

Proceedings of the Sixth International Conference on Establishment Statistics

Monday, June 14

9:00-10:10 **General Session : Welcome & Keynote Address**

Chair: Danni Lewis, Office for National Statistics

Small Data Solving Big Data Biases: Measurement of Social and Economic Outcomes ([abstract](#))

R. Rigobon, MIT Sloan School of Management

Parallel Sessions

10:30-12:00 **Invited session: The Design of a New Complex Survey for the Very Large Non-Financial Enterprises in the Netherlands: Process, Methods, and Lessons Learned**

Chair: Gary Brown, Office for National Statistics, UK

Organizer: Leanne Houben, Statistics Netherlands

Discussant: Stefan Bender, Deutsche Bundesbank

Toward the New 'CBS-DNB Finances of Enterprises and Balance of Payments' Survey ([abstract](#))

F. Demollin, Statistics Netherlands

Questionnaire Communication with Large Non-Financial Enterprises ([abstract](#))

G. Snijkers, Statistics Netherlands

Survey Communication for the Newly Developed Business Survey ([abstract](#))

L. Houben, Statistics Netherlands

10:30-12:00 **Invited session: Robust Estimation in the Presence of Influential Units**

Chair: David Haziza, Université de Montréal

Organizer: David Haziza, Université de Montréal

Bootstrap Estimation of the Conditional Bias for Measuring Influence in Complex Surveys ([abstract](#))

J. Beaumont, Statistics Canada

Efficient Multiply Robust Imputation Procedures in the Presence of Influential Units ([abstract](#))

S. Chen, Univ. of Oklahoma Health Sciences Center

Controlling Representative Outlier Bias of M-Quantile Model-Based Small Area Estimators ([abstract](#))

G. Bertarelli, Department of Economics and Management, University of Pisa, Italy

10:30-12:00 **Topic contributed session: Measuring the Impact of Technology on the Economy**

Chair: Anne Russell, U.S. Census Bureau

Organizer: Cathy Buffington, Census Bureau

Discussant: Nathan Cruze, NASS; Jay Dixon, Statistics Canada

New Measures of Robot Use in US Manufacturing ([abstract](#))

A. Rosengarth, US Census Bureau

Measures of Robotic Expenditures from the Annual Capital Expenditures Survey ([abstract](#))

V. Mastalski, US Census Bureau

Toward a Digital Economy Satellite Account ([abstract](#))

J. Nicholson, Bureau of Economic Analysis

10:30-12:00 **Contributed speed session: Topics in Classification and Frame Development**

Chair: Juana Sanchez, UCLA

How a Statistical Office Scrapes and Processes Internet Data ([abstract](#))

C. Grahonja, Statistical office of the Republic of Slovenia

Application of Bidirectional Encoder Representations from Transformers (BERT) for the classification of occupations for establishment surveys ([abstract](#))

N. Lucas, Ministry of Manpower

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| <i>Predicting the number of freshman and graduates at Universidad Nacional de Rosario using random forest techniques</i> (abstract) | F. Jonsson, Statistics Sweden |
| Coverage and field disposition codes from a virtual listing frame of commercial buildings (abstract) | K. Lewis, EIA |
| <i>2018 CBECS Stratum Misclassification: Issue and Solutions</i> (abstract) | F. Hubbard, Westat |
| Establishment base Informal Sector Statistics: An endeavor of measurement from Economic Census 2018 of Nepal (abstract) | M. Pradhan, Central Bureau of Statistics |
| <i>Getting it Right: The Accuracy of Sampling Frame Data and Predicting Survey Contact</i> (abstract) | J. Pacer, Abt Associates |
| <i>Classifying university housing in the 2020 Census of Group Quarters</i> (abstract) | A. Tuttle, US Census Bureau |

Parallel Sessions

13:30-15:30 **Introductory overview lecture:** *Experiments in Business Surveys: Opportunities and Challenges*

Chair: Joseph Sakshaug, Institute for Employment Research / University of Mannheim
Organizer: Joseph Sakshaug, Institute for Employment Research / University of Mannheim

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| <i>Strategies for Embedding Experiments in Establishment Surveys: Examples from the US Department of Agriculture's National Agricultural Statistics Service Data</i> (abstract) | K. Ott, National Agricultural Statistics Service |
| <i>Experiments with Recruitment Strategies in a National Establishment Survey</i> (abstract) | J. Langeland, U.S. Bureau of Labor Statistics |
| <i>Methodological Purity Meets Practical Reality in Embedded Business Survey Experiment Design: Experience and Learning from Australia</i> (abstract) | T. Price, Australian Bureau of Statistics |
| <i>More Information, Less Item Nonresponse? Implementation of a Question Experiment in the IAB Job Vacancy Survey</i> (abstract) | B. Kűfner, Institute for Employment Research (IAB) |

