

## Biostatistics 2016 // Homework assignment #3

### Practical case #1

The three major causes of neonatal deaths worldwide are infections (which include sepsis, pneumonia, tetanus and diarrhoea), pre-term and birth asphyxia. There is some variation between countries depending on their care configurations. Data for neonatal deaths by cause in Plovdiv for 2015 are given in the table below. Calculate a 95% confidence interval for the population proportion of neonatal deaths by sepsis.

| Cause of neonatal deaths | Number of cases |
|--------------------------|-----------------|
| Sepsis                   | 21              |
| Pneumonia                | 56              |
| Tetanus                  | 2               |
| Diarrhoea                | 15              |
| Total                    | 94              |

### Practical case #2

A clinical trial of 1 186 multiple sclerosis patients was organized to study a new drug. After the end of the trial, 23 of 671 treated patients experienced relapse of the diseases. In the placebo group, relapse was documented for 45 out of 470 patients. Is there a difference in the relapse rate of the two groups? Is the new drug effective?

### Practical case #3

152 diabetes patients were put on a clinical trial for a new drug. After the end of the first week, the normal fasting (no food for eight hours) blood sugar level in the intervention group ( $n = 91$ ) was  $89 \pm 11$  mg/dL, while the same outcome in the control group ( $n = 61$ ) was  $93 \pm 6$  mg/dL. Is the new diabetes drug more effective?

### Practical case #4

Mean birthweight of 3 427 infants born to non-smoker mothers was found to be 3726.5 g, with a standard deviation of 385.7 g, while mean birthweight of 563 infants born to smoker mothers was found to be 3 104 g, with a standard deviation of 621 g. Is there a statistically significant difference in the sample mean birthweights of these two groups?