

AGING IN PLACE

2022 DATATHON

CONCLUSION



6:05 - 6:15 Intro & Announcements

6:15 - 6:45 Team 1: ElderNet's impact in the community

6:45 - 7:15 Team 2: Decision-making insights dashboard

7:15 - 7:45 Team 3: Growth opportunities



Worldwide organization that promotes **gender diversity** in the **R community** via **meetups** and **mentorship** in a **friendly** and **safe** environment



Local group of **data** professionals and enthusiasts who **learn** about the latest technologies and models in **data science** via speaker events, workshops, and networking.

Announcements

- We are recording this meetup!

RLadies:

- Mentor/Speaker directory: rladiesphilly.shinyapps.io/mentorship/
- Our Youtube channel: youtube.com/c/RLadiesPhilly
- Slack: tiny.cc/rladies-phl-slack
- Upcoming R-Ladies Philly events: [meetup.com/rladies-philly/](https://www.meetup.com/rladies-philly/)
 - ▶ Happy hour once the weather turns nice! and Lightning talks (<https://tinyurl.com/rladiestalks2022>)

DataPhilly:

- Past speakers and talks: <https://dataphilly.github.io/>
- Our YouTube channel: <https://www.youtube.com/c/DataPhilly>
- Slack: dataphilly.slack.com
- Upcoming DataPhilly events: <https://www.meetup.com/DataPhilly/>
 - ▶ Career Advice Workshop (April) and IT fundamentals for Data Scientists (May)

Live-tweet: @RLadiesPhilly, @DataPhilly, @ElderNet1976 **Q&A:** [#203522](https://www.sli.do)



About our datathons

- Hands-on, collaborative work with real data
- Serving a good cause and making a real impact
- Every contribution is valuable, everyone can learn something

Live-tweet: @RLadiesPhilly, @DataPhilly, @ElderNet1976 **Q&A:** [#203522](http://www.sli.do)



Mission:

ElderNet provides a safety net for older and disabled adults to help them remain in their homes, and strengthens the food and financial security for all community members in need of assistance.



Volunteer Services

- Escort Driver
- Odd Jobs
- Friendly Visitor/Friendly Caller

Care Management

- Support
- Information
- Referrals
- Guidance

Community Resources

- Choice Food Pantry
- Care Coordinator
- Ask A Nurse Program
- Emergency Financial Assistance



Team 1: ElderNet's impact in the community

Troy Bleacher, Gabriel Butler, Brendan Graham, Katarina Gutierrez, Kathrine McAulay,
Georgette Nicolaides, Sumner Siebels, Carl Thompson



Objective:

ElderNet's impact in the community:

- How has ElderNet helped clients remain in their home longer?
- How well is ElderNet connecting participants to the public benefits they need? (consider number of interactions, type of benefits/assistance provided, duration between ElderNet enrollment and first ride or first pantry interaction)
- How do the counties served by ElderNet compare to similar counties where services like ElderNet are not available? (e.g. combine with Census data)



The Story of “508”

Living in poverty
Reaches out to Eldernet
Is visited in-home by a volunteer
Receives food for the holidays
Is given a ride for errands
Is given multiple rides to doctor’s visits



The Story in Aggregate

21,504 instances of direct care

766 home visits lasting more than **485 hours**

Over **638** hours of phone calls

Over **145,000** pounds of food

2,102 rides to doctor's appointments



The Story of Those Most in Need

- 146 The number of rides Anne received to doctor's appointments
- 40 The number of rides Janel received for shopping
- 2350 The pounds of food given to Freida
- 119 The number of clients using services 50+ times
- 66 The number of clients using services 100+ times

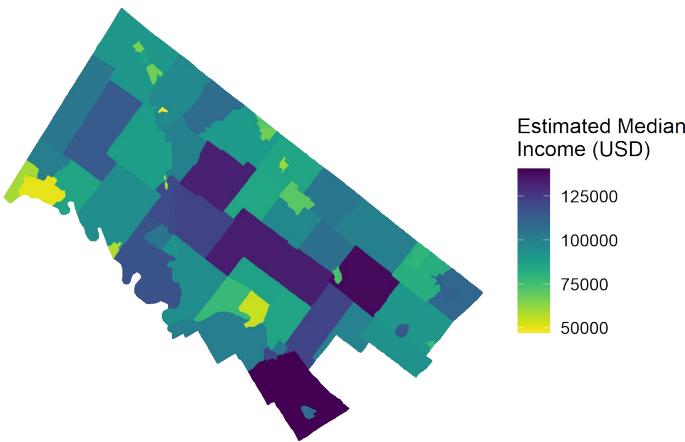


The Demographics

Reaching Communities in Poverty

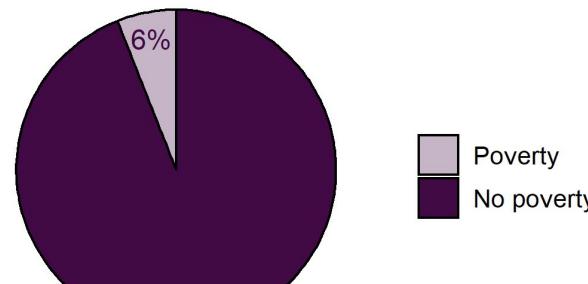
Median Income Across Montgomery County, PA

Data source: US Census Bureau, 2016-2020 ACS



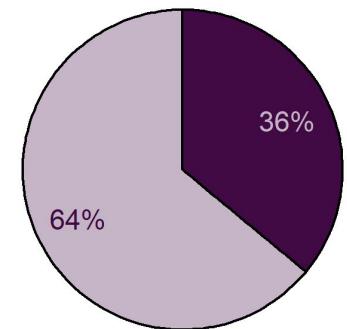
Montgomery County Residents

Data source: US Census Bureau, 2016-2020 5-year ACS



ElderNet Clients

Data source: Datathon 2022

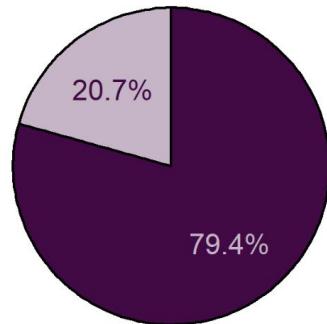


Although only 6% of Montgomery County Residents are below the Federal Poverty Level and the median income in Lower Merion Township is the highest in the county at \$140,000, almost two thirds of ElderNet clients may be in poverty

Reaching Minority Communities

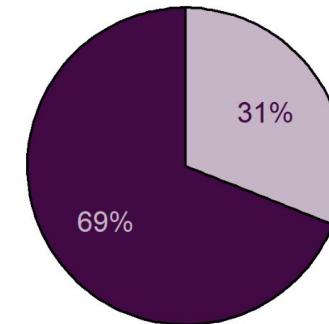
Montgomery County Residents

Data source: US Census Bureau population estimates, 2019



ElderNet Clients

Data source: Datathon 2022

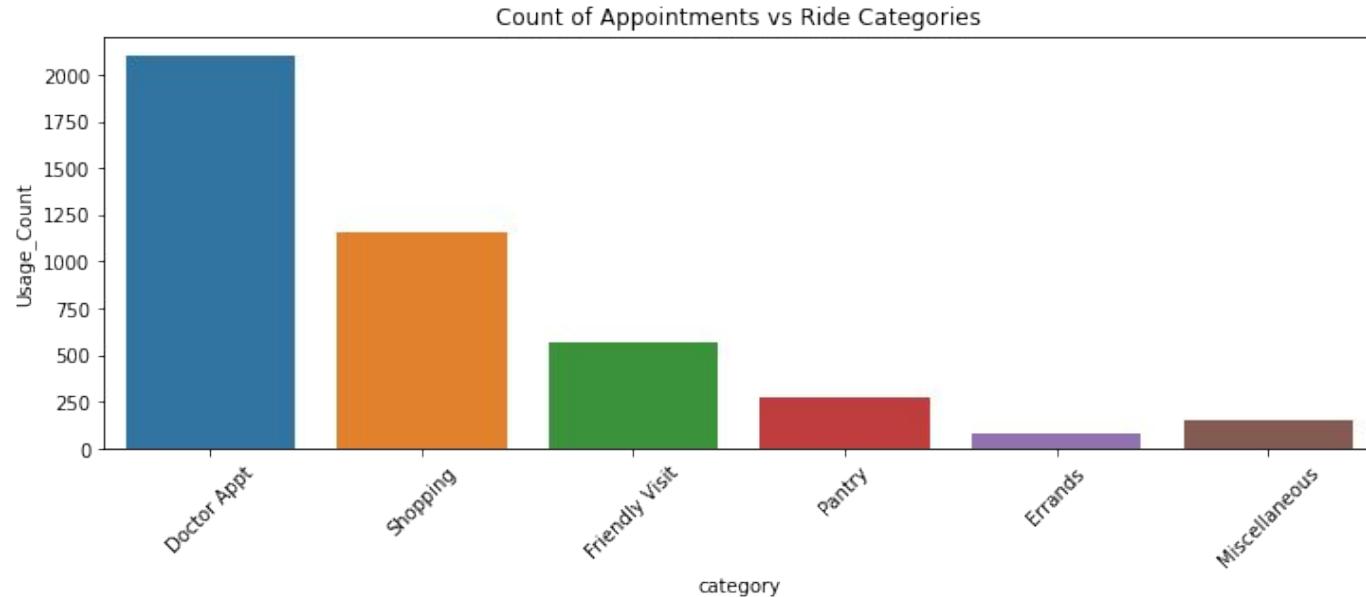


21% of Montgomery County's 800,000 residents identify as a minority race
However 31% of clients in the dataset were classified as minority



