



Crunching the Numbers

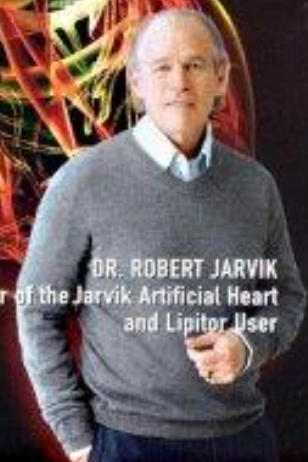
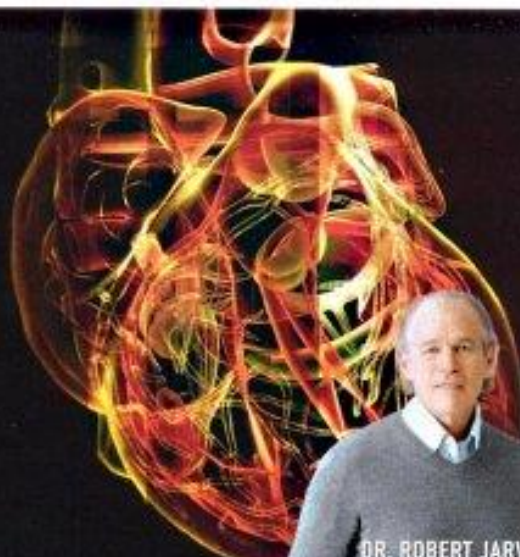
Baseline risk and effect on treatment decisions

Prof C Heneghan

In patients with multiple risk factors for heart disease,

Lipitor
reduces risk *of*
heart attack
by **36%***

If you have risk factors such as family history, high blood pressure, age, low HDL ('good' cholesterol) or smoking



DR. ROBERT JARVIK
~Inventor of the Jarvik Artificial Heart
and Lipitor User

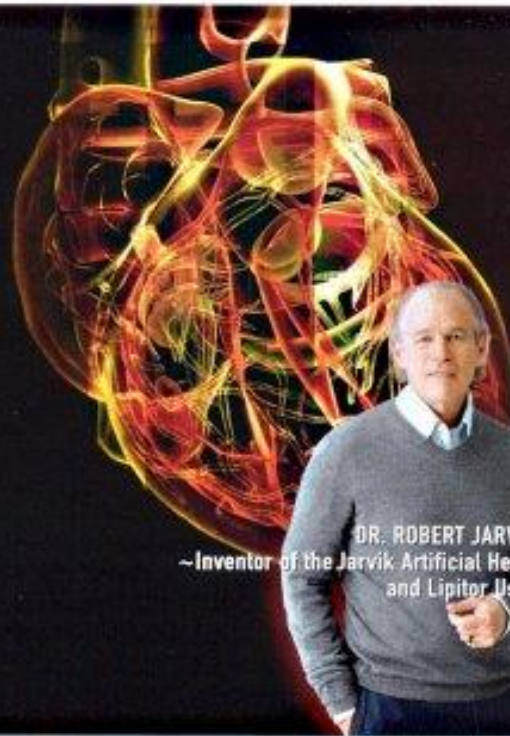
HDL ('good' cholesterol) or smoking
history, high blood pressure, age, low
HDL ('good' cholesterol) or smoking

