

Is the 1% rule applicable for CVD risk assessment in aeromedical practice?

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Case No1/ Air Traffic controller, 51 y. o. (male) on revalidation examination

- stable after myocardial infarction and coronary stenting event (mid LAD & IDES) 5 years ago.
- adequate physical activity, regularly taking medication (rosuvastatin+ ezetimibe, perindopril+ amlodipine 5/5 mg).
- Physical examination-no significant findings, BMI 29.
- Lab tests- CBC, electrolytes, uric acid, creatinine, liver enzymes- within normal range
- Lipid profile- TC- 2.12 mmol/l, LDL-C 0.74 mmol/l, HDL 0.82 mmol/l, Triglycerides- 2.12 mmol/l, Glucose 5.15 mmol/l, HgA1C- 5%

Cardiologist evaluation

- ECG- sinus rhythm 72 in 1', Left axis deviation, flattened T wave in I and aVL, partial RBBB
- Echocardiography- satisfactory left ventricular function with no important abnormality of wall motion, LVEF 50%.
- Coronarography after 5 years after the revascularization- demonstrated- mid LAD stent was fully functioning, distant LAD- 30% narrowing, open angle artery OM1- 30% narrowing.
- Ds: IHD, I25.2 Old myocardial infarction, Z95. 5 Presence of coronary angioplasty implant, I11- Hypertension 1st degree, high risk
- Cardiologist evaluation- Low risk of repeated event.

SCORE2 risk prediction algorithms: new models to estimate 10-year risk of cardiovascular disease in Europe

- SCORE2—a new algorithm derived, calibrated, and validated to predict 10-year risk of first-onset CVD in European populations—enhances the identification of individuals at higher risk of developing CVD across Europe.
- SCORE2 provides risk estimates for the combined outcome of fatal and non-fatal CVD events.
- The SCORE2 charts available for CVD risk estimation in four European risk regions; countries were grouped into four risk regions according to their most recently reported WHO age- and sex-standardized overall CVD mortality rates per 100,000 population (ICD chapters 9, I00-I99).

Figure 2 Risk regions based on standardised cardiovascular disease mortality rates. Countries were grouped into four ...

