

Principer för prevention av hjärt-kärlsjukdomar (CVD)

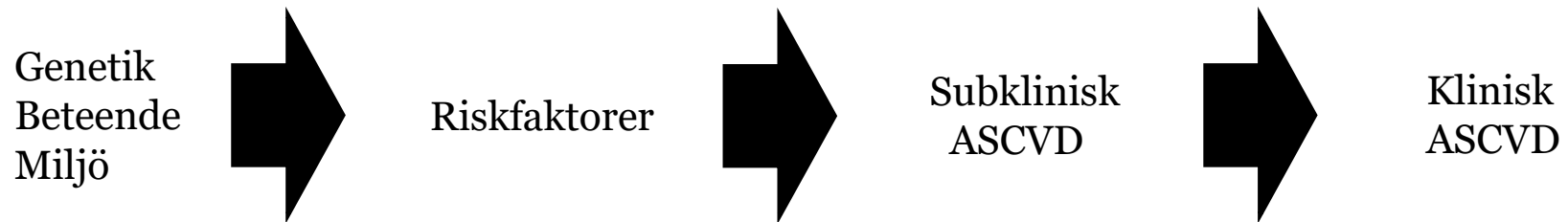
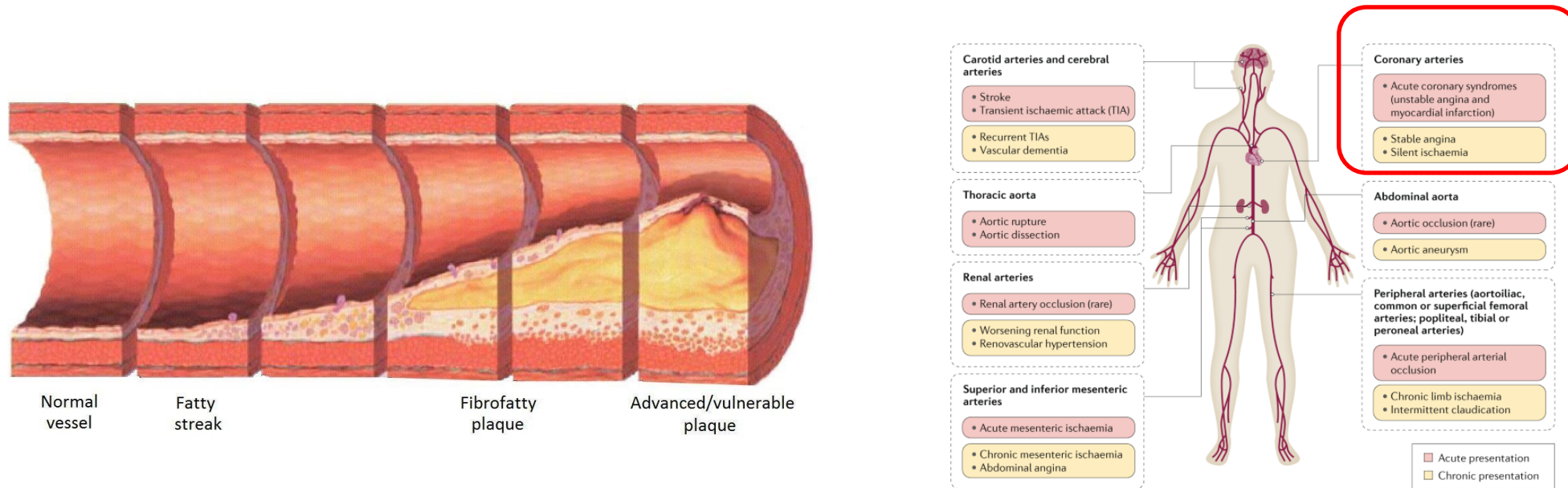
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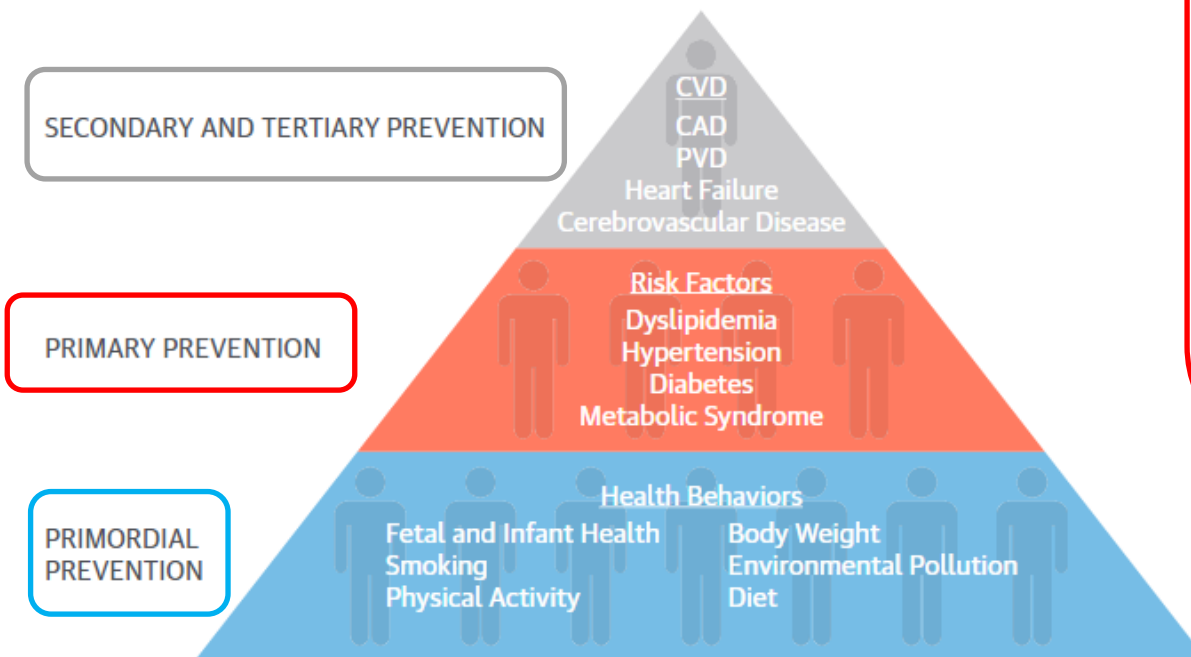
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Aterosklerotisk hjärt-kärlsjukdom (ASCVD)



Prevention av ASCVD



Hong, K.N. et al. J Am Coll Cardiol. 2017;70(17):2171-85.

Hälsa- och sjukvårdens huvudfokus



Förhindra återinsjuknande/progress av ASCVD

Behandla riskfaktorer för att förhindra utveckling av ASCVD

Insatser/åtgärder för att förhindra utveckling av riskfaktorer

Prevention av ASCVD: allmänna principer

- **Multipla riskfaktorer** samverkar i utvecklingen av ASCVD.
- Riskfaktorer är i allmänhet **kvantitativa** and **kumulativa**!
- **Hög ASCVD-risk** → **Stor nytta** av prevention och behandling! ("Risk-benefit paradigm")
- **Livsstilsinterventioner, medicinsk behandling** och/eller **revaskularisering**.

