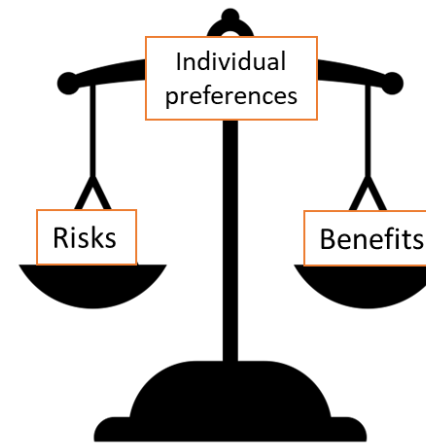


Evidence Based Medicine in Geriatrics: Statins for Primary Cardiovascular Disease Prevention in Older Adults



Ariela R. Orkaby, MD, MPH

Geriatrics & Preventive Cardiology

New England GRECC, VA Boston Healthcare System

Division of Aging, Brigham & Women's Hospital

Assistant Professor of Medicine, Harvard Medical School



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- VA CSR&D CDA-2
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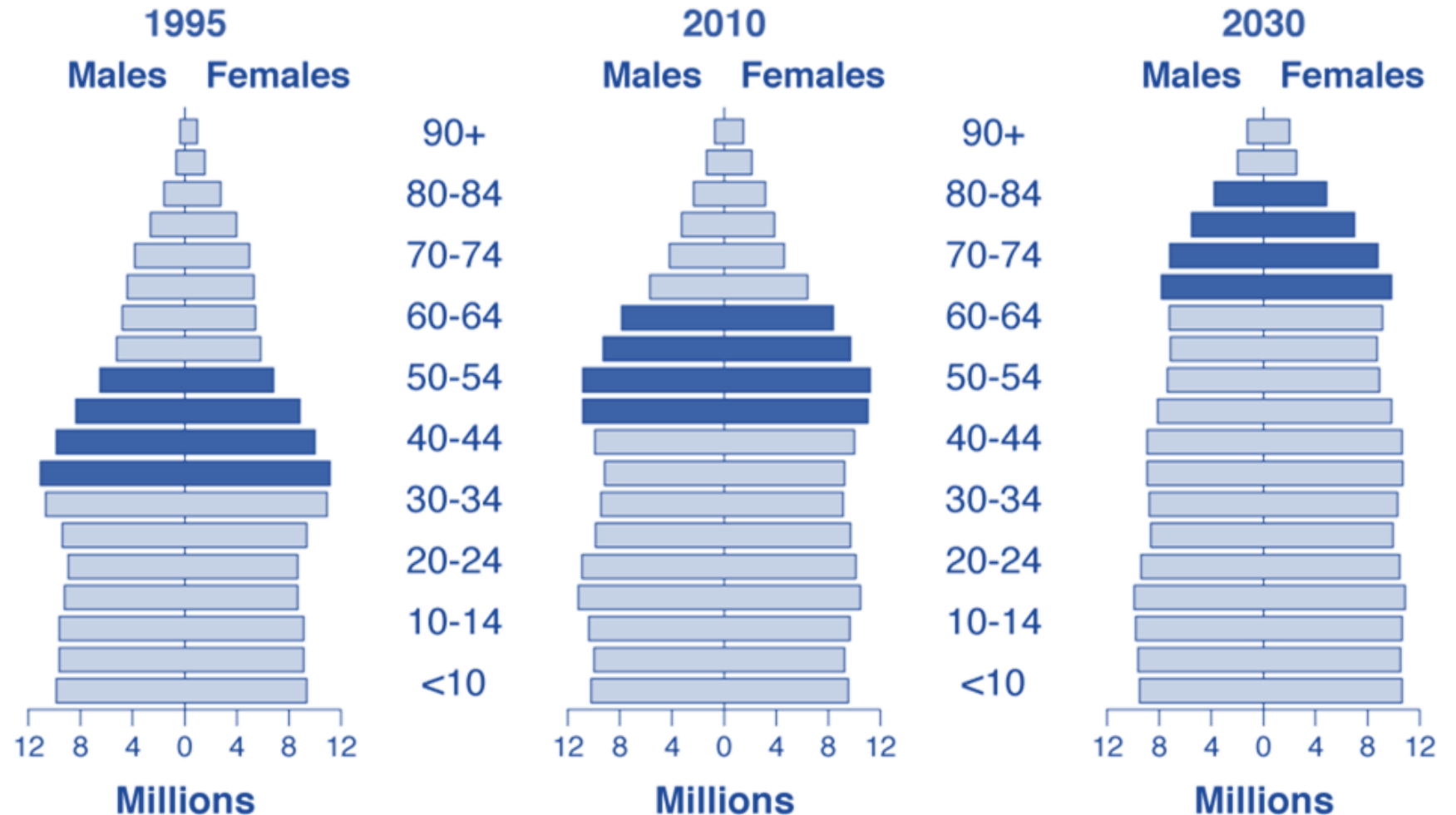
- “The average 70-something is not bedridden. ... If the pandemic doesn’t change life expectancy, half the U.S. population will live past 80 years of age.”
- Dr. Louise Aronson, NEJM 2020

The US Demographic is changing: those >85 are the fastest growing segment of the population

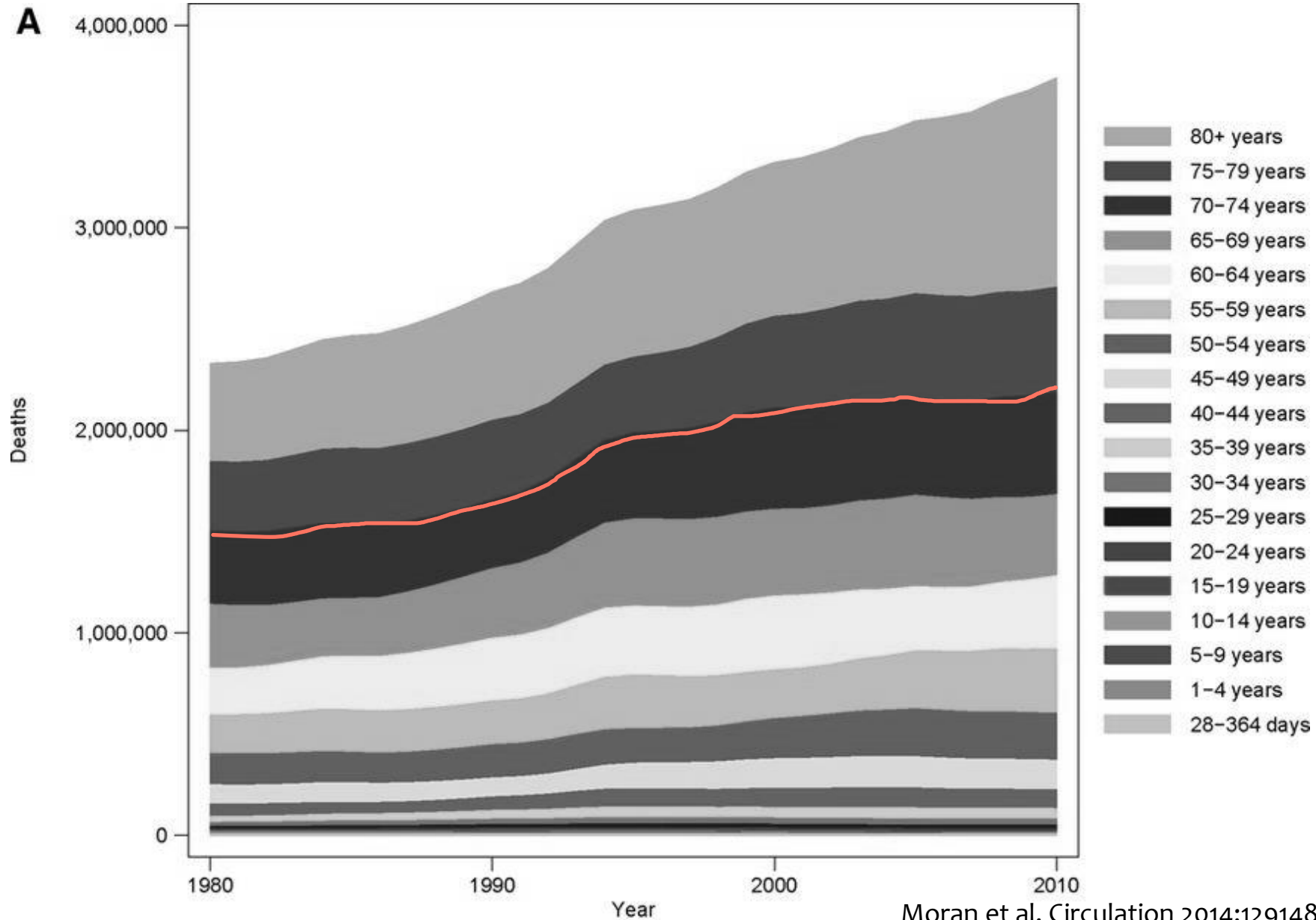
Baby Boomers are just now turning 75!

(born 1946-1964)

The changing U.S. demographic is in part due to gains in average life years, but also in the influx of baby boomers (**Blue**) born between 1946 and 1964.



Global burden of IHD: 1980-2010



Patient 1: Mr. J



- 82M, independent, hiker
- HL, HTN, glaucoma, family history of CVD
- Former smoker, glass of wine with dinner
- **Medications:** Amlodipine 5mg, Rosuvastatin 20mg, Latanoprost drops
- **Total Cholesterol:** 180 mg/dL
- **LDL-C:** 70 mg/dL
- **HDL-C:** 60 mg/dL
- **Triglycerides:** 95 mg/dL

Patient 2: Ms. G

- 80F, independent, uses cane for stability
- HTN, HL, DM, anxiety, arthritis, h/o colon cancer
- Former smoker, no alcohol
- **Medications:** Metformin 1000mg, Losartan 50mg, Sertraline 50mg, Acetaminophen 1000mg
- **Total Cholesterol:** 240 mg/dL
- **LDL-C:** 189 mg/dL
- **HDL-C:** 55 mg/dL
- **Triglycerides:** 199 mg/dL



Patient 3: Mrs. Y



- 81F, wheelchair for distances
- Assistance with bathing, dressing
- AF, HTN, HL, mild dementia, CKD, osteoporosis, malnutrition, urinary incontinence
- Never smoker, no alcohol
- **Medications:** Donepezil 10mg, Lisinopril 5mg, Pravastatin 20mg, Oxybutinin 10mg, Warfarin 5mg, Vitamin B12, Alendronate 70mg/wk
- **Total Cholesterol:** 220 mg/dL
- **LDL-C:** 130 mg/dL
- **HDL-C:** 40 mg/dL
- **Triglycerides:** 150 mg/dL

A blue speech bubble graphic with a white question. The bubble has a dark blue shadow on the left side, giving it a 3D effect. The text is centered within the bubble.

How can we individualize
care?

Estimator	Clinicians	Patients	About
ASCVD Risk Estimator*			
10-Year ASCVD Risk <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>42.8% <small>calculated risk</small></p> <p>24.0% <small>risk with optimal risk factors**</small></p> </div> <div style="border: 2px solid red; padding: 5px;"> <p>24.0% <small>risk with optimal risk factors**</small></p> </div> </div>		Lifetime ASCVD Risk <p>⚠ Lifetime Risk Calculator only provides lifetime risk estimates for individuals 20 to 59 years of age.</p>	
Recommendation Based On Calculation			

Gender

Male Female

Age

79

⚠ Note: Lifetime risk is only calculated for the 20 to 59 year range

Race

White
 African American
 Other

Total Cholesterol (mg/dL)

170

HDL - Cholesterol (mg/dL)

42

Systolic Blood Pressure

146

Treatment for Hypertension

Yes No

Diabetes

Yes No

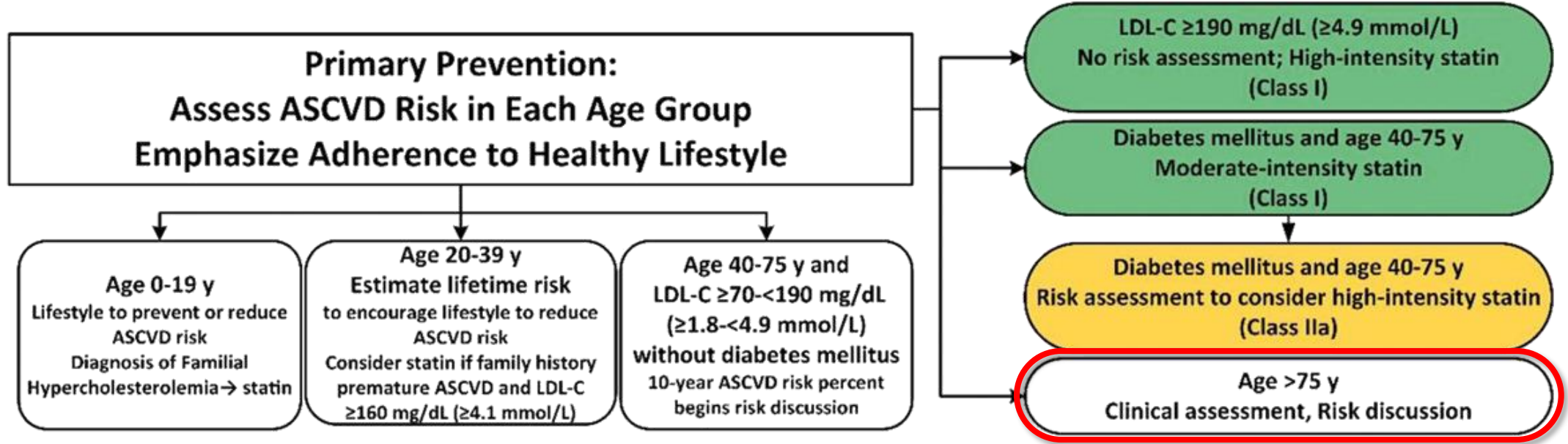
Smoker

Yes No

*Intended for use if there is not ASCVD and the LDL-cholesterol is <190 mg/dL

**Optimal risk factors include: Total cholesterol of 170 mg/dL, HDL-cholesterol of 50 mg/dL, Systolic BP of 110 mm Hg, Not taking medications for hypertension, Not a diabetic, Not a smoker

2018 AHA ACC Cholesterol Guidelines



COR	LOE	Recommendations
IIb	B-R	1. In adults 75 years of age or older with an LDL-C level of 70 to 189 mg/dL (1.7 to 4.8 mmol/L), initiating a moderate-intensity statin may be reasonable. ^{S4.4.4.1-1-S4.4.4.1-8}
IIb	B-R	2. In adults 75 years of age or older, it may be reasonable to stop statin therapy when functional decline (physical or cognitive), multimorbidity, frailty, or reduced life-expectancy limits the potential benefits of statin therapy. ^{S4.4.4.1-9}

