ASPH EPI #5 "CALCULATE BASIC EPI MEASURES"

BASIC EPIDEMIOLOGIC MEASURES (REVIEW)

INCIDENCE - MEASURE AS A RATE OR PROPORTION ("RISK")
INCLUDES NEW OCCURRENCES ONLY; "SPEED" (RATE) OR "RISK" (PROPORTION) OF NEW OCCURRENCE

PREVALENCE - PROPORTION, INCLUDES "OLD" & "NEW" CASES

"RELATIVE RISK" - RELATIVE EFFECT; "STRENGTH"; BASELINE = 1
INCLUDES RATE RATIO, ODDS RATIO, AND SMRs

"RISK DIFFERENCE" - "ABSOLUTE EFFECT; BASELINE = 0

ATTRIBUTABLE PROPORTION - IN EXPOSED CASES (AF_e) AND IN POPULATION (AF_p); "PROPORTION AVERTED"

2-BY-2 TABLE NOTATION

	D+	D-	
E-	A_1	B_1	N_1
E-	A_0	B_0	N_0
	M_1	M_0	N

[IGNORE B_1 & B_0 FOR PERSON-TIME DATA]

$R_1 = A_1/N_1$ $\qquad$ $R_0 = A_0/N_0$

$RR = R_1/R_0$

$RD = R_1 - R_0$

$AF_e = \dfrac{RR-1}{RR}$ (OTHER FORMULAS, BUT THIS IS EASIEST)

$AF_p = AF \times p_c$ WHERE, p_c = PROPORTION OF CASES EXPOSED
(OTHER FORMULAS FOR DIFFERENT SITUATIONS)

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3/18/09

DERIVATION OF ATTRIBUTABLE FRACTIONS

RISK DIFFERENCE: $R_1 - R_0$ REPRESENTS ABSOLUTE REDUCTION WITH REMOVAL OF EXPOSURE

PUT THIS OVER R_1 TO GET FRACTIONAL REDUCTION AMONG EXPOSED CASES: CALL THIS THE "ATTRIBUTABLE FRACTION, EXPOSED" (AF_e)

$$AF_e = \frac{R_1 - R_0}{R_1}$$

ALGEBRAICALLY EQUIVALENT FORMS

$$AF_e = \frac{R_1 - R_0}{R_1} = \frac{R_1}{R_1} - \frac{R_0}{R_1} = 1 - \frac{1}{RR}$$

$$= \frac{RR}{RR} - \frac{1}{RR}$$

$$= \frac{RR - 1}{RR}$$

MULTIPLY AF_e BY PROPORTION OF POPULATION CASES THAT ARE EXPOSED (P_c) TO THE AGENT TO DETERMINE FRACTION OF CASES IN POPULATION THAT WOULD BE AVERTED WITH ELIMINATION OF EXPOSURE. CALL THIS THE "ATTRIBUTABLE FRACTION, POPULATION" (AF_p):

$$AF_p = AF_e \times P_c$$

SEE CH 8 FOR EQUIVALENT EXPRESSIONS