

ACRES OF DIAMONDS:
REDISCOVERING COMMUNITY ASSETS IN DALLAS BACKYARDS

by

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DISSERTATION

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ABSTRACT

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The University of Texas Southwestern Medical Center, 2016

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Background: Diabetes directly affects 8% of the US population and poses a growing burden to healthcare providers, to the health system, and to society. Cultivating self-efficacy enhances personal agency and enables patients to take an active role in the management of their disease. Effectively cultivating self-efficacy among patients from diverse backgrounds requires a patient-tailored assessment of existing gaps in patients' diabetes self-management skills. Tying patients to existing community health resources through ZIP code-based mapping is an effective patient-tailored intervention that creates long lasting change in diabetes self-management. To this end, a two-armed approach to community resource mapping was taken: In the first arm, existing resources in the categories of exercise, nutrition, and diabetes management were catalogued and mapped across Dallas County ZIP codes; in the second arm, patient awareness of existing resources across the same three categories was mapped across Dallas County ZIP codes. A comparison of each study arm across overlapping ZIP codes showed that resources abound in Dallas, but awareness of these resources is the limiting factor in fostering increased patient self-efficacy. To increase self-efficacy and empower patients to improve self-management of their diabetes, patients should be connected with community resources to tackle the issue of underutilization of community resources and thereby gain "mastery experiences."

Objective: This project hypothesizes that community resources are plentiful in Dallas and that there is a relative lack of awareness of community resources, limiting patient self-management of diabetes.

Methods: This study mapped community assets in the categories of exercise, nutrition, and diabetes management across the Dallas ZIP codes with the heaviest burden of diabetes. This study then mapped awareness of these same resources and compared both maps to identify a disconnect between community resources and the communities they serve.

Results: Sample maps of community assets in several of 14 target ZIP codes were produced with the aid of Google maps, showcasing the abundance of community resources throughout the ZIP codes of Dallas County, including those with poor clinical and socioeconomic measures. Though results may not be representative of individual ZIP codes, awareness of resources appears to vary more directly with these clinical and socioeconomic measures than does true resource distribution.

Conclusion: This study applies quality improvement and process analysis tools to empirically advance theoretical population health frameworks. Asset cataloguing and geospatial mapping demonstrate an abundance of community resources evenly distributed throughout Dallas but a dearth of resource awareness that loosely correlates with negative community measures. Such measures include median household income, BMI, HbA1C, and crime index. Continued indexing of Dallas County resources with more sophisticated mapping software will yield asset catalogues more consistent in their value to society; and continued awareness surveying is necessary to develop representative ZIP code awareness maps for deep comparison of these objective resource and subjective awareness measures.

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PRIOR PUBLICATIONS & PRESENTATIONS

PRESENTATIONS AND POSTERS:

UT Southwestern Endocrinology Grand Rounds, Friday, February 26, 2016

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Chapter 1: An Introduction

BACKGROUND KNOWLEDGE

Self-efficacy

To paraphrase Albert Bandura of Stanford University, self-efficacy is belief in one's ability to perform essential tasks in the face of challenges.¹ Self-efficacy's paramount role in creating sustainable change in patient management of chronic diseases is well documented and remains an important target for population health studies. According to Bandura, the most important influence on self-efficacy is "mastery experiences," the result of intense individual effort that breaks through challenges and achieves goals. Building self-efficacy through mastery experiences is key to empowering populations to change habits that affect chronic disease management. Effectively cultivating self-efficacy among patients from diverse backgrounds begins with a patient-tailored approach to assessing existing gaps in patients' diabetes self-management to identify skills of low personal competence—skills lacking in mastery. Further cultivation involves tying patients to existing community health resources to establish healthier habits, enabling these mastery experiences, and creating patient-tailored interventions for long lasting change in diabetes self-management.

The Chronic Care Model

This paper's emphasis on community resources takes root in the Chronic Care Model, created by the MacColl Institute in 1998 to delineate components of the health system and community essential to understanding chronic disease management.² To compare time spent

¹ Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71-81). New York: Academic Press. (Reprinted in H. Friedman [Ed.], *Encyclopedia of mental health*. San Diego: Academic Press, 1998).

² "Model Elements :: Improving Chronic Illness Care". *Improvingchroniccare.org*. N.p., 2006. Web. 19 Jan. 2016.

in the health system to time spent in the community, two conservative assumptions are made. First, the average patient spends two hours per month in doctor's appointments and related health system visits. Second, patients sleep eight hours a night, permitting a sixteen-hour waking day. Based on these assumptions, the average patient spends 24 of 5,840 waking hours each year in the health system. This time in the system, when a patient can expect face-to-face interaction with a healthcare provider or educator, constitutes merely 0.41% of waking hours.

Building a meaningful patient relationship, adjusting medications, and teaching patients how to eat, exercise, and manage their diabetes effectively in brief meetings throughout the year is one of the greatest challenges facing healthcare and its providers today. Patient behavior, in particular, requires concerted effort over multiple visits with considerable work on the parts of both the provider and the patient to change effectively. Yet the brunt of efforts made by physicians, nurses, diabetes educators, and other key healthcare providers attempt to optimize medical management and alter patient behavior in this narrow window of face-to-face interaction.

Clearly there is a large gap where efforts in the lower-exposure health system are expected to produce meaningful lifestyle changes for the long-term, while the higher-exposure community setting is disproportionately neglected.

The CCM population-level framework addresses deficiencies in chronic illness management, and expounds on the need for health systems to partner with community

programs and resources to transform healthcare from a system that treats problems as they arise to one that promotes general health and prevents medical problems before they arise. This framework leverages the 99.6% of waking hours spent in the community to create opportunities where mastery experiences can be fostered.

LOCAL PROBLEM

HORIZONS

A 2012 groundbreaking collaborative project called “HORIZONS: The Dallas County Community Health Needs Assessment” involved leaders of Dallas County Health and Human Services (DCHHS), New Solutions, Inc., and Parkland Health and Hospital System (PHHS) to address areas of healthcare concern in Dallas County. Areas of concern included the burden of diabetes mellitus among the approximately 2.4 million Dallas County residents and four key factors that drive this national epidemic.³ 8% of Americans suffer from diabetes, making the disease one of the most common and expensive health-related burdens to society, with an estimated cost of \$245 billion in 2012.⁴ This prevalence is higher at 9.6% for Texans and higher still, at 11.4% for Dallas residents. To further compound this prevalence, 25% of patients with diabetes are currently undiagnosed, suggesting that as much as 15% of Dallas’ population may suffer from diabetes.

The collaborative HORIZONS study highlighted important factors contributing to this 11-15% prevalence, including family history, obesity, lack of physical activity, and access to

³ Edwards, J., Pickens, S., Schultz, L., Erickson, N., Dykstra, D. (2012). Horizons: The Dallas County Community Health Needs Assessment. Dallas, TX: Dallas County Health and Human Services and Parkland Health and Hospital System.

⁴ "Statistics About Diabetes". *American Diabetes Association*. Web. 5 Nov. 2015.

environmental resources, the latter further segmented into access to wholesome food, healthcare, and recreation. Family history cannot be altered, but the latter three factors are mutable and intimately intertwined: Increased access to environmental resources in the predefined categories of wholesome food, healthcare, and recreation can, in coordination, effectively reduce obesity rates and very directly eliminate the lack of physical activity factor.

INTENDED IMPROVEMENT

Taken together, HORIZONS and the CCM attempt to bridge patients and the health system with existing community resources in Dallas County to combat the epidemic of diabetes. Through the cataloguing and mapping of community assets in the categories of exercise, nutrition, and diabetes management, this study endeavors to connect patients with existing resources to foster relevant mastery experiences and to thereby increase self-efficacy in the target population.

Asset mapping involves taking an objective inventory of existing resources across a pre-specified geographical area.⁵ This project took inventory of community assets in Dallas County with the understanding that resources across the categories of exercise, nutrition, and diabetes management could be either positive or negative. Positive resources were defined as community assets that promoted good health—specifically places that enabled physical activity, offered fresh produce, and improved medical management of diabetes. While the

⁵ Bazemore, Andrew. "The Power Of Maps: Exploring The Frontiers Of Geospatial Analysis To Address Health Equity". Presentation.

vast majority of resources were positive, resources encouraging bad health habits, particularly bad nutrition, were initially entertained as negative assets.

Equally important was establishing where no resources existed in either category, positive or negative. 10% of all census tracts in 2011 qualified as food deserts, defined by the USDA as census tracts with low access to nutritious food. Specifically, at least a third of residents of food deserts live more than one mile from sources of fresh produce, namely large grocery stores or supermarkets.⁶ To extend this definition to include the HORIZONS diabetes factors, this paper advanced the definition of “food deserts” to encompass the more expansive “resource deserts,” tracts of land that lack consistent availability of resources in the categories of exercise, nutrition, and diabetes management.

To empirically apply the results of the HORIZONS study and the CCM, a geospatial mapping effort was undertaken to compare community resources to measures internal and external to the ambulatory patient population of the University of Texas Southwestern Medical Center (UTSW). The aim of this study was to compare awareness of Dallas County resources in the categories of exercise, nutrition, and diabetes management to an objectively catalogued index of these resources. This pilot project’s eventual intervention to incorporate asset maps into the electronic medical record (EMR) aims to improve self-efficacy scores and inversely decrease HbA1Cs in the UTSW patient population.

⁶ "USDA Introduces Online Tool For Locating 'Food Deserts' | USDA Newsroom". *Usda.gov*. N.p., 2016. Web. 17 Jan. 2016.

STUDY QUESTION

Do sufficient community resources exist in the categories of exercise, nutrition, and diabetes management? And by increasing awareness of existing resources, can self-efficacy among the UTSW patient population be increased?

Chapter 2: Experimental procedure

ETHICAL ISSUES

This study was directly aligned with UT Southwestern's major mission statement: "To improve health care in our community, Texas, our nation, and the world through innovation and education."⁷ This study was intended as a positive pilot analysis of existing resources and resource awareness in Dallas County. A detailed stakeholder analysis was completed to assess key figures likely to be affected directly or indirectly by this study. Local patients, healthcare providers, the health system, and society stand to benefit from eventual interventions that result from this project. No prior or foreseeable harm is associated with this study or its future interventions.

SETTING

A number of key project measures were chosen for their utility and relevance to this project's aim. Data analysts at UTSW provided objective patient data mined from the UTSW EMR for only UTSW ambulatory clinics, including Family Medicine clinics, General Internal Medicine clinics, and Endocrinology clinics. These EMR data included measures internal to the UTSW patient population, such as the total number of diabetic patients in each

⁷ "Mission And History - UT Southwestern Medical Center, Dallas, TX". *UT Southwestern Medical Center*. Web. 25 Jan. 2016.

