

# Misclassification Bias Illustration

Non-Differential Misclassification with 20% Error Rate

True Association

With Misclassification

	Disease +	Disease -	Total
Exposed	80	20	100
Unexposed	20	80	100
Total	100	100	200

Risk Ratio = 4.0

	Disease +	Disease -	Total
Exposed	68	32	100
Unexposed	32	68	100
Total	100	100	200

Risk Ratio = 2.125

True RR = 4.0  $\xrightarrow{20\% \text{ misclassification}}$  Observed RR = 2.125

47% attenuation toward null

## How Misclassification Occurs

	Disease +	Disease -
Exposed	80 $\xrightarrow{20\%}$ 68	20 $\xrightarrow{20\%}$ 32
Unexposed	20 $\xrightarrow{20\%}$ 32	80 $\xrightarrow{20\%}$ 68

**Key Parameters:** Sensitivity = Specificity = 0.80  
 20% of exposed misclassified as unexposed  
 20% of unexposed misclassified as exposed

## Impact Summary

Measure	True Value	Observed	Bias
Risk Ratio	4.00	2.125	-47%
Risk Difference	0.60	0.36	-40%
Exposed with Disease	80%	68%	-15%