

TEACHING STATISTICS AT THE CIVIL SERVICE ACADEMY OF PAKISTAN: AN INNOVATIVE ENDEAVOUR

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In the developing world, there is a need to create awareness in civil servants regarding the importance of carrying out in-depth analyses of official data, in order to ensure policy-formulation aimed at improving the lives of the people. This paper reports on an attempt to achieve this at the first level of civil service, through an innovative approach in rendering a course entitled “Quantitative Tools for Decision-Making” to the probationary officers of the 43rd Common Training Program at the Civil Services Academy of Pakistan. The course was wholly based on data pertaining to the 2011 Punjab Multiple Indicator Cluster Survey (MICS 2011). Feedback from participants in the four-month-long course provides motivation for recommending the ongoing adoption of this approach at all levels of civil service. Similar strategies may prove to be worthwhile in many other developing countries of the world striving to create statistical awareness in civil servants.

INTRODUCTION

Policy-formulation on the part of the government has a direct bearing on the lives of the people and, the levels of deprivation in various sectors being much higher in developing countries than in the developed world, the need for policymaking targeted at improving the quality of life of the people is much more pronounced in developing countries. Evidence-based decision-making being the key to the accomplishment of this goal, it is vitally important that (i) pertinent statistical data are collected by national statistical offices, (ii) in-depth statistical analyses of these data-sets are carried out and disseminated among the stake-holders, and (iii) bureaucrats formulate policies in the light of the insights gained as a result of the analyses. The role of bureaucrats is vitally important due to the fact that public bureaucracies, staffed largely by permanent civil servants, are responsible for the vast majority of policy initiatives taken by governments and that bureaucrats have gained an over-riding influence over the evolution of the decision-making process (Putnam, 1973). In fact, there exists an aspiration that higher level bureaucrats should not only implement public policy but should also promote broad public interest and prevent any abuse of powers by politicians (Cheema, Armstrong, & Matsuda, 2003). Bureaucrats thus having a crucial role in governmental policy formulation, it is vitally important to instill in civil servants a cognizance of the importance of analyzing official data in such a way that it brings to the surface the on-ground realities and, as such, facilitates evidence-based policy formulation and budget allocation.

Indubitably, the role of official statistics in good governance cannot be over-emphasized. Hauser (1973), for example, comments that statistics are quantitative facts collected, aggregated and analyzed in order to provide intelligence and to facilitate understanding as well as to serve as a foundation for policy-formulation, development and administration of programs and evaluation of the impact of programs. More recently, Wyatt (2002) puts forth the fact that the term “evidence-based policy-making” has come to be used as a definable method or body of professional practice.

Civil service being crucially important for any country, not only the developed nations but also a number of developing countries have created public sector institutions for imparting training to civil servants. The Civil Service Colleges of Uganda and Mauritius, the Kenya School of Government and the Civil Services Academies of Pakistan and Turkmenistan provide a few examples. Included in the wide variety of training courses rendered by these institutions for improving the quality of public service are courses such as “Drussa Training in Evidence-based

Policy making” (Uganda) and “Quantitative Tools for Decision-Making” (Pakistan). This paper reports on an innovative approach that was adopted for rendering the latter mentioned course to the probationary officers of the 43rd Common Training Program at the Civil Services Academy of Pakistan. The course was rendered in a workshop-style format where the officers analyzed micro-level data pertaining to the 2011 Multiple Indicator Cluster Survey [MICS] (Bureau of Statistics, Planning and Development Department - Government of the Punjab, 2011) which provides information on a large number of indicators based on data collected from 102,545 households randomly selected from within the Punjab province of Pakistan. This was the first time in the history of the Academy that probationary officers were exposed to the basic concepts of Statistics through analysis of real data that exhibited glaring differences between the situations of various categories of people. The fact that the analyses were being conducted in the milieu of the Sustainable Development Goals that had been recently adopted by the world made the learning impactful and sustainable.

The paper presents an outline of the four-month-long exercise that ran from October 26, 2015 to February 19, 2016, including course contents, methodology used, projects undertaken by groups of probationary officers, assessment scheme and the performance of the course participants. Feedback from officers indicates that similar courses may prove to be a valuable intervention in the established systems of bureaucracy of other developing countries struggling to achieve a better quality of life for the people.

