

## Stating the Meaning of Effect Size Measures in Plain English

### Fictitious Case Example

A now unethical RCT of sunscreen vs. placebo for melanoma shows a rate of  $1/1000 = .001$  for 20-year sunscreen use vs.  $5/1000 = .005$  for placebo in the prevention of melanoma.

**EER** (Experimental Event Rate) = .001

"The risk of developing melanoma over 20 years in the (sunscreen) experimental group was 0.1% or 1 in 1000."

"The proportion of those who developed melanoma over 20 years in the sunscreen group was 1 out of 1000."

"The rate of developing melanoma in the sunscreen group was 0.1%"

**CER** (Control Event Rate) = .005

"The risk of developing melanoma over 20 years with placebo is 0.5%."

**ARR** (Absolute Risk Reduction) =  $EER - CER = .004$

"Sunscreen use reduces the absolute risk of developing melanoma by 0.4%."

"0.4% of patients, or 4 of 1000, are preventing from developing melanoma by using sunscreen."

"For every 1000 patients using sunscreen, 4 cases of melanoma are averted."

**NNT** (Number-needed-to-treat) =  $1/ARR = 250$

"250 patients would need to be treated with sunscreen rather than placebo for 20 years to prevent one additional case of melanoma."

**RR** (Relative Risk) =  $EER/CER = .20$

"People who use sunscreens for 20 years have less than a fifth of the risk of developing melanoma of those who use a placebo. Alternatively, people who do not use sunscreens have a 5 times greater risk of developing melanoma over 20 years as compared to those who use sunscreens."

"The risk of melanoma without sunscreen is 5 times the risk with sunscreen."

"The rate of melanoma with sunscreen is 20% of the rate without sunscreen."

**Risk remaining:** "Just 20% of the original risk of developing melanoma remains for those who use sunscreen."

**RRR** (Relative Risk Reduction) =  $(EER - CER)/CER$  or  $1 - RR = .80$

"Sunscreen use decreases the risk of developing melanoma by 80% compared with no sunscreen."

**Risk removed:** "80% of the risk of developing melanoma is removed by using sunscreen."