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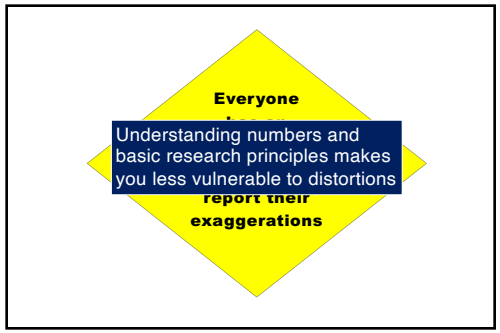

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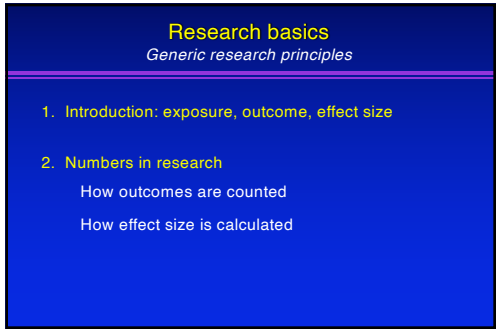


3

Generic Medical Research Question

Does exposure to _____ lead to the outcome of _____?

4

Does exposure to _____ lead to the outcome of _____?

Exposure	Outcome
Asbestos	Mesothelioma
Radon	Lung cancer

When most of us hear the word "exposure", we think about something bad.

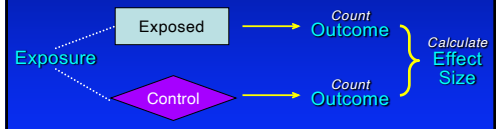
But in medical research an "exposure" is not necessarily bad, it may also be something good.

Aspirin → *Less* Heart attack

An exposure is simply something that is associated with a change in outcome -- either for better or for worse.

5

Basic study design



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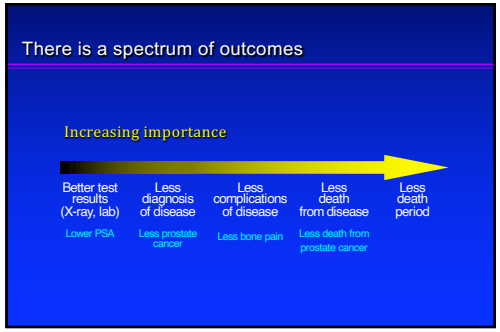

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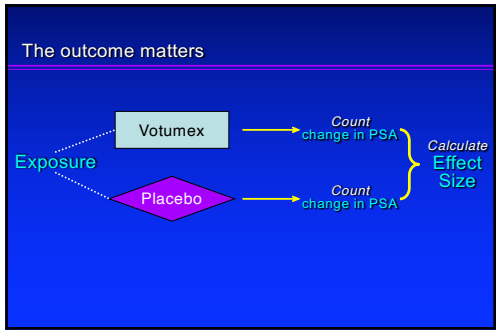

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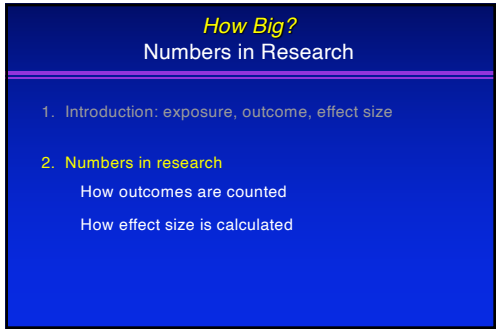

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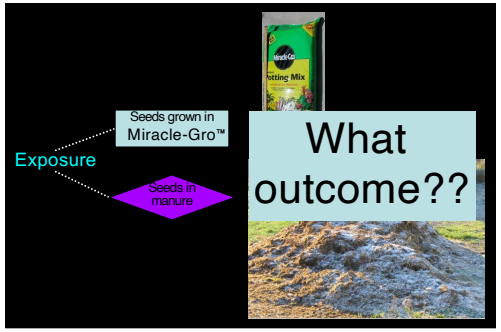