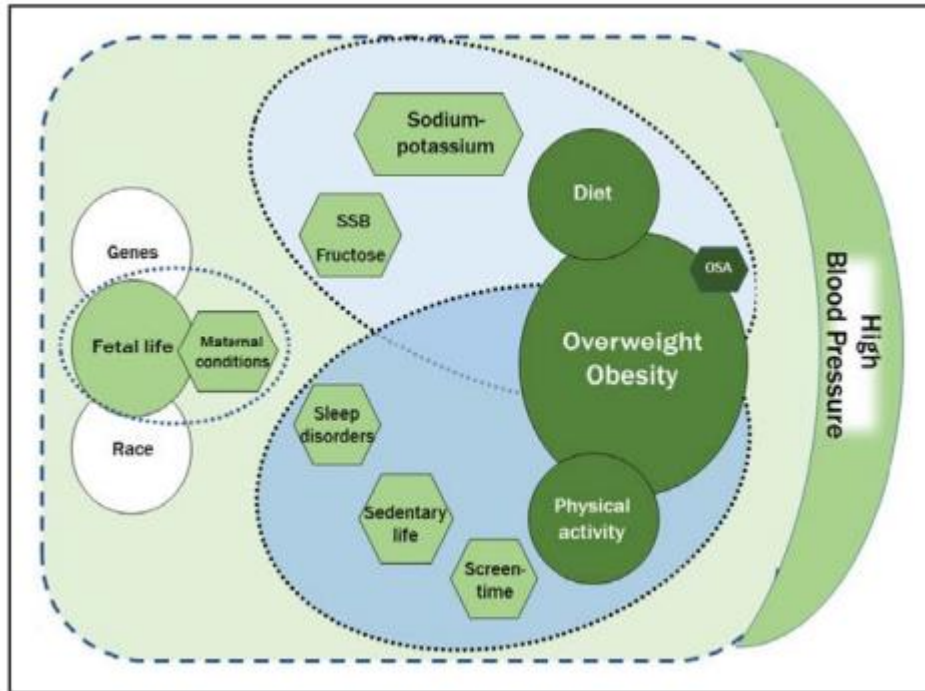


Livsstilsinterventioner - grunden i all ASCVD-prevention

- Livsstilsfaktorer verkar ofta på **flera olika mekanismer** i patogenesen av ateroskleros, vilket resulterar i potentiellt stora vinster av en intervention.
- I allmänhet **säkra** med få biverkningar och **kostnadseffektiva**.
- Hälsosamma livsstilsval har potential att även förebygga **icke-kardiovaskulär sjuklighet** and **dödlighet** (tex cancer, diabetes, demens, osteoporos).
- Livsstilsinterventioner är effektiva i **alla stadier** av ASCVD.



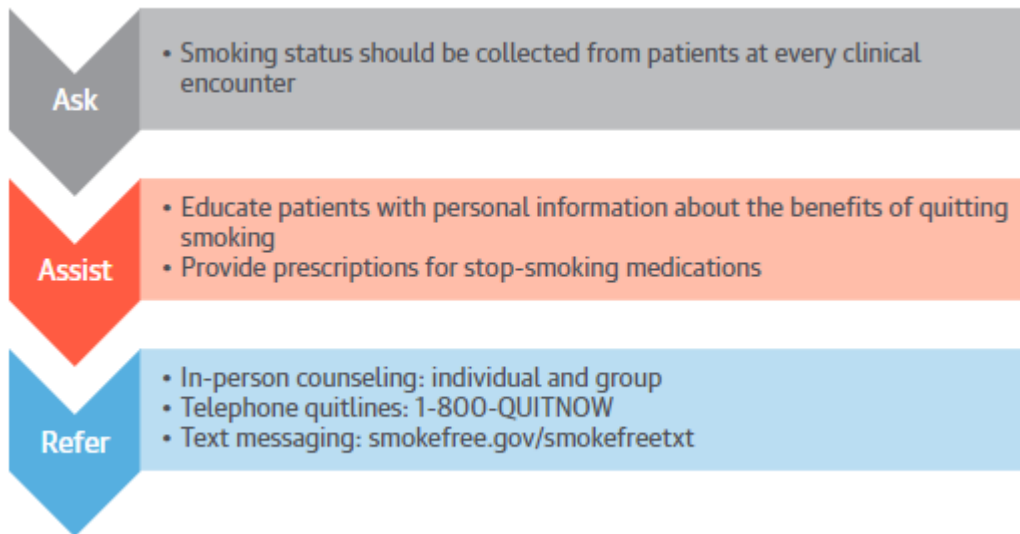
Exempel: Primordial prevention



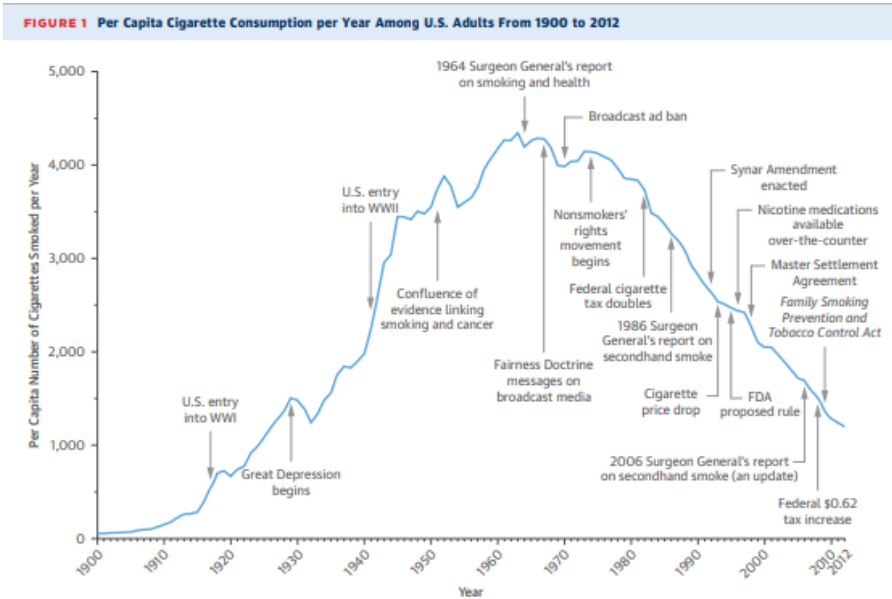
Insatser/åtgärder för att motverka utveckling av hypertoni hos barn

Falkner, B et al. Hypertension. 2020;75:1142-1150

Exempel: Primär prevention



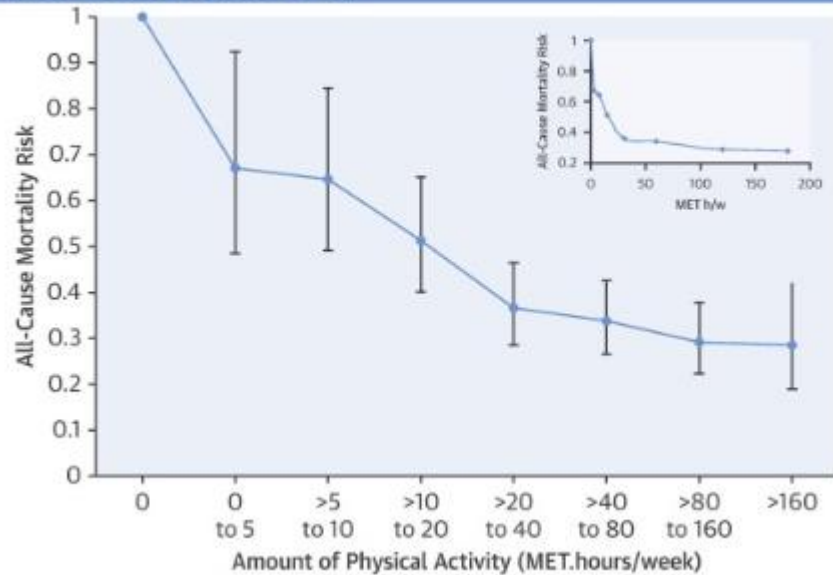
Kalkhoran, S et al. J Am Coll Cardiol 2018;72:1030–45



