

# Census Technology

## Developing the 2030 Recommendations

Conference of European Statisticians task force on census  
technology

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# Task Force 4: Census Technology



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# Changes from the 2020 Recommendations



- 7 new parts added:

- The recommended components of testing
  - Design of the electronic questionnaire
  - Technology to support the enumeration of the impaired and digitally disconnected
  - Interactive online platforms for dissemination
  - Storage and archiving
  - Cloud
  - Technologies for the use of administrative data
- *GIS are in a separate chapter*

- More emphasis and detail on:

- electronic data collection tools
- cloud technologies
- integrated solutions for automatization all stages of census work from census planning to dissemination of its results
- data security

# Structure



- Introduction
- General considerations
- Data collection in direct enumeration
- Data processing
- Technologies for the use of administrative data

# General considerations (1)



- Drivers for technological innovation

- Potential to improve the census coverage and data quality, reduce costs and disseminate results timelier
- Output systems to reach diverse users

- Evaluation

- Adoption of new technologies or methodological approaches should only be considered where there is a sound understanding of their benefits and where their developments can be managed.
- The feasibility of adopting any technology that is previously untested in a census environment should be carefully evaluated in advance, taking into consideration the national context, the relative costs compared with traditional solutions, the work needed for development and testing, the potential implications for the overall organization of the census operations, the potential effects on the quality of census results and the impact on the general population.

# General considerations (2)



- Testing

- 17 recommended components grouped into:
  - Domain-specific or content-based tests
  - Tests specific to IT
  - Functional tests
- Mandatory testing of the entire technological solution

- Project management:

Software for large-scale projects: planning, recruitment, payment and other admin tasks

# Data collection in direct enumeration: Internet



- For direct enumeration, it is recommended to offer the option of **responding over the Internet** as the first or preferred option
- **Physically separate infrastructures** should be set up to collect and to process the census information. Completed individual census forms, after their collection and capture, should be moved into a secure data processing infrastructure that is separate from the collection infrastructure.
- Forms **for online completion** are recommended.

# Data collection in direct enumeration: Portable devices



- Potentially **cost-effective**
- Provide **real time** two-way management information
- To be considered: technical issues; security issues; use after the census
- The **training tools for the portable devices** should be
  - uploaded to the device for the convenience of their use by the enumerators for the training and during the field work
  - cover all the elements of the enumerator's work
  - be interactive
  - have easy navigation
  - contain illustrative examples of the enumerator's reaction in all possible situations of using this device

# Data collection in direct enumeration (3):



- Design of the electronic questionnaire: 8 requirements; further 8 requirements if self-completed online
- Technology to support the enumeration of the impaired and digitally disconnected
  - Reaching respondents who do not have Internet connection or who are digitally disconnected
  - Accessibility to people with limitations: Web Content Accessibility Guidelines 2.2
- Census management software: mandatory components

# Data processing: Paper questionnaires



- Combination of digital imaging, Intelligent Character Recognition, automatic repair and automated coding
- Generative artificial intelligence can be expected to lead to new possibilities and replace keyers. Investment to build proper models to keep high quality of data.

# Data processing: Output production; Dissemination



- Traditionally: aggregated tables, statistics, illustrations and maps with appropriate metadata
- Online dissemination via the Internet:
  - Flexibility to satisfy different kinds of users
  - Application programming interfaces (API)
  - Small geographic areas
- Interactive online platforms recommended

# Data processing: Storage and archiving; Cloud



- Hybrid approach: Cloud and on-premises. Factors for deciding
- A transitional approach to the adoption of the Cloud.
- Using the Cloud can bring important advantages to the census but is not always the best approach. It is recommended to do a thorough evaluation before moving to the Cloud.

# Technologies for the use of administrative data



- New ICT allows administrative sources to be utilized more widely in population and housing censuses
- Growing emphasis on data security, privacy, and data protection in society
- Data linking, transfer and storage
- Improving the administrative data: automatic data cleaning. Machine learning. Artificial intelligence

# Conclusion



- Thoroughly updated
- 7 new parts
- More detail throughout on
  - electronic data collection tools
  - cloud technologies
  - integrated solutions for automatization
  - data security

# Thank you for your attention!

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