Bringing Food Where Hunger Lives

GIS Mapping and Service Data Analysis for The Foodbank, Inc., Dayton, Ohio

This study provides data analysis and service area GIS maps for The Foodbank, Inc. serving Montgomery, Greene, and Preble counties in Ohio for the calendar year 2014, the first year food pantries utilized electronic client intake systems. Utilizing client service data, ArcGIS mapping, and interviews with local stakeholders, pockets of the community underserved by present food assistance programs are identified. Recommendations are provided to close gaps in service and improve emergency food access.

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April 29, 2015
Executive Summary

This study identifies and investigates geographic areas in Montgomery, Greene, and Preble counties in Ohio where individuals have difficulty accessing emergency food resources. Access to a great degree is a question of geography; however, The Foodbank, Inc. (Dayton, Ohio) is also interested in learning about any demographic factors that may affect equitable service delivery.

Until recently, The Foodbank received only county-level data regarding food insecurity from the national organization, Feeding America. In 2014, The Foodbank began requiring member-agency food pantries to utilize an electronic client intake system. This new data system provides the opportunity for more extensive data analysis about whom The Foodbank is and is not serving.

Findings

Montgomery County is the most populous county studied and has many individuals who qualify for food assistance. However, Montgomery County has an extensive food pantry network that appears to provide adequate coverage for the majority of the county with a couple important gaps in service. Preble and Greene counties are less populous and home to fewer hunger relief agencies resulting in multiple emergency food service gaps.
Recommendations

Each area has unique needs, one-size-fits-all recommendations would be imprudent.

The following recommendations could improve services for communities with the most need.

Greene County

1. **Fairborn & Xenia**- Increase strategic marketing of existing resources
2. **Bowersville**- Consider this village to host a mobile pantry
3. **Jamestown**- Increase marketing of existing resources; Advocate with farmer’s market to accept WIC/SNAP benefits
4. **Bath Township**- Increase strategic marketing of existing resources
5. **Bellbrook**- Actively seek a food pantry in this area; Consider hosting a mobile pantry
6. **Spring Valley**- Continue mobile pantry; Seek a small pantry to serve this area
7. **Yellow Springs**- Reach out to support Yellow Springs United Methodist Church

Preble County

1. Open a Hot Meal Site
2. **College Corner**- There appears to be an awareness problem here; pantries in Oxford, Ohio will provide food to College Corner residents
3. **Lake Lakengren**- Appears as an area of concern on map but is not; No action needed

Montgomery County

1. **West/Northwest Dayton & Ft. McKinley**- Pantry hours should be staggered; agencies need help improving capacity; Consider hosting mobile pantry
2. **Vandalia**- Reach out to support Vandalia-Butler Food Pantry
3. **Trotwood & New Lebanon**- Actively seek food pantries; host mobile pantry
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Acknowledgements

For their expert opinion, assistance with this project, and dedication to improving access to emergency food assistance with the use of specialized data, the authors would like to thank and acknowledge the following individuals:

Katy Anderson, Community Initiatives Manager, Roadrunner Food Bank of New Mexico
Tabatha Bennett, Community Programs Manager, Roadrunner Food Bank of New Mexico
Myron A. Levine, Ph.D., Capstone Project Advisor, Wright State University
Taryn McCook, Research and Evaluation Manager, Greater Chicago Food Depository
Kristen Mikelbank, Planning Coordinator, Greater Cleveland Regional Food Bank
Mark Mollenkopf, Strategic Solutions Developer, Mid-Ohio Foodbank
David Pickering, Strategic Solutions Specialist, Mid-Ohio Foodbank
Michelle Riley, Chief Executive Officer, The Foodbank, Inc.
Daniel J. Taitelbaum, Capacity Analysis Manager, The Greater Boston Food Bank
Sandy Williams, Director, HelpLink 2-1-1, United Way of the Greater Dayton Area
Stephanie Zidek, Analytics Manager, Feeding America
This study identifies and investigates geographic areas in Montgomery, Greene, and Preble counties in Ohio where individuals have difficulty accessing emergency food resources. As funding environments change, food banks are faced with making tough decisions about where resources are most equitably allocated. With limited time in a day and resources to go around, it is essential that decision makers are provided with the most complete information and analysis on which to base these decisions.

**Client**

The Foodbank, Inc. in Dayton, Ohio has a mission of acquiring and distributing food to member-agency nonprofits in Montgomery, Greene, and Preble counties. Member-agency nonprofits include soup kitchens, after-school meal programs, homeless shelters, domestic violence shelters, and food pantries.

There is no cost for an agency to be a food bank member and more than half of the food in The Foodbank’s warehouse is completely free. Member-agencies are charged 10 cents per pound for food items requiring extensive handling and a delivery fee if the agency chooses to have items delivered by The Foodbank, Inc. These minimal fees help The Foodbank provide nutritious and diverse food items to more than 100 hunger relief programs across its three-county service territory.
Project Definition

The Foodbank, Inc. is interested in identifying and investigating areas where individuals are unable to access emergency food resources. Access to a great degree is a question of geography; however, The Foodbank, Inc. (Dayton, Ohio) is also interested in learning about any demographic factors that may affect equitable service delivery.

Current Measures of Meeting Demand

Feeding America, formerly America’s Second Harvest Foodbanks, coordinates the efforts of food banks across the country. Feeding America provides resources to improve services and ensures that a robust network of food assistance is available to individuals and families. Three major gap identification tools provided to food banks by Feeding America include: the Hunger in America Study, Map the Meal Gap data, and Pounds per Person in Poverty dashboards.

Until recently, these three measures were the only metrics providing information to food banks about food insecurity in their area and how the need may, or may not, be met. Each measure provides aggregated data helping food banks identify large areas where attention is needed.

Key Terms

Public Food Assistance, refers to government assistance programs like Women Infants and Children (WIC) and the Supplemental Nutrition Assistance Program (SNAP, also called food stamps)

Private Food Assistance or Emergency Food Assistance refers to food pantries, soup kitchens, meals at shelters, and other programming generally completed by nonprofit organizations

Food Insecurity refers “to a household-level economic and social condition of limited or uncertain access to adequate food” (Nord & Prell, 2007)
However, these measures fall short of providing information for specific communities.

These county-level measures may lead a food bank to redirect resources from one county to another without fully understanding the challenges faced by a community. The decision could lead some areas to be over-served while other parts of the county are under-served. This disparity would be imperceptible with available reports as the information is aggregated to a county-level.

**Hunger in America**

Feeding America partners with the Urban Institute to conduct the hunger study every four years that is released as *Hunger in America*. This data is collected for each food bank’s service area which typically includes multiple counties. The study has two parts, an agency survey (conducted October through January) and a client survey (collected the following April through August). This study identifies costs, such as prescription medicine, that make purchasing food a challenge for individuals living in poverty as well as challenges faced by agencies distributing food to those individuals, such as not having full-time staff members. Data are combined for Montgomery, Greene, and Preble counties throughout the report. The Foodbank, Inc. uses this information to communicate local need with funding groups.
Map the Meal Gap

Feeding America’s Map the Meal Gap annually reports two types of data: (1) county-level food insecurity estimates and (2) estimates of additional money needed by food insecure individuals to meet their food needs (Feeding America, 2015). This data is combined to create an interactive map listing the average cost of a meal in a given county, estimated eligibility for food assistance, and overall food insecurity rates. Prior to the adoption of electronic client intake systems, Map the Meal Gap was the most current information food banks could access to understand which counties in their service area had the highest need.