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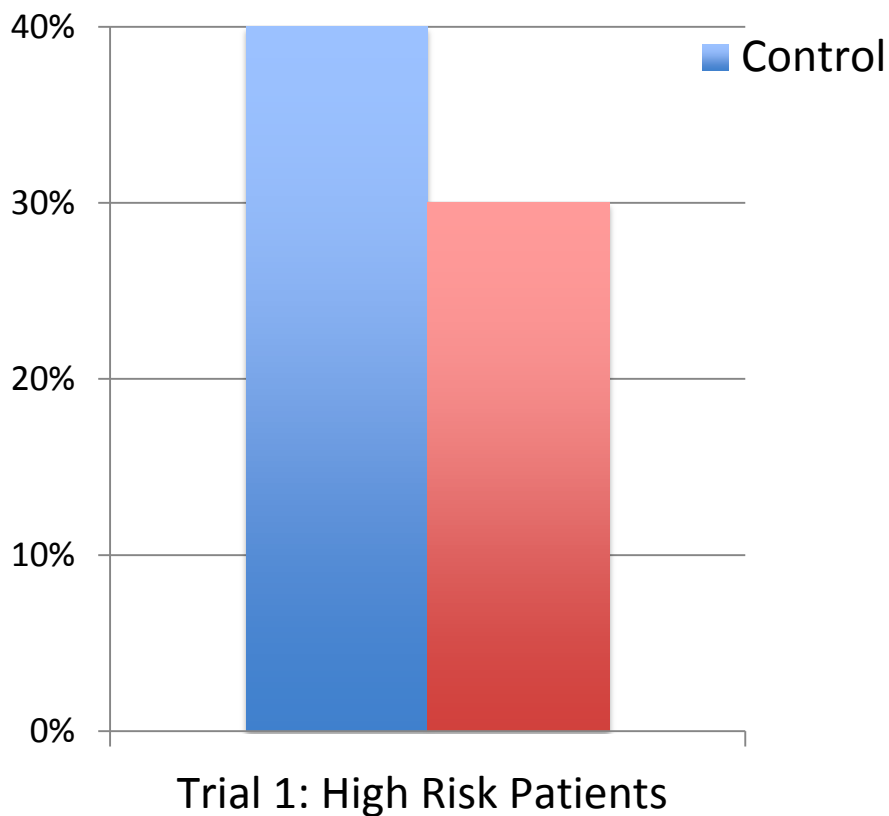
*That means in a large clinical study, 3% of patients taking a sugar pill or placebo had a heart attack compared to



LIPITOR[®]
atorvastatin calcium

to
by
to
*That means in a large clinical study, 3% of patients taking a sugar pill or placebo had a heart attack compared to 2% of patients taking Lipitor.

Trial 1: High Risk Patients



New drug for AMI to reduce mortality

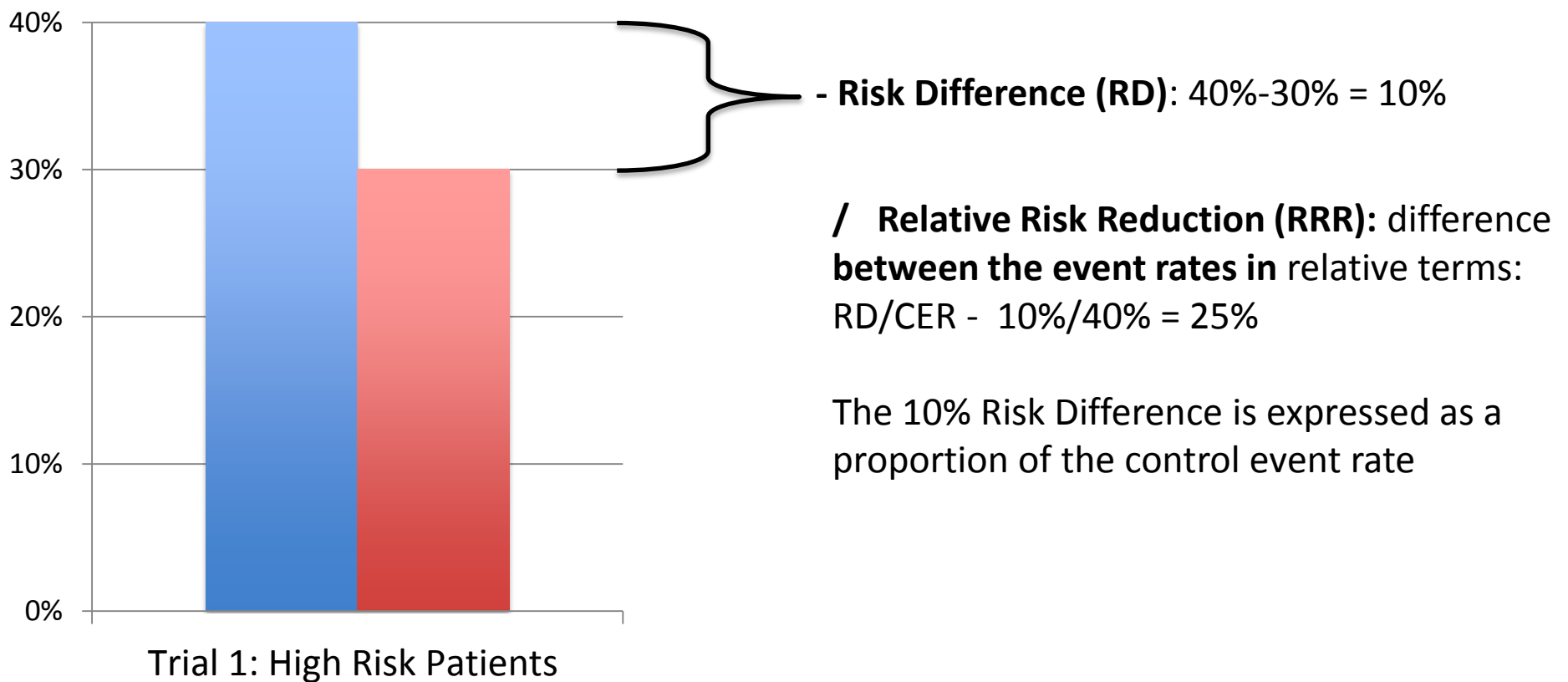
First studied in a high risk population:

40% mortality at 30 days among untreated

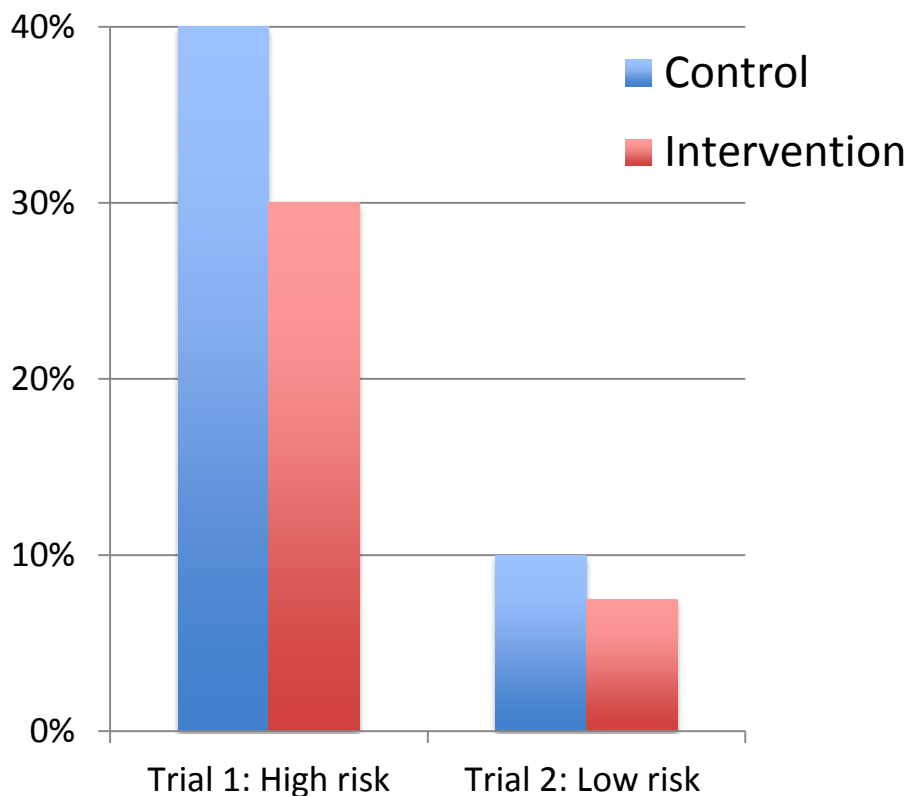
30% mortality among treated

How would you describe effect of new intervention?