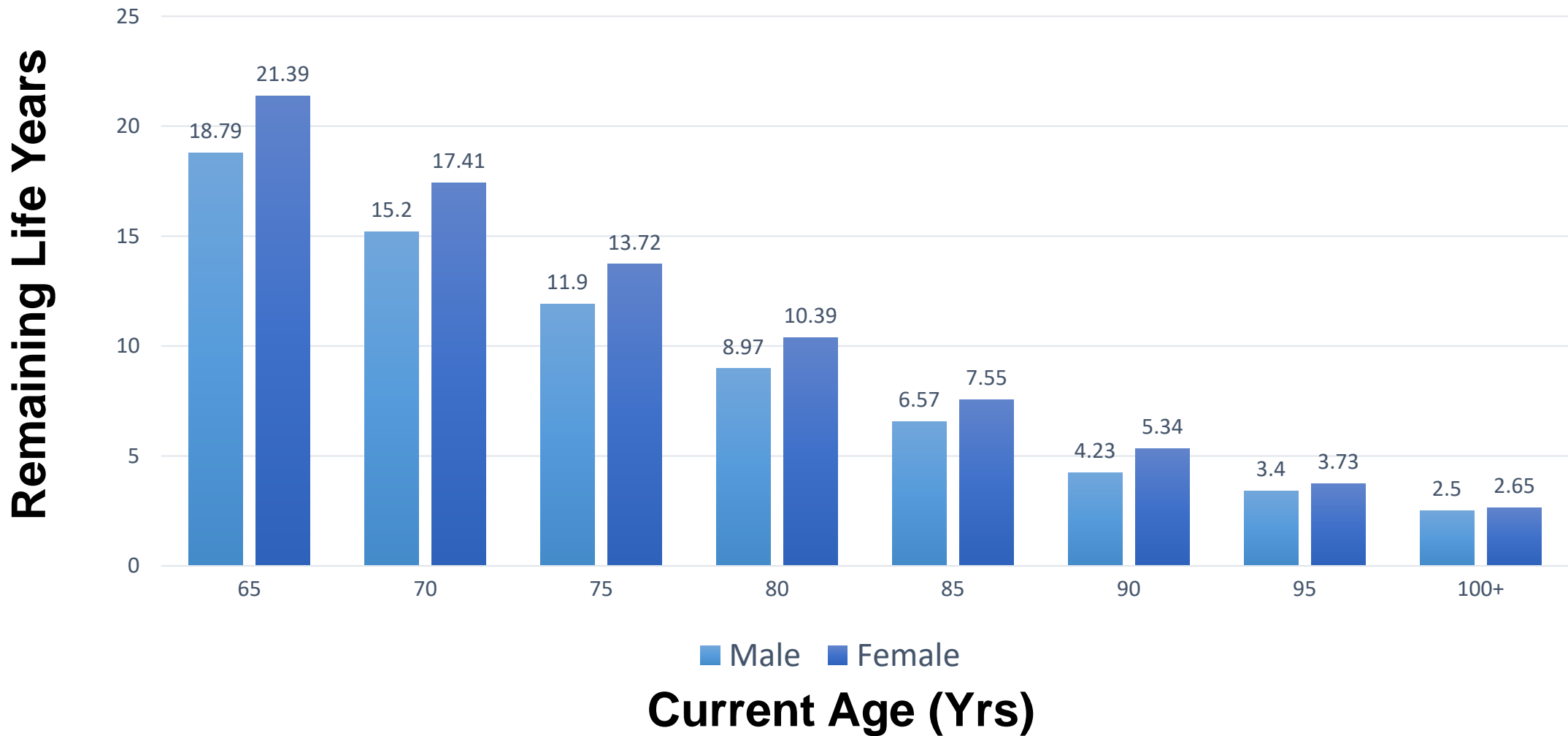
Table 1 Differences in guideline indications for statins for primary prevention based on age and risk across the age spectrum [8, 14–19]

Guideline	Age Cut Points for Recommendations				
	≤ 64 years old	65 years old	75 years old	85 years old	
ESC/EAS ^a	2016	5-10% 10-yr risk per SCORE with LDL-C of ≥ 155 ^b	SCORE not applicable beyond age 65 but should be considered in older adults with hypertension, smoking, diabetes and dyslipidemia		
CCS ^c	2016	10-19% 10-yr risk per modified FRS-CVD with LDL-C ≥ 135 ^b and one risk factor	FRS is not well validated age >75, and indication for statins is less defined		
USPSTF	2016	≥ 10% 10-yr risk per PCE with LDL-C ≤ 190 and one or more risk factor	No recommendation given for those age ≥ 75		
AHA/ACC ^d	2018	≥ 7.5% 10-yr risk per PCE with LDL-C 70-189 ^b	Age ≥ 75, risk discussion should be used, including considering CAC. It is reasonable to consider moderate intensity statin for adults ≥ 75 with LDL-C 70-189 ^b		
ACC/AHA ^e	2019	≥ 7.5% 10-yr risk per PCE with LDL-C 70-189 ^b	No recommendation given for those age ≥ 75		
NICE-UK ^f	2014	≥ 10% 10-yr risk per QRISK2 up to age 84		Consider atorvastatin 20mg for age ≥ 85	
VA/DoD	2014	Consider moderate intensity statin for 6-12% 10-yr risk per FRE or PCE regardless of age (no age cut point) Indicated for ≥ 12% 10-yr risk per FRE or PCE regardless of age			

Legend

Recommendation	Strong or Class I	Weak or Class IIa	Class II b	No recommendation
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Estimated Remaining Life Years at Each Age



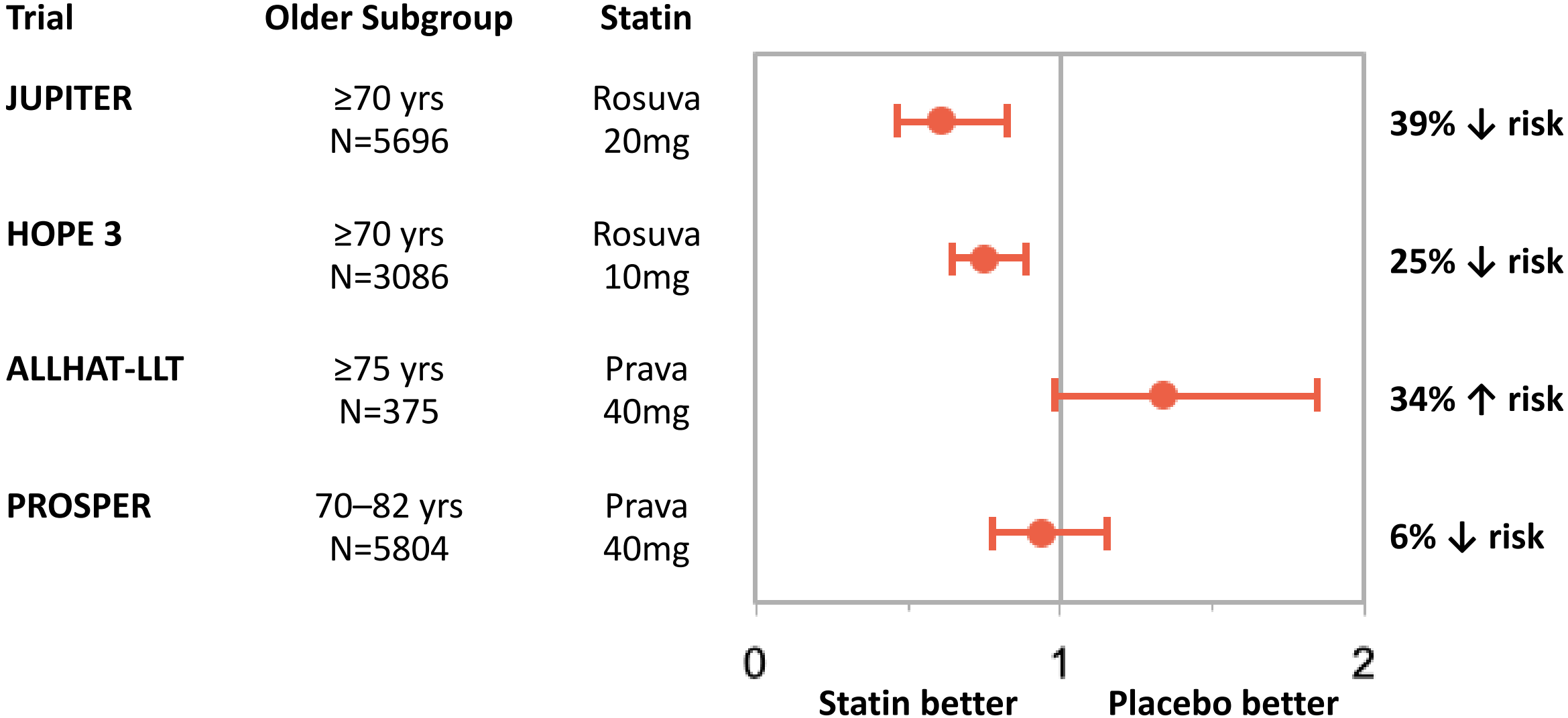
Assessment of frailty can re-set life expectancy estimates, independent of age

2002	Median Survival Time (Years)					
		Men			Women	
Frailty	Age	Age	Age	Age	Age	Age
Score	65-74	75-84	≥85	65-74	75-84	≥85
≤0.1	13.0	10.4	6.4	19.2	11.6	7.4
>0.1 - ≤0.2	12.4	8.7	5.7	15.1	10.5	6.5
>0.2 - ≤0.3	9.5	7.0	4.8	12.0	8.8	5.6
>0.3 - ≤0.4	6.8	5.4	3.8	8.5	7.0	4.5
>0.4	4.6	3.8	2.8	6.0	5.1	3.7
Overall	12.9	8.0	4.9	15.6	9.5	5.7

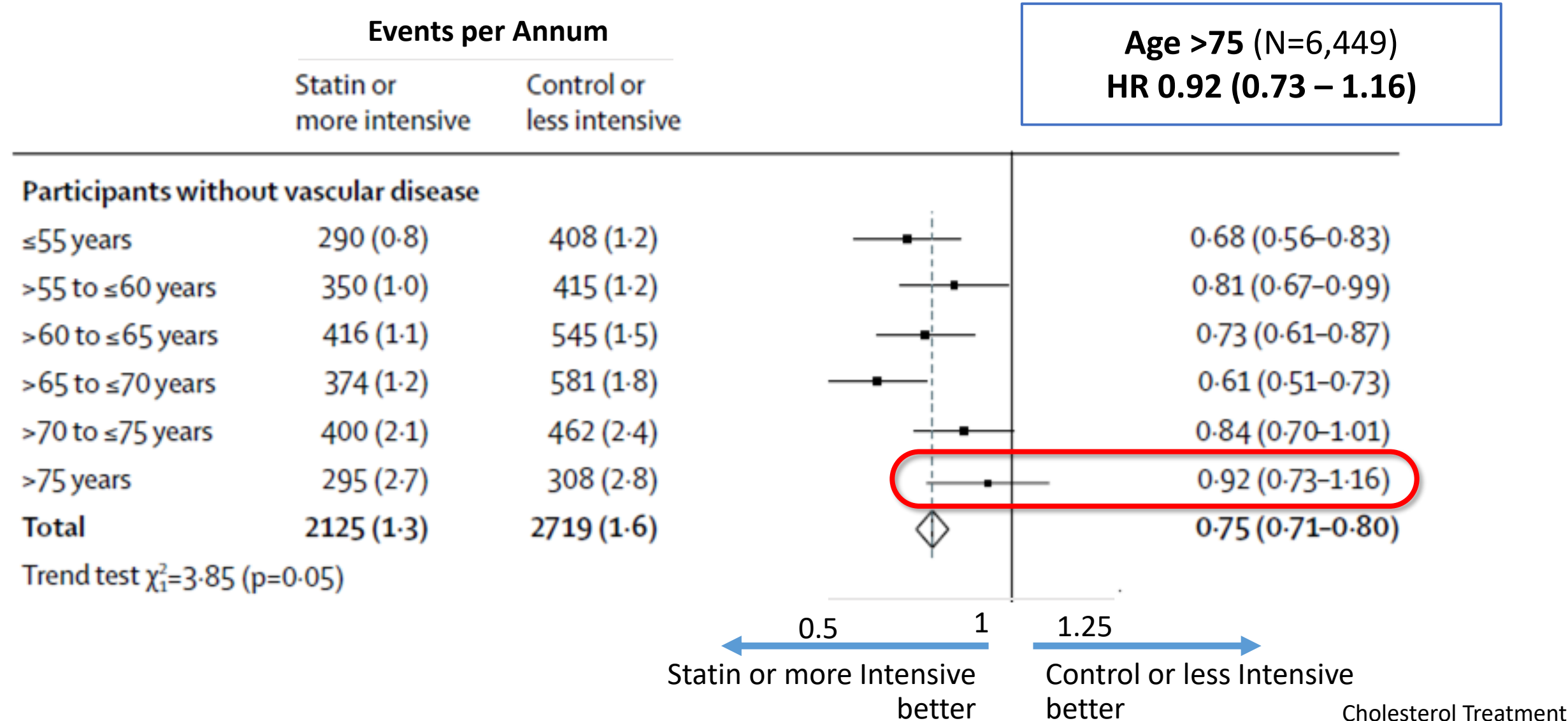


What is the evidence for
statins to date?

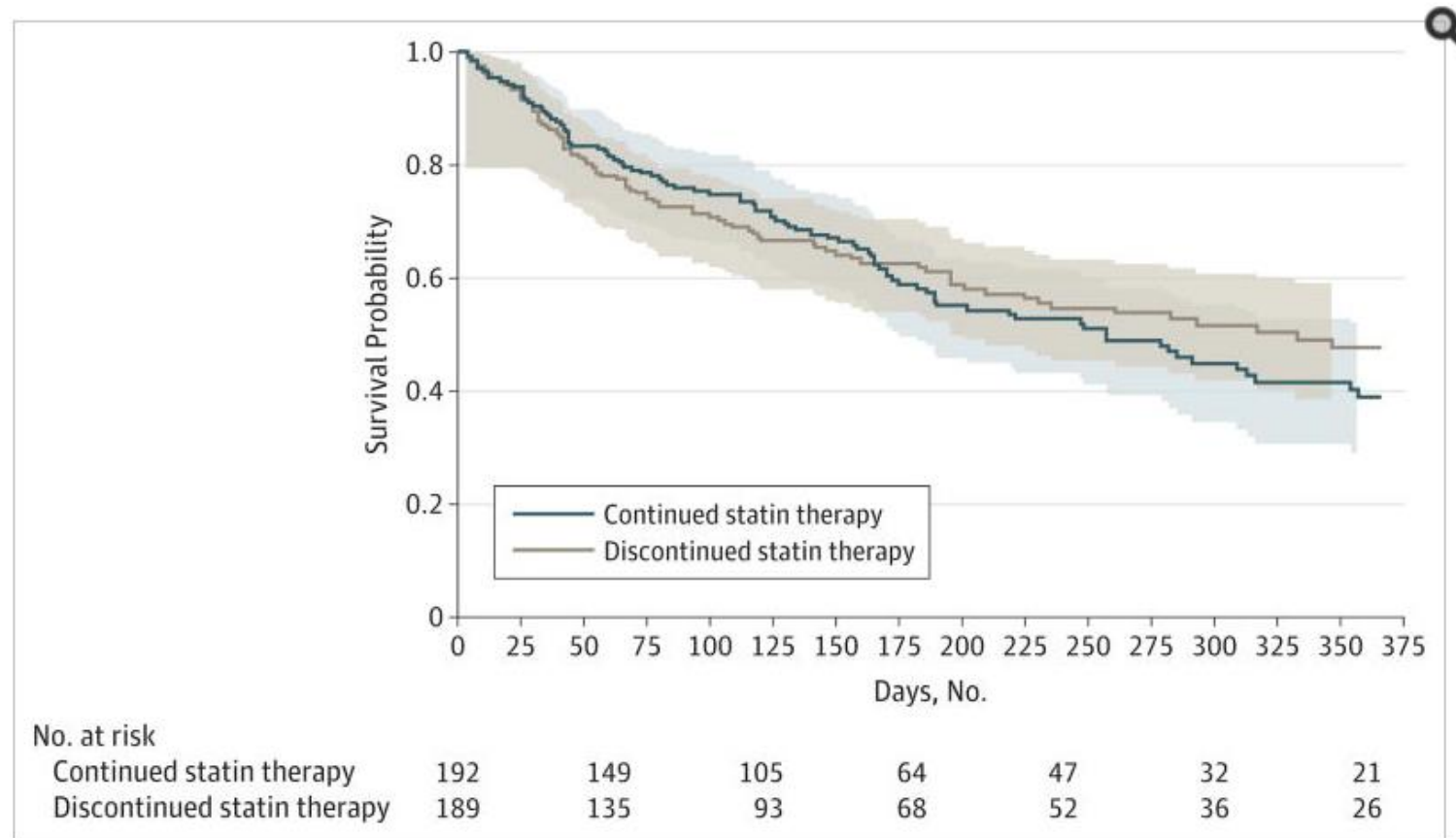
Older Adult Subgroups in Primary Prevention Statin Trials