Pounds per Person in Poverty (PPIP)

Pounds per person in poverty (PPIP)\(^1\) is a single easy-to-read internal dashboard provided by Feeding America. This dashboard compares the pounds of food distributed by a food bank with the number of individuals eligible for assistance in that area. Job and Family Services, a state agency overseeing public assistance programs, requires individuals receiving emergency food services to have income no higher than 200 percent of the poverty line. Each Feeding America food bank submits a quarterly report to Feeding America, detailing the total pounds of food received and distributed in their service area. This report falls short of identifying specific community needs by providing only county-level data.

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\(^1\) PPIP is calculated using the total number of pounds distributed by a member food bank divided by the total number of persons in poverty (at or below 100 percent threshold) as identified by the U.S. Census.
Evolving Opportunities

Feeding America has recognized the shortcomings of only reporting pounds of food and introduced a new measure, Meals per Person in Need (MPIN). MPIN attempts to recognize all hunger relief activities rather than just pounds of food distributed. The recent development of electronic client intake systems provides food banks with client-level data previously not available for programmatic decision making. These new measures will allow The Foodbank, Inc. to make more informed decisions concerning where food pantries should be located and what specific types of food are likely to be needed.

Meals per Person in Need (MPIN)

Feeding America is changing from the PPIP (Pounds per Person in Poverty) measure to utilizing MPIN (Meals per Person in Need)\(^2\). MPIN accounts for SNAP, or food stamp, applications in an area and removes water and non-food distributed items from the calculation. This new measure provides a more accurate account of a food bank’s efforts to relieve hunger. Compliance with Feeding America requires that food banks distribute at least 34.51 Meals per Person in Need (MPIN) in each county that a food bank serves (HungerNet, 2015).

\(^2\) MPIN is calculated as \([(\text{Pounds Distributed - Water & Non-Food Pounds}) + \text{SNAP Meals using SNAP calculator} + \text{Pounds Distributed by others}] / \text{Persons in Need determined through Map the Meal Gap. Pounds are converted to meals using the formula 1.2 pounds = 1 Meal} \) (HungerNet, 2015).
Electronic Client Intake

Food pantries across the United States operate with paper-based Emergency Food Assistance Program (TEFAP) forms designed by the United States Department of Agriculture (USDA) and Job and Family Services departments in each state. A common problem cited in reviewed literature and interviews indicated that these forms are filed in a cabinet and only reviewed in the event of audit.

Commercial software companies were contracted by some food banks to develop electronic client intake systems to eliminate paper forms and allow data analysis. Commercial products used in Ohio include VESTA and Virtual Case Manager (VCM). Multiple similar products exist in different areas of the United States, each operating with a fee and many requiring specialized equipment. Agencies report finding VCM cumbersome as it requires a web-camera, signature pad, and specialized cards to be used with client intake. In addition to the system fees, these items can mean a significant investment for a food pantry. A second system, VESTA, is used by Freestore Foodbank in Cincinnati but has not been used in The Foodbank, Inc.’s service area.

Effective January 1, 2014, all of The Foodbank, Inc.’s member-agency pantries were required to adopt an electronic intake system. The Foodbank, Inc. was the first food bank in the state of Ohio to add this requirement to agency contracts and received a waiver from the Ohio Department of Job and Family Services to complete Emergency Food Assistance Program (TEFAP) forms electronically through these systems.
PantryTrak

PantryTrak was developed by Mark Mollenkopf, Strategic Solutions Developer at Mid-Ohio Foodbank, while he was volunteering with a small food pantry. He believed that a well-designed system could improve the experience for families and the collected data could help food banks improve available services. PantryTrak creates the opportunity for food banks to transform client-level data into precise reports and tools to provide more effective service to families. In an effort to preserve food pantry resources, PantryTrak is provided free of charge and requires no specialized equipment.

In addition to the original motives, PantryTrak has decreased the storage space needed for paper forms, increased accuracy, standardized data collection and reporting, made auditing intake forms easier, and provided food banks with invaluable tools.

PantryTrak is an essential piece of our study as it is the only available database in Ohio that provides an unduplicated client count across multiple food pantries. This data, used in conjunction with demographic data and input from agencies, will help to identify who is seeking food assistance, why they are seeking assistance, and how often they are seeking assistance.

Advice and Best Practices from U.S. Food Banks

Several food banks have started using Geographic Information System (GIS) mapping tools to gain a greater understanding of their service area. As food banks shift from a goal of distributing more pounds within a county to attempting to shorten the lines at
private food assistance providers, these insights can define gaps in service and influence programmatic decisions.

**Roadrunner Foodbank of New Mexico (Albuquerque, NM)**

Roadrunner Foodbank has a unique resource in their community- the New Mexico Community Data Collaborative. Multiple organizations and government agencies have access to and can upload data to this system. Information is provided primarily by the Department of Public Health, the American Community Survey, and local schools. In 2014, Roadrunner Foodbank began using the collected data to create maps related to program performance. Roadrunner does not simply open a new site in response to every request received from a pantry, shelter, or soup kitchen. Instead, they use mapped data to identify key areas of need and to seek agencies to serve those areas.

The Roadrunner Foodbank shared that the collaborative gives their food bank the capacity to map and analyze this data. While the project is new and does not include client addresses, this data has fundamentally shifted the understanding of the organization by providing ground-level data. It has clarified the local understanding of which populations and geographic areas are likely to need food assistance. Dayton does not have a similar data collaborative; however, we can utilize information from the American Community Survey to build a local map (Anderson & Bennett, 2015).
Greater Chicago Food Depository (Chicago, IL)

Greater Chicago Food Depository (GCFD) began looking for unmet need in completely new ways in 2006. GCFD purchases community-specific *Map the Meal Gap* data from Feeding America. The Food Depository plots this information on a map. Food insecurity information with current programming locations and agency capacity levels, using a twenty-point weighted criterion, is then added to the map (McCook, 2015). The resulting map highlights areas where service may be sparse.

Member-agency food pantries use a mix of an electronic system called Food Bank Manager and paper forms for client intake. When GCFD member-agencies are fully utilizing Food Bank Manager, client-level data can further refine their mapping.

Programmatic decisions, such as beginning senior feeding programs or opening after-school meal sites, have been influenced by subpopulation gap analysis (McCook, 2015). This study replicates the successes of GCFD’s sub-population analysis by using the American Community Survey and client-level data from PantryTrak and Virtual Case Manager.
The Greater Boston Food Bank (Boston, MA)

For the last three to four years, The Greater Boston Food Bank (GBFB) has paid for sub-county level *Map the Meal Gap* measures. These measures have helped GBFB shift from a model of providing more food pounds to building a network of private food assistance agencies. Using information from Feeding America, surveys at pantries and backpack distribution sites, and a list of member-agencies, GBFB created one map to show current meals distributed and a second map to highlight the number of meals to meet goals.

GBFB was surprised to find individuals in wealthy neighborhoods were often traveling great distances to reach private food assistance (Taitelbaum, 2015). They found the mapped data made it simple to identify and understand areas of need. GBFB shared that they experience a data availability challenge. Client intake occurs in multiple ways and agency reports have varying levels of detail. Comparing this data is a challenge GBFB meets by looking at trends over time and working to find new ways to fill data gaps.

