

Impacts of Differential Privacy on data about
American Indian
and Alaska Native People
and people on
Tribal Lands

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Data on tribal lands & AIAN people is hard to get!
Census data is often the only data source.

Core users include

- Tribal leaders for tribal governance, local governments, state and federal governments, researchers, judges, lawmakers, policy makers, advocacy groups

Some uses of these data

- Funding allocations, policy development, policy evaluation, planning
- Fertility rate denominators, other vital rate denominators
- Water rights and other litigation and judicial decisions
- Enforcement of equal employment, housing, and other anti-discrimination laws

Some Issues with the 2020 Census data

- Collected during a pandemic
- Threat of the “citizenship question” may have impacted response
- New coding system for race and ethnicity may have had a big impact
- **Differential Privacy**

Differential Privacy (DP)

This is the Census Bureau's way of protecting the 2020 Census data

- It is a **mathematical algorithm** applied by a computer program
- It has been used in other contexts but is new for the Census Bureau
- **It was used already on the 2020 results** you have seen

The Census Bureau is thinking of using DP on other Census data, like the American Community Survey

To learn more about DP, see: <https://www.census.gov/programs-surveys/decennial-census/decade/2020/planning-management/process/disclosure-avoidance/differential-privacy.html>

Simplified Example of Differential Privacy

| County | Real # of AIAN counted | DP adds/sub | # AIAN in the public data | % difference |
|--------------|------------------------|-------------|---------------------------|--------------|
| Ada County | 550 | +38 | 588 | 7% |
| Barhe County | 1,234 | -148 | 1,086 | -12% |



- The differential privacy algorithm adds or subtracts a number that's drawn at random from a distribution of numbers.
- This is done to every number; the results do not always make sense.

How different can the census numbers be while still being useful?

The Census Bureau's example data show the
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Abbreviations

AIAN single-race = People reported as American Indian and/or Alaska Native in the Census race question and no other races.

AIAN AOIC = People reported as American Indian and/or Alaska Native in the Census race question, whether alone or in combination with another race or races.

Note that this is self-described race; tribal membership is not required.

Figure 1: The example data show that differential privacy algorithm causes 2020 Census **AIAN single-race** county population sizes to be mis-reported