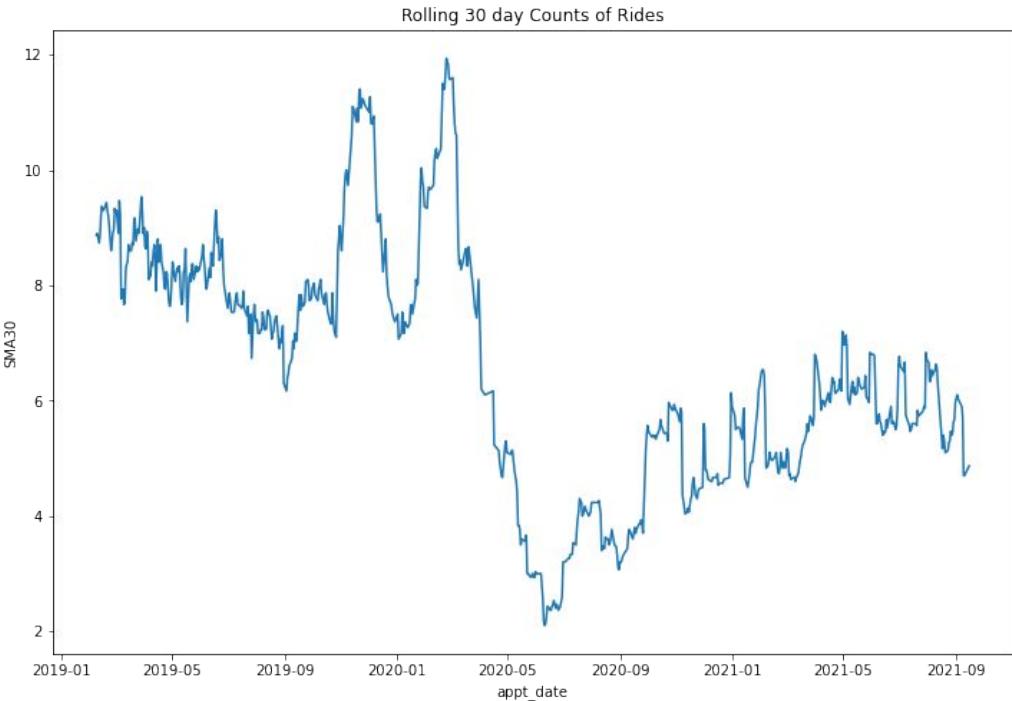
The Data

Ridership by Category



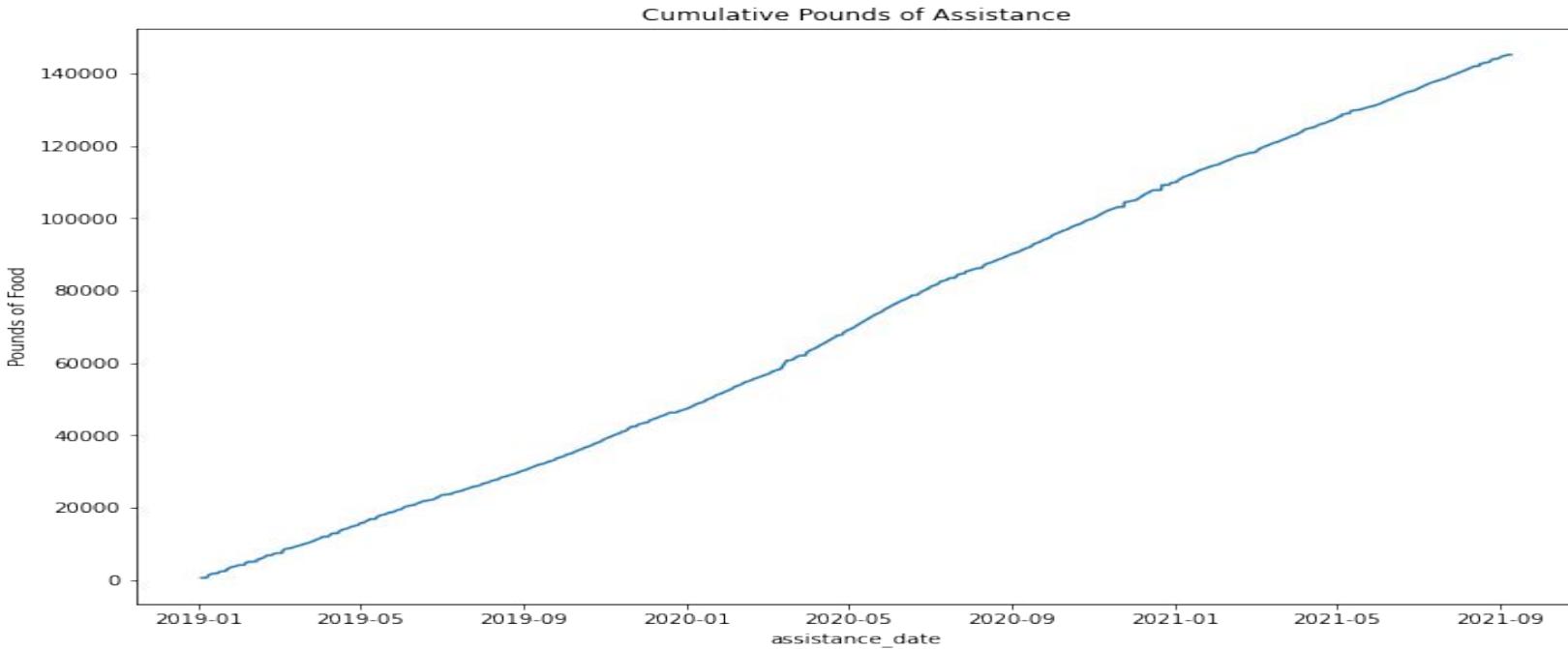
During recent 26 month period, over 4100 rides were given to ElderNet clients

Ridership: 30-day Rolling Average



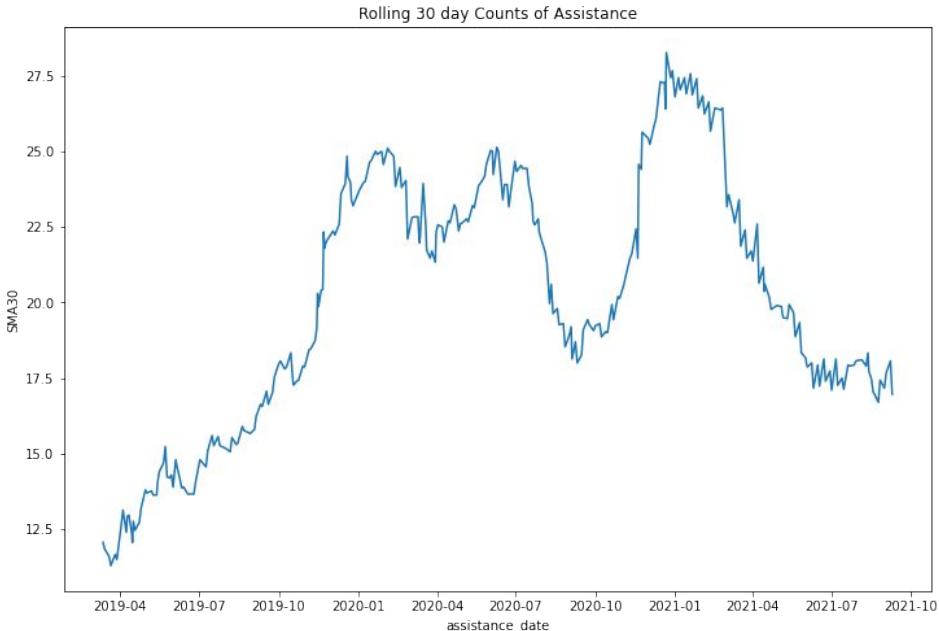
Ridership took a significant hit at start of pandemic and has not yet fully recovered to pre-pandemic levels.

Pantry Food Aid



Over 145,300 pounds of food distributed, 25 pounds at a time.

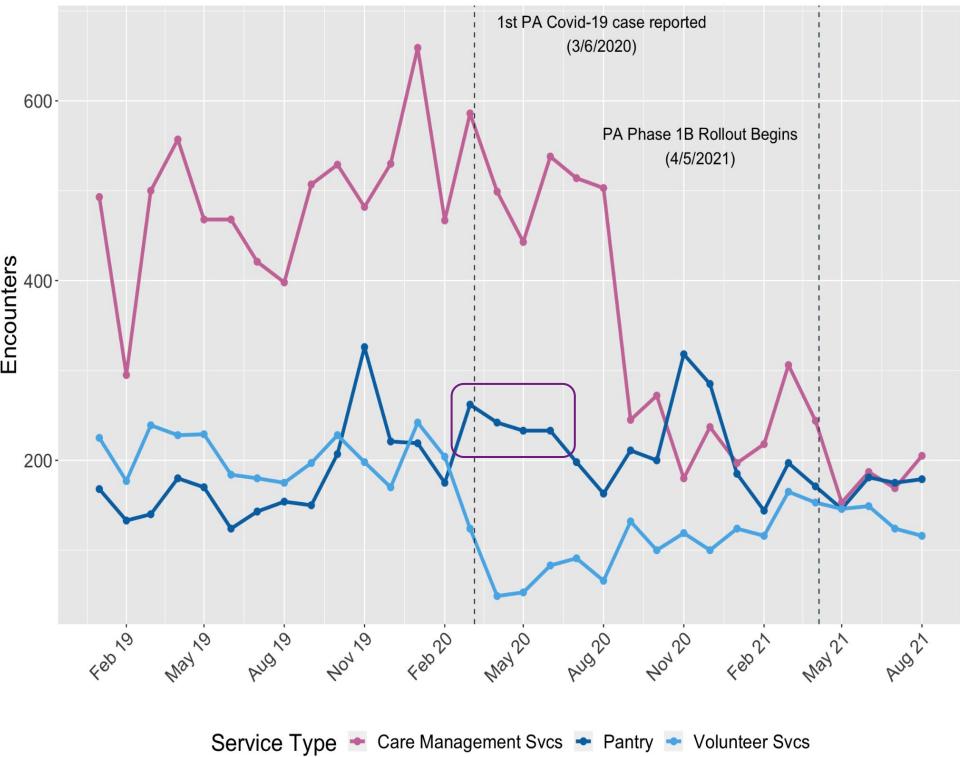
Pantry Average Use



- There was a consistent upward trend until early pandemic (March 2020), then a resurgence in usage.
- Pantry visits increased significantly the last couple of months of each year covered by study. Is this due to increased need, or more awareness during end of year holidays?

ElderNet Service Utilization

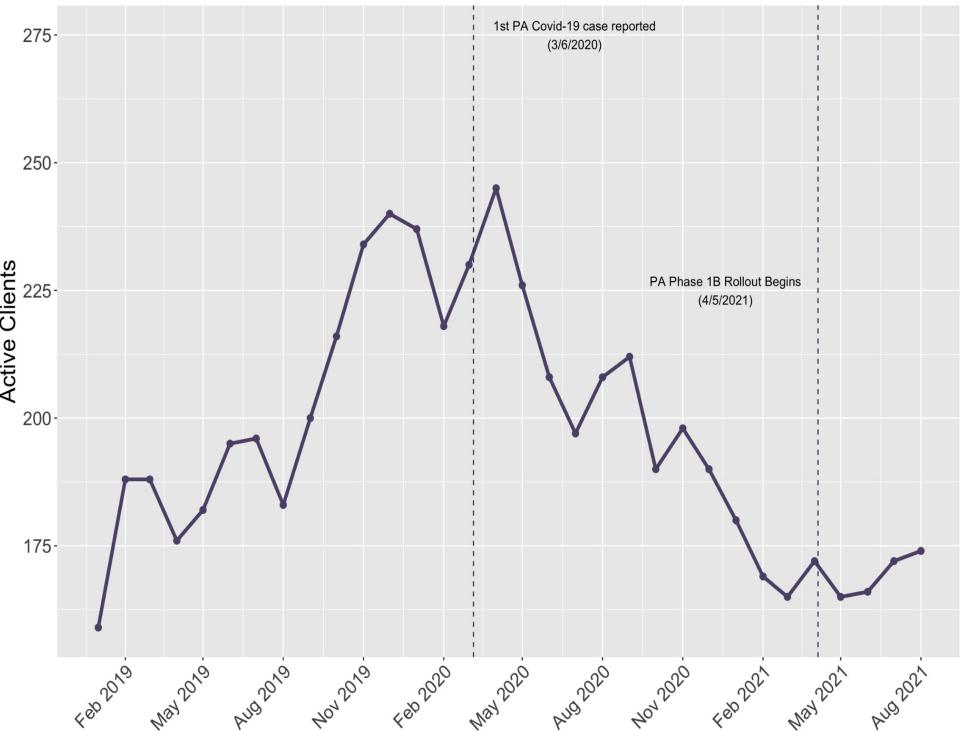
Monthly ElderNet Service Utilization



- Pantry provides valuable services - usage *increased* during early pandemic months
- There are opportunities to ramp up care management and volunteer services to their pre-pandemic levels