COURSE CONTENTS

Topics in the course included Types of Variables, Random Sampling from a Population, Tabular and Diagrammatic representation of qualitative data including Simple Bar Chart, Pie Chart, Cross-tabulation and Subdivided Bar Chart, the concept of Proportions and Probabilities as well as the Chi Square Test of Independence. Techniques for analysis of quantitative data included Frequency Distribution and Histogram, concepts of Normality, Skewness & Kurtosis, measures of Central Tendency including the Mean, Mode and Median, partition values including Quartiles, Quintiles, Deciles and Percentiles, measures of Dispersion including the Range, Quartile Deviation Standard Deviation and Coefficient of Variation. Bivariate analyses included the concepts of Correlation & Simple Linear Regression, Interpretation of Correlation Coefficient and Regression Coefficient, Utilization of Y-Intercept and Regression Coefficient for estimating the expected value of the dependent variable. Next came Multiple Linear Regression including Utilization of Y-Intercept and Partial Regression Coefficients for estimating the expected value of the dependent variable. Inferential Statistics topics included Confidence Interval for the Population Mean, Hypothesis Testing regarding population means, Hypothesis Testing regarding population proportions and Hypothesis Testing regarding the population correlation coefficient.

METHODOLOGY

The course spanned 16 weeks, the two-hour-long sessions being held in the computer lab and the instructor being assisted by three teaching assistants. The 236 probationary officers involved in this training comprised 143 male and 93 female officers and were distributed among four Academic Groups. In general, each Academic Group met the instructor once a week, whereas for the instructor and the teaching assistants it meant four days a week for sixteen weeks.

The tone of the course was set in the very first session when the following two questions were put to the probationary officers one after the other: (i) What are the primary responsibilities of civil servants ?; (ii) What are Sustainable Development Goals (SDG)? Having invited answers to these questions, the instructor drew the probationers’ attention to each of the 17 SDG that had been recently adopted by the world, and then asked the probationers to focus on Goal No. 7: Access to

Affordable and Clean Energy. Electricity being one of the important forms of energy, the class was advised to concentrate on access to electricity in the largest province of Pakistan, the Punjab, as indicated in the HH (Household) file of MICS Punjab 2011. Through a simple cross-tabulation of information that had been collected in response to the question aimed at determining presence or absence of an electricity connection in the house, the instructor was able to show that, in the sample, the percentage of rural households deprived of electricity was almost ten times the percentage of urban households without an electricity connection!

The micro-level data pertaining to the Multiple Indicator Cluster Survey had been made available by the Punjab Bureau of Statistics in the form of four SPSS files. As for an overwhelming majority of the probationary officers this was their first exposure to SPSS, the instructor had the challenging task of teaching basic commands of SPSS along with the basic concepts of Statistics. A fairly large number of variables contained in the MICS data-files were picked up by the instructor during the first ten weeks to impart to the probationary officers an understanding of the topics included in the syllabus along with a basic know-how regarding SPSS. This resulted in a transition on the part of the officers from being “scared” of Statistics and of the lab-work to a feeling of familiarity, comfort and contentment.

PROJECTS

Soon after the Mid-term Examination came the allocation of projects. The probationers were divided into thirty-two groups of approximately eight students; for each group, one probationer was appointed leader and another one deputy-leader. Every group was assigned a topic in the context of the SDG, Millenium Development Goals (MDG), or some other area of importance. For each group, the task was to analyze data on pertinent variables in MICS 2011 to write a report regarding the situation of the Punjab with reference to the topic assigned. Titles of some of the projects are as follows:

- Inequalities in the Punjab on the basis of mother-tongue (reference to SDG 10: Reduced Inequalities)
- Situation of the Punjab with reference to education (SDG 4: Quality Education)
- Situation of the Punjab with reference to employment (SDG 8: Decent Work and Economic Growth)
- Situation of the Punjab with reference to measures for population control being adopted by the people (ref. Human Population Planning)
- Situation of the Punjab with reference to maternal health (MDG 5: Improvement of Maternal Health)
- Inequalities between the urban and the rural populations (SDG 10: Reduced Inequalities)
- Situation of the Punjab with reference to consumption of food (SDG 2: Zero Hunger)
- Situation of the Punjab regarding child mortality (MDG 4: Reduction of Child Mortality)
- The quality of life of the youth in the Punjab (United Nations Study on Global Profiles on the Situation of Youth: 2000-2025)

For example, the set of instructions given to the group required to work on the project given at the top of the above list is as follows:

Pick up Sustainable Development Goal No. 10: Reduced Inequalities. Explore all six files related to the Multiple Indicator Cluster Survey conducted in the Punjab in 2011 in order to write a comprehensive report regarding the situation of the Punjab with reference to inequalities on the basis of mother-tongue in the context of this goal.

