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

Renee Robinson PharmD, MPH, MSPharm, MBA
Elaine Nguyen, PharmD, MPH
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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.
• 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.
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.
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.
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).
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.
Results
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.