Second Printing
Errata as of December 9, 2004
Biostatistical Methods: The Assessment of Relative Risks
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The following errors have been detected to date in the second printing. The printing of your copy of the book can be determined by the lowest number on the line at the bottom of the copyright page (iv, not numbered).

I apologize to the reader for this inconvenience. In order to keep the cost down, I agreed to prepare the final camera ready copy, both typing and page layouts. This detracted from carefully proofing the text. All errors are mine. Since publication I and a graduate student have carefully re-read the entire text. Corrections are noted by page and line number, or relative to a referenced equation, example or problem number. Negative line numbers are counted from bottom of the page

Dedication page (missing): To my family.

p. 18. line 3 after (2.20). Change "Section 2.7.6" to "2.6.6".

p. 22, Example 2.2: Add group numbers 1 and 2 to the column headings in the right 2x2 table.

p. 23, 2 lines above (2.28), change "σ^2" to "σ_1^2".

p. 27, line after (2.50): change "bounded by -1 to +1" to "contained within $(0, \infty]$".

p. 30, line 1: change "p =" to "$\mathbf{p}$ =".

p. 36, (2.78), change "a" to "x" in 3 places.

p. 37, line -3: change "a consistent" to "an efficient".

p. 41, The paragraph following (2.91) should be reworded as follows:

It is also instructive to demonstrate this result as follows. Asymptotically, assume that $n_1/N \to \xi$, $n_2/N \to (1-\xi)$, ξ being the sample fraction for group 1. Also, since $m_1/N \overset{p}{\to} \pi$ and $m_2/N \overset{p}{\to} (1-\pi)$ under H_0, then from Slutsky's Convergence Theorem (A.45), $\widehat{E}(a)/n_1 \overset{p}{\to} \pi$ and $\widehat{V}(u)/n_1 \overset{p}{\to} (1-\xi)\pi(1-\pi)$. Since a is the sum of $i.i.d.$ Bernoulli variables, then a/n_1 is asymptotically normally distributed. Then from Slutsky's Theorem (A.43) and (A.44), Z_u is asymptotically distributed as standard normal.

p. 44, line 1: Interchange X_u^2 and X_c^2.

p. 55, Problem 2.4.3 should be reworded to read, "assuming m_1/N is small (close to zero)."

p. 58, after (2.16) reword to read "Using Taylor's expansion show that Z_g is asymptotically equal to the usual Z-test in (2.80). Hint: evaluate $g(p_j)$ about the assumed common π under H_0.

p. 59, line 6 of 2.12: remove comma.

p. 59, (2.129): The numbers in the two columns should be interchanged.

p. 64, line 1 of text: remove "and".

p. 66. line 4: Change "$\mu_1 - \mu_0 \neq 0$" to "$\mu_1 - \mu_0 > 0$".

p. 74, first line after (3.42) replace entire line with "Since the marginal constraints are the same for the η_{ij} and the η_{0ij}, then"

p. 84, line 4 of 3.3.3: change "2.0" to "1.5" and change "2.5" to "2.0".

p. 84, last line of 3.4.2: change "ξ_j" to "ξ_i".

p. 85, 3.5.2: change "Z" to "$\widehat{\lambda}_1 - \widehat{\lambda}_2$".

p. 101, line 4: change "θ_S" to "θ_K".

p. 102, line -4 of Table 4.3: In stratum 3 change "1.000" to "1.001".

p. 103, line 11 of program: Change "K=" to "*K=" at the beginning of the line.

p. 108, line 5 above (4.42): change "p_{xy}" to "ρ_{xy}".

p. 113, line 5, change 334.706 to 34.706.

p. 113, last line of first para, change "among females is less" to "among females is greater".

p. 121, line 2: Change "1x(K-1)" to "(K-1)x1".

p. 123, Example 4.10, second table: Change "log risk difference" to "risk difference".

p. 128, in (4.80), change the first "=" to "-".

p. 132, in the expression for $\widehat{w}_{(RD)1}$, change 0.40440 to 0.40449.

p. 134, line 9: Change "(4.49)" to "(4.48)".

p. 136, in (4.112) change "$E(T_r|\theta_s)$" to "$E(T_r)$"

p. 146, Section 4.10.1, line 5, change "*i.i.d.* observations" to "independent observations".

p. 148, third para beginning "A test of homogeneity". On line 2 change $\neq$ to $>$.

