Data Analysis and Data Interpretation
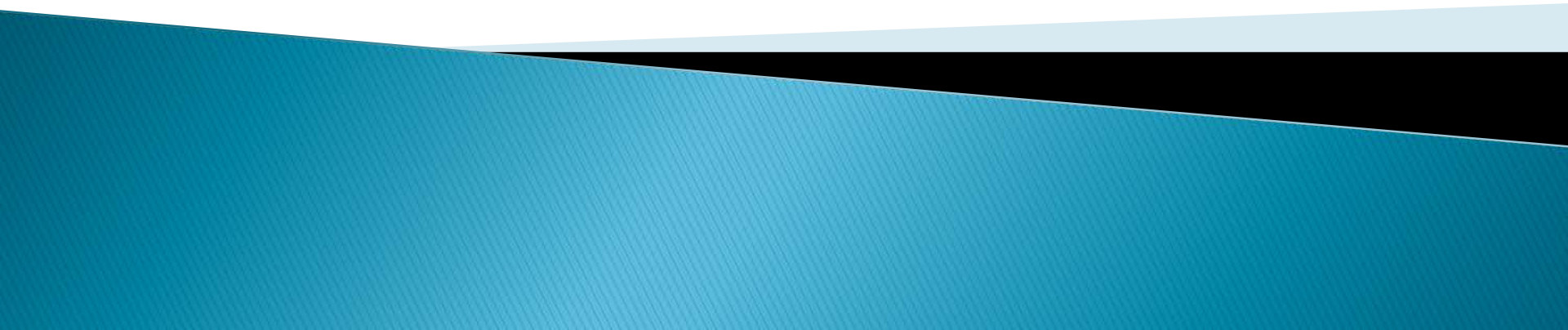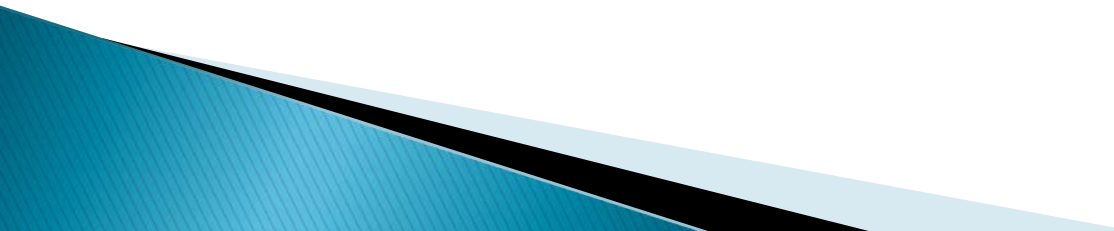
Statistics & Public Administration

- Advantages of a Statistical Approach
- Offers Insights into Issues and Problems in the field that would otherwise go unnoticed
- Describing systematically information/data
  - Main tendencies as well as the spread of data around them in a sample or the entire dataset.
  - e.g. Motor Vehicle Office- How many persons comes everyday for services/ By how much this no. vary day by day
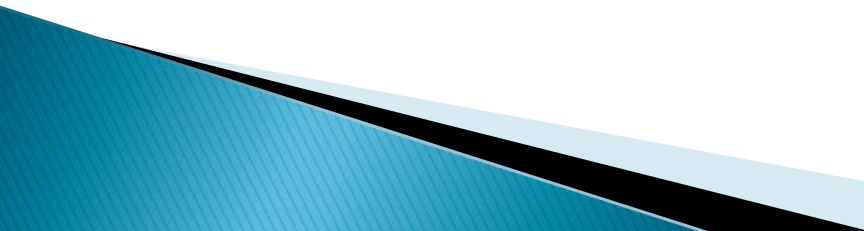
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- Testing our intuitive ideas to empirical test-hypothesis testing
  - e.g C-SAT is discriminatory for candidates from Hindi speaking areas.
- Statistics-Determining the extent to which data available support or refutes the hypotheses.
- Inference from a sample of data to its parent, the full population
  - Tax evasion in the State based on some samples of data of tax evaders.
  - Satisfaction levels of citizen with Govt. Services based on certain sample surveys.
- Evaluating the risk of error when making inferences. Estimating the probability or extent of error.
- Deriving a confidence band or interval about an estimate that expresses the uncertainty in generalizing from data to the entire population.

Contd…

- Keeping track of innumerable variables at the same time.
- Statistics – enables the Administrator to measure the influence of variable on the desired outcome e.g. citizen satisfaction in public sector
- Making sense of complicated relationship among variables and making sense out of that
- Discerning consumer of quantitative info.
- Cannot escape from facts, assertions based on statistical analysis
- Provide skills for evaluating conflicting claims and representations made and avoid getting misled.
- Useful Tool in Pub. Ad. in addition to general understanding of broader political, legal, economic, social forces

