

# Region of Attainable Redaction, an extension of Ellipse of Insignificance analysis for gauging impacts of data redaction in dichotomous outcome trials - Mathematical Appendix

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## ABSTRACT

Mathematical appendices for ROAR analysis - Form of  $g(x,y)$  and  $h(x,y)$ .

## Coefficients of $g(x,y)$

Table S1

Experimental arm with significantly higher risk ( $RR_e > 1$ )	
Variable	Coefficient
$x^3y^2$	1
$x^3y$	$2c$
$x^3$	$c^2$
$x^2y^3$	1
$x^2y^2$	$n + 2(b+c) - v$
$x^2y$	$4bc + c^2 - 2ad + 2cn - (a + 2c + d)v$
$x^2$	$c(2bc - 2ad + cn) - (a + c)(c + d)v$
$xy^3$	$2b$
$xy^2$	$b^2 + 4bc - 2ad + 2bn - (a + 2b + d)v$
$xy$	$2(b+c)(bc - ad) + 4bcn - 2adn - (a + 2b + d)(a + 2c + d)v$
$x$	$(bc - ad)(bc - ad + 2cn) - (a + c)(a + 2b + d)(c + d)v$
$y^3$	$b^2$
$y^2$	$b(-2ad + b(2c + n)) - (a + b)(b + d)v$
$y$	$(bc - ad)(-ad + b(c + 2n)) - (a + b)(b + d)(a + 2c + d)v$
Constant term	$(bc - ad)^2n - (a + b)(a + c)(b + d)(c + d)v$
Experimental arm with significantly lower risk ( $RR_e < 1$ )	
Variable	Coefficient
$x^3y^2$	1
$x^3y$	$2d$
$x^3$	$d^2$
$x^2y^3$	1
$x^2y^2$	$n + 2(a+d) - v$
$x^2y$	$4ad + d^2 - 2bc + 2dn - (b + 2d + c)v$
$x^2$	$d(2ad - 2bc + dn) - (b + d)(c + d)v$
$xy^3$	$2a$
$xy^2$	$a^2 + 4ad - 2bc + 2an - (b + 2a + c)v$
$xy$	$2(a+d)(ad - bc) + 4adn - 2bcn - (b + 2a + c)(b + 2d + c)v$
$x$	$(bc - ad)(bc - ad - 2dn) - (b + d)(b + 2a + c)(c + d)v$
$y^3$	$a^2$
$y^2$	$a(-2bc + a(2d + n)) - (a + b)(a + c)v$
$y$	$(bc - ad)(bc - a(d + 2n)) - (a + b)(a + c)(b + 2d + c)v$
Constant term	$(bc - ad)^2n - (a + b)(a + c)(b + d)(c + d)v$

Coefficients of resultant cubic curve  $g(x,y)$

## Coefficients of $h(x,y)$

Table S2

Experimental arm with significantly higher risk ( $RR_e > 1$ )	
Variable	Coefficient
$x^4y$	-2
$x^4$	-2c
$x^3y^2$	-3
$x^3y$	$-2(2b + 2c + n - v)$
$x^3$	$-4bc - c^2 + 2ad - 2cn + (a + 2c + d)v$
$x^2y^3$	3
$x^2y^2$	$-6b + 6c$
$x^2y$	$-2b^2 + 3c^2 + 4ad - 4b(2c + n - v) + 2(a + d)v$
$x^2$	$-2(b + c)(bc - ad) - 4bcn + 2adn + (a + 2b + d)(a + 2c + d)v$
$xy^4$	2
$xy^3$	$2(2b + 2c + n - v)$
$xy^2$	$-3b^2 + 8bc + 2c^2 - 4ad + 4cn - 2(a + 2c + d)v$
$xy$	$2(b - c)(-2bc + 2ad - bn - cn + nv)$
$x$	$-(bc - ad)(-ad + b(c + 2n)) + (a + b)(b + d)(a + 2c + d)v$
$y^4$	2b
$y^3$	$b^2 + 4bc - 2ad + 2bn - (a + 2b + d)v$
$y^2$	$2(b + c)(bc - ad) + 4bcn - 2adn - (a + 2b + d)(a + 2c + d)v$
$y$	$(bc - ad)(bc - ad + 2cn) - (a + c)(a + 2b + d)(c + d)v$
Experimental arm with significantly lower risk ( $RR_e < 1$ )	
Variable	Coefficient
$x^4y$	-2
$x^4$	-2d
$x^3y^2$	-3
$x^3y$	$-2(2a + 2d + n - v)$
$x^3$	$-4ad - d^2 + 2bc - 2dn + (b + 2d + c)v$
$x^2y^3$	3
$x^2y^2$	$-6a + 6d$
$x^2y$	$-2a^2 + 3d^2 + 4bc - 4a(2d + n - v) + 2(b + c)v$
$x^2$	$-2(a + d)(ad - bc) - 4adn + 2bcn + (b + 2a + c)(b + 2d + c)v$
$xy^4$	2
$xy^3$	$2(2a + 2d + n - v)$
$xy^2$	$-3a^2 + 8ad + 2d^2 - 4bc + 4dn - 2(b + 2d + c)v$
$xy$	$2(a - d)(2bc - 2ad - an - dn + nv)$
$x$	$-(bc - ad)(bc - a(d + 2n)) + (a + b)(a + c)(b + 2d + c)v$
$y^4$	2a
$y^3$	$a^2 + 4ad - 2bc + 2an - (b + 2a + c)v$
$y^2$	$2(a + d)(ad - bc) + 4adn - 2bcn - (b + 2a + c)(b + 2d + c)v$
$y$	$(bc - ad)(bc - ad - 2dn) - (b + d)(b + 2a + c)(c + d)v$

Coefficients of Lagrange derived polynomial  $h(x,y)$