Trial 1: High Risk Patients



Trial 2: Low Risk Patients



Trial 2: younger patients

New drug for AMI to reduce mortality

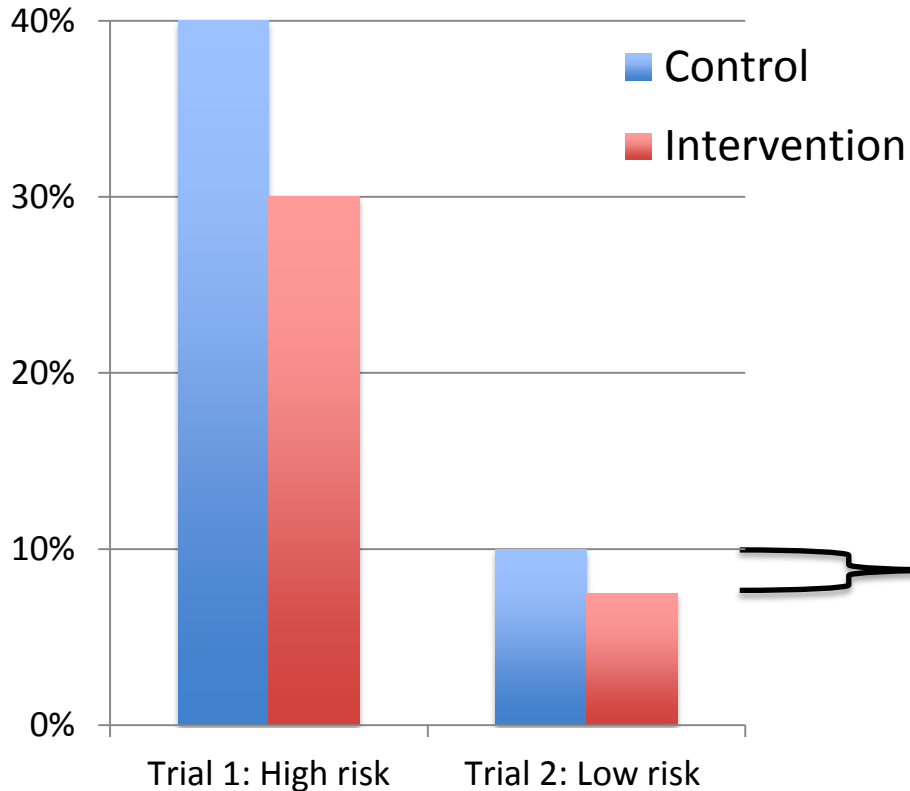
Later studied in low risk population:

10% mortality at 30 days among untreated

7.5% mortality among treated

How would you describe effect of new intervention?

Trial 2: Low Risk Patients



/ **Relative Risk Reduction (RRR):** difference between the event rates in relative terms:
 $RD/CER - 2.5\%/10\% = 25\%$

The 2.5% Risk Difference is expressed as a proportion of the control event rate

- **Risk Difference (RD):** $10\% - 7.5\% = 2.5\%$

Summary Points for Relative Risk Reduction and Risk Difference

- Relative risk reduction is often more impressive than absolute risk reduction.
- The lower the risk in the control group, the larger the difference between relative risk reduction and absolute risk reduction.

Estimate NNT

How many 60-year-old patients with mild **hypertension** would you have to treat with **diuretics** for 5 years to prevent 1 **stroke**?

NNT



Estimate NNT

NNT

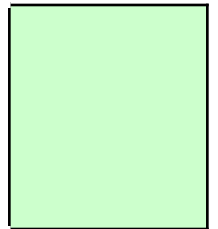
How many people with **myocardial infarction** would you have to treat with **β-blockers** for 2 years to prevent 1 **death**?



Estimate NNT

NNT

How many people with **acute myocardial infarction** would you have to treat with **streptokinase** to prevent 1 person from **dying** in the next 5 weeks?