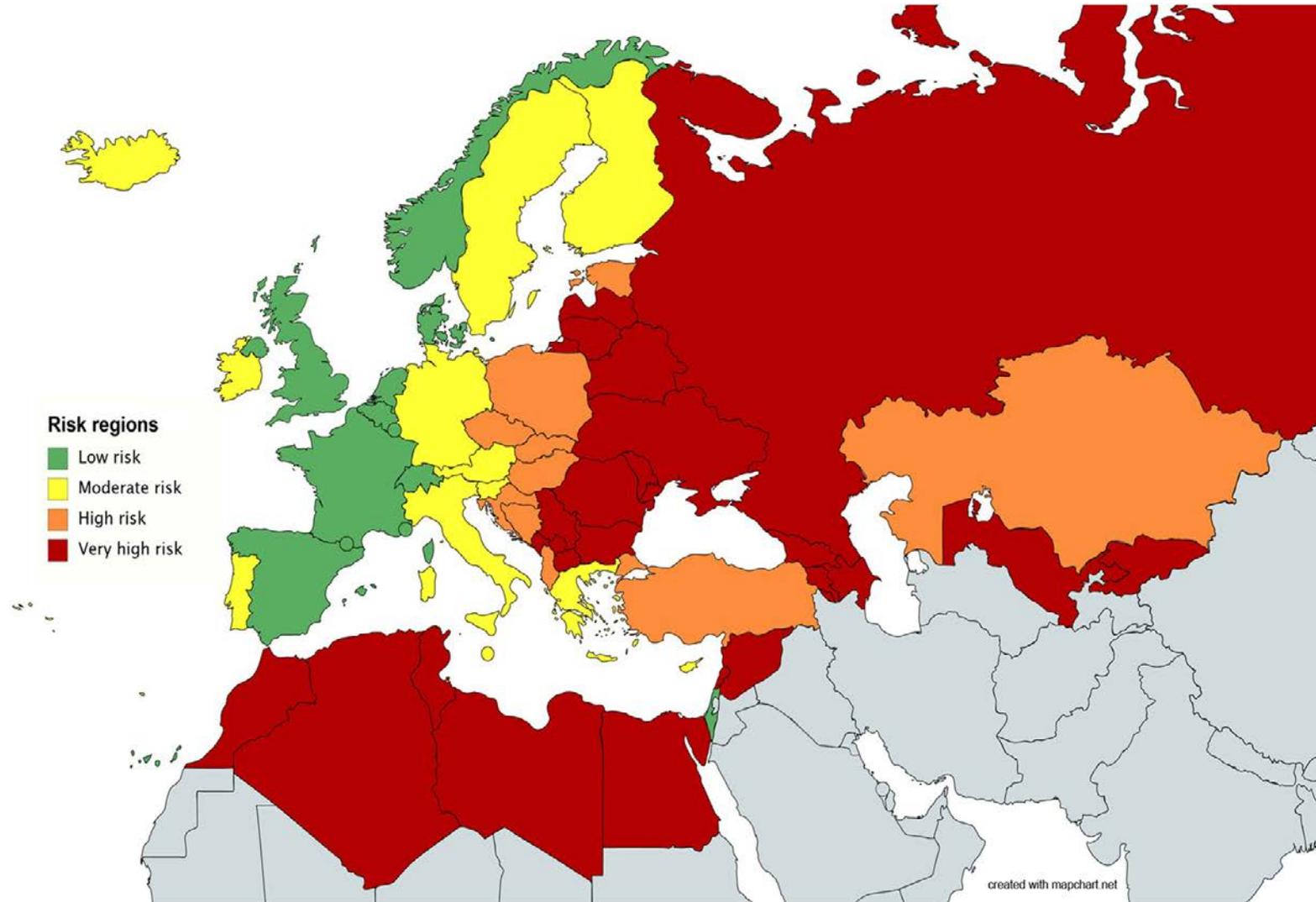
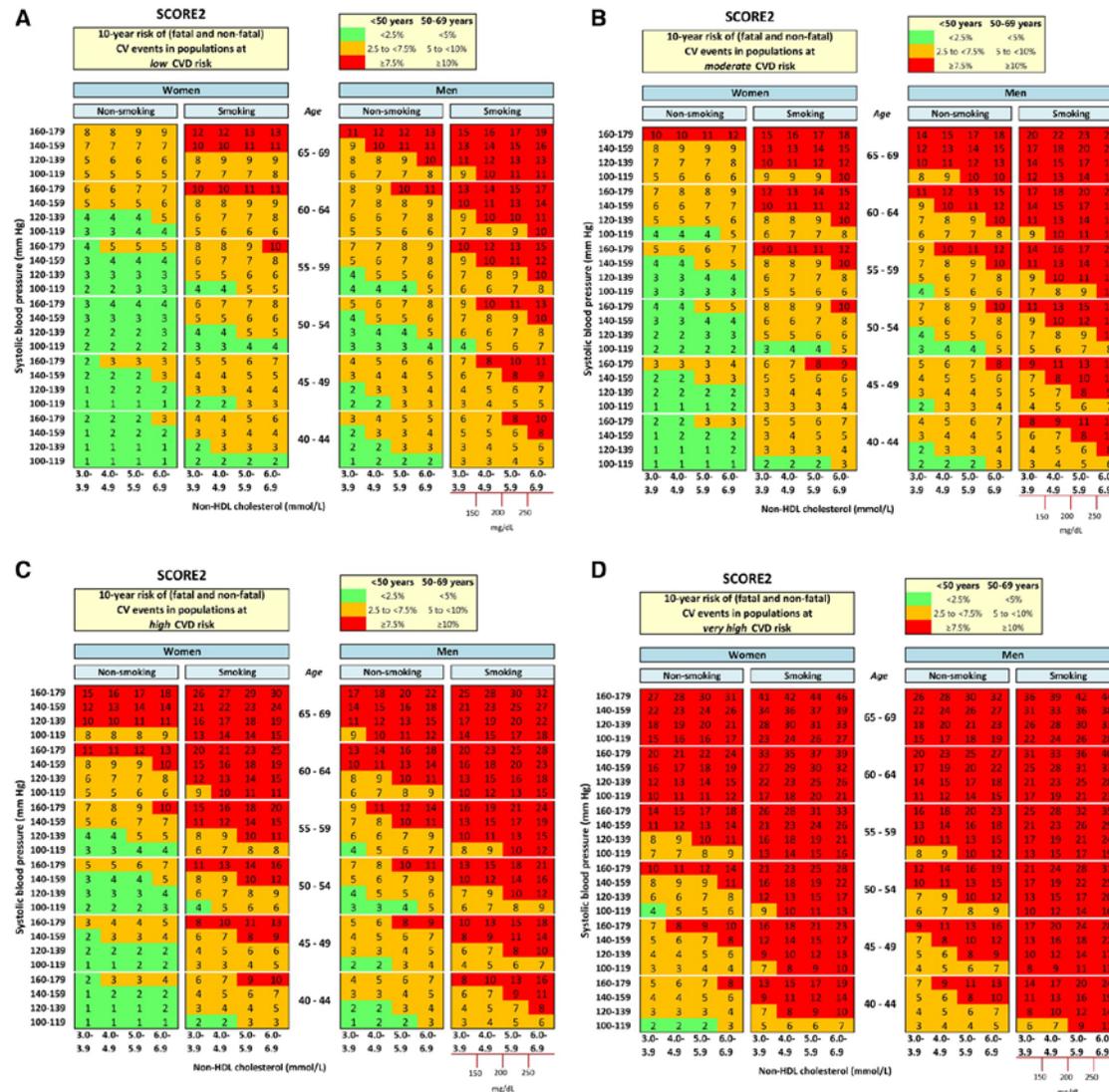
