Census Delays and Introduction to Differential Privacy

May 4, 2021
Introduction to Census Data Delays

• Census Act – 13 U.S.C. § 141
  • (a) April 1 “decennial census date”
  • (b) Apportionment data w/n 9 months
  • (c) Population tabulation by state “as expeditiously as possible” but w/n 12 months
    • Known as “P.L. 94-171 data” – 1975 amendment
Introduction to Census Data Delays

• 2021 Census Bureau announcement
  • February 12: “COVID-19-related delays and prioritizing the delivery of the apportionment results delayed the Census Bureau’s original plan to deliver the redistricting data to the states by March 31, 2021.”
    • COVID-19 pushes “Nonresponse Followup” effort from May 2020 to approx. August
    • Gulf Coast hurricanes, west coast fires, civil unrest
  • P.L. 94-171 data by September 30, 2021
  • Legacy data by August 16, 2021
Differential Privacy and Impact on Census

• Confidentiality requirement 13 U.S.C. § 9(a)(2)
  • Census Bureau may not “make any publication whereby the data furnished by any particular establishment or individual under this title can be identified.”

• Necessitates disclosure avoidance strategies

• Census Bureau deems previous use of “data swapping” inadequate
  • Data swapping held the population count and voting age population invariant (constant) at the block group level

• New method: differential privacy
  • Differential privacy introduces (allegedly) appropriate noise into the block level data, while maintaining overall state populations invariant
What is differential privacy?

- First introduced in computer science literature in 2006. Has since been used in aggregate data analysis by Google, Apple, Uber, and others.
- Defined in formal mathematical language.
- Simply, differential privacy ensures that the only things that can be learned about an individual from a dataset are essentially the same as what could have been learned if the analysis had been performed without that individual’s data.
  - That is, that the presence or absence of any one individual in a dataset does not significantly affect the responses that the data system provides.
- To achieve this, differential privacy injects a carefully tuned amount of “noise” to the statistics outputted.
What does differential privacy protect against?

• Differential privacy aims to protect against “privacy attacks”
• A common privacy attack is taking de-identified data (such as anonymized health records) and comparing it to publicly available datasets (such as voter registration records) to deduce who the individuals in the de-identified dataset are.
• Example: in 1990s, Massachusetts published de-identified data of state employees’ hospital records. A researcher compared the data in this set to voter registration data and identified the health records of Massachusetts Governor William Weld.
How to calibrate “noise”

- Injecting noise means that the computation gives an approximate answer to individual pieces of data.
- Determining how much “noise” to inject is determined by setting the privacy-loss budget, also known as the privacy-loss parameter or epsilon value ($\epsilon$).
- Like tuning a knob for balancing privacy and accuracy
  - Setting $\epsilon$ to zero means perfect privacy but useless data
  - Setting $\epsilon$ to infinity means perfectly accurate data but no privacy
- Determining where to set $\epsilon$ is a policy decision that depends on the intended use of the data and the importance of privacy.
The Census Bureau’s Use of Differential Privacy

• Census Bureau says it introduced its intention to use differential privacy in 2018.

• The Bureau has indicated that its internal studies indicate that Census data is vulnerable to re-identification attacks through record linkage.

• The Bureau first released four sets of “demonstration data” applying differential privacy to 2010 Census data.
  • These demonstration datasets applied $\epsilon$ value of 4.

• These demonstration datasets resulted in serious accuracy concerns, now at issue in Alabama litigation.
The Census Bureau’s Use of Differential Privacy

• The Census Bureau says it deliberately set a low $\epsilon$ value to its first demonstration datasets to identify issues and fine-tune approach later.
• Published new demonstration dataset on April 28, 2021 that applies substantially higher $\epsilon$ value of 10.3.
• Census Bureau says that this demonstration dataset is much more accurate.
According to Census Bureau, the most recent dataset shows the following from differential privacy:

- Total populations for counties have average error of +/- 5 persons
- At the block level, differentially private data have an average population error of +/- 3 persons
- No meaningful bias in the statistics for racial and ethnic minorities even in very small population geographies like Federal American Indian Reservations

- Final $\epsilon$ value will be determined in June, 2021
- Census Bureau has invited feedback based on most recent dataset for fitness of use (including redistricting and VRA), privacy, and improvements
- Deadline for feedback is May 28, 2021
Census Delay Litigation

- **Ohio v. Raimondo** (S.D. Ohio Feb. 25, 2021)
  - Based on Census Bureau’s announcement of delay
  - Causes of action:
    - Violation of the Census Act, 13 U.S.C. § 141(c) (P.L. 94-171)
      - Failure to meet statutory deadline
    - Violation of the Administrative Procedure Act, 5 U.S.C. § 706
      - Not in accordance with law
        - Failure to meet statutory deadline
      - Arbitrary and capricious:
        - Failure to accommodate states with early deadlines
        - Failure to account for states’ reliance interests on the March 31 deadline
  - Remedies:
    - Declaratory judgment, preliminary injunction, writ of mandamus
Census Delay Litigation

