



# Supporting Statistics by Innovating in Survey Methods and Beyond

**IAOS-IASS Webinar to Celebrate World Statistics Day: On the Importance to Society of High-Quality Public Statistics**

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**November 5, 2020**

Delivering insight through data for a better Canada



Statistics  
Canada

Statistique  
Canada

Canada

# Society is Changing

- Statisticians, taking pictures of society need to adapt
- Constantly changing approaches, constantly changing tools



# Innovation takes place

- New context (data revolution, post-truth)
- New questions / demands (faster, more details)
- New data sources
- New producers
- New means (crowdsourcing, web scraping)
- New users



# National Statistical Offices as Guides

- Mandate to inform
  - Public good
  - New needs such as increased timeliness and granularity which speak to relevance
  - Relevance depends on accuracy
- ➔ Trust in the NSO

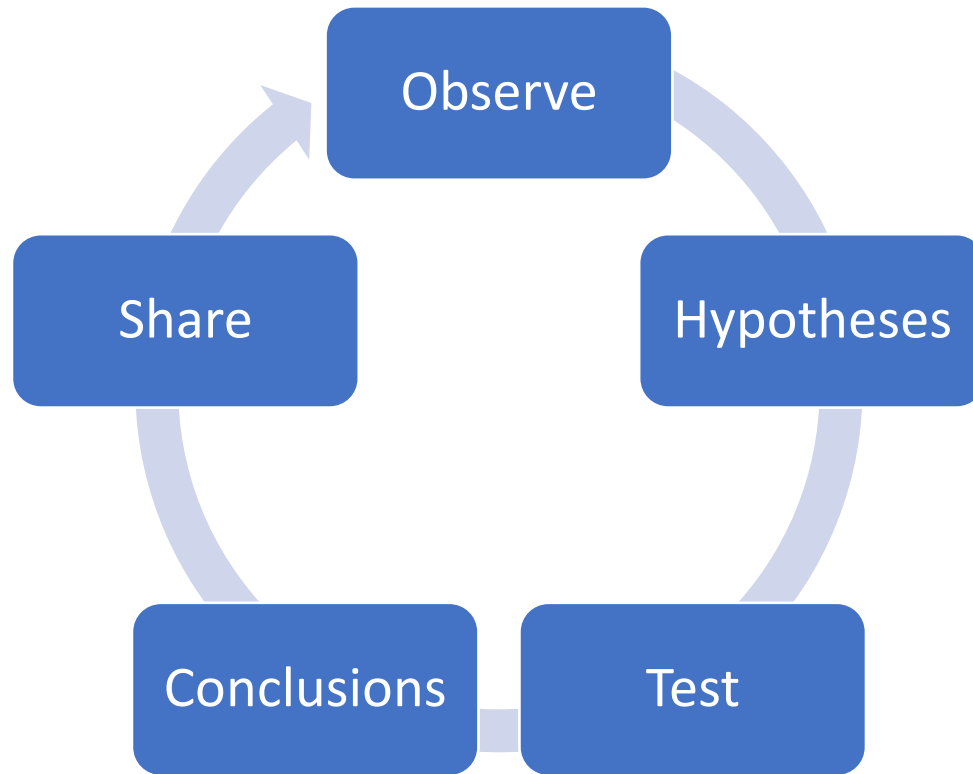


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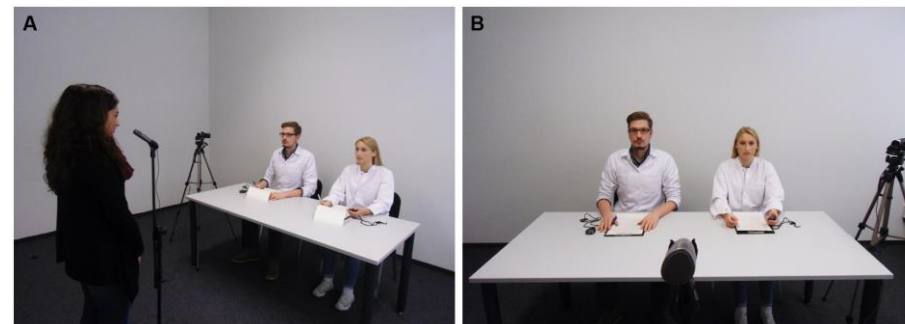
# Rigor and the Scientific Approach

- Starts with a need



# Conducting Social Scientific Experiment

- Need to control as many factors as possible
- Observe / measure what is not controlled
- Issue: Number of uncontrolled elements is increasing!
  - Coverage
  - Response / participation
  - Causes