ElderNet Service Utilization: Monthly Active Clients

Monthly Active Clients

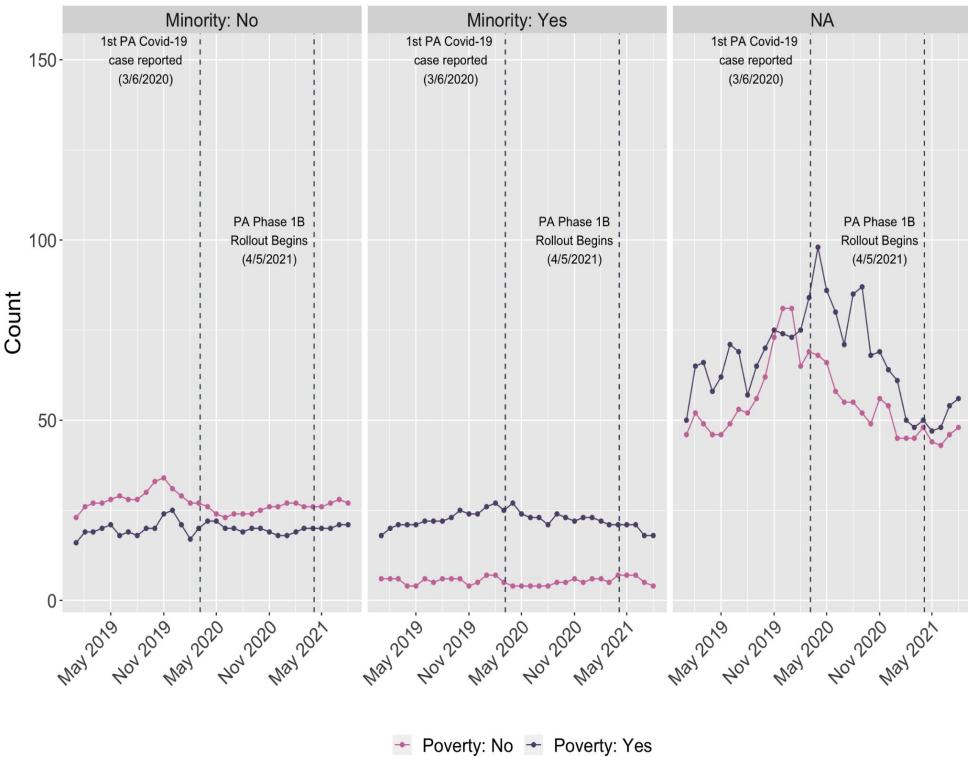


- We attempted to define an “active” ElderNet client
- Tracking *active clients* over time can give some insight into the value of ElderNet services through consistent, repeated usage

Active Client Definition:
*Used at least 1 service offered
 (pantry, volunteer, or care mgmt) in
 at least 1 of the 2 previous months*

Monthly Active Clients Stratified

Active Clients per Month



- Minority clients, regardless of poverty status, tended to remain consistently active throughout the pandemic
- Given their consistent usage, ElderNet was a lifeline for these clients throughout the pandemic
- However, it's hard to draw solid conclusions given high number of NA's in the data



Questions We Considered, But Were Unable to Answer

- What services were most likely to enable a client to stay in their home?
- Did client Covid-19 vaccination status impact ridership or other services?
- Was the drop in ridership during early pandemic due to reduced demand, or reduced availability of drivers?
- Did the rise in telemedicine impact need for rides to doctor's appointments, that is, what percentage of rides could be eliminated if patients were able to access telemedicine?



Conclusions

- Based on typical usage, transportation, especially to doctor's appointments, is an extremely desired service
- Access to the food pantry was a consistent and well used service
- The pandemic impacted monthly active clients, but active clients began to rise following vaccine rollout
- Linking this information to the current in-home status of clients would allow provide more insight into the effectiveness of these services

slido



Audience Q&A Session

- ⓘ Start presenting to display the audience questions on this slide.



Team 2: Decision-making insights dashboard

Paromita Barua (She/Her), Sean Cancino (He/Him), Michelle Chiu (She/Her), Cynthia Cho (She/Her)



Hello!

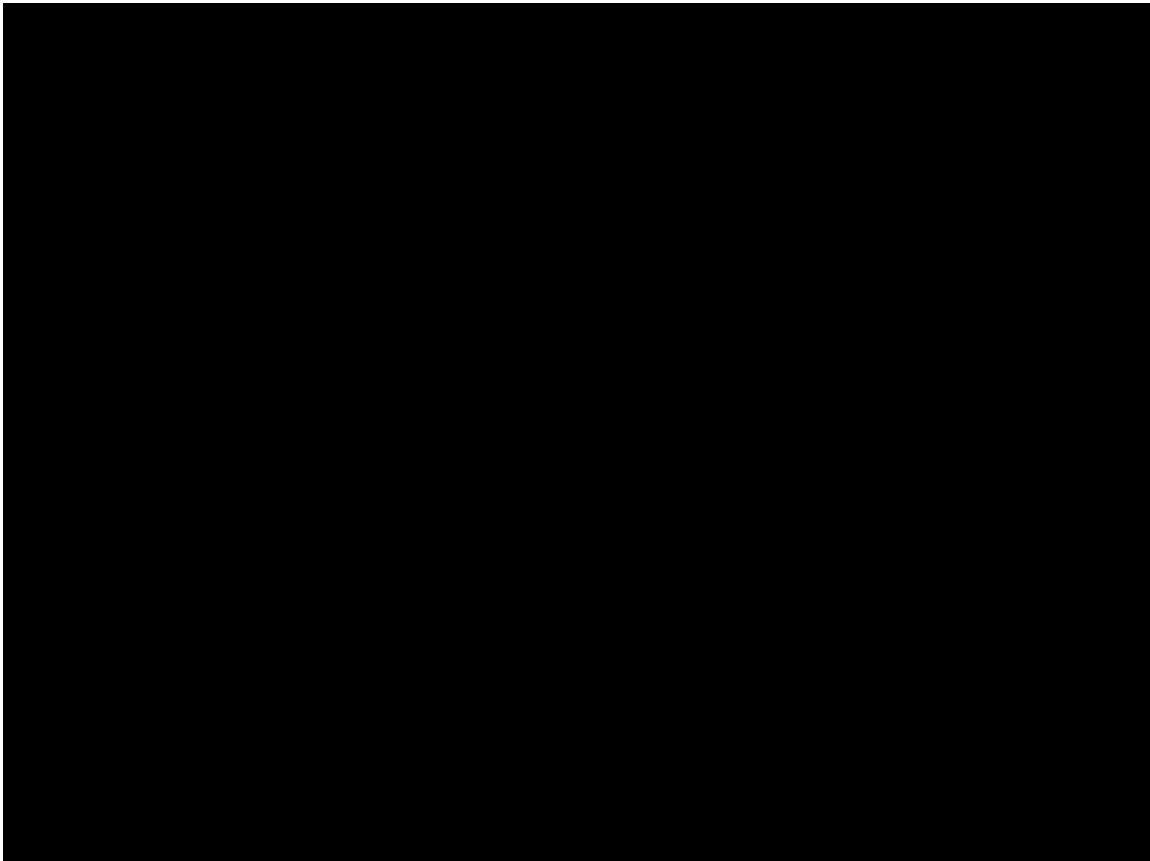
This presentation was prepared by:

- Paromita Barua (She/Her)
- Sean Cancino (He/Him)
- Michelle Chiu (She/Her)
- Cynthia Cho (She/Her)



Dashboard 1: Financials

Tableau



Dashboard 2: Care Management

Tableau

Client County

County	
Montgomery	93.76%
Other	6.24%

Client Age Group

D	14.82%
G	27.15%
NA	33.85%
P	9.98%
T	14.20%

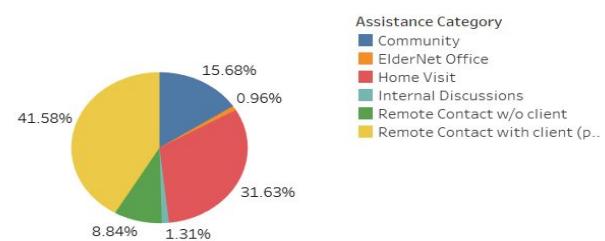
Client Ethnicity

NA	75.66%
No	16.85%
Yes	7.49%

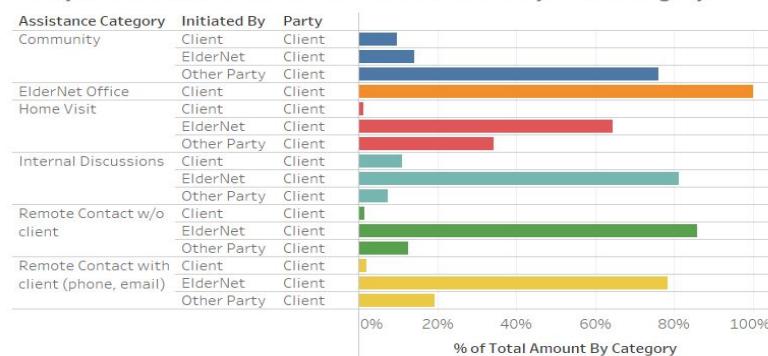
Client Economic Status

NA	6.24%
No	33.54%
Yes	60.22%

Proportion of Assistance Categories Compared to Total Amt of Assistance Provided



Party to Client Interactions As % of Total Amt By Asst Category





Dashboard 2: Care Management (cont.)

Tableau

Types of Assistance and the Benefits They Provide (Ranked)

Benefit 1	Assistance 1								
	Continuation	Coordination	Enrollment	Facilitation	Filing	Information	Medical	Referral	Support
ADL	5	5	6			9		4	10
ElderNet	6	1	2		4	5		11	1
Financial	10	4	4		2	1		2	3
Food	2	6	5		5	6		7	5
Housing	1	3	1	1	1	3	1	5	8
Information		13							
Legal	8	8	8		3	4		3	9
Medical	3	2	3		6	2		1	6
Safety		9	10			12		6	4
Social		10				10			2
Telecommunication	7	12				11		10	12
Transportation	9	11	7			8		8	10
Utilities	4	7	8			7		8	7



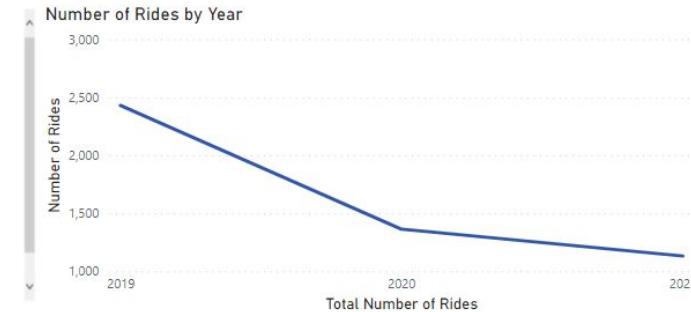
Dashboard 3: Client Engagement

PowerBI

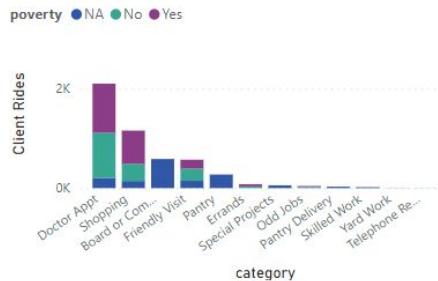
Client Engagement - Volunteer services (rides involving clients) between 2019/01 and 2021/09

category	Hours Volunteered
Doctor Appt	4,366.75
Shopping	3,376.75
Pantry	2,478.50
Friendly Visit	2,086.25
Board or Committee Mtg	1,353.00
Special Projects	793.50
Skilled Work	568.50
Odd Jobs	200.50
Pantry Delivery	156.50
Total	15,589.00