Hjälp till rökstopp hos unga vuxna

Exempel: Sekundär prevention

All-cause mortality risk associated with each doubling of habitual physical activity volume, and by linear increase in physical activity



Regelbunden fysisk träning hos patienter med kronisk kranskärslsjukdom (CCS)

Stewart, R et al. J Am Coll Cardiol 2017;70:1689–700

"The prevention paradox"

Strategy of prevention: lessons from cardiovascular disease

GEOFFREY ROSE

If an obstetrician had a case of eclampsia he would ask, "What went wrong?" The occurrence of a preventable disaster is a threat to his professional reputation, for an obstetrician accepts prevention as an integral part of his normal professional responsibilities. Antenatal care is in fact largely preventive, and the integration of prevention with treatment has led to an excellent fall in maternal and perinatal mortality rates. In paediatrics too there are no demarcation disputes between prevention and treatment; and a similar trend is now also appearing in general practice. If a stroke occurs in an untreated or badly treated hypertensive patient, a good general practitioner asks, "What went wrong?" For, in middle age at least, strokes are largely preventable. When one occurs it suggests a possible failure of practice organisation.

Clinician and prevention

Unfortunately, in other branches of medicine there is a continuing and regrettable separation of the therapeutic and the preventive roles, and doctors generally continue to see the care of the sick as their whole responsibility.

CORONARY HEART DISEASE IS PREVENTABLE

Figure 1 shows the recent trends in mortality from coronary heart disease in various countries of the world. In Japan the rates have throughout this period been extremely low.

Based on the Adolf Ströcher memorial lecture given at the North Staffordshire Medical Institute, Stoke-on-Trent, on 13 November 1980, which will be published in full later this year in the *Journal of the North Staffordshire Medical Institute*.

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GEOFFREY ROSE, DM, FRCP, professor of epidemiology

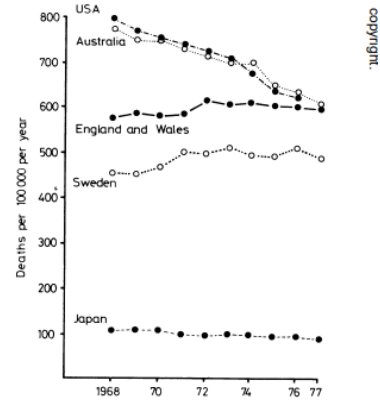
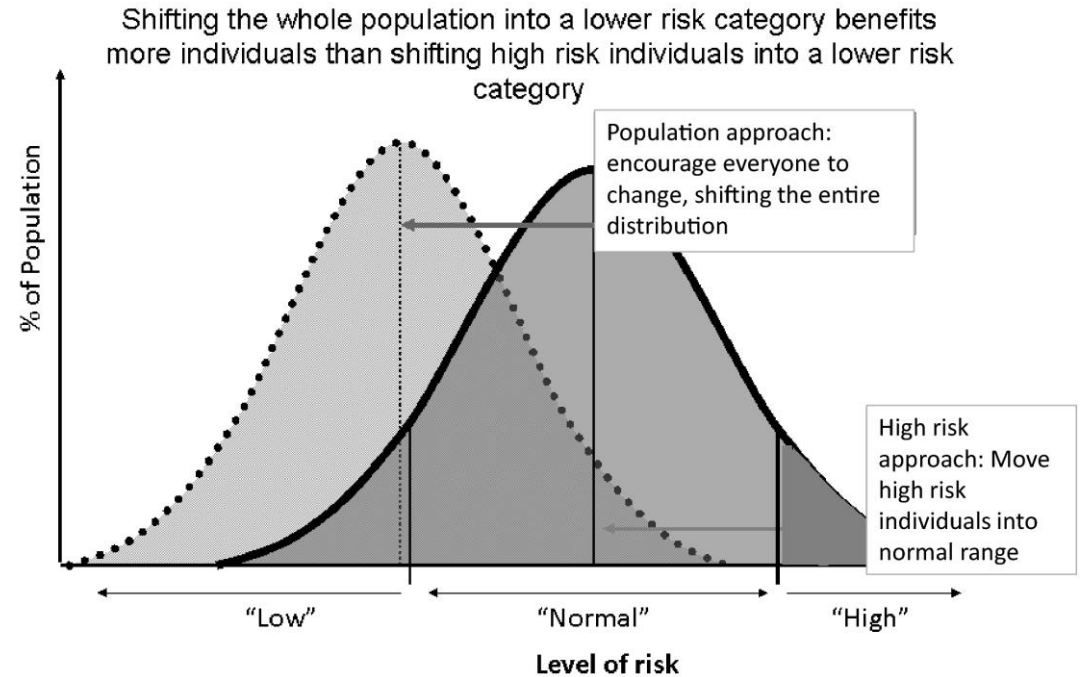


FIG 1—Age-adjusted death rates from coronary heart disease (ICD, 8th revision, 410-14) among men aged 35-74 in various countries.

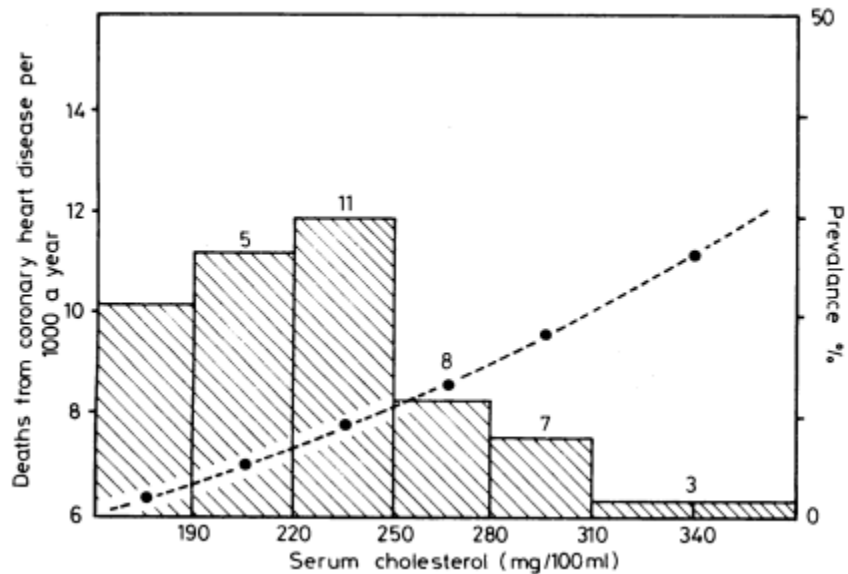
Australia and the United States at the start of the period they were high, but they have fallen by some 25%. In England and Wales they started a little short of the American and Australian rates and have shown little change. The Japanese owe their low rates not to their genes but to their way of life: when they move to America they rather quickly acquire American rates. The large recent declines in Australia and the United States must surely be due largely to a declining incidence of disease, since