This study seeks to build upon the successes from Boston. PantryTrak and Virtual Case Manager data provides a large database of addresses and ages of those using pantries in The Foodbank’s service area. To gain a greater understanding of who The Foodbank, Inc. serves, this study will overlay local data similar to GBFB and other food banks with client addresses.
Greater Cleveland Regional Foodbank (Cleveland, OH)

Greater Cleveland Regional Foodbank (GCRF) adopted the use of PantryTrak at some member-agency food pantries. Using data from PantryTrak, an employee with GIS skills identified the number of times individuals accessed pantries and which pantries they were utilizing. PantryTrak data from June through August 2014 from three cities was used for this pilot project (Mikelbank, PantryTrak Pilot Mapping Project, 2014).

GCRF generated maps utilizing census-tract-level data from the American Community Survey to identify areas of poverty surrounding Cleveland. Client home addresses were then added to the map in order to identify areas where large numbers of clients reside (Mikelbank, PantryTrak Pilot Mapping Project, 2014).

GCRF’s study was limited to analyzing services provided by a few member-agencies. GCRF did not have access to data reflecting the use of all emergency food assistance assets in their service area. However, this is the first project using data collected through PantryTrak and provided an opportunity to test data analysis previously not feasible (Mikelbank, Planning Coordinator, Greater Cleveland Regional Foodbank, 2015). This study seeks to build on GCRF’s work by identifying every individual served in pantries, the number of times they were served, and their proximity to a pantry in The Foodbank, Inc.’s service area. Maps generated for this study use a similar style to those generated by GCRF.
Methods for Identifying Need

Previous studies have cited difficulty accessing client data as a barrier to understanding hunger (Berner, Ozer, & Paynter, 2008; Furness, Simon, Wold, & Asarian-Anderson, 2004; Mosley & Tiehen, 2004; Paynter, Berner, & Anderson, 2011). This study utilizes data from the PantryTrak and Virtual Case Manager databases, eliminating this barrier.

In order to understand the geographic challenges of service delivery, this study will:

1. Map the service territory of The Foodbank, Inc. using ArcGIS software.
2. Create color-coded areas of that map using information from the American Community Survey, a Census Bureau Survey that samples a percentage of the population every year.
3. Add a graphic dot for each food pantry receiving food from The Foodbank, Inc.
4. Add a graphic dot for each address receiving food from The Foodbank, Inc. member-pantries.

Additional manipulations of the map include:

- Altering the size of the dot to represent how many times an individual accessed a pantry;
- Visualizing unemployment rates and rates of poverty using color scales; and
- Adding a two- or five- mile radius\(^3\) to each agency to visualize the service reasonable travel distance to agencies and the relative coverage of a given county.

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\(^3\) Acceptable travel distances were determined for urban and rural settings. Pantries in urban areas had a higher instance of public transit availability and thereby fewer clients with vehicles. Urban travel distances were set at 2-miles while rural areas, with higher instances of vehicle access, were set at 5-miles (Duffy, et al., 1999). Study authors also altered these travel distances on the map between one and ten miles. Decreasing the acceptable travel distance had little to no impact on the results of the study.
Addresses were verified through a geocoder and invalid addresses were manually corrected before being mapped in ArcGIS. Using the mapped information and statistical analysis, the following indicators of potential gaps in the service area are further explored:

- United Way of Greater Dayton HelpLink 2-1-1 assistance requests;
- Service provided by age group, gender, and family size;
- American Community Survey data;
- Availability of pantry services near those served and throughout the service area;
- Informal client interviews in key areas; and
- Agency information in key areas (open times, capacity questions).

A full explanation of methodology, including technical information, may be found in Appendix A on page 37.

Identifying Gaps in Service

How a gap or mismatch in service can be identified is the most complex question of this study. There are a number of options for answering this question with the newly available data. Multiple methods were employed in gap identification.

- Phone calls for assistance to United Way’s HelpLink 2-1-1 system that could not be referred, listed by zip-code, were compared to calls that could be referred to food assistance programs

- When mapping, an area had a service mismatch if:
  - A large number of client addresses were grouped together without a pantry within a two- or five-mile radius.
  - A pantry had little to no client addresses grouped nearby.

- Beyond mapping, service records were analyzed for patterns using:
  - Age;
  - Gender;
  - Family Size; and
  - Frequency of Pantry Usage.
When a gap was identified in service through one indicator but not another, agency capacity was a likely cause. For example, an area with multiple food pantries and high need is not a mismatch. However, if United Way’s HelpLink 2-1-1 received a high volume of calls from that area that could not be referred to a food pantry, pantry capacity was the likely cause. No food pantries are open 24-hours a day or 7-days a week. As seen in other studies, pantries have funding, staffing, and storage limitations that determine the number of individuals they can serve (Paynter, Berner, & Anderson, 2011, pp. 50-53).

One study suggested clients complete an additional paper survey when visiting a food pantry for services; few surveys were completed. Additionally, food pantries did not want to collect demographic information from clients because they were concerned it created an unnecessary barrier to a family receiving food assistance (Berner, Ozer, & Paynter, 2008).

**Data Limitations and Project Scope**

This analysis looks at 2014, the first year the electronic systems were required by The Foodbank, Inc. The available client data provides more information than any previous report and allows for detailed data analysis. While the data set is a huge advancement, there are a few limitations of note.

First, only pantries are required to use electronic client intake systems. The Foodbank, Inc. supports hot meal sites, shelters, Kid’s Cafés, and a weekend backpack
program. Other food assistance programs are tracked by a simple head count and plate count. This limits the focus of this analysis to pantries as data is not available for other meal programs.

Second, The Foodbank, Inc. had 58 agencies in Montgomery, Greene, and Preble counties in Ohio enrolled in PantryTrak. This is the great majority of pantries that received food from The Foodbank, Inc. in Dayton. However, there are six pantries in Montgomery, Greene, and Preble counties that utilized the Virtual Case Manager system. The data entered into these independent systems does not allow for the removal of duplicate family records. When feasible, both data sets are used. PantryTrak captured 71 percent of family records (31,862 families) and 72 percent of services (123,489 service visits) in 2014.

Third, The Foodbank, Inc. shares service in Preble County with Shared Harvest Foodbank in Fairfield, Ohio. Client information from Shared Harvest’s member-agencies is not included in this study due to data collection and storage. Finally, 229 client records contained in the data sets had addresses that could not be geocoded and an additional 426 records were listed as “homeless” with no address. These records are included in the service analysis sections but do not appear on maps.

An electronic client intake system means that client information no longer sits in a file cabinet; it can be accessed and used to help food banks improve service. Food banks are able to see who is coming to pantries, when they are coming to pantries, how often they receive assistance, and how far they are traveling to access a pantry. This vital information can fundamentally change conversations about hunger.
Ethical Considerations Protecting Client Confidentiality

The analysis in this study is conducted with records stripped of names. While ages, and in some cases birthdays, are included with street addresses, that information is not included in this report. Family and family member identification numbers were included, at most, in analysis files. Files stored with personally identifiable information were encrypted.

Maps used in presentations and included in this report are presented at a level where individual addresses cannot be identified. Graphs, tables, and analysis beyond mapping has been conducted at a community, zip code, or census tract level.

A limited number of informal interviews were conducted with clients and pantry staff. Individuals were approached at pantries in key areas and asked about their experience. Each individual could decline to answer any or all questions. Individuals were not asked their name or for any identifying information. Comments were recorded by pantry location only.

Identifying Areas of Need: Analyzing Calls for Assistance

United Way of the Greater Dayton Area operates HelpLink 2-1-1, a single number where individuals can call for referrals to assistance agencies. The system is available by calling, toll-free, 2-1-1 or by accessing the database through a website. Website traffic was
not available for study, however, phone calls in 2014 were tracked by service request type and if the caller could or could not be referred to a resource.