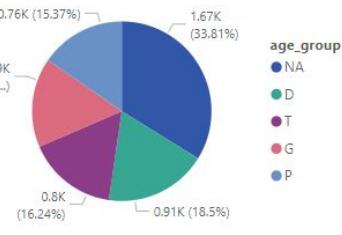
category	Total # of Rides
Doctor Appt	2102
Shopping	1158
Board or Committee Mtg	586
Friendly Visit	571
Pantry	273
Errands	79
Special Projects	56
Odd Jobs	43
Pantry Delivery	30
Skilled Work	20
Yard Work	4
Total	4925



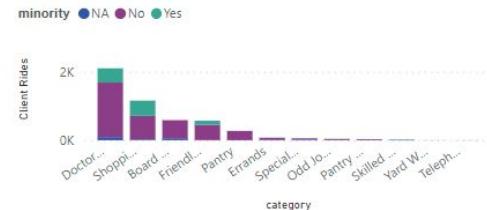
Client Rides by category and poverty



Client Rides by age_group



Client Rides by category and minority

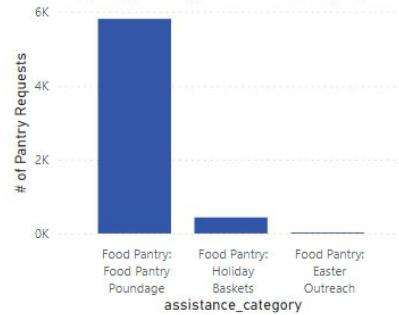


Dashboard 3: Client Engagement

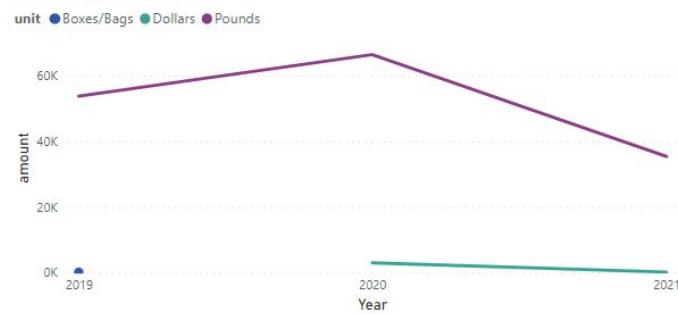
PowerBI

Client Engagement - Food pantry interactions between 2019/01 and 2021/09

of Pantry Requests by assistance_category

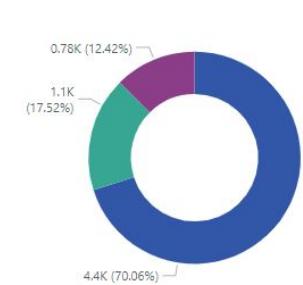


amount by Year and unit

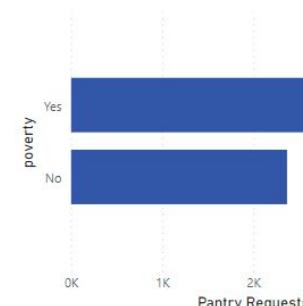


unit	# of Pantry Requests
Pounds	6161
Dollars	99
Boxes/Bags	13
Total	6273

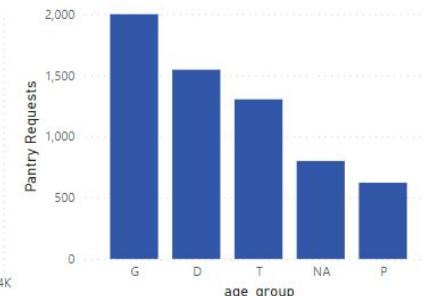
Pantry Requests by minority



Pantry Requests by poverty



Pantry Requests by age_group



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Audience Q&A Session

- ⓘ Start presenting to display the audience questions on this slide.



Team 3: Growth opportunities



Hello!

This presentation was prepared by:

- Michael Bryan (He/Him)
- Lasaly Changkachith (She/They)
- Cara Cuiule (She/Her)
- Zane Dax (She/They)
- Jamaal Green
- Michael Holt (He/Him)
- Alisha Paul
- Dave Slinger (He/Him)



Prompt

1. Are there areas that ElderNet should focus on in the future?
2. Explore ElderNet's growth in donations, clients, etc.
3. Any other analyses you think would be interesting?

1

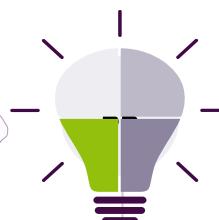
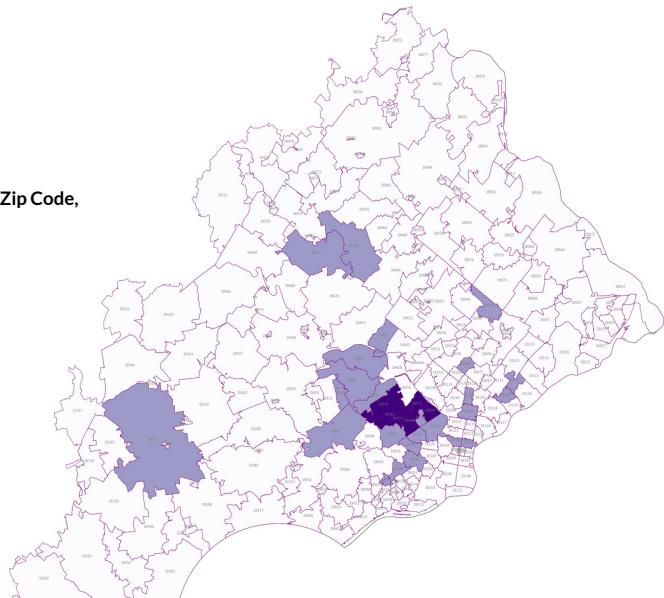
Areas of need for future focus

Census data and service area modelling

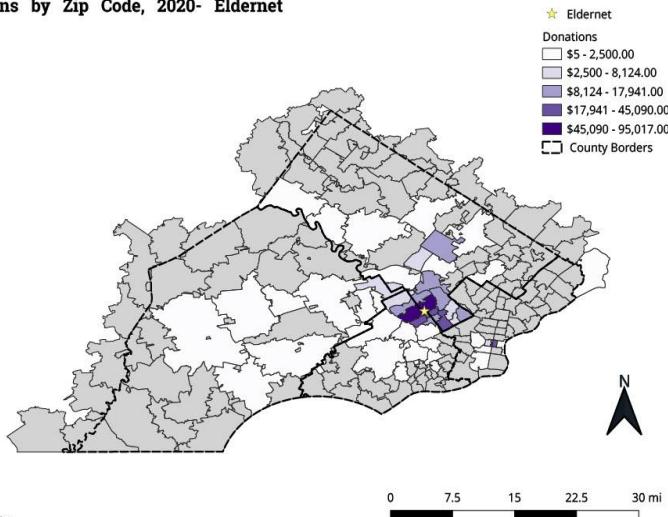
Observation: Geography matters

ElderNets service delivery and donations are local. Future growth in both locations and variety of services provided should be location oriented.

Client Counts by Zip Code,
ElderNet Region



Donations by Zip Code, 2020- ElderNet Region



Source: ElderNet

Services are growing past Lower Merion.
Consider developing a [location model](#).

Observation: Demographic data from Census ACS should relate to ElderNet client demand

- Median Household Income
- Population over 55
- Population with disabilities

suggest client demands in . . .

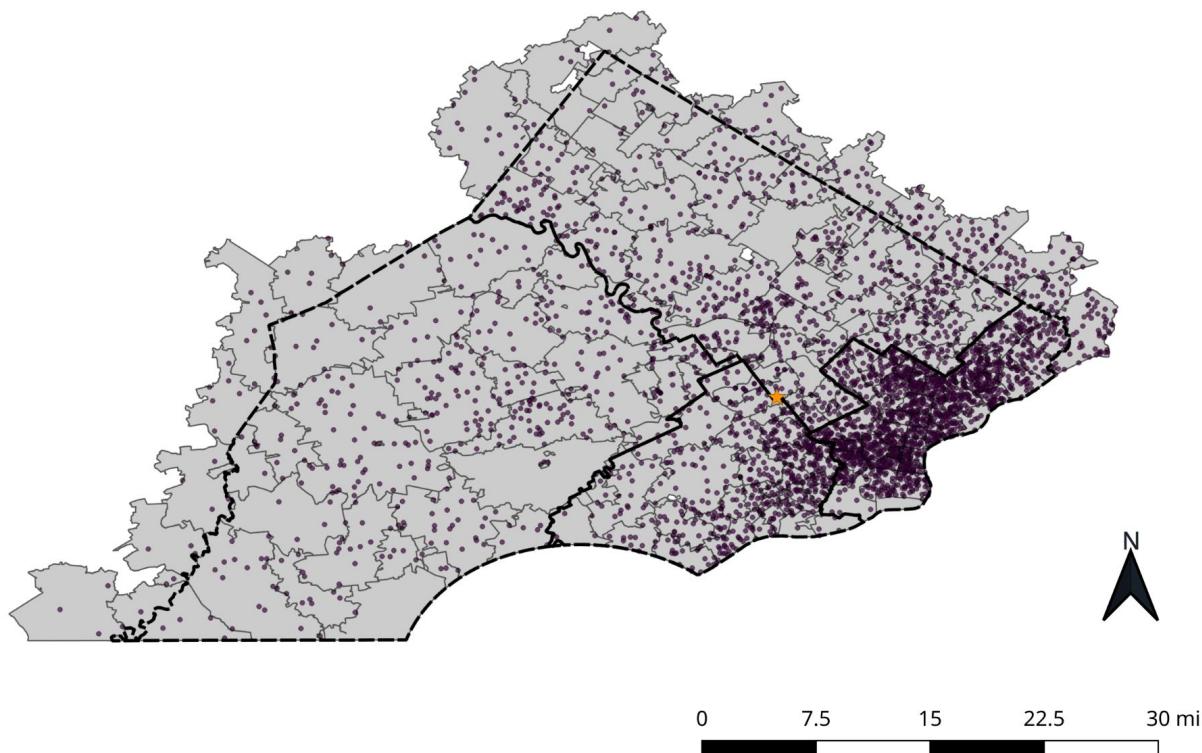
- Philadelphia
- Eastern Delaware County including Darby (19023)
- Central Montgomery County including Norristown (19404)
- Western Montgomery County including Pottstown (19464)
- Central Chester County including Coatesville (19320)