13:30-15:30 **Topic Contributed session:** *Adaptive Cluster Sampling: Methodology and Implementation to Survey Informal Businesses*

Chair: Laura Bechtel, US Census Bureau
Organizer(s): Joshua Wimpey, World Bank

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| <i>Surveying Informal Businesses Using Adaptive Cluster Sampling</i> (abstract) | J. Rodriguez Meza, World Bank Group |
| <i>Challenges and Potential Improvements of Methodology and Practices of ACS</i> (abstract) | F. Jolevski, World Bank |
| <i>Practical Implementation of ACS: Tools and Steps</i> (abstract) | D. Francis, World Bank |
| <i>Results from the Application of ACS in the Field</i> (abstract) | A. Aga, World Bank |
| <i>Evaluating Application of Adaptive Sampling Approaches to Survey Informal Firms: Simulation Results Based on (Real) Population Data</i> (abstract) | J. Wimpey, World Bank |

13:30-15:30 **Topic Contributed session:** *Updating Surveys in Response to Stakeholder Feedback: The 2017 Census of Agriculture as a Case Study*

Chair: Linda Young, USDA, National Agricultural Statistics Service
Organizer(s): Virginia Harris, USDA, National Agricultural Statistics Service

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| <i>Measuring Women in Agriculture</i> (abstract) | H. Ridolfo, National Agricultural Statistics Service |
| <i>Agile Processing: Modifying the Editing and Imputation Procedures to Quickly Handle Questionnaire Changes to the 2017 Census of Agriculture</i> (abstract) | M. Lipke, National Agricultural Statistics Service |
| <i>Effects of Changes to the 2017 Census of Agriculture Questionnaire on Capture-Recapture Methodology</i> (abstract) | D. Miller, National Agricultural Statistics Service |
| <i>Adapting a Census Publication Program to Changes to the 2017 Census of Agriculture Questionnaire</i> (abstract) | V. Harris, USDA, National Agricultural Statistics Service |

13:30-15:30 **Topic contributed session: Adventures in Administrative and Alternative Source Data**

Chair: Joseph Parsons, USDA/NASS
Organizer: Andrew Dau, USDA/NASS

In Search of Alternative Data ([abstract](#))

J. Bailey, USDA/NASS

Developing Statistical Frameworks for Administrative Data: The Good, the Bad, and the Unknown ([abstract](#))

T. Tarling, Office for National Statistics

Cruising with Administrative Data as a Co-Pilot: Using Administrative Data in a Screening Survey ([abstract](#))

A. Dau, USDA/NASS

Improving the Quality of Administrative Data at Their Source: Two Case Studies Applying Cognitive Methods to Developing and Testing Regulatory Forms ([abstract](#))

A. Hernandez, U.S. Census Bureau

Tax Data: The Backbone to the Modernized Agriculture Program at Statistics Canada ([abstract](#))

J. Girard, Statistics Canada

Tuesday, June 15

Parallel Sessions

9:30-11:00 **Invited session: Modelling of Time Series Data - Challenges and Applications to Economic Statistics**

Chair: Juana Sanchez, UCLA
Organizer: Steve Matthews, Statistics Canada
Discussant: Paul Smith, University of Southampton

Toward Near Real-Time Economic Indicators Using Time Series Models: Statistics Canada's Progress to Date ([final paper](#))

S. Matthews, Statistics Canada

A New Look at Signal Extraction for Manufacturers' Shipments, Inventories, and Orders (M3) Survey ([final paper](#))

C. Viehdorfer, US Census Bureau

Seasonal adjustment of daily and weekly data published in the UK during the COVID-19 pandemic ([abstract](#))

D. Elliott, Office for National Statistics

Variance estimation under nearest neighbor hot deck imputation for multinomial data: Introducing the Case Study ([abstract](#))

A. Thompson, U.S. Census Bureau

Variance Estimation Under Nearest Neighbor Ratio Imputation ([abstract](#))

K. Kim, Iowa State University

Nearest Neighbor Multiple Imputation: Problems and Potential Solutions ([abstract](#))

R. Andridge, The Ohio State University

9:30-11:00 **Topic Contributed Session: Measuring Investment in Intangible Assets**

