

Spatial access to diabetes intervention for Guyanese immigrants in Schenectady, New York

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Background

Type 2 diabetes mellitus prevalence is disproportionately high among Guyanese immigrants in Schenectady, New York. A large proportion of Guyanese belong to faith-based organizations (FBOs). Diabetes intervention at FBO is an evidence-based community approach to address high diabetes burden; however, long travel distance to a FBO can be a barrier to participating in the intervention.

Objectives

To determine whether collective access to a community-based diabetes education intervention for Guyanese immigrants would improve by locating the program at Schenectady’s four largest FBOs by Guyanese membership.

Methods

- Residential addresses from a cross-sectional health survey were geocoded.
- Statistical software automated querying of an online mapping service, and extracted shortest driving distances between homes, FBOs, and the existing diabetes education center (DEC).
- Distances for Guyanese and non-Guyanese adults with diabetes and prediabetes (n=238) were analyzed.
- Geographic information systems generated Guyanese population density maps to evaluate proximities of existing and proposed DEC.

Conclusion

Extending the diabetes education intervention to FBOs would improve spatial access for Guyanese. Close proximity to FBO is a likely enabler for regular utilization of the faith-based intervention.

Affiliations



Results

- Guyanese participants were more likely to be FBO-affiliated than non-Guyanese (77.8% vs. 61.2%).
- Mean driving distance to FBO was shorter for Guyanese (1.19 miles; 95% CI, 0.98-1.39) than non-Guyanese (2.87 miles; 95% CI, 1.93-3.82). (Table 1)
- In all socio-economic and health subcategories, driving distance to FBO was uniformly lower in Guyanese. (Table 1)
- A higher proportion of Guyanese participants lived closer to FBOs than to the DEC compared to non-Guyanese (52.2% vs. 34.7%).
- Figure 1 shows a population density map of Guyanese participants in relation to the four largest FBO’s and the existing DEC. Dark shades indicate higher population density.
- For Guyanese closer to FBO than to DEC who belonged to the four largest FBOs, mean driving distance to FBO was 0.8 miles. (Table 2)

Table 1: Driving distances to FBOs among Guyanese and non-Guyanese with diabetes and pre-diabetes who belong to a FBO, Schenectady, NY (in miles).

| | | Guyanese | | | Non-Guyanese | | | | |
|------------------|-------------------|----------|------|-------------|--------------|----|------|--------------|--------|
| | | N | Mean | 95% CI | Median | N | Mean | 95% CI | Median |
| All | | 87 | 1.19 | (0.98-1.39) | 1.00 | 64 | 2.87 | (1.93-3.82) | 1.60 |
| Sex | Men | 40 | 1.35 | (1.05-1.65) | 1.20 | 21 | 2.34 | (1.51-3.17) | 1.90 |
| | Women | 47 | 1.05 | (0.76-1.34) | 0.80 | 43 | 3.14 | (1.76-4.51) | 1.40 |
| Age | 18-49 | 23 | 1.01 | (0.60-1.42) | 0.70 | 12 | 2.76 | (0.23-5.29) | 1.35 |
| | ≥50 | 64 | 1.25 | (1.00-1.49) | 1.05 | 52 | 2.90 | (1.84-3.96) | 1.65 |
| Education | <High school | 36 | 0.94 | (0.58-1.31) | 0.50 | 2 | n/r | n/r | n/r |
| | High school | 47 | 1.39 | (1.13-1.65) | 1.30 | 22 | 2.61 | (1.19-4.02) | 1.70 |
| | >High School | 1 | n/r | n/r | n/r | 40 | 3.13 | (1.79-4.47) | 1.65 |
| Marital status | Married | 65 | 1.18 | (0.95-1.42) | 1.10 | 41 | 2.58 | (1.76-3.39) | 1.60 |
| | Not married | 21 | 1.22 | (0.71-1.73) | 0.90 | 23 | 3.41 | (1.09-5.72) | 1.60 |
| Diabetes status | Diabetes | 76 | 1.19 | (0.96-1.41) | 1.00 | 41 | 2.46 | (1.52-3.39) | 1.60 |
| | Pre-diabetes | 11 | 1.16 | (0.53-1.10) | 0.80 | 23 | 3.61 | (1.48-5.75) | 1.90 |
| General health | Good to excellent | 52 | 1.36 | (1.06-1.66) | 1.20 | 55 | 3.13 | (2.04-4.22) | 1.80 |
| | Poor to fair | 35 | 0.93 | (0.68-1.19) | 0.80 | 9 | 1.31 | (0.50-2.12) | 1.10 |
| Health insurance | Insured | 65 | 1.24 | (1.00-1.48) | 1.10 | 61 | 2.93 | (1.93-3.92) | 1.60 |
| | Uninsured | 20 | 1.09 | (0.59-1.58) | 0.85 | 1 | n/r | n/r | n/r |
| Denomination | Hindu | 45 | 1.18 | (0.90-1.46) | 1.00 | 1 | n/r | n/r | n/r |
| | Protestant | 41 | 1.19 | (0.86-1.52) | 0.80 | 20 | 3.82 | (1.36-6.28) | 1.95 |
| | Roman Catholic | 0 | n/r | n/r | n/r | 39 | 2.55 | (1.57- 3.53) | 1.40 |
| | Other Christian | 1 | n/r | n/r | n/r | 3 | n/r | n/r | n/r |
| | Jewish | 0 | n/r | n/r | n/r | 1 | n/r | n/r | n/r |

n/r: not reported due to sample size < 5



Figure 1: Map of Schenectady.