Total Population- Eldernet Region

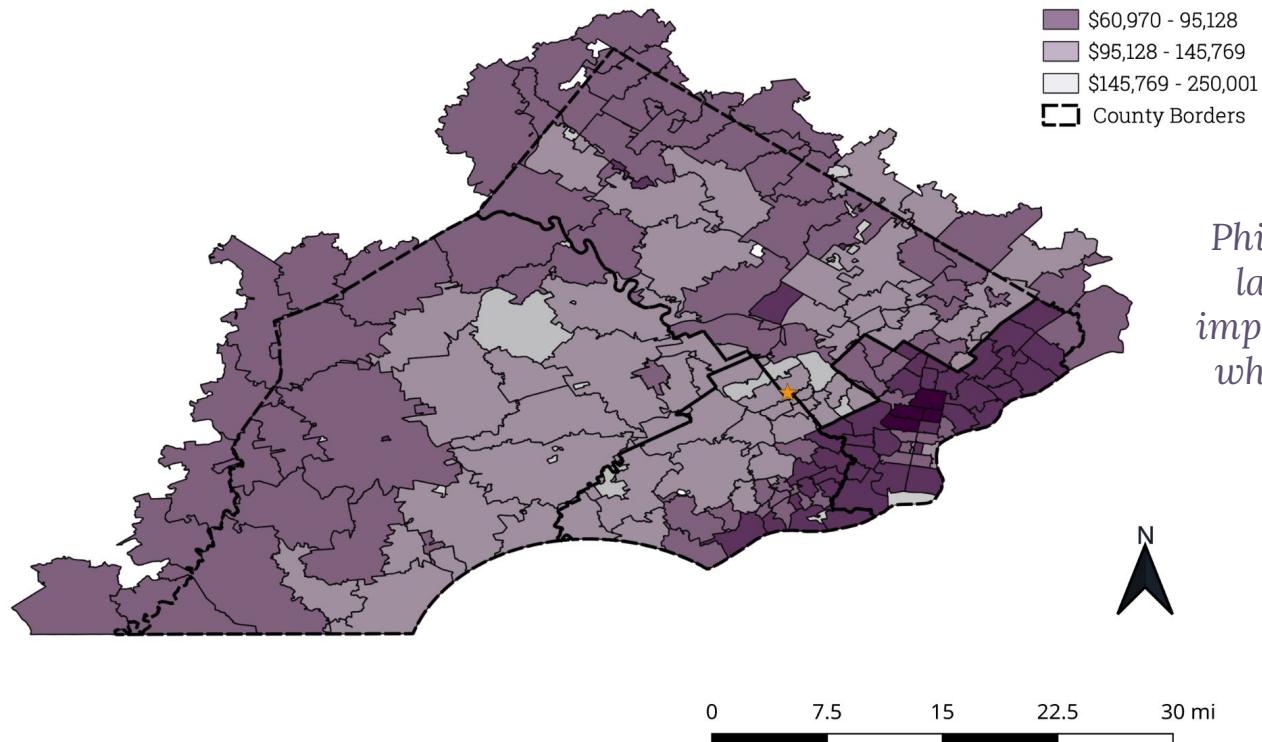


- ★ Eldernet
- Total Population (per 1,000)
- County Borders



Source: ElderNet, American Community Survey 2015-2019

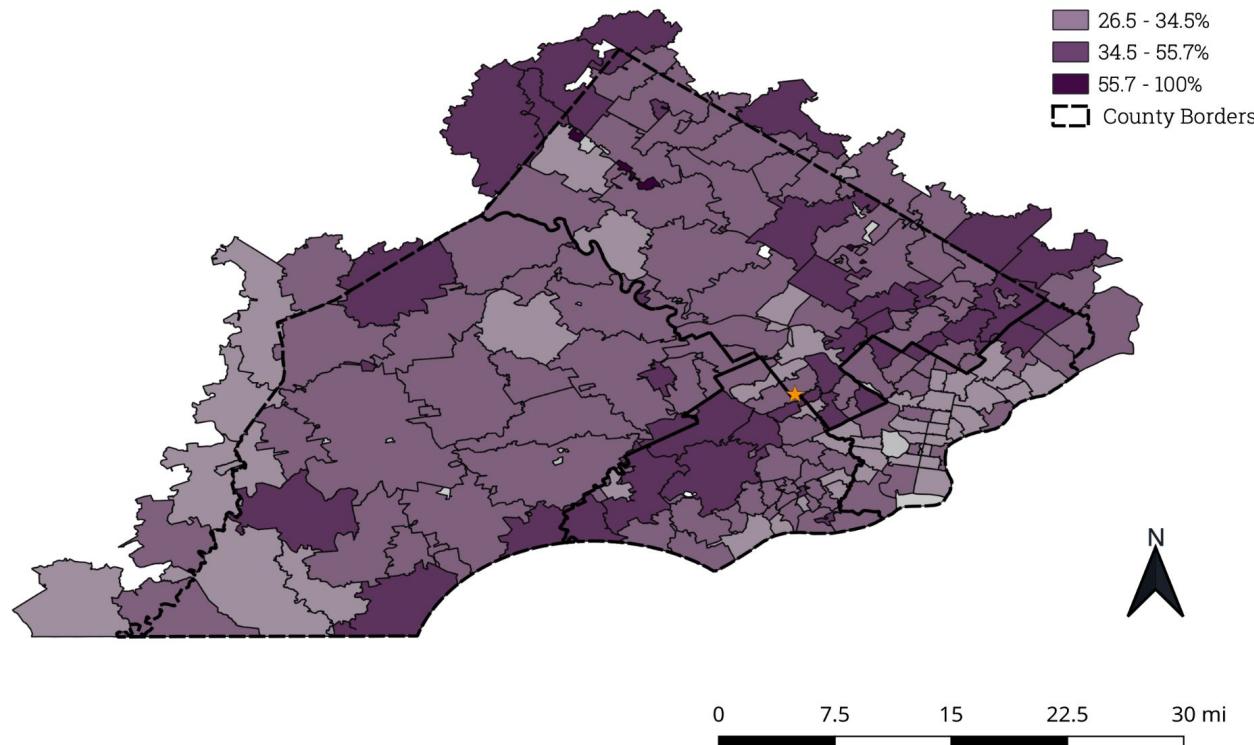
Median Household Income- Eldernet Reion



Philadelphia also has the largest aggregation of impoverished populations, which includes the elder community.

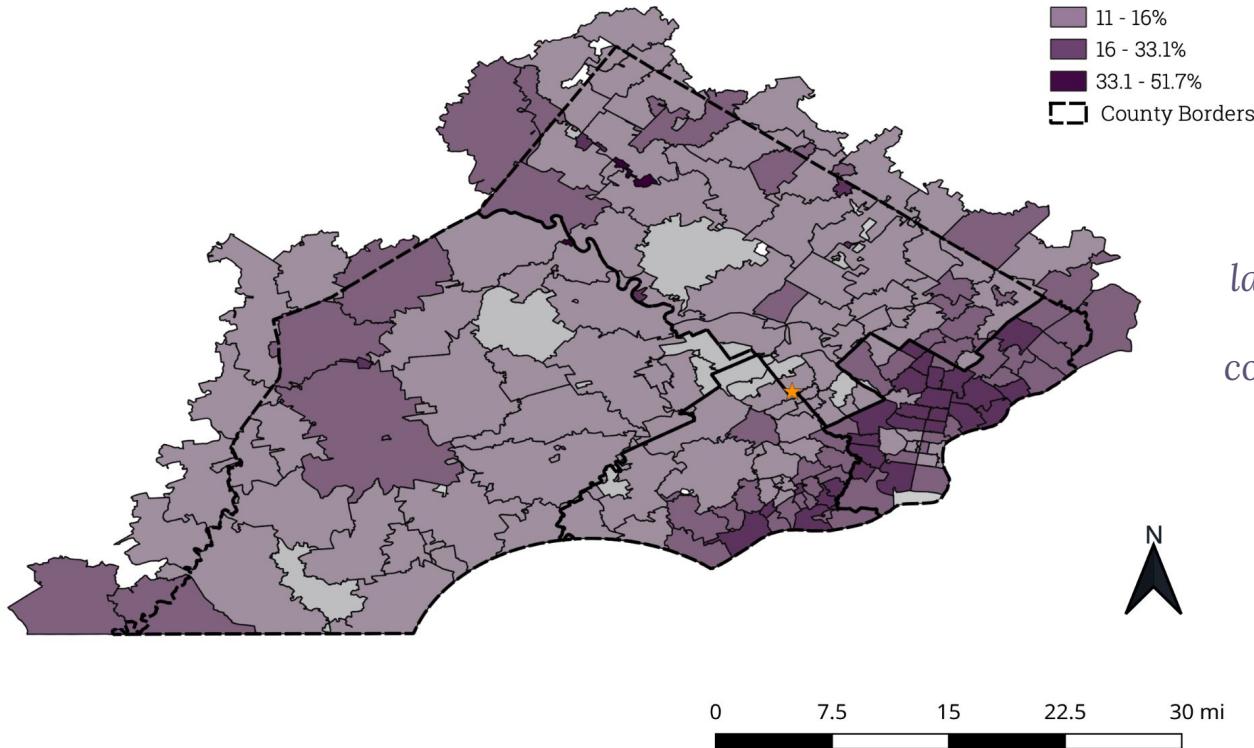
Source: ElderNet, American Community Survey 2015-2019

55+ Population- Eldernet Region



Source: ElderNet, American Community Survey 2015-2019

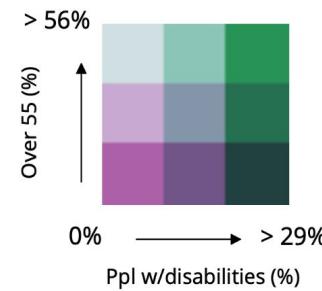
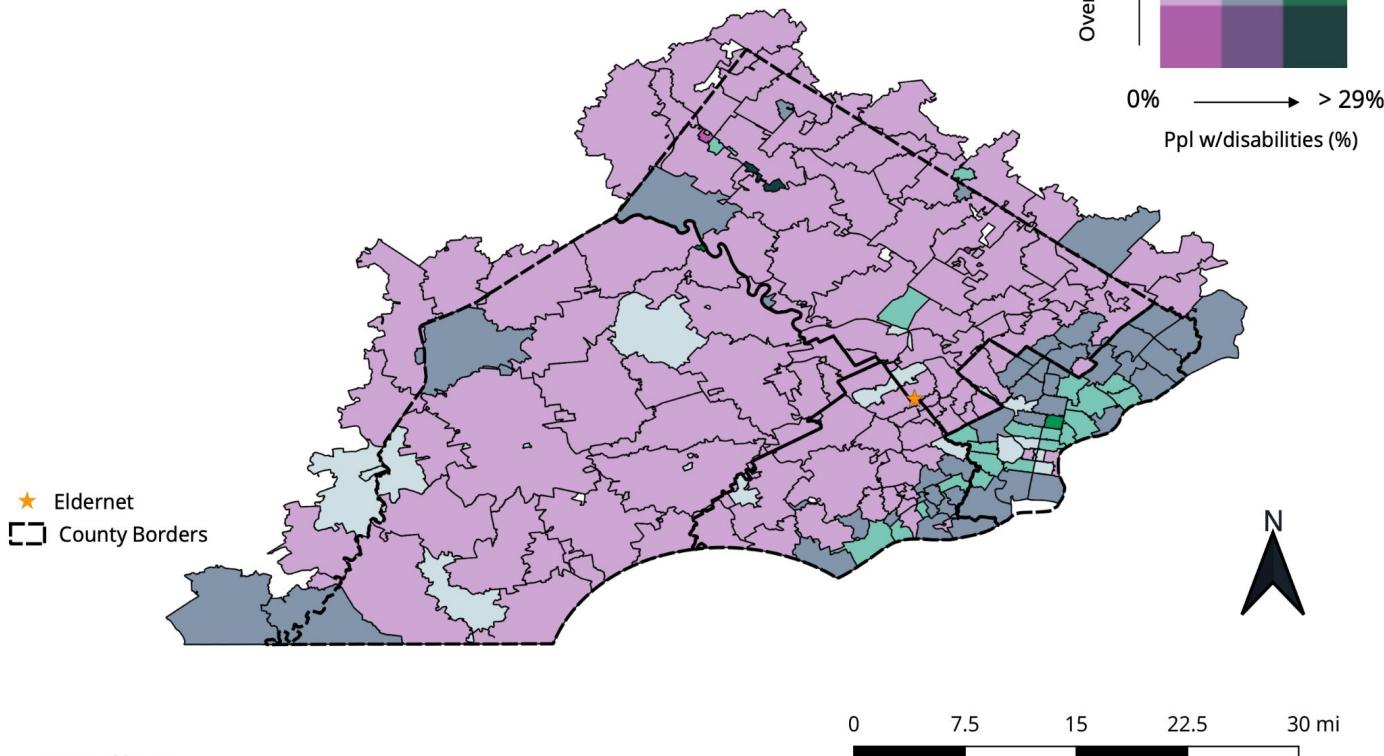
People with Disabilities Share- Eldernet Reion



Philadelphia has a
large population of
disabled peoples
compared to the areas
around it.

