

STA 2212 S

Feb. 5

0. Screen shot yesterday ; Covid Link ; Stat 200

1. HW 2

2. ~~HW~~ χ^2 g of fit

3. HW 3

In AoS only g-of-fit test in χ^2 .

$\underline{X}_1, \underline{X}_2, \dots, \underline{X}_n$ iid Multinomial ($n; p$)

$$\underline{X}_i \sim \text{Mult}(n; p) \quad p = (p_1, \dots, p_m) \quad \sum_{j=1}^m p_j = 1$$

Simple case $H_0: p = p_0$ e.g. $(\frac{1}{m}, \frac{1}{m}, \dots, \frac{1}{m})$ uniform
e.g. $(\frac{1}{16}, \frac{3}{16}, \frac{3}{16}, \frac{9}{16})$ Mendel

maybe $H_0: p = p(\underline{\theta}) \quad \dim(\underline{\theta}) < m$

Test of H_0 :

	1	...	m
N_j	N_1	...	N_m
H_0	$np_1(\underline{\theta})$	...	$np_m(\underline{\theta})$

$N_j = \# \underline{X}_i \text{ in cell } j$

$$\chi^2_{\text{test statistic}} = \sum_{j=1}^m \frac{\{N_j - np_j(\hat{\underline{\theta}})\}^2}{np_j(\hat{\underline{\theta}})} \quad \frac{(O - E)^2}{E}$$

$\underline{\theta} \leftarrow \hat{\underline{\theta}}$

Example Test Hardy-Weinberg equilibrium

predicts blood type as

	M	MN	N
$p(\underline{\theta})$:	$(1-\theta)^2$	$2\theta(1-\theta)$	θ^2

$\sum_{i=1}^3 = 1$

External validation with APPROVe study

[108 Baron et al.]

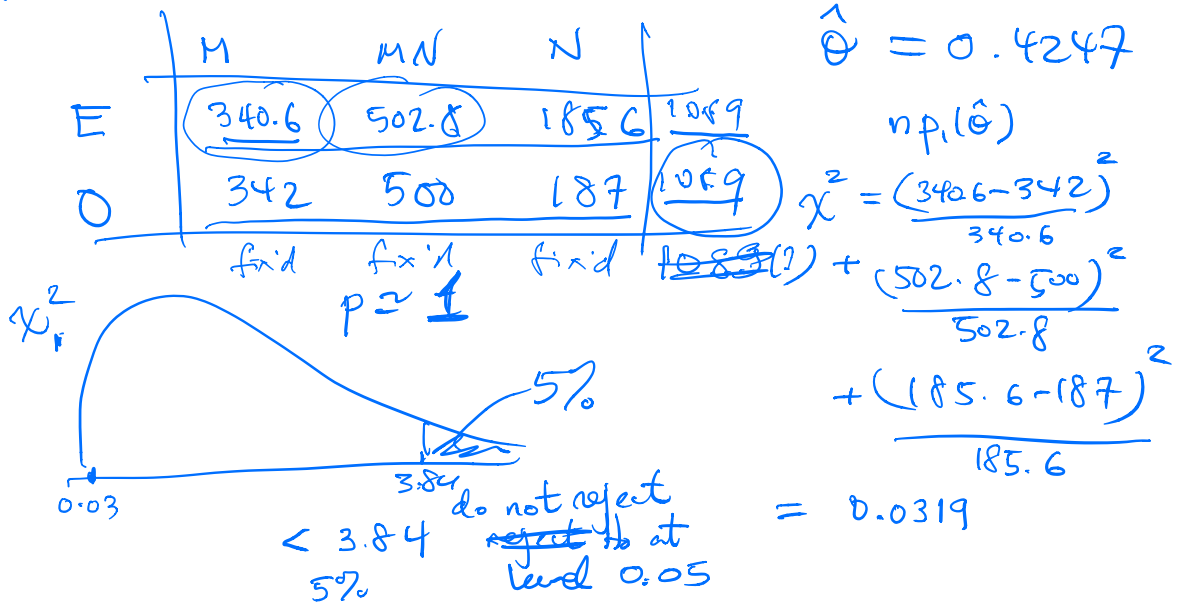
Vioxx vs placebo

GI subgroups	p-value for HTE significance	CVT subgroups	p-value for HTE significance
✓ History of GI event	0.022	✓ History of atherosclerosis	0.048
History of hypertension & prior usage of steroids	(*small size, no events)	✓ Usage of aspirin indicated a/c to FDA	0.016
Old age & prior usage of steroids	(*small size, no events)	✓ Old age & male gender	0.012

*inconclusive

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n.c.



"2 independent cells", θ has been est'd
 n fixed

$$2 - 1 = 1 \text{ d.f.}$$

→

	D	A	
T	(a)	b	—
C	c	d	—

$\chi^2 = \frac{(ad - bc)^2}{n} \sim \chi^2_1$ (?)

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~~str~~
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