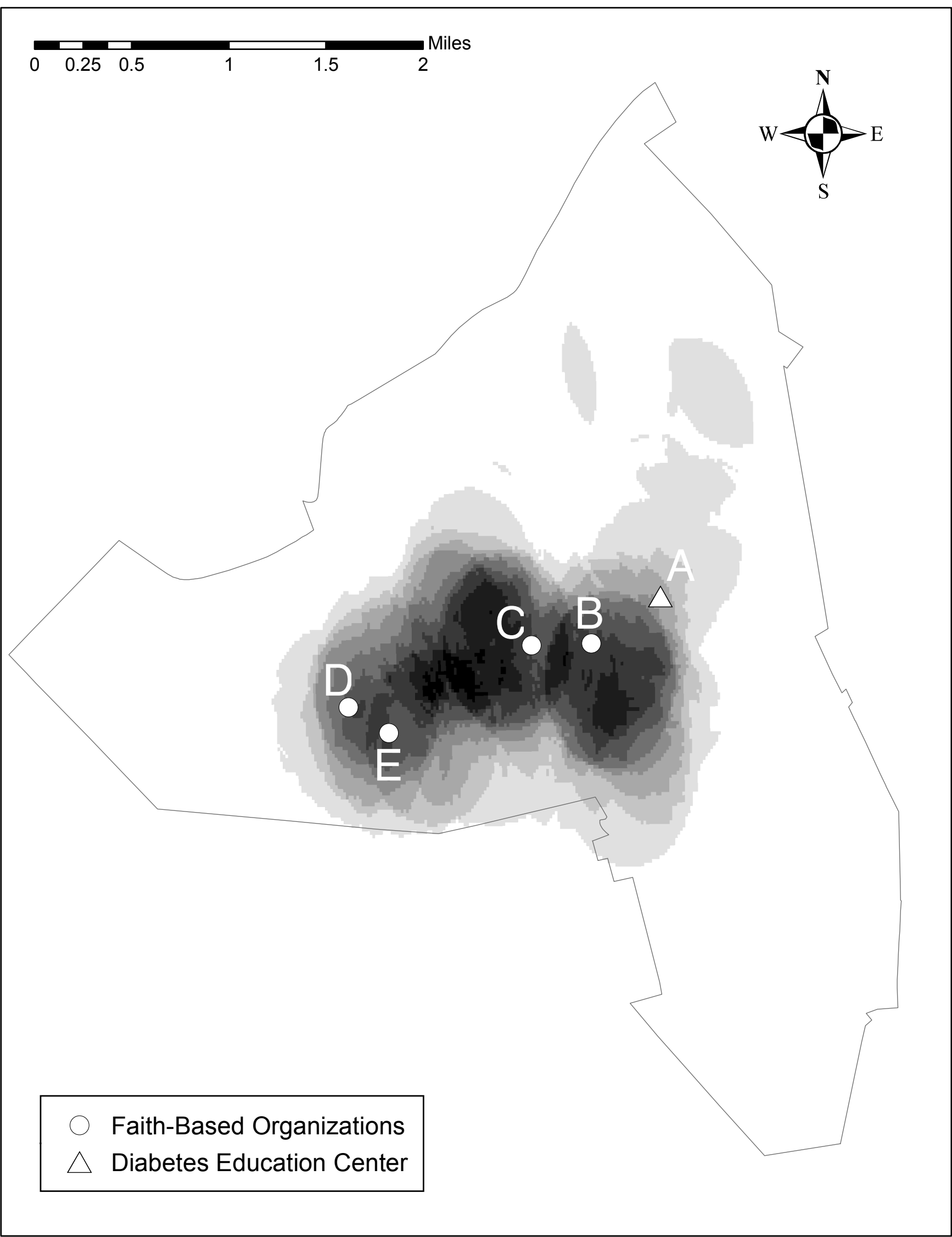


Table 2: Driving distance to closer facility when four largest FBOs and existing DEC were chosen as intervention sites (in miles).

| | N | % | Mean | 95% CI |
|------------------------|----|------|------|-------------|
| FBO is closer* | 57 | 48.7 | 0.80 | (0.62-0.97) |
| DEC is closer* | 19 | 16.2 | 1.37 | (0.83-1.92) |
| DEC is the only choice | 37 | 31.6 | 1.37 | (1.16-1.58) |
| Unknown FBO | 4 | 3.4 | n/a | n/a |

n/a: not applicable; * those who belong to one the 4 most popular FBOs; † those who do not belong to any of the 4 most popular FBOs