The following are key findings from the available data: (1) the majority of calls from Montgomery County could be referred for food pantries and soup kitchens; (2) no calls for soup kitchen-assistance could be referred in Preble County; and (3) one-third of calls for food assistance could not be referred in Greene County with the majority of calls coming from Xenia and Fairborn. More detailed findings for each county and community can be found below.

**Montgomery County**

- 92 percent of calls (11,011) for soup kitchens and food pantries were successfully referred
- 33 percent of calls (312) that could not be referred to food pantries came from West Dayton, East Dayton, and Northwest Dayton/Ft. McKinley

**Preble County**

- 100 percent of calls (33) for soup kitchen assistance could not be referred
- 11 percent of calls (66) for food pantries could not be referred
- The highest volume of calls, county-wide, that could not be referred to pantries came from College Corner with 24 percent of calls (24)
Greene County

- County-wide, one-third of calls (582) requesting food assistance could not be referred
- More than half the calls for food pantries in Spring Valley, Bath Township, Jamestown, and Bellbrook could not be referred to an agency
- 89 percent of all calls (1,218) in Greene County were made by individuals in Fairborn (543 calls) or Xenia (463 calls)
- Figure 1.1, below, highlights the percentage of callers unable to be referred to a food pantry by community.

Figure 1.1- Percentage of Callers Unable to be Referred to a Food Pantry by Community, Greene County

*Other Includes: Jamestown, Beavercreek Township, Spring Valley, and Bath Township

Source: United Way of Greater Dayton HelpLink 2-1-1 Calls for Food Assistance, 2014
PantryTrak Records Information

Age of Individuals Served

The age of individuals served provides little assistance when viewed by county; however, community age profiles could assist program managers in identifying specific program priorities for a smaller area. For example, an area with a large number of children may need infant supplies or assistance signing up for free and reduced priced lunches.

Figure 1.2, below, presents an age profile of individuals served in Greene County. This shows pantry services are well-distributed at the county-level between age groups. While this figure refers to Greene County, a similar pattern appears in Preble and Montgomery Counties. Graphs for additional counties can be found in Appendix C on page 41.

Figure 1.2- Age of Individuals Served by The Foodbank, Inc.
PantryTrak Pantries, Greene County, 2014

Gender of Individuals Served

The clear majority of clients served were female. PantryTrak records reveal nearly two-thirds of individuals served by food pantries were female, see Figure 1.3 below.

Figure 1.3- Gender of Individuals Served by The Foodbank, Inc. PantryTrak Pantries, Percentage by County, 2014

Source: PantryTrak Client Data, The Foodbank, Inc. Service Area, Calendar Year 2014.

While females do represent a higher percentage of individuals living at or below the poverty line (see Table 1.1, below) within all three counties, the percentages are not as drastically different as those found in our PantryTrak data.

Table 1.1- Percentage of Population and Number of Individuals Living Below Poverty by Gender in Montgomery, Greene, and Preble Counties

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percentage</td>
<td>Percentage</td>
</tr>
<tr>
<td></td>
<td>(Population)</td>
<td>(Population)</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>17.8%</td>
<td>19.9%</td>
</tr>
<tr>
<td></td>
<td>(44,276)</td>
<td>(53,606)</td>
</tr>
<tr>
<td>Montgomery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greene</td>
<td>14%</td>
<td>14.9%</td>
</tr>
<tr>
<td></td>
<td>(10,627)</td>
<td>(11,670)</td>
</tr>
<tr>
<td>Preble</td>
<td>11.1%</td>
<td>13.8%</td>
</tr>
<tr>
<td></td>
<td>(2,269)</td>
<td>(2,858)</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 2011-2013 3-Year Average American Community Survey
**Family Size and Number of Visits**

The relationship between family size and the number of times that a family accessed a food pantry during the studied period was tested with correlation analysis. Areas with a higher concentration of large families would need more pantry resources than areas with smaller families if there was a relationship. It was determined that family size is not a predictor of how often an individual or family will utilize pantry services. For full details and results of the correlation analysis, see Appendix D on page 42.

**Geographic Mismatch**

Montgomery County has the largest population and largest number of individuals eligible for assistance; it also has the most extensive network of pantries in the studied area. The Foodbank, Inc. consistently serves double the minimum Meals per Person in Need (MPIN) metric in Montgomery County. Greene and Preble Counties have significantly fewer member-agencies and distribution. Meeting MPIN standards can be a challenge in these counties. One way The Foodbank, Inc. meets this challenge is by operating the mobile pantry, distributing fresh produce and baked goods, to Greene and Preble Counties.

The maps used in this study revealed that many areas with high poverty and unemployment rates already had several agencies operating within an acceptable traveling distance. Individuals living in generally affluent areas were forced to travel much greater distances to visit the closest pantry.
Table 1.2., below, summarizes the eight locations where large concentrations of individuals in a community are traveling a distance to reach the nearest pantry.

Table 1.2- Key Characteristics of Communities Identified as Geographic Gaps

<table>
<thead>
<tr>
<th>Municipality</th>
<th>County</th>
<th>Total Population</th>
<th>Number of Individuals Eligible for Assistance*</th>
<th>Number of Families Receiving Pantry Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trotwood</td>
<td>Montgomery</td>
<td>23,893</td>
<td>11,565</td>
<td>2,194</td>
</tr>
<tr>
<td>Vandalia</td>
<td>Montgomery</td>
<td>15,042</td>
<td>3,997</td>
<td>123</td>
</tr>
<tr>
<td>New Lebanon</td>
<td>Montgomery</td>
<td>3,844</td>
<td>1,789</td>
<td>190</td>
</tr>
<tr>
<td>Lake Lakengren</td>
<td>Preble</td>
<td>3,462</td>
<td>618</td>
<td>41</td>
</tr>
<tr>
<td>Yellow Springs</td>
<td>Greene</td>
<td>3,271</td>
<td>837</td>
<td>55</td>
</tr>
<tr>
<td>Lewisburg</td>
<td>Preble</td>
<td>1,670</td>
<td>709</td>
<td>108</td>
</tr>
<tr>
<td>Spring Valley</td>
<td>Greene</td>
<td>491</td>
<td>83</td>
<td>21</td>
</tr>
<tr>
<td>Bowersville</td>
<td>Greene</td>
<td>280</td>
<td>136</td>
<td>19</td>
</tr>
</tbody>
</table>

Sources: U.S. Census Bureau, 2011-2013 3-Year Average American Community Survey PantryTrak Client Data, The Foodbank, Inc. Service Area Calendar Year 2014

* Number of Individuals Eligible for Assistance equates to the number of individuals living below 200 percent of poverty

Service Recommendations by County

As each area has unique needs, one-size-fits-all recommendations would be imprudent. There are a number of ways to correct a service mismatch and close a gap: (1) utilize the mobile pantry program to reach individuals closer to their homes, (2) work to expand the capacity of a nearby pantry to either serve a larger area or offer deliveries, (3) collaborate with a local organization to open a food pantry, and (4) provide advocacy materials to an area. Below is a list of gaps in service listed by county and community followed by best practices for rural food distributions.
Montgomery County

Within Montgomery county, three zip code areas were of particular note from the United Way 211 calls that could not be referred to a pantry: 45417 (West Dayton), 45406 (Northwest Dayton/ Ft. McKinley), and 45403 (East Dayton). For these three zip codes, there are 19 pantries. Specific to scheduling:

- No pantries are open on Sundays
- Only one pantry has evening hours (Living Hope, 45417, open once per month)
- Four of the pantries are only open once per month
- Most pantries are only open for 2-3 hours, typically between 9 a.m. – 1 p.m.