It may be useful to include in your report comparisons with other provinces and areas of Pakistan as well as comparisons with other countries of the region. (You may --- or may not --- discover that the situation of the region is substantially different from the goal set for the world as a whole.) You might think of other factors that you may consider important in this study.

Very importantly, suggest a three/four/five-year-plan/a set of policies that would need to be adopted for optimizing the reduction of inequalities on the basis of mother-tongue in the Punjab as depicted by MICS 2011.

Instructions given to other groups were quite similar to the one above and compatible with each other. The probationers were intellectually challenged and the leaders and deputy-leaders were in trouble! The instructor emailed to the groups the skeleton of a report that she prepared on a different topic. The groups prepared a set of 32 project reports in a span of a few weeks. Summary statistics produced by various groups revealed, among other things, glaring differences between the situations of (i) men and women, (ii) urban people and rural people, (iii) people in the big cities and those in small towns, and (iv) people belonging to various divisions of the Punjab province.

A panel of in-house faculty members of the Civil Services Academy evaluated the projects through slide presentations rendered by the group representatives. Subsequently, a test was administered to all 236 probationary officers in order to assess their understanding of the projects that had been assigned to them. The grand finalé of the entire exercise was the presentation of the five best projects in front of the Director General of the Punjab Bureau of Statistics in a well-organized and impressive event.

ASSESSMENT SCHEME

Class Assignment 1: 15%, Midterm Exam: 25%, Class Assignment 2: 10%, Project Presentation: 10%, Class Assignment 3 (based on Project): 15%, Final Exam: 25%.

QUESTIONS INCLUDED IN EXAM PAPERS

The questions included in the Midterm and Final exam papers aimed at testing the probationers' understanding of Statistics as well as their know-how regarding SPSS. A sample question from a Midterm Exam paper and one from a Final Exam paper are given below.

1. *Open the WM (Women) file of the Multiple Indicator Cluster Survey that was conducted in the Punjab in the year 2011. Concentrate on the variable possessing the code WB3. Execute the appropriate SPSS commands to obtain a table depicting the Urban/Rural Comparison with reference to the question "Ever attended school?" as indicated by the WM (Women) file of the MICS 2011 data. Draw an appropriate graph/diagram for conveying the same information. What can you say regarding the education of women included in the MICS 2011 survey based on the analyses carried out above?*

2. *Open the HL file of MICS 2011. Concentrate on the variables Age and Hours worked in the past week for someone who is not a household member. Treating age as the independent and Hours worked in the past week for someone who is not a household member as the dependent variable, compute the coefficient of correlation and interpret your result. Fit a regression line and use it to estimate the expected number of hours that will be used for working per week for someone who is not a household member by a 28-year-old person.*

PERFORMANCE OF COURSE PARTICIPANTS

A vast majority of the officers had gained a considerable amount of confidence by the time of the Midterm Exam, and appeared to be quite relaxed and composed at the time of the Midterm and Final Exams. A sample of marks obtained by the probationary officers in the Final Examination (reproduced in Table 1 below) testifies to the fact that, by and large, the performance of the officers in the Course was satisfactory.

Table 1: Sample of final examination marks, out of 25.

Sr. No.	Total marks Out of 25	Sr. No.	Total marks Out of 25	Sr. No.	Total marks Out of 25
1	19	8	21	15	22
2	24	9	20	16	20
3	20	10	22	17	15
4	22	11	20	18	21
5	22	12	21	19	19
6	22	13	21	20	17
7	17	14	22	21	19

FEEDBACK FROM PARTICIPANTS

Subsequent to the passage of nearly one year after the completion of the course, the instructor sought feedback from some of the officers who had been a part of the 43rd Common Training Program. The fact that ten to twelve months had passed since the culmination of the CTP and its deadline-related pressures provided the instructor confidence that the comments received would be more objective and realistic. The officer was asked to send a few lines regarding his/her experience of this course—both positive and negative—and, in particular, the *single most important impression* regarding the course that had stayed with him/her to this date. Excerpts from some comments received are presented below.

Respondent No. 1: The course was taught drawing upon data from MICS 2011, Punjab, Pakistan. Data pertaining to various sectors such as education, agriculture, health and utilities were analyzed. The trends were depicted using different techniques and based on the same; policy suggestions were given to improve government's service delivery. The entire experience was highly rewarding as the instructor ensured that all probationers coming from diverse educational backgrounds develop the required conceptual basis. The course will certainly go a long way in benefitting us in our roles as public administrators. Our decisions will be more informed and our recommendations more likely to be meaningful towards addressing Pakistan's multifarious challenges. No longer will policies be based solely upon political considerations, personal choices or past precedent.