Usefulness of Statistics

- Decision Making- earlier guesses, assumptions now computer printouts, contingency tables, regression analysis, decision trees.
- HR managers- Personnel projections to schedule recruitment efforts.
- Transportation planners- Urban Transportation system design
- Budget Officers- Economic Projections
- Program evaluators- Quantitative assessment of program effectiveness.
- Few options- Can act as if these don't exist and refuse to read reports containing statistics- Lose valuable info.
- Accepting, Uncritically, the findings of an data analyst rather than revealing ignorance of statistics.
- Analyze, synthesize, think critically, solve problems and make decisions

Measurement

- Statistical Approach starts with Measurement.
- Assigning Numbers to phenomenon interested in analysing. e.g. effectiveness of an office.
- However in many cases, Measurement is not thought about consciously.
- Obtaining data and subject it to analysis.
- Police crackdown on prostitution. Daily arrests by squads increase. Can it be said that prostitution has reduced.
- Measurement theory– A concept representing some phenomenon cannot be directly measured e.g. educational achievement, program success, bus driver performance etc…

Contd...

- Such concepts are measured indirectly through indicators specified by operational definition.

- Operational definition- How a concept will be measured.

- Indicators- Set of observations that results from applying operational definition.

- Operational definition e.g. Educational status of a school- Scores achieved; Officer Effectiveness- evaluation by senior officers; Client satisfaction with services- His response on a questionnaire??

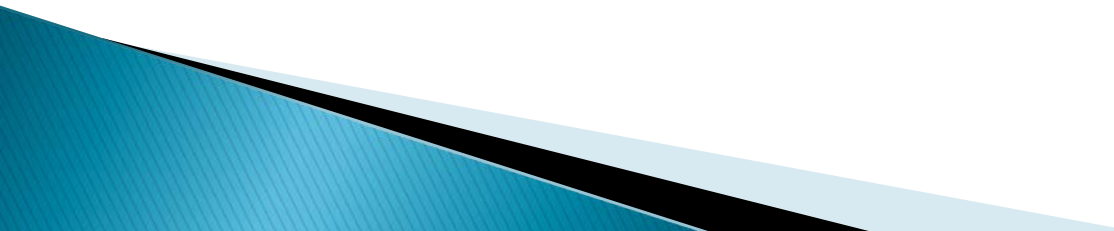- Often in Public Administration these definitions are not defined strictly- Hence difficulty in measurement.

Contd..

▸ City Bus System evaluates the job performance of its drivers by examining each one's accident record and on time rate- Is it a good indicator ??

▸ Indicator may not be a complete measure of concept.

▸ Indicator= Concept + Error

▸ Multiple Indicators- Concept having more than one dimension.

▸ City Development program of a Municipality- What are the indicators to measure the success of the program??

▸ Multiple Indicator Strategy is often recommended for public sector program.

Measurement- Reliability & Validity

- Valid indicator- Accurately measures the Concept- CSE exam- Is it a valid indicator of on the Job Performance ??
- Face , Consensual, Predictive, Correlational Validity.
- Community Police Effectiveness, Health of A City.
- Reliable Indicator- Values are not affected by who is doing the measurement, by where the measuring is being done.
- Two Major Threats- Subjectivity and lack of Precision.
- Quality of Life in a City- Subjective
- Eliminating Subjectivity- Ask specific questions. Was there trash in the streets, Streets have potholes, Average Commuting time, jobs creations etc....
- However removing subjective element altogether will increase reliability but may decrease validity.
- Lack of Precision- e.g surveying high unemployment rates of parts of city

Types of Measures

- Subjective- Objective Indicator
- Amount of City Services delivered to each neighbourhood in the city.
- Objective- Acres of City parks, Number of tons of trash collected, No. of Police Patrols etc..
- Subjective- Asking Citizens whether levels of various services are adequate.

Levels of Measurement

- Actual Numbers to measure phenomena: tons of garbage collected, number of arrests made by police per week, response times of a fire dept, no. of children attending schools, tax collections etc..
- All kind of calculations possible– Average.
- However for administrators this may not be the case always.
- Citizen is " Very satisfied", "satisfied", "neutral", "dissatisfied" or " Very dissatisfied" with a new job training prog. Difficult to put numbers.
- Classifying citizen according to race, gender, religion and many other attributes
- Arithmetic average of race or religion.
- Concepts of Level of Measurement

Contd...

- Three levels of Measurement
- Interval Level- Most precise- Measurement is based on a unit or interval accepted as a common standard. Weight, Height, Distance, Time etc..
- Ordinal- One Unit or observation has more or less of a given characteristic than another; How much more or less- Not possible to say; Measuring Attitudes or Opinion. How a unit of satisfaction may be defined
- How good a Mayor is doing his job of running the city (Very Good, Good, Average , Poor)

Contd..

- Nominal– One loses the ability to state exactly how much characteristic an object possess (interval measurement)or whether it has more or less of the characteristic than another object(ordinal)
- Lacks any sense of relative size or magnitude.
- Allows whether things are same or different.
- Race, gender, religion, occupation, type of housing, job classification, sector of the economy, employment status etc.
- Variables coded at higher level of measurement can be transformed at lower levels but not vice versa

Group Exercise:

A) What will you measure?
   −Swachha Bharat Mission (Grameen)

B) How would you analyze them?