Without knowing the specific reason individuals could not be referred to a pantry, recommendations come from best reasoning as to causes. The following may be causes:

- Pantries are not open when the caller is able to access them
- The caller may lack transportation to the pantry
- The caller may have already visited available pantries the maximum number of times allowed in a given month

There are significant pantry resources available in these areas; however, capacity may be the challenge. The Foodbank, Inc. could work with the pantries in these areas to adjust hours of service, increase the number of days each month the pantries are open, or suggest limited appointments for emergency situations.

Maps including poverty rate, unemployment rate, pantry and client addresses, acceptable travel distance, and number of visits for Montgomery County may be found in Appendix E, beginning on p. 44.
One pantry worker shared that their pantry would like to be open more often and serve more people but they operate with benevolent funds, in a limited space, with volunteers. The pantry finds that many clients carpool and a handful walk to the pantry, transportation does not seem to be a challenge. The pantry reports that they see many of the same clients each month in this Northwest Dayton area but has additional clients each month.

The Foodbank, Inc. could bring the mobile pantry to apartment complexes within these areas; however, there are a number of other communities with gaps and no pantries. This may not be the most prudent use of the resource. One Foodbank employee suggested increasing the frequency of mobile pantries by scheduling multiple sites in a day and using light truck usage days to visit low-income apartment complexes and senior centers not included in the regular rotation.

**Vandalia.** The City of Vandalia has a central downtown area but individuals with Vandalia addresses can be spread out. Due to the geography and limited public transit, individuals in this area are likely to have access to vehicles.

There is a single non-Foodbank member pantry serving this area, the Vandalia-Butler Food Pantry. This pantry is open five days per week, year-round, offering both in-person shopping and delivery (City of Vandalia, 2015). The Foodbank, Inc. should consider reaching out to this pantry to further support their efforts.
**Trotwood.** There are currently no food pantries open in Trotwood. Nearly 2,200 people accessed member-agency pantries in 2014 with 11,500 people eligible for assistance in this area. This is a clear mismatch of need and available resources. The Foodbank, Inc. should actively seek a food pantry in this area. Until a pantry can be established, taking the mobile food pantry to a central location, preferably along a public transit line, would be advised. Figure 1.4, right, provides a reference map for this area.

**New Lebanon.**

There are currently no food pantries in New Lebanon. Located halfway between the Preble County line and Drexel, New Lebanon could be an excellent location for a pantry willing to serve a large area. Individuals are likely to have access to transportation in this area. The Foodbank, Inc. should actively seek opening a food pantry in New Lebanon. If establishing a mobile

*Figure 1.4-The Foodbank, Inc. Agencies and Clients Served Selected Areas, Montgomery County, Ohio, 2014*

*Sources: PantryTrak Client Data, The Foodbank, Inc. Service Area Calendar Year 2014; 2014 TIGER/Line Shapefiles (machinereadable data files) / prepared by the U.S. Census Bureau, 2014*
pantry, marketing materials should be distributed in New Lebanon, West Alexandria, and Drexel.

**Greene County**

In Greene County, most calls for food assistance to United Way 211 came from Fairborn and Xenia, the two largest cities in the county. More than half of calls from Spring Valley, Bath Township, Jamestown, and Bellbrook could not be referred to a food pantry.

Maps including poverty rate, unemployment rate, pantry and client addresses, acceptable travel distance, and number of visits for Greene County may be found in Appendix F, beginning on p. 49

**Fairborn and Xenia** appear to have an awareness challenge. Both cities have brick-and-mortar pantries available. Fairborn also hosts mobile pantries from both The Hope Foundation of Greater Dayton and The Foodbank, Inc. once per month. In 2015, BOGG Ministries is adding a mobile site to Xenia and The Foodbank, Inc. will continue two mobile sites in Xenia. Services in Fairborn are available in the evening, on Saturdays, and during the day with varying hours throughout the week. In Xenia, pantry services are open Monday through Friday between 9 a.m. and 5 p.m., with an evening mobile pantry beginning in 2015.

A recommendation for these areas is to strategically increase the marketing efforts to reach families that may need the pantry. Establishing relationships with social workers, senior centers, libraries, city offices, and schools in these areas would make it easier for those in need of services to connect with resources.
**Jamestown** has a single food pantry that serves families living within the Greeneview School District. It is open once per week and requires appointments. When necessary, the pantry will make exceptions to their regular schedule if an individual is unable to visit within that time window. Like many pantries, available storage space and cooler/freezer space are challenges. The Foodbank, Inc. also brings the mobile pantry once per month to Jamestown. Increasing awareness of the mobile pantry in this area as well as in neighboring small communities, such as Shawnee Hills, and continuing to allow individuals to pick up food for others, with prior written approval, is advised.

Without a “big box store”, groceries in Jamestown can be more expensive. Encouraging individuals to apply for WIC or SNAP benefits and helping Farmer’s Market vendors to accept these payments could provide additional assistance in this area.

Several clients visiting the mobile pantry in Jamestown were picking up food for family members and neighbors who were unable to visit the pantry due to work schedule or illness. Many clients had mobility challenges and reported frequently making the decision between purchasing medication and food. One client, a seasonal worker, noted that they only utilized food pantries when their seasonal work ended. Many clients noted that receiving fresh produce from the mobile pantry was crucial as the local pantry lacks cooler space for produce and other fresh foods.
**Bowersville.** Individuals from Bowersville currently being served by The Foodbank, Inc. are largely visiting the mobile pantry in Jamestown, Figure 1.5, below, depicts a map of service in this area. With 19 individuals served and nearly 200 eligible in the area, The Foodbank, Inc. should consider taking the mobile pantry to Bowersville directly.

**Figure 1.5-The Foodbank, Inc. Agencies and Clients Served Selected Areas, Greene County, Ohio, 2014**

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*Sources:* PantryTrak Client Data, The Foodbank, Inc. Service Area Calendar Year 2014; 2014 TIGER/Line Shapefiles (machinereadable data files) / prepared by the U.S. Census Bureau, 2014
To save on transportation costs to this far-reaching village, consider partnering this location with the Jamestown location. Several clients visiting the mobile pantry in Jamestown noted that the addition of a food resource center or mobile pantry would be beneficial for Bowersville.

**Bath Township** appears to have an awareness challenge with available pantry services. Individuals in this area could be served by one pantry offering home deliveries, another pantry allowing individuals to receive items each week, or residents could visit three nearby mobile locations. If transportation is a challenge, calls from this area may not be referred to the delivery agency because it is located in a different city. Alerting United Way HelpLink 2-1-1 about the delivery agency and providing flyers in this area for mobile pantries should alleviate the challenges here.

**Bellbrook** does not have any pantries and does not host a mobile pantry. Neighboring Spring Valley hosts The Foodbank, Inc.’s mobile pantry once per month from Spring through Fall. To best support this area, The Foodbank, Inc. should consider partnering with an organization to host and champion a mobile food pantry in the area and/or open a brick-and-mortar pantry. Given the spread-out geography and lack of regular public transit routes here, having an option for delivering food directly to clients would be ideal.
**Spring Valley.** The village of Spring Valley is home to fewer than 500 people. Spring Valley does not have a brick-and-mortar pantry and The Foodbank, Inc.’s mobile pantry only comes Spring through Fall. Ideally, a small brick-and-mortar pantry could be fostered in this area, perhaps at a local church or the community center. With a village of this size, a small pantry could make a huge impact. The Foodbank, Inc. should continue the mobile pantry in this area and consider increasing awareness through flyer distribution.