- **Ohio** – Order Denying Preliminary Injunction/Dismissing Case (Mar. 24, 2021)
  - Held, Ohio lacks standing
    - No redressability
      - Not possible to order the Census Bureau to meet Mar. 31 deadline
      - Congressional apportionment must come first
    - No injury-in-fact
      - Statutory violation, in and of itself, is insufficient
        - Census Act provides no cause of action
        - Ohio law does not require federal redistricting data
          - No allegation that federal redistricting data will result in better districts, or better comply with federal law
      - Alleged need to avoid debates about the quality of data, and/or potential distrust, are speculative injuries
      - Injury is traced to Ohio’s rigid timeline, not any act of the Census Bureau
Census Delay Litigation

  • Based on census delay and use of differential privacy
  • Plaintiffs: State of Alabama, two individual voters, one candidate for Congress
  • Causes of action:
    • Violation of the Census Act, 13 U.S.C. § 141(c) (P.L. 94-171)
      • Differential privacy results in failure to produce accurate “tabulations of population” required under law
    • Violation of the Right to Vote under the Equal Protection Clause of the 5th Amendment
      • Differential privacy will result in false redistricting data, creating substantial risk the individual plaintiffs’ votes will be diluted in violation of the one-person, one-vote principle
    • Violation of the Administrative Procedure Act, 5 U.S.C. § 706
      • Not in accordance with law
        • Differential privacy results in failure to produce accurate tabulations under 13 U.S.C. § 141(c)
      • Contrary to constitutional right
        • Differential privacy produces substantial risk of vote dilution in violation of one-person, one-vote
Census Delay Litigation

• **Alabama v. U.S. Dept. of Commerce** (M.D. Alabama Mar. 10, 2021)
  - Causes of action (con’t):
    - Violation of the Administrative Procedure Act, 5 U.S.C. § 706
      - Arbitrary and capricious
        - Failure to consider the effect of differential privacy on states that rely on accurate data
        - Failure to offer states the option for accurate redistricting data in lieu of differential privacy data
        - Offering an explanation that runs counter to the evidence before the Census Bureau
    - Violation of the Census Act, 13 U.S.C. § 141(c) (P.L. 94-171)
      - Failure to meet statutory deadline
    - Violation of the Administrative Procedure Act, 5 U.S.C. § 706
      - Not in accordance with law
        - Failure to meet statutory deadline
Census Delay Litigation

  • Causes of action (con’t):
    • Violation of the Administrative Procedure Act, 5 U.S.C. § 706
      • Arbitrary and capricious
        • Failure to roll out data and prioritize states with early deadlines
        • Failure to account for states’ reliance interests on the March 31 deadline
  • Remedies:
    • Declaratory judgment, preliminary/permanent injunction, vacatur of delay decision, writ of mandamus
  • 3-judge panel appointed
  • Oral argument May 3, 2021

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Census Delay Litigation

• **Alabama v. U.S. Dept. of Commerce** (M.D. Alabama Mar. 10, 2021)
  - Commerce Department response to Motion for Preliminary/Permanent Injunction
    - Plaintiffs lack standing
      - Differential privacy issues
        - Plaintiffs have not suffered any injuries-in-fact
          - Plaintiffs will not suffer an informational injury because the Census Bureau will properly deliver “tabulations of population” under 13 U.S.C. § 141(c)
          - Plaintiffs will not suffer a sovereign injury that impedes its interest in drawing fair districts
            - The differential privacy data will be perfectly fit/useful
            - Alabama law doesn’t mandate use of federal redistricting data
          - Potential loss of federal funding is too speculative
          - Too early to tell whether differential privacy data will dilute minority groups’ votes (plus such claims must be brought by voters residing in the affected districts)
          - A mere violation of federal law is insufficiently particularized injury
• **Alabama v. U.S. Dept. of Commerce** (M.D. Alabama Mar. 10, 2021)
  • Commerce Department response to Motion for Preliminary/Permanent Injunction
    • Plaintiffs lack standing
      • Differential privacy issues (con’t)
        • Plaintiffs’ alleged injuries are not traceable to the Census Bureau’s conduct
          • Alabama’s conundrum is due to its own state law inflexibility (citing Ohio)
          • Alabama cannot show that differential privacy data is less accurate than alternative disclosure avoidance methodologies
    • Plaintiffs’ injuries are not redressable
      • Census Bureau still must protect privacy; 2010 data swapping in adequate and would make the data more inaccurate
      • Abandoning differential privacy would require the Bureau to start over, creating a delay of “several months”
Census Delay Litigation