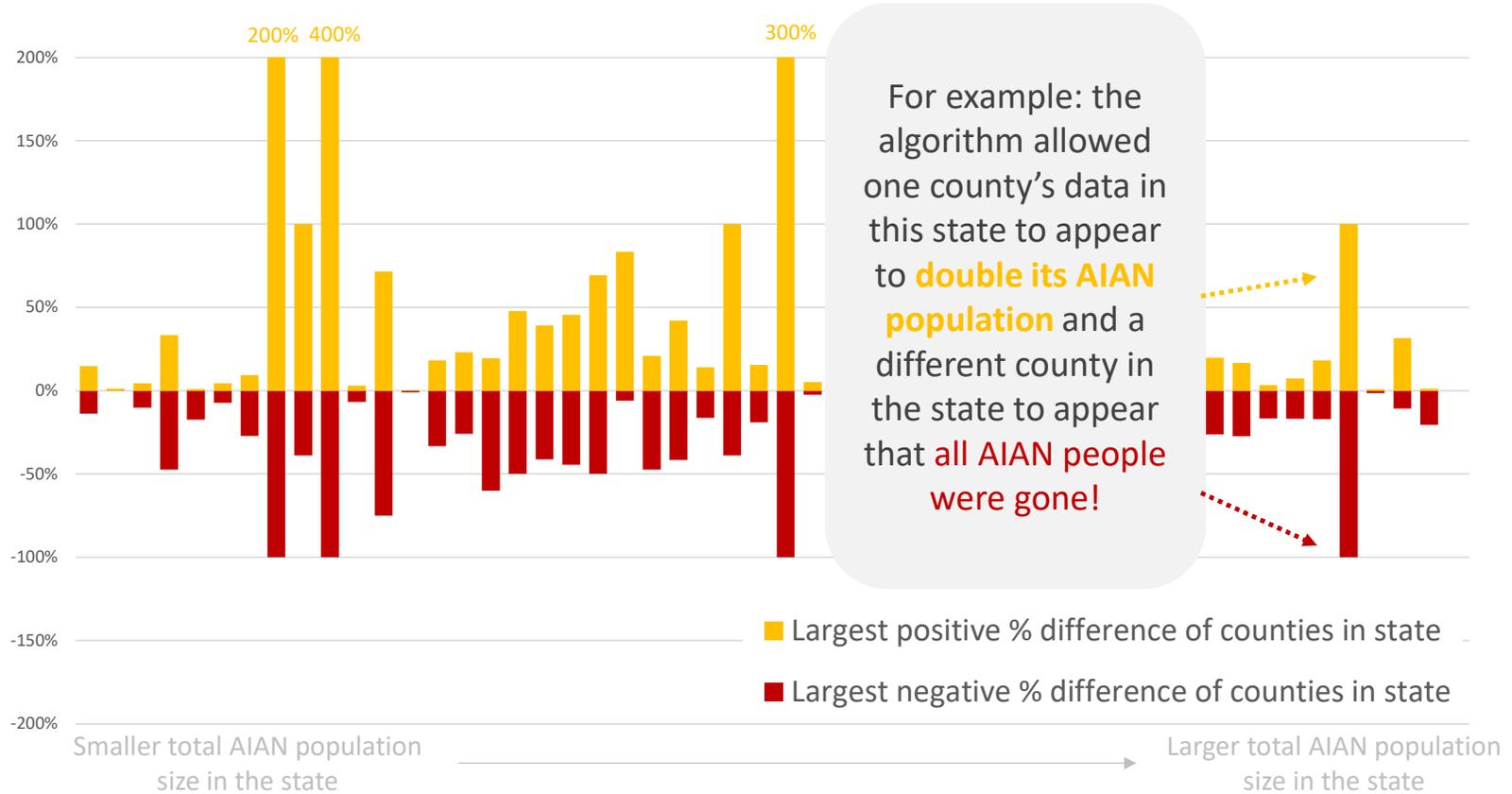


Figure 2: The example data show that the differential privacy algorithm causes 2020 Census **AIAN AOIC** county population sizes to be mis-reported

