

Sixth International Conference on Teaching of Statistics

ICOTS 6

Opening address by

The Honourable Trevor Manuel (MP)

Minister of Finance

South Africa

Conference held in Cape Town

7th

to

12th

July

2002

I would like to commend ICOTS and the organising committee for the work done in preparation for this conference. In looking at the programme my particular favourite is Session 4H “Educating Managers, Executives, Lawyers, Politicians, Government officials and other Decision Makers”. Numeracy for Lawyers? For Politicians? What next – elementary numeracy for Auditors?

My enthusiasm for the work of ICOTs arises from my responsibilities as a policy maker in South Africa. Our young democracy is but 8 years old and was built to improve on the quality of life of all its citizens. This task is undertaken against the history of huge inequalities; not just in material circumstance, but also in access to knowledge and understanding. I believe fundamentally that democracy works when citizens participate, because citizens know, because they’ve been empowered through education.

Dr. Helmut F. Spinner (1999) (German obviously), at the conference on policies and statistics in the European Union: Challenges and responses, defines a Knowledge Society: as a well informed society in fact, that should become increasingly better informed and he argues that in a complete knowledge society, all the knowledge of the world will be available to everyone, available everywhere, available simultaneously and available freely. This is what we are striving to achieve here in South Africa. Dr. Spinner poses the five pre-conditions for this to happen as:

- The non-technological infrastructure should first be upgraded
- Literacy should be achieved
- There should be promotion of use
- There should be promotion of access
- Basic freedoms should be guaranteed.

The question to yourselves is what knowledge do we impart in the teaching of statistics? I will hazard it is knowledge as understanding and knowledge as insight. The latter being more important in that we do not see people in our offices churned out of universities performing at this third level of knowledge. That is knowledge as insight.

Larry Gonick and Woollcott Smith (1993), authors of the cartoon guide to statistics say “we muddle through life making choices based on incomplete information.” In order to make informed decisions in the face of incomplete data we often use statistics and....”what makes statistics unique is its ability to quantify uncertainty, to make it precise. This allows statisticians to make categorical statements, with complete assurance- about their level of uncertainty.” By quantifying this uncertainty, one begins to know what to do about risk, and what resources to allocate to it. On a daily basis my political portfolio has to deal with uncertainties about the markets, currency behaviour, prices of the bullion, the all share index, inflation rate, GDP growth, savings and investment, sectoral performance, employment, investor confidence, likely direct

foreign investment, asset security, their growth, adequacy of their deployment and ultimately derivation and appropriation of value for society. In examining this array of information, the risk is that I may confuse the noise of so much information with reliable statistics.

I do not wish to replace the statisticians in Stats SA, they must be consummate professionals, nor do I wish to undermine the valuable work that the Statistics Council does in providing an external quality assurance to the work of Stats SA. I seek, as policy maker to define the terms for engagement between the statistical agency and Cabinet.

From the list of matters outlined above that concern government and my portfolio, you can realise that I have to deal with *statistics matter*, that is, measurement of inputs, outputs, outcomes and impact. While the first of the four measures might be a matter of arithmetic and largely financial accounting, the latter three are the subject of statistical collection, collation and derivation of indices for measurement, evaluation and decision making for determining:

- ?? What types and levels of inputs should be made?
- ?? Why these inputs should be made?
- ?? For whom these inputs should be made?
- ?? When these inputs should be made?
- ?? Where these inputs should be made?
- ?? How these inputs should be made to have maximum effect?
- ?? How will I know that the inputs are working for me? Am I measuring what I need to measure? How will I recognise success? How will I recognise failure?

“Three fourths of the mistakes a man makes are made because he does not really know what he thinks he knows” (James Bryce 1838-1922). Am I measuring what I need to measure? Do I have confidence in the indicators I am using? And what is my confidence level?

My responsibility as a Minister of Finance is to firstly ensure that the country has sufficient high quality statistics produced by our statistical agency and secondly to ensure that the populace can receive the statistics. This is where educators come in. Thirdly, Government has to intermediate between the generation and the use of statistics.

Indeed “when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind. It may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science”. (William Thomson, Lord Kelvin 1824-1907).

