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Utilization of Geographic Information Systems to Assess Patient Access to Diabetes Self-Management Education and Support (DSMES)

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Background

- ~12,690 people in Idaho are diagnosed with diabetes.
- People with diabetes have medical expenses approximately 2.3 times higher than those who do not have diabetes.
- ~10.3 percent of Idahoans, live with diabetes.
- Those with diabetes are twice as likely to have heart disease or stroke.
- As community needs become more extensive, especially in light of the pandemic, the demand for responsive, accessible, equitable healthcare continues to grow.

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Background

Peoples Diabetic Clinic & Pharmacy

- Pharmacists are the most accessible healthcare providers, capable of providing a wide range of healthcare services in the community setting.

- Pharmacists have the necessary clinical experience and medication knowledge to effectively provide diabetes self-management education and support (DSMES); however, barriers exist to DSMES implementation by community pharmacists.

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Project Objective

- The objective of our study was to explore pharmacist availability to support and expand DSMES service availability, especially in rural and underserved communities.

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Methods

- A geospatial analysis was conducted to determine distance and drive time to community pharmacies.
- Pharmacy and Diabetes Self-Management Education and Support (DSMES) program locations were provided in a spreadsheet format containing the name and physical address of each site.
- Addresses were converted into point GIS feature class layers using the Geocode Addresses tool in ArcGIS Pro.
- A five-mile buffer polygon feature class was created around each point location using the Create Buffers tool.
- Census block data for the 2020 census was acquired from the US Census Bureau and converted into a polygon feature class.

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Methods

- The sum of the population was calculated from this selection and used as a basic indicator of the availability of pharmacies and DSMES sites to the citizens of Idaho.
- Program addresses were collected from the Idaho Department of Health and Welfare, diabetes programs, and related foundation websites.
- Addresses were converted into point GIS feature class layers using the Geocode Addresses tool in ArcGIS Pro.
- To determine drive time to community pharmacies, proximity was determined using the Generate Drive Time Trade Areas tool in ArcGIS Pro (5-, 10-, 15-, and 30-minute interval).

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Methods

- Similar to the Euclidean distance buffer polygons described above, these polygons were used to select the underlying Census block polygons using the Select by Location tool.
- Iterative process, once for all 5-minute drive time polygons, and then again for the 10-minute, 15-minute, etc. drive times resulting in six sets of selections.
- The sum of the population was calculated from these selections and used to indicate the availability of pharmacies and DSMES sites to the citizens of Idaho.
- Statistics were graphed to aid in data visualization showing the pharmacy proximity and DSMES sites as well as the percent of Idaho citizens within proximity of these sites.

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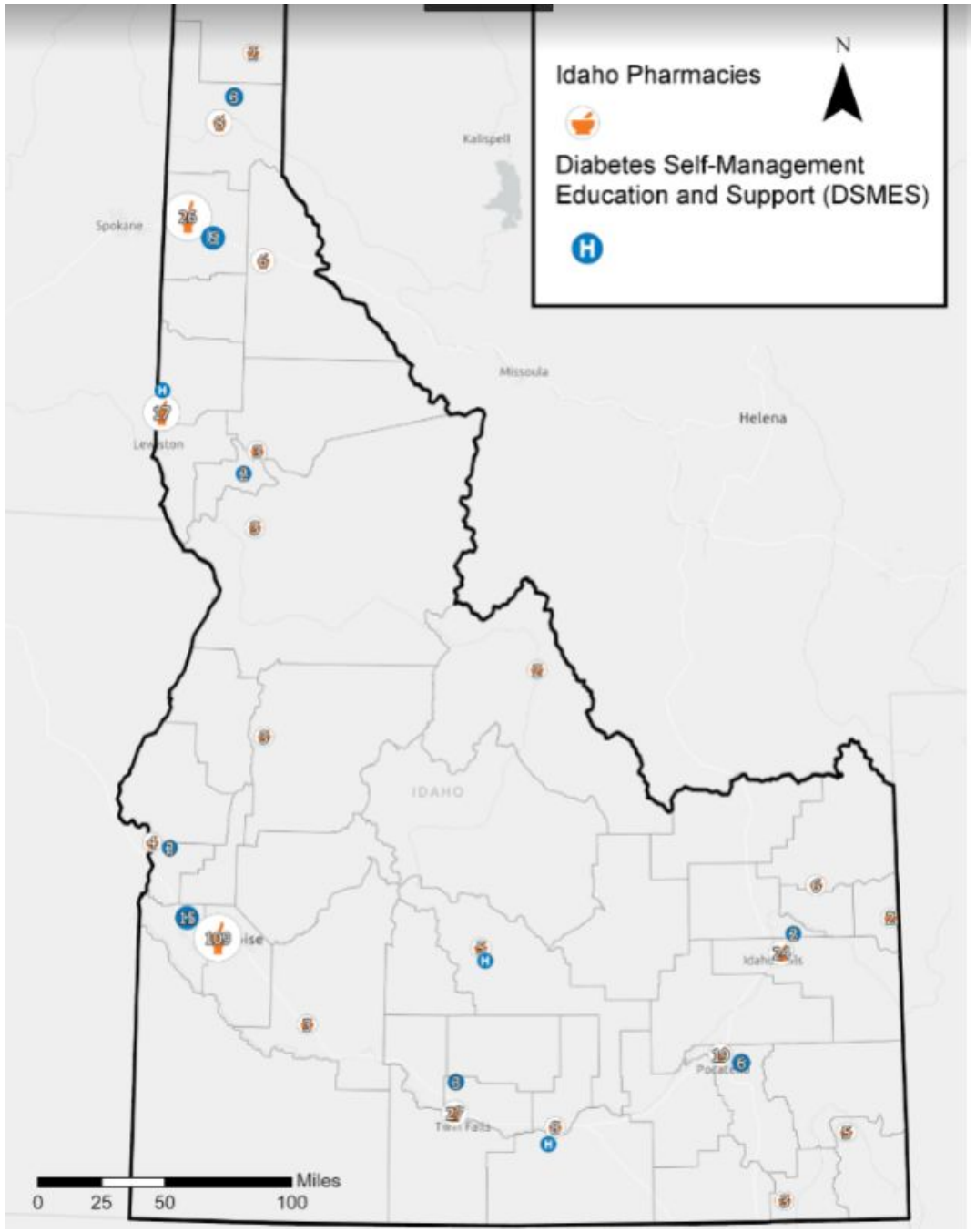
Results



