

PREVENTING HOMELESSNESS WITH EMERGING TECHNOLOGIES



Schenley Group

Presented by: Dane Bluestone, Ian Fisher, Nicole Li, Peter Wu

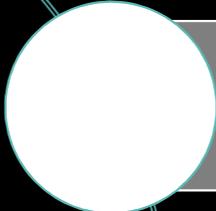
MOTIVATION

While the Department of Human Services (DHS) currently has strong programming for addressing individuals in the homeless system, there is a need to prevent individuals from reaching homelessness in the first place. We use emerging technologies to improve the flow of information that can help prevent homelessness from occurring.

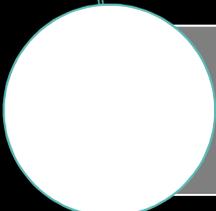
Agenda

1. Homeless Population and Barriers
2. Spatial Models in Predicting Homelessness
3. Machine Learning for Individual Assessment
4. Example of Web Interface
5. Strategy for Implementing Both Models
6. Evaluation Frameworks
7. Ethical Considerations
8. Questions

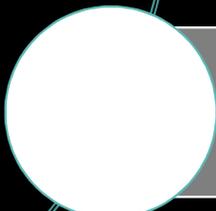
HOMELESSNESS IN ALLEGHENY COUNTY TODAY



In 2015, 94,000 low-income households in Allegheny County were determined to be at risk for homelessness



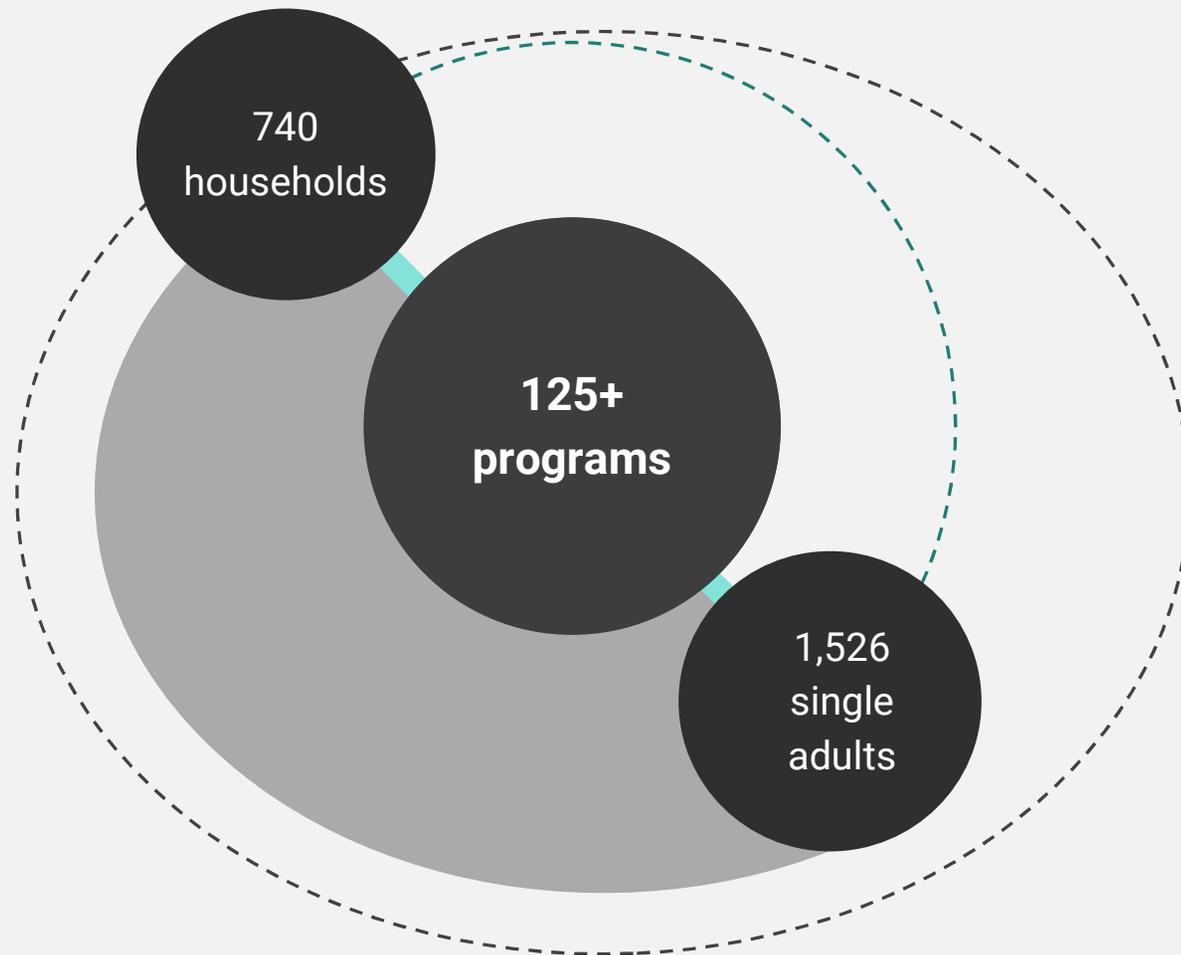
11,782 unique people were active in homeless related programs between 1/1/2017 and 12/31/2017.