Respondent No. 2: These courses are backbone of effective decision-making as they provide a medium to know about the condition of the masses.

Respondent No. 3: My strongest impression is that we got acquainted with hard numbers for the first time. One thing common with all the developed countries is their passion to gather numbers. These numbers are then interpreted. Sadly, we have a scant regard for statistics. This course helped me to value data. Also, the tools that can make data-handling more convenient were taught.

Respondent No. 4: The positive aspect of the course was development and inculcation of a scientific enquiry into socio-economic factors to enable the budding bureaucrats come up with objective analysis of subjective phenomena that would empower them with making statistically accurate decisions. Besides, the interesting methodology adopted by the mentor helped in understanding otherwise rough statistical details in an easy animated manner; summing up detailed work in form of colorful graphical visualizations were intriguing. Thanks to her dedication and dutiful commitment as a teacher, we got to learn so many things in such a little time, especially statistical distributions, inferences, probabilities. Her efforts of assigning very peculiar and significant tasks to various project-groups are really commendable as these encompassed our three months' learning of the course. Negative was the way groups were evaluated as ma'am was herself not available during the assessment/grading of individual groups.

Respondent No. 5: Overall it was a good experience. We learned a lot and the results from survey were quite understandable which means that data given to us was authentic to the maximum extent. Negative thing is that data was out-dated. We were dealing with 2011 data in year 2016 so it may not be much useful in a country like Pakistan where population is increasing rapidly, so it should be updated regularly.

Respondent No. 6: What still remains with me to date is that the snow-storm of data can be interpreted effectively to decide upon things most needed for any area for which we'd be working considering their demographics and dynamics. I, Assistant Commissioner Revenue for Karachi West, utilize this skill for better decision-making in public service delivery.

Respondent No. 7: The course helped me develop certain special skills which I never had the chance to learn before in the way our instructor taught us. Being in the field where my work revolves around dealing with statistical data and its analysis, I must mention that the invaluable skills I have acquired during the course help me a lot in making rational and informed decisions.

Respondent No. 8: 43rd CTP learnt few of the most relevant techniques and best practices used for analysis and decision making. Public policy making has become a science and with the help of the MICS 2011 data we started to learn better decision-making. It is felt among probationers of our batch that our instructor did an act of magnanimity to the future of Pakistan.

CONCLUSION

One of the key components of the mandate of the government in any country of the world is to strive for improving the quality of life of the people and, for obvious reasons, this objective assumes paramount importance in the poor and under-developed countries. In order to align policy-formulation with the on-ground realities of developing countries, it is imperative not only to collect pertinent data in these countries but also to analyze them in detail so that the hidden realities may become visible. At the same time, it is crucially important to inculcate in the civil servants of developing countries a cognizance of the importance of in-depth analyses of official data. This paper has reported an endeavor to achieve this at the initial level of civil service through an original and ground-breaking methodology that was implemented for teaching “Quantitative Tools for Decision-Making” to the probationary officers of the 43rd Common Training Program at the Civil Services Academy of Pakistan. Feedback from participants provides incentive for recommending the adoption of this approach at this level on a continuing basis. However, the annual Common Training Program of Pakistan’s Civil Services Academy being only the first level of the civil service career (the probationary period), it is important to instill recognition of the importance of official data in the minds of civil servants at all levels of hierarchy. As such, there seems to be a need for an ongoing series of two-to-three-week-long courses of this nature as a regular feature of the training programs at various levels of civil service in Pakistan. Analogous approaches may turn out to be advantageous and beneficial in many other developing countries of the world and are strongly recommended. Only through a culture of widespread acceptance of the importance of proper utilization of large-scale socio-economic data for policy-formulation will developing countries be able to move toward evidence-based decision making truly aimed at changing the lives of the people.

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REFERENCES

- Bureau of Statistics, Planning and Development Department – Government of the Punjab. (2011). *Multiple Indicator Cluster Survey*. Retrieved from <http://microdata.worldbank.org/index.php/catalog/2211>
- Cheema, S., Armstrong, E. Y., & Matsuda, Y. (2003, May). *Workshop 3.4: Depoliticising the Civil Service*. Workshop presented at the 11th International Anti-Corruption Conference, Seoul, Republic of Korea.
- Hauser, P. M. (1973). Statistics and Politics, *The American Statistician*, 27(2), 68–71.
- Putnam, R. D. (1973). The political attitudes of senior civil servants in western Europe: a preliminary report. *British Journal of Political Science*, 3(3), 257–290.
- Wyatt, A. (2002). Evidence based policy making: The view from a centre. *Public Policy and Administration*, 17(3), 12–28.