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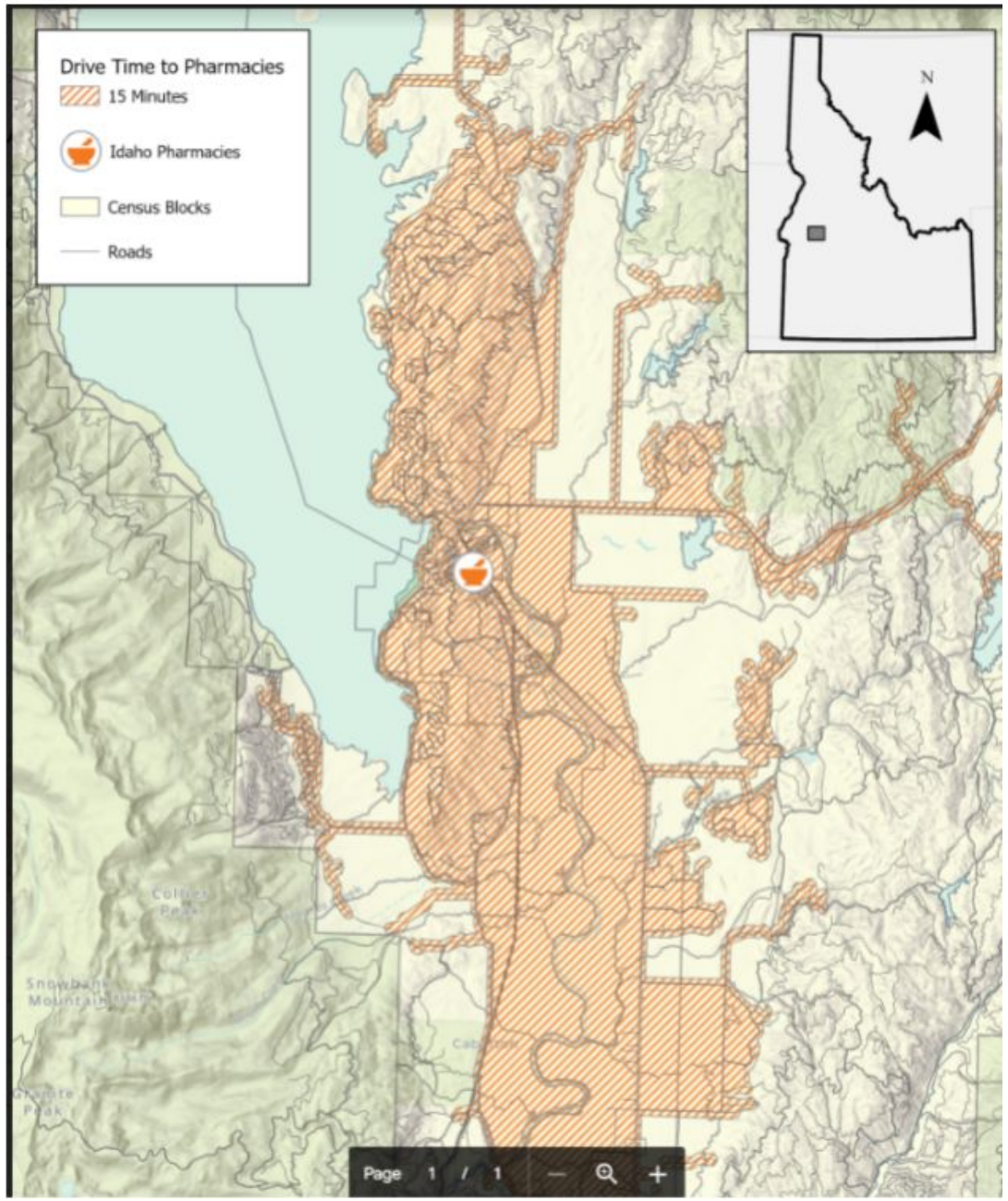

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Discussion /Conclusions

- DSMES has been shown to decrease cost and improve health;
- Not all qualified and readily accessible healthcare providers (e.g., pharmacists) are being reimbursed for DSMES services
- Without adequate reimbursement, sustainable provision of services is limited.

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