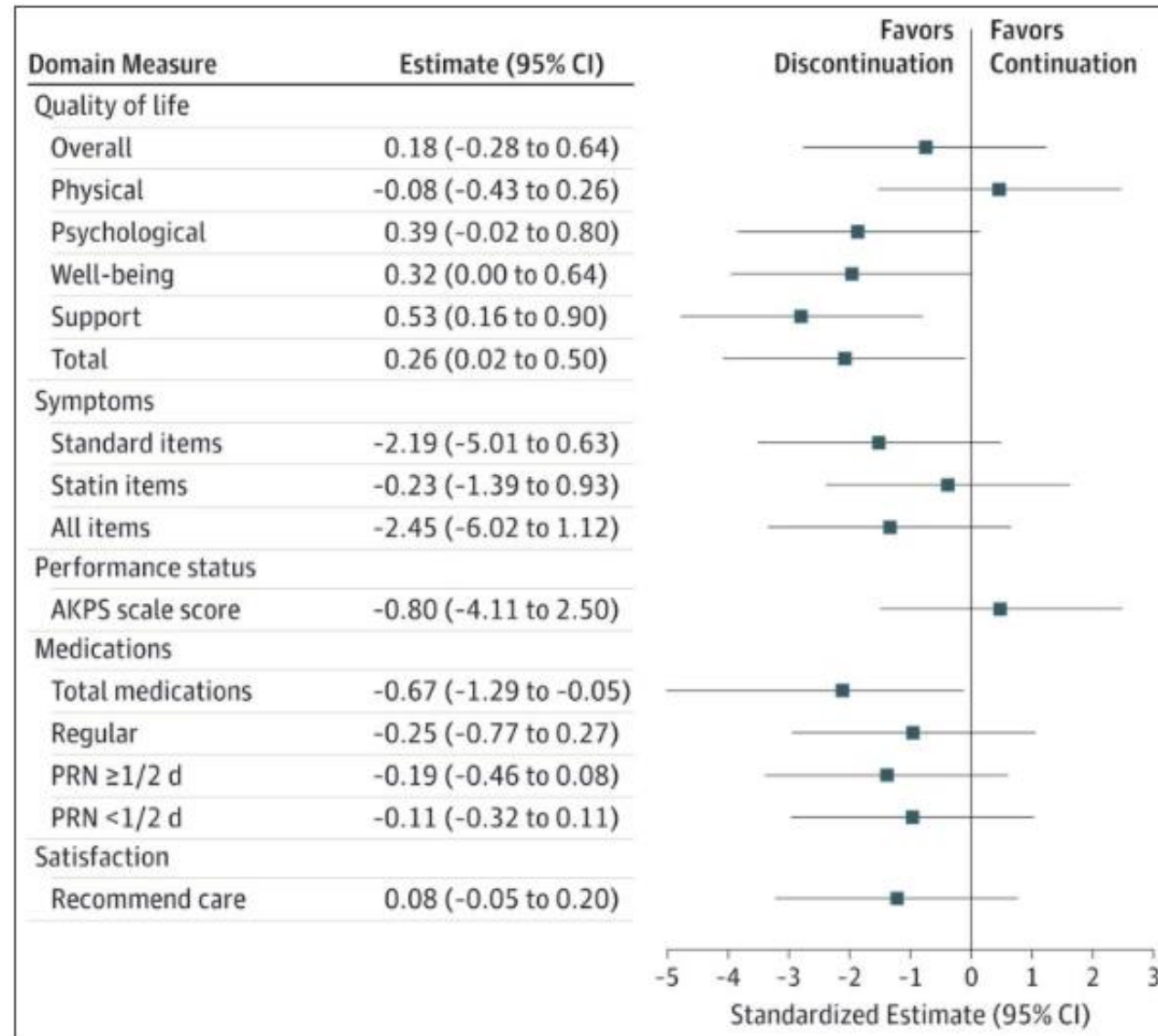
Meta-analysis of 28 trials major statin trials: 186,854 participants, only 8% were ≥ 75 years



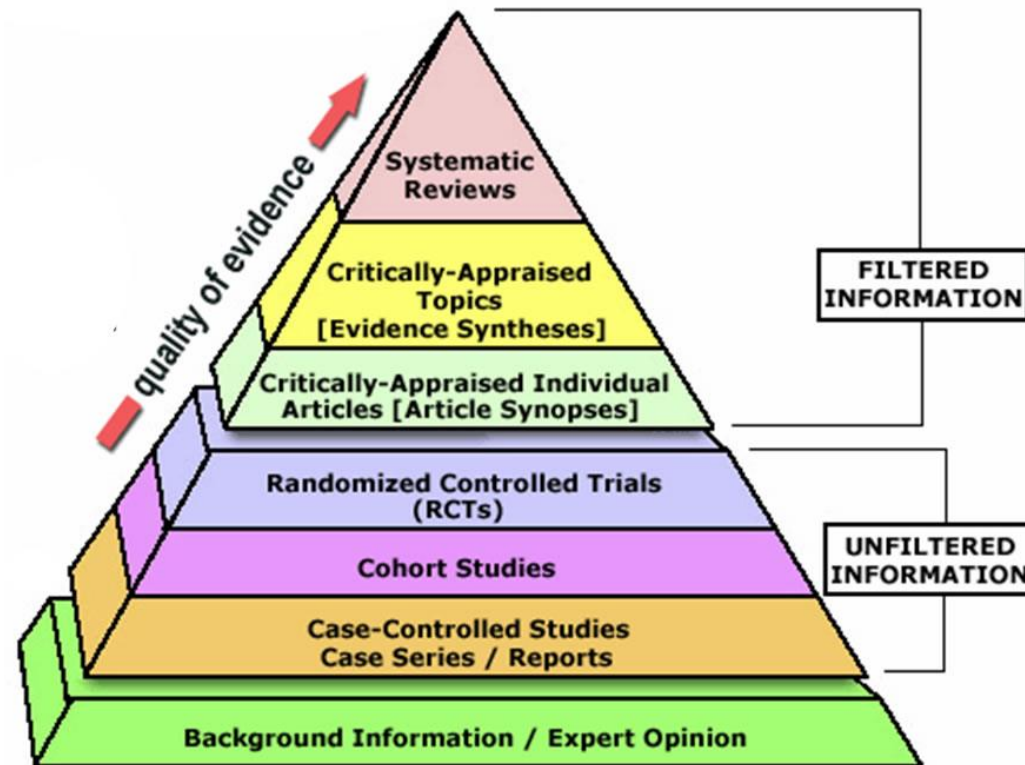
Safety and Benefit of Discontinuing Statin Therapy in the Setting of Advanced, Life-Limiting Illness A Randomized Clinical Trial



Statin discontinuation at end of life: Improvement in measures of QOL, no difference in mortality



Limited trial data has led to observational data



Study design considerations in pharmacoepidemiology

Confounding by indication, healthy user bias

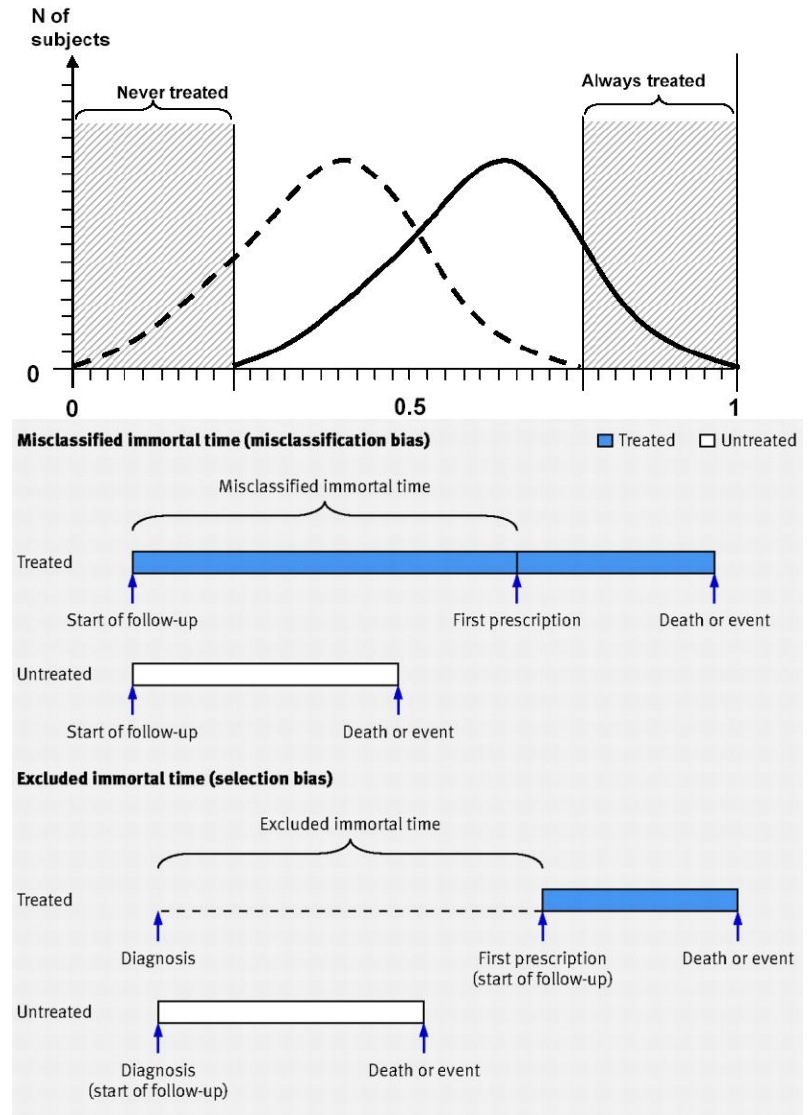
→ Propensity score methods
(mimic balance in clinical trials)

Prevalent user bias

→ New user design

Immortal time bias

→ Appropriately account for time not on treatment



Ray WA et al Am J Epidemiol 2003.

Seeger JD et al Med Care 2007.

Lévesque L et al BMJ 2010.

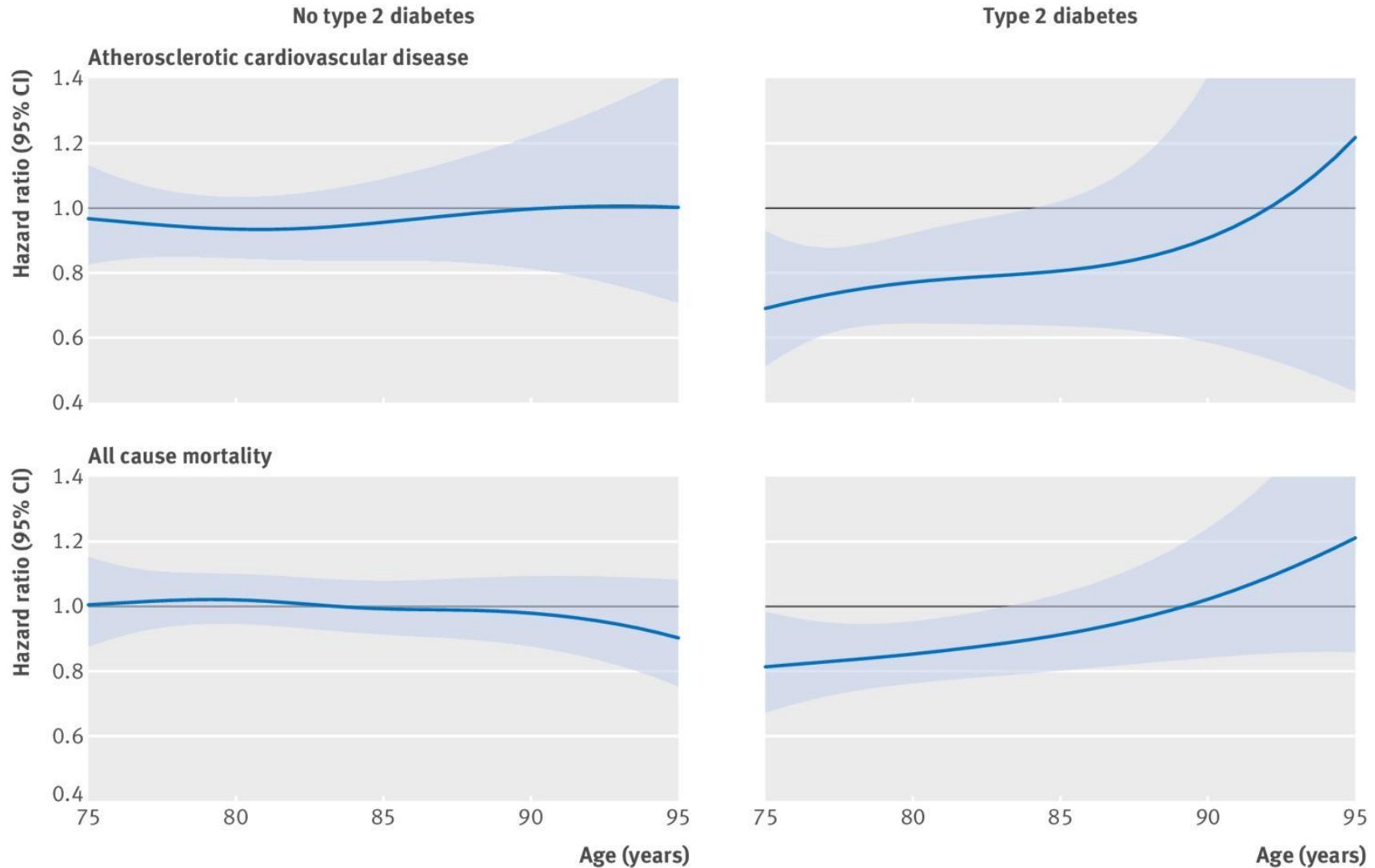
Li F Am J et al Epidemiol 2019.



Retrospective cohort study in Spain

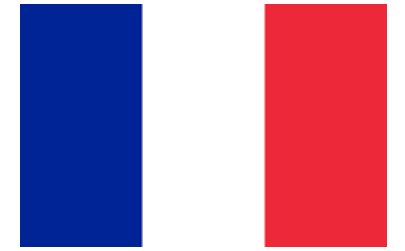
- Catalan primary care system, 2006-15.
- 46,864 adults aged 75 and older without ASCVD
 - stratified by diabetes status at baseline
- New user design, propensity score adjustment
- Exclusion: “to avoid frailty bias, people with cancer, dementia, or paralysis, and those receiving dialysis, living in residential care, or with an organ transplant.”
- Co-primary outcome: time to ASCVD event, mortality

Older adults with diabetes may benefit from statins for ASCVD and mortality prevention