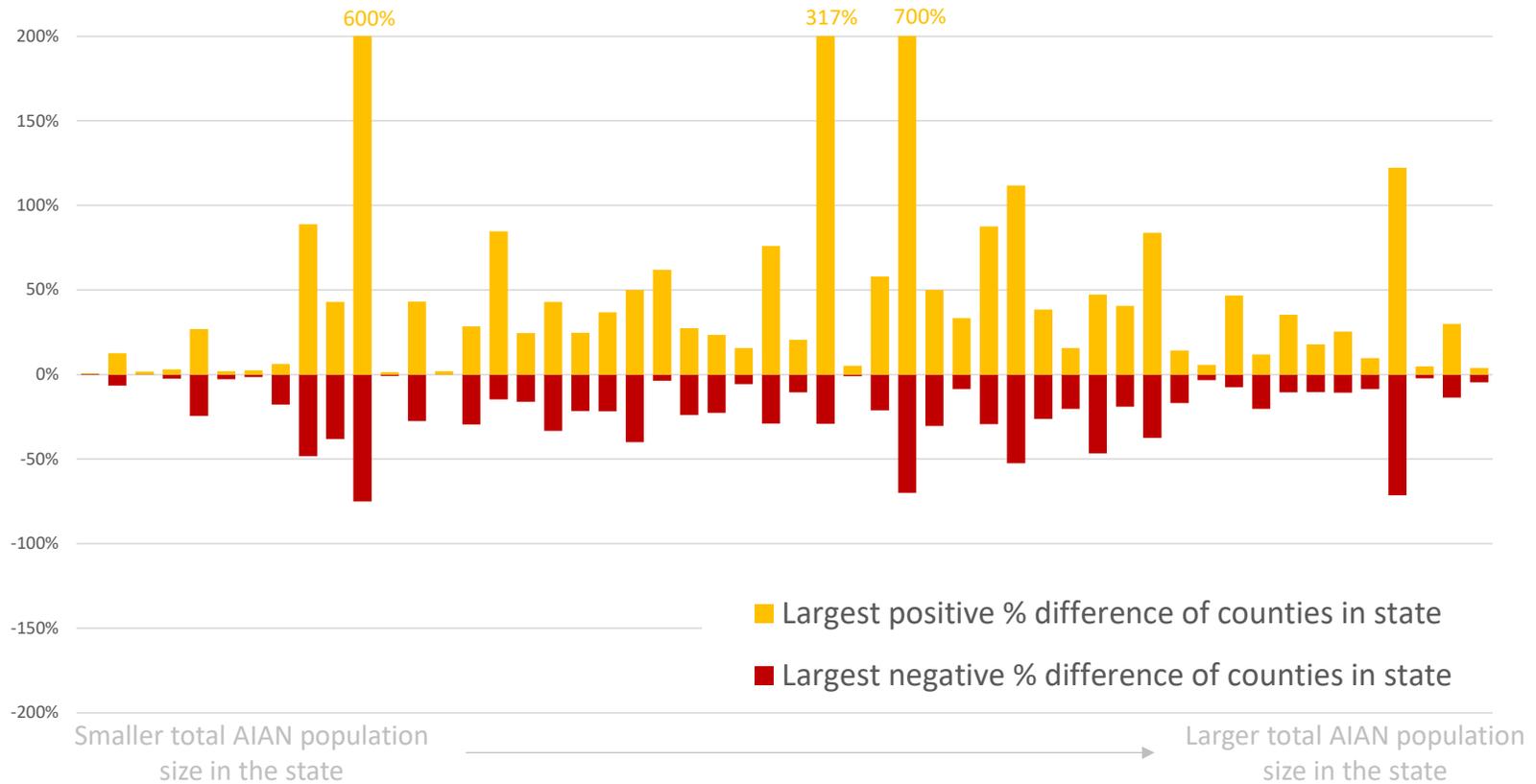


Figure 3: The example data show that differential privacy algorithm causes 2020 Census **AIAN AOIC adult** (age 18+) county population sizes to be mis-reported