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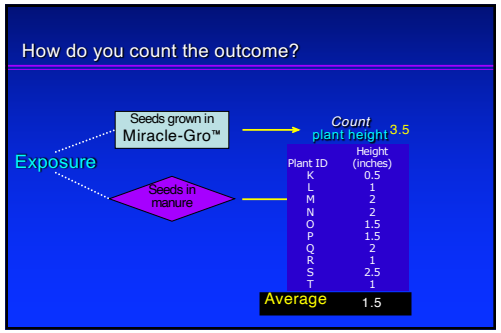

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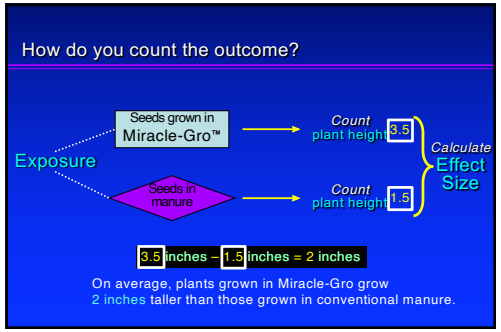

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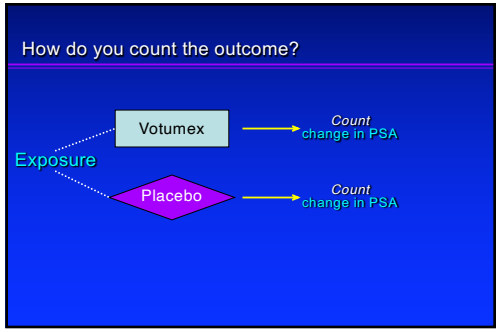

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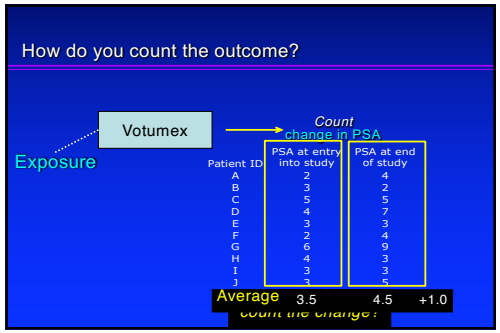

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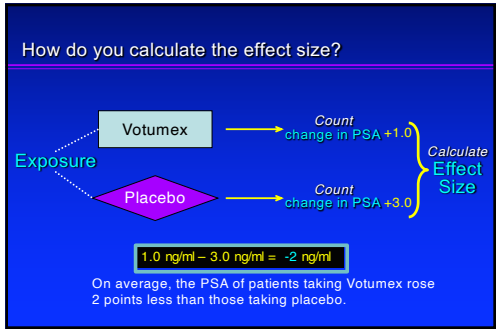

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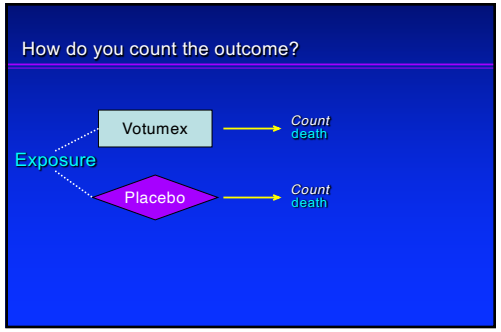

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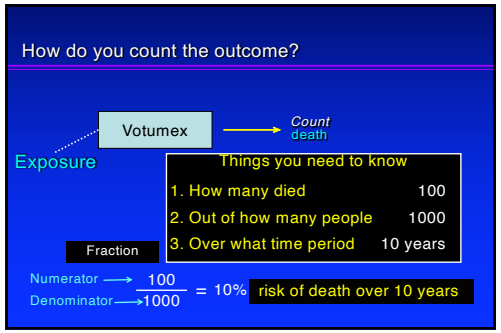