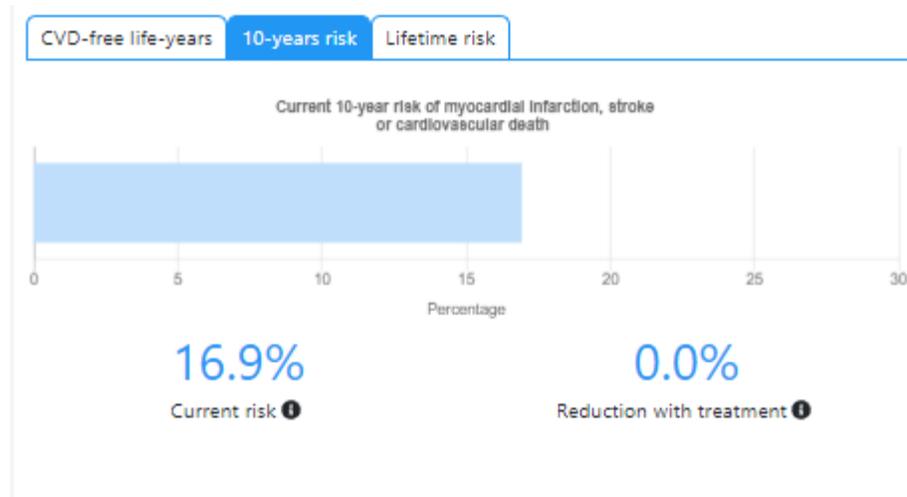