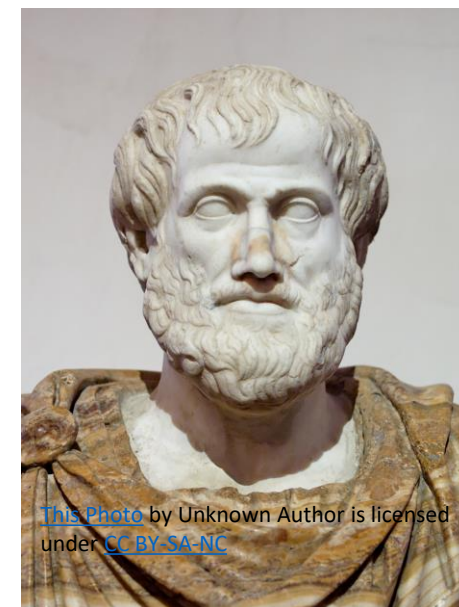


➔ More hypotheses made ➔ High need to innovate / research

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# Reconvergence of Sciences

- Statistics
  - Survey Sampling
  - Data Science
- Philosophy
  - Data Ethics
  - AI Ethics
  - Ethical sources
- Psychology
  - Data Sensitivity
  - Response Behaviour
- Sociology
  - Social Acceptability
- Economics
  - Virtual transactions
  - Spending choices



# Sciences

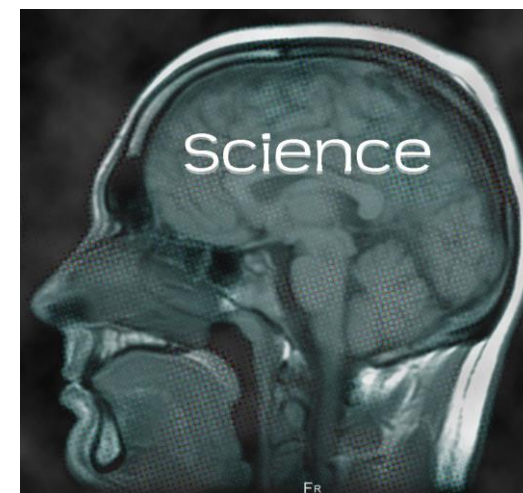
Socio-Economic  
Phenomenon

Statistics

Sociology  
Economics

Philosophy

Psychology





# **Back to Rigor and the Scientific Approach**

- Need to be open to other ways while not losing track of the essence

## **Example:**

- Survey sampling (since Neyman, 1934) has been strongly influenced by deductive thinking
- Now Data Science brings an inductive influence
- ➔ One is not better than the other; both are part of scientific development
- ➔ Much more research and innovations are needed as we move forward
- ➔ Many more examples (response studies, crowdsourcing, etc.)

# Data Science

- Brings new modern tools
- Brings new issues and thinking points

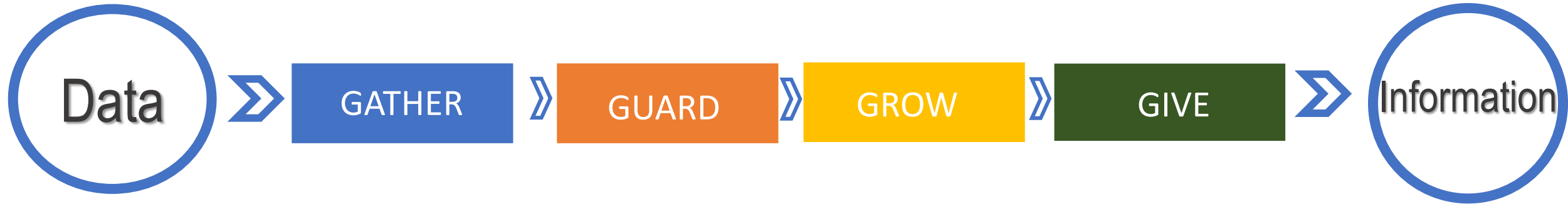
## At Statistics Canada:

- Created a start-up unit (data science accelerator) in 2018
- Morphed into a division in 2019 within Methodology Branch
- Powering the Data Science Network for the Federal Public Service 2020
- More than 50 active projects



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# Activities / Innovation Examples



- Administrative data
- Alternative data
- Web panel
- Crowdsourcing
- Web Scraping
- Focus Groups
- Necessity and Proportionality Framework

- De-identification
- Encryption methods
- Cloud
- Stewardship
- Enhanced Information Management

- Small Area Estimation
- Near-time / Real-time estimation
- Machine learning
- Data Science
- Modeling
- Data integration
- Mixed methods

- Virtual data centres
- 5 safes
- Collaborative spaces
- Synthetic data
- Perturbation methods

## Requirements

- Knowing / Understanding needs, not just demand
- Be at policy & discussion fora
- Follow / participate in international work
- Team up
- Be open and actioned towards change
- Training
- Pro-active communication and engagement



# From Being Responsive to Leading

My dream My mandate!

- Good: Mobilizing quickly to demands
- Better: Being ready for immediate start
- Pro-active: Anticipate demands and start even before it comes
- Target: Lead by delivering information (methods) as (before) demands come and (scientifically) influence



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# Thank you!

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