

UNIVERSITY OF NEWCASTLE UPON TYNE

Premedical course

MOCK Examination I

2 hours

Answer all questions

1. Write short notes on

- methods of graphical representation of the distribution of a continuous variable;
- the relative merits of hypothesis testing and confidence intervals;
- Simpson's paradox.

[15 marks]

2. A case-control study was carried out to see whether children with peptic ulcer differed genetically from other children. The following results were obtained in relation to the Rhesus D blood group:

	Rh+	Rh-	
Peptic ulcer	36	6	42
Control	28	12	40
	64	18	82

What proportion of a) children with peptic ulcer, b) control children are Rhesus positive?

For the table

	Factor present	Factor absent	
Cases	a	b	n_1
Controls	c	d	n_2
	n_3	n_4	N

the odds ratio is $\hat{\psi} = ad/bc$ and 95% confidence limits for $\hat{\psi}$ may be obtained through the formula for the standard error of $\log \hat{\psi}$ which is $\sqrt{1/a + 1/b + 1/c + 1/d}$. Calculate and interpret the odds ratio, with its 95% confidence limits, for the table given.

[15 marks]


```
MTB > Describe 'agestart' 'ngames';
SUBC> By 'anywrist'.
```

	anywrist	N	MEAN	MEDIAN	STDEV	SEMEAN
agestart	0	138	47.97	53.00	16.09	1.37
	1	76	41.01	42.00	16.06	1.84
ngames	0	138	71.45	60.00	50.99	4.34
	1	76	80.76	72.50	51.54	5.91

```
MTB > TwoT 95.0 'agestart' 'anywrist';
SUBC> Alternative 0;
SUBC> Pooled.
```

```
TWOSAMPLE T FOR agestart
anywrist  N      MEAN      STDEV    SE MEAN
1          76      41.0      16.1     1.8
0         138      48.0      16.1     1.4
```

```
95 PCT CI FOR MU 1 - MU 0: ( -11.5, -2.4)
TTEST MU 1 = MU 0 (VS NE): T= -3.03 P=0.0028 DF= 212
POOLED STDEV = 16.1
```

```
MTB > TwoT 95.0 'ngames' 'anywrist';
SUBC> Alternative 0;
SUBC> Pooled.
```

```
TWOSAMPLE T FOR ngames
anywrist  N      MEAN      STDEV    SE MEAN
1          76      80.8      51.5     5.9
0         138      71.4      51.0     4.3
```

```
95 PCT CI FOR MU 1 - MU 0: ( -5.1, 23.7)
TTEST MU 1 = MU 0 (VS NE): T= 1.27 P=0.20 DF= 212
POOLED STDEV = 51.2
```

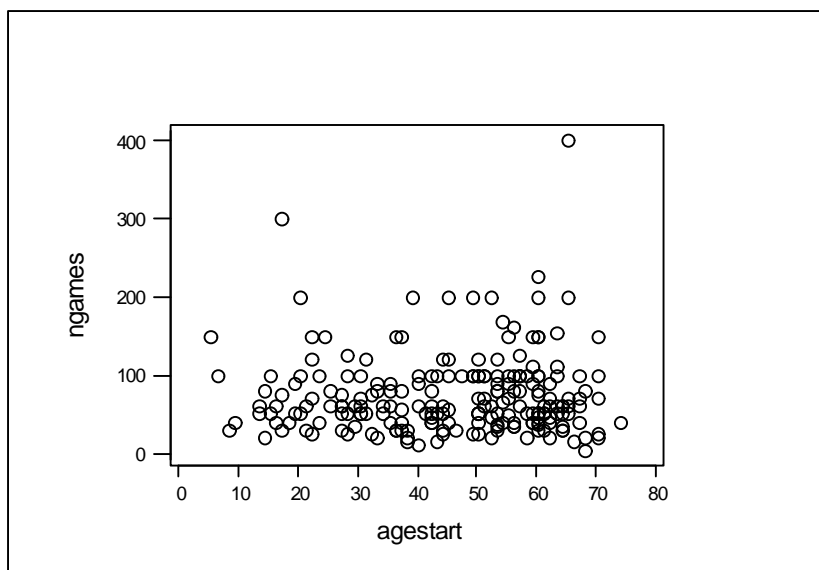
```
MTB > Table 'sex' 'anywrist';
SUBC> Counts;
SUBC> ChiSquare.
```

ROWS: sex COLUMNS: anywrist

	0	1	ALL
1	110	59	169
2	28	17	45
ALL	138	76	214

CHI-SQUARE = 0.128 WITH D.F. = 1

```
MTB > Plot 'ngames'*'agestart';
SUBC> Symbol.
```



MTB > Regress 'ngames' 1 'agestart'.

The regression equation is
ngames = 71.4 + 0.073 agestart

Predictor	Coef	Stdev	t-ratio	p
Constant	71.42	10.38	6.88	0.000
agestart	0.0734	0.2148	0.34	0.733

s = 51.37 R-sq = 0.1% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS	F	p
Regression	1	308	308	0.12	0.733
Error	212	559401	2639		
Total	213	559709			

[18 marks]

4. Discuss some of the problems you might encounter in writing the protocol for a clinical trial comparing two analgesics for their efficacy in relieving pain after extraction of wisdom teeth.

[12 marks]