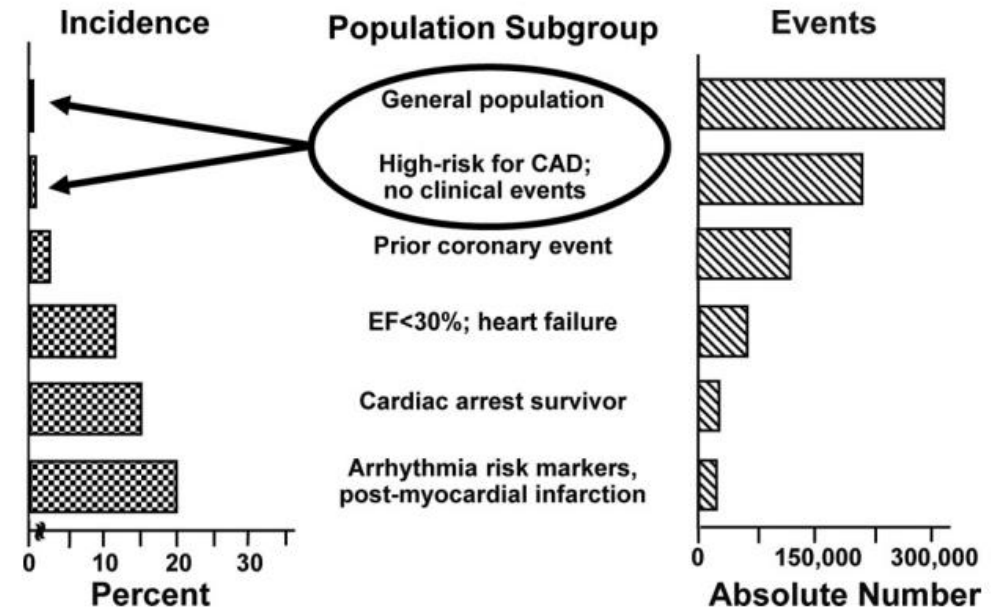
Befolkningsstrategi vs Högriskstrategi

Rose, G. BMJ 1981;282:1847-1851

Exempel: The Prevention Paradox



Rose, G. BMJ 1981;282:1847-1851



Myerburg, RJ et al. Circulation. 2012;125:1043-1052

"Sick individuals"

The causes of cases:

-Vad är orsaken till att denna patient fick denna sjukdom just nu?



Högriskstrategier

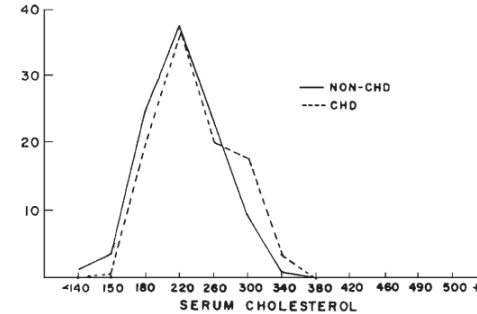


Figure 3 Percentage distribution of serum cholesterol levels (mg/dl) in men aged 50-62 who did or did not subsequently develop coronary heart disease (Framingham Study⁵)

Table 1 Prevention by the 'high-risk strategy': advantages

1. Intervention appropriate to individual
2. Subject motivation
3. Physician motivation
4. Cost-effective use of resources
5. Benefit: risk ratio favourable

Table 2 Prevention by the 'high-risk strategy': disadvantages

1. Difficulties and costs of screening
2. Palliative and temporary—not radical
3. Limited potential for (a) individual
(b) population
4. Behaviourally inappropriate

"Sick populations"

The causes of incidence:

-Varför har denna population högre blodtryck/kolesterol jämfört med en annan population?



Befolkningsstrategier

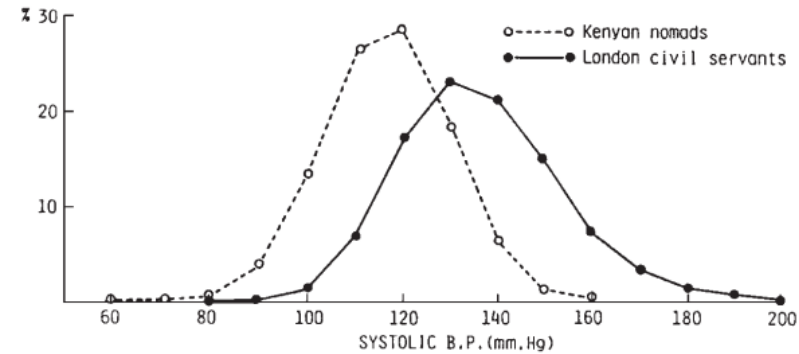


Table 5 Prevention by the 'population strategy': advantages

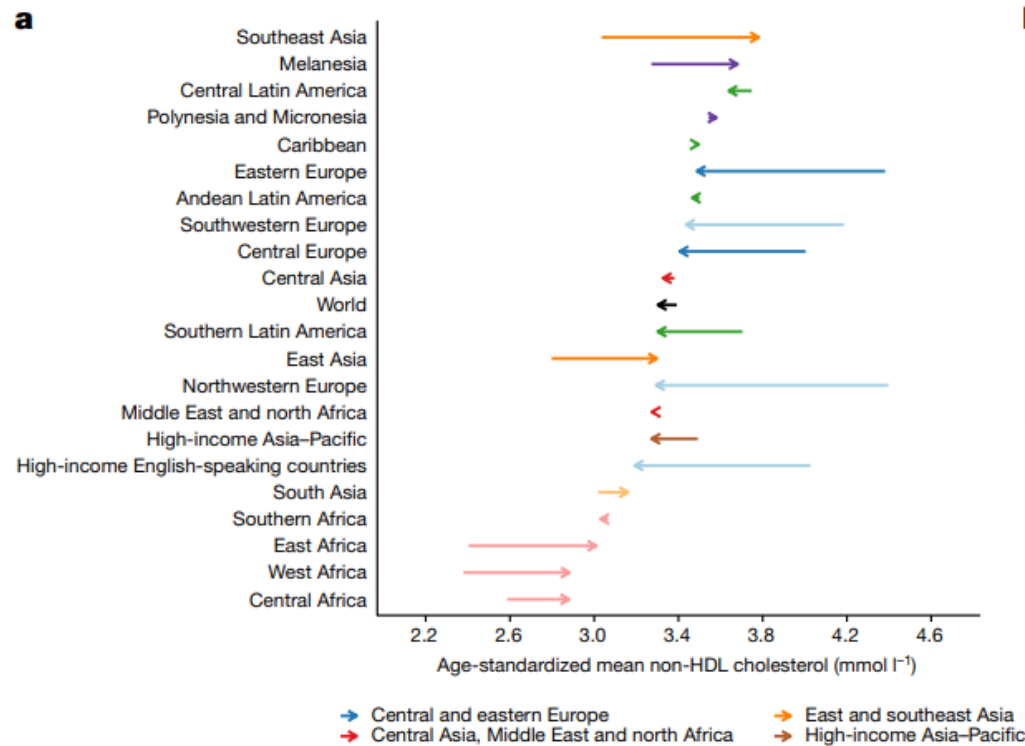
1. Radical
2. Large potential for population
3. Behaviourally appropriate