Chair: Steve MacFeeley, UNCTAD
Organizer: Mojca Bavdaz, University of Ljubljana
Discussants: Peter Van de Ven, OECD; Sanjiv Mahajan, Office for National Statistics, United Kingdom

UK Experience of Measuring Intangible Assets ([abstract](#))

J. Martin, UK Office for National Statistics

Designing an Intangible Assets' Business Survey: The State of the Art ([abstract](#))

G. Perani, ISTAT

Global Value Chains: The Productivity Contribution of Intangible Assets and Participation in Global Value Chains ([abstract](#))

A. Bounfour, Université Paris-Sud,
Université Paris-Saclay

9:30-11:00 **Topic Contributed session: More Data, Geography, and Reduce Burden? Approaches to Improve Measurement of Goods Movements in the United States**

Chair: Berin Linfors, US Census Bureau
Organizer: Berin Linfors, US Census Bureau
Discussant: Julie Parker, Bureau of Transportation Statistics

Development of Commodity Flow Data on CFS Sub-Area ([abstract](#))

O. Brozek, U.S. Census Bureau

Modernizing CFS Collection and Operations with Machine Learning ([abstract](#))

C. Moscardi, US Census Bureau

Exploratory Research on Optimization of CFS Sampling Design ([abstract](#))

M. Hashemipour, US DOT

Parallel Sessions

11:30-13:00 Contributed Speed session: Modernization Efforts in Establishment Statistics 1

Chair: Mojca Bavdaz, University of Ljubljana

Can we get anything from non-respondents? A pilot test of the third European Survey of Enterprises on New and Emerging Risks (ESENER-3) ([abstract](#))

X. Irastorza, European Agency for Safety and Health at Work (EU-OHA)

Exploring Employment Discrimination Data: A First Look into EEO-1 Public Use Microdata File ([abstract](#))

J. West, U.S. Equal Employment Opportunity Commission

Transition to WEB in the Survey on Consumption of Energy, Fuels and Selected Oil Derivatives ([abstract](#))

M. Nemeč, Statistical Office of the Republic of Slovenia

The Path to a 21st Century Data Collection: The Modernization of the Employer Information EEO-1 Survey ([abstract](#))

M. Noonan, EEOC

A new sampling design for the Swiss Earnings Structure Survey ([abstract](#))

L. Qualité, Swiss Federal Statistical Office

11:30-13:00 Contributed Speed session: Topics in the Collection, Production, and Estimation of Short Term and other Business Statistics

Chair: Daniel Assoulin, BFS

A Better Benchmark Process for the US Current Employment Statistics Survey ([final paper](#))

K. Robertson, U.S. Bureau of Labor Statistics

What Do the Business Tendency Surveys Measure, and What Is Their Information Content? ([final paper](#))

P. Smith, University of Southampton

Adaptation of Winsorization to weight share method ([abstract](#))

A. Fizzala, INSEE

Transitioning to Model-Based Official Statistics: the Case of Crops County Estimates ([abstract](#))

L. Chen, NISS

Small Area Estimation for the Job Statistics, an example of innovative experimental statistics from SFS ([abstract](#))

D. Kilchmann, Swiss Federal Statistical Office

Business Response Survey to the Coronavirus Pandemic ([abstract](#))

E. Thomas, US Bureau of Labor Statistics

Data integration: the evolution of use of administrative data in business statistics ([abstract](#))

C. Hanley, Central Statistics Office Ireland

11:30-13:00 Contributed Speed session: Treatments for Nonresponse: Imputation, Weighting, and Other Models

Chair: Rebecca Andridge, The Ohio State University

Variance estimation of calibration estimators under nonresponse in survey sampling ([abstract](#))

P. Andersson, Stockholm University

Weighting for Nonresponding Institutions in a Two-Stage Probability Proportional to Size Sampling Design when Measure of Size Is Estimated ([abstract](#))

A. Sukasih, RTI International

An expression for bias in an estimate of the change in the presence of non-ignorable nonresponse ([abstract](#))

D. Hedlin, Stockholm University

Stratified Multiple Imputation Estimation for Complex Business Surveys ([abstract](#))

J. Sanchez, UCLA

Balanced Imputation for Swiss Cheese Nonresponse ([abstract](#))

E. Eustache, University of Neuchâtel

An evaluation of some Imputation Methods on the Annual Survey of Commerce's companies' Revenue ([abstract](#))

