

QC COURSE

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MODULE 2 – BASIC STATS

Introduction

To begin with, let me repeat a vital message from Module 1 – statistics are merely tools that provide us with information. But that is all they are - tools, not laws or rules that must be blindly obeyed. And these tools called statistics provides us with vital information that needs to be intelligently considered before you perform any action. The information from statistical calculations should be used to help you decide what action – if any – should take place. It must not dictate what you do or when you react – there is no such thing as a statistical rule. How you react to statistical information is your decision as an informed professional user of statistics.

And sadly, there are calculations that need to be explained and understood before we go any further. From experience many people find calculations, especially statistical ones, to be dull and difficult, if not incomprehensible. If that includes you studying this course, you have my sympathy. But you still need to do the calculations – sorry!

Variation and dispersion – natural and inevitable

We have already mentioned Biological Variation (BV) as a natural phenomenon that covers many changes relevant to us in clinical laboratories, such as when and by how much measured results from an individual will vary from day to day. Now, to illustrate variation or dispersion more effectively, let's consider the setting up of 'Normal Ranges' in your lab, although we will use the more accurate description of Reference Ranges. The definition of what constitutes 'normal' is too deep and convoluted for us here, whereas the concept of referring or comparing patient results to a Reference Range is more logical.

Firstly you should not steal ranges from another lab group, or even worse copy ranges from a textbook or package insert. Such methods will not satisfy your patient population in any way, for as you know, Reference Ranges can change with population ages, sex, or race, so how can anyone possibly know that about your patients, let alone their diet or lifestyles or exercise habits? The only valid ranges are those you have worked out for yourself – but you knew that anyway, so let's proceed.

If you assemble a suitable set of patients – and there are plenty of sources to guide you with this difficult part of the process – you immediately start to get variables.

Collection: When do you collect the samples? - perhaps time of day will be a factor. Then the collecting system is another variable, as will be the transport time to the separating stage.