Mean age 81
>60% women

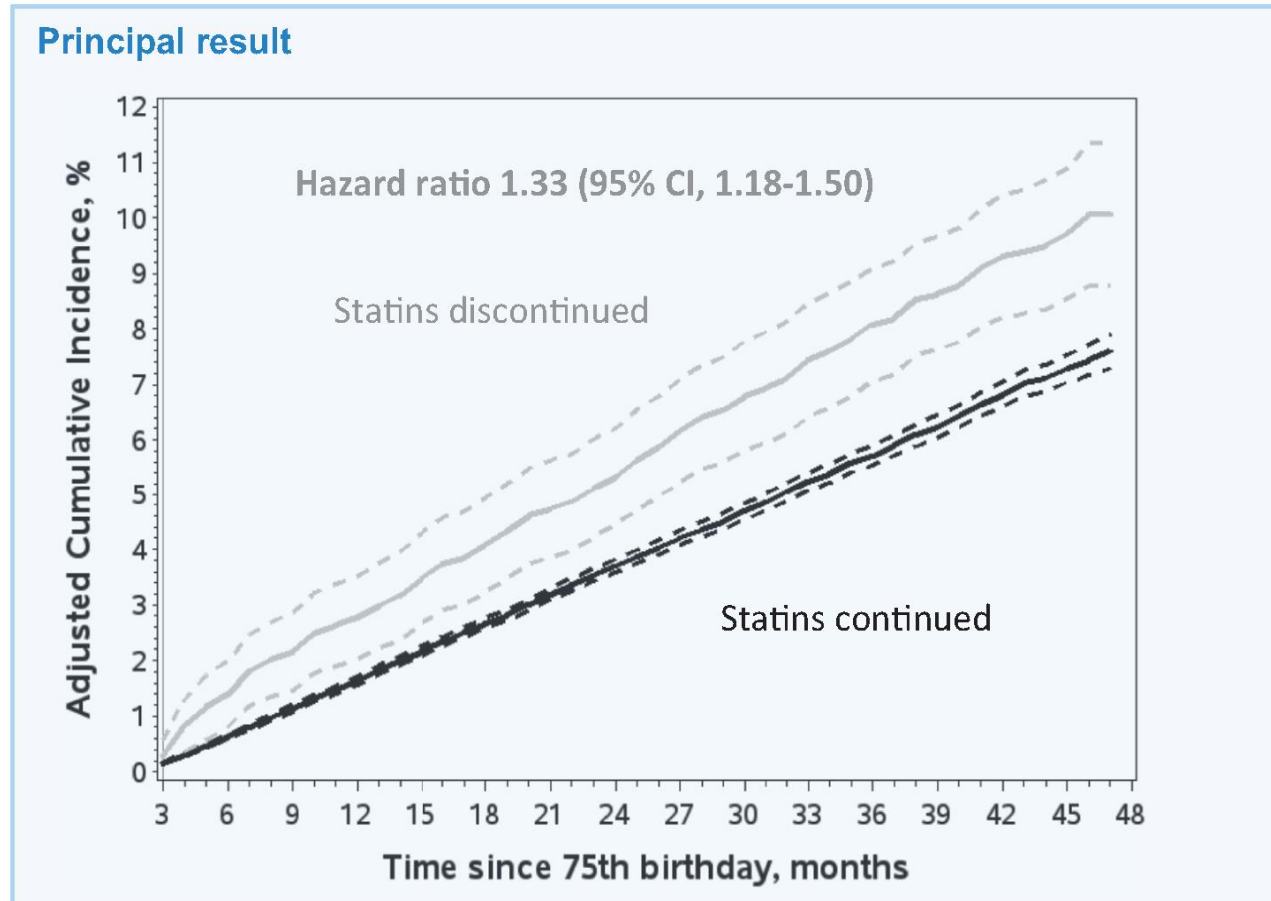
Retrospective cohort study in France



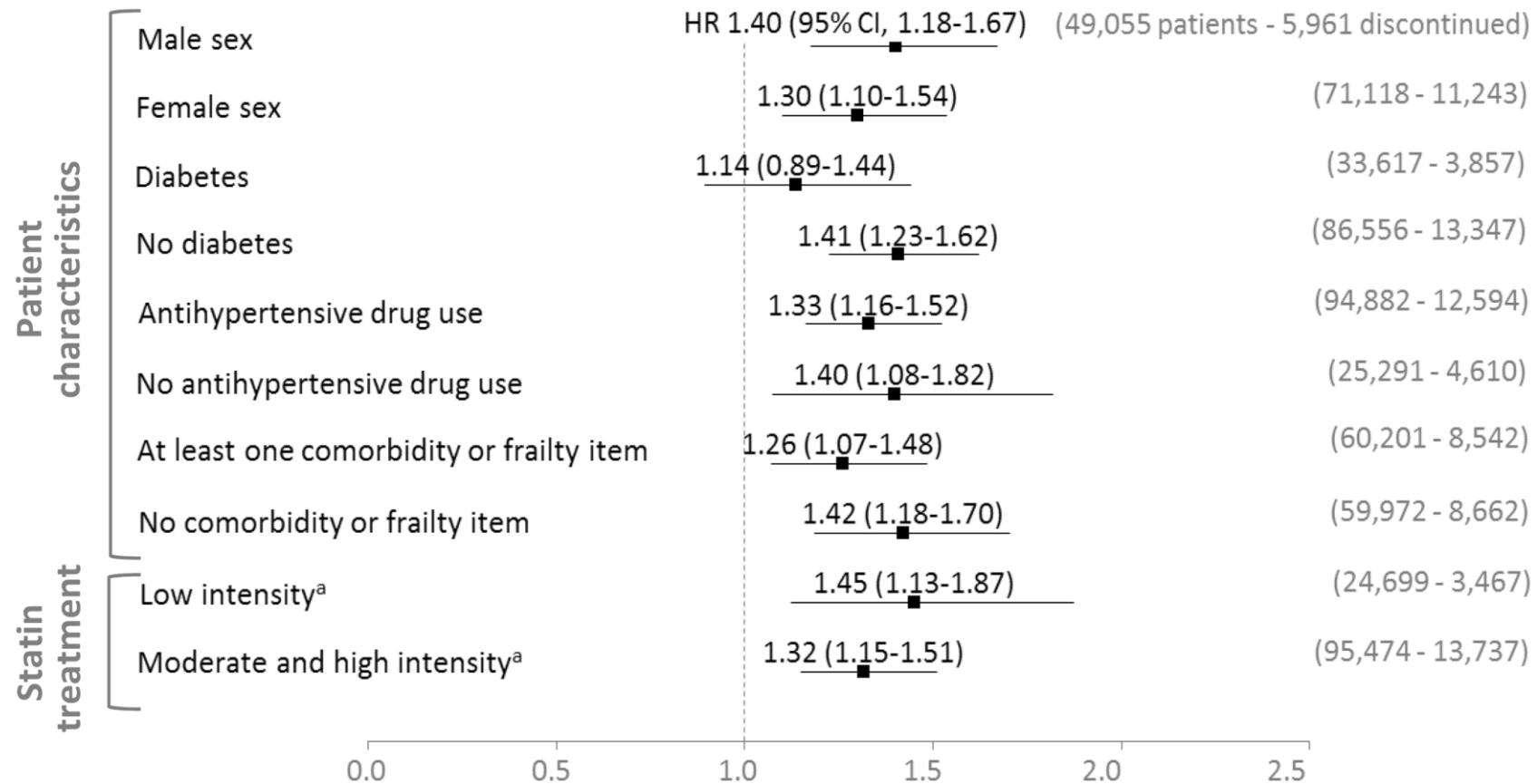
- French national health insurance claims database, 2012-14
- 120,173 adults without ASCVD, ≥ 75 with a statin medication possession ratio (MPR) at least 80% in each of the previous 2 years
- Propensity score weights
- Nursing home patients excluded
- Primary outcome: time to hospitalization for an ASCVD event

Statin discontinuation after age 75 was significantly associated with an increased risk of an ASCVD event

60% women



Results were unchanged when considering statin intensity or frailty



Retrospective cohort study in the US



JAMA | **Original Investigation**

Association of Statin Use With All-Cause and Cardiovascular Mortality in US Veterans 75 Years and Older

Ariela R. Orkaby, MD, MPH; Jane A. Driver, MD, MPH; Yuk-Lam Ho, MPH; Bing Lu, MD, PhD; Lauren Costa, MPH; Jacqueline Honerlaw, RN, MPH; Ashley Galloway, MPH; Jason L. Vassy, MD, MPH; Daniel E. Forman, MD; J. Michael Gaziano, MD, MPH; David R. Gagnon, MD, PhD; Peter W. F. Wilson, MD; Kelly Cho, PhD; Luc Djousse, MD, ScD

Retrospective cohort study in US Veterans



- US Veterans ≥ 75 with regular use of VA healthcare, 2002-2012
- No exclusion for cancer, dementia or paralysis
- Aging specific variables:
 - Arthritis, dementia, polypharmacy (≥ 5 medication classes), gait abnormality)
- New user design, Propensity score overlap weighting
- Co-primary outcome: All-cause and ASCVD mortality

Results: 326,981 Veterans included with 57,178 (17.5%) new statin users



- Mean age 81±4 years (range, 75-107)
- 91% White
- 97% Men
 - > In total 8,737 women
- 4% Hispanic/Latinx
- Followed for an average 7 years
- 53,727 (94%) had at least one follow up prescription

Most common statins:

- Simvastatin: 84.8%
- Lovastatin: 11.0%
- Pravastatin: 2.5%
- Fluvastatin: 1.2%
- Atorvastatin and Rosuvastatin: 0.5%

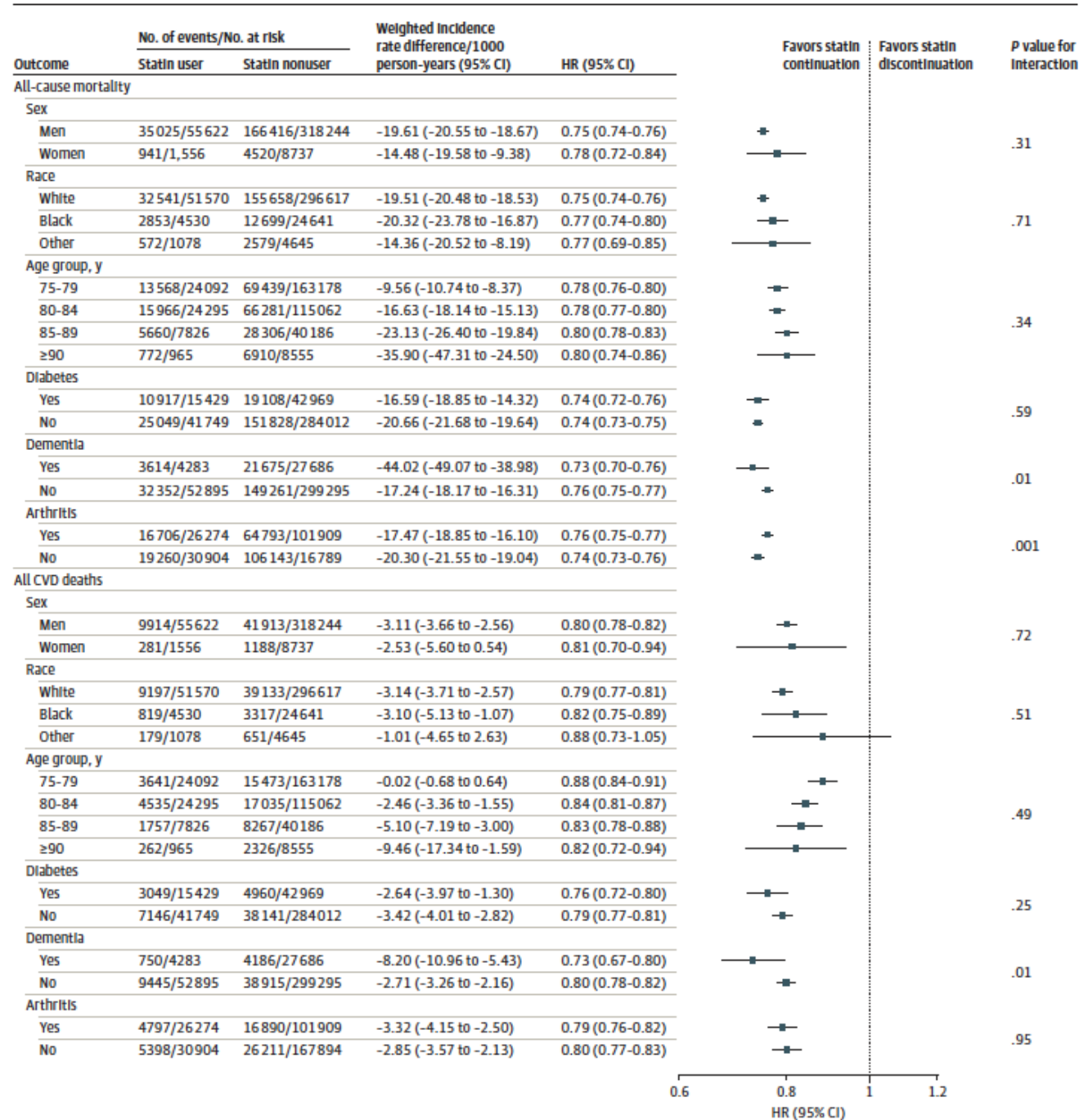
Among US veterans ≥ 75 without ASCVD, statin therapy was significantly associated with a lower risk of mortality.

Table 2. Association Between Statin Use, All-Cause Mortality, and Major Cardiovascular Events In 326 981 US Veterans 75 Years and Older Free of Atherosclerotic Cardiovascular Disease at Baseline, After Propensity Score Overlap Weighting

Outcome	Weighted rate/1000 person-years		Weighted incidence rate difference/1000 person-years (95% CI) ^a	HR (95% CI)	P value
	Statin user (N = 57 178)	Statin nonuser (N = 269 803)			
Primary outcomes					
All-cause mortality (n = 206 902)	78.7	98.2	-19.45 (-20.38 to -18.52)	0.75 (0.74 to 0.76)	<.001
All CV death (n = 53 296)	22.6	25.7	-3.09 (-3.63 to -2.55)	0.80 (0.78 to 0.81)	<.001
Secondary outcomes					
ASCVD composite (n = 123 379) ^b	66.3	70.4	-4.05 (-5.09 to -3.02)	0.92 (0.91 to 0.94)	<.001
Myocardial infarction (n = 24 951)	13.2	12.6	0.56 (0.13 to 0.98)	0.99 (0.97 to 1.03)	.94
Ischemic stroke (n = 35 630)	18.4	18.2	0.25 (-0.26 to 0.76)	0.98 (0.96 to 1.01)	.20
CABG surgery/PCI (n = 74 362)	35.2	39.2	-3.38 (-4.12 to -2.64)	0.89 (0.88 to 0.91)	<.001

Results were unchanged when stratified by sex, race, age, diabetes, dementia and arthritis

Figure 1. Association Between Statin Use and All-Cause and Cardiovascular Mortality in 326 981 US Veterans 75 Years and Older Free of Atherosclerotic Cardiovascular Disease at Baseline, Stratified by Age, Sex, Race, Diabetes, Dementia, and Arthritis

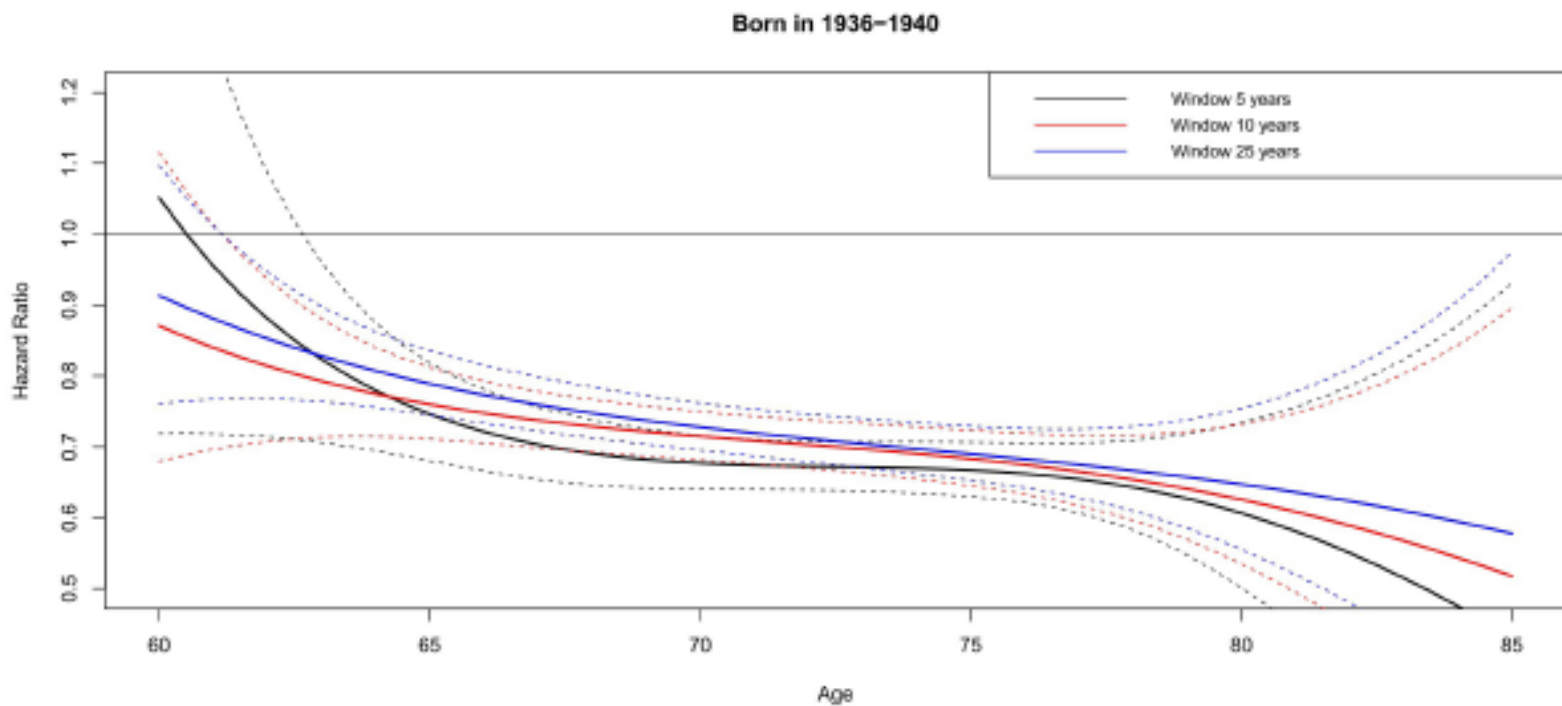
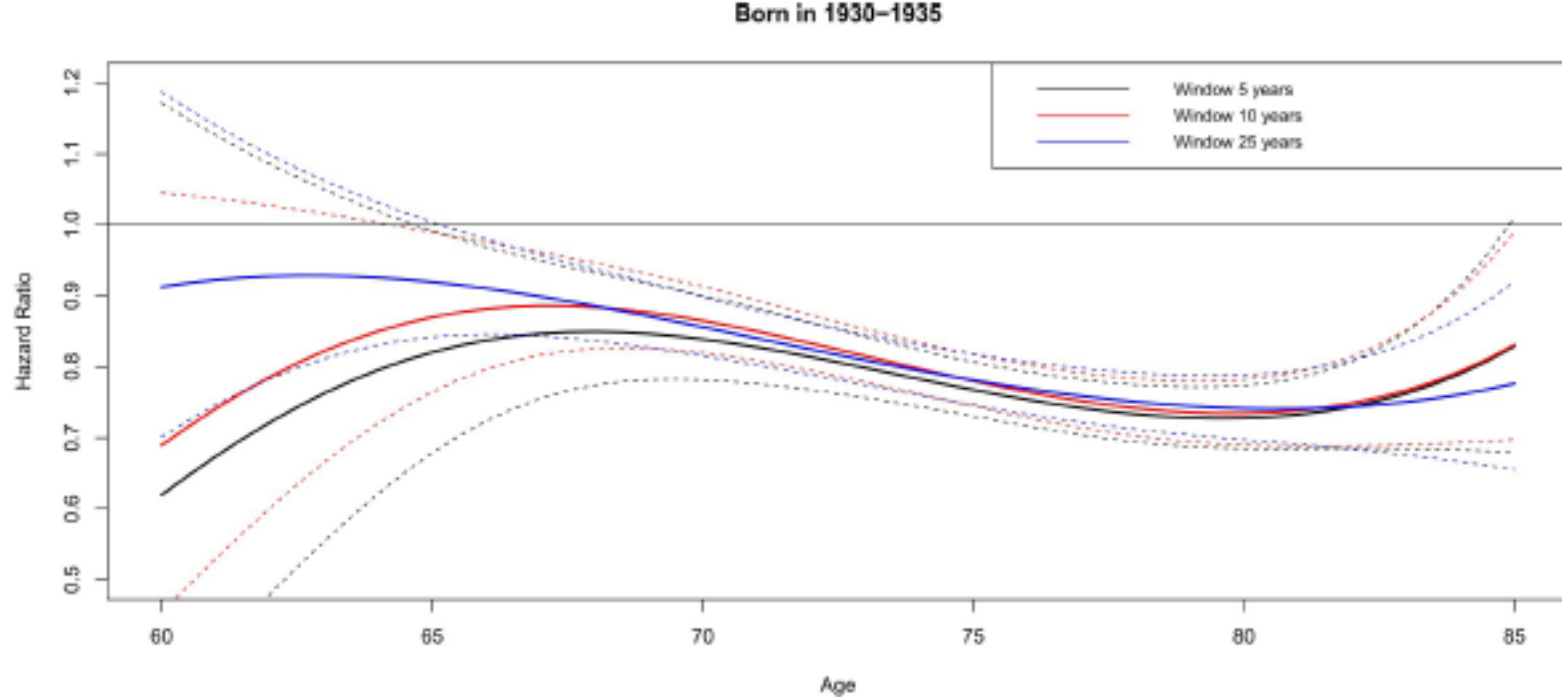