Source: ElderNet, American Community Survey 2015-2019

People with Disabilities and Over 55- Eldernet Region



Notice the dark gray and light green areas showing density of both populations over 55 and disabilities.

Observation: ElderNet services compare to federal and state offerings.



- U.S. Department of Health & Human Services, Department of Aging
- National Institutes of Health, Institute on Aging
- Commonwealth of Pennsylvania, Department of Aging
- Montgomery County, Office of Senior Services

Offer surveys and reports with trends rather than appendable data



Can support ElderNet service definitions and potential new services



Comparing...



ElderNet Services

Service	Category	Activity
Care Management	Community	757
	ElderNet Office	47
	Home Visit	766
	Internal Discussions	233
	Remote Contact	1948
Volunteer Services	Meetings	◆ 586
	Doctor Appt	2102
	Errands	◆ 79
	Friendly Visit	571
	Odd Jobs	43
	Pantry	273
	Pantry Delivery	30
	Shopping	1158
	Skilled Work	◆ 20
	Special Projects	56
Pantry	Telephone Reassurance	3
	Yard Work	4
	Easter Outreach	19
	Food Pantry Poundage	5817
	Holiday Baskets	◆ 437

Pennsylvania Department of Aging

Directives
✓ Care Management
✓ Volunteer Services
✓ Passenger Transportation
✓ Food Banks
○ Home-Delivered and Congregate Meals
○ Socialization, Recreation, Education & Health
○ Adult Day Services
○ Employment Services
○ Legal Assistance
○ Medicare Consulting
✓ Information And Referral
○ Home Health
○ Personal Care
○ Domiciliary Care
✓ Personal Assistance Services
○ Medical Equipment Home Support
○ Protective Services Intake & Investigation
○ Prescription Assistance

Live-tweet: @RLadiesPhilly, @DataPhilly, @ElderNet1976 Q&A: [#203522](http://www.sli.do)



Suggests new services ...

- Integrate with public services that meet basic needs.
(ElderNet probably already does this)

- Homebound services including meals and caregiving.
- Activity services like Senior Centers & Adult Day Care.
- Health services for wellness, Medicare and prescriptions.
- Financial support with taxes, insurance and social security.

2

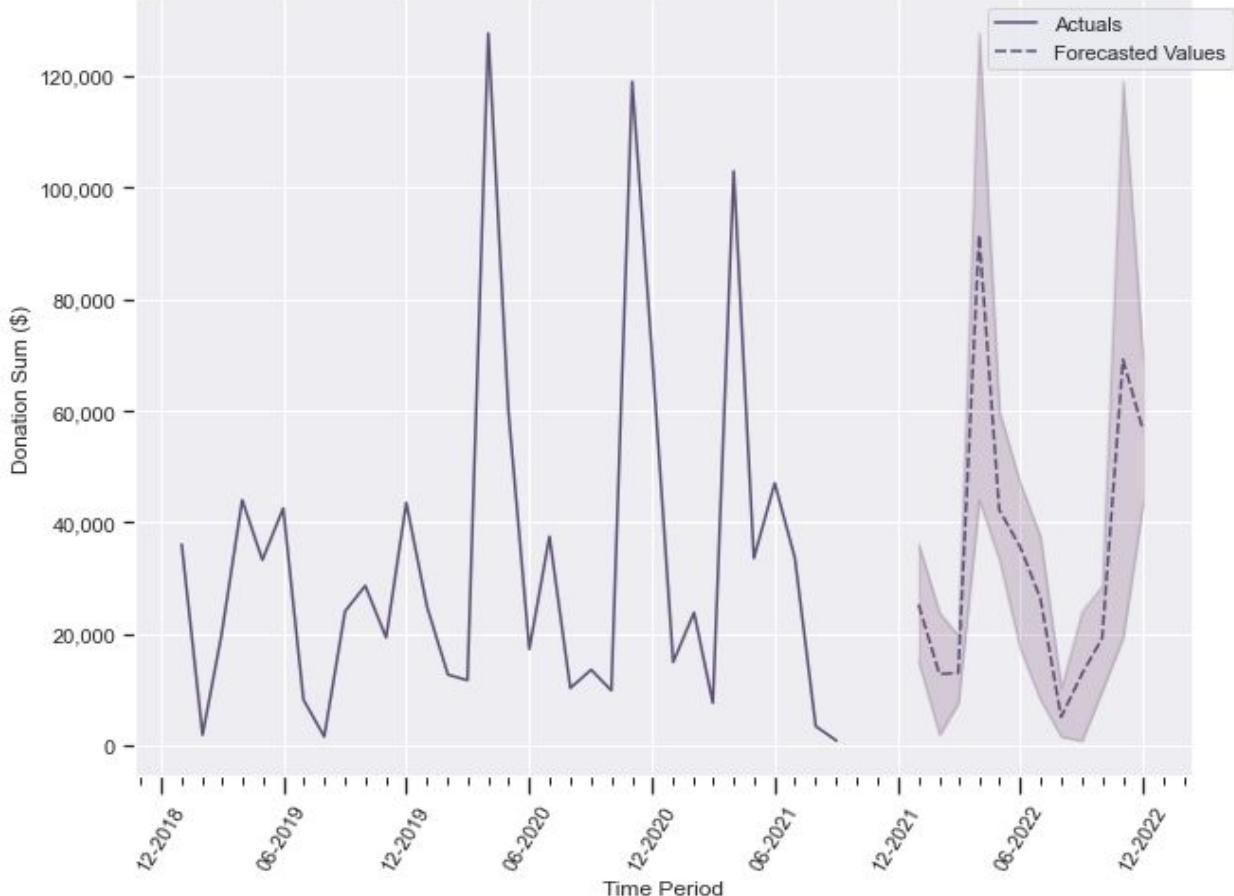
Eldernet's Growth

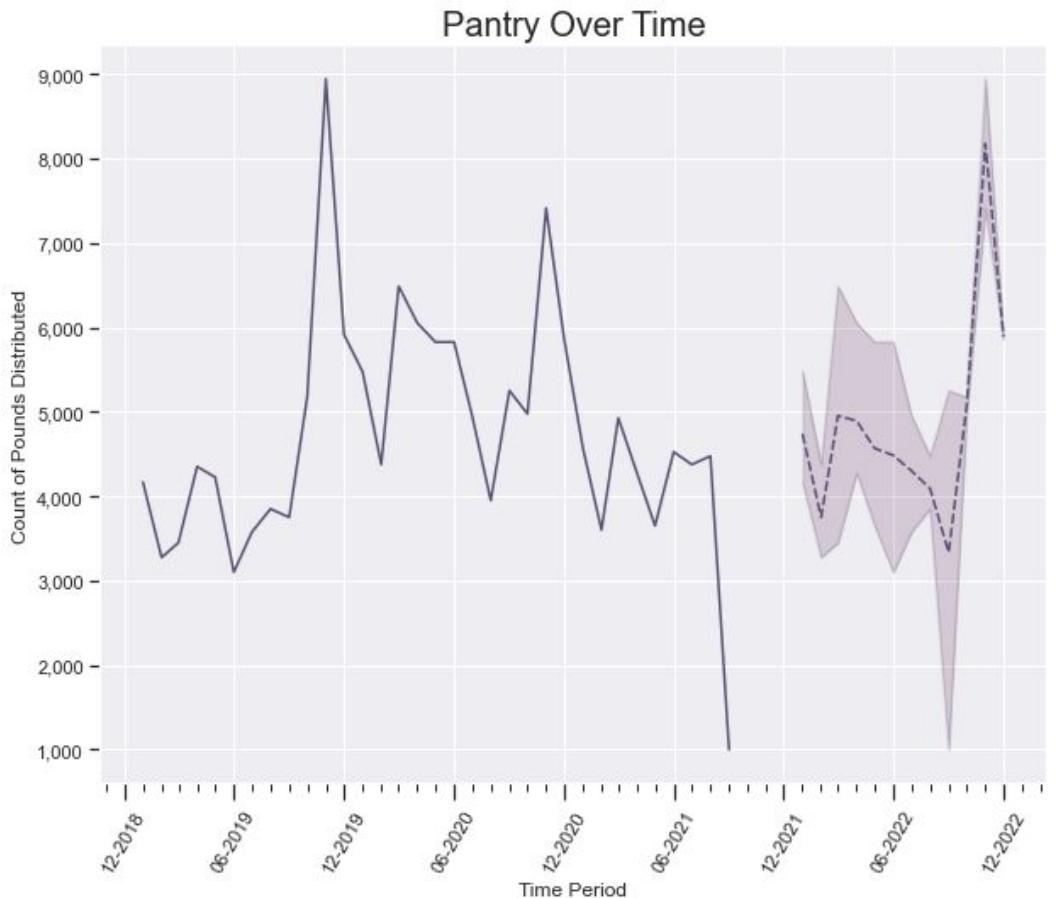
in donations and services by geography



Trends are difficult to predict with limited data and must be treated with caution, shaded purple shows the min/max for each month

