LEVERAGING CROSS-SYSTEM DATA TO IMPROVE PROGRAM PERFORMANCE AND ENSURE EQUITY

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TWO PROJECTS

- Both projects conducted in conjunction with the Connecticut Behavioral Health Partnership and Beacon Health Options

#1 – Governor's Task Force on Housing and Supports for Vulnerable Populations – 500 Familiar Faces

Better understand high need populations that utilize the services of multiple state and private agencies by integrating data across 5 state and 1 private entity

#2 – Connecticut Housing Engagement and Support Service (CHESS)

Develop a data driven method of identifying Medicaid recipients with the highest need regarding healthcare and housing services

GOV'S TASK FORCE

CT Gov's Task Force on Housing and Supports for Vulnerable Populations*

- Documented a high degree of interagency involvement among highest-need populations

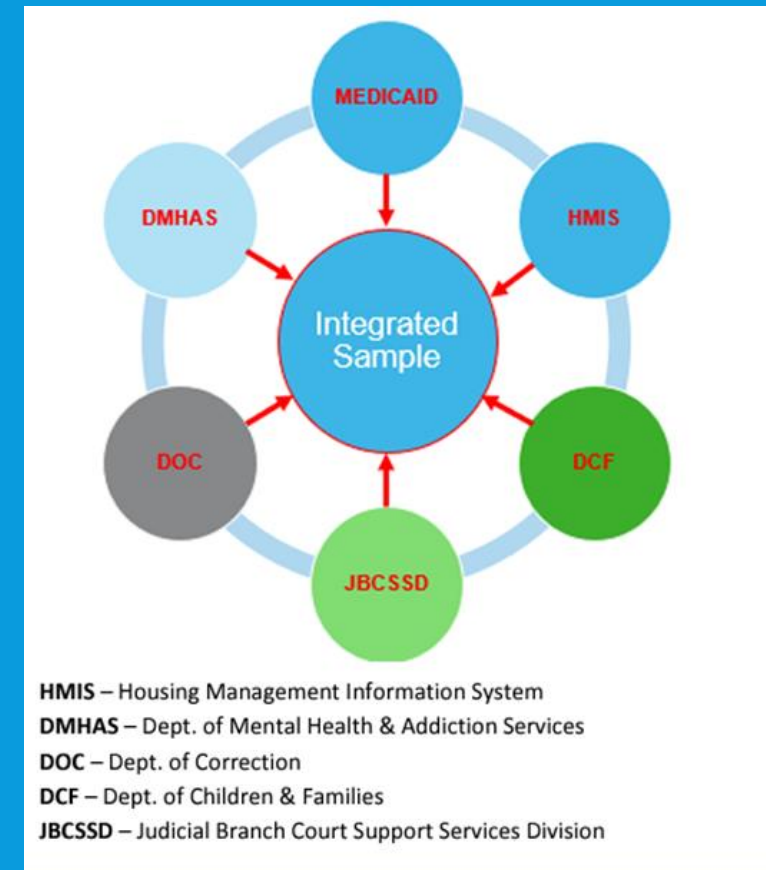- Data was used to build interactive dashboards and conduct analyses to improve care management

*https://portal.ct.gov/Office-of-the-Governor/Working-Groups/Task-Force-on-Housing-and-Supports-for-Vulnerable-Populations#:~:text=Governor%20Lamont%20created%20the%20Task,clients%2C%20and%20implements%20best%20practices

*Work completed by a team at Beacon Health Options led by the author in conjunction with the CT Behavioral Health Partnership (CTBHP) agencies (Department of Children and Families, Department of Social Services, and the Department of Mental Health and Addiction Services) and the Governor's Office. All views and opinions are solely those of the author and do not represent those of the CTBHP, Beacon Health Options, or the Governor's Task Force.