ZIP code and the percentage of patients in each ZIP code with uncontrolled diabetes—defined as an HbA1C>9%. Requirements for patient inclusion in this EMR data set were a minimum of two visits in the prior two years and a minimum of one visit in the prior year. Figures 1 and 2 show a selection of these data arranged in heat maps. Figure 1 reflects the number of diabetic patients in each ZIP code in Dallas county, where darker colors indicate a larger number. Figure 2 reflects the percentage of diabetic patients in each ZIP code with a HbA1C>9%, where darker colors indicate a higher percentage.

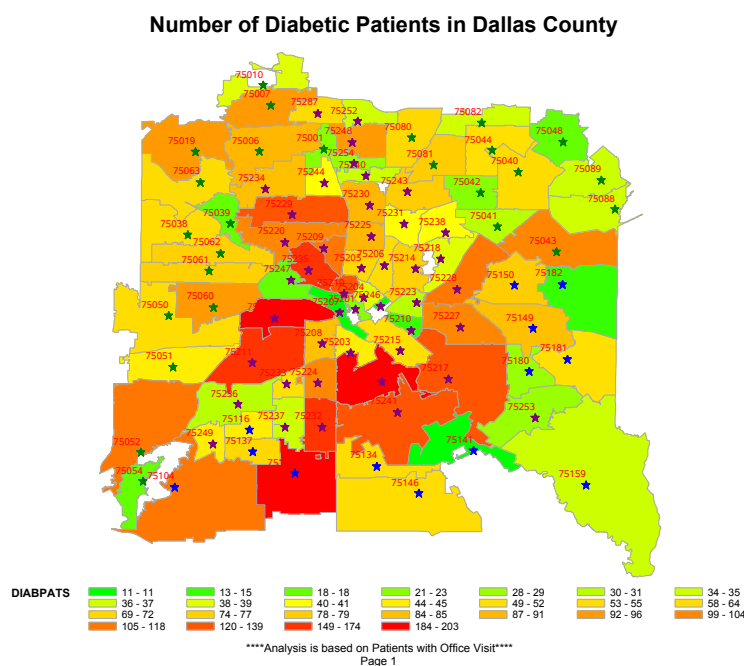


Figure 1: Number of Diabetic Patients in Dallas County by ZIP code (UTSW patients only)

Control Rate for Diabetic Patients (HbA1C>9%) in Dallas County

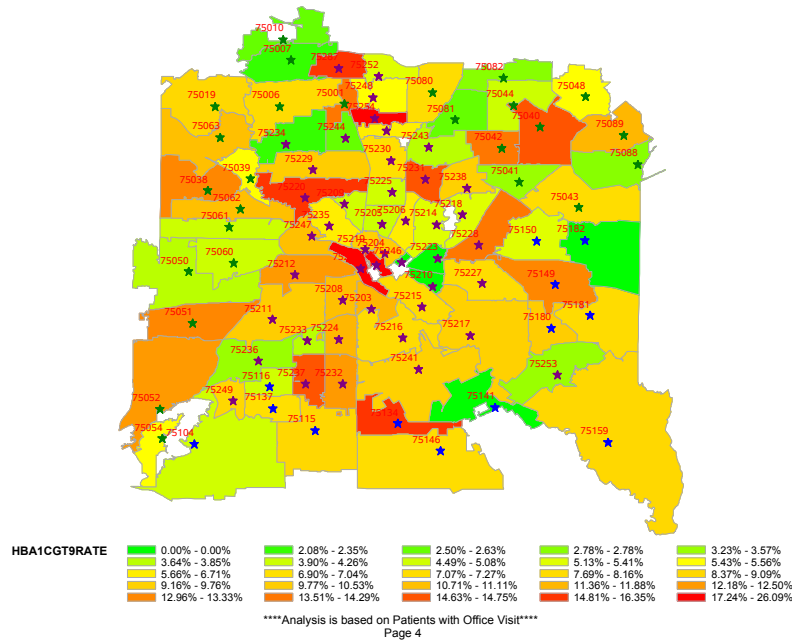


Figure 2: % of Diabetic Patients in Dallas County with HbA1C>9% by ZIP code (UTSW patients only)

Objective measures included data provided by UTSW data analysts as well as data collected during the “Measure” phase of the organizing DMAIC framework. Particularly important outcome measures included self-efficacy and HbA1Cs in the target patient population. Additional objective measures external to the UTSW patient population were crime index by ZIP code, median household income by ZIP code, and this project’s proprietary community asset catalogues and maps.^{8,9} Subjective measures include survey instruments deployed during this study, in particular the Community Assessment Survey. As subjective measures, surveys helped to cultivate the “voice of the customer,” an important quality improvement

⁸ Moving.com., "Dallas, TX 75237 - Zip Code Information - Moving.Com". N.p., 2016. Web. 1 Feb. 2016.

⁹ (DADS), Data. "American Factfinder - Results". *Factfinder.census.gov*. N.p., 2016. Web. 10 Jan. 2016.

tool that ensured a patient-centered approach from beginning to end of this project. Project measures are summarized in Table 1.

<u>Objective Measures</u>	<u>Subjective Measures</u>
% pts with HbA1C>9% in each ZIP code	Community Assessment Survey
# pts with Diabetes in each ZIP code	Chronic Care Model Survey
Crime index by ZIP code	Self-efficacy Scales
Median household income by ZIP code	
Geospatial asset mapping	

Table 1: Study measures, subjective and objective

PLANNING AND IMPROVING THE STUDY ARMS

This project hypothesized that the epicenter for absolute numbers of uncontrolled diabetic patients was south-central Dallas, based on preliminary analysis of BMIs and median household incomes; this project further hypothesized that diabetes would be most uncontrolled in this same area. These hypotheses shaped the planning process for the community asset mapping initiative.

Figure 1 (above) partially affirmed the geographic focus hypothesis, suggesting that the largest number of UTSW diabetic patients resides in south-central Dallas. Figure 2, however, showed a more scattered distribution of patients, refuting the hypothesis that diabetes was disproportionately uncontrolled in south-central Dallas. These data encouraged a more detailed analysis of patient distribution, with efforts made to focus on areas with the greatest volume of uncontrolled diabetes.

A	B	C	D	E	F	G	H	I	J	K
	Note:									
	1. Analysis is based on UTSW Patients who									
	1) had at least 2 office visits at UTSW during the last two years ending Jul. 2015									
	2) had at least 1 office visit at UTSW during the last year ending Jul. 2015									
	2. Diabetic Patients were identified by encounter dx of diabetics during the last two years ending Jul. 2015									
	3. Used encounter diagnosis: 249.00, 249.01, 250.00 - 250.99, 357.20, 362.01 - 362.07, 366.41, 648.00 - 648.04									
	ZIP	Number of Patients	Number of Diabetic Patients	Average of BMI	Number of Diabetic Patients with HbA1C<8	Number of Diabetic Patients with HbA1C>9	Percent of Diabetic Patients	Percent of Diabetic Patients with HbA1C<8	Percent of Diabetic Patients with HbA1C>9	
	75001	419	21	30.8211	10	3	5.01%	47.62%	14.29%	
	75006	904	91	32.1465	44	7	10.07%	48.35%	7.69%	
	75007	993	96	29.6465	60	2	9.67%	62.50%	2.08%	
	75010	430	38	28.9603	16	1	8.84%	42.11%	2.63%	
	75019	1,559	92	29.3733	46	8	5.90%	50.00%	8.70%	
	75038	654	54	32.1377	29	7	8.26%	53.70%	12.96%	
	75039	628	18	30.3329	7	1	2.87%	38.89%	5.56%	
	75040	604	61	33.7356	27	9	10.10%	44.26%	14.75%	
	75041	260	31	32.2955	11	1	11.92%	35.48%	3.23%	
	75042	325	22	33.6429	10	3	6.77%	45.45%	13.64%	
	75043	916	99	33.3361	52	7	10.81%	52.53%	7.07%	
	75044	621	49	31.2263	17	2	7.89%	34.69%	4.08%	
	75048	258	18	30.5125	7	1	6.98%	38.89%	5.56%	
	75050	501	55	32.6698	23	2	10.98%	41.82%	3.64%	
	75051	367	45	32.8500	22	6	12.26%	48.89%	13.33%	
	75052	1,128	113	32.9241	38	14	10.02%	33.63%	12.39%	
	75054	159	18	30.4765	10	1	11.32%	55.56%	5.56%	
	75060	800	94	31.3055	48	4	11.75%	51.06%	4.26%	
	75061	801	77	33.2373	42	3	9.61%	54.55%	3.90%	
	75062	957	74	32.4283	35	8	7.73%	47.30%	10.81%	
	75063	1,224	64	29.7213	34	7	5.23%	53.13%	10.94%	

Figure 3: UTSW ambulatory clinic data by ZIP code for patients with diabetes

To hone in on these high yield areas, variables thought to most affect or most propagate the epidemic of diabetes were selected as foci for analysis. To determine which ZIP Codes to map for this pilot study, a utilitarian approach was embraced: The absolute number of diabetic patients per ZIP code was multiplied by the percentage of patients with a HbA1C of greater than 9% (the cutoff for poorly controlled disease) per ZIP code to find absolute numbers of patients with HbA1C's of greater than 9% (populated in column G of Figure 3) in each ZIP code. This method highlighted areas where diabetes was both most rampant and most uncontrolled.

Sorting ZIP codes by the greatest number of patients with uncontrolled diabetes, however, resulted in ZIP codes physically disconnected from each other. This scattered distribution limited utility of this study for one simple reason: Patients are generally unaware of ZIP code distribution and are not limited in their daily lives by these artificial boundaries.

To address this impracticality, an area containing 14 ZIP codes was instead chosen, circumscribing a “daily functioning radius” of households around the apparent nidus of uncontrolled diabetes. These 14 ZIP codes with segmented population data are presented in Figures 4 and 5.