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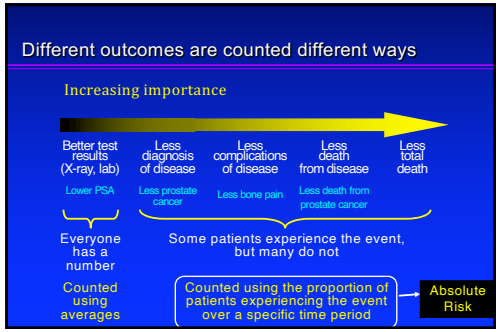

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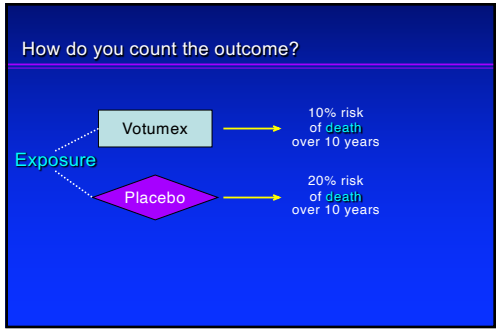

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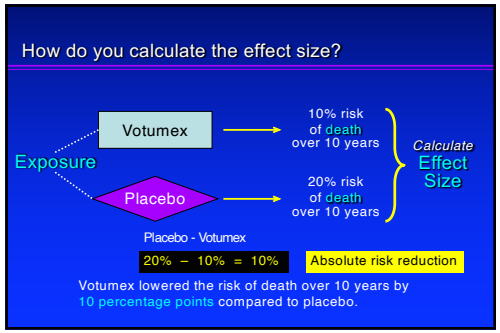

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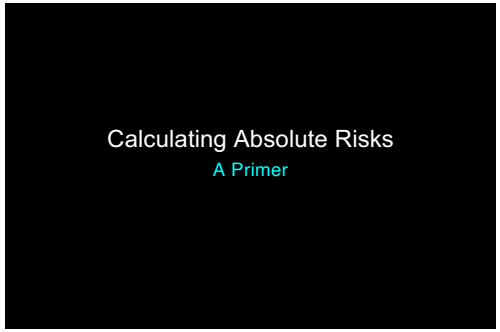

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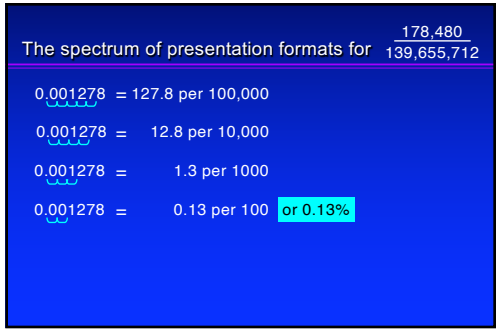

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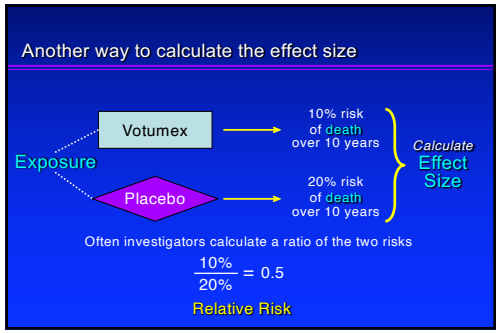

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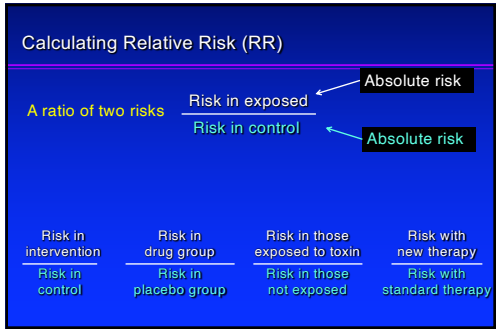

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Calculating RRs
now you try:

16% develop heart disease following new therapy vs. 20% in controls. $\frac{16\%}{20\%} = 0.8$

10% of smokers develop lung cancer vs. 1% in non-smokers. $\frac{10\%}{1\%} = 10$

10% of patients taking placebo have a stroke vs. 4% taking new drug. $\frac{4\%}{10\%} = 0.4$

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Interpreting a relative risk

$$\frac{\text{Risk in exposed}}{\text{Risk in control}}$$

Relative Risk	Effect of exposure (intervention, toxin, etc.)
Less than 1	Exposure decreases the chance of the outcome.
Equals 1	Exposure is not related to the outcome.
Greater than 1	Exposure increases the chance of the outcome.