GOV'S TASK FORCE – DATA INTEGRATION

- Matched HMIS to Medicaid to establish base sample
- No universal identifier so used probabilistic matching (90% of the sample was matched = 10,420)
- Leveraged existing data agreements and HIPAA provisions for quality improvement to ease data-sharing challenges
- Involved all agencies in key metric definition re: data set & highest need

https://portal.ct.gov/Office-of-the-Governor/Working-Groups/Task-Force-on-Housing-and-Supports-for-Vulnerable-Populations#:~:text=Governor%20Lamont%20created%20the%20Task,clients%2C%20and%20implements%20best%20practices

HMIS – Housing Management Information System
DMHAS – Dept. of Mental Health & Addiction Services
DOC – Dept. of Correction
DCF – Dept. of Children & Families
JBCSSD – Judicial Branch Court Support Services Division

GOV'S TASK FORCE - PARTICIPATING ORGANIZATIONS

- **Homeless Management Information System (HMIS)**– Individuals with 1 or more days in homeless shelter during 9-1-18 through 11-30-19 (15 months) including family information
- **DSS** – Individuals eligible for Medicaid with all claims and authorization data
- **DCF** – Children with any kind of DCF involvement plus key child welfare indicators
- **DMHAS** – Medicaid Eligible Adults that are DMHAS clients including those with non-Medicaid funded encounters
- **DOC** - Individuals with at least 1 day incarcerated in the past three years including key indicators of high need
- **CSSD –** Individuals on probation or otherwise served by CSSD including key indicators of high need

(all members from all agencies must be Medicaid eligible to be part of the data set)