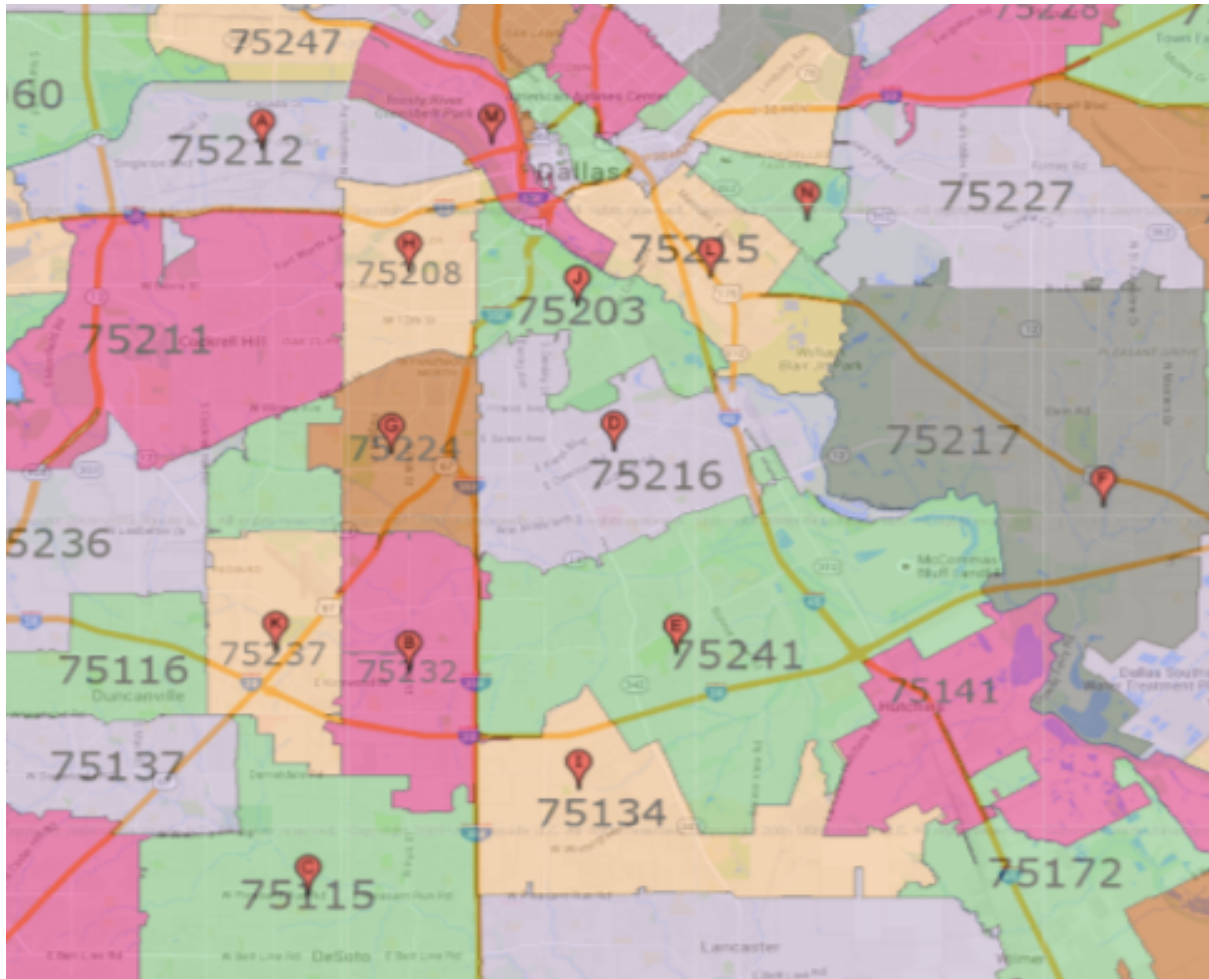


Figure 4: Dallas County ZIP codes selected for mapping with contextual Dallas County map. (Legend included in Figure 5)

ZIP codes with Map Legend	# DM patients with HbA1C>9% (+ as percentage of total # DM pts)		total # DM pts
A= 75212	23	(12.5%)	184
B= 75232	19	(12.2%)	156
C= 75115	17	(8.4%)	203
D= 75216	15	(7.7%)	195
E= 75241	13	(9.4%)	139
F= 75217	12	(9.2%)	131
G= 75224	12	(11.9%)	101
H= 75208	9	(11.0%)	84
I= 75134	8	(14.8%)	54
J= 75203	5	(11.4%)	44
K= 75237	5	(14.7%)	34
L= 75215	4	(8.0%)	50
M= 75207	2	(18.2%)	11
N= 75210	0	(0%)	13
Total ZIP codes: 14	Total # DM pts w/ HbA1C>9%= 144 (10.3%)		Total # DM pts= 1399

Figure 5: Dallas County ZIP codes selected for mapping (with segmented data and legend for Figure 4)

Further planning of the intervention involved identifying mapping technologies to analyze the selected ZIP codes. This study took advantage of the accessibility of Google Maps to effectively catalogue resources across the predefined categories of exercise, nutrition, and diabetes management.

Cultivating the voice of the customer and mapping awareness of resources constituted the second arm of this study. An adequate understanding of patient awareness of existing resources in patient neighborhoods was vital. In order to achieve this, a survey instrument was devised from the Canadian Community Health Survey 2015 and adapted to the target population.¹⁰

This questionnaire, shown in Figure 6, was deployed in the waiting room of UTSW's Aston ambulatory clinic and gauged patients' community resource awareness. The ten-question "Community Assessment Questionnaire" focused on patients' neighborhoods, including instructions to consider only resources within a fifteen-minute walking distance from patients' homes. Example questions included, "how safe do you feel it is to go out in your neighborhood at night?" and "how well paved are the sidewalks in your area?" Other questions focused on awareness of exercise and recreational facilities and fresh produce accessibility by favored mode of transportation. The final question asked patients for their ZIP code in order to map measured awareness.

¹⁰ Statistics Canada,. "Canadian Community Health Survey (CCHS)-2015". N.p., 2015. Web. 17 Nov. 2015.

Community Assessment Questionnaire

We are going to talk about your neighborhood. Think about the different facilities in your neighborhood. By this, we mean the area around your home that you could walk to in less than 15 minutes. Please circle your response to each question.

1. Many shops, stores, markets or other places to buy things I need are within easy walking distance of my home.
1: Strongly agree
2: Somewhat agree
3: Somewhat disagree
4: Strongly disagree
2. There are sidewalks on most of the streets in my neighborhood.
1: Strongly agree
2: Somewhat agree
3: Somewhat disagree
4: Strongly disagree
3. In or near my neighborhood, there are designated areas for bicycling such as special bicycle lanes, separate paths or trails, shared use paths for bicycles and pedestrians.
1: Strongly agree
2: Somewhat agree
3: Somewhat disagree
4: Strongly disagree
4. My neighborhood has several recreation facilities, such as parks, walking trails, bike paths, recreation centers, gyms, playgrounds, public swimming pools, etc.
1: Strongly agree
2: Somewhat agree
3: Somewhat disagree
4: Strongly disagree
5. The crime rate in my neighborhood makes it unsafe to go on walks at night.
1: Strongly agree
2: Somewhat agree
3: Somewhat disagree
4: Strongly disagree

6. The sidewalks in my neighborhood are well maintained (paved, with few cracks) and not obstructed.
1: Strongly agree
2: Somewhat agree
3: Somewhat disagree
4: Strongly disagree
7. There is so much traffic on the streets that it makes it difficult or unpleasant to walk or ride a bicycle in my neighborhood.
1: Strongly agree
2: Somewhat agree
3: Somewhat disagree
4: Strongly disagree
8. Within walking distance, there are many stores where I can get fresh produce.
1: Strongly agree
2: Somewhat agree
3: Somewhat disagree
4: Strongly disagree
9. Fresh produce stores and exercise facilities are easily accessible by my favored mode of transportation.
1: Strongly agree
2: Somewhat agree
3: Somewhat disagree
4: Strongly disagree
10. What is your zip code? _____

Adapted from the Canadian Community Health Survey (CCHS)-2015

1

Adapted from the Canadian Community Health Survey (CCHS)-2015

2

Figure 6: Community Assessment Questionnaire adapted from the Canadian Community Health Survey 2015

To create a meaningful and representative resource awareness map required efficient survey delivery to achieve large numbers of completed surveys. PDSA cycles were incorporated to engineer the survey process for maximum efficiency; and through iterative process engineering involving numerous PDSA cycles, a higher rate of survey acceptance and completion was achieved. This quality improvement tool's application is summarized below.

After analyzing patient flow at Aston clinic, a survey delivery process map was created to determine how best to deliver surveys. Given the number of moving parts in the clinic and the risk of interfering with patient care, it appeared least disruptive to clinic flow to administer surveys in the Aston Endocrinology Clinic waiting room.

To start, medical students carried the Community Assessment Questionnaire on clipboards, delivering them with a lengthy introduction to patients who appeared to have completed their clinical paperwork. To be eligible to take the survey, patients were required to have at least one person in their household—themselves included—with diabetes.

Studying the results of this particular method provided multiple lessons: Approaching patients with a clipboard immediately appeared suspicious and some patients appeared to have made up their minds not to participate even before introductions began. And while many patients very politely accepted the survey, approximately 20% respectfully declined at this phase. Also, by focusing only on patients who were idle, surveyors missed patients who were called to an exam room before completing their paperwork.

The first change made to the process involved adjusting the location of survey delivery: Rather than wander around the waiting room with clipboards, surveyors hoped to achieve a higher patient survey acceptance rate by administering surveys from behind the check-in counter. From the standpoint of social dynamics, the scenario was switched: Patients now approached the surveyors. Additionally, all patients were screened for survey eligibility upon check-in, nearly doubling the exposure rate of patients to surveys. These two features combined, improved total completed surveys in a four-hour period twofold but introduced its own complication: Patients checking in received two clipboards with very different forms with different instructions for return. After a short pilot of approximately 10 patients, it became clear that expecting patients to carry two clipboards to their seats was a rather unwieldy task, and some patients seemed to have trouble balancing survey and clinic paperwork.

Based on these early results, the process was streamlined further: Desk clerks agreed to administer their clinical paperwork alongside this study's Community Assessment Questionnaires on a single clipboard. This method worked exceptionally well, earning a 0% refusal rate and increasing the number of returned surveys by an additional 50%. Patients perceived this integration of paperwork as a more organic interaction and clinic flow.

On the other hand, this process did make organization more difficult because patients sometimes gave the surveys, along with the remainder of their paperwork, to the nurses upon completion. This meant an extra effort to collect the occasionally misplaced survey from nursing staff. This particular problem was solved by introducing clinic nurses to this study, whereupon they made an effort to bring stray surveys back to surveyors when inadvertently received. A final balancing measure to this survey delivery approach arose when the clinic grew too busy for the desk clerks to continue administering the surveys alongside clinic paperwork; at this stage, surveyors reverted to the wandering model of survey delivery but with a shortened introduction, with an openness to approaching busy-appearing patients—and without clipboards.