Table 6 Prevention by the 'population strategy': disadvantages

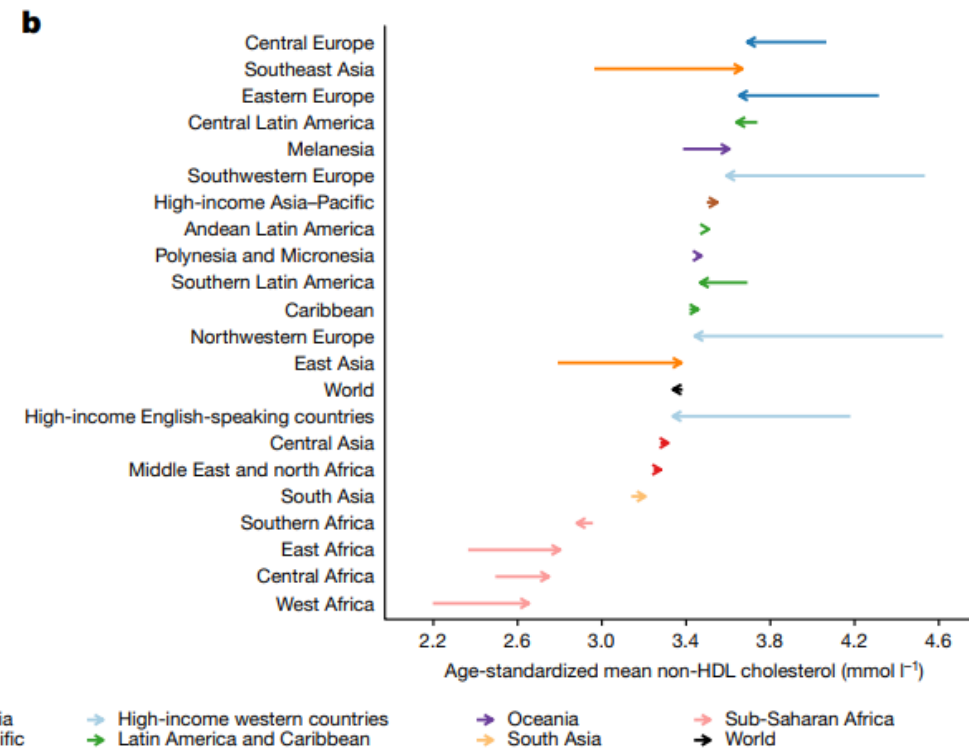
1. Small benefit to individual ('Prevention Paradox')
2. Poor motivation of subject
3. Poor motivation of physician
4. Benefit: risk ratio worrisome

"Sick populations"

Kvinnor (1980-2018)

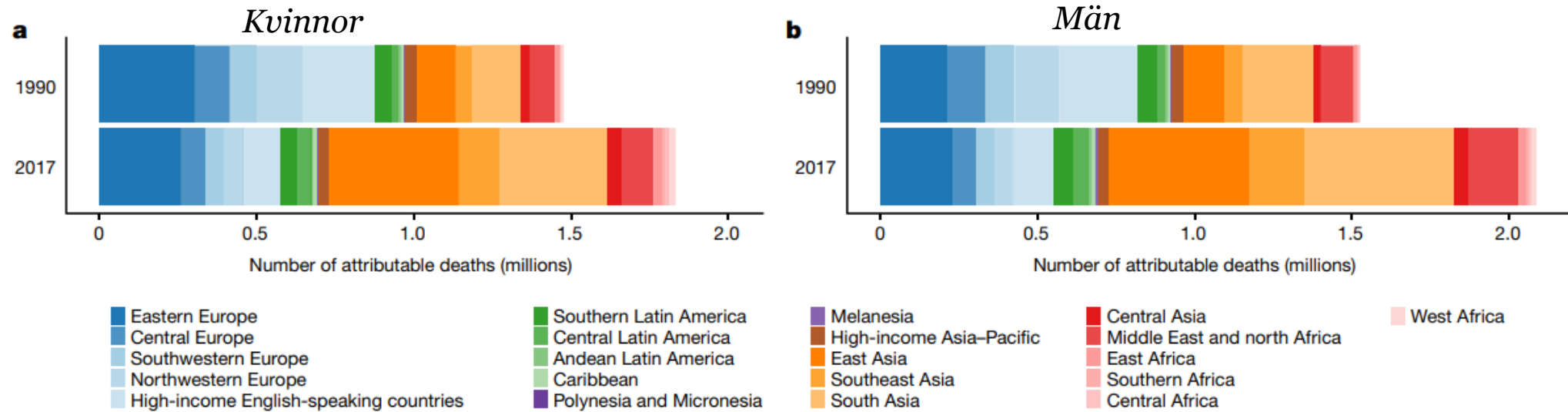


Män (1980-2018)



"Sick populations"

Död IHD och stroke pga högt non-HDL-C

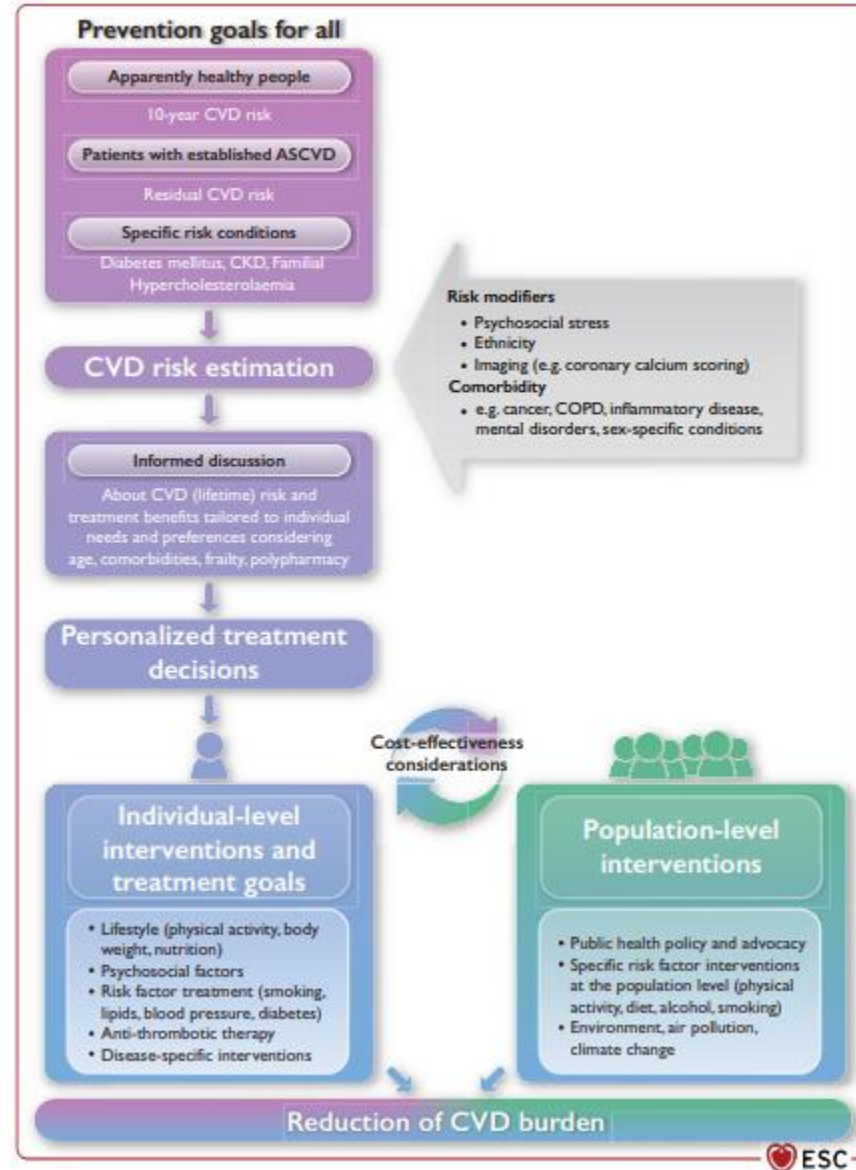


Nature 2020;582:73–77

Hög-riskstrategier

- 1) Screening
- 2) Riskvärdering (absolut ASCVD-risk)
- 3) Interventioner och behandlingsmål på individnivå utifrån
 - absolut ASCVD-risk
 - comorbiditet, preferenser

