South Dakota Department of Health's enhanced geocoding processes improved infectious disease surveillance

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CATEGORY: **Epidemiology and Laboratory Capacity (ELC)** | CATEGORY: **Partnership and Innovation**

The South Dakota Department of Health utilized OpenAI functions to enhance their existing geocoding processes. This enabled them to better monitor where cases and patterns of infectious diseases occurred across the state, and enabled sharing of the data with Tribes and the Tribal Epidemiology Center.

The "What"

The South Dakota Department of Health (SD-DOH) has a geocoding process for patient address information collected in their electronic disease surveillance system, which is functionally maintained through funding from the Epidemiology and Laboratory Capacity for Prevention and Control of Emerging Infectious Diseases (ELC) Cooperative Agreement under Program C: Health Information Systems. Approximately 70% of patient addresses resulted in high-confidence latitude and longitude coordinates to visually represent cases of infectious disease in the state. Unfortunately, that meant nearly 30% of addresses were not able to be
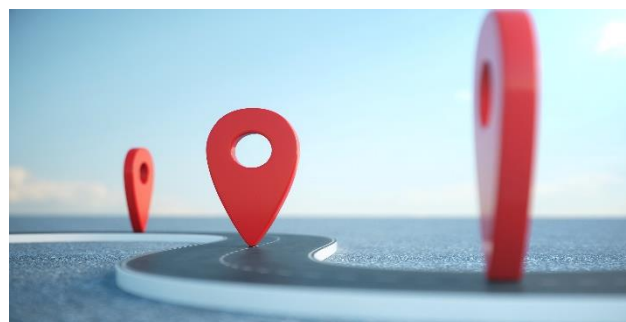
geocoded. This negatively impacted a SD-DOH project to develop Tribe-specific infectious disease dashboards to build awareness among Tribal leaders of infectious diseases occurring on Tribal lands.

Through funding from ELC, Program C: Health Information Systems and the Data Modernization Initiative Supplement, SD-DOH was able to retain an Informatics Lead as their subject matter expert and support costs for Microsoft Azure Cloud services (e.g., Azure Maps and OpenAI). The Informatics Lead developed a geocoding service using Azure Maps that was evaluated by the GIS Analyst, who was funded from the CDC Public Health Emergency Preparedness Cooperative Agreement. The Informatics Lead further enhanced the geocoding process using OpenAI functions: (1) parse the address field to improve the address structure for geocoding, and (2) parse a place of business entered into the address fields (e.g., name of a nursing home).

SUBMITTED DECEMBER 2024

Interestingly, the greatest increase [in coordinate capture] was observed on Tribal land (395%) compared to the rest of the state (27%).

The "So What"

The newly developed geocoding service leveraging OpenAI increased the capture of latitude and longitude coordinates in a random sample of nearly 18,000 addresses by 36% statewide compared with Azure Maps alone. Interestingly, the greatest increase was observed on Tribal land (395%) compared to the rest of the state (27%). The geocoding service also returned county, census tract, and importantly for our Tribe-specific dashboard, whether the address was located on Tribal land and which Tribe was associated with the Tribal land (using Azure Maps Point-in-Polygon search).

The "Now What"

SD-DOH's focus on improving a core electronic disease surveillance system function of geocoding addresses has enabled the development of a Tribe-specific infectious disease dashboard for each of the nine Tribes located in South Dakota and the Great Plains Tribal Epidemiology Center. Health equity has been at the core of the dashboard project to ensure Tribal leaders have access to an infectious disease summary to aid their local decision-making. Tribal leaders provided feedback on the draft dashboard, which is now widely used. Per feedback, the dashboard updates monthly to allow comparison to the state disease rates and the dashboard has been updated to share the record-level data with Tribes. Discussions on use and improvements to the secure and confidential dashboard continue monthly.