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Interpreting RRs
now you try:

Pick one: increases or decreases

RR = 0.8 for heart disease following new therapy vs. controls.
New therapy *decreases* the risk of heart disease

RR = 10 for lung cancer in smokers vs. non-smokers
Smoking *increases* the risk of lung cancer

RR = 0.4 for stroke in patients taking new drug vs. placebo
New drug *decreases* the risk of stroke

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Interpreting RRs in words
now you try: *Think "times the risk"*

RR = 0.8 for heart disease following new therapy vs. controls.

Patients taking new therapy have _0.8_ times the risk of heart disease as controls

RR = 10 for lung cancer in smokers vs. non-smokers

Smokers have _10_ times the risk of lung cancer as non-smokers

RR = 0.4 for stroke in patients taking new drug vs. placebo

Patients taking new drug have _0.4_ times the risk of stroke as those taking placebo

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Calculating % increase

An RR of 1.5 would equal _150_ %

But that doesn't mean 150% increase, it means 150% of the risk in the comparison group - which is a 50% increase.

The calculation:
RR - 1, then convert to %

If the RR = 1.60
1.60 - 1 = 0.60 or a 60% increase

If the RR = 2.60
2.60 - 1 = 1.60 or a 160% increase

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Writing about a relative risk (RR) greater than 1

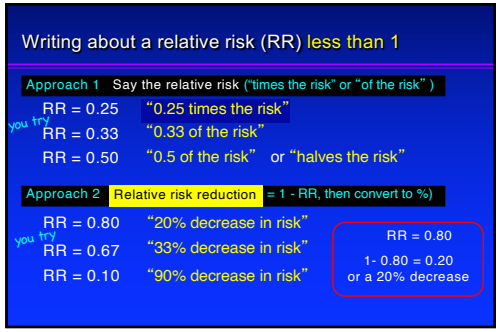
Approach 1 Say the relative risk ("times the risk")

RR = 1.5 "1.5 times the risk"
RR = 3 "3 times the risk"
RR = 4.5 "4.5 times the risk" or "over 4 times the risk"
RR = 9 "9 times the risk"

Approach 2 Use percent increase (= RR - 1, then convert to %)

you try
RR = 1.5 "50% increase in risk"
RR = 1.75 "75% increase in risk"
RR = 1.3 "30% increase in risk"

30



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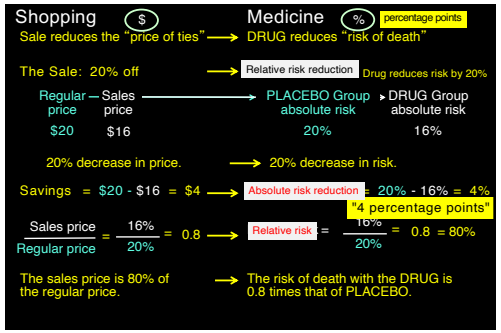

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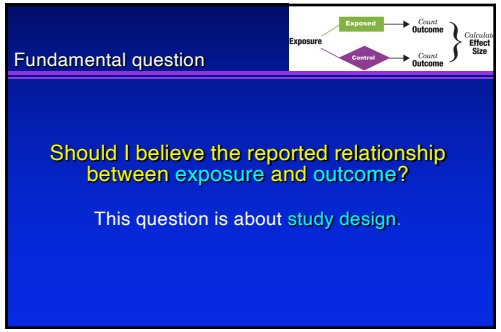

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