CENTER FOR INNOVATION THROUGH DATA INTELLIGENCE
CIDI

WE ARE A DATA INTELLIGENCE TEAM.

WE USE INTER-AGENCY RESEARCH TO INFORM DATA-DRIVEN POLICY DECISIONS.

WE ARE LOCATED IN THE MAYOR'S OFFICE AND OPERATE UNDER DEPUTY MAYOR FOR HEALTH AND HUMAN SERVICES.

VISION:
MAKING DATA COME ALIVE TO INSPIRE CHANGE

DATA

PROCESS

INFORMATION

ACTION

CONTEXT

AREAS OF EXPERTISE

RESEARCH

STRATEGY AND **TECHNICAL ASSISTANCE** TO AGENCIES

SPECIAL TIME SENSITIVE DATA PROJECTS TO DRIVE **ACTION**

PROFESSIONAL **WRITING** AND PUBLICATIONS

LITERATURE REVIEWS AND **BEST PRACTICE KNOWLEDGE** BASE

OUTSIDE FUNDER RELATIONSHIPS AND **FINANCIAL INVESTMENT**

SPEAKING ENGAGEMENTS

MAPPING AND DATA **VISUALIZATION**

REPORT AND INFORMATION **DESIGN**

PRIORITY AREAS

CHILD WELFARE

HOMELESSNESS

EDUCATION

EQUITY

HEALTH & WELL-BEING

CROSS-SECTOR

DATA SYSTEMS

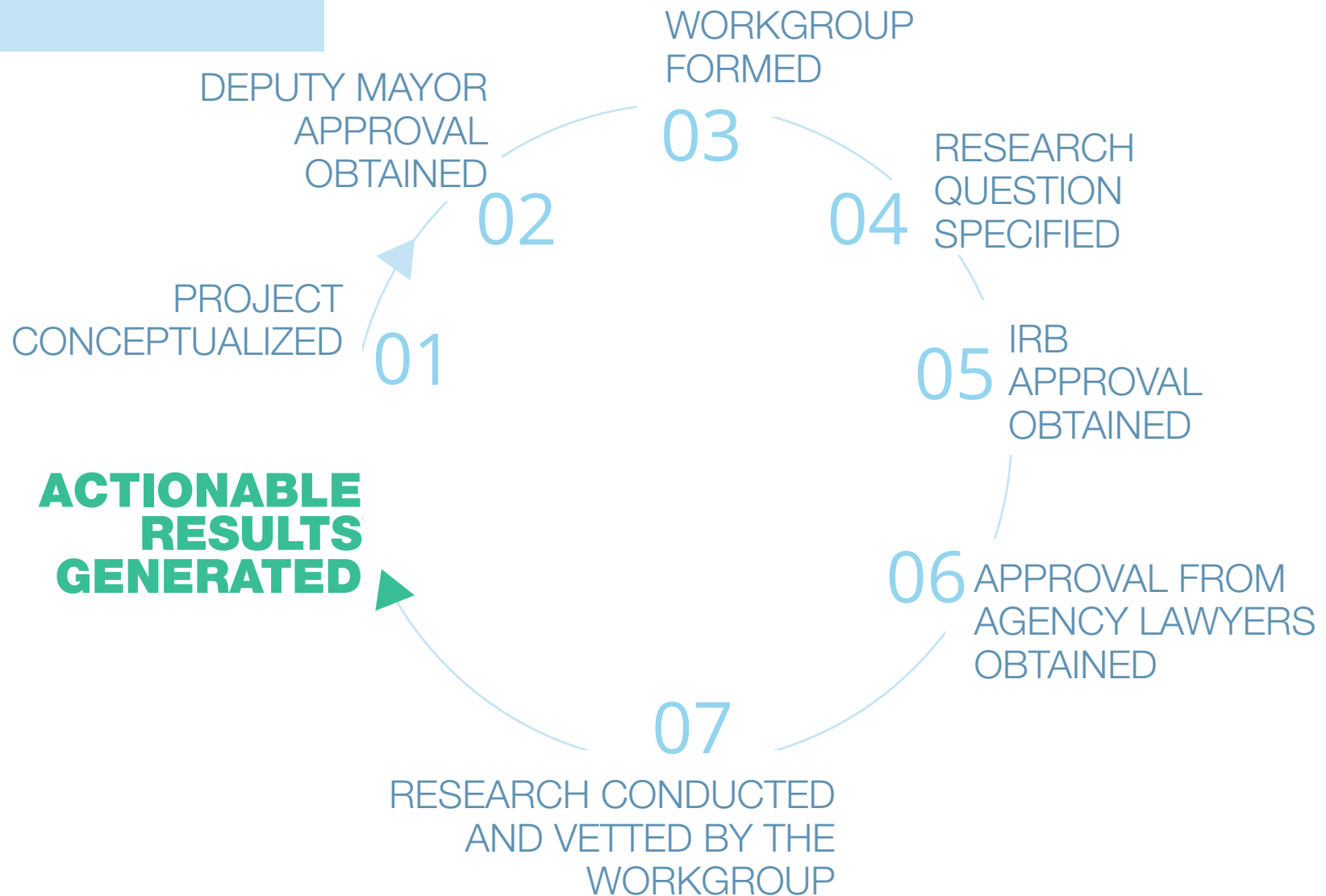|	
HRA	HUMAN RESOURCES ADMINISTRATION
DHS	DEPARTMENT OF HOMELESS SERVICES
ACS	ADMINISTRATION FOR CHILDREN'S SERVICES
DOHMH	DEPARTMENT OF HEALTH AND MENTAL HYGIENE
H+H	HEALTH AND HOSPITALS
DOC	DEPARTMENT OF CORRECTIONS*
DOP	DEPARTMENT OF PROBATION*
DYCD	DEPARTMENT OF YOUTH & COMMUNITY DEVELOPMENT*
DFTA	DEPARTMENT FOR THE AGING
DOE	DEPARTMENT OF EDUCATION*