Figure 3 SCORE2 charts for estimation of CVD risk in four European risk regions.



My calculations of CVD residual risk

<https://u-prevent.com/calculators/results/smartReach>



SMART-REACH model

Personal Risk Profile *i*

Gender	F*	Age	51 years	Type(s) of atherosclerotic vascular disease		Systolic blood pressure	120 mmHg
Geographic region	Oth*	Current smoking	-	- Coronary artery disease	+	Total cholesterol	3 mmol/L
Statin	Ato*			- Cerebrovascular disease	-	LDL-cholesterol	0.82 mmol/L
Dose	80*			- Peripheral artery disease	-	Creatinin	100 umol/L
Ezetimibe	-			Diabetes mellitus	-		
PCSK9-inhibitor	-			Heart failure	-		
Antithrombotic treatment	A+D*			Atrial fibrillation	-		
Colchicine	-						

[Adjust intake](#)

Future treatment *i*

Statin	Atorvastatin
Dose	80 mg
Ezetimibe	<input type="checkbox"/>
PCSK9-inhibitor	<input type="checkbox"/>
Systolic blood pressure	No treatment target
Antithrombotic treatment	Aspirin + low dose DOAC
Colchicine <i>i</i>	<input type="checkbox"/>

Probability of survival free of heart attack or stroke

Age	Percentage
51	100%
76	0%

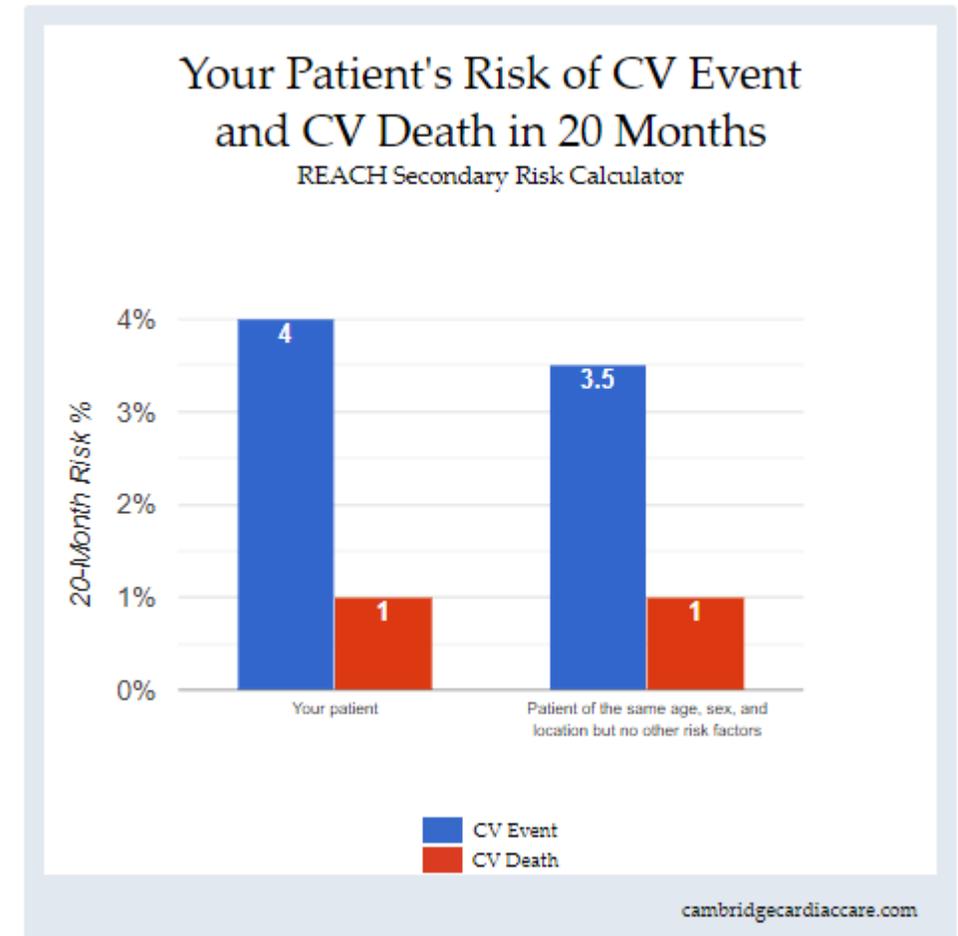
51 Age start treatment *i* | 76 CVD-free life-expectancy *i* | 0 CVD-free years gained *i*

