Relative Risk Reduction = |EER-CER|/CER
In clinical studies it is important to look at both the absolute risk and the relative risk. For example, say the disease A occurs in 1 in 100,000 people but taking drug X reduces the incidence to 1 in 10,000,000. The absolute risk of disease is 0.001%. The relative risk is 0.00001/0.001 = 0.1 and the relative risk reduction is 1- 0.1 = .9 or 90% while the absolute risk reduction is 0.00001-0.001=-0.00099 or 0.099%. Probably not something you will really care about unless the disease is rapidly fatal and the drug has absolutely no side effects but guess which figure the drug advertisement is going to state. In contrast, disease B has a mortality rate of 50% and drug Y reduces mortality from 50% to 40%. The absolute risk of death with disease B is .5 or 50% and the relative risk is .4/.5 = 0.8 or 80%. The relative risk reduction is 1-0.8 = 0.2 or 20% while the absolute risk reduction is 0.4-0.5= .1 or 10%. In this case the relative risk reduction is 20% (much below the RRR for drug X in disease A) while the absolute risk reduction is much higher, 10%. So even though the drug is not very effective, you would still prescribe drug Y in disease B to reduce mortality by 10% unless a more effective drug was available.

Absolute Risk Reduction = |EER-CER|
ARR is the difference in the event rate between treatment group and control groups.

Group:
Experimental Event Rate (EER) = Event rate in treated group = a/(a+b) =

Group:
Control Event Rate (CER) = Event rate in control group = c/(c+d) =

The number needed to treat (NNT) is the number of patients who need to be treated in order to prevent one additional bad outcome (i.e. the number of patients that need to be treated for one to benefit compared with a control in a clinical trial). It is defined as the inverse of the absolute risk reduction. It was described in 1988. The ideal NNT is 1, where everyone improves with treatment and no-one improves with control. The higher the NNT, the less effective is the treatment.

	Outcome Present	Outcome Absent	
Treated/exposed	a =	b =	EER (Experimental Event Rate) $\frac{a}{a+b}$ = =
Control/not exposed	c =	d =	CER (Control Event Rate) $\frac{c}{c+d}$ = =

		RRR [RRI] Relative Risk Reduction/Increase	ARR [ARI] Absolute Risk Reduction/Increase	NNT [NNH] Numbers Needed to Treat/Harm
CER =	**EER =**	$\frac{(CER-EER)}{CER}$ =	**CER-EER =**	$\frac{1}{ARR}$ = **1/** =