PRACTICALS GUIDE
Medicine & Society Module (FF2613)

INTRODUCTION

In this module there will be 4 practical sessions for the research project and statistical exercises.

Students will be guided by the respective lecturer/tutor assigned to each lab.

The schedule for the practical sessions for this semester is as stated below;

DATE	TIME	TOPIC	CONTENT
1/10/14	10.30 – 12.30	Descriptive Statistics & Research Project 1	Manipulation and presentation of data using the given dataset, including calculating the measures of central tendencies and variability using statistical formulas. Determine the title, objective, problem framework, hypothesis and methodology. Once the above has been agreed upon, as homework, they are expected to write up the proposal, including the questionnaire, which will be discussed during the second practical session.
9/10/14	10.30 – 12.30	Analysis of Quantitative Data & Research Project 2	Calculation and interpretation of t-tests and proportionate tests using the given dataset. Presentation of the complete research proposal. Upon acceptance, as homework, the students are expected to distribute the questionnaires and collect the data for the study. All completed forms are to be brought to the third practical session.
31/10/14	10.30 – 12.30	Correlation & Research Project 3	Calculation and interpretation of correlation and regression using the given dataset. Students are guided on how to enter the data into the computer using Excel or SPSS. Each lab is required to prepare a notebook for the session. For homework, students will complete the data entry for all collected data and bring the complete file to the fourth practical session.
14/11/14	10.30 – 12.30	Chi-Square, Non-Parametric and Research Project 4	Calculation and interpretation of non-parametric and chi-square tests using the given dataset. Each lecturer will demonstrate how to analyse the data using computer and advice on the interpretation of results. For homework, the students will complete the analysis and prepare a PowerPoint presentation for the final practical session.
27/11/14 1/12/14	10.30 – 12.30 14.00 – 17.00	Research Project 5	Presentation of their findings. For homework, the students will prepare a written report of the study, to be submitted in two weeks time from their presentation.

Practical 1
Descriptive Statistics

Introduction

In the old curriculum, the practical sessions were slotted immediately after the respective lectures. In the past we had 25 hours of lectures and 8 practical sessions just for statistics and research methodology. Now we only have 7 hours of lecture and 4 practical sessions for statistics and research methodology in the new curriculum. Whenever possible, we try to slot the practical sessions according to lectures. But we can't cover everything; therefore students are also expected to learn on their own. Please be patient and persists in doing the exercises.

For this session, we are will learn about measures of central tendency and variability. We use these measures of central tendency and variability to describe the data that we collected. The measures of central tendency are mean, mode and median. For variability, it is standard deviation (sd). Kindly refer to your formula sheet or your books for help.

Measures of Central Tendency for Quantitative Data

1. Write down the formulas for mean in the boxes below;

Basic Formula	Formula for grouped data (Formula A)

2. Calculate the mean, mode and median for the age χ_i of the following respondents;

35 24 36 21 21 20 34 29 37 30 26 27 29 34 33 33 27 25 21 26 32 30 33 36 28 33 19 29 27 29 22 23 31 32 31

Total = _____ n = _____ Median = _____
Mean = _____ Mode = _____

3. Write down the formulas for standard deviation in the boxes below;

Basic Formula	Formula for grouped data (Formula A)

4. Using the data from Q.2, calculate the standard deviation and variance of the age χ_i of respondents.

x	x-mean	$(x\text{-mean})^2$	x	x-mean	$(x\text{-mean})^2$
19.00			29.00		
20.00			30.00		
21.00			30.00		
21.00			31.00		
21.00			31.00		
22.00			32.00		
23.00			32.00		
24.00			33.00		
25.00			33.00		
26.00			33.00		
26.00			33.00		
27.00			34.00		
27.00			34.00		
27.00			35.00		
28.00			36.00		
29.00			36.00		
29.00			37.00		
29.00					
Total			Total		

Total $(x\text{-mean})^2$ = _____
Therefore standard deviation s = _____

It is easy to calculate the mean and standard deviation for data with few observations. But for studies with large number of samples, it is much harder. Therefore for large studies, the quantitative data are sorted in frequency tables such as the one below;

5. These are data from a case-control study to identify factors that are associated with small for gestational age amongst newborn babies. For the table below, the factor being studied is the weight of the mothers during first trimester (first three months of pregnancy) and the incidence of babies with low birth weight.

Weight during first trimester in kg	All Frequencies	Frequency of Cases	Frequency of Controls
30.0-39.9	5	5	0
40.0-49.9	69	48	21
50.0-59.9	82	43	39
60.0-69.9	45	10	35
70.0-79.9	10	2	8
80.0-89.9	3	1	2
90.0-99.9	4	1	3
Total	218	110	108

For the following exercise, calculate the mean, mode, median and standard deviation for both cases and controls. To simplify matters, just fill up the table below;

For cases;

Weight in kg	Frequency	m.p	f.mp	$f.mp^2$	f cumulative
30.0-39.9	5	34.95			5
40.0-49.9	48	44.95			53
50.0-59.9	43	54.95			96
60.0-69.9	10	64.95			106
70.0-79.9	2	74.95			108
80.0-89.9	1	84.95			109
90.0-99.9	1	94.95			110
Total	110				

For controls;

Weight in kg	Frequency	m.p	f.mp	$f.mp^2$	f cumulative
30.0-39.9	0	34.95	0	0	0
40.0-49.9	21	44.95			21
50.0-59.9	39	54.95			60
60.0-69.9	35	64.95			95
70.0-79.9	8	74.95			103
80.0-89.9	2	84.95			105
90.0-99.9	3	94.95			108
Total	108				

☻ $f.mp^2$ means "frequency x $(midpoint)^2$", not $(fmp)^2$

Fill up your answers in the table below;

	Case	Control
Mean	_____ =	_____ =
Mode	+ _____ . =	+ _____ . =
Median	+ _____ . =	+ _____ . =
Standard deviation	$\sqrt{\quad\quad}$ =	$\sqrt{\quad\quad}$ =

The answers above will be used in the coming practical sessions.

Practical 1b
Research Proposal

Each lab group is required to come up with a research proposal, collect the data required, analyse the data, present their findings and write up the final report for submission.

For this session, the students are expected to agree on the;

- Title of the research
- Objectives
- Problem Framework
- Hypothesis
- Methodology

Once the above has been agreed upon, as homework, they are expected to write up the proposal, including the questionnaire, which will be discussed during the second practical session.