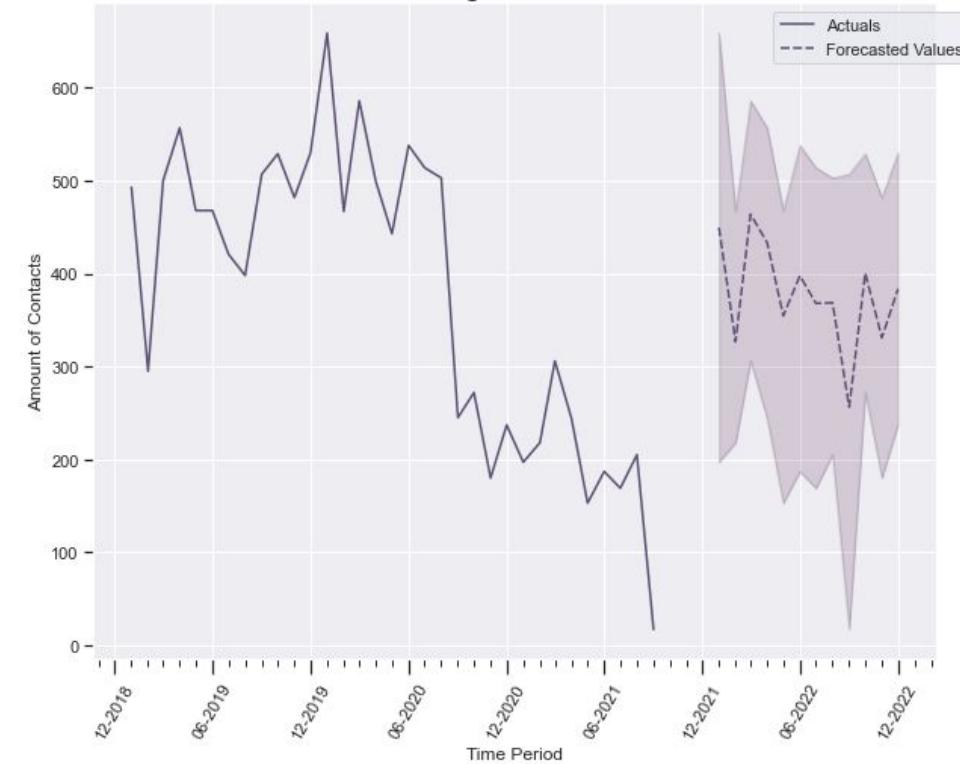
Donations Over Time



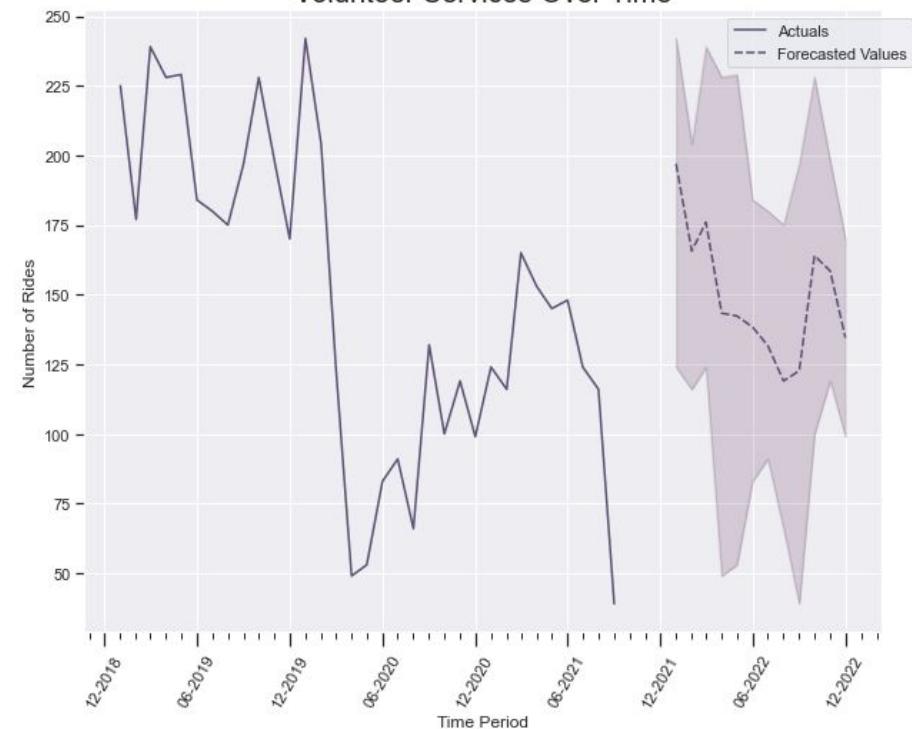


Amount of pounds distributed peaks in November, with some minor peaks in between.

Care Management Over Time



Volunteer Services Over Time



Number of Care Management and Volunteer Services contact events declined likely due to the pandemic.

Observation:

Donations relate to Median Household Income.

Among the expected prediction variables, Median Household Income appears statistically significant. Development campaigns can focus on affluence in households and neighborhoods. This conclusion is probably shared with other non-profits, so consider external data services.



Donations by Zip Code, 2019- Eldernet Region



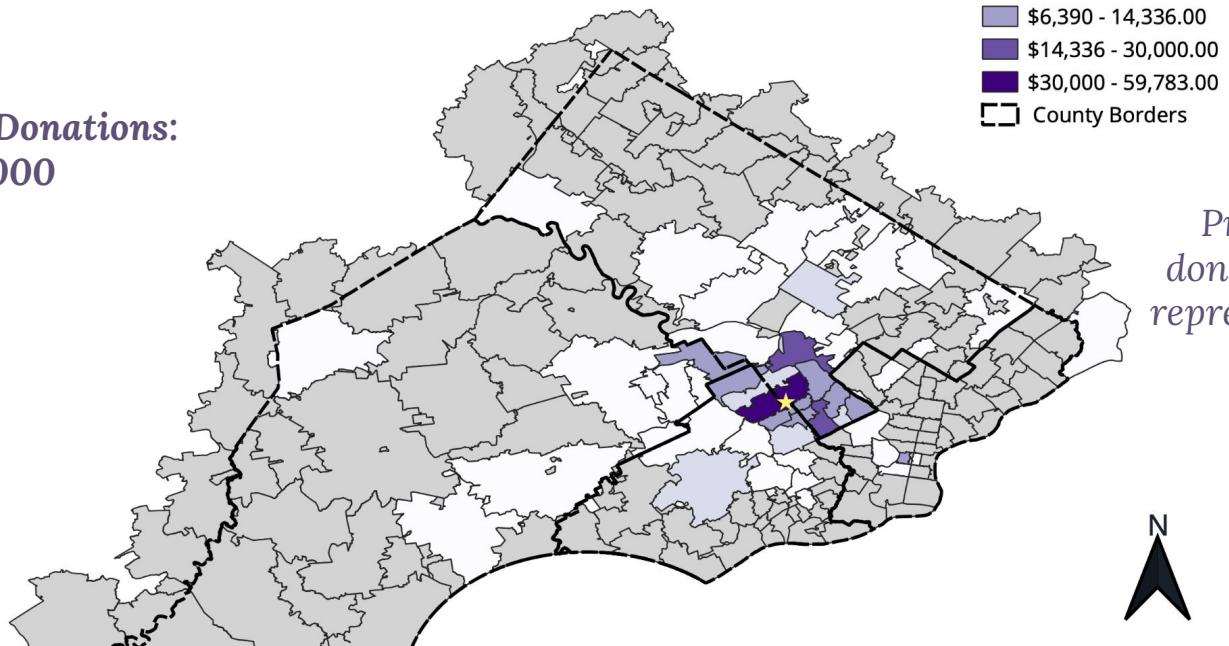
Total Donations:
\$268,000

★ Eldernet Location

Donations

- \$10 - 1,525.00
- \$1,525 - 6,390.00
- \$6,390 - 14,336.00
- \$14,336 - 30,000.00
- \$30,000 - 59,783.00

□ County Borders



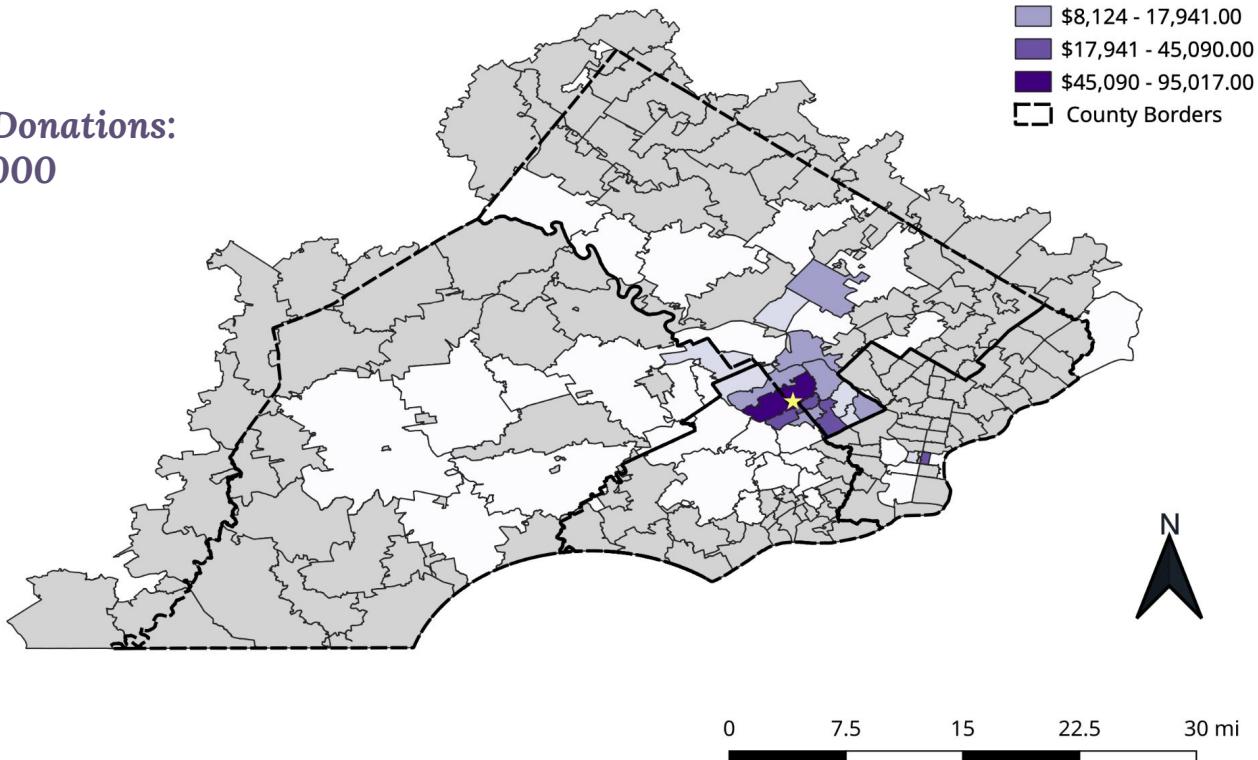
Pre-pandemic map of
donations. Assuming 2019
represents the total amount
received annually.

Source: ElderNet

Donations by Zip Code, 2020- Eldernet Region



Total Donations:
\$460,000



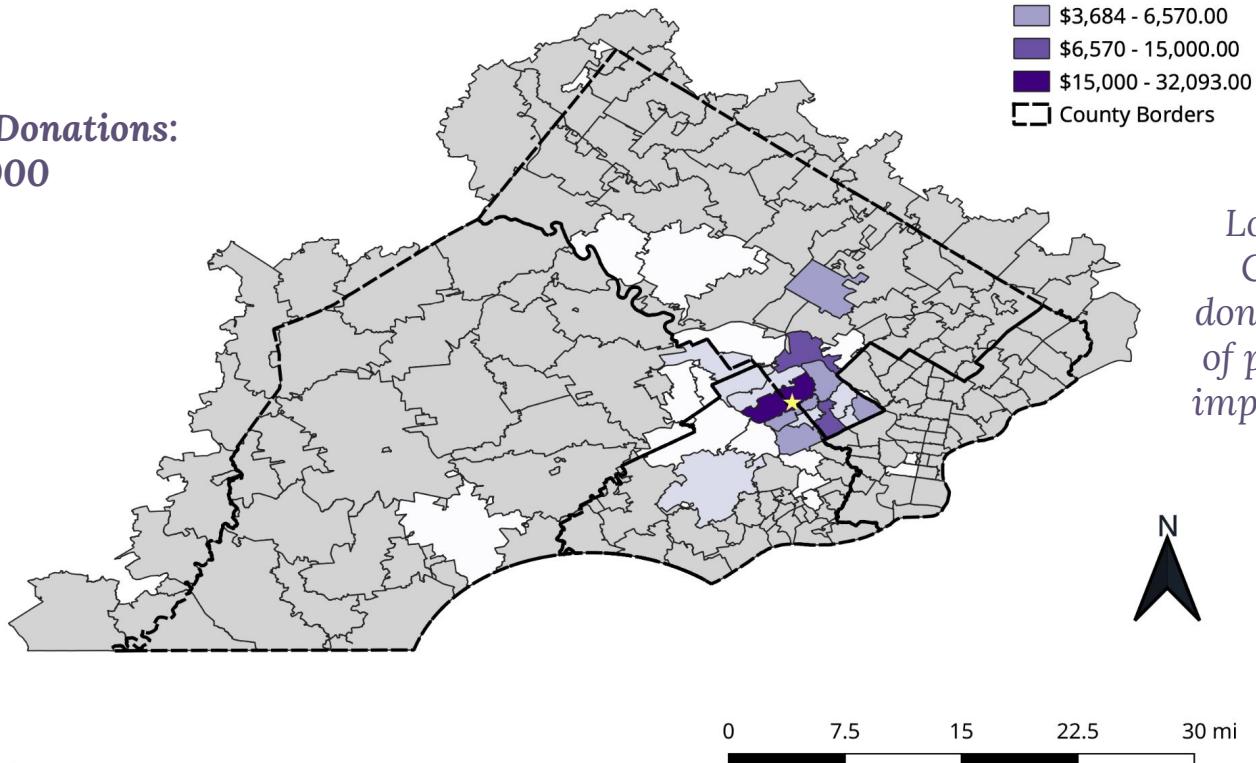
In the first year of the pandemic, the areas of donations shifted. Some zip codes dropped and gained new zip codes.