In January 2017, a total of 1,145 homeless people were identified in Allegheny County.

AVAILABLE AID PROGRAMS

- Shelters and case management are limited
- Rehousing programs and permanent solutions can be difficult to navigate
- All in accordance with the Housing First model



BARRIERS TO SEEKING ASSISTANCE

- Unaware of resources available
- Not knowing which programs they are eligible for
- Limited outreach resources
- Stigmatization





WHERE EMERGING TECHNOLOGIES CAN CREATE AN IMPACT

HOW EMERGING TECHNOLOGIES CAN HELP

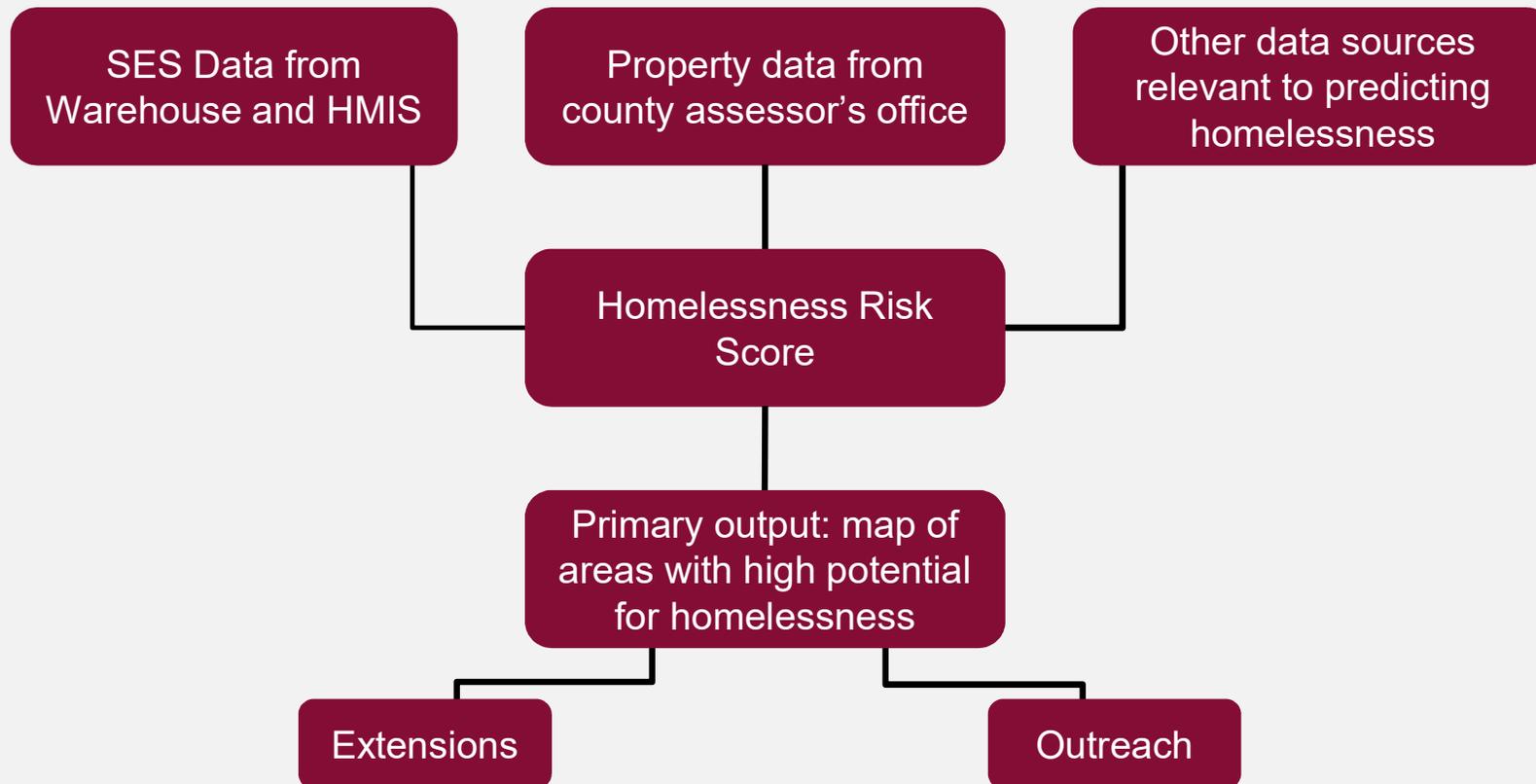
Targeting At Risk Populations

- Use spatial modelling to identify areas with high risk of increased homelessness

Providing Real Time Information

- Use machine learning to provide personal risk assessments and connect to available programs