p. 152, Table 4.9. In column headings, change "$\widehat{\mu}_\theta$" to "$\widehat{\mu}_\theta^{(1)}$".

p. 152, Table 4.9, change the log Odds Ratio in Stratum 3 from 1.000 to 1.001. Also change the $\widehat{\omega}_j^{(1)}$ in stratum 1 from 0.489 to 0.409.

p. 156 (4.169), In the last term in brackets on the right, change "$g'(\pi_j)^2$" to "$g'(\pi_j)$".

p. 159, in (4.179) denominator change $\sum_{j=1}^2$ to $\sum_j$

p. 160, line 1 of 4.2.4: change "π_1" to "π_{1j}" and "π_2" to "π_{2j}".

p. 160, (4.181). In the denominator (the term in parentheses), change "j" to "ℓ" in two places.

p. 164, problem 4.8.4, at the end of the sentence, add the phrase "for the log odds ratio."

p. 179, line 1 below (5.26), delete "joint".

p. 182, Table 5.1: In the program, change "x=f" to "x=g" and vice versa.

p. 190, line -2: change "[log $\widehat{OR}$]" to "[log $\widehat{OR}_C$]".

p. 197, in (5.83): change "$\widehat{RR}_{C(MH)}$" to "$\widehat{RR}_{A(MH)}$".

p. 205, Problem 5.10.1, all the subscripts should read "12|z" and "21|z".

p. 206, last line, change "four strata" to "three strata".

p. 211, second equation from top, change "$\mathcal{N}[\pi$" to "$\mathcal{N}[n\pi$".

p. 221, paragraph 2, line 1: Change "Section A.6.2" to "Section A.6.5".

p. 227, there is a minor notation conflict. The π_{i1} on p. 227 has a different meaning from the π_{11} on page 226.

p. 230, Section 6.6.3, line 6, change "$L(\beta)$" to "$\log L(\beta)$".

p. 235, (6.135): change "$\widetilde{\theta}_1$" to "$\widehat{\theta}_1$".

p. 236, paragraph 2 line 3: delete "values".

p. 238, Table 6.3: Change the second column heading from "$\widehat{\beta}^{(i)}$" to "$\widehat{OR}^{(i)} = e^{\widehat{\beta}^{(i)}}$".

p. 239, problem 6.2.7 should be changed to read: "Show that these estimates yield the value zero for the score equations presented in problems 6.2.2 and 6.2.3."

p. 243, in 6.8.2 change "stratum specific" to "pair specific".

p. 258, line 6 (two places), line after (7.29) and in (7.30) change "π" to "π_i".

p. 261. Line -3, replace "exp" with "int".

p. 262, line -6, change "since it the" to "since it is the".

p. 262, line -10: change "-0.0895" to "-0.8905".

p. 266, line 2 of paragraph 2, change "$\mathbf{x}$" to "$\mathbf{X}$" in three places.

p. 272, line 4 of 7.3.1.2: change "$(p \leq q + r)$" to "$(p = q + r)$"

p. 274, (7.60): change "$\mathbf{x}$" to "$\mathbf{X}$" in two places.

p. 274, line -1: change "$\mathbf{x}$" to "$\mathbf{X}$".

p. 275, (7.61): change "$\mathbf{x}$" to "$\mathbf{X}$" in two places.

p. 281, (7.69) and (7.70): change "$\overline{\pi}$" to "$\overline{\widehat{\pi}}$"

p. 290, table in middle of page, on the line with "$X_1 X_3$" change "Group" to "Intensive Rx"

p. 290, table at bottom of page: In the last column, the odds ratios for the intensive group are incorrect. Change "0.06213" to "0.15899" and change "0.05984" to "0.16999".

p. 291, lines 3-4, change "$\widehat{OR}_{I:C|D=9} = (0.06213/0.91147) = 0.0682$" to "$\widehat{OR}_{I:C|D=9} = (0.15899/0.91147) = 0.1744$".

p. 291, lines 4-5, change "$\widehat{OR}_{I:C|D=10} = 0.0663$" to "$\widehat{OR}_{I:C|D=10} = 0.1884$".

p. 291, line 7, change "$\widehat{OR}_{D+1|I} = (0.05984/0.06213) = 0.963$" to "$\widehat{OR}_{D+1|I} = (0.16999/0.15899) = 1.06919$".

p. 303, line 15: Change "54 (69%)" to "54 (31%)".