**Yellow Springs.** The village of Yellow Springs is a tight-knit community. There is a food pantry located at Yellow Springs United Methodist Church, open two Thursdays per month as well as meeting emergency food requests (Yellow Springs United Methodist Church, 2015). This pantry is not a member-agency of The Foodbank, Inc. The individuals included in this study were likely served through The Hope Foundation’s Feed Fairborn mobile pantry or The Foodbank, Inc.’s mobile pantry in Fairborn. A recommendation would be to reach out to the Yellow Springs United Methodist Church to offer food bank resources to bolster their work in their community.

**Preble County**

Based on United Way HelpLink 2-1-1 calls, the first recommendation is to open a hot meal site within Preble County. Eaton would be centrally located for all county residents but any hot meal site would be a good addition to the available resources.
One Preble County pantry volunteer shared that the pantry is always busy. All families used to receive SNAP benefits on the same day until recently. With SNAP benefits disbursed at different times throughout the month, families need assistance at different times. The same volunteer noted that the pantry consistently serves the same families, including new generations, as parents and grandparents educate their children about utilizing these resources. The volunteer cited the lack of employment opportunities in Preble County as a significant challenge for their community.

**Lake Lakengren.** This community is within five miles of four different agencies and has no grocery stores within the community other than a small convenience store. Families from this area tend to visit between one and three times within the calendar year. Figure 1.6, right, depicts

*Figure 1.6- The Foodbank, Inc. Agencies and Clients Served Selected Areas, Preble County, Ohio, 2014*

Maps including poverty rate, unemployment rate, pantry and client addresses, acceptable travel distance, and number of visits for Preble County may be found in Appendix G, beginning on p. 54.
Lake Lakengren. In 2014, 41 families were served from this community. Given the proximity to other resources, few pantry visits by residents, and likelihood that families already travel for grocery resources, this community is not an area of concern despite its appearance on the map.

**College Corner** presents a unique challenge. The town is located in Preble and Butler counties in Ohio as well as in Indiana. With a population of less than 500, it is located five miles from Oxford, Ohio where there are two pantries. Referrals were likely not made in this area due to the county lines and this area should not be of concern to The Foodbank, Inc.

**Lewisburg.** In 2014, 108 people were served in Lewisburg, largely at the mobile pantry at Tri-County North High School. The Foodbank, Inc. has moved that mobile pantry to the Lewisburg Community Center to better serve families with an indoor location. This is one of two locations that operate year-round in all weather. The Foodbank, Inc. should continue this mobile location.

**Considerations for Rural Areas**

Greater distances between families, less accessible public transit, fewer options for goods and services leading to higher costs, longer travel times, and stigma against utilizing emergency food services are just a few of the unique challenges in rural areas (Duffy, et al., 1999). The Duffy study shares that understanding the community is essential to improving service delivery.
One option for service delivery in rural areas is to partner with religious institutions and community centers already providing food assistance. These trusted institutions are often already providing services to community members. Rather than beginning anew, bolstering their response to hunger requires fewer resources from The Foodbank, Inc.

A second option for service delivery is the Meals on Wheels model of hot-meal home-delivery. While this model provides an excellent service to those with transportation challenges, it has high resource requirements to the organization providing it. The Duffy study suggests that a brick-and-mortar food pantry could utilize a church van for home deliveries. This option could be limited to only special cases as defined by the agency and/or encouraged by offering a Foodbank credit to food pantries operating such a program.

Finally, The Foodbank, Inc. and other food banks operate mobile food pantries bringing food to areas not served by agencies. Continuing this program, with consideration to the areas from which families are traveling, will assist in finding appropriate mobile pantry placement. Working with local champions who know the community and can assist in both locating appropriate centers and spreading the word about the mobile pantry is highly recommended. Maintaining regular scheduling and distributing information to housing centers, community centers, caseworkers, schools, and other organizations will assist families in locating and accessing resources.
Opportunities for Further Study

There are two major opportunities to improve the visibility of hunger in a studied area: (1) including all pantry data in a single database through data bridging between electronic systems and (2) capturing client information at shelters, hot meal sites, and other programs that currently collect only a head count and plate count.

The data set collected through electronic client intake systems provides a number of opportunities for analysis. Truly, a researcher is limited only by their imagination, time, and patience. One data set that The Foodbank, Inc. has currently that was not included in this analysis is the pounds distributed to agencies. These numbers, when refined to a specific area and type of food, may aid in highlighting areas where agency capacity building is most needed.

The services provided and agencies providing services in a given area are constantly changing. Add to this environment the ebb and flow of unemployment and movement of families and hunger relief organizations have a moving target. This study is meant to provide a snapshot in time and should be revisited as the environment changes and opportunities grow. Time-series data depicting multiple time frames could shed light on how programmatic changes have altered the landscape.
Recommendations

Each area has unique needs; one-size-fits-all recommendations would be imprudent.

The following recommendations could improve services for communities with the most need.

Below is a list of the gaps in service listed by county and community.

Greene County

1. **Fairborn & Xenia**- Increase strategic marketing of existing resources
2. **Bowersville**- Consider this village to host a mobile pantry
3. **Jamestown**- Increase marketing of existing resources; Advocate with farmer’s market to accept WIC/SNAP benefits
4. **Bath Township**- Increase strategic marketing of existing resources
5. **Bellbrook**- Actively seek a food pantry in this area; Consider hosting a mobile pantry
6. **Spring Valley**- Continue mobile pantry; Actively seek a pantry to serve this area
7. **Yellow Springs**- Reach out to support Yellow Springs United Methodist Church

Preble County

1. Open a Hot Meal Site
2. **College Corner**- There appears to be an awareness problem here; pantries in Oxford, Ohio will provide food to College Corner residents
3. **Lake Lakengren**- Appears as a gap on the map but is not; No action needed

Montgomery County

1. **West/Northwest Dayton & Ft. McKinley**- Pantry hours should be staggered; agencies need help improving capacity; Consider hosting mobile pantry
2. **Vandalia**- Reach out to support Vandalia-Butler Food Pantry
3. **Trotwood & New Lebanon**- Actively seek food pantries; host mobile pantry

This study is meant to provide a snapshot in time and should be revisited as the environment changes and opportunities grow.
Appendices
Appendix A: GIS Methodology

Introduction

This study incorporated spatial analysis and GIS systems to enhance our research. ArcGIS was utilized to create accessibility models and identify service gaps in Montgomery, Greene, and Preble counties. This analysis required data collected from every service provided to citizens seeking assistance at food pantries for the calendar year 2014. This data was provided by the administrators overseeing the electronic client intake system, PantryTrak, based out of the Mid-Ohio Foodbank in Columbus, Ohio. Additional client level information was extracted from the Virtual Case Manager (VCM) system for agencies not utilizing PantryTrak (details in Appendix B). It is hoped that this appendix helps to provide insight into the analysis and development of this project for others seeking to complete similar studies.

Overview of Methodology

For each county served by The Foodbank, Inc. a series of steps were conducted as part of the overall service and accessibility assessments. This project identified four areas critical to analyzing service needs and capacity:

1) the number of times each family was served in calendar year 2014
2) the acceptable service boundary of each agency
3) unemployment rates by community and census tract
4) individuals living below 200% of poverty in each community and census tract

Base layer files were generated to identify the borders of zip codes, census tracts, and cities within the Montgomery, Greene, and Preble county boundaries using U.S. Census Bureau TIGER files. The files were then supplemented with the addition of the client information, demographic information, and the addresses of each pantry.