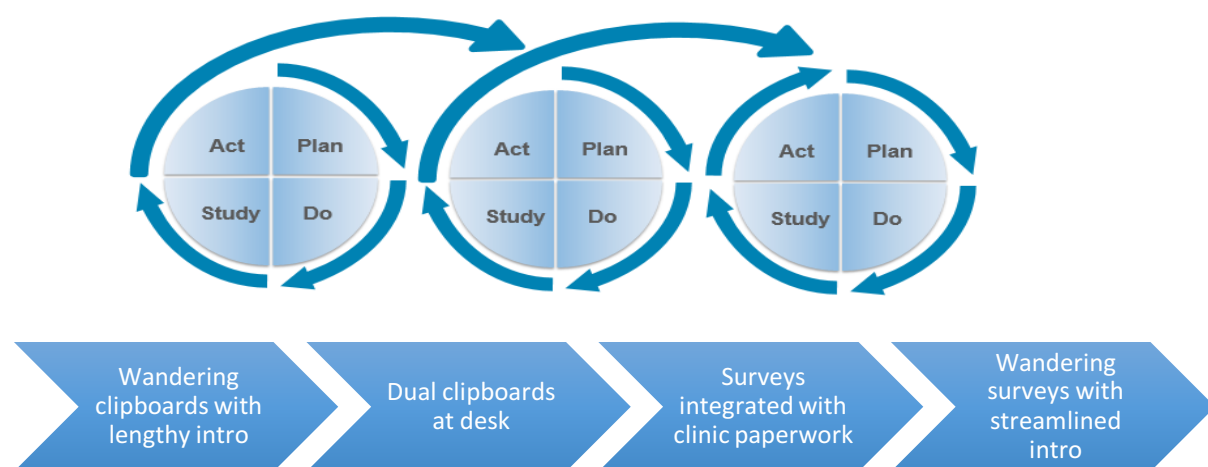


Figure 8: Graphic illustration of survey delivery PDSA cycles

ANALYSIS

This study incorporated a number of process analysis and quality improvement tools and frameworks into its organization that are summarized in Table 2. The direct application of bold-faced tools is referenced and discussed in this or prior chapters.

<u>Quality Improvement</u>	<u>Process Analysis</u>
Pareto charts	Flow Charts
Statistical analysis	Heat maps
Stakeholder analysis	Brainstorming
Voice of the Customer	Geospatial mapping
PDSA Cycles	Data collection
Process maps	Histograms
DMAIC	Delphi survey methodology
Project charter	

Table 2: Quality Improvement & Process Analysis tools (bold-faced tools are discussed explicitly in this paper)

Based on analysis of the HORIZONS study and the CCM, community assets were analyzed and categorized as exercise, nutrition, or diabetes management resources. By harnessing the power of digital, searchable maps, resources widely accessible to the general population were indexed and tabulated in spreadsheets for ease of reference and mapping.¹¹ These spreadsheets are presented in Appendix A. Each category of resource is further explored in this section.

The category of exercise included physically and financially available resources that encouraged and enabled physical activity. This category excluded resources such as gyms with expensive memberships, instead including only facilities available to a broad population—resources like public parks, jogging trails, YMCAs, and public pools.

Under the category of nutrition, a two-pronged approach was initially taken by categorizing resources as either positive or negative. As previously defined, positive resources were venues that stocked fresh produce, most notably grocery stores and farmers' markets. The decision to focus primarily on areas where people could get fresh produce was centered in the belief that nutritionally deplete foods are a strong driver of obesity and diabetes in the Dallas population. This work led to additional groundbreaking studies including those by Anne Peters, M.D. at the University of Southern California. Her work on food deserts in Los Angeles encouraged this study to focus on how best to analyze existing resources in the category of nutrition.¹²

¹¹ See Appendix A for asset catalogue

¹² Peters, Anne. "Innovating Change Through Community Health Initiatives". 2015. Presentation.

The complicating factor in this particular category was originally highlighted by Peters' USC study: Early in this project, fast food was categorized as a negative resource and assumed to be worse by far than the other food sources available in any area. Peters' work showed that in certain areas, fast food may be the only nutrition readily available, and even fast food is almost certainly better than no food at all. Additionally, a significant portion of fast food chains have grown to accommodate health-conscious consumers and now offer fresh food options.

This revelation complicated the categorization of fast food resources, and without a consistent rubric for evaluating menu options on a chain-by-chain basis, this study elected to count fast food as positive resources with the caveat that later interventions involving patient education would help patients make correct dietary choices.

Because this project's target group included only UTSW patients, and because strict inclusion criteria were imposed on EMR data collection parameters, the category of diabetes management resources was more straightforward than that of nutrition. Hence, for mapping, this study focused on diabetes wellness centers, community health centers, and pharmacies, particularly those with health stations—all places where patients have access to regular blood pressure checks and consistent access to refills of their medications for both diabetes and other comorbid diseases.

After tabulating pages of resources in spreadsheets, several of the target ZIP Codes were mapped to visualize resource distribution. To map resources, this project employed Google Maps because it was the most readily available resource and permitted ZIP code outlining. Once outlined, a ZIP code was searched for resources, which were catalogued by address and

other key identifying information, before being mapped with color-coded place-markers. An additional feature important to this study was inclusion of screenshots of Google street view pictures in order to better understand intangible factors, including accessibility, customer target, and quality of each establishment. An example of spreadsheet catalogues is seen in Figure 9. An example of ZIP code mapping is seen in Figure 10.

Name of Place	Address	Type of Place	Nutrition	Exercise	Diabetes Management	Description
1 My T Quick Food Store	4330 Gannon Ln # A, Dallas, TX 75237	Grocery Store	x			Small Grocery Store
2 Sam's Club	2900 W Wheatland Rd, Dallas, TX 75237	Grocery Store	x			Whole sale, membership required
3 Long John Silver's	4355 W Camp Wisdom Rd, Dallas, TX 75237	Fast Food Restaurant	x			Negative resource
4 Taco Cabana	4355 W Camp Wisdom Rd, Dallas, TX 75237	Fast Food Restaurant	x			Negative resource
5 KFC	3415 W Camp Wisdom Rd, Dallas, TX 75237	Fast Food Restaurant	x			Negative resource
6 Whataburger	3222 W Camp Wisdom Rd, Dallas, TX 75237	Fast Food Restaurant	x			Negative resource
7 Burger King	7300 S Cockrell Hill Road, Dallas, TX 75236	Fast Food Restaurant	x			Negative resource
8 Wings & More Place	7455 S Westmoreland Rd, Dallas, TX 75237	Fast Food Restaurant	x			Negative resource
9 North Texas Food Bank	4500 S Cockrell Hill Rd, Dallas, TX 75236	Food Bank	x			
10 Planet Fitness	3200 Camp Wisdom Dr, Dallas, TX 75237	Fitness Center		x		24 hours gym
11 Oak Cliff YMCA	6701 S Hampton Rd, Dallas, TX 75232	Community Fitness Center		x		
12 Boulder Park	6600 Pastor Bailey Dr, Dallas, TX 75237	Public Park		x		Biking and Running Trail
13 Southwest Center Mall	3662 W Camp Wisdom Rd, Dallas, TX 75237	Shopping Mall		x	x	Mall for walking, contains GNC for nutritional supplies
14 Methodist Charlton Medical Center	3500 W Wheatland Rd, Dallas, TX 75237	Hospital			x	
15 Texas Nutrition Consulting Group	4848 S Cockrell Hill Rd, Dallas, TX 75236	Health-related Business			x	Custom nutrition plans
16 A&C Discounts Pharmacy	8067 W Virginia Dr, Dallas, TX 75237	Pharmacy			x	
17 Walmart Supercenter	4111 Mint Way, Dallas, TX 75237	Grocery Store	x	x	x	Contains fast food, pharmacy, and walking space
18 Meadow Stone Park	3150 Bainbridge Dr, Dallas, TX 75237	Public Park		x		Park is connected to the elementary
19 Target	39739 LBJ Fwy, Dallas, TX 75237	Grocery Store	x	x	x	Contains food, pharmacy, and walking space

Figure 9: Sample ZIP code catalogue of 75237 with resource category, address, and additional descriptors

Nutrition examples:

Full-service grocery stores
Fast food
Farmer's markets

Exercise examples:

Local parks
Jogging trails
YMCA/accessible gyms

DM Management examples:

Diabetes Wellness Centers
Community health centers
Pharmacies w/ Health Stations

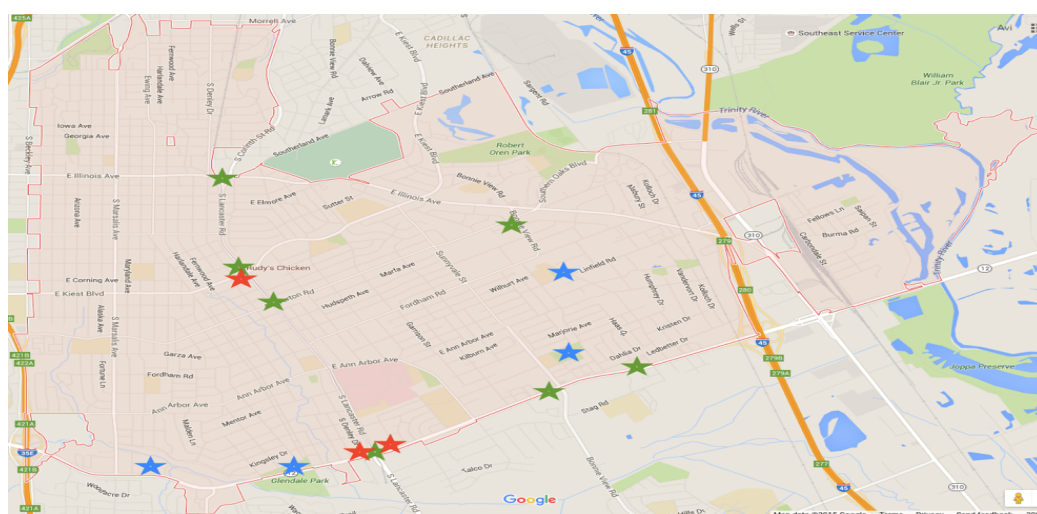


Figure 10: Sample ZIP code mapping of 75216

Chapter 3: Results

OUTCOME

After all community assessment surveys were sorted, the sheer breadth of UTSW's patient population—hailing from wide areas across North Texas— became apparent. After a week of survey collection, 74 surveys had been gathered from 53 unique ZIP Codes, suggesting that while focusing on mapping a relatively small area as a pilot was useful, these surveys would not provide statistically significant awareness data on a ZIP code-by-ZIP code basis. Shown in Table 3 are averages of survey and EMR data, in addition to externally gathered data across target ZIP codes.