SPATIAL MODELS FOR PREDICTING AREAS WITH HIGH POTENTIAL FOR HOMELESSNESS



EXPECTED IMPACT OF THE SPATIAL MODELING

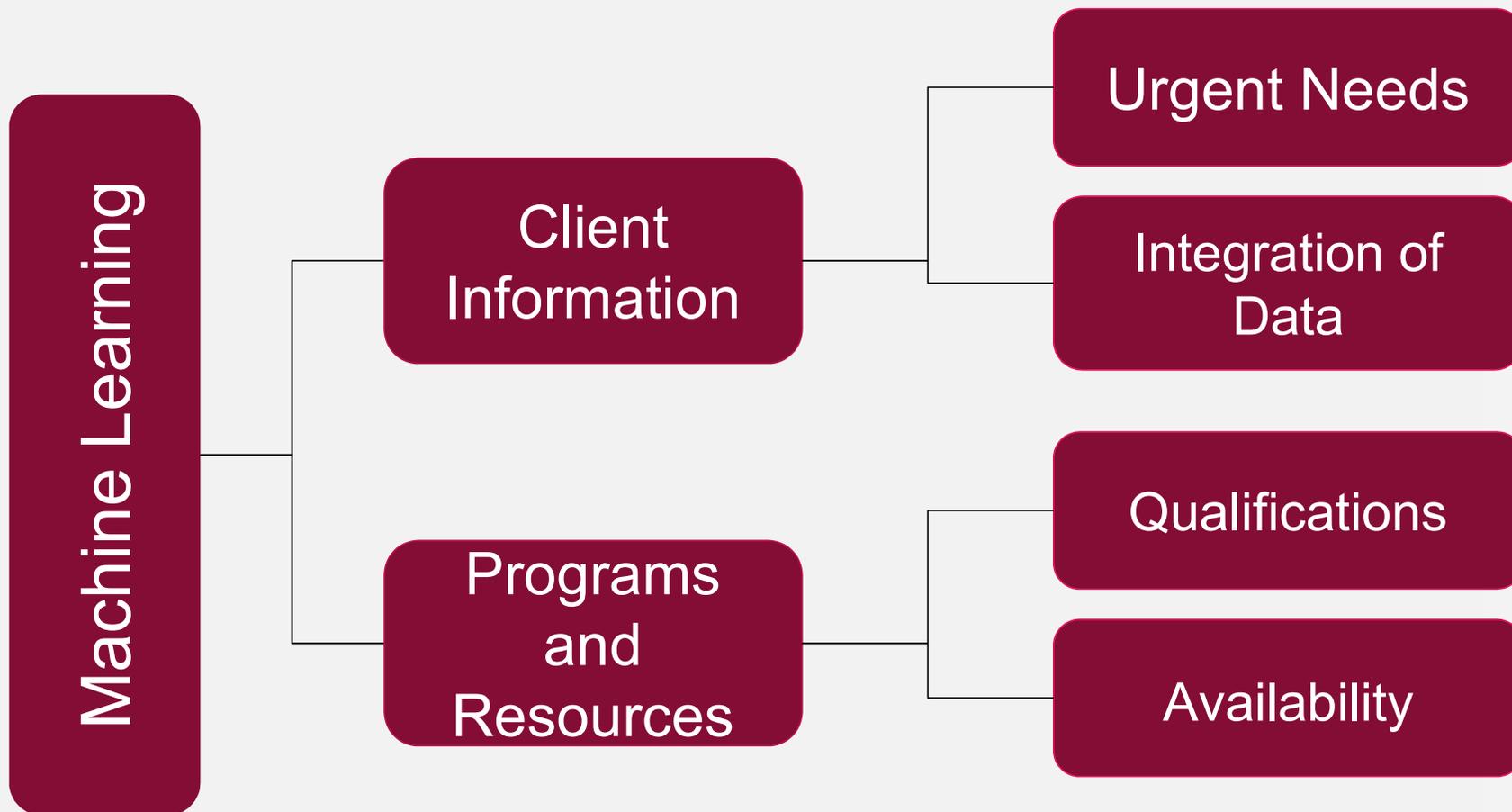
EXPECTED BENEFITS

- Prioritize outreach
- Predict where displacement will occur next
- Show trend over time
- Simple to implement

LIMITATIONS

- Data availability vs granularity
- Selecting optimal number of clusters is challenging
- Could miss other vulnerable populations

MACHINE LEARNING FOR PERSONALIZED INFORMATION



EXPECTED IMPACT OF MACHINE LEARNING

EXPECTED BENEFITS

- Assist staff in evaluation of individuals
- Time efficiency
- Tailored recommendations

LIMITATIONS

- Not enough information
- Outdated information
- False positives/negatives

WEB INTERFACE OF SCALED-DOWN MODEL

- Information about support programs for homelessness is difficult to find
- Create an interactive tool to educate about risk factors for homelessness
- Users can select characteristics that pertain to them (no data will be saved)
- List of resources and tailored recommendations will be provided to individuals with high risk

EXAMPLE OF WEB INTERFACE

Financial Information

* Red asterisk indicates required

How many adults are in your household?*

Select One ▼

How many children are in your household?*

Select One ▼

How much total money (before taxes) did all of the people in your household get last month?*

How much cash does the household have on hand? Include cash, money in checking accounts and saving accounts, etc.*

How much did your household spend on rent in the past month?

Does anyone have a disability? *

Yes No

Is anyone pregnant?*

Yes No

Back

Continue

Strategy for Implementing the Spatial Model