J. Rodrigues, Brazilian Institute of Geography and Statistics (IBGE)

11:30-13:00 **Contributed Speed session: Understanding, Assessing, and Transitioning to Mixed Mode Collections**

Chair: Ger Snijkers, Statistics Netherlands

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| <i>Lessons Learned in a National Survey of Robotics Use Among U.S. Manufacturing Companies</i> (abstract) | H. Hagerty , NORC at the University of Chicago |
| <i>The path of least resistance: Changing mode to boost response rates in an establishment survey</i> (abstract) | M. Spiegelman , U.S. Department of Education |
| <i>Library Data in the United States</i> (abstract) | M. Riedmann , Institute of Museum and Library Services |
| <i>Experiences with sequential mixed-mode interviewing in ESENER-3, a cross-national establishment survey on health and safety at work</i> (abstract) | A. Riedmann , Kantar |
| <i>Mixed-mode experiment in the IAB Establishment panel</i> (abstract) | M. Volkert , IAB |
| <i>Differences in response patterns between telephone and push-to-web administration of a cross-national survey of establishments</i> (abstract) | G. van Houten , Eurofound |
| <i>Transitioning to a Mixed-Mode Data Collection: Questionnaire Considerations and Data Quality Impacts</i> (abstract) | J. Michaels , U.S. Energy Information Administration |

Parallel Sessions

14:30-16:30 **Invited session: Panel: Producing official statistics during the COVID-19 pandemic**

Chair: Jacqui Jones, Australian Bureau of Statistics
Organizer: Jacqui Jones, Australian Bureau of Statistics

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| <i>Producing Official Statistics During the COVID-19 Pandemic</i> (abstract) | M. Volkert , IAB J. Sakshaug , Institute for Employment Research /University of Mannheim D. Elliott , Office for National Statistics D. Mead , Australian Bureau of Statistics L. Ryan , Australian Bureau of Statistics N. Ahmad , OECD T. Price , Australian Bureau of Statistics C. Konig , Institute for Employment Research |
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14:30 -16:30 **Invited session: Integrating Administrative Data Into Business Statistics**

Chair: Steve Matthews, Statistics Canada
Organizer: Nicholas Cox, Statistics New Zealand (Stats NZ)
Discussant: Danni Lewis, Office for National Statistics

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| <i>Integrating Alternative and Administrative Data Into the Monthly Business Statistics: Some Applications from Statistics Canada</i> (abstract) | M. Duval , Statistics Canada |
| <i>Integrating Administrative Data Into Business Statistics</i> (abstract) | G. Rabaiotti , Office for National Statistics |
| <i>Establishment of a Standardized Design in the Production of Economic Statistics: The Stats NZ Experience</i> (abstract) | N. Cox , Statistics New Zealand (Stats NZ) |

14:30 – 16:30 **Topic Contributed session: Research, Development, and Evaluation of Survey Communication Materials**

Chair: Kari Klinedinst, US Census Bureau
Organizer: Kari Klinedinst, US Census Bureau

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| <i>Developing a web portal for reporting businesses</i> (abstract) | L. Houben , Statistics Netherlands |
| <i>Communicating with Businesses Through the Altinn Portal</i> (abstract) | B. Hole , Statistics Norway |
| <i>A Creative Approach to Promoting Survey Response</i> (abstract) | C. Brady , US Census Bureau |
| <i>Building Capability in Business Data Collection Methodology</i> (abstract) | T. Price , Australian Bureau of Statistics |

14:30 – 16:30 **Contributed Speed session: *Balancing Response Burden and Data Quality***

Chair: Denise Abreu, National Agricultural Statistics Service

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| <i>Evaluating the Impact of Enrollment Nonresponse on an Establishment Panel Survey</i> (abstract) | J. Dixon , Bureau of Labor Statistics |
| <i>Improving Data Quality and Reducing Respondent Burden of the U.S. Public Libraries Survey</i> (abstract) | M. Pelczar , Institute of Museum and Library Services |
| <i>Impact of Instant Feedback on Data Quality Follow Up</i> (abstract) | S. Ginder , RTI International |
| <i>Getting Beyond the Front Office is Half the Battle: Multiple Levels of Incentives in a Two-Stage School Establishment Survey</i> (abstract) | A. Zotti , U.S. Census Bureau |
| <i>Developing best practices of managing response burden and data quality for law enforcement agency surveys</i> (abstract) | Y. Hsieh , RTI International |
| <i>The Effects of Interview Length and Rest Period on Response In Establishment Surveys</i> (final paper) | J. Rodhouse , National Agricultural Statistics Service |

