of the frequency. Define also a relevance function such that observations above t receive relevance 1 while values below t receive relevance 0 meaning that the extreme values are more relevant in the data. This creates a subset of D, $D_r = \{(\boldsymbol{X}_i, Y_i) \in D : Y_i \geq t\}$ which are used to create synthetic observations.

0. Define D, D_r as the data set of interest and the data set considered under represented, t as the threshold defining when Y is considered extreme, $\%o$ as the percentage of oversampling of D_r i.e. how many extra samples should be created with response of interest, k as the number of nearest neighbours of each observations should be used to generate new observations.

nng ← number of new observations to be generated
for all observations $\in D$ **do**
  1. Set nns ← kNN(k, observation, $D_r \setminus$ observation)
  for i in $1, \ldots,$ nng **do**
    2. Randomly choose $\boldsymbol{X}$ with replacement from nns
    for all $(X_i, Y_i) \in (\boldsymbol{X}, Y)$ **do**
    if X_i is numeric **then**
    $X_{i\,\text{diff}} \leftarrow X_{i\,\text{observation}} - X_i$ // Difference between the numeric value of the explanatory variable X_i of the observation and of the kNN X_i
    $X_{i\,\text{new}} \leftarrow X_{i\,\text{observation}} + \text{RANDOM}[0, 1] \times X_{i\,\text{diff}}$
    else
    $X_{i\,\text{new}} \leftarrow$ randomly select among $X_{i\,\text{observation}}$ and X_i
    end if
    end for
    3. Calculate $d_1 \leftarrow \text{HEOMDistance}(X_{i\,\text{new}}, X_{i\,\text{observation}})$ and $d_1 \leftarrow \text{HEOMDistance}(X_{i\,\text{new}}, X_i)$ to find the new target value.

$$Y_{i\,\text{new}} \leftarrow \frac{d_2 \times Y_{i\,observation} + d_1 \times Y_i}{d_1 + d_2}$$

  end for
end for

3. Problem Statement & Solution – Summary of approach

Datasets

Simulated data with known risk properties without oversampling

Simulated data with known risk properties with oversampling

Real dataset from Wasa motorcycle insurance without oversampling

Real dataset from Wasa motorcycle insurance with oversampling

Applied Models

Generalized Linear Models with different specifications

Generalized Additive Models with different specifications

Random Forests

Generalized Additive Models with different specifications

Regression Trees

Artificial Neural Networks

Scope

A total of 410 different models fitted and compared in each of the total 4 datasets.

The fitting algorithms are run approx. 16000 times for the specifications to be evaluated

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3 Problem Statement & Solution

4 Results

5 Going Forward

1

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Background

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Results

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Going Forward

4. Results – Summary & Conclusions

Data	Oversampling	Best Performance*
Simulated data	No	GLM
	Yes	Regression Tree
Wasa insurance data	No	GLM
	Yes	Random Forest

* Out of sample

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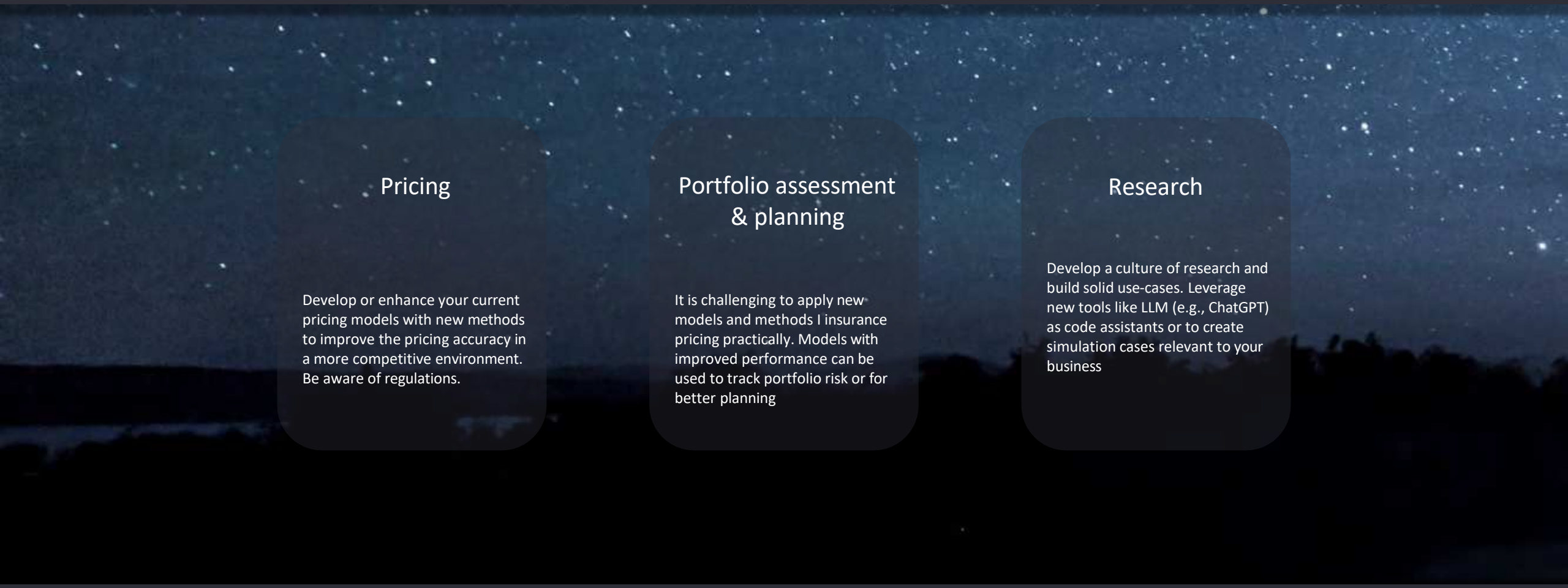
5. Going forward