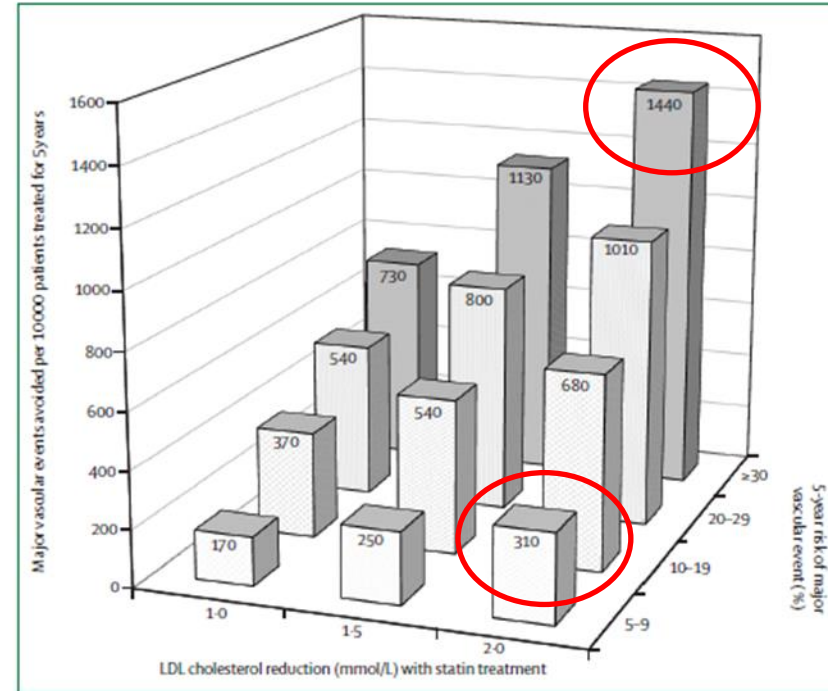
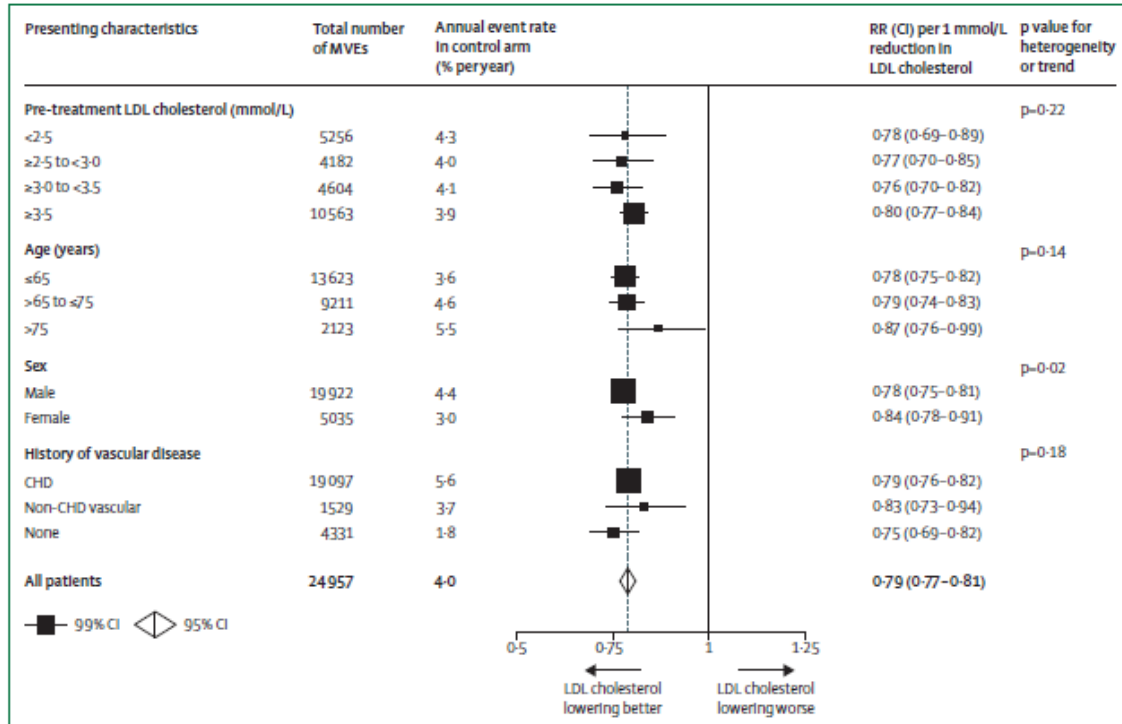
”Risk-benefit paradigm”



ESC prevention Guidelines (2021)

Befolkningsstrategier

“Risk-Benefit paradigm”

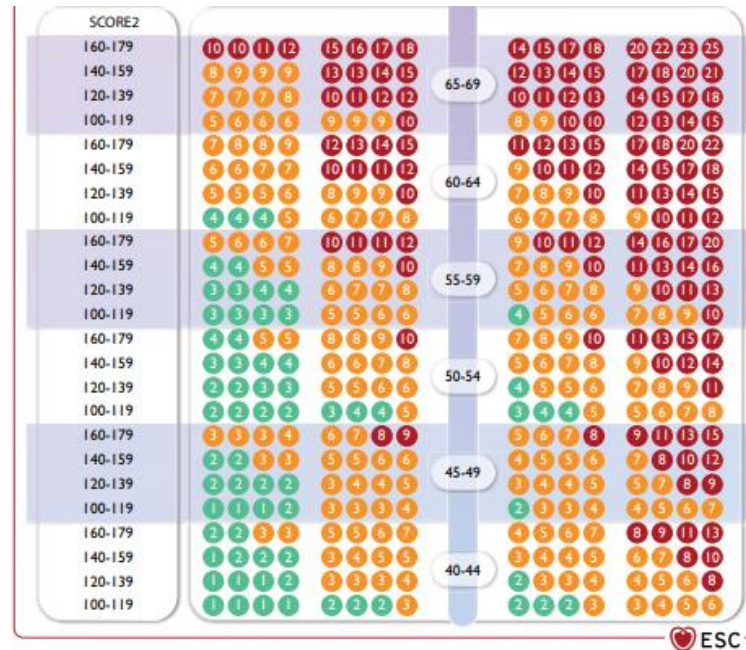
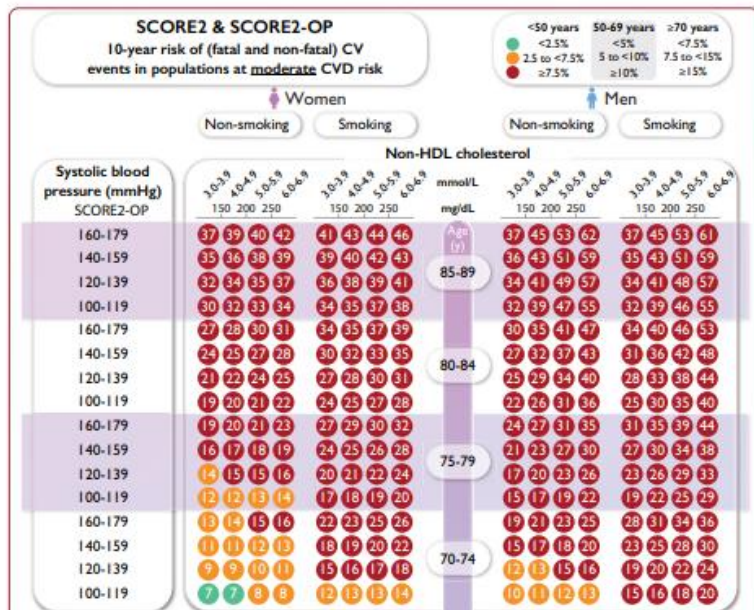