“Before [Census@Schools](#) I did not know how tall I was”, remarked a young girl of 15 years of age from a remote school. This was in September 2001 when StatsSA conducted Census at Schools. “The census says we are not as many as we are” was exclaimed a resident from the Western Cape Province when the census results of Western Cape were released in October 1998. “How can we be classified as not being poor” was the question raised by a resident of the Province of Mpumalanga when the report on poverty measurement was released in 2000.

Statistics are a matter of life and death too. Where they are applied to amplify knowledge they can save lives and where they are ignored losses can be incurred.

Larry Gonick notes that in 1986, the space shuttle challenger exploded, killing seven astronauts, including a lady teacher. The decision to launch at a temperature of 29 degrees had been made without doing a simple analysis of performance data at low temperature. On the other hand the trials of salk polio vaccine performed in 1954 on a sufficiently large sample of children, 400 000 in number eliminated bias in the results. Robust statistical analysis of the data firmly established the vaccine’s effectiveness, and today polio is a thing of the past.

Why should a young girl of fifteen at school fail to know about herself. She says I did not know how tall I was? A UN Statistics Division Handbook on the Operation and Organization of a Statistical Agency (December 2001) notes that, encouraging schools and high schools in the learning of statistics constitutes best practice. In fact they note that in Poland, there is an active high school competition for the best essay in which extensive use is made of official statistics. I have also realized that Canada recently has introduced the teaching of statistics for teachers and as I surfed the Web I came across a website on statistics in primary schools for Japan.

It will be desirable that statistical institutions avail their stacks of data to schools for use as teaching material. The United Kingdom in outlining their management model for statistical office opine that there has to be a critical mass of key skills. So you are potentially producers of these skills for that reason you have to seek relevance.

I have looked at the programme and I have been struck by a few topics that will be handled, and allow me to reference them without influencing you on which ones you should attend. I am pleased to see that a political angle is brought to the fore through a presentation titled looking at the behaviour of the electorate by Theodore Chadjipaledis. Larry Gonick in his book “a cartoon guide to statistics” argues that all this probability stuff is only good before an election. Your poll star statistician will tell you that I am 95% or 99% confident that you will win the election. This is so because of several things, such as response bias because

voters can lie to the interviewer, secondly, the actual voters is what counts although the potential voters constitutes an unbiased sample and thirdly voters may not be home to answer the poll. After the election, the senator is either 100% in or 100% out.

Let me digress by drawing attention to a matter of fundamental importance to policy makers all over, but especially in the developing world, namely HIV and Aids. There is no dispute about the severity of the disease but it is exceedingly hard to deal with this in an environment where there is no reliable statistics available. In South Africa we have results from ante-natal clinics and we have available actuarial models constructed for appreciating risk in the life assurance companies and not for public policy making. In addition the disease remains stigmatised in communities and doctors do not always capture Aids as a cause of death raising concerns about the veracity of parts of a huge mortality study presently underway. Simultaneously, there are a range of interests on this matter who all claim infallible statistics. In an environment of the absence of a cure, policy makers face a huge dilemma on resource allocation. Would money be best spent on research into a cure or a vaccine, on preventive education, on drug therapies, care for people living with the disease or welfare on those left behind? Each of these choices is relative and dependent both on the reliability of statistics and on the ability to engage with the populace. In many respects the results will be shaped by the extent of exposure of ordinary people to the basic natural sciences; physiology, nutrition and efficacy of drugs which all influence lifestyle choices. None of this is assisted by statistical noise be this on infection rates or life expectancy. Part of my appeal to this conference is to give attention to the interconnectedness between the teaching of numeracy and the links to that which would empower people.

I am pleased that Professor John Volmink is presenting on the issues of statistical literacy for South Africa. My appeal to Stats SA is to engage with these matters and to bring results which would allow other parts of government to take forward the work of [Census@Schools](#). I want to welcome the entry into the discussion of community based learning and wish to express appreciation to Trisha Thorne and Rob Root for their paper. I am encouraged by the paper by Madden and Choi on the duties of statistical agencies to their clients. I am happy that Koffi N'Guesson is advancing discussion on the training of African statisticians – our heads of state gathered in Durban to launch the African Union and take forward the New Partnership for Africa's development will depend for their efforts on good quality statistics to advance these programmes.

My challenge to all of you is to help us help the 15-year-old who did not know how tall she was. My challenge to all of you is to help us to understand what we should focus on to build an empowered society. My challenge to this conference is to help us to meet Spinner's definition of a knowledge society.

I wish you fruitful deliberations.