Data Cleanup

PantryTrak data is initially verified using smartystreets.com to validate the residential address tied to each family ID which is then assigned a code of ‘10’, indicating a successful geocode, ‘1’ indicating an attempt to geocode that failed and requires cleanup, or ‘0’ indicating a file was not geocoded. This software identifies which addresses can be located and which need to be physically reviewed by a human. The researchers then edited the PantryTrak and VCM addresses requiring cleanup. Addresses were examined for spelling mistakes or formatting errors and corrected as necessary. Addresses were then verified via smartystreets to confirm their validity. Files with missing addresses and those that could not be correctly geocoded were removed from the mapped data. Files marked as homeless were also removed and noted in the analysis.
Number of Visits per Family

An address locator was constructed in ArcMap to convert location descriptions into geographic features. This was completed using the U.S. Census Bureau’s U.S. Address-Dual Ranges file to define every address in each county. Client addresses were then loaded into the address locator for each county. Any files that were not able to be located were corrected or removed from the data that was mapped. Each address is displayed as a blue point over the base layer of each county and the census tracts. Pantry addresses were then validated and loaded into the address locator for each county and depicted as yellow points over the base layers.

The PantryTrak data included a count of the number of times each family ID had visited a pantry in The Foodbank, Inc.’s service area which was tied to the addresses located in ArcMap. Before the VCM file was loaded into ArcMap a subtotal function had to be completed in Excel to total the number of times each family ID visited a pantry. These numbers were utilized to change the symbology of each data point so that each point grew in size as the number of visits increased.

Service Boundaries

After all of the agency and client addresses were loaded into ArcMap, a buffer shapefile was created to define a service boundary for each agency. Buffer boundaries were selected based on research conducted during this study. The Montgomery County buffer radius was set to 2 miles while the buffers in Preble County and Greene County were set to a 5 mile radius. The buffer shapefiles were merged into a single shapefile and then dissolved to eliminate overlap of service provision by each agency. Areas left within the buffered areas were identified as within an acceptable traveling distance from a pantry site.

Unemployment Rates

American FactFinder data collected for each county was joined to the existing census tract shapefile in ArcMap. The unemployment rate was calculated by adding a field in ArcMap that divided the number of unemployed residents in each census tract by the total population of each census tract. This reflected the percentage of unemployment in each tract. The symbology was adjusted for this layer to show the percentage of unemployment in each census tract. Tracts that were white or light green depicted a very low unemployment rate while dark green tracts identified areas with very high unemployment rates.

Individuals Living in Poverty

American FactFinder data for poverty in each county was collected to identify the number of individuals living below 200% of poverty. A new field was added to Excel which calculated the percentage of citizens living in poverty by dividing the number of individuals
living below 200% of poverty by the population in that area. This file was then joined to the existing census tract shapefile in ArcMap where the symbology was adjusted to show the percentage of individuals living below 200% of poverty. Census tracts that were white or pink depicted low poverty areas while those in dark red depicted high poverty areas. This variable was selected as individuals living below 200% of poverty are eligible to receive food services from area agencies.

**Analysis**

The poverty and unemployment maps were then utilized to identify areas with high rates of poverty and unemployment. These areas were then compared against the buffer file to identify areas beyond the acceptable traveling distance for each agency. It was discovered that most of the areas with the highest poverty and unemployment rates already had several agencies operating within an acceptable traveling distance and that poor citizens living in generally affluent areas were forced to travel much greater distances to visit the closest pantry.

This led us to refocus our analysis on underserved areas outside of the existing service areas identified by the buffer zones. A community boundary layer was created in ArcMap using U.S. Census data to identify the boundaries of major urban centers. Eight communities were identified as underserved and suggested as potential sites for permanent or mobile pantries: Yellow Springs, Bowersville, Spring Valley, Vandalia, Trotwood, New Lebanon, Lewisburg, and Lake Lakengren. Many cities occupy a relatively small area of their respective census tracts, especially those cities in Preble and Greene Counties. This meant that poverty and unemployment rates depicted in the census tract maps did not provide the most accurate picture of the conditions in each community. Census information was collected for each community including total population, individuals living below 200% of poverty, number of individuals in the labor force, and the number of unemployed citizens. This information was entered in Excel and percentages were calculated for poverty and unemployment rates to determine the potential for need in these cities.

A column was added to the point file to identify a value of ‘1’ for every client point. A spatial join was then performed to join the community boundary shapefile and the family ID point file utilizing the Sum function. The Sum function summed the total number of families within each community boundary. The total number of families utilizing pantries within each community boundary was then compared against the poverty population of each respective community. Cities with the largest need for emergency food services were then prioritized using the following criteria: the number of families seeking emergency food services, the number of individuals living below 200% of poverty, and the unemployment rate.
Appendix B: Technical Specifications of Data

Virtual Case Manager Reports

Virtual Case Manager provides some data extraction capabilities to administrators. Data from agencies utilizing Virtual Case Manager were extracted by Lizz Kelly, Manager of Volunteers, Canned Food Drives, Mobile Food Pantry, & Statistics, The Foodbank, Inc.

The initial hope was to be able to pull family member information as well as household information. However, Virtual Case Manager was unable to provide a report in which household members could be linked to their respective households. Consequently, the “Services Provided” Services Report was utilized for this project to identify the number of services provided per unique individual ID. Data from each agency utilizing Virtual Case Manager had to be extracted separately.

PantryTrak Reports

PantryTrak is an innodb MySQL database. Family Data and Family Member data, was extracted with two separate queries conducted by David Pickering, Strategic Solutions Specialist, Mid-Ohio Foodbank. These queries reflect data entered by member-agency food pantries of The Foodbank, Inc. in Montgomery, Greene, and Preble counties. The data in this report does not reflect any services provided by agencies that utilize Virtual Case Manager or services provided by food pantries that are not member-agencies of The Foodbank, Inc.

Family Data were extracted querying one record per unique family id (family_id in the database). This query returned: (1) count of services provided per family ID by PantryTrak agencies, (2) family size, (3) family address information, and (4) demographic information for the head of household. This query began with the “service_events” table which records one data point per instance of service. That query is joined to the families table, generating an unduplicated list of families with a count of how many services were rendered in a given time period (01/01/2014-12/31/2014 in this instance). Using a subselect, the number of members in a given family was generated. Lastly, demographic data points for the head of household and address information for the family were retrieved from the families table.

Family Member Data were extracted with a single query generating one unique record per family member (as determined by member_id) with (1) family address information, (2) age, (3) gender, (4) other demographic information, and (5) “family_id” in order to link members with their respective families.

Both the Family Data and Family Member data were manipulated in Excel using “CountIfs” and “SumIf” functions to tabulate totals within the demographic data and to place individuals into age groups based on recorded birthdates/ages.
Appendix C: Ages Served by County, Preble & Montgomery

Figure 2.1-Age of Individuals Served by The Foodbank, Inc. PantryTrak Pantries, Montgomery County, 2014

Source: PantryTrak Client Data, The Foodbank, Inc. Service Area, Calendar Year 2014.

Figure 2.2-Age of Individuals Served by The Foodbank, Inc. PantryTrak Pantries, Preble County, 2014

Source: PantryTrak Client Data, The Foodbank, Inc. Service Area, Calendar Year 2014.
Appendix D: Family Size and Number of Visits

This research team hypothesized that there may be a positive correlation between the size of a family and the number of times they visited a pantry. After running the regression statistics, we found that the test statistics (R-Square) was .0032. With an R-Square value below 0.15, we determined there is no relationship between the two variables.