NNT = 7

NNT = 32

10 000 patienter med 5 års statinbehandling

ASCVD-risk hos "friska individer"



- **Kön**
- **Ålder**
- **Rökning**
- **Systoliskt BT**
- **NonHDL**

Gäller INTE vid...

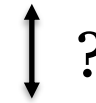
- **känd ASCVD**
- **diabetes mellitus**
- **kronisk njursjukdom**
- **familjär hyperkolesterolemi (andra ärftliga dyslipidemier)**

10-års risk för fatal och icke-fatal ASCVD (hjärtinfarkt och stroke)

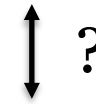
Risk modifiers

- Övervikt/bukfetma
- Fysisk inaktivitet
- Dåliga mat- och dryckesvanor
- Psykosociala stressorer
- Allvarlig psykisk sjukdom
- Socioekonomiska faktorer
- Exponering för luftföroreningar
- Familjehistorik (tidig ASCVD: kvinnor < 60 åå, män < 55 åå)
- Genetiska risk score (GRS)
- Biomarkörer: Lp(a), hsCRP
- Aterosklerosförekomst vid bilddiagnostik
- Tillstånd/sjukdomar med förhöjd risk: inflammatoriska systemsjukdomar, polycystisk ovarialsyndrom (PCO), migrän med aura, prematur menopaus, graviditetskomplikationer (pre-eklampsi, diabetes mm)

Mycket hög risk



Hög risk



Låg-Måttlig risk

ASCVD-risk hos "särskilda patientgrupper"

- **Kronisk njursjukdom** (hög – mycket hög risk): eGFR och albuminuri.
- **Familjär hyperkolesterolemi*** (hög risk): LDLC. **Även andra ärftliga dyslipidemier*
- **Diabetes mellitus** (måttlig – hög – mycket hög risk): diabetes duration, organskada (albuminuri, retinopati och/eller neuropati), övriga ASCVD-riskfaktorer.
- **Känd ASCVD** (mycket hög risk) *Vad menas med känd ASCVD?*

Eur Heart J 2020;41:111-188

Eur Heart 2021;42:3227-3337

Vad menas med känd ASCVD (sekundärprevention)?

- Känd/dokumenterad/manifest/etablerad ASCVD

Very-high-risk

People with any of the following:
Documented ASCVD, either clinical or unequivocal on imaging. Documented ASCVD includes previous ACS (MI or unstable angina), stable angina, coronary revascularization (PCI, CABG, and other arterial revascularization procedures), stroke and TIA, and peripheral arterial disease. Unequivocally documented ASCVD on imaging includes those findings that are known to be predictive of clinical events, such as significant plaque on coronary angiography or CT scan (multivessel coronary disease with two major epicardial arteries having >50% stenosis), or on carotid ultrasound.

Eur Heart J 2020;41:111-188

Klinisk ASCVD

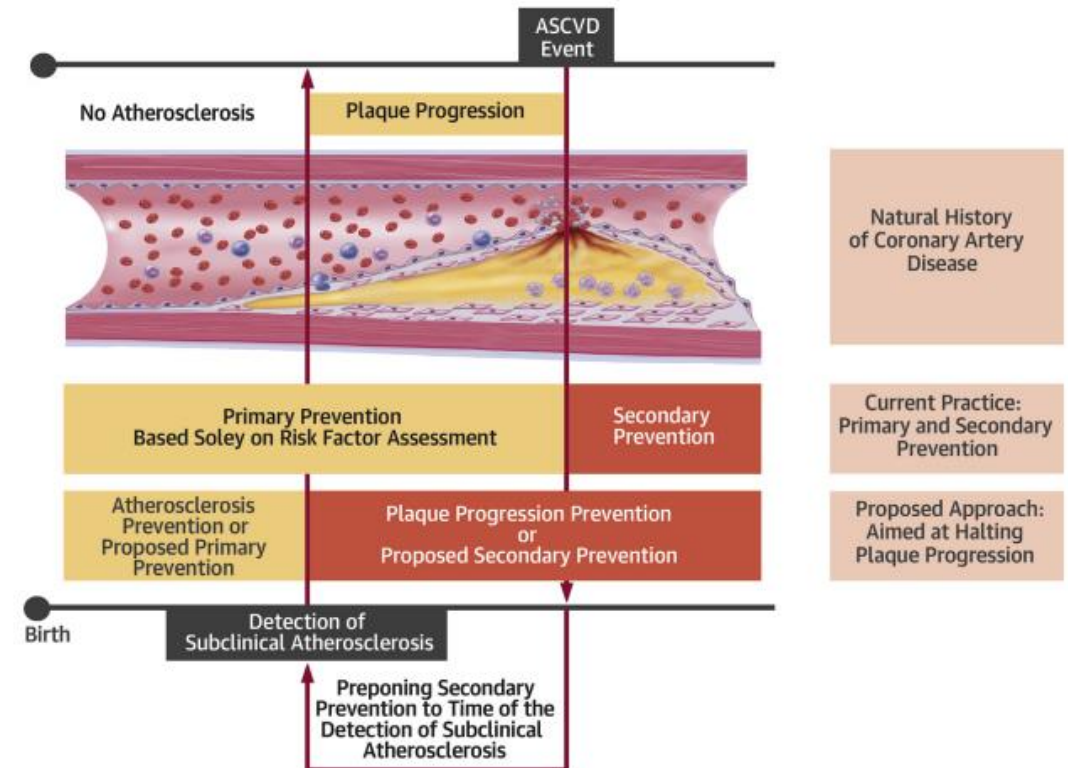
eller

Subklinisk ASCVD



*Bilddiagnostik visar prognostisk
ogynnsam ASCVD*

Att flytta fram gränsen för sekundär prevention?



Ahmadi, A. et al. J Am Coll Cardiol. 2019;74(12):1608-17.

