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.”