Count of Analyzed Records
Total Families: 44,668  Total Family Members: 126,366  Total Visits: 170,605

Step 1: State the Null Hypothesis

\( H_0: \rho (\text{rho}) = 0 \) or there is no relationship between the size of a family and the number of times they visited a pantry

\( H_1: \rho (\text{rho}) \neq 0 \) or there is a positive relationship between the size of a family and the number of times they visited a pantry

Step 2: Set the Significance Level

\( \alpha = .05 \quad \text{P-value} < .05 \)

Step 3: Choose a Test Statistic: R Square
Step 4: Calculate the Test Statistic

\[ R \text{ Square} \quad 0.0032 \]

Step 5: Identify the Critical Value

With an R-Square value below 0.15, we determine there is no relationship between the two variables.

Step 6: Accept the Null Hypothesis

\[ H_0: \rho \text{ (rho)} = 0 \] or there is no relationship between the size of a family and the number of times they visited a pantry
Appendix E: Montgomery County Maps
Figure 2.3-Percentage of Population Below 200% of Poverty per Census Tract
Montgomery County, Ohio, 2014

Sources: U.S. Census Bureau, 2011-2013 3-Year American Community Survey
PantryTrak Client Data, The Foodbank, Inc. Service Area Calendar Year 2014
2014 TIGER/Line Shapefiles (machinereadable data files) / prepared by the U.S. Census Bureau, 2014
Figure 2.4 - Unemployment Rate per Census Tract Montgomery County, Ohio, 2014

Sources: U.S. Census Bureau, 2011-2013 3-Year American Community Survey
PantryTrak Client Data, The Foodbank, Inc. Service Area Calendar Year 2014
2014 TIGER/Line Shapefiles (machinereadable data files) / prepared by the U.S. Census Bureau, 2014
Figure 2.5-The Foodbank, Inc. Agencies with Acceptable Travel Distance* and Clients Served Montgomery County, Ohio, 2014

Legend
- The Foodbank, Inc. Agencies
- 2 Mile Agency Buffer
- City Boundaries
- The Foodbank, Inc Client Addresses

*Acceptable travel distance in Montgomery County is 2 miles.

Sources: PantryTrak Client Data, The Foodbank, Inc. Service Area Calendar Year 2014
2014 TIGER/Line Shapefiles (machinereadable data files) / prepared by the U.S. Census Bureau, 2014
Figure 2.6-The Foodbank, Inc. Agencies and Number of Food Pantry Services per Family Montgomery County Ohio, 2014

Sources: PantryTrak Client Data, The Foodbank, Inc. Service Area Calendar Year 2014
2014 TIGER/Line Shapefiles (machine-readable data files) / prepared by the U.S. Census Bureau, 2014
Figure 2.7-The Foodbank, Inc. Agencies and Number of Food Pantry Services per Family Montgomery County Ohio, 2014 (4 or more visits)

Legend

The Foodbank, Inc. Agencies
The Foodbank, Inc. Client Addresses
Number of Food Pantry Services per Family

- 4 - 13
- 14 - 22
- 23 - 37
- 38 - 68

Sources: PantryTrak Client Data, The Foodbank, Inc. Service Area Calendar Year 2014
2014 TIGER/Line Shapefiles (machinereadable data files) / prepared by the U.S. Census Bureau, 2014
Appendix F: Greene County Maps

Figure 2.8-Percentage of Population Below 200% of Poverty per Census Tract Greene County, Ohio, 2014

Sources: U.S. Census Bureau, 2011-2013 3-Year American Community Survey
PantryTrak Client Data, The Foodbank, Inc. Service Area Calendar Year 2014
2014 TIGER/Line Shapefiles (machinereadable data files) / prepared by the U.S. Census Bureau, 2014
Figure 2.9-Unemployment Rate per Census Tract Greene, County, Ohio 2014

Sources: U.S. Census Bureau, 2011-2013 3-Year American Community Survey
PantryTrak Client Data, The Foodbank, Inc. Service Area Calendar Year 2014
2014 TIGER/Line Shapefiles (machinereadable data files) / prepared by the U.S. Census Bureau, 2014
Figure 2.10-The Foodbank, Inc. Agencies with Acceptable Travel Distance* and Clients Served Greene County, Ohio 2014

Sources: PantryTrak Client Data, The Foodbank, Inc. Service Area Calendar Year 2014
2014 TIGER/Line Shapefiles (machinereadable data files) / prepared by the U.S. Census Bureau, 2014
Figure 2.11-The Foodbank, Inc. Agencies and Number of Food Pantry Services per Family Greene County, Ohio 2014

Sources: PantryTrak Client Data, The Foodbank, Inc. Service Area Calendar Year 2014
2014 TIGER/Line Shapefiles (machinereadable data files) / prepared by the U.S. Census Bureau, 2014
Figure 2.12-The Foodbank, Inc. Agencies and Number of Food Pantry Services per Family Greene County, Ohio 2014 (4 or more visits)

Sources: PantryTrak Client Data, The Foodbank, Inc. Service Area Calendar Year 2014
2014 TIGER/Line Shapefiles (machinereadable data files) / prepared by the U.S. Census Bureau, 2014
Appendix G: Preble County Maps

Figure 2.13-Percentage of Population Below 200% of Poverty per Census Tract Preble County, Ohio, 2014

Sources: U.S. Census Bureau, 2011-2013 3-Year American Community Survey
PantryTrak Client Data, The Foodbank, Inc. Service Area Calendar Year 2014
2014 TIGER/Line Shapefiles (machinereadable data files) / prepared by the U.S. Census Bureau, 2014
Figure 2.14-Unemployment Rate per Census Tract Preble County, Ohio, 2014

Source: U.S. Census Bureau, 2011-2013 3-Year American Community Survey
PantryTrak Client Data, The Foodbank, Inc. Service Area Calendar Year 2014
2014 TIGER/Line Shapefiles (machinereadable data files) / prepared by the U.S. Census Bureau, 2014
Figure 2.15 - The Foodbank, Inc. Agencies with Acceptable Travel Distance* and Clients Served Preble County, Ohio, 2014

Source: PantryTrak Client Data, The Foodbank, Inc. Service Area Calendar Year 2014
2014 TIGER/Line Shapefiles (machine-readable data files) / prepared by the U.S. Census Bureau, 2014

*Acceptable travel distance in Preble County is 5 miles.
Figure 2.16-The Foodbank, Inc. Agencies and Number of Food Pantry Services per Family Preble County, Ohio, 2014

Legend
- The Foodbank, Inc. Agencies
- Shared Harvest Foodbank Agencies

Number of Food Pantry Services per Family
- 1 - 3
- 4 - 13
- 14 - 22
- 23 - 37
- 38 - 50

Sources: PantryTrak Client Data, The Foodbank, Inc. Service Area Calendar Year 2014
2014 TIGER/Line Shapefiles (machine readable data files) / prepared by the U.S. Census Bureau, 2014
Figure 2.17 - The Foodbank, Inc. Agencies and Number of Food Pantry Services per Family Preble County, Ohio, 2014 (4 or more visits)

Legend
- The Foodbank, Inc. Agencies
- Shared Harvest Foodbank Agencies

Number of Food Pantry Services per Family
- 0 - 1
- 2 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 - 60
- 61 - 70
- 71 - 80
- 81 - 90
- 91 - 100

Sources: PantryTrak Client Data, The Foodbank, Inc. Service Area Calendar Year 2014
2014 TIGER/Line Shapefiles (machinereadable data files) / prepared by the U.S. Census Bureau, 2014
References


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