NNTs from Controlled Trials

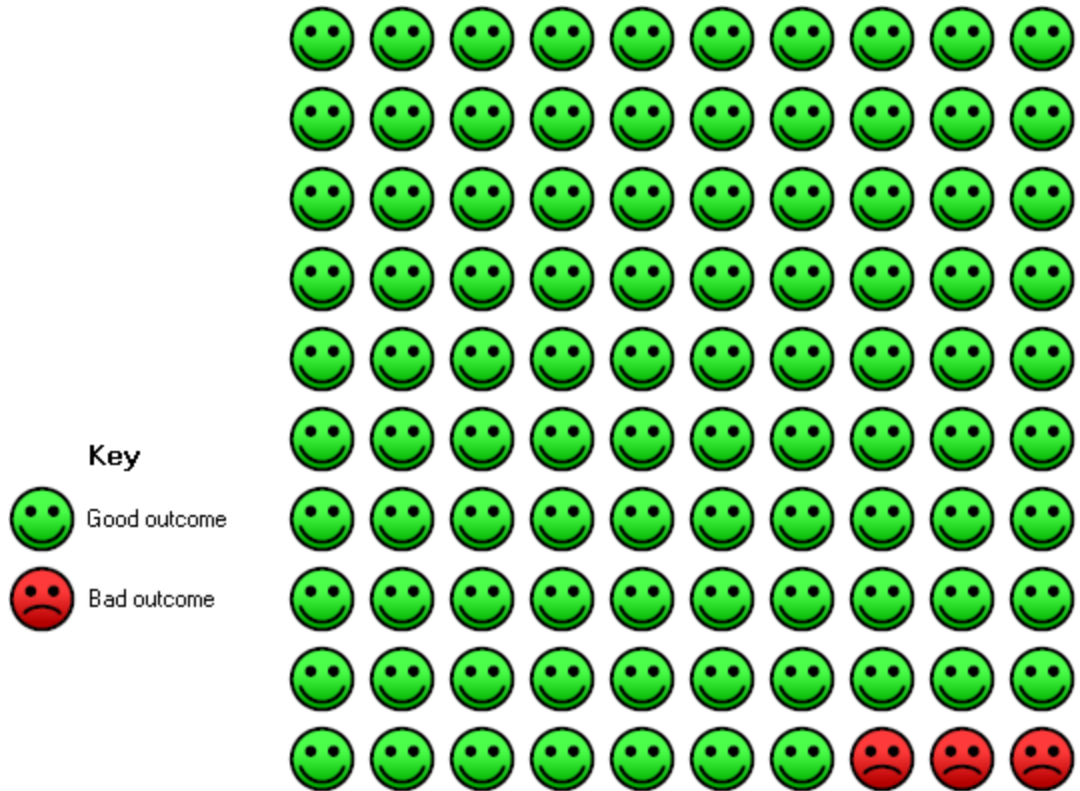
Population: hypertensive 60-year-olds
Therapy: oral diuretics
Outcome: stroke over 5 years

Population: myocardial infarction
Therapy: β -blockers
Outcome: death over 2 years