Retrospective cohort study in England and Wales



- Primary Care database 1990-2000 followed to 2017
- 110,243 adults without ASCVD, ≥ 60 separated by birth cohorts
- 6-month sliding window 'landmarking'
- Primary outcome: all cause mortality

Statin use was associated with a lower risk of all-cause mortality in all age groups



Limitations of observational data

- Residual confounding
- Generalizability: European cohorts, US Veterans, exclusion of nursing home patients
- Varying statins over time (VA study: Simvastatin)
- Side effects, drug-drug interaction, impact on function, cognition
- Patient centered outcomes?



Other important considerations: Statins and Cognitive Impairment

- Existing randomized evidence with statins in later life finds no adverse effect on cognitive function¹
- Clinical **and subclinical** CVD increase the risk for vascular cognitive impairment and dementia (VCID)²
 - Statins prevent ischemic stroke, a significant contributor to vascular dementia³
- Lower BP targets lower risk of MCI/dementia — further linking vascular health and cognition⁴

¹ Prosper Trial J Neurol, 2010. 257(1): p. 85-90

² CV and Alz. Dementia Links. J Intern Med, 2006. 260(3): p. 211-23

³ Heart Protection Study, Lancet, 2002. 360(9326): p. 7-22

⁴ Sprint Mind JAMA. 2019 Feb 12;321(6):553-561

There has been a decline in the incidence of dementia over the last 30-years: in part due to improved CV prevention

Table 2. Temporal Trends in the Incidence of Dementia.*

Subtype	No. of Cases	Total No. of Observation Periods	5-Yr Cumulative Hazard Rate (95% CI)†				5-Yr Hazard Ratio (95% CI)‡				P Value for Trend
			Epoch 1	Epoch 2	Epoch 3	Epoch 4	Epoch 2	Epoch 3	Epoch 4	Trend§	
Overall dementia	371	9015	3.6 (2.9–4.4)	2.8 (2.2–3.5)	2.2 (1.8–2.8)	2.0 (1.5–2.6)	0.78 (0.59–1.04)	0.62 (0.47–0.83)	0.56 (0.41–0.77)	0.80 (0.72–0.90)	<0.001
Alzheimer’s disease	264	9015	2.0 (1.5–2.6)	2.0 (1.5–2.6)	1.7 (1.3–2.3)	1.4 (1.0–1.9)	1.00 (0.70–1.43)	0.88 (0.62–1.25)	0.70 (0.48–1.03)	0.88 (0.77–1.00)	0.052
Vascular dementia	84	9014	0.8 (0.6–1.3)	0.8 (0.5–1.2)	0.4 (0.2–0.7)	0.4 (0.2–0.7)	0.89 (0.51–1.56)	0.46 (0.25–0.86)	0.45 (0.23–0.87)	0.71 (0.56–0.90)	0.004

* The baseline examination period was between 1977 and 1983 for the first epoch, between 1986 and 1991 for the second epoch, between 1992 and 1998 for the third epoch, and between 2004 and 2008 for the fourth epoch.

† The 5-year cumulative hazard rates (the cumulative incidence of dementia per 100 persons over a period of 5 years) are adjusted for age and sex.

‡ The 5-year hazard ratios (the incidence of dementia during each epoch relative to the incidence during the first epoch) are adjusted for age and sex.

§ We estimated linear trends (the decline per decade in the 5-year incidence of dementia) using the elapsed mean time (in decades) between the first epoch and each consecutive epoch.

Statins and Physical Function

- In randomized trials, participants on statin are only 0.3% more likely to report muscle symptoms compared to those on placebo¹
- A meta-analysis found no evidence for a negative effect of statins on physical function²
- Physical disability results from a diverse set of physiologic and physical contributors³
- Statins may preserve physical function by preventing disabling vascular events, reducing inflammation, or improving vascular health⁴

¹ Lancet, 2016. 388(10059): p. 2532-2561

² Eur J Clin Pharmacol, 2014. 70(12): p. 1413-22

³ Circulation, 2017. 135(16): p. e894-e918.

⁴ Jama, 2010. 304(17): p. 1919-28.

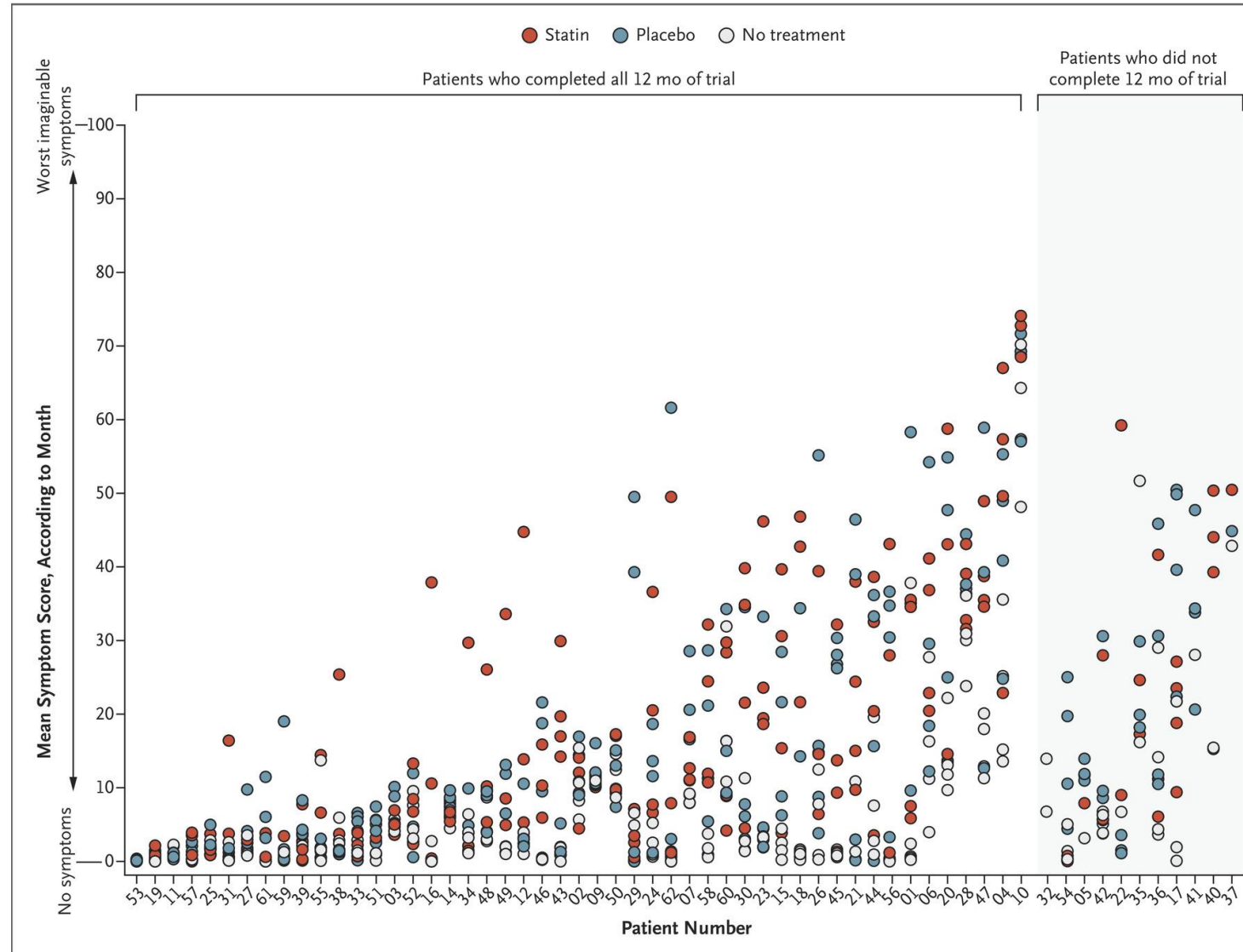
Statins, Nocebo, Pre-existing Symptoms

- In practice, 10% stop taking statins because of subjective muscle symptoms
- Muscle symptoms are not higher with statin than placebo in blinded studies
- Asking about muscle symptoms increases reporting 3-fold (for placebo, too)
- Causal associations are flawed
 - Cross over controlled design in statin intolerant patients found that those getting statin first had slightly more symptoms, but 26% of placebo first also reported symptoms.

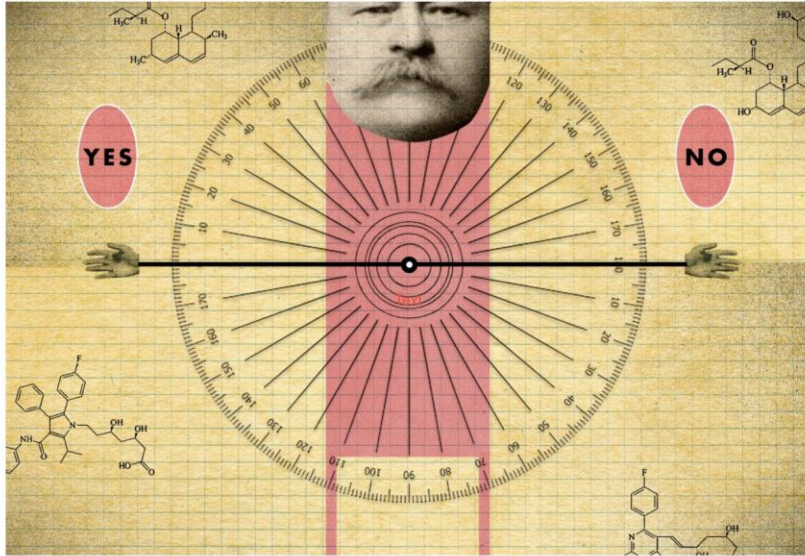
Side effects in Randomized Trials (Statin vs. Placebo)

	Statin Run-in Period prior to RAND	No Run-In Period
Routinely asked about muscle symptoms	HPS Trial 32.9% vs. 33.2%	CORONA Trial 8.9% vs. 8.3%
Did not ask about symptoms	HOPE-3 5.8% vs. 4.7%	8 other trials 4.8% vs. 4.4%

SAMSON trial, N-of-1-trial: 90% of statin related complaints are due to the placebo effect



You're Over 75, and You're Healthy. Why Are You Taking a Statin?



David Plunkert

By Paula Span

The side effects of statins leave many patients and doctors wary – despite their lifesaving capabilities

... the American College of Cardiology, statins use was not associated with a decline in memory or cognition over a six-year period in an elderly ...

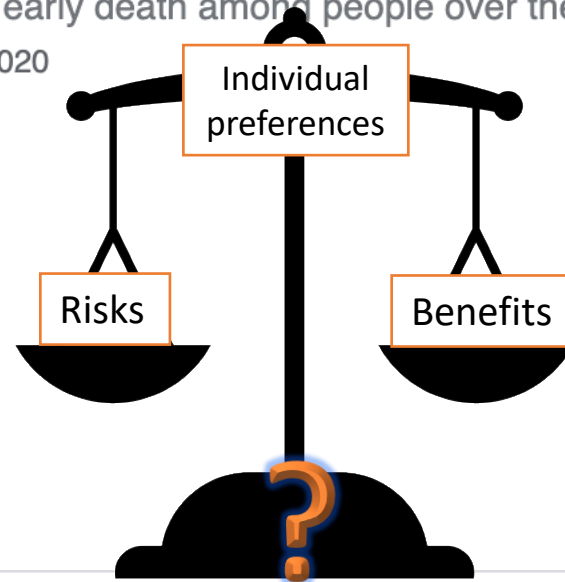
May 4, 2020



Elixir Of Life? Elderly Taking Statins Reduces Risk To Death By A Quarter Among Those Over 75 Years Old

Statins, pills that are known to lower cholesterol may reportedly reduce the risk of early death among people over the age of 75 years old.

Jul 8, 2020



For Older People, Reassuring News in the Statin Debate

There is accumulating evidence that the benefits of statins far outweigh possible risks, and nearly all statins on the market are now available as inexpensive generics.