Source: ElderNet

Donations by Zip Code, 2021- Eldernet Region



Total Donations:
\$182,000



Long-haul impact of COVID-19 reduced donations during year 2 of pandemic. Economic impact on working class and rural areas.

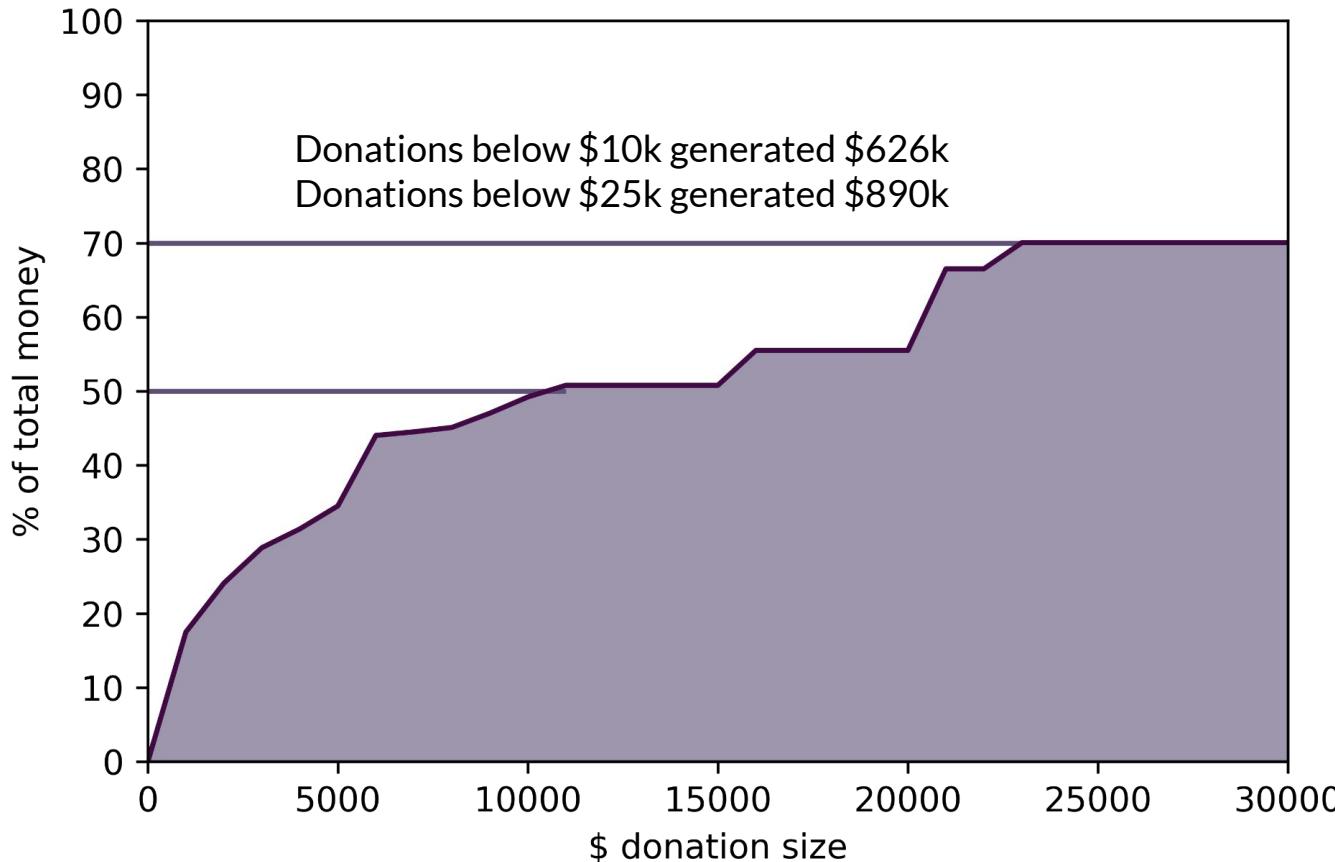
Source: ElderNet

3

Other Analyses

for better understanding the data

Small donations can really add up.





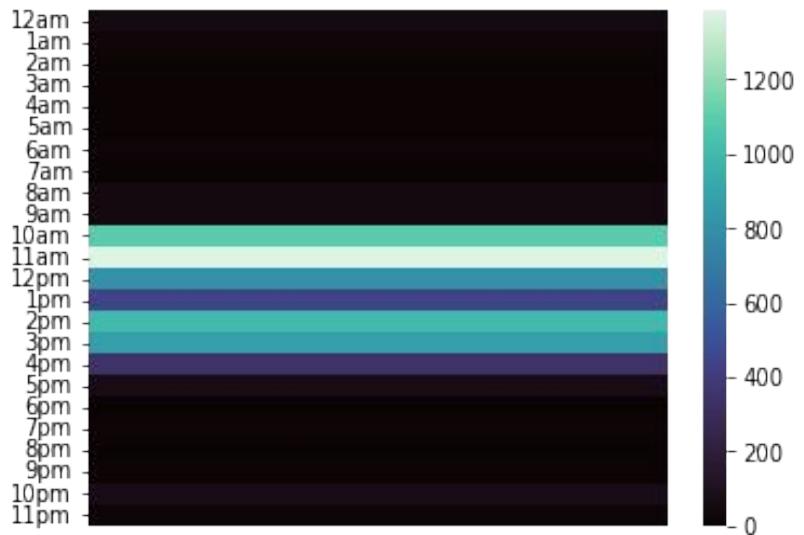
Recommendations for Increasing Donations

- Expand marketing through social media. In addition to Facebook page add Instagram, Twitter, and LinkedIn.
- Wider market may equate to increased donations.

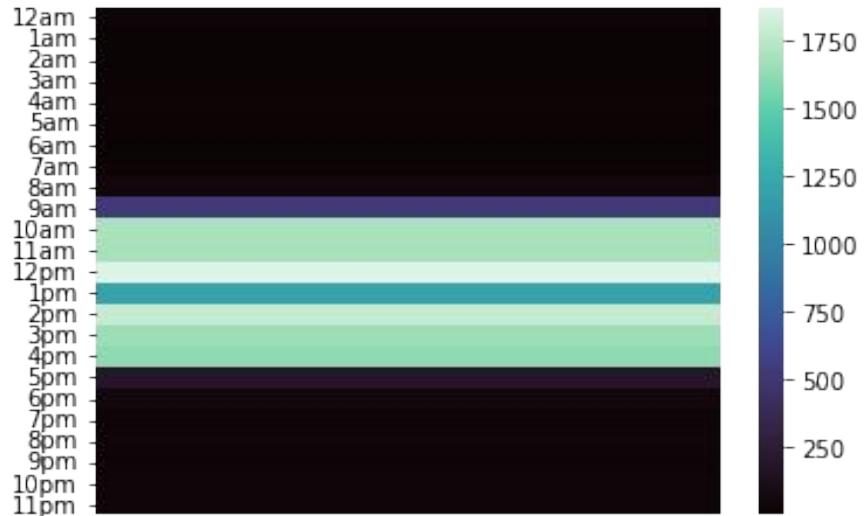


Peak hours differ for each event.

Total Pantry Events by Hour.



Total Care Management Events by Hour.

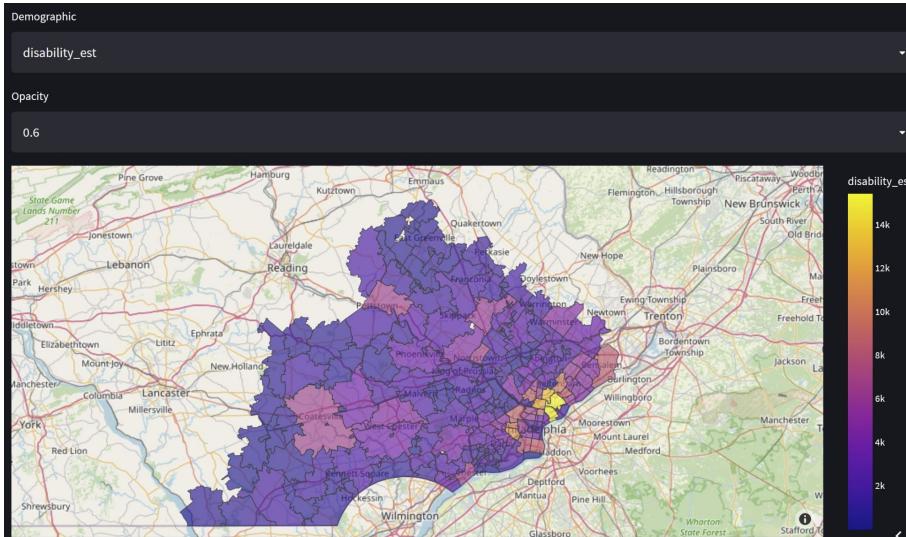


Demo



Value of interactive maps

https://share.streamlit.io/dslgr/2022_datathon/main/zctas_script.py



Live-tweet: @RLadiesPhilly, @DataPhilly, @ElderNet1976 Q&A: [#203522](http://www.sli.do)



Summary

- Results are by observation and not statistical assertions.
- Geography and demographics matter.
- Donations relate to median household income.
- Philadelphia is an elephant in the room
- Public data can define potential for future services

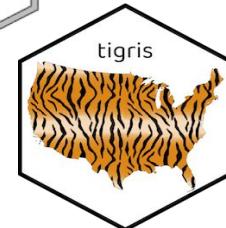
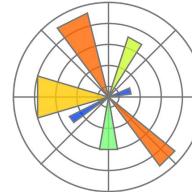
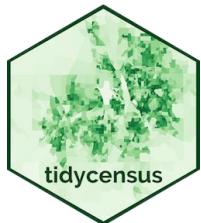
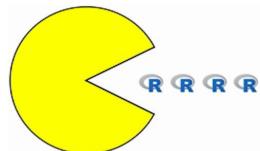


Data & Technology Used

- Eldernet's public files and its counts by service and ZIP.
- 2019 American Community Survey, 5 Year estimates
- ACS geographic delineations from TIGER/Line
- Federal, state and county social services reports
- Python, R and their IDEs and public packages



Applied Technologies





Credits

Special thanks to all the people who made and released these awesome resources for free:

- Presentation template by [SlidesCarnival](#)
- Photographs by [Unsplash](#)



Thanks!

slido



Audience Q&A Session

- ⓘ Start presenting to display the audience questions on this slide.



THANK YOU

- Datathon Participants!
- ElderNet!
- Datathon leads and organizers!

Live-tweet: @RLadiesPhilly, @DataPhilly, @ElderNet1976 **Q&A:** [#203522](http://www.sli.do)