p. 305, 7.1.5: Change "with elements in" to "has elements as in".

p. 307, 7.6.4. Add "Assume X_1 is also a binary variable."

p. 311, Problem 7.14.4, change A.193 to A.195.

p. 314, 7.16, line 1: change "Section 7.5" to "Section 7.6".

p. 326, line 2 after (8.38): change "$\widehat{\overline{r}}$" to "$\overline{r}$".

p. 331, line 4 above Example 8.4: Change "(8.26)" to "(8.25)".

p. 341, line below (8.55): Change "x" to "X".

p. 345, in Problem 8.2, replace A.8 with A.9.

p. 350, 8.8.3: Change "(8.26)" to "(8.25)".

p. 359, 2 lines above (9.26): change "jth event is" to "jth event time is".

p. 365, line -1: change "proportions, is" to "proportions, such as".

p. 366, the group labels in the table should be reversed.

p. 369, 4 lines after (9.42): change "through the ith interval" to "through the jth interval".

p. 372. In (9.46) replace the product with a summation.

p. 394. A point of clarification is necessary. For an event time, the interval should be closed right, so that on line 5 of Section 9.4.6.1, change $A_j = [\tau_{j-1}, \tau_j)$ to $A_j = (\tau_{j-1}, \tau_j]$. Thus an observation at $t_i = \tau_j$ has the associated value $a_i = j$. The problem then arises as to the appropriate interval for a censored observation. The convention is that a censored observation tied with the time of an event is considered to be at risk at that time, and then censored thereafter. Thus if an observation is censored at $t_i = \tau_j$, then that observation should have the associated value $a_i = j + 1$. This implies that the intervals for censored observations should be closed left $A_j = [\tau_{j-1}, \tau_j)$, so that the expression at the bottom of the page for A_{K+1} applies. Then the likelihood in (9.98) results. Note that the distinction is irrelevant if no censored observations occur at the boundary of any intervals.

p. 417, line above (9.131): change "hazard" to "intensity".

p. 421, 2 lines above Example 9.11: change "hazard" to "intensity".

p. 456, (A.35): Change "$\mathbf{G(T)}$" to "$\mathbf{G(\mu)}$".

p. 458. lines 3-4, change to read "Let t_n be a sequence of statistics such that as $n \to \infty$

Change (A.43) to read

$$\sqrt{n}[(r_n + t_n) - (\rho + \mu)] \xrightarrow{d} \mathcal{N}(0, \ \sigma^2) \qquad ((A.43))$$

Change (A.44) to read

$$\sqrt{n}\,(r_n t_n - \rho\mu) \xrightarrow{d} \mathcal{N}(0, \ \rho^2\sigma^2). \qquad ((A.44))$$

p. 465, 4 lines above (A.77): change "values θ_0" to "value θ_0".

p. 466, in (A.82) change $\mathbf{U}_i(\theta)$ to $\mathbf{U}_i(\boldsymbol{\theta})$.

p. 467 in (A.85) change dy to dy_i in three places.

p. 469, 1 line after (A.97), change "A.96" to "A.95".

p. 471, line -2 above (A.111): change "∂" to "d" in two places.

p. 478: The expression in (A.150) is repeated in the preceeding text. Delete the expression from text.

p. 479, line -2 above A.7.3: change "test." to "tests.".

p. 482, line 4 above Example A.12: change "also be shown" to "also been shown".

p. 485, (A.184): change "$y|\mathbf{x}$" to "$y_i|\mathbf{x}_i$" in 3 places in the right two expressions.

p. 486, line -1 above A.8.2: change "for observations" to "for all observations".

p. 491, line -3 above (A.218): change "defined as" to "defined by".

p. 493, line -8: change "$C(\alpha)$ test subset" to "$C(\alpha)$ test for a subset".

p. 494, lines 2 and 4 of A.10.1: change "μ" to "$\mu(\mathbf{x})$" in three places.

p. 500, line -3 above A.10.4: change "$N = 100$" to "$df = 100$".

p. 501, line -3: change "Section 6.5" to "Section A.6.5".

Web Supplement: Chapter 9 Programs. Some programs, such as nepha1c use arrays within PROC PHREG. Older versions of SAS used expressions like "Array mhba (9) " and statements like "lmhba=log(mhba(j))". In later versions of SAS the (9) and (j) must be changed to {9} and {j}.