Wednesday, June 16

9:00 – 10:10 **Invited session: *Waksberg Address***

Chair: Jean-Francois Beaumont, Statistics Canada
Organizer: Wesley Yung, Statistics Canada

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| <i>Science and the Management of Surveys</i> (abstract) | R. Tourangeau , Westat |
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Parallel Sessions

10:30-12:00 **Invited session: *Response Burden Management: Toward Burden Reduction Noticeable by Businesses***

Chair: Anita Vaasen-Otten, Statistics Netherlands
Organizer: Deirdre Giesen, Statistics Netherlands
Discussant: Mojca Bavdaz, University of Ljubljana

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| <i>Beyond Managing Response Burden</i> (abstract) | J. Erikson , Statistics Sweden |
| <i>Managing Response Burden in Business Surveys and Minimizing Its Negative Perception by Respondents</i> (abstract) | P. Saraiva dos Santos , Statistics Portugal |
| <i>Response Burden Reduction More Noticeable for Businesses in the Netherlands</i> (abstract) | D. Giesen , Statistics Netherlands |
| <i>Discussant</i> (final paper) | M. Bavdaz , University of Ljubljana |

10:30-12:00 **Invited session: *Producing Synthetic Microdata with 'High' Utility and 'Low' Disclosure Risk***

Chair: Katherine Thompson, U.S. Census Bureau
Organizer: Katherine Thompson, U.S. Census Bureau
Discussant: Tom Krenzke, Westat

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| <i>Synthetic Microdata for Establishment Surveys Under Informative Sampling</i> (abstract) | J. Drechsler , Institute for Employment Research, Germany |
| <i>Risk-Efficient Bayesian Data Synthesis for Privacy Protection</i> (abstract) | J. Hu , Vassar College |
| <i>Validating Outcomes from Synthetic Data: Results from a Multi-Year Implementation</i> (abstract) | L. Vilhuber , Cornell University |

10:30-12:00 **Topic Contributed session: *Dealing with Missing and Erroneous Data in Establishment Statistics***

Chair: Nicole Czaplicki, U.S. Census Bureau
Organizer: Benjamin Reist, NASA

Using Multiple Imputation to Mitigate a Sample Reduction ([abstract](#))

T. Murphy, National Agricultural
Statistics Service

Clean, Rinse, Repeat: Student Perceptions of Dirty Data ([abstract](#))

E. Keiffer, University of Arkansas

Imputation Strategies for Establishment Surveys Using Random Forest Models ([abstract](#))

T. Wilson, USDA, NASS

The Impact of Persistent Measurement Error on Survey Estimates ([abstract](#))

C. Weng, U.S. Census Bureau

10:30-12:00 **Topic contributed session: Leveraging Machine Learning to Improve Economic Surveys and Programs**

Chair: Michael Larsen, Saint Michael's College
Organizer: Anne Russell, U.S. Census Bureau

Integrating Machine Learning in the ACES Survey Instrument ([abstract](#))

V. Mastalski, US Census Bureau

Industry Classification Using Machine Learning: An Application to the Economic Census ([abstract](#))

A. Russell, US Census Bureau

Automating the Extraction of Health Care Provision Data from Standardized Insurance Plan PDF Documents ([abstract](#))

B. Kopp, Bureau of Labor Statistics

A Smart Instrument NAPCS Classification Tool for the Economic Census (SIN-CT) ([abstract](#))

A. Goldman, US Census Bureau

12:00-13:30 **Software Demo session: Software Demonstrations**

Survey Data Imputation and Analysis Using SAS/STAT® ([abstract](#))

P. Mukhopadhyay, SAS

Survey data analysis using Stata ([abstract](#))

Y. Marchenko, StataCorp LLC

R package: rpms, Recursive Partitioning for Modeling Survey Data ([abstract](#))

D. Toth, US Bureau of Labor Statistics

Survey data analysis using Stata ([abstract](#))

K. MacDonald, StataCorp LLC

Survey data analysis using Stata ([abstract](#))

I. Canette, StataCorp LLC

Parallel Sessions

13:30-15:30 **Invited session: The Future of Establishment Surveys Is Easy as ABC: AI, Big Data, Cutting-Edge Survey Design**

Chair: Danni Lewis, Office for National Statistics
Organizer: Gary Brown, Office for National Statistics, UK
Discussant: Wesley Yung, Statistics Canada

AI Models in Survey Estimation ([abstract](#))

K. McConville, Reed College

Methods for Estimating the Quality of Multisource Statistics ([abstract](#))