	75216	<u>Average</u>	75225
Survey Score	32	21.7	10
% pts w/HbA1C>9%	7.69%	7.65%	4.49%
Crime index ⁷	330	161	192
Median household income ⁸	\$23,591	\$61,772	\$156,173
BMI	34.2	32.3	29.3

Table 3: A Tale of Two ZIP Codes: a comparison of mean study measures and sample ZIP codes 75216 and 75225

⁷ Moving.com,. "Dallas, TX 75237 - Zip Code Information - Moving.Com". N.p., 2016. Web. 1 Feb. 2016.

⁸ (DADS), Data. "American Factfinder - Results". *Factfinder.census.gov*. N.p., 2016. Web. 10 Jan. 2016.

Returning to the second arm of the study, each question on the Community Assessment Questionnaire was graded on a scale of 1-4, as seen in Figure 6 (above). For all but questions 5 and 7, a lower score meant greater awareness. Questions 5 and 7, which had an opposite orientation and were questions of negation, were scored with the scale inverted: for example, a response of “1, strongly agree” was scored as a “4, strongly disagree,” to maintain a positive survey orientation. A perfect total survey score, or a response of 1 (strongly agree) to each question, was 9—and this was interpreted as perfect awareness of accessible resources. The worst possible score was 36, or a response of 4 (strongly disagree) to each question. With this scoring rubric, the average survey score across 74 surveys was 21.7 for 9 graded questions, corresponding to a mean response score of 2.4 per question. This mean response score of 2.4 is approximately midway between answers of “2, somewhat agree” and “3, somewhat disagree” with each question, indicating a generally neutral level of awareness.

This tepid response is both discouraging and encouraging—discouraging because the patient population spread across the whole of North Texas is neutral in its community resource awareness; encouraging primarily for two reasons: Though low community awareness appears to correlate with low median household income and a high crime rate, this study’s objective arm of asset mapping showed an abundance of resources in areas that fare poorly in income and crime. Further, if awareness is low but sufficient resources exist, no new resources must be created, patients merely need be connected with these resources to improve their self-efficacy.

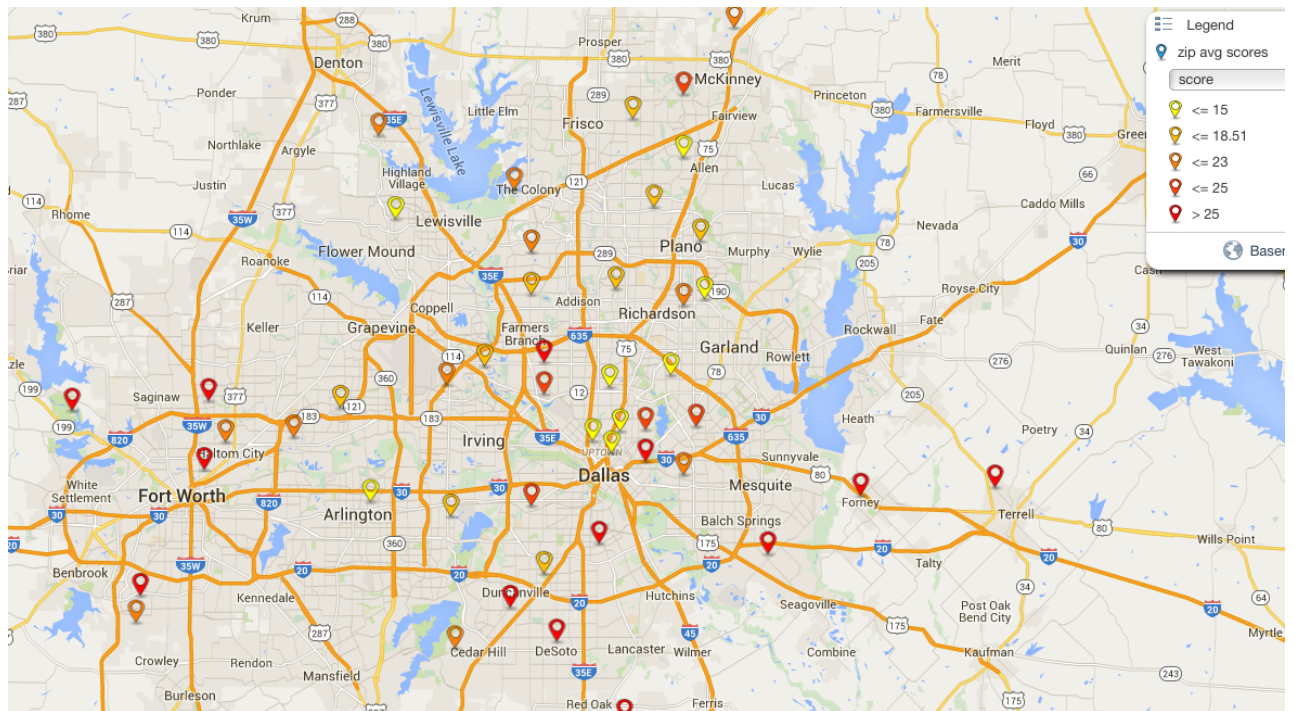


Figure 9: Mapped survey scores across north Texas ZIP codes; 74 surveys from 53 ZIP codes

Chapter 4: Conclusions and Recommendations for Acres of Diamonds

DISCUSSION

One constraint of this study’s resource mining and mapping process was being limited to only those resources that were searchable online. If resources in underserved areas were more likely to have lacked an online presence, this may suggest that areas that fare poorly in economic measures have a relatively greater resource abundance when corrected for underrepresentation by this study’s search method. An additional limitation was the inability to see inventories of mapped resources, forcing the assumption, for example, that establishments loosely—and perhaps generously—called grocery stores automatically meant access to fresh produce. A tool that could be useful in future studies, if consistently applied, is online reviews of inventoried resources, though this may introduce further subjectivity to what is otherwise considered an “objective measure” of this study.

The main conclusions found through the two arms of this study are twofold. Community resources abound throughout Dallas. Across the 14 catalogued and mapped ZIP codes, resources in the categories of exercise, nutrition, and diabetes management were readily identified, with a mean resource tally of 21.1. Though the number of resources does not vary greatly from one ZIP code to the next, there is variation in the constellation of these resources that may be important but is not statistically significant from the currently gathered data.

Resource awareness involved cultivating the voice of the customer and was underpowered in this study for the sole reason that patients visited UTSW from a broader-than-expected geography. 74 surveys might have provided useful data had they represented only 10 ZIP codes. The breadth of patient neighborhoods, however, reduced the representativeness of these surveys, and future work should involve collection of many hundreds more surveys to have meaningful results for each mapped ZIP code.

As a pilot project, this study illuminated multiple methods for easily and effectively mapping community resources. Extending these techniques with the aid of sophisticated mapping software can quickly increase the scope and scale of future mapping projects to produce more consistently sourced maps that represent resources across a statistically meaningful constellation of assets. From the results attained in this small sample, it appears that resources are plentiful throughout Dallas County, but an inconsistently distributed awareness means resources may be underutilized.

An advantage to this scenario is that the cost of connecting patients to existing resources is likely less than the cost of developing new resources, particularly new public parks and new community health clinics. After mapping and additional awareness surveys are

concluded, the next phase of this project will involve determining a baseline of self efficacy of the UTSW patient population through the Stanford Chronic Disease Self-efficacy Scales.¹³ After additional maps are created, they will be accessible to both healthcare providers through the EMR and to patients through a customized web portal. Finally, toward the end of this intervention, the Stanford self-efficacy scales will be re-administered to determine whether the intervention had the desired meaningful effects, demonstrated by key outcome measures. These measures are increased self-efficacy and the ultimate end outcome for this project—a lower average HbA1c. These interventions will permit a truly patient-centered model of care that tailors lifestyle changes to patient's communities and unique backgrounds. With concerted efforts to tie the health system and the community together, this project's long-term intervention is to leverage the 99.6% of waking hours spent in the community and to thereby increase the number and intensity of mastery experiences. With these interventions, patients should see an improvement in their diabetes self-care and their overall quality of life, and society should see a decreased disease burden and diabetes-related healthcare expenditure. Centered in the belief that optimal access to optimal resources improves patient self-efficacy and chronic disease management, this project is the foundation for future work in the population health arena, hopefully one that will make a dent in the Dallas diabetes epidemic.

¹³ "Chronic Disease Self-Efficacy Scales - Research Instruments Developed, Adapted Or Used By The Stanford Patient Education Research Center - Patient Education - Department Of Medicine - Stanford University School Of Medicine". *Patienteducation.stanford.edu*. N.p., 1996. Web. 24 Oct. 2015.

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APPENDIX A: A ZIP CODE ASSET CATALOGUE

Name of Place	Address	Type of Place	Nutrition	Exercise	Diabetes Management	Description
1 Tom Thumb	210 E. Pleasant Run Rd, Desoto Shopping Center, DeSoto, TX 75115		x		x	Includes pharmacy
2 ALDI	102 W Pleasant Run Rd, DeSoto, TX 75115		x			Discount grocery
3 Kroger	1001 N Beckley Ave, DeSoto, TX 75115		x		x	Includes pharmacy
4 Albertsons Market	1300 W Belt Line Rd, DeSoto, TX 75115		x			
5 Walmart Neighborhood Market	108 W Parkerville Rd, DeSoto, TX 75115		x			
6 Daily Food Mart	900 N Polk St #102, DeSoto, TX 75115		x			
7 Walgreens	731 W Belt Line Rd, DeSoto, TX 75115				x	
8 Walgreens	734 E Pleasant Run Rd, DeSoto, TX 75115				x	
9 Walmart Super Center	951 W Belt Line Rd, DeSoto, TX 75115		x	x	x	
10 Health Food Center	Desoto Shopping Center, 204 E Pleasant Run Rd # 112, DeSoto, TX 75115		x			
11 GNC	The Rose Garden Antique Mall, 901 N Polk St # 350, DeSoto, TX 75115		x			
12 Healthy Life Styles for Tru Friends	1630 Falcon Dr, DeSoto, TX 75115		x			Non-profit organization- focused on community health
13 Jack in the Box	901 N Hampton Rd, DeSoto, TX 75115		x			Negative Resource
14 McDonald's	804 N Hampton Rd, DeSoto, TX 75115		x			Negative Resource
15 Wendy's	1304 E Pleasant Run Rd, DeSoto, TX 75115		x			Negative Resource
16 Sonic	1484 N Hampton Rd, DeSoto, TX 75115		x			Negative Resource
17 Kentucky Fried Chicken	915 N Interstate 35 E, DeSoto, TX 75115		x			Negative Resource
18 Whataburger	961 W Belt Line Rd, DeSoto, TX 75115		x			Negative Resource
19 Golden Chicken	106 S Cockrell Hill Rd, DeSoto, TX 75115		x			Negative Resource
20 Dairy Queen	625 N Hampton Rd, DeSoto, TX 75115		x			Negative Resource
21 Twister Spirit Athletics	100 Euell Dr, DeSoto, TX 75115			x		Children's cheerleading
22 CrossFit 3816	1516 Ogney Dr #201, DeSoto, TX 75115			x		
23 Uptains Pilates and Professional	712 N Hampton Rd # 210, DeSoto, TX 75115			x		
24 Curves	East Townsend Square, 900 N Polk St #104, DeSoto, TX 75115			x		
25 Gold's Gym Express	1001 N Beckley Ave #240b, DeSoto, TX 75115			x		
26 Camp Gladiator	400 N Hampton Rd, DeSoto, TX 75115			x		
27 Swim Strong Fitness	708 Heather Knoll Dr, DeSoto, TX 75115			x		
28 DeSoto City Library	211 E Pleasant Run Rd # C, DeSoto, TX 75115				x	
29 Premier Health Care	1666 N Hampton Rd # 200, DeSoto, TX 75115				x	Primary Care Hospital
30 Grimes Park	501 E Wintgreen Rd, DeSoto, TX 75115					
31 Ernie Roberts Park	515 E Pleasant Run Rd, DeSoto, TX 75115			x		
32 Ruby Young Elementary School	707 Young Blvd, DeSoto, TX 75115			x		Elementary school with a field
33 Les Zeiger Park	400 Eagle Dr, DeSoto, TX 75115			x		
34 Briarwood Park	1625 W Belt Line Rd, DeSoto, TX 75115			x		
35 Kiva Park	1155 Beaverbrook Ln, DeSoto, TX 75115			x		