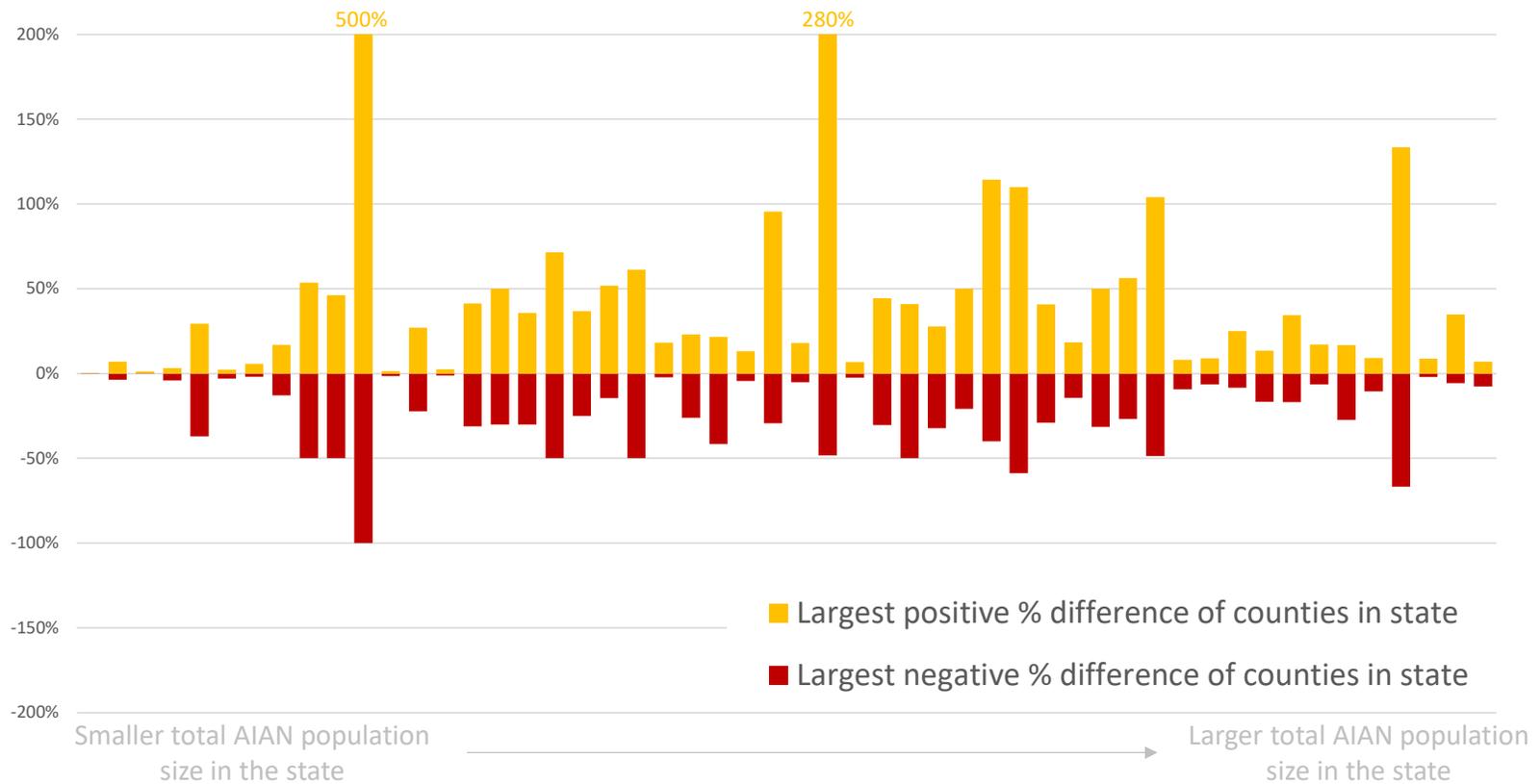
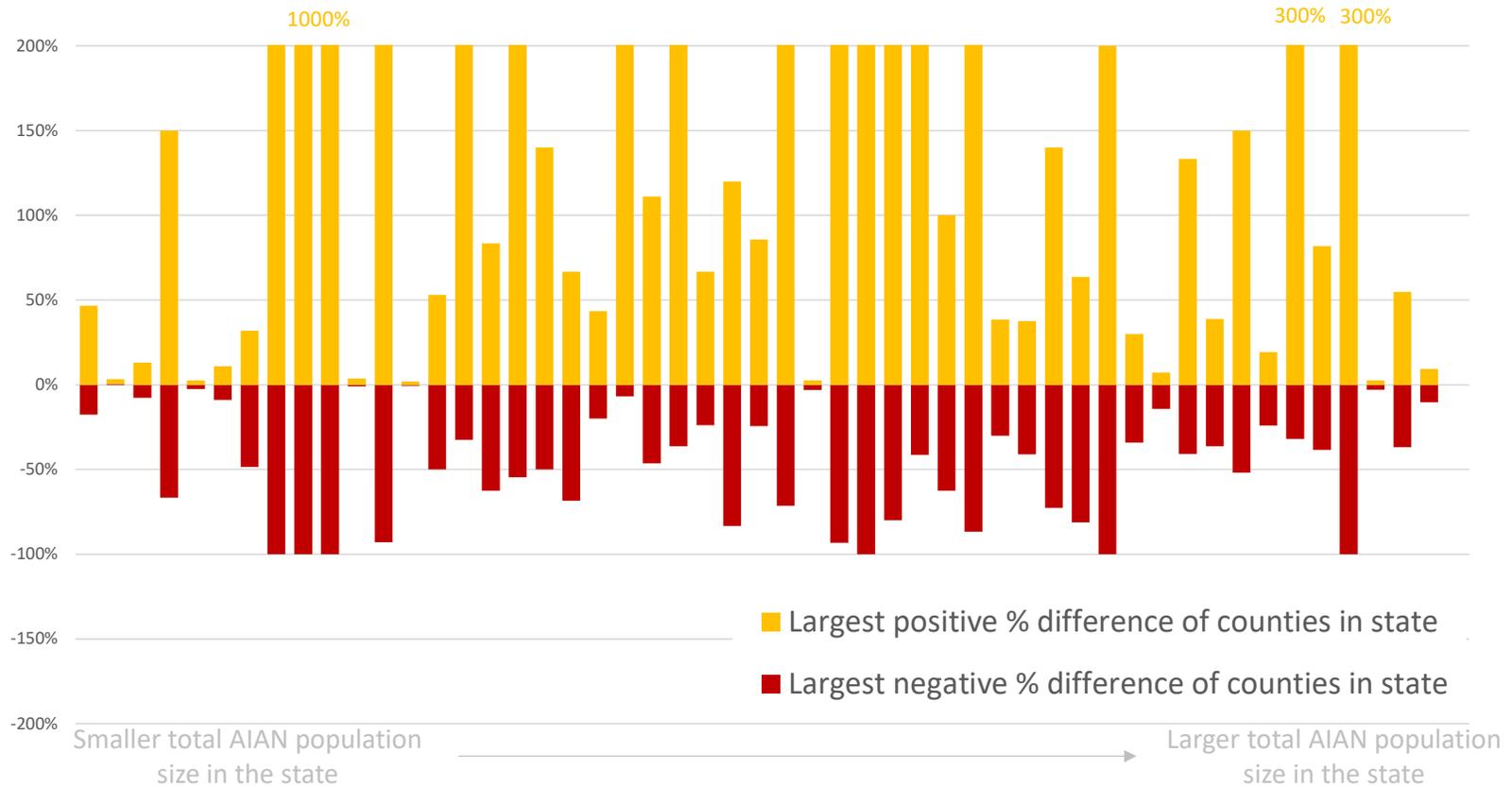