A. Van Delden, Statistics Netherlands (CBS)

Smarter Designs, Not Just Alternative ([abstract](#))

G. Brown, Office for National Statistics, UK

13:30-15:30 **Topic Contributed session: Advanced Imputation Techniques for Handling Missing Data**

Chair: Sixia Chen, University of Oklahoma Health Sciences Center
Organizer: Sixia Chen, University of Oklahoma Health Sciences Center
Discussant: Don Jang, NORC

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| <i>On the Missing Data Analysis with High-Dimensional Data</i> (abstract) | C. Xu, University of Oklahoma Health Science Center |
| <i>Why, When, and How to Weight When Imputing</i> (abstract) | P. Kott, RTI International |
| <i>Estimation for nonignorable missing responses or covariates using semi-parametric quantile regression imputation and a parametric response probability model</i> (abstract) | E. Berg, Iowa State University |
| <i>Bayesian Jackknife Empirical Likelihood Based Inference for Missing Data and Causal Inference Problems</i> (abstract) | Y. Zhao, Georgia State University |

13:30-15:30 **Topic Contributed session: Statistical Confidentiality and Establishment Surveys: Challenges and Solutions to Improving Data Utility**

Chair: Daniell Toth, US Bureau of Labor Statistics
Organizer: Tom Krenzke, Westat

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| <i>Construction of a Feasible, Complete Table from a Published Table with Suppressions</i> (final paper) | B. Wang, Census Bureau |
| <i>Modernizing EIA's Cell Suppression Software Used in Disclosure Limitation</i> (final paper) | D. Kinyon, U.S. Energy Information Administration |
| <i>A Proposed 'Bottom-Up' Differential Privacy Approach for Disclosure Prevention in Data Query Tool</i> (final paper) | J. Li, Westat |
| <i>Data Protection Toolkit's Playbook as Demonstrated Through the PIAAC Prison Study</i> (final paper) | T. Krenzke, Westat |
| <i>Improving Access to Statistics Canada Business Data</i> (abstract) | S. Thomas, Statistics Canada |

13:30-15:30 **Topic contributed session: Minimizing Revisions for a Monthly Indicator**

Chair: Scott Holan, US Census Bureau/University of Missouri
Organizer: Laura Bechtel, US Census Bureau
Discussant: Scott Scheleur, U.S. Census Bureau

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| <i>Evaluating the Link-Relative Estimator Used by a Monthly Economic Indicator Survey</i> (abstract) | L. Bechtel, US Census Bureau |
| <i>Identifying High-Priority Units for Analyst Imputation in a Monthly Economic Indicator Survey</i> (abstract) | N. Czaplicki, US Census Bureau |
| <i>Imputation Models for a Monthly Economic Indicator Survey with Seasonal Data and Low Unit Response</i> (abstract) | S. Kaputa, US Census Bureau |
| <i>Nowcasting Versus Advanced Surveys for Estimating Austrian Principal Economic Indicators</i> (abstract) | M. Froehlich, Statistics Austria |

Thursday, June 17

9:00-10:10 **General Session: Keynote Address and Closing Ceremony**

Chair: Katherine Thompson, U.S. Census Bureau

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| <i>Big Data and Small Surveys: Which One Should We Trust More?</i> (abstract) | X. Meng, Harvard University |
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Parallel Sessions

10:30-12:00 **Invited session: Measuring Global Production**

Chair: Erich Strassner, Bureau of Economic Analysis
Organizer: Rami Peltola, United Nations; Tihomira Dimova, United Nations
Discussant: Sanjiv Mahajan, Office for National Statistics, United Kingdom

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| <i>Multinational Profit Shifting and Measures Throughout Economic Accounts</i> (abstract) | D. Rassier, U.S. Bureau of Economic Analysis |
| <i>Systematic Approach to Addressing MNEs and the Impact on National Processes</i> (abstract) | F. Demollin, Statistics Netherlands |
| <i>Finnish Experience in Measuring Global Production and Guidance on Sharing of Economic Data</i> (abstract) | T. Koskimäki, Statistics Finland |

10:30-12:00 **Invited session: Machine Learning in the Production of Official Economic Statistics**

Chair: Wesley Yung, Statistics Canada
Organizer: Wesley Yung, Statistics Canada
Discussant: Gary Brown, Office for National Statistics, UK