Residual Cardiovascular Risk calculation

<https://cambridgecardiaccare.com/calculator/>

REACH Risk Calculator

Sex <input checked="" type="button" value="Male"/> <input type="button" value="Female"/>	Age 50-54
Smoker? <input type="button" value="Yes"/> <input checked="" type="button" value="No"/>	Diabetes? <input type="button" value="Yes"/> <input checked="" type="button" value="No"/>
BMI <input type="button" value="Less than or equal to 20kg/m<sup>2</sup>"/> <input checked="" type="button" value="Greater than 20kg/m<sup>2</sup>"/>	Number of affected vascular beds including CAD, PAD and cerebrovascular disease 2
CV event in the previous year? <input type="button" value="Yes"/> <input checked="" type="button" value="No"/>	Congestive Heart Failure? <input type="button" value="Yes"/> <input checked="" type="button" value="No"/>
Atrial Fibrillation? <input type="button" value="Yes"/> <input checked="" type="button" value="No"/>	Currently on Statin therapy? <input checked="" type="button" value="Yes"/> <input type="button" value="No"/>
Currently on Aspirin? <input checked="" type="button" value="Yes"/> <input type="button" value="No"/>	Location of patient's current residence Eastern Europe/middle east



Case No/2, Renewal of Class 1 certificate of a 59 y.o pilot.

- IHD, Coronary revascularization event after acute coronary syndrome 1 year ago (October 2021).
- Coronary Artery Bypass Graft (CABG) Surgery description-
- Vena—→OM
- N.T Vena→_RCA
- Vena-seq→ Diagonal1-→ Diagonal 2
- Mamaro-coronary shunt- → LIMA-LAD
- Underwent Laparoscopic Cholecystectomy 3 months prior to cardiac event.

Case No2/ Physical examination and Lab tests

- Physical examination- otherwise normal, except BMI 30,
- Lab tests- CBC, Gluc, uric acid, creatinine, liver enzymes- within normal range, HgA1C 6.1%
- Lipid profile- TC 3.46 mmol/l, Triglycerides- 1.58 mmol/l, HDL 0.8, LDL 1.94 mmol/l
- ECG- Sinus rhythm, 70 per 1', CA left deviation, -T wave in aVL and I, flattened T wave in V₅-V₆.
- Extracranial vessel duplex examination- atherosclerosis of extracranial vessels, w/o occlusion.

Case No2/Cardiologist's evaluation/ suggested low risk of new events

- Echocardiography- no dilation of heart chambers, inferior and lateral mild hypokinesis, LVEF 50 %, Right ventricular contraction- Normal.
- 24H ECG- dominant sinus rhythm, prone to tachycardia, max 122, min 67. No ischemic episodes detected, no significant rhythm disturbances detected.
- Coronarography-1 year after revascularization- October 2022
- mid LAD 99% occlusion, Prox CX- 100 occlusion,
- Diag1, Diag2, Om1, PDA shunts are functioning appropriately, LAD shunt functioning appropriately
- Ds: IHD, I25.8 Other forms of chronic ischaemic heart disease, Z95.5 Presence of coronary angioplasty graft, E66.0 Obesity first degree, alimentary genesis, Z90.4 Acquired absence of other parts of digestive tract (post cholecystectomy)

Calculator predictions:

uPrevent Calculator output

Date of calculation: 07/12/2022

CVD-free life-years:

Current lifetime risk of myocardial infarction, stroke or cardiovascular death

Age start treatment: 59

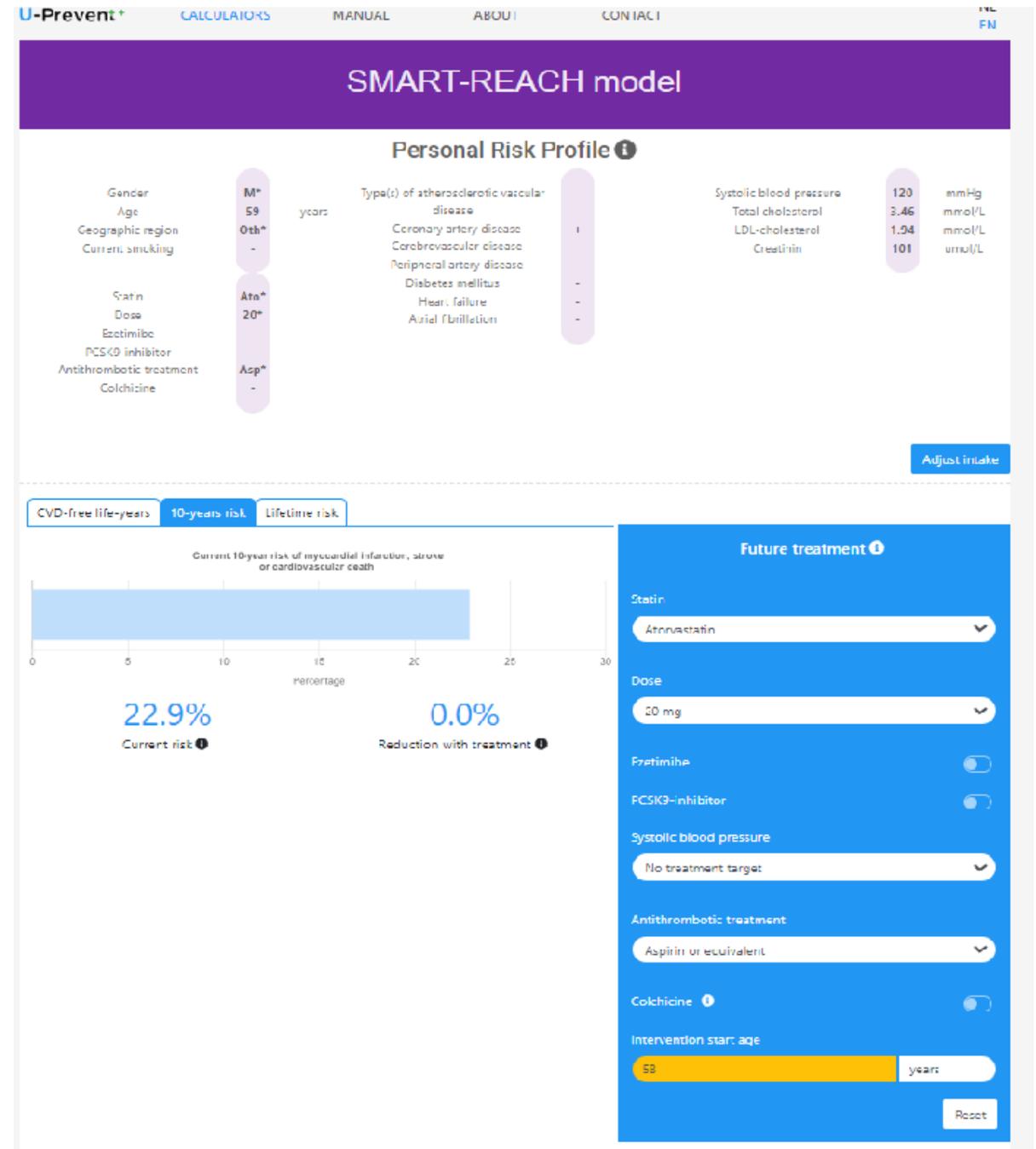
CVD-free life-expectancy: 76

10-years risk:

Current 10-year risk of myocardial infarction, stroke or cardiovascular death

Current risk: 22.87%

Reduction with treatment: 0%

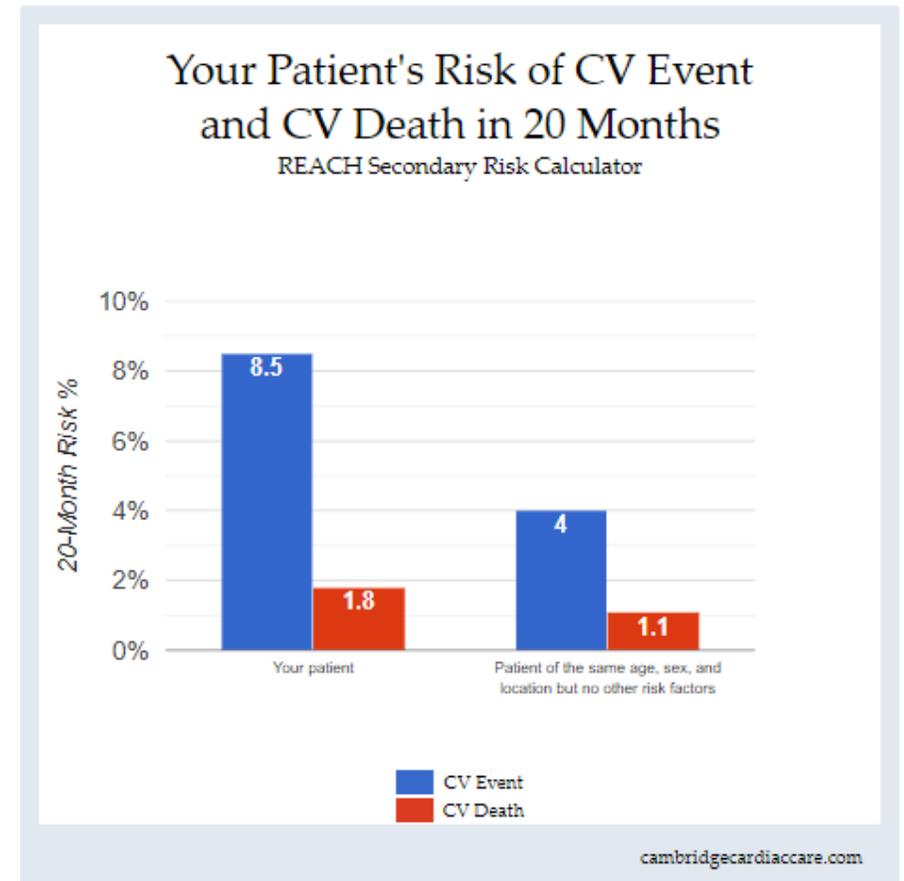


My calculations of CVD Residual risk

<https://cambridgecardiacare.com/calculator/>
REACH Risk Calculator

Sex <input checked="" type="button" value="Male"/> <input type="button" value="Female"/>	Age 55-59
Smoker? <input type="button" value="Yes"/> <input checked="" type="button" value="No"/>	Diabetes? <input type="button" value="Yes"/> <input checked="" type="button" value="No"/>
BMI <input type="button" value="Less than or equal to 20kg/m<sup>2</sup>"/> <input checked="" type="button" value="Greater than 20kg/m<sup>2</sup>"/>	Number of affected vascular beds including CAD, PAD and cerebrovascular disease 3
CV event in the previous year? <input checked="" type="button" value="Yes"/> <input type="button" value="No"/>	Congestive Heart Failure? <input type="button" value="Yes"/> <input checked="" type="button" value="No"/>
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CV Event REACH Score 15	CV Death REACH Score 11
20-month risk of next CV event 8.5%	20-month risk of next CV death 1.8%



- Aeromedical evaluation-Class 1 with OML.
- CVD event free life expectancy- 76 and cardiologists assurance about relatively small risk for repeated event- helped to take decision.
- Would you agree?

Toros Roslin miniature,
a page from a 13th century
gospel,

*written in Hromkla, fortress of Cilician
Armenia, that served as the residence of
the Catholicos of All Armenians from 1149
till 1292.*