75115

Name of Place	Address	Type of Place	Nutrition	Exercise	Diabetes Management
1 Super Mercado Monterrey	300 E Jefferson Blvd, Dallas, TX 75203	Grocery Store	x		
2 QT Food Mart	1227 Morrell Ave, Dallas, TX 75203	Grocery Store	x		
3 Grocery Store	2823 Cedar Crest Blvd, Dallas, TX 75203	Grocery Store	x		
4 Friendly Food Store	2200 Cedar Crest Blvd, Dallas, TX 75203	Grocery Store	x		
5 Kiest Market	3807 E Kiest Blvd, Dallas, TX 75203	Grocery Store	x		
6 Seven Day Grocery	2232 S Corinth St Rd, Dallas, TX 75203	Grocery Store	x		
7 Eloise Lundy Recreation Center	1228 Sabine St, Dallas, TX 75203	Gym		x	
8 Lake Cliff Park	300 East Colorado Blvd., Dallas, TX 75203	Park		x	
9 Turner Plaza	500 E. Jefferson Blvd., Dallas, TX 75203	Plaza		x	
10 Kessler Parkway Park	1821 Kessler Pkwy, Dallas, TX 75203	Park		x	
11 Oak Cliff Founders Park	507 E Colorado Blvd., Dallas, TX 75230	Park		x	
12 Marsalis Park	603-799 S Marsalis Ave., Dallas, TX 75203	Park		x	
13 Tama Park	419 S Moore St, Dallas, TX 75203	Park		x	
14 Moore Park	1900 E 8th St, Dallas, TX 75203	Park		x	
15 Cedar Crest Golf Course	1800 Southerland Ave, Dallas, TX 75203	Golf Course		x	
16 Bonnieview Park/ Pool	1211 Hutchins Rd., Dallas, TX 75203	Pool		x	
17 Sargent Park	2825 Sargent Rd., Dallas, TX 75203	Park		x	
18 Methodist Dallas Medical Center	1441 N Beckley Ave, Dallas, TX 75203	Medical Center			x
19 Walgreens Pharmacy	1306 N BECKLEY AVE DALLAS, TX 75203	Pharmacy			x
20 Bluit's Pharmacy	2809 Cedar Crest Blvd, Dallas, TX 75203	Pharmacy			x

75203

Name of Place	Address	Type of Place	Nutrition	Exercise	Diabetes Management
1 CPI Foods Inc	4744 Gretna St, Dallas, TX 75207	Grocery Store	x		
2 Big C Food Mart	2240 Irving Blvd, Dallas, TX 75207	Grocery Store	x		
3 Veggie Boy	2212 Irving Blvd, Dallas, TX 75207	Grocery Store	x		
4 Produccion Del Campo Mexicano	106 Express St, Dallas, TX 75207	Grocery Store	x		
5 1825 Market Center	1825 Market Center Blvd # 388, Dallas, TX 75207	Grocery Store	x		
6 Elmers Drive-in Grocery	2101 S Riverfront Blvd, Dallas, TX 75207	Grocery Store	x		
7 Txsonya Inc	201 Corinth St, Dallas, TX 75207	Grocery Store	x		
8 Trinity Strand Trail	Trinity Strand Trail, Dallas, TX 75207	Running trail		x	
9 Trinity River Greenbelt Park and associated trails	3700 Sylvan Ave, Dallas, TX 75207	Park		x	
10 Reunion Arena Park	301 Hyatt Regency Hotel Dr., Dallas, TX 75207	Park		x	
11 Trinity Overlook Park	110 W Commerce St., Dallas, TX 75207	Park		x	
12 Coram Healthcare	1444 Oak Lawn Ave # 54S, Dallas, TX 75207	Pharmacy			x
13 Meridian Pharmacy Group	2730 N Stemmons Fwy # 813, Dallas, TX 75207	Pharmacy			x

75207

Name of Place	Address	Type of Place	Nutrition	Exercise	Diabetes Management
1 Tom Thumb	315 S Hampton Rd Dallas, TX 75208	Grocery Store	x		
2 Fiesta	611 W Jefferson Dallas, TX 75208	Grocery Store	x		
3 Cox Farms Market	778 Fort Worth Ave, Dallas, TX 75208	Grocery Store	x		
4 Gonzalez Food Products	1610 Fort Worth Ave, Dallas, TX 75208	Grocery Store	x		
5 Elrod's Cost Plus Supermarket	2025 Fort Worth Ave, Dallas, TX 75208	Grocery Store	x		
6 Seven Mart Food Store	501 W Davis St, Dallas, TX 75208	Grocery Store	x		
7 Jerry's Supermarkets Inc	532 W Jefferson Blvd, Dallas, TX 75208	Grocery Store	x		
8 La Michoacana Meat Market	800 W Jefferson Blvd, Dallas, TX 75208	Grocery Store	x		
9 Tienda de Tarjetas	1317 W Davis St, Dallas, TX 75208	Grocery Store	x		
10 De La Fuente's Produce	1424 W Davis St, Dallas, TX 75208	Grocery Store	x		
11 One Stop Food Store	2017 W Davis St, Dallas, TX 75208	Grocery Store	x		
12 Crown Grocery and Deli	1210 S Hampton Rd, Dallas, TX 75208	Grocery Store	x		
13 La Guadalupeana Meat Market	902 S Hampton Rd, Dallas, TX 75208	Meat Market	x		
14 Tienda Santa Rosa	611 S Hampton Rd, Dallas, TX 75208	Grocery Store	x		
15 Stevens Park Golf Course	1005 N Montclair Ave, Dallas, TX 75208	Golf Course		x	
16 Kidd Springs Park/ Swimming Pool	711 W Canty St, Dallas, TX 75208	Park		x	
17 Greiner Park	600 S Montclair Ave., Dallas, TX, 75208	Park		x	
18 Edgefield Park	810 N Edgefield Ave., Dallas, TX, 75208	Park		x	
19 Stemmons Plaza Park	107 W Jefferson Blvd., Dallas, TX, 75208	Park		x	
20 Ruth Meade Park	800 S Van Buren Ave., Dallas, TX, 75208	Park		x	
21 Twelve Hills Nature Center	900 Mary Cliff Rd., Dallas, TX, 75208	Nature Center		x	
22 Golden Cross Academic Clinic	122 W Colorado Blvd, Dallas, TX 75208	Clinic			x
23 Avita Pharmacy	219 Sunset Ave, Dallas, TX 75208	Pharmacy			x
24 Ravens Pharmacy	820 N Zang Blvd #120, Dallas, TX 75208	Pharmacy			x
25 Tom Thumb Pharmacy	315 S Hampton Rd, Dallas, TX 75208	Pharmacy			x

75208

Name of Place	Address	Type of Place	Nutrition	Exercise	Diabetes Management
1 Minyard Food Stores	3230 Martin Luther King Jr Blvd, Dallas, TX 75210	Grocery Store	Y		Y
2 Fair Park Grocery	2203 Lagow St, Dallas, TX 75210	Grocery Store	Y		
3 Hackney Food	4815 Collins Ave, Dallas, TX 75210	Grocery Store	Y		
4 Brotherhood Food Mart	2803 Lagow St, Dallas, TX 75210	Grocery Store	Y		
5 Holland Farm	4537 Elsie Faye Heggins St, Dallas, TX 75210	Grocery Store	Y		
6 Dixon Grocery	3752 Dixon Ave, Dallas, TX 75210	Grocery Store	Y		
7 Lee's Food Market	3839 Dixon Ave, Dallas, TX 75210	Grocery Store	Y		
8 Save-A-Lot	3021 Martin Luther King Jr Blvd, Dallas, TX 75215	Grocery Store	Y		
9 Southside Grocery	4630 Elsie Faye Heggins St, Dallas, TX 75210	Grocery Store	Y		
10 TMA Grocery Beer & Wine	302 S 2nd Ave, Dallas, TX 75210	Grocery Store	Y		
11 By Lo Grocery	4126 Metropolitan Ave, Dallas, TX 75210	Grocery Store	Y		
12 Diabetes Health and Wellness Institute	4500 Spring Ave, Dallas, TX	Community Health Center		Y	Y
13 Martin Luther King Jr. Family Clinic	2922 Martin Luther King Jr Blvd, Dallas, TX 75215	Community Health Center			Y
14 Hatcher Station Health Center	4600 Seyene Rd, Dallas, TX 75210	Community Health Center			Y
15 Texas Discovery Gardens	Fair Park, 3601 Martin Luther King Jr Blvd, Dallas, TX 75210	Garden		Y	
16 Juanita J. Craft Swimming Pool	3125 Lyons St, Dallas, TX 75210	Pool		Y	
17 Fair Park	1300 Robert B Cullum Blvd, Dallas, TX 75210	Sports Complex		Y	
18 Shearith Israel Memorial Park	Dolphin Rd, Dallas, TX 75223	Park		Y	
19 Juanita Craft Park		Park		Y	
20 Wahoo Park		Park		Y	
21 Walgreens	1461 Robert B Cullum Blvd, Dallas, TX 75210	Pharmacy			Y
22 Larry Johnson Rec Center	3700 Dixon Ave, Dallas, TX 75210	Rec Center		Y	