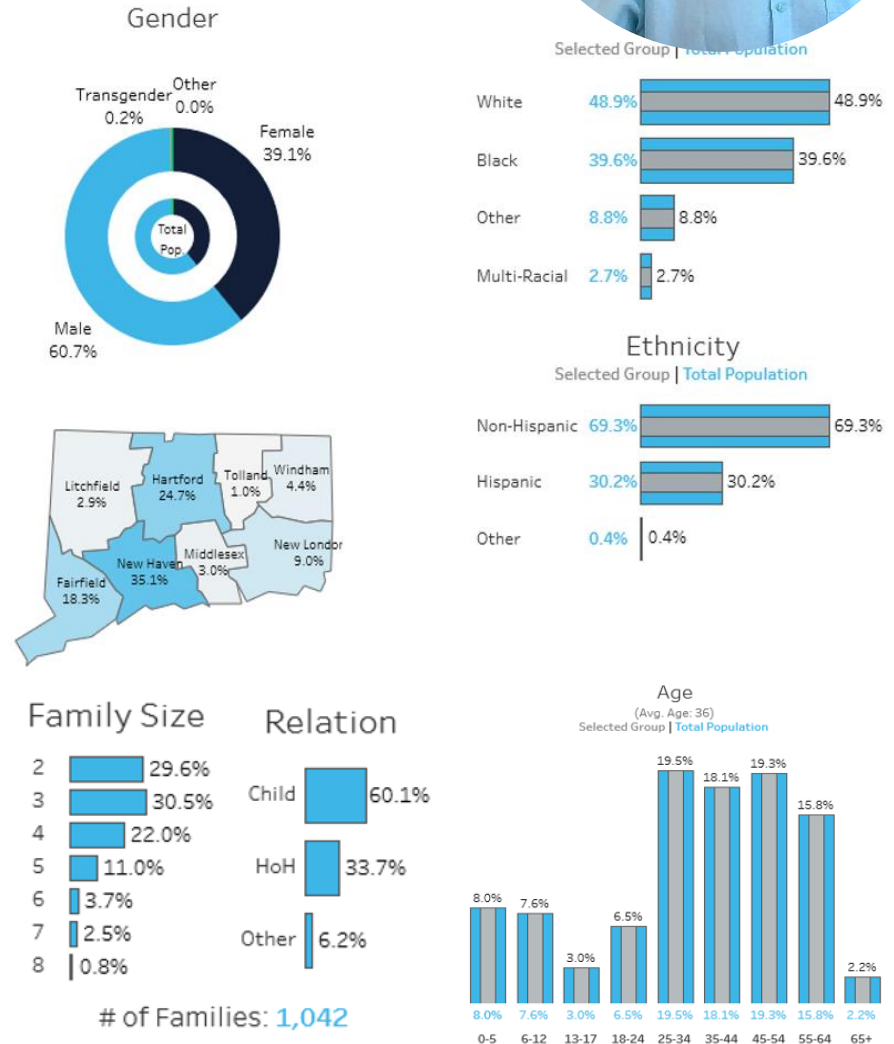| HMIS	DSS
DCF	DMHAS
DOC	CSSD

GOV'S TASK FORCE - INTERACTIVE DASHBOARD

- Insights enhanced by structuring data into a filterable dashboard with intuitive data visualizations
- Dashboard elements;
  - Demographics (gender, age, race, ethnicity, family size/composition, county, zip – see graphic on right)
  - Agency High Need
  - Cross Agency High Need (5 or more agencies, 2 or more High Need)
  - Group subtypes –cluster analysis
  - Shelter Days
  - Shelter Episodes
  - BH & Medical Diagnoses
  - Utilization (ED & Hospitalization)
  - Etc.
- Cluster Analysis identified 6 subgroups of highest-need individuals
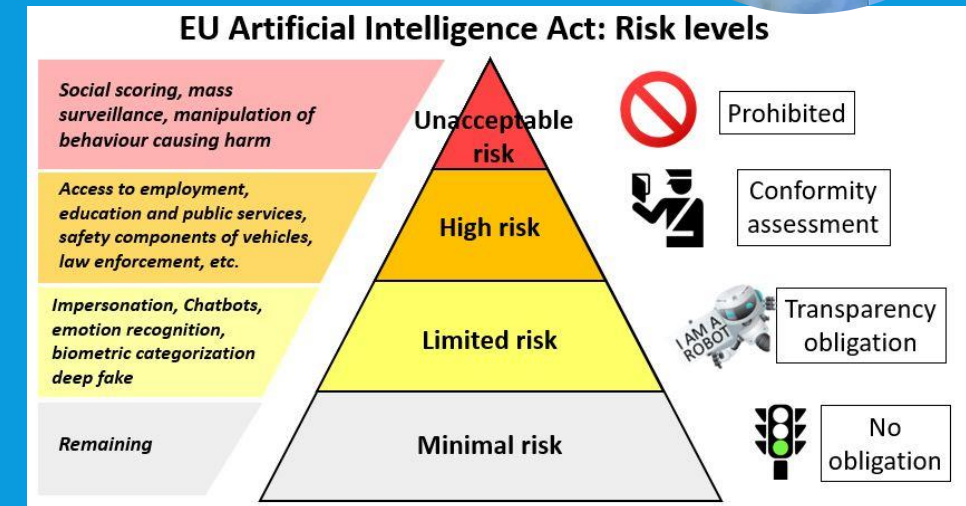
CHESS ALGORITHM – ENSURING EQUITY

CT Housing Engagement & Support Service (CHESS)

- CT launched a 1915i Medicaid Waiver for the CT Housing Engagement and Support Service (CHESS)

- State engaged Beacon Health Options to develop an algorithm that would help to select those with the greatest housing and health needs

CHESS ALGORITHM - BACKGROUND

- Algorithms, Artificial Intelligence (AI), and less complex data-driven methods can be extremely useful in connecting the right service, to the right person, at the right time
- However, Research by Obermeyer* and others has highlighted the risk of inequity due to bias in underlying healthcare data
- Awareness of potential bias has sparked the passage of regulations of AI in the European Union and many states in the US, including Connecticut

EU Artificial Intelligence Act: Risk levels

Source of the graphic above can be found at: https://www.telefonica.com/en/communication-room/blog/a-fit-for-purpose-and-borderless-european-artificial-intelligence-regulation/

