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Statistics at Square One

Answers to exercises

1.1 Median 0.71, range 0.10 to 1.24, first quartile 0.535, third quartile 0.84 $\mu\text{mol}/24\text{ hr}$

2.1 Mean = 2.41, SD = 1.27.

2.2 Mean = 0.697 $\mu\text{mol}/24\text{ hr}$, SD = 0.0214 $\mu\text{mol}/24\text{ hr}$, range .0215 to 1.179 $\mu\text{mol}/1$

2.3 Points 0.10 and 1.24. 2/40 or 5%.

3.1 SE(mean) = 0.074 $\mu\text{mol}/24\text{ hr}$

3.2 A uniform or flat distribution. Population mean 4.5, population SD 2.87.

3.3 The distribution will be approximately Normal, mean 4.5 and SD $287/\sqrt{5} = 1.28$.

4.1 The reference range is 12.26 - 57.74, and so the observed value of 52 is included in it.

4.2 95% CI 32.73 to 37.27.

5.1 0.42 g/dl, $z = 3.08$ $0.001 < P < 0.01$, difference = 1.3 g/dl, 95% CI 0.48 to 2.12 g/dl.

5.2 0.23 g/dl, $P < 0.0001$.

6.1 SE (percentage) = 2.1%, SE (difference) = 3.7%, difference = 3.4%. 95% CI -3.9 to 10.7%, $z = 0.94$, $P = 0.35$.

6.2 Yes, the traditional remedy, $z = 2.2$, $P = 0.028$.

7.1 37.5 to 40.5 KA units.

7.2 $t = 2.652$, d.f. = 17, $0.01 < P < 0.02$.

7.3 0.56g/dl, $t = 1.243$, d.f.=20, $0.1 < P < 0.05$, 95% CI -0.38 to 1.50g/dl.

7.4 15 days, $t = 1.758$, d.f. = 9, $0.1 < P < 0.05$, 95% CI -4.30 to 34.30 days.

8.1 Standard $\chi^2 = 23.295$, d.f. = 4, $P > 0.5$. Trend $\chi^2 = 2.25$, d.f. = 1, $P = 0.13$.

8.2 $\chi^2 = 3.916$, d.f. = 1, $0.02 < P < 0.05$, difference in rates 9%, 95% CI 0.3 to 17.9%.

8.3 $\chi^2 = 0.931$, d.f. = 1, $0.1 < P < 0.5$, difference in rates 15%, 95% CI -7.7 to 38%.

8.4 $\chi^2 = 8.949$, d.f. = 3, $0.02 < P < 0.05$. Yes, practice C; if this is omitted the remaining practices give $\chi^2 = 0.241$, d.f. = 2, $P > 0.5$. (Both χ^2 tests by quick method.)

9.1 Sickness rate in first department 28%, in second department 8%, difference 20% (approximate 95% CI = -6 to 45%, $P = 0.24$ (Fisher's Exact test mid P)). P is calculated from $2 \times (0.5 \times 0.173 + 0.031)$.

10.1 Smaller total = -30. No.

10.2 Mann-Whitney statistic = 74. The group on the new remedy. No.

11.1 $r = -0.848$.

11.2 $r_s = -0.867$.

11.3 $y = 36.1 - 2.34x$. This means that, on average, for every 1 mile increase in mean distance the attendance rate drops by 2.34%. This can be safely accepted only within the area measured here.

11.4 SE = 0.39, 95% CI = $-2.34 - 2.145 \times 0.39$ to $-2.34 + 2.145 \times 0.39 = -3.1$ to -1.5% .

12.1 $O_A = 6$, $t_A = 8.06$, $O_B = 8$, $E_B = 5.94$. Log rank $\chi^2 = 1.24$, d.f. = 1, $0.1 < P < 0.5$.

12.2 Risk = 0.55, 95% CI 0.19 to 1.60.

13.1 Matched case control study.

13.2 Cohort study.

13.3 Cross sectional study.

13.4 Randomised controlled trial.

13.5 Quasi experimental design.