75210

Name of Place	Address	Type of Place	Nutrition	Exercise	Diabetes Management	Description
1 R&J Grocery Store	3439 Maybeth St, Dallas, TX 75212	Grocery Store	x			
2 Pepe's Grocery	4819 Bernal Dr, Dallas, TX 75212	Grocery Store	x			
3 Foodland Supermarket	4639 Singleton Blvd, Dallas, TX 75212	Grocery Store	x			
4 Jerry's Market	3301 Bernal Dr, Dallas, TX 75212	Grocery Store	x			
5 Food International of Dallas	2950 W Commerce St, Dallas, TX 75212	Grocery Store	x			
6 Chef's Produce Co	1654 Terre Colony Ct, Dallas, TX 75212	Grocery Store	x			
7 Dallas USA Foods	1880 Lone Star Dr, Dallas, TX 75212	Grocery Store	x			
8 Minyard Food Stores	2223 Singleton Blvd, Dallas, TX 75212	Grocery Store	x			
9 Jerry's Supermarket	1719 Singleton Blvd, Dallas, TX 75212	Grocery Store	x			
10 Fish Trap Lake Park	3309-3649 Fish Trap Rd, Dallas, TX, 75212	Park		x		
11 Mattie Nash-Myrtle Davis Park	3710 N Hampton Rd, Dallas, TX 75212	Park		x		
12 Benito Juarez Park	3352 N Winnetka Ave, Dallas, TX 75212	Park		x		
13 Johnny Oates Baseball Field	2111 Bickers St, Dallas, TX 75212	Park		x		
14 Jaycee Zarazoga Park/ Recreation Center	3114 Clymer St, Dallas, TX 75212	Park		x		
15 Tipton Park	3607 Magdeline, Dallas, TX, 75212	Park		x		
16 Kingsbridge Park	3019 Bickers St., Dallas, TX, 75212	Park		x		
17 North Hampton Park	3300 N Hampton Rd, Dallas, TX, 75212	Park		x		
18 Hattie Rankin Moore Park	801-899 Duluth St., Dallas, TX, 75212	Park		x		
19 Hattie Rankin Moore Swim Pool	3122 N Winnetka Ave, Dallas, TX 75212	Pool		x		
20 Anita Martinez Recreation Center	3212 N Winnetka Ave, Dallas, TX 75212	Gym		x		
21 Bickers Park	1421 Bickers St., Dallas, TX 75212	Park		x		
22 Pueblo Park	3226 Bataan St., Dallas, TX, 75212	Park		x		
23 Lakewest Family YMCA	3737 Goldman Ave Dallas, TX 75212	Gym		x		
24 Los Barrios Unidos Community Clinic	809 Singleton Blvd, Dallas, TX 75212	Clinic			x	
25 Brother Bill's Helping Hand	3906 N Westmoreland Rd, Dallas, TX 75212	Community Center		x	x	
26 Cut-Rate Pharmacy	3528 N Hampton Rd, Dallas, TX 75212	Pharmacy			x	

75212

Name of Place	Address	Type of Place	Nutrition	Exercise	Diabetes Management
1 Park South YMCA	2500 Romine Ave, Dallas, TX 75215	YMCA		Y	
2 Opportunity Park	3105 Pine St, Dallas, TX 75215	Park		Y	
3 Mildred L. Dunn Park	3300 Carpenter Ave, Dallas, TX 75215	Park		Y	
4 Lord & A Pharmacy	2949 Martin Luther King Jr Blvd # 1, Dallas, TX 75215	Pharmacy			Y
5 Dr. Deano's Pharmacy	4432 Malcolm X Blvd, Dallas, TX 75215	Pharmacy			Y
6 Dallas Diabetes Awareness Progra	2922 Martin Luther King Jr Blvd, Dallas, TX 75215	City Government Office		Y	Y
7 Exline Recreation Center	2525 Pine St, Dallas, TX 75215	Rec Center		Y	
8 MLK Jr. Park	2901 Pennsylvania Ave, Dallas, TX, 75215	Park		Y	
9 Nelson Park				Y	
10 Urban Market	South Side on Lamar, 1409 S Lamar St, Dallas, TX 752	Grocery Store	Y		
11 Shop N Go Grocery	1909 S Cesar Chavez Blvd, Dallas, TX 75215	Grocery Store	Y		
12 Grand City Grocery	3026 Grand Ave, Dallas, TX 75215	Grocery Store	Y		
13 Fresh Produce Co	2800 Logan St, Dallas, TX 75215	Grocery Store	Y		
14 Green Produce	2424 S Cesar Chavez Blvd, Dallas, TX 75215	Grocery Store	Y		
15 Smith & Rohde Produce Co	2428 Harrison Ave, Dallas, TX 75215	Grocery Store	Y		
16 Save-A-Lot Grocery	3021 Martin Luther King Jr Blvd, Dallas, TX 75215	Grocery Store	Y		
17 Meadow Food Market	3312 Meadow St, Dallas, TX 75215	Grocery Store	Y		
18 Dallas Supermart	2410 Pine St, Dallas, TX 75215	Grocery Store	Y		
19 Four Seasons Grocery	3945 Myrtle St, Dallas, TX 75215	Grocery Store	Y		
20 Allen's Grocery Market	2500 Lawrence St, Dallas, TX 75215	Grocery Store	Y		
21 TC Grocery	5109 Bexar St, Dallas, TX 75215	Grocery Store	Y		
22 JBC Market	6411 Bexar St, Dallas, TX 75215	Grocery Store	Y		
23 Turner Courts Rec Center	6601 Bexar St, Dallas, TX 75215	Rec Center		Y	
24 William Blair Jr. Park	3000 Rochester St, Dallas, TX 75215	Park		Y	

75215

Name of place	Address	Type of Place	Nutrition	Exercise	Di
1 Minyard Food Store	2130 E Ledbetter Dr, Dalla	Grocery store	x		
2 Autry's Grocery Store	4903 S Lancaster Rd, Dalla	Grocery store	x		
3 Vermont Grocery Store	819 Vermont Ave, Dallas,	Grocery store	x		
4 Ann Arbor Food Store	1562 E Ann Arbor Ave, Dal	Grocery store	x		
5 Hi Ho Grocery	105 E Saner Ave, Dallas, T	Grocery store	x		
6 Save-a-lot	2611 S Lancaster Rd, Dalla	Grocery store	x		
7 Food Rite	2215 S Marsalis Ave, Dalla	Grocery store	x		
8 Fiesta Mart	3030 S Lancaster Rd, Dalla	Grocery store	x		
9 Gold Star Food Store	2837 E Ledbetter Dr, Dalla	Grocery store	x		
10 Pal's Food Mart	2307 E Ann Arbor Ave, Dal	Grocery store	x		
11 Stop 'n Save Market	1406 E Overton Rd, Dallas,	Grocery store	x		
12 Sam Food Market	717 E Ann Arbor Ave, Dalli	Grocery store	x		
13 Quick Check Grocery	3034 E Illinois Ave, Dallas,	Grocery store	x		
14 Cummings Park	2900 Cummings St, Dallas,	Park		x	
15 Veterans Park	4600 Veterans Dr, Dallas,	Park		x	
16 Glendale Park	1515 E Ledbetter Dr, Dalla	Park		x	
17 Moorland Family YMCA	907 E Ledbetter Dr, Dallas,	Gym		x	
18 Cummings Recreation Center	2996 Cummings St, Dallas,	Recreation center		x	
19 JC Phelps Recreation Center	3030 Tips Blvd, Dallas, TX	Recreation center		x	
20 Fruitdale Recreation Center	4408 Vandervort Dr, Dalla	Recreation center		x	
21 Lisbon Swimming Pool	4700 Horizon Dr, Dallas, T	Public pool		x	
22 Bluit-Flowers Health Center	303 E Overton Rd, Dallas,	Community clinic			x
23 VA North Texas	4500 S Lancaster Rd, Dalla	Hospital			x
24 Walgreens	3211 S Lancaster Rd, Dalla	Pharmacy			x
25 CVS Pharmacy	5050 S Lancaster Rd, Dalla	Pharmacy			x

75216

Name of Place	Address	Type of Place	Nutrition	Exercise	Diabetes Management	Description
1 Pinnacle Facilities	1515 N Elm St	Lan medical clinic		Y		medical clinic that can help with blood glucose
2 Lancaster High Sc	200 E Wintergree	high school		Y		track outside to work out on
3 Cedardale Park	Lancaster Texas	7 park		Y		place to work out at
4 Rasson Abraham	2962 S Longhorn C	pharmacy	Y		Y	likely to have some healthy food options, diabetes medication, as well as blood pressure monitors
5 Lancaster Public Li	1600 Veterans Mer	library			Y	possibly help with diabetes management

75134

Name of Place	Address	Type of Place	Nutrition	Exercise	Diabe
1 Janie C Turner Rec Center	6424 Elam Rd, Dallas, TX 75217	Rec Center		Y	
2 Trinity River Audubon Center	6500 S Great Trinity Forest Way, Dallas, TX 75217	Park		Y	
3 Fireside Rec Center	8601 Fireside Dr, Dallas, TX 75217	Rec Center		Y	
4 Crawford Memorial Park	8700 Elam Rd, Dallas, TX 75217	Park		Y	
5 Community Health Integrated	7905 Komalty Dr, Dallas, TX 75217	Health Center			Y
6 Southwest Dallas Health Center	9202 Elam Rd, Dallas, TX 75217	Health Center			Y
7 Malone's Cost Plus	7007 Lake June Rd, Dallas, TX 75217	Grocery Store	Y		
8 El Rancho Supermarket	Pleasant Grove Shopping Center, 1515 S E	Grocery Store	Y		
9 Hunt's Food Store	Loop No 12 South Shopping Center, 7932	Grocery Store	Y		
10 Malone's Cost Plus	St Augustine Shopping Center, 333 S St A	Grocery Store	Y		
11 Hilda's Grocery	1016 Murdock Rd, Dallas, TX 75217	Grocery Store	Y		
12 La Michoacana Meat Market	1506 S Buckner Blvd, Dallas, TX 75217	Grocery Store	Y		
13 Minyard Food Store	10121 Lake June Rd # 200, Dallas, TX 75217	Grocery Store	Y		
14 El Rio Grande	10325 Lake June Rd, Dallas, TX 75217	Grocery Store	Y		
15 Mom's Grocery	10819 Elam Rd, Dallas, TX 75217	Grocery Store	Y		
16 CVS Pharmacy	1235 S Buckner Blvd, Dallas, TX 75217	Pharmacy			Y
17 Walgreen's	2060 S Buckner Blvd, Dallas, TX 75217	Pharmacy			Y
18 Elam's Pharmacy	9209 Elam Rd # 105, Dallas, TX 75217	Pharmacy			Y
19 Grove Medical Center Pharmacy	1143 S Buckner Blvd # 121, Dallas, TX 75217	Pharmacy			Y
20 CSA Pharmacy	10325 Lake June Rd, Dallas, TX 75217	Pharmacy			Y
21 Mahrouq Eyad K	Pleasant Grove Shopping Center, 1515 S E	Pharmacy			Y