*Obermeyer, Z., Powers, B., Vogeli, C., & Mullainathan, S. (2019). Dissecting racial bias in an algorithm used to manage the health of populations. Science, 366(6464), 447-453.
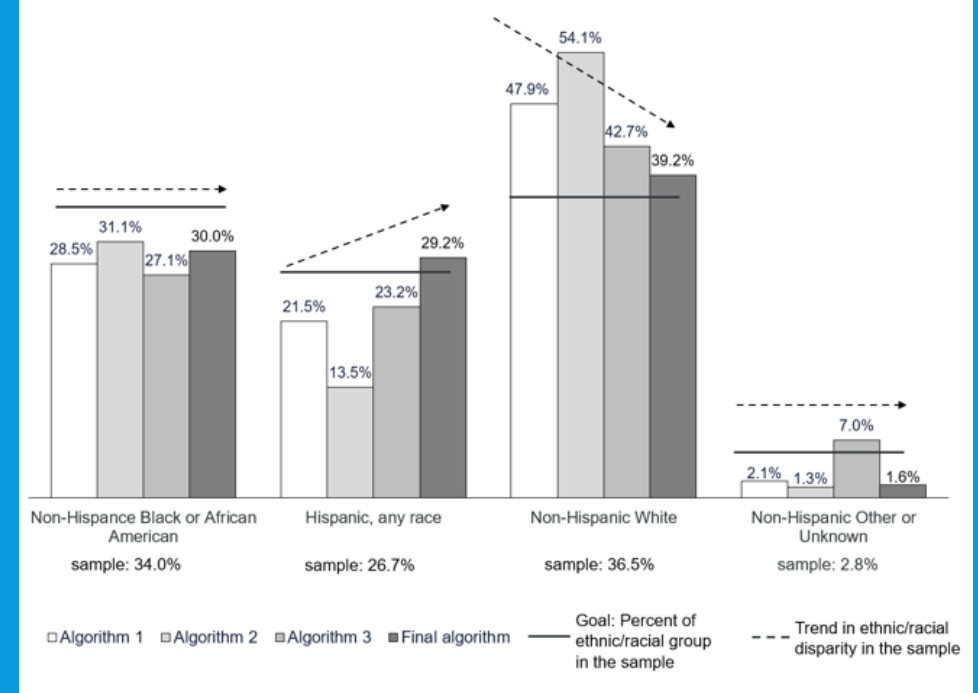
CHESS ALGORITHM - MITIGATING BIAS

- Team was aware of Obermeyer article and risk of bias
- It took the team 1 year, and 4 attempts to mitigate the bias observed in the initial model and develop a fair process
- Initial attempts used risk of hospital readmission, then cost to estimate health need – both were biased in favor of non-Hispanic Whites
- Shifted approach to use a diagnosis based comorbidity index and lifetime days homeless
- Integrating data from other sources (SDOH) outside of healthcare is one such mitigation strategy

FIGURE 1. Comparison of racial/ethnic composition across multiple iterations of algorithm to select homeless Medicaid enrollees in the program

Noam, K., Schmutte, T, Bory, C. & Plant, R. (2023). Mitigating Racial Bias in Healthcare Algorithms: An Account of Improving Fairness in Access to Supportive Housing. Manuscript submitted for publication.

MITIGATING BIAS – KEY STRATEGIES

DEFINE & TEST	Define and test for fairness
Open	Open the "black box"
Examine	Examine source data for bias
Avoid	Avoid proxy measures to the extent possible
Replace	Replace cost and utilization-driven indicators with less or unbiased indicators such as diagnosis or comorbidity indices
Integrate	Integrate other relevant social determinants of health such as the number of shelter days and/or episodes
Include	Include human decision-making in selection processes
Get	Get input from those most likely to be affected

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Don't miss your chance to be part of the community driving real-world change through practical approaches to combatting algorithmic bias.

THANK YOU

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Cross System Data