Pricing

Develop or enhance your current pricing models with new methods to improve the pricing accuracy in a more competitive environment. Be aware of regulations.

Portfolio assessment & planning

It is challenging to apply new models and methods I insurance pricing practically. Models with improved performance can be used to track portfolio risk or for better planning

Research

Develop a culture of research and build solid use-cases. Leverage new tools like LLM (e.g., ChatGPT) as code assistants or to create simulation cases relevant to your business

Thank you for listening!

Mattias Ribbing

Psykisk hälsa och arbetsförmåga

SCOR Sweden Re:s Nordic Life Insurance Conference

DIN HJÄRNA 2.0

- NYA VERKTYG FÖR VÄLMÅENDE OCH PRESTATION I EN DIGITAL VARDAG

SCOR
The Art & Science of Risk

13/10 2023

Mattias Ribbing

1 timme siffror

OFFICIELLT RESULTAT **1060**

**67285476091472958673760275726276237562637181395959374929464264857390595472657303595962515396070429374686020203045725344028603860192755826590801748602759682762659706876826566072769673763765711048598739583775621807286856365867468291054769376019304244028645285926573920565737661253879840265927591759276027607693755244165071397047276983669463683669229682397763767251659766563628663892049794020867473769382756437353856345276976743876439273628683708586738597905483737967998309758939695947360968215089465684936685473652517486932675583272659584632638686643637684938692736576443434534532967303046465430200450640405873920303504939292989385934846473026306060430308597506637296069836276057262869846275968364693222626486956275946265941268572662760472635483202950573625265927265660398475745325585845326595836237596746354778843626496755363867869797534060326584372545578991739566265960479402747696037378879309396979975303586536959583757643516375969074728296957373496957362663637299625593725256026493860382659698404947335257583276646352528406926594068605937524193860226592659265927

FOKUS, FLEXIBILITET OCH FLER TIMMAR OM DYGNET!?

Upplevelse

Simulerad upplevelse

En bild per sida

Closing

SCOR Sweden Re:s Nordic Life Insurance Conference

October 13, 2023

Svein Børre Solvang, CEO

FORWARD
2026
Driving
value creation.
Shaping
the reinsurer
of tomorrow.

Livförsäkringskonferens 14 oktober 2022

- Tackmail till deltagarna
- Utvärderingen gick till 191 personer
- Enkät på 7 frågor med fritext

Feedback on the 2022 Conference

- Asle Toje world class even though very depressing
- Torbjørn Åkerstedt very funny (unintentional) about sleep
- Would like to learn more about sleep
- Finally, an Actuary (Lina Palmborg) who could communicate with normal people
- Still impossible to understand the actuaries
- Great meeting place
- Food and drinks a disaster. The desert, what on earth was it?
- Food very good
- Enjoyed the longer breaks
- Bring more wine to the tables
- Well done SCOR Sweden Re - Fantastic

- Presentation messy and impossible to follow
- One of the most boring persons I ever have listened to
- His ego is out of proportion
- A very nice guy

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Please give us your valuable feedback also in 2023

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Presentations available on our
website from 17.00
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INSURANCE TOGETHER