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
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
Rigor and the Scientific Approach

• Starts with a need

Observe

Hypotheses

Conclusions

Test

Share
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
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
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Sciences

Socio-Economic Phenomenon

Statistics

Sociology

Economics

Philosophy

Psychology

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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
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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