Gracia Lam



By Jane E. Brody

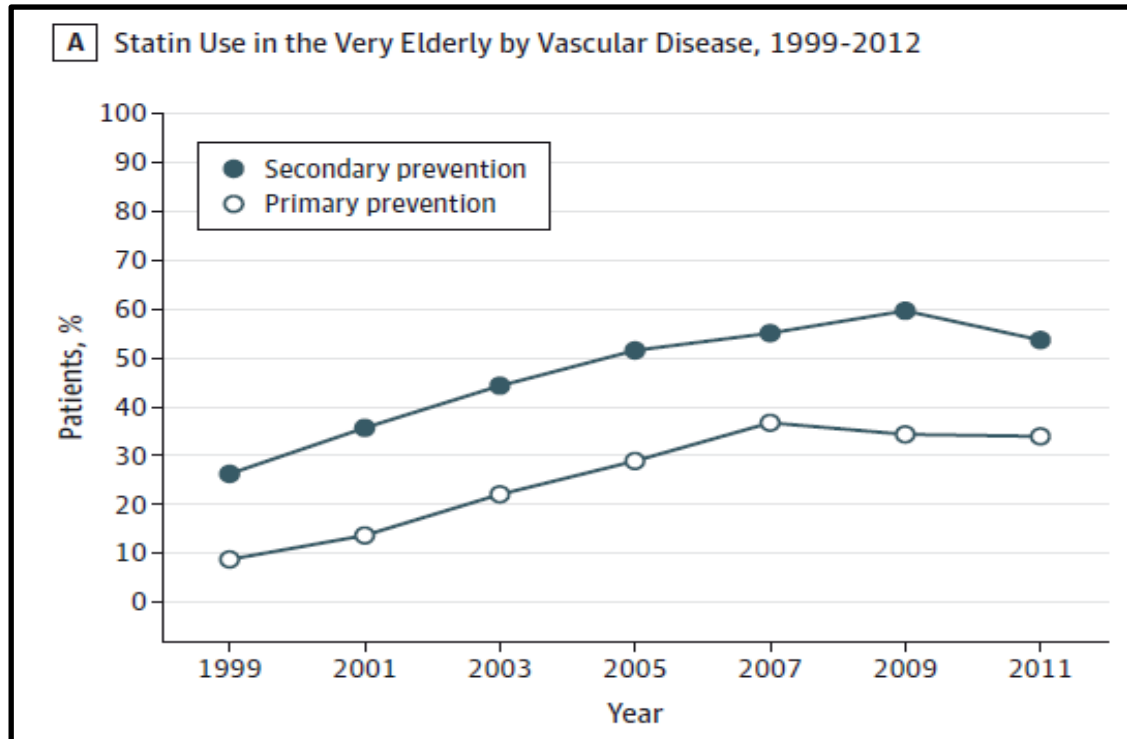
Statins Are Effective for...

- Secondary prevention of CV events in those w/CVD
- Primary prevention of CV events up to age 75
- Primary prevention over age 75, particularly in the setting of multiple chronic conditions
- Other common conditions such as MCI/dementia, functional decline, or HFpEF

 **A healthy 80-year-old has 8-9 additional years of life.**

Use of statins for primary and secondary prevention is increasing over time, but still low

Older adults (>79 years)— Medical Expenditure Panel (AHRQ, CDC)



Older Adults (≥ 75 years) without CVD (PCORnet)

- N=1,722,860
 - 16% DM (N=282,932)
 - 63% female (N=1,078,333)
- Statin Users
 - 31% on a statin (mostly prevalent use)
 - 51% of DM on a statin

Older Populations Are at Risk for...

- Cognitive impairment and dementia
- Frailty and mobility limitations
- Multi-factorial contributions of acute and chronic conditions
- Treatments to reverse cognitive impairment and disability

 **Best bet is effective prevention.**

We need more data – trials are coming!

PREVENTABLE Trial: Pragmatic Evaluation of Events and Benefits of Lipid-Lowering in Older Adults



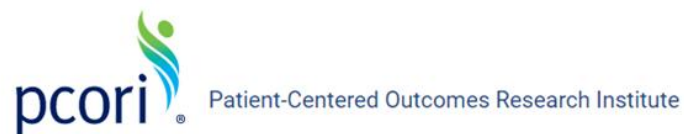
DCRI to Lead Pragmatic Study to Assess Effectiveness of Statins in Older Adults

October 23, 2019 – A \$90 million award expected from the National Institute of Aging and the National Heart, Lung, & Blood Institute will fund the largest pragmatic trial with placebo-controlled drug assignment to date.

Building on its success in leading pragmatic approaches for clinical study design, the DCRI has been awarded funding to conduct a pragmatic trial studying the effectiveness of statins in older adults without known cardiovascular disease. Funding for the trial is expected to total \$90 million over the next seven years.



The study, known as Pragmatic Evaluation of Events and Benefits of Lipid-Lowering in Older Adults (PREVENTABLE), will be funded by the National Institute of Aging and the National Heart, Lung, & Blood Institute of the National Institutes of Health under award number U19AG065188 and conducted in partnership with Wake Forest School of Medicine. The largest pragmatic trial with placebo-controlled drug assignment to date, PREVENTABLE also is the first statin trial with a non-cardiovascular primary outcome. Investigators will study whether statins could help prevent dementia or physical disability, the most important outcome for older adults looking to maintain

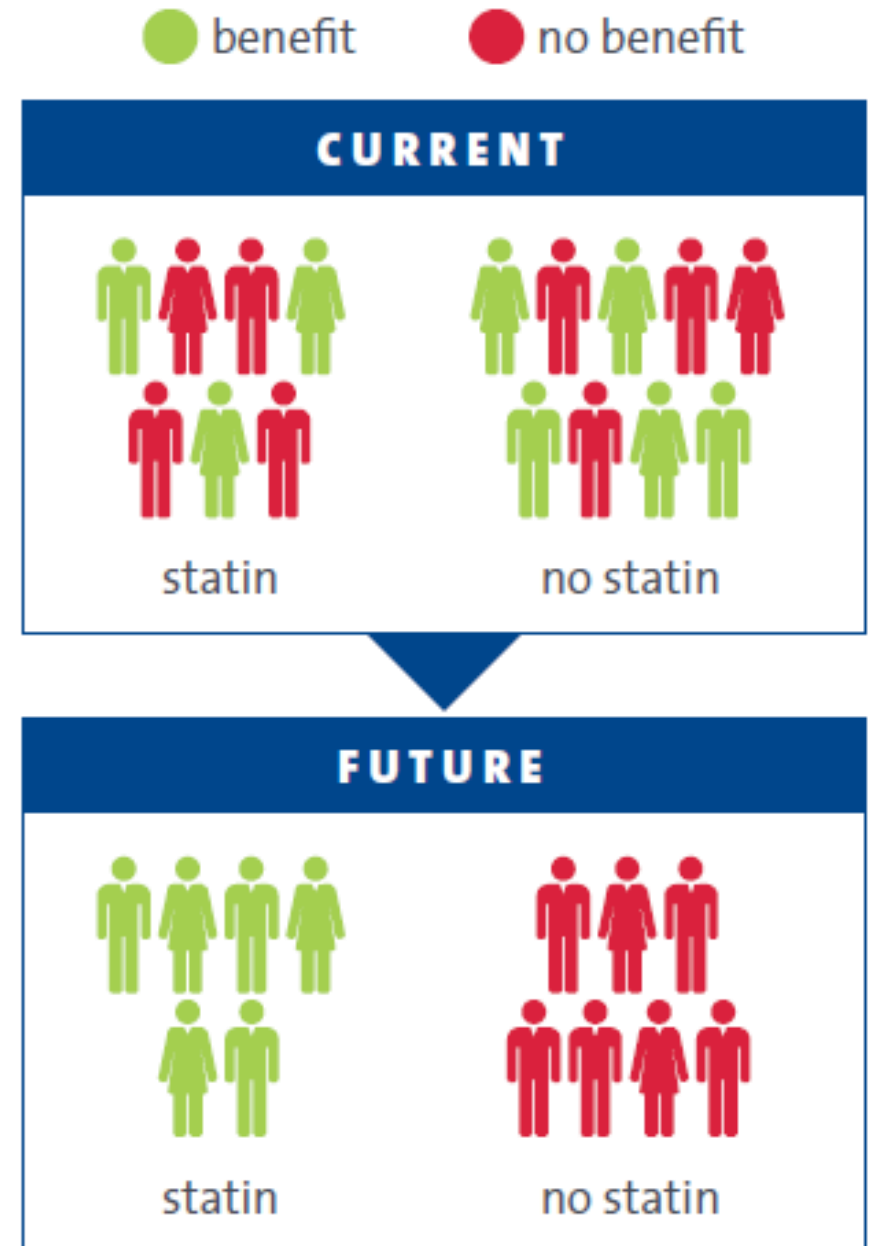


Will enroll 20,000 adults ≥ 75 , free of dementia, disability, and CVD
- Atorvastatin vs placebo



PREVENTABLE Pragmatic Goal

- Get the right drug to the right people
 - Clarifying the effectiveness of statins for improving health of older adults w/o CVD
 - Ask if effective vascular prevention reduces risk of other common conditions of aging (MCI or dementia, disability, or HFpEF)
- Identify who should start taking a statin and who should stop



A blue speech bubble graphic with a white text overlay. The bubble has a dark blue shadow on the left side, giving it a 3D effect. The text is centered within the bubble.

Individualizing care for
older adults



"Because of your age, I'm going to recommend doing nothing."

REVIEW



LEARNING OBJECTIVE: Readers will consider the patient's frailty status when managing cardiovascular risk factors

ARIELA R. ORKABY, MD, MPH

VA Boston Healthcare System, Geriatric Research, Education, and Clinical Center (GRECC), Boston, MA; Division of Aging, Brigham & Women's Hospital, Harvard Medical School, Boston, MA

OYERE ONUMA, MD, MSc

Medical Officer, World Health Organization, Department for Management of Noncommunicable Diseases, Disability, Violence, and Injury Prevention, Geneva, Switzerland

SAADIA QAZI, DO, MPH

VA Boston Healthcare System, Massachusetts Veterans Epidemiology and Research Information Center (MAVERIC), Boston, MA; Division of Aging, Brigham & Women's Hospital, Harvard Medical School, Boston, MA

J. MICHAEL GAZIANO, MD, MPH

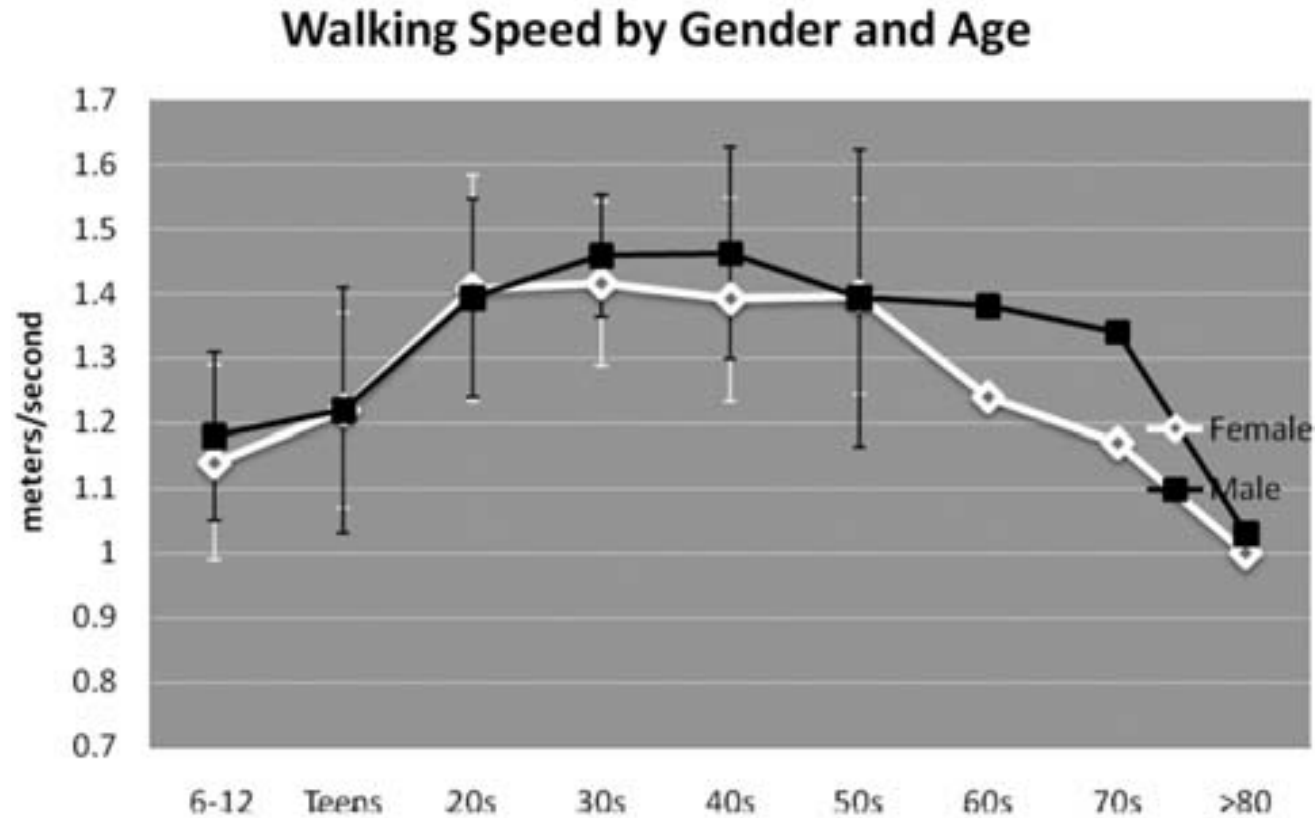
Preventive Cardiology Fellowship Director, VA Boston Healthcare System, Massachusetts Veterans Epidemiology and Research Information Center (MAVERIC) and Geriatric Research, Education, and Clinical Center (GRECC), Boston, MA; Chief, Division of Aging, Brigham & Women's Hospital; Professor of Medicine, Harvard Medical School, Boston, MA

JANE A. DRIVER, MD, MPH

VA Boston Healthcare System, Associate Director-Clinical, Geriatric Research, Education, and Clinical Center (GRECC), Boston, MA; Division of Aging, Brigham & Women's Hospital; Assistant Professor, Harvard Medical School, Boston, MA

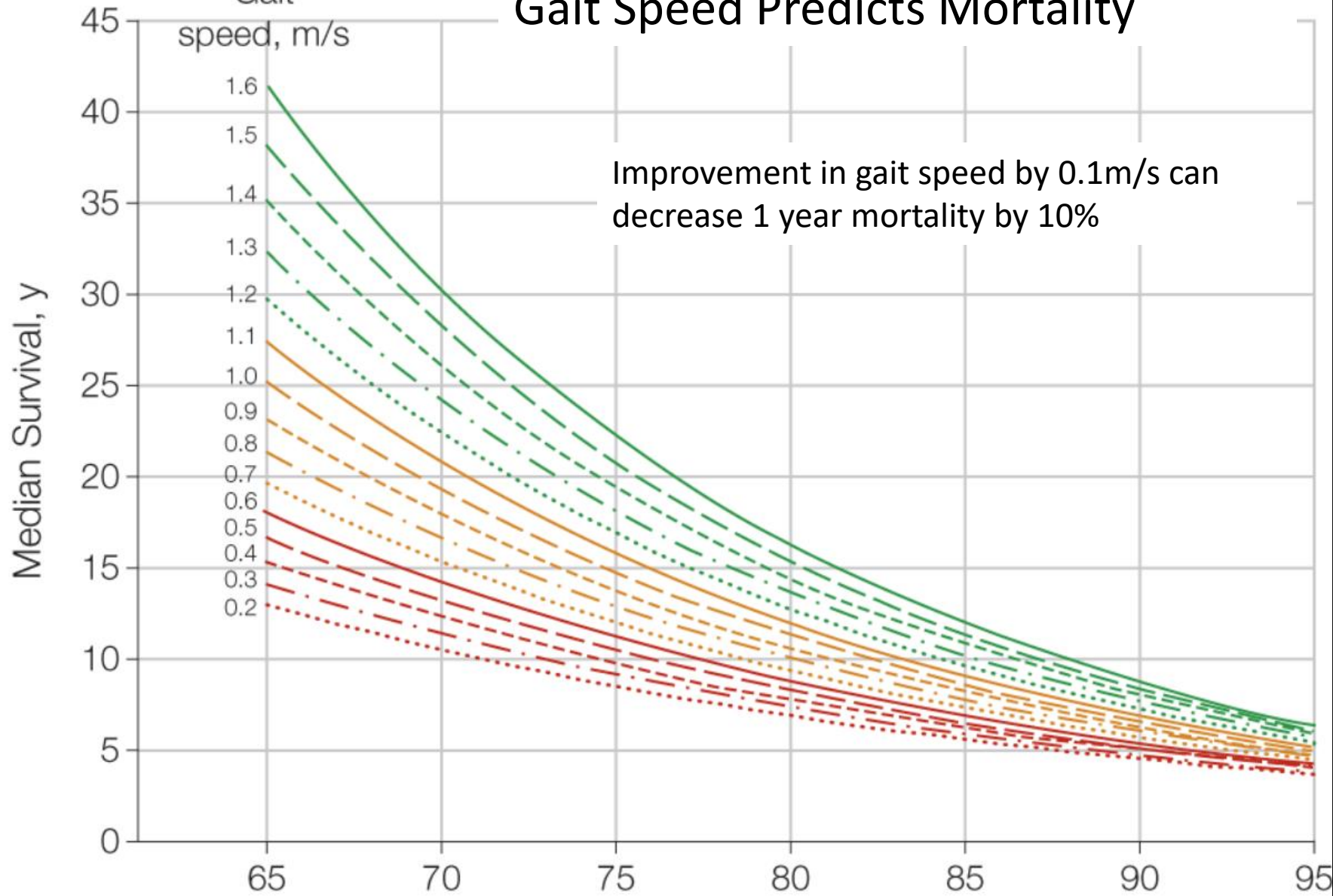
Preventing cardiovascular disease in older adults: One size does not fit all