Figure 4: The example data show that differential privacy algorithm causes 2020 Census **AIAN AOIC child** (ages 0-17) county population sizes to be mis-reported



Summary of the impacts of differential privacy on **county-level data** about AIAN people in the 2020 Census

- Sometimes the 2020 Census data totals are **similar** to the actual count
- Sometimes, DP makes the population **huge**! Other times, the population is **gone**.

We do not currently have any way to officially know from the Census Bureau whether the data in a particular place are wrong.

- **If it looks like a ridiculous number, it probably is!**

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Tribal lands

Reservations and other land areas defined and used by tribal governments.

History is complex so there are many legal statuses of lands.

- People of any race(s) in these areas
- Borders cross state and county boundaries

Tribal governance requires accurate, geographically-detailed information at the tribal tract level.

Tribal census tracts are commonly used for governance. They nest within tribal lands and have a minimum population of 1,200, a maximum population of 8,000, and an optimum population of **4,000**.



Figure 5: The example data show that differential privacy algorithm causes 2020 Census **AIAN (single race)** and **AIAN AOIC** population sizes in Tribal Land Areas to be mis-reported

| Total Population of Tribal Land Area | # of Tribal Land Areas of this size | AIAN single race | | AIAN AOIC | |
|--------------------------------------|-------------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| | | Largest negative % difference | Largest positive % difference | Largest negative % difference | Largest positive % difference |
| 10 to 199 people | 381 | -100% | 300% | -100% | 900% |
| 200 to 999 people | 352 | -100% | 400% | -100% | 600% |
| 1,000 to 1,999 people | 245 | -60% | 300% | -39% | 136% |
| 2,000 to 2,999 people | 310 | -43% | 35% | -45% | 46% |
| 3,000 to 3,999 people | 254 | -60% | 27% | -34% | 21% |
| 4,000 or more people | 471 | -22% | 50% | -24% | 56% |

- In some Tribal Land Areas (even large ones), the DP algorithm makes it seem like there are **no AIAN people!** Or that there are 4x as many as were actually counted in the 2020 Census.

Final thoughts

- **Data on Tribal Lands & AIAN people is hard to get!** Census data is often the *only* data source.
- The 2020 Census data about AIAN people and Tribal Lands has been **deeply damaged by Differential Privacy.**
- The **Census Bureau needs to hear from Tribal Leaders** about:
 - Whether Tribal Leaders want DP to be applied to other data like ACS.
 - Impacts of the decisions that have already been made.

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Differential privacy demonstration data were provided by the Census Bureau and distributed by IPUMS NHGIS at <https://www.nhgis.org/privacy-protected-2010-census-demonstration-data>

- Finalized DP settings for 2020 redistricting data, released June 8, 2021, should be cited as: David Van Riper, Tracy Kugler, and Jonathan Schroeder. IPUMS NHGIS Privacy-Protected 2010 Census Demonstration Data, version 20210608 [Database]. Minneapolis, MN: IPUMS. 2020.