Building Spatial Model

- Study data availability and feasibility
- Predict potential displacement
- Showing long-term trends

Strategy for Outreach

- Raising awareness
- Outreach to community centers and other anchor institutions in targeted areas

Evaluation Framework

- Data collection of performance by outreach
- Success factors
 - number of calls from specific neighborhoods

Strategy for Implementing the Machine Learning Model

Cultivate Appropriate Data Sources

- Data collection and availability
- Analyzing quality of data
- Design
- Feasibility

Individual Assessment

- Address urgent needs
- Connection to specific program or resource

Evaluation of Framework

- Measurement of time Staff takes to go through each cases
- Days it takes to connect individuals
- Satisfaction Surveys

ETHICAL CONSIDERATIONS

- Stigmatization
- Diversity and Multiculturalism
- Gender as a spectrum
- Ageism
- Differing abilities



A Person-First Approach

- Informed consent with details about how their personal information is being used
- Data integrity
- Accessibility to the information

POTENTIAL QUESTIONS



- Is the accessibility of the information realistic?
- How can this model adapt to ethical variabilities?
- How are these models different from their counterparts?

THANK YOU

References

- <https://www.alleghenycountyanalytics.us/wp-content/uploads/2016/09/Homeless-in-Allegheny-County-The-Client-Experience-1.pdf>
- <http://endhomelessness.org/wp-content/uploads/2016/04/housing-first-fact-sheet.pdf>
- <http://www.county.allegheny.pa.us/Human-Services/Programs-Services/Basic-Needs/Allegheny-County-Continuum-of-Care.aspx>
- <https://www.bigburgh.com/app.html#/who>