Gait speed, the “6th vital sign”, is a quick way to measure frailty anywhere



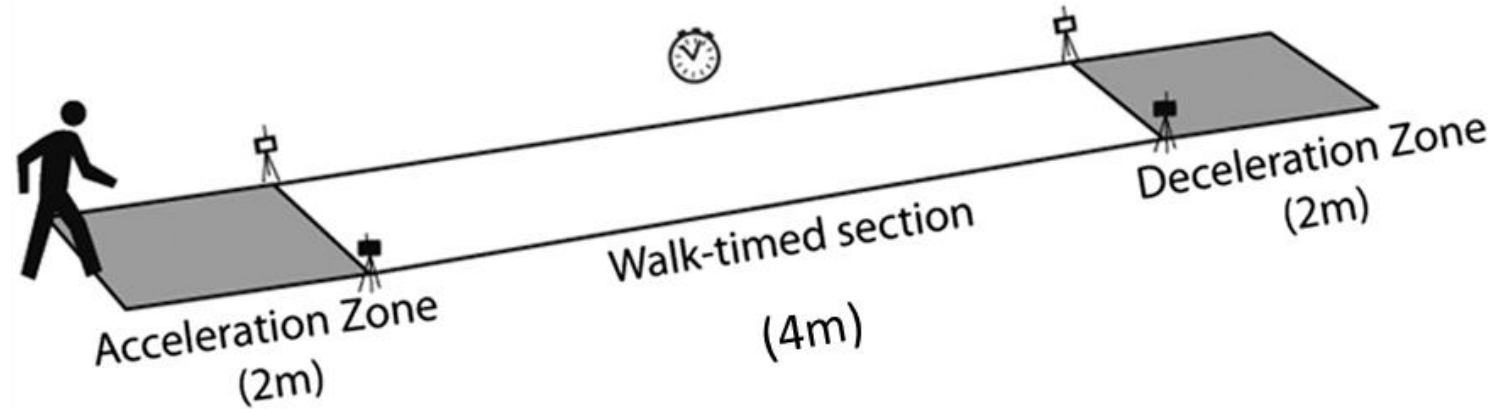
Women

Gait Speed Predicts Mortality



Studenski S, et al. JAMA 2011.

Gait Speed Assessment



Frailty cut off:
4m in <5 seconds (0.8m/s)



VIDEOS IN CLINICAL MEDICINE

SUMMARY POINTS

Julie R. Ingelfinger, M.D., *Editor*

Mobility Assessment in Older Adults

Kirstyn James, M.D., Andrea Wershof Schwartz, M.D., M.P.H.,
and Ariela R. Orkaby, M.D., M.P.H.



A blue ribbon graphic with a 3D effect, featuring a darker blue shadow on the left side. The text "Our patients" is written in white, sans-serif font across the center of the ribbon.

Our patients

Patient 1 Mr. J

4m gait speed: 3.2 sec = 1.25m/s



- 82M, independent, hiker
 - HTN, glaucoma, family history of CVD
 - Former smoker, glass of wine with dinner
 - **Medications:** Amlodipine 5mg, Rosuvastatin 20mg, Latanoprost drops
 - **Total Cholesterol:** 180 mg/dL
 - **LDL-C:** 70 mg/dL
 - **HDL-C:** 60 mg/dL
 - **Triglycerides:** 95 mg/dL
- **Robust/Non-frail**
 - **Maintenance of activity**
 - **Continue statin**

Patient 2: Ms. G

4m gait speed: 5.3 sec = 0.75m/s



- 80F, independent, uses cane for stability
 - HTN, HL, DM, anxiety, arthritis, h/o colon cancer
 - Former smoker, no alcohol
 - **Medications:** Metformin 1000mg, Losartan 50mg, Sertraline 50mg, Acetaminophen 1000mg
 - **Total Cholesterol:** 240 mg/dL
 - **LDL-C:** 189 mg/dL
 - **HDL-C:** 55 mg/dL
 - **Triglycerides:** 199 mg/dL
- Pre-frail**
- Encourage activity, PT to improve mobility
 - Nutrition review
 - Consider adding a statin

Patient 3: Mrs. Y

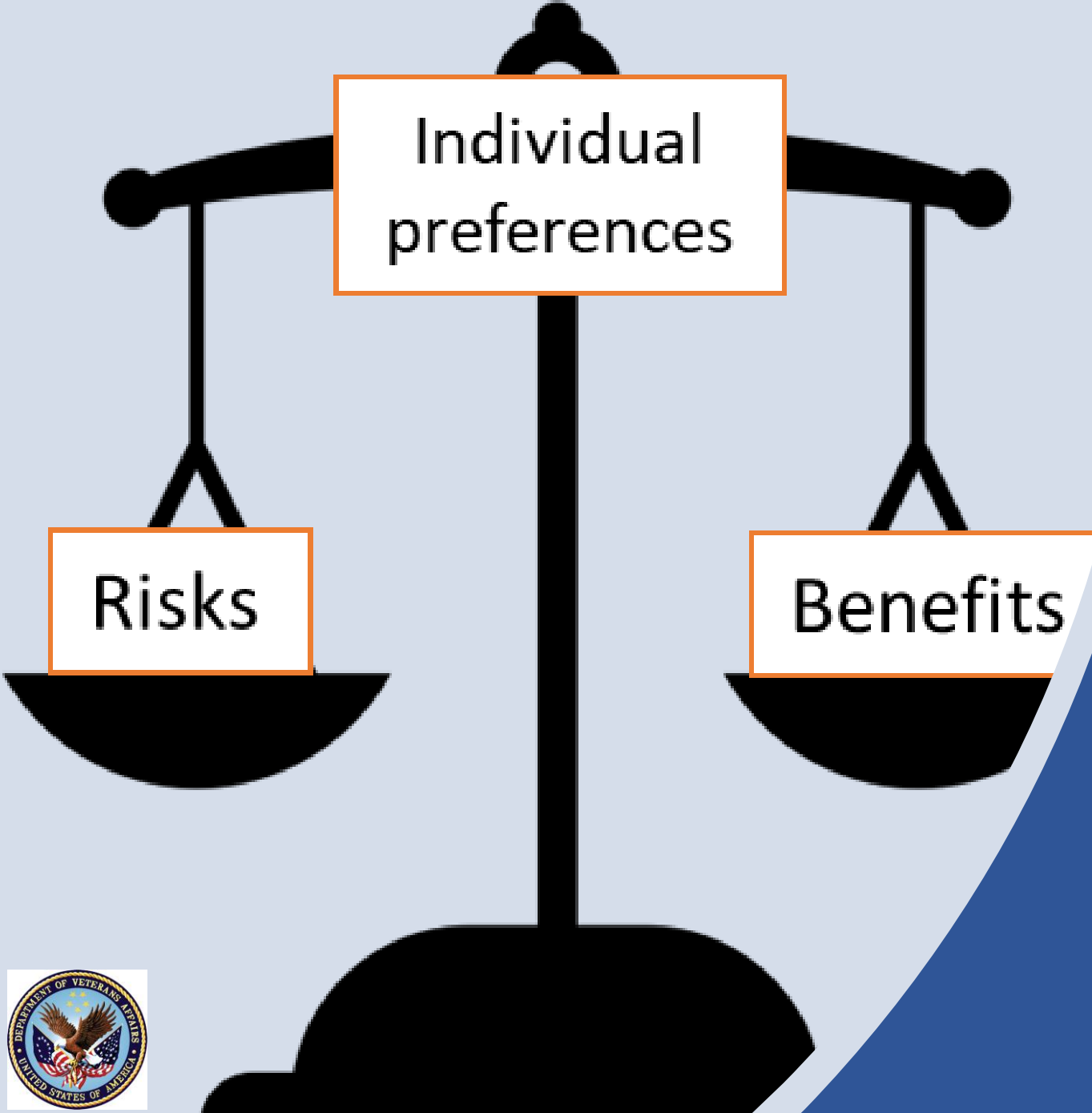
4m gait speed: 9.6 sec = 0.42m/s



- 81F, wheelchair for distance
 - Assistance with bathing, dressing
 - AF, HTN, HL, mild dementia, CKD, osteoporosis, malnutrition, urinary incontinence
 - Never smoker, no alcohol
 - **Medications:** Donepezil 10mg, Lisinopril 5mg, Pravastatin 20mg, Oxybutinin 10mg, Warfarin 5mg, Vitamin B12, Alendronate 70mg/wk
 - **Total Cholesterol:** 220 mg/dL
 - **LDL-C:** 130 mg/dL
 - **HDL-C:** 40 mg/dL
 - **Triglycerides:** 150 mg/dL
- Frail**
- **Encourage activity, diet may need to be liberalized**
 - **Unlikely to benefit from statin treatment**

Bottom Line

- Age is the driving risk factor for CVD, risk calculators are unhelpful
- Everyone benefits from lifestyle improvement
- Consider frailty and function before prescribing
- In those without a life limiting illness:
 - Consider low-intensity, low dose statin trial
e.g. pravastatin 10mg
 - Start low, go slow ... but get there!
 - Change in LDL is more important than a target
 - If HDL is low and/or TGs are high consider adding meds
- In those with life limiting disease: deprescribing statins is appropriate



Individual
preferences

Risks

Benefits

Statins for Primary Prevention in Older Adults

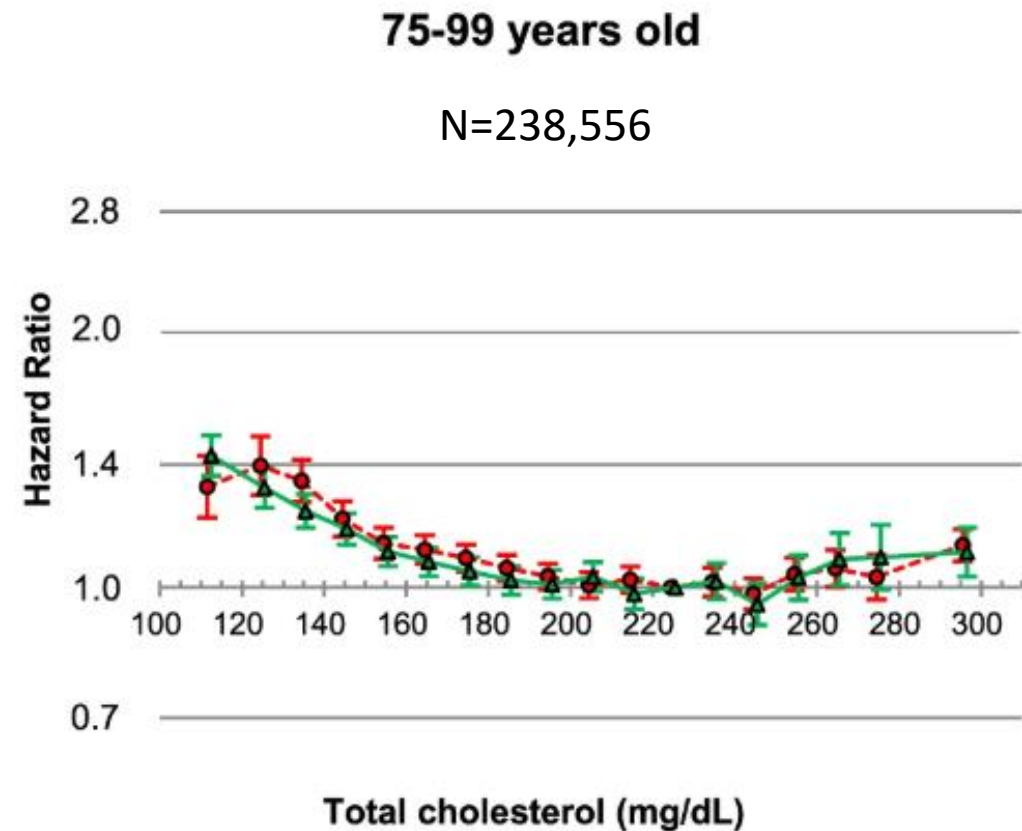
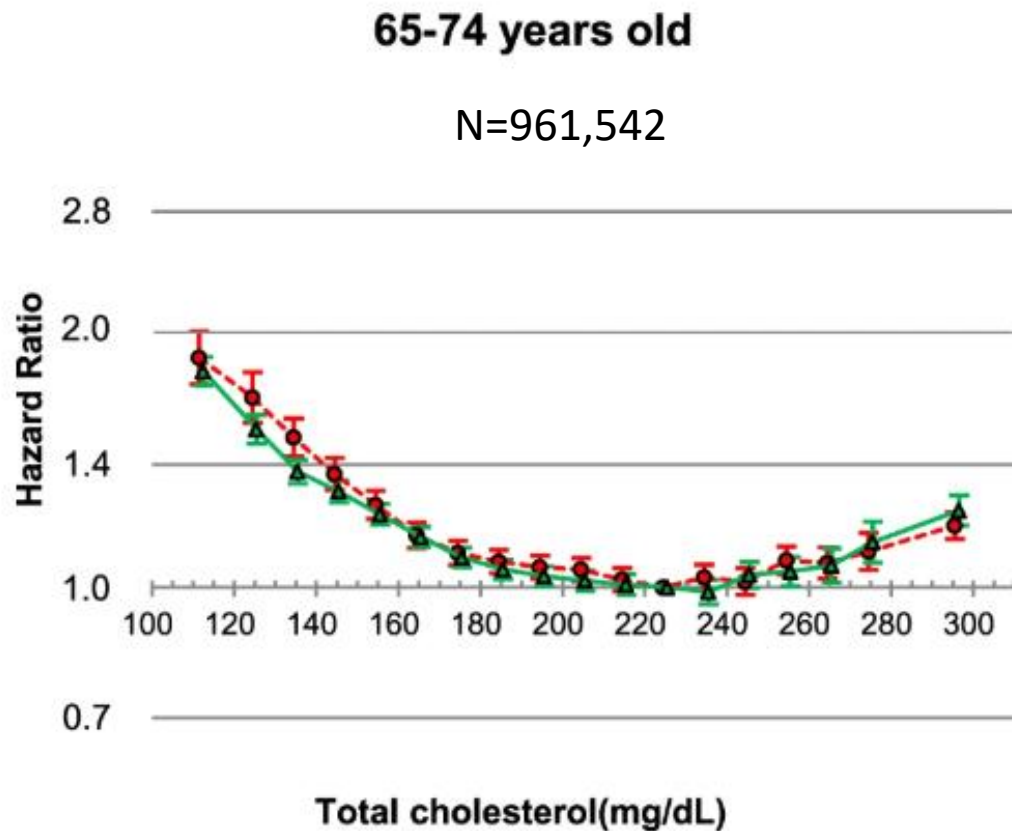
July 27, 2022