ASCVD-risk styr behandling och målvärden

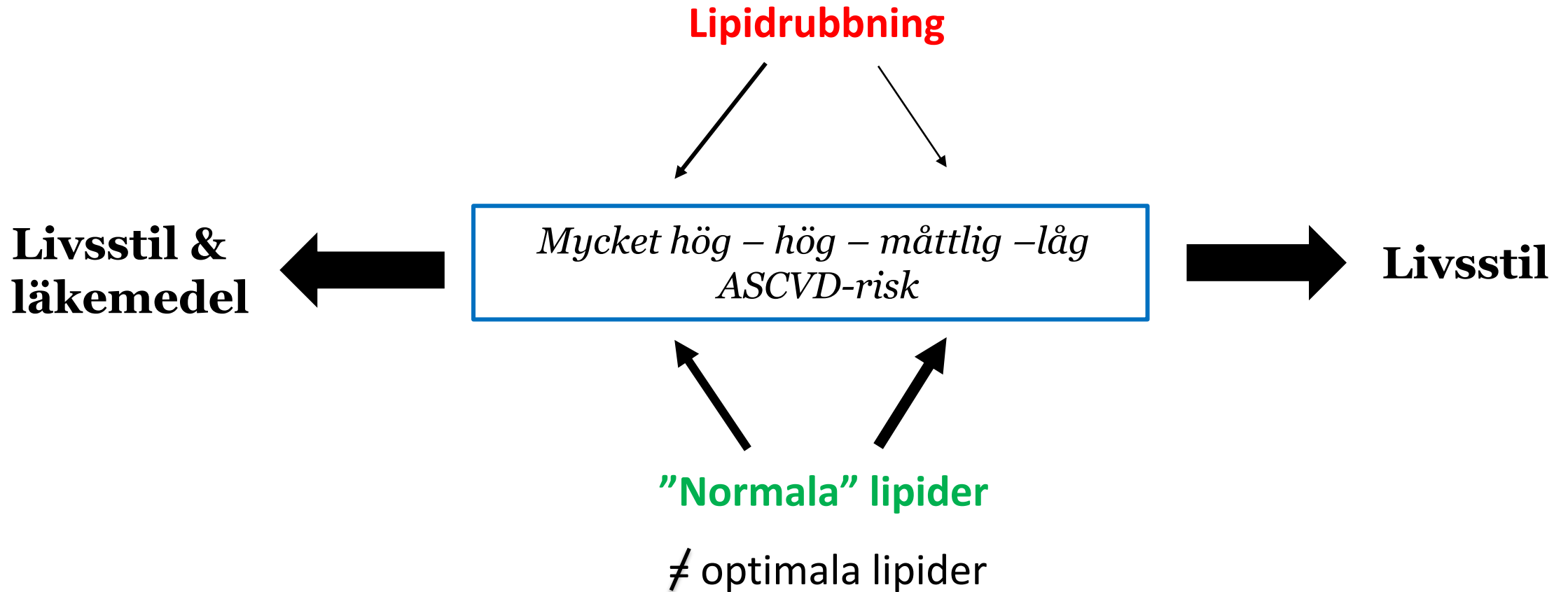
Table 5 Cardiovascular disease risk categories based on SCORE2 and SCORE2-OP in apparently healthy people according to age

	<50 years	50 – 69 years	≥70 years ^a
Low-to-moderate CVD risk: risk factor treatment generally not recommended	<2.5%	<5%	<7.5%
High CVD risk: risk factor treatment should be considered	2.5 to <7.5%	5 to <10%	7.5 to <15%
Very high CVD risk: risk factor treatment generally recommended ^a	≥7.5%	≥10%	≥15%

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Eur Heart 2021;42:3227-3337

ASCVD-risk styr behandling och målvärden



ASCVD-risk styr behandling och målvärden

*Sekundära målvärden**

- **Mycket hög risk:**
 - Livsstilsintervention
 - **Läkemedel** med behandlingsmål **LDLC < 1.4 mmol/L OCH ≥50% reduktion**
- **Hög risk:**
 - Livsstilsintervention
 - **Läkemedel** med behandlingsmål **LDLC < 1.8 mmol/L OCH ≥50% reduktion**
- **Måttlig risk:**
 - Livsstilsintervention
 - Överväg **läkemedel** om **LDLC ≥ 2.6 mmol/L** trots livsstilsintervention
- **Låg risk:**
 - Livsstilsråd om **LDLC < 3.0 mmol/L**
 - Livsstilsintervention om **LDLC ≥ 3.0 mmol/L**
 - Överväg **läkemedel** om **LDL ≥ 3.0 mmol/L** trots livsstilsintervention

*nonHDLc < 2.2 mmol/L
ApoB < 0.65 g/L*

*nonHDLc < 2.6 mmol/L
ApoB < 0.80 g/L*

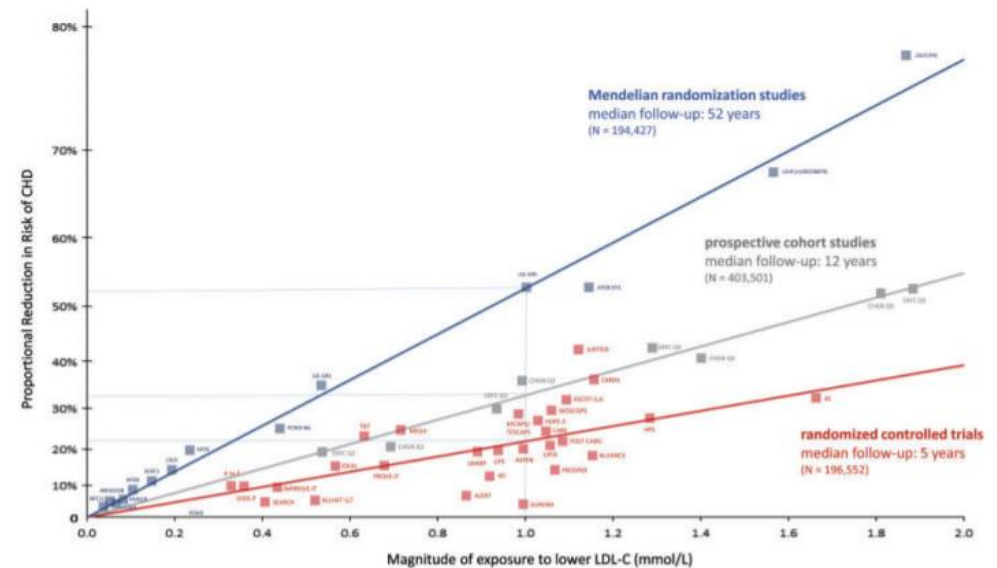
*nonHDLc < 3.4 mmol/L
ApoB < 1.00 g/L*

**Används ffa vid S-TG ≥ 2 mmol/L,
då LDLc kan vara missvisande!*

Causal-exposure paradigm

- Risk-Benefit paradigm använder absolut 10-årsrisk för ASCVD.
- Underskattar den långsiktiga risken hos unga individer, som tidigt i livet exponeras för riskfaktorer.
- Att tidigt i livet identifiera kausala riskfaktorer och erbjuda intervention över lång tid kan ha stora vinster på 30-årsrisk och livstidsrisk.
- Reducera ateroskleros – reducera ASCVD-risk

J Clin Lipid 2014;8:594-605



Exempel: Risk - Benefit vs Causal Exposure

- 75-årig man, aldrig rökare, normalt blodtryck, normala lipidnivåer, normalviktig, regelbunden fysisk träning → Statinbehandling med målnivå LDLC < 1.4 mmol/L (mycket hög risk)
- 42-årig kvinna, ex-rökare (20 paketår), Blodtryck 150/100 mmHg, fysiskt inaktiv, bukfetma, nonHDLc 6.5 mmol/L → Ej statinbehandling (låg risk)