• **Alabama v. U.S. Dept. of Commerce** (M.D. Alabama Mar. 10, 2021)
  • Commerce Department response to Motion for Preliminary/Permanent Injunction
    • Plaintiffs lack standing (con’t)
      • Census delay issues
        • Plaintiffs have not suffered any injuries-in-fact
          • Alabama is not required to use the federal census data
          • Alabama’s Board of Registrars is able to get a head start in reassigning voters to correct precincts
          • Plaintiff candidate will not be uniquely harmed by shorted campaign time
        • Plaintiffs’ alleged injuries are not traceable to the Census Bureau
          • Any injuries result form the state’s independent actions
          • Front-loading Alabama could result in rushed, inaccurate data
        • Plaintiffs’ alleged injuries are not redressable.
          • Not possible to speed up the delivery date
Census Delay Litigation

  - Commerce Department response to Motion for Preliminary/Permanent Injunction
    - Plaintiffs cannot prevail on the merits
      - Differential privacy issues
        - Use of differential privacy data complies with the Census Act, 13 U.S.C. § 141(c)
          - Alabama (as a state) doesn’t qualify as an “aggrieved person” under a federal law, P.L. 105-119, § 209, and thus cannot bring a lawsuit to private enforce violations of the Census Act
        - Differential privacy won’t necessarily create vote dilution, and state not even required to use the data
        - The Census Bureau did not violate the APA by use of differential privacy data
          - The differential privacy announcement is not a “final agency action”
            - Plaintiffs criticize broad policy, not specific “agency actions”
            - The action is not “final”
              - Only non-final demonstrations have been produced
              - No final decision has been made on how to tune the data noise
Census Delay Litigation

  - Commerce Department response to Motion for Preliminary/Permanent Injunction
    - Plaintiffs cannot prevail on the merits
      - Differential privacy issues
        - The Census Bureau did not violate the APA by use of differential privacy data (con’t)
          - The differential privacy decision does not violate any law
          - The decision is not arbitrary or capricious, and meets a highly deferential standard
          - The decision was based on reasoned conclusions that the 2010 methodology was inadequate
Census Delay Litigation

• **Alabama v. U.S. Dept. of Commerce** (M.D. Alabama Mar. 10, 2021)
  • Commerce Department response to Motion for Preliminary/Permanent Injunction
    • Plaintiffs cannot prevail on the merits
      • Census delay issues
        • Alabama (as a state) doesn’t qualify as an “aggrieved person” under a federal law, P.L. 105-119, § 209, and thus cannot bring a lawsuit to private enforce violations of the Census Act
        • The Census Bureau did not violate the APA by delaying the redistricting data
          • The Feb. 12 announcement is not a “final agency action”
            • The action is not “final”
              • No legal consequences because Alabama is not required to use the data
            • The delay decision is not arbitrary or capricious because it was supported by a reasoned decision: COVID-19 made it impossible to meet the statutory deadline
Census Delay Litigation

• **Alabama v. U.S. Dept. of Commerce** (M.D. Alabama Mar. 10, 2021)
  • Commerce Department response to Motion for Preliminary/Permanent Injunction
    • Plaintiffs cannot demonstrate irreparable harm
      • Alabama has not alleged any harm, much less irreparable harm
      • Harm cannot be irreparable if Alabama waited nearly 2 years
    • Balance of hardships
      • Differential privacy is in the public interest
        • Creating a new disclosure avoidance method would delay the census data by months
        • Ordering an accelerated deadline for Alabama would disrupt other states
Census Delay Litigation

• **Alabama v. U.S. Dept. of Commerce** (M.D. Alabama Mar. 10, 2021)
  • Amicus Curiae participation
    • Supporting plaintiffs
      • Professor Jane Bambauer, U of A law professor (applying differential privacy across the board, without context or assessment of particular privacy risks, is an irrational policy)
      • Professor Margo Anderson, Univ. of Wisc. history professor (critiquing lack of sufficient state consultation)
      • 16 States: Utah, Alaska, Arkansas, Florida, Kentucky, Louisiana, Maine, Mississippi, Montana, Nebraska, New Mexico, Ohio, Oklahoma, South Carolina, Texas, and West Virginia (relied on Utah Legislature study comparing 2010 differential privacy demonstration data and 2010 final redistricting data; demonstrates differential privacy data is inaccurate and thus impacts federal funding, rural communities, and minorities)
      • State Government Leadership Foundation and legislators from Louisiana, Minnesota, Mississippi, Nevada, Oklahoma, and Vermont (differential privacy will threaten redistricting plans and create litigation)
      • Pennsylvania Republican legislative leaders
    • Supporting the Census Bureau
      • Coalition of 20 privacy experts (differential privacy is the only sound method to prevent reconstruction attacks)
      • National Redistricting Foundation (rushing process would be harmful; no position on differential privacy)
Thank you

Questions?

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