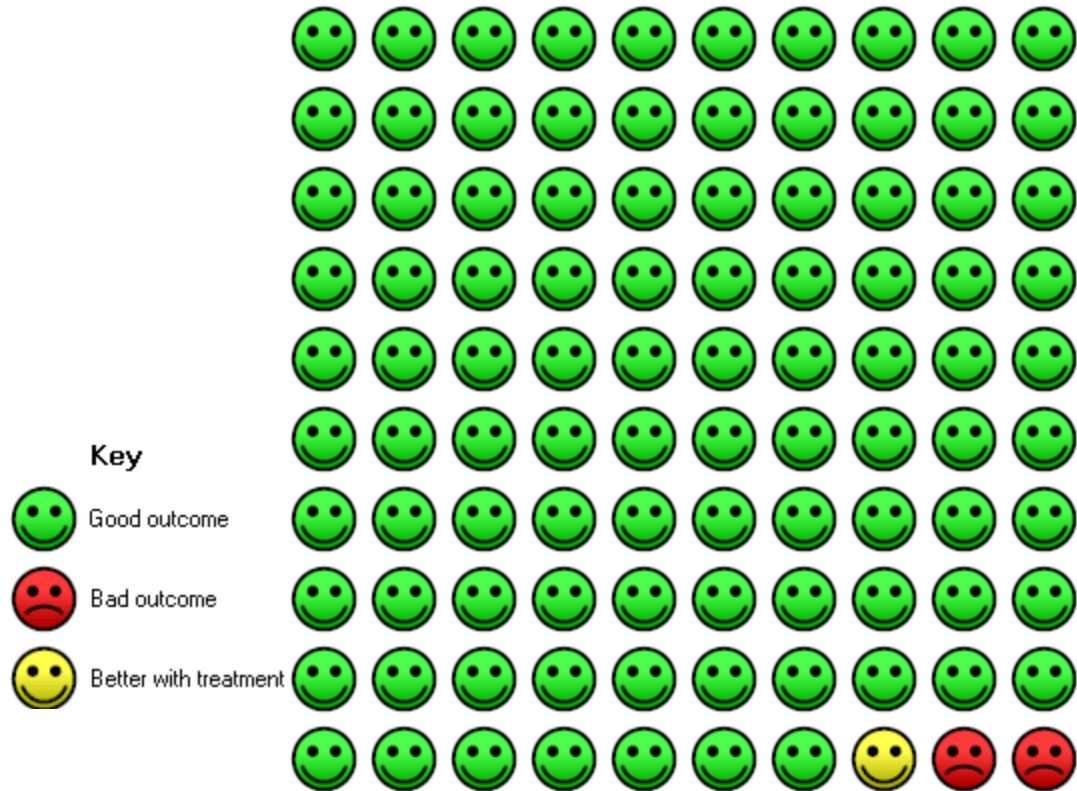
Population: acute myocardial infarction
Therapy: streptokinase (thrombolytic)
Outcome: death over 5 weeks

Control Event %	Treatment Event %	Risk Difference %	NNT
2.9	1.9	1	100
9.8	7.3	2.5	40
12	9.2	2.8	36

Population: hypertensive 60-year-olds
Outcome: stroke over 5 years
Depiction of Results in Control Group



Population: hypertensive 60-year-olds
Outcome: stroke over 5 years
Depiction of Results in Treatment Group



Concerns over Cholesterol lowering individual versus population effects

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Editorials

Statins and *The BMJ*

BMJ 2014 ; 349 doi: <http://dx.doi.org/10.1136/bmj.g5038> (Published 07 August 2014)
Cite this as: BMJ 2014;349:g5038

Article Related content Metrics Responses

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Lots of lessons, but we still need the data

An expert panel convened by *The BMJ* has concluded that two articles published last year^{1 2} should not be retracted.³ The panel's report comes after a lengthy and public row over proposals to statins to healthy people at low risk of heart disease.⁴ What are the lessons from this episode for the scientific community? And what does it mean for the wider debate on statins?

The panel of seven internationally respected clinicians and researchers met seven times over a period of several months, acted independently of the journal, undertook a detailed statistical review of the two articles, considered evidence from all parties, and reviewed the journal's processes. They concluded that the only articles that have been corrected and "were unanimous in their decision that the two papers do not meet any of the criteria for retraction."

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BMJ 'right' in statins claims row

By James Gallagher
Health editor, BBC News website



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HOW STATINS CAN CAUSE DIABETES

Pills raise the risk of getting disease by 46% say experts



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BACKLASH OVER DOWNTON TRAGEDY

Cholesterol

individual versus population effects

The effects of lowering LDL cholesterol with statin therapy in people at low risk of vascular disease: meta-analysis of individual data from 27 randomised trials

10% risk	At 5 years
Vascular events	11 per 1000 less
myopathy	0.5 per 1000 more
Rhabdomyolysis	0.1 per 1000 more
Haemorrhagic stroke	0.5 per 1000 more
Diabetes	5 per 1000 more
Vascular Death	4 per 1000 less