*Not in portfolio

DATA DATASETS

CITY
Human Resources Administration-Cash Assistance, SNAP, Medicaid
Department of Homeless Services-Prevention, Shelter, Street Homeless
Administration for Children Services-Child Welfare, Juvenile Justice
Department for the Aging-Case Management
Department of Correction-Admissions, Discharges
Department of Probation-Juvenile Justice Intakes, Probation Clients
Department of Finance-Senior Citizen Rent Increase Exemption, Disability Rent Increase Exemption

STATE
NYS Department of Labor-Wages, Unemployment Insurance
Statewide Planning and Research Cooperative System-NYS Hospital and Clinics
Office of Court Administration-Housing Court

NATIONAL
Housing and Urban Development-Public Housing and Housing Choice Vouchers (i.e., Section 8)

PROCESS

PROJECT CONCEPTUALIZED

01

DEPUTY MAYOR APPROVAL OBTAINED

02

WORKGROUP FORMED

03

RESEARCH QUESTION SPECIFIED

04

IRB APPROVAL OBTAINED

05

APPROVAL FROM AGENCY LAWYERS OBTAINED

06

RESEARCH CONDUCTED AND VETTED BY THE WORKGROUP

07

ACTIONABLE RESULTS GENERATED

ACTIONABLE RESEARCH

DEPARTMENT OF HOMELESS SERVICES

GATEWAY ATTENDANCE MATTERS PILOT EVALUATION

Participate in evaluation of the Attendance Matters pilot which has been implemented in three DHS family with children shelters. The pilot is designed to use existing resources with minimal additional resources and coordination support to identify, address and manage multiple systemic, inter-generational and logistical barriers to improve and encourage good school attendance among homeless children.

DHS
DOE

TEMPORAL TRENDS IN HEALTH SERVICE USE AND HOMELESSNESS

In collaboration with the NYU School of Medicine, identify adult trends in emergency department visits and hospitalizations before and immediately after homeless shelter entry. The study links DHS data with NYS SPARCS data. The project received a small grant from NYU.

DHS

EXAMINING THE AGING POPULATION OF HOMELESS ADULTS AND HEALTH CARE COSTS

In collaboration with the NYU School of Medicine and University of Pennsylvania, CIDI received a grant from the NYS Health Foundation to identify the health care utilization patterns and costs for the aging population of homeless adults. Findings are informing solutions to mitigate homelessness and concomitant health care costs among this population.

DHS
HRA
DOHMH

NEWBORNS IN SHELTER

The study will examine the health status of newborns in shelter and compare their health and human service outcomes to other low-income newborns in NYC.

DHS
DOHMH
ACS
HRA

THE EFFECTS OF EVICTIONS ON LOW-INCOME FAMILIES

In collaboration with New York University's Furman Center examine the consequences of evictions for benefits receipt, individual health, homelessness, education, justice involvement and labor market success.

DHS
HRA
DOC
DOE
DOL

A TYPOLOGY OF TRANSITION-AGE YOUTH

In collaboration with the Corporation for Supportive Housing, analyzed the characteristics and trajectories of young adults exiting foster care/ transitional housing to inform housing prioritization for young adults. Funded by New York Community Trust.

DHS
ACS
DYCD

NEIGHBORHOODS AND FAMILY HOMELESSNESS IN NEW YORK CITY

Explore how patterns of shelter usage and household well-being compare between families placed in their neighborhood/borough of origin to those placed in new neighborhoods.

DHS
HRA
DOL
DOE

PREDICTING HOMELESS SHELTER ENTRY

Collaboration with the NYU Furman Center for Real Estate and Urban Policy to understand how household, building and neighborhood characteristics contribute to family homelessness.