75217

Name of Place	Address	Type of Place	Nutrition	Exercise	Diabetes Management	Description
1 Ann's Health Food Center and Market	2634 S Zang Blvd., Dallas, TX, 75224	Health Food	x			
2 Kroger	752 Wynnewood Village Shp Ctr Dallas, TX 75224	Grocery Store	x			
3 Fiesta	2225 West Ledbetter Dallas, TX 75224	Grocery Store	x			
4 El Rancho	Wynnewood Village, 655 W Illinois Ave, Dallas, TX 75224	Grocery Store	x			
5 Rainbow Food Store	2517 S Beckley Ave, Dallas, TX 75224	Grocery Store	x			
6 6-Twelve Food Store	1910 S Edgefield Ave, Dallas, TX 75224	Grocery Store	x			
7 Maria's Nopalitos	1323 Berkley Ave, Dallas, TX 75224	Grocery Store	x			
8 Covarrubias Mexican Products	1610 Wilbur St, Dallas, TX 75224	Grocery Store	x			
9 Jerry's Supermarkets Inc	2314 W Illinois Ave, Dallas, TX 75224	Grocery Store	x			
10 Save-A-Lot	1150 W Kiest Blvd #201, Dallas, TX 75224	Grocery Store	x			
11 Swann's Market	543 Early Dawn Trail, Dallas, TX 75224	Grocery Store	x			
12 Everything Market	Accessory Plaza, 4515 Village Fair Dr, Dallas, TX 75224	Grocery Store	x			
13 Kiest Park	3080 S Hampton Rd, Dallas, TX 75224	Park		x		
14 Beckley-Saner Park/Recreation Center	114 W Hobson Ave, Dallas, TX 75224	Park		x		
15 Elmwood Park	1900 Rugged Dr., Dallas, TX, 75224	Park		x		
16 Gannon Park	1333 S Zang Blvd., Dallas, TX, 75224	Park		x		
17 Falcon Field	3900 Rugged Dr., Dallas, TX, 75224	Baseball Field		x		
18 Oak West Health Center - Dallas	4201 Brook Spring Dr, Dallas, TX 75224	Clinic			x	
19 CVS Pharmacy	2323 W Illinois Ave, Dallas, TX 75224	Pharmacy			x	
20 Kroger Pharmacy	752 Wynnewood Dr, Dallas, TX 75224	Pharmacy			x	
21 Walgreens Pharmacy	438 W Illinois Ave, Dallas, TX 75224	Pharmacy			x	
22 Recept Pharmacy	2225 Vatican Ln, Dallas, TX 75224	Pharmacy			x	
23 Hampton Allied Pharmacy	2701 S Hampton Rd, Dallas, TX 75224	Pharmacy			x	
24 Longhorn Pharmacy	2301 S Hampton Rd, Dallas, TX 75224	Pharmacy			x	
25 Wynnewood Village Pharmacy	501 Wynnewood Village Shopping Center, Dallas, TX 75224	Pharmacy			x	

75224

Name of Place	Address	Type of Place	Nutrition	Exercise	Diabetes Management	Description
1 ALDI	8034 Chrysalis Dr, Dallas, TX 75237	Grocery Store	x			Discount grocery
2 Walmart Super Center	200 Short Blvd, Dallas, TX 75232	Grocery Store	x	x	x	Fast food, pharmacy, and walking space
3 Church's Fried Chicken	1025 W Camp Wisdom Rd, Dallas, TX 75232	Fast Food	x			Negative resource
4 McDonald's	125 W Camp Wisdom Rd, Dallas, TX 75232	Fast Food	x			Negative resource
5 Dairy Queen	8150 S Polk St, Dallas, TX 75232	Fast Food	x			Negative resource
6 Carl's Jr.	8800 S Polk St, Dallas, TX 75232	Fast Food	x			Negative resource
7 Smoothie Factory	8702 S Polk St, Dallas, TX 75232	Health Food	x			
8 Minyard Food Stores	1201 W Camp Wisdom Rd, Dallas, TX 75232	Grocery Store	x			
9 Walgreens	1060 W Camp Wisdom Rd, Dallas, TX 75232	Pharmacy			x	
10 Twin Fall's Park	6300 S Polk St, Dallas, TX 75232	Public Park		x		Small neighborhood park
11 Beckley Heights Park	6661 Greenspan Ave, Dallas, TX 75232	Public Park		x		Park is connected to the school
12 David W. Carter High School	1819 W Wheatland Rd, Dallas, TX 75232	Public School		x		Contains an outdoor track
13 Birdie Alexander Elementary School	1830 Goldwood Dr, Dallas, TX 75232	Public School		x		Contains an outdoor field
14 Umphrey Lee Elementary School	7808 Racine Dr, Dallas, TX 75232	Public School		x		Contains an outdoor basketball court
15 Danieldale Park	300 W Wheatland Rd, Dallas, TX 75232	Public Park		x		Official address given is slightly farther away from the actual park
16 The Golf Club of Dallas	2200 W Red Bird Ln, Dallas, TX 75232	Gold Club		x		Costs money
17 CVS Pharmacy	2420 W Wheatland Rd, Dallas, TX 75237	Pharmacy			x	
18 McAllen Medical Center	4373 S Hampton Rd, Dallas, TX 75232	Medical Center			x	
19 Polk-Wisdom Library	7151 Library Ln, Dallas, TX 75232	Public Library			x	

75232

Name of Place	Address	Type of Place	Nutrition	Exercise	Diabetes Management	Description
1 My T Quick Food Store	4330 Gannon Ln # A, Dallas, TX 75237	Grocery Store	x			Small Grocery Store
2 Sam's Club	2900 W Wheatland Rd, Dallas, TX 75237	Grocery Store	x			Whole sale, membership required
3 Long John Silver's	4355 W Camp Wisdom Rd, Dallas, TX 75237	Fast Food Restaurant	x			Negative resource
4 Taco Cabana	4355 W Camp Wisdom Rd, Dallas, TX 75237	Fast Food Restaurant	x			Negative resource
5 KFC	3415 W Camp Wisdom Rd, Dallas, TX 75237	Fast Food Restaurant	x			Negative resource
6 Whataburger	3222 W Camp Wisdom Rd, Dallas, TX 75237	Fast Food Restaurant	x			Negative resource
7 Burger King	7300 S. Cockrell Hill Road, Dallas, TX 75236	Fast Food Restaurant	x			Negative resource
8 Wings & More Place	7555 S Westmoreland Rd, Dallas, TX 75237	Fast Food Restaurant	x			Negative resource
9 North Texas Food Bank	4500 S Cockrell Hill Rd, Dallas, TX 75236	Food Bank	x			Negative resource
10 Planet Fitness	3200 Camp Wisdom Dr, Dallas, TX 75237	Fitness Center		x		24 hours gym
11 Oak Cliff YMCA	6701 S Hampton Rd, Dallas, TX 75232	Community Fitness Center		x		
12 Boulder Park	6600 Pastor Bailey Dr, Dallas, TX 75237	Public Park		x		Biking and Running Trail
13 Southwest Center Mall	3662 W Camp Wisdom Rd, Dallas, TX 75237	Shopping Mall		x	x	Mall for walking, contains GNC for nutritional supplies
14 Methodist Charlton Medical Center	3500 W Wheatland Rd, Dallas, TX 75237	Hospital			x	
15 Texas Nutrition Consulting Group	4848 S Cockrell Hill Rd, Dallas, TX 75236	Health-related Business			x	Custom nutrition plans
16 A&C Discounts Pharmacy	8067 W Virginia Dr, Dallas, TX 75237	Pharmacy			x	
17 Walmart Supercenter	4111 Mint Way, Dallas, TX 75237	Grocery Store	x	x	x	Contains fast food, pharmacy, and walking space
18 Meadow Stone Park	3150 Bainbridge Dr, Dallas, TX 75237	Public Park		x		Park is connected to the elementary
19 Target	39730 LBJ Fwy, Dallas, TX 75237	Grocery Store	x	x	x	Contains food, pharmacy, and walking space

75237

Name of Place	Address	Type of Place	Nutrition	Exercise	Diabetes Management	Description
1 Wilmer-Hutchins High School	5520 Langdon Road Dallas, TX 75241	High School		X		high school with outdoor track and field
2 Alta Mesa Park	Dallas, TX 75241	Park		X		park for exercise
3 Tommie M Allen Recreation Center	7071 Bonnie View Road Dallas, TX 75241	recreation center		X	X	gym with possible nutrition information
4 Tommie M Allen Swimming Pool	6901 Bonnie View Road Dallas, TX 75241	Public Swimming Pool		X		public swimming pool
5 JJ Lemmon Park	6100 J J Lemmon Road Dallas, TX 75241	Park		X		park for exercise
6 Singing Hills Park	Dallas, TX 75241	Park		X		park for exercise
7 Glendale Park	1515 E Ledbetter Drive Dallas, TX 75241	Park		X		park for exercise
8 Arden Terrace Park	2280-2358 E Pentagon Parkway Dallas, TX 75241	Park		X		park for exercise
9 College Park	Dallas, TX 75241	Park		X		park for exercise
10 Kennedy-Curry Middle School	6605 Sebring Drive Dallas, TX 75241	Middle School		X		
11 Trinity Forest Trail	Dallas, TX 75241	Park		X		park for exercise
12 Subway	S Lancaster Road Dallas, TX 75241	Restaurant	X			
13 Minyard Food Store, Inc.	2130 E Ledbetter Drive Dallas, TX 75241	Grocery/Pharmacy	X	X		
14 Red Bird Community Clinic	1251 E Red Bird Lane #A Dallas, TX 75241	Medical Clinic			X	
15 Fresenius Medical Care Kiest Station	5148 S Lancaster Road Dallas, TX 75241	Medical Clinic			X	
16 WIC	8702 S Lancaster Road Dallas, TX 75241		X		X	food and nutrition
17 Walgreens	5101 S Lancaster Rd, Dallas, TX 75241	Pharmacy	X	X	X	food, nutrition, small groceries

75241

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