

HELP! WHERE'S THE PROGRAMME ? THE USE OF HAND CALCULATORS AND COMPUTER SERVICES

Dr. (Mrs) Marie Farrell and Dr. (Miss) Aparna Bhaduri

Dear Reader,

With the advent of calculators and computers, much of the work you have just completed by hand calculations can be done for you.

"What!! You mean, I didn't have to learn how to do all that analysis!! I can't believe it!"

It is very important that you understand the statistical tests used and how to compute them. But if you have a calculator, or access to a computer, the process is certainly faster. The calculator or computer will compute the same statistics, but can do them more quickly and accurately. In this letter we will discuss the use of the hand calculator, both the arithmetic and statistical types, and make some introductory comments about the nature of computers and how you go about obtaining computer services.

Hand Calculators

If you can afford one, a statistical hand calculator is worth the money. In some countries calculators are produced locally, and representatives are available to provide you with demonstrations of their different models. If a statistical calculator is unavailable and/or too costly, an arithmetic calculator is still quite useful and inexpensive. A hand calculator can be purchased for about \$10.00 (U.S.). The arithmetic hand calculator is small enough to hold in your hand (it weighs about 110 grams), is easily stored, runs on "C" batteries, and is simple to operate.

It is turned on by a simple button, can perform the operations of addition, subtraction, multiplication, and division by pushing the number buttons called "Keys". Some can compute percentages as indicated by the notations "%", some can calculate the square of a number (X^2), square root ($\sqrt{X}$), sum of the scores (ΣX), sum of the

scores squared (ΣX^2), the mean ($\bar{X}$), standard deviation (σ), and variance (σ^2) —all of these

terms have been discussed in earlier letters. Some hand calculators have memory capability, often labelled (M). All types have a clear key (CE/E) which erases all previous calculations, and all show the numbers in a **display** at the top of the calculator. If an error is made, some calculators blink on the word "ERROR", and some will simply blink the numbers if you have waited too long between calculating two functions.

The Computer*

To make use of computer services, it is important that you understand some of the basic terms about the computer itself, the implements to run the computer, and the people who will assist you in processing your data.

The computer is an electronic device capable of making extremely rapid calculations, and storing large amounts of data in its memory. This means that what would take you weeks and months to compute can be done by an electronic digital computer in about 20 seconds. That includes the calculations reading in and printing out the data. The computer can take thousands of repetitive operations and accurately compute the desired statistical tests.

Generally, there is a major piece of machinery, or main computer which is made up of electronic parts. The actual machines are often referred to as the **hardware**. To operate the computer, one must have a set of instructions, which are written in the form of a **computer programme**, called the **software**. The machine does not use English, it requires a machine language that tells it what to do and how to do it. The person who writes in machine computer language is a **programmer**, skilled in several computer languages, the most common of which is Fortran. Other languages are BASIC, AND COBOL. Fortran, then, is the language mediator between your needs as a researcher and what the computer can do for you. There are some statistics and calculations used repeatedly and thus the same directions are given to the computer time after time. For example, in your research, you probably will need measures of central tendency, standard deviation, variance, t-test and Chi-square calculations. So do other researchers. To avoid

*This section was developed with the assistance of Ms Jacques Farrell, M.B.A., Consultant QED, Wellesley Hills, Massachusetts, U.S.A.

writing the same programmes over and over, complete programme are available as **packages**, called "canned programmes". The one most frequently used by social and behavioral scientists is called SPS or Statistical Package for the Social Sciences.

Cost of Computer Services

The cost of computer services are calculated by the length of time required by the computer to complete your **run**. The calculations can be estimated by ascertaining the cost of computer time per hour, which currently runs about \$650-750 (U.S.) per hour. So if your data requires 15 seconds, the cost would be between \$162.50 and \$187.50. If you are writing a research proposal, the data analysis costs should be calculated as part of your budget. However, many universities and some government agencies grant free computer time to faculty and students. And usually the programmes, professional help, and facilities are included in the service.

The People you Need

When you bring your materials to a data centre, your initial contact may be the **data processing manager**. He/she is a highly skilled professional who has background in several machine languages, understands users research problems, and has in-depth knowledge of the total computer system—its capabilities, etc. He/she will direct you to examine your work and determine how to get you the information you need. Then a key punch operator types up your data on computer cards, with data for each element in your study per card. The cards are put in order, with directions inserted to tell the computer what calculations to perform on the data.

Each card contains 80 columns and nine rows. So you must calculate how much data you need for the entire sample. Suppose your questionnaire has 120 items, then you would require at least two cards for identifying data, and the subjects responses or answers to the 120 item questionnaire. The programme is written in Fortran, and a computer called a **compiler** translates the Fortran into a machine language programme. The computer will perform the calculations, and give you a printout of your data—large sheets of white paper with all the statistical calculations completed.

It is important to realize that a computer is absolutely stupid, and can perform only what you tell it to perform. Computers will never take over our work because they cannot think. In fact, computers, because of human error, produce garbled numbers. If you programme the computer with an error it will produce erroneous information, for it behaves exactly like a robot. Programmers have a phrase for this event—it is called "garbage in—garbage out"; you put in nonsense, you will get nonsense. "Ductility" or stupidity is a prominent feature of computers, but should **not** be a characteristic shared by the user of the computer.

Report on the First Phase of the Project on Primary Health Care

Dr. (Miss) A. Chandy

P RIMARY health care is the essential health care made universally accessible to individuals and families in the community by means acceptable to them through their full cooperation and active participation and at a cost that the community and the country can afford. It forms an integral part both for the country's health system of which it is the nucleus and for the overall social and economic development of the country.

Health is a human right, but it has not yet become in reality as a universal human right. The College of Nursing, Uttar Pradesh, Kanpur has been successful in developing a project on Primary health care as stated in Alma-ata declaration (Sept. 1978)—a call for urgent and effective action by all health workers to provide minimum health care for all by 2000 A.D. as a part of development programme. The project was initiated by the T.N.A.I. Kanpur district branch in collaboration with College of Nursing team under the direction of Dr. (Miss) A. Chandy, President, TNAI Uttar Pradesh State and the Principal, College of Nursing, Kanpur.

This is the first time that the nurses of Uttar Pradesh have come forward to extend their services voluntarily to the people living in the slums—away from the four walls of the hospital.

As the project was ready for its implementation Dr. (Mrs.) Hemlata Swaroop, Vice Chancellor of Kanpur University was invited to inaugurate the project on 12th September 1980. In her inaugural speech, Dr. Swaroop expressed her appreciation and support to make the programme a success. She suggested that the project should be assessed, periodically to find out the progress. Dr. Swaroop pointed out that, College of Nursing as a department of Faculty of Medicine of Kanpur University deserves a prominent place for its high standard of performance and will provide assistance to improve future programme as well.

PROJECT PLAN:

1. Philosophy of the project:

We the members of the nursing profession believe that health is a human right and every indi-

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