Ariela R. Orkaby, MD, MPH

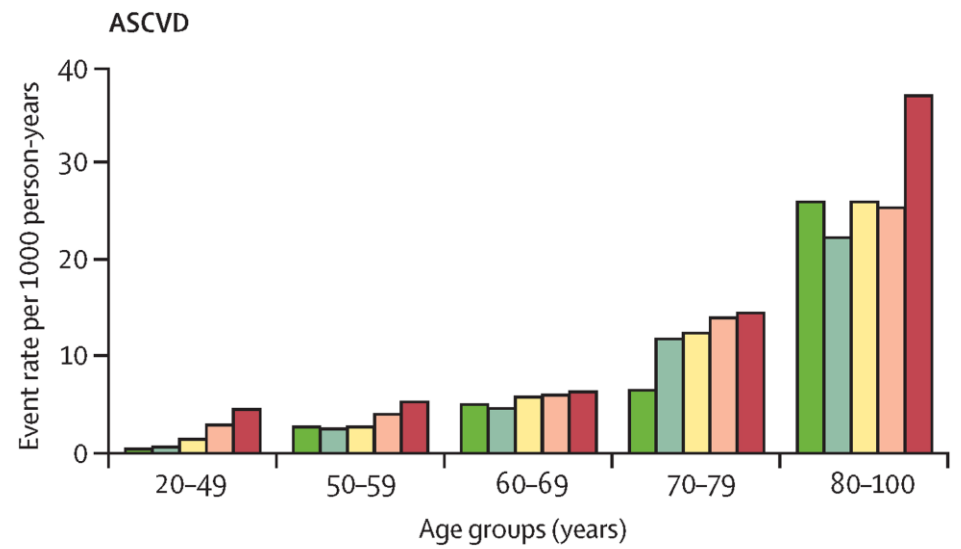
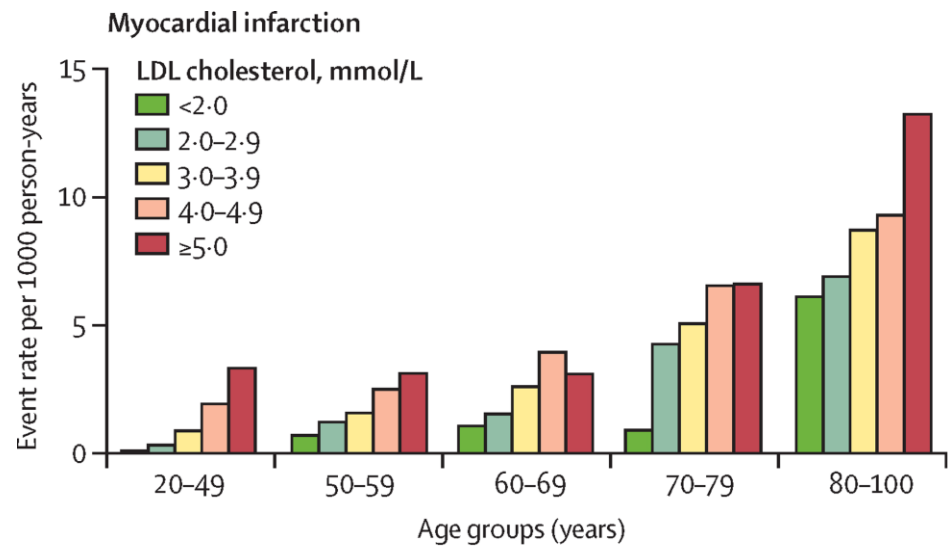
aorkaby@bwh.harvard.edu



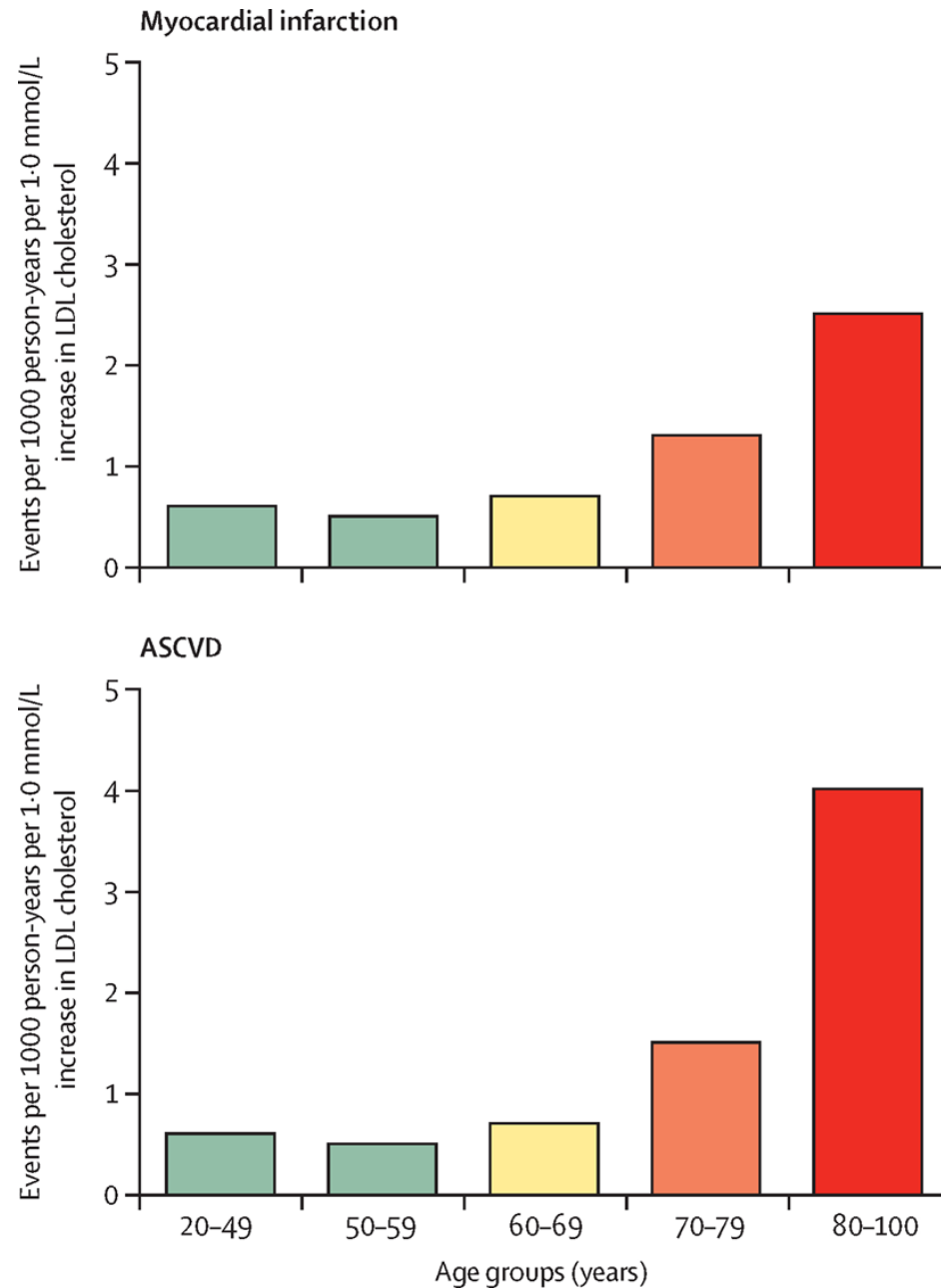
J-shaped relationship between cholesterol and mortality – largely driven by end-stage diseases (e.g. cancer, heart failure)



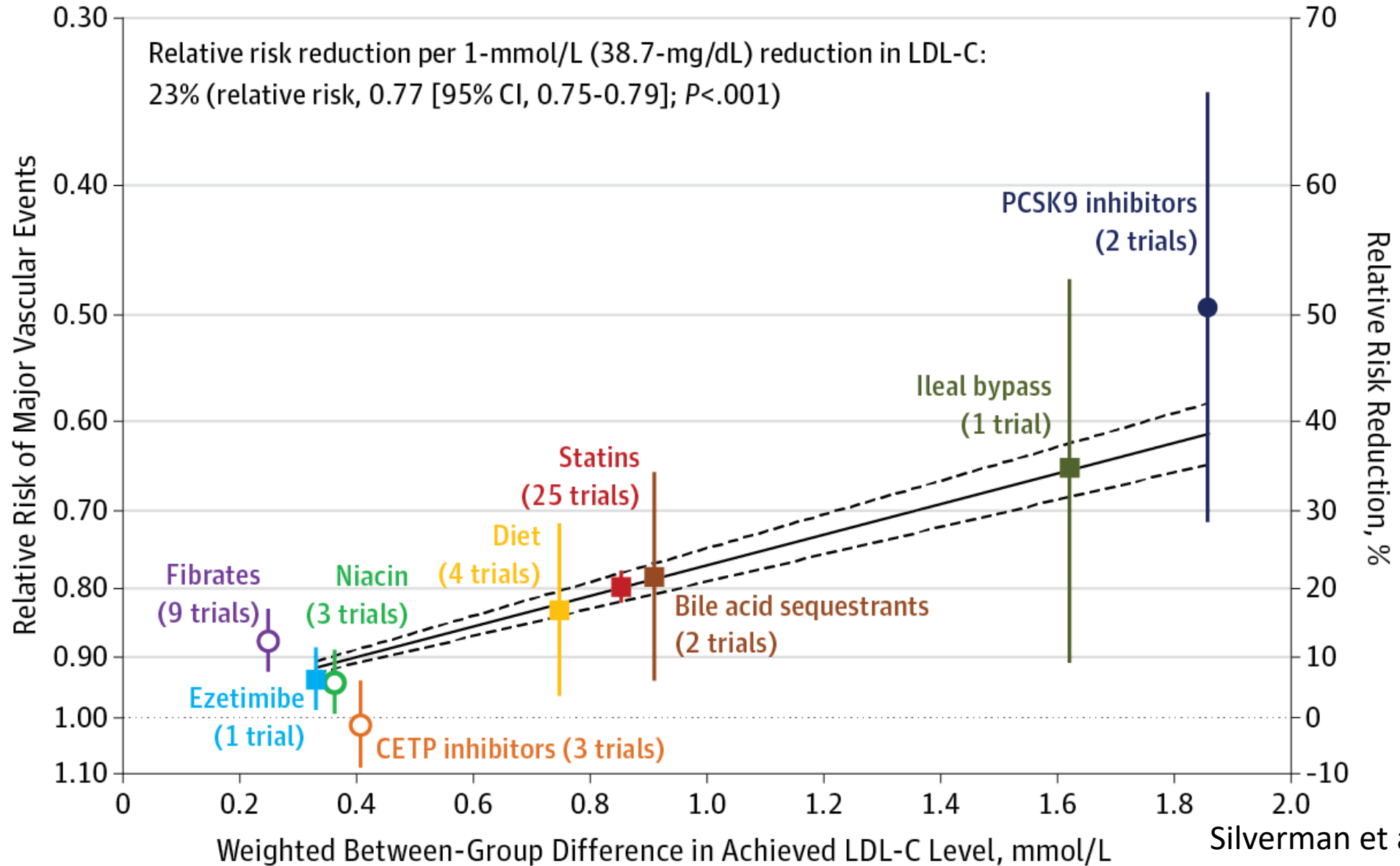
New evidence: Elevated LDL is associated with an increased risk of ASCVD, especially in late life



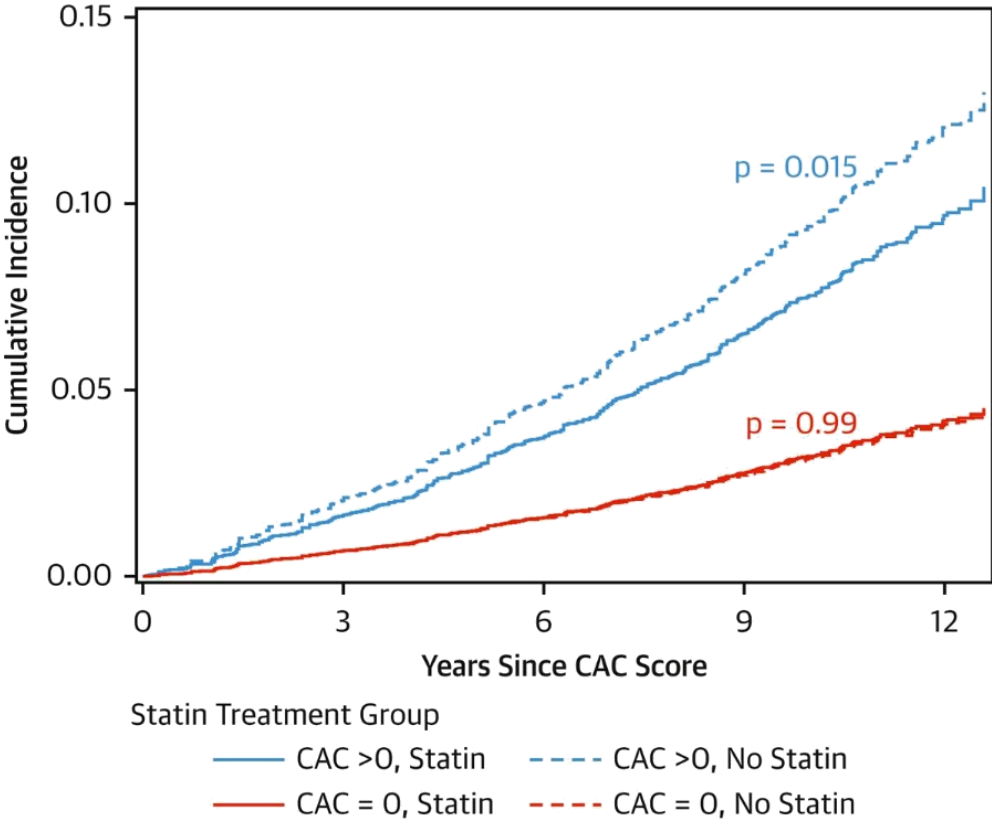
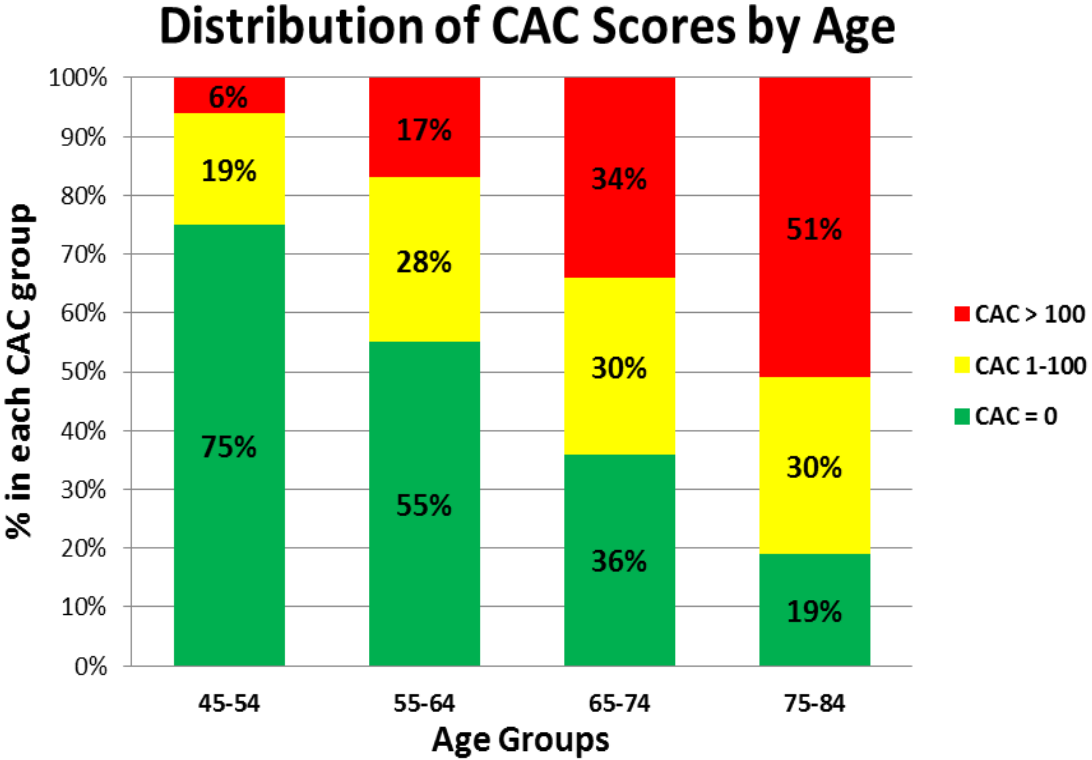
For every 39 mg/dL (1.0 mmol/L) increase in LDL, the risk of an MI/ASCVD event rises, with the highest rates in those over age 80



There is a linear relationship between lower LDL and risk of major vascular events



Statins, Sub-clinical CVD, and Age: The role of Coronary Artery Calcium for risk stratification



No. at risk	0	3	6	9	12
CAC >0, No Statin	1,140	1,072	958	597	140
CAC >0, Statin	3,144	3,027	2,728	1,608	272
CAC = 0, No Statin	5,618	5,355	4,872	2,973	600
CAC = 0, Statin	3,742	3,632	3,258	1,978	318

Tota Maharaj R, Euro Heart J 2012.
Mitchell, J Am Coll Cardiol 2018.