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| <i>Machine Learning for Classification, Imputation, and Outlier Detection in German Establishment Statistics</i> (abstract) | F. Dumpert, Federal Statistical Office of Germany |
| <i>Coding Text Survey Responses Using Machine Learning: 5 Years In</i> (abstract) | A. Measure, Bureau of Labor Statistics |
| <i>Imputation Through Machine Learning Procedures: An Empirical Comparison</i> (abstract) | D. Haziza, Université de Montréal |

10:30-12:00 **Invited session: Integrating Survey and Non-Survey Data**

Chair: Barbara Rater, USDA National Agricultural Statistics Service
Organizer: Barbara Rater, USDA National Agricultural Statistics Service
Discussant: Wendy Martinez, US Bureau of Labor Statistics

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| <i>Using Alternative Data Sources in United States Census Bureau Retail Data Products</i> (abstract) | R. Hutchinson, US Census Bureau |
| <i>Improving Agricultural Estimates While Reducing Respondent Burden</i> (abstract) | L. Young, USDA, National Agricultural Statistics Service |

10:30-12:00 **Invited session: Panel: The importance of the Statistical Business Register**

Chair: Jacqui Jones, Australian Bureau of Statistics
Organizer: Egon Gerards, Statistics Netherlands

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| <i>Statistical Business Registers for Establishment Statistics</i> (abstract) | E. Marquette, US Census Bureau I. Machdi, BPS - Statistics Indonesia W. Erasmus, Australian Bureau of Statistics |
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12:00-13:30 **Software Demo session: Software Demonstrations**

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| <i>mase, an R package for Model-Assisted Survey Estimation</i> (abstract) | K. McConville, Reed College |
| <i>SUDAAN: the WTADJUST and WTADJX procedures</i> (final paper) | P. Kott, RTI International |
| <i>Cantabular: a framework of tools for the protection & publication of statistics: The Sensible Code Company</i> (abstract) | M. Thompson, The Sensible Code Company |

Parallel Sessions

13:30-15:30 **Topic Contributed session: Creative Approaches to Questionnaire Development and Pretesting**

Chair: Ger Snijkers, Statistics Netherlands
Organizer: Diane Willimack, U.S. Census Bureau
Discussant: Danna Moore, Washington State University

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| Using Multi-Method Testing to Improve Reporting of Complicated Constructs in Multiple Data Collection Modes (abstract) | H. Ridolfo, National Agricultural Statistics Service |
| Adapting Qualitative Research Techniques to Pretest Emerging Economic Topics (abstract) | A. Anderson Riemer, U.S. Census Bureau |
| Resurrecting a Survey After 20 Years of Dormancy (abstract) | R. Morrison, National Center for Science and Engineering Statistics |
| Expanding Record-Keeping Study Methodology to Assess Structure and Availability of Data in Business Records (abstract) | M. Cidade, U.S. Census Bureau |

13:30-15:30 **Topic contributed session: Cost and Acceptance of Cash, Cards, and Innovations for Retail Payments: Results from Central Banks Around the World**

Chair: Angelika Welte, Bank of Canada
Organizer: Gradon Nicholls, Bank of Canada

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| Payment Acceptance Trends Among Small Merchants in Canada (abstract) | G. Nicholls, Bank of Canada |
| The Costs of Payment Methods in the Retail Sector (abstract) | J. Kimmerl, Deutsche Bundesbank |
| When Will Swedish Retailers Stop Accepting Cash? (abstract) | B. Segendorf, Sveriges Riksbank |
| Measuring the Distribution of Payments Fraud in a Survey of Banks: What Factors Influence Fraud Rates? (abstract) | G. Gerdes, Federal Reserve Board |
| The World Bank Practical Guide for Measuring Retail Payment Costs (abstract) | H. Banka, World Bank Group |

13:30-15:30 **Topic contributed session: The Behavioral Health Services Information System (BHSIS): Monitoring Mental Health and Substance Use Treatment in the United States**

Chair: Aryn Hernandez, U.S. Census Bureau
Organizer: Herman Alvarado, SAMHSA

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| Overview of BHSIS and the Use of Secondary Sources to Supplement Listing Frame (abstract) | H. Alvarado, SAMHSA |
| Linking Facility-Level and Client-Level Substance Use Survey Data: A Cautionary Tale (abstract) | K. Southwell, Eagle Technologies |
| Enhancements to Behavioral Health Establishment Surveys to Reduce Respondent Burden (abstract) | M. Potts, Mathematica |
| The Use of Experiments to Improve Responses in Behavioral Health Establishment Surveys (abstract) | K. Cybulski, Mathematica |
| The 'Venting' Question: How Open-Ended Comments Can Be Used to Improve Establishment Surveys (abstract) | L. Vittoriano, Mathematica |

13:30-15:30 **Contributed Speed session: Modernization Efforts in Establishment Statistics 2**

Chair: Samson Adeshian, Energy Information Administration

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| Score-Matching Representative Approach for Big Data Analysis and Its Extension (abstract) | K. Li, Northwestern University |
| Explicit Parameterizations for Linking Establishments and Entities under Sparse Classifications (abstract) | Y. Thibaudeau, Census Bureau Center for Statistical Research and Methodology |
| Demonstration of the National Hospital Care Survey: Inpatient and Emergency Department Encounters for Congestive Heart Failure, 2016 (abstract) | D. White, National Center for Health Statistics, CDC |
| "Crowd-sourcing" Information About Missing Frame Units (abstract) | S. Ginder, RTI International |
| Strategies for Ensuring the Accuracy and Completeness of an Establishment Frame (final paper) | S. Brumbaugh, RTI International |
| Towards Necessary and Sufficient Conditions for Transparency in Establishment Surveys (abstract) | D. Gillman, US Bureau of Labor Statistics |

Invited session: Introductory Overview Lecture: Coordinated Sampling and Bayesian Methods Applied to Small Area Estimation for Establishment Statistics

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| <i>Some Thoughts on Sample Coordination in Repeated Surveys</i> (abstract) | Y. Tillé, University of Neuchatel |
| <i>Bayesian Methods Applied to Small Area Estimation for Establishment Statistics</i> (abstract) | S. Holan, US Census Bureau/ University of Missouri |
| <i>Sample coordination methods and systems for establishment surveys</i> (abstract) | A. Matei, University of Neuchâtel, Switzerland |
| <i>Sample coordination methods and systems for establishment surveys</i> (abstract) | P. Smith, University of Southampton |

Invited session: Introductory Overview Lecture: Data Integration and Data Linking/Matching

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| <i>Record Linkage: Background and Challenges for Linkage of Persons and Establishments</i> (abstract) | M. Larsen, Saint Michael's College |
| <i>BLADE: A practical example of business data linking</i> (abstract) | A. Herning, Australian Bureau of Statistics |

Invited session: Introductory Overview Lecture: Introduction to Business Surveys - Questionnaire Design

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| <i>Computerized Business Questionnaires</i> (abstract) | G. Haraldsen, Statistics Norway |
| <i>Questionnaire Completion Paradata in Business Surveys</i> (abstract) | G. Snijkers, Statistics Netherlands |

Invited session: Introductory Overview Lecture: Introduction to Issues in the Production of Official Establishment Statistics

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| <i>Statistical Producer Challenges and Help</i> (abstract) | J. Jones, Australian Bureau of Statistics |
| <i>Standardization Leads to Efficiency: Canada's Integrated Business Statistics Program</i> (abstract) | H. O'Byrne, Statistics Canada / Government of Canada |

Invited session: Introductory Overview Lecture: Introduction to New Data Sources, New Technologies, and New Methods

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| <i>Data, Algorithms and Data Governance</i> (abstract) | S. Olhede, University College London |
| <i>Statistical Data-Production in a Digitized Age: Potentials for Statistics, Research and Society</i> (abstract) | S. Bender, Deutsche Bundesbank |

Invited session: Introductory Overview Lecture: Introduction to New Measures/Indicators for the Economy

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| <i>Gross Domestic Product and National Accounting: The Past and Present</i> (abstract) | S. MacFeely, UNCTAD |
| <i>SNA and GDP in detail: The Future</i> (abstract) | P. Van de Ven, OECD |

Invited session: Introductory Overview Lecture: Introduction to Sampling and Estimation

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| <i>Sample Design in Establishment Surveys</i> (abstract) | P. Smith, University of Southampton |
| <i>Estimation Approaches in Establishment Surveys</i> (abstract) | W. Yung, Statistics Canada |

Invited session: Measuring and improving data quality

The use of administrative data in business statistics: methodological developments ([abstract](#))

A. Van Delden, Statistics Netherlands (CBS)

Methodology of the use of administrative data in business statistics: practical considerations ([abstract](#))

D. Lewis, Office for National Statistics

Invited session: Introductory Overview Lecture: Variance Estimation for Probability and Nonprobability Surveys

Variance Estimation for Nonprobability Surveys ([abstract](#))

J. Dever, RTI

Variance estimation for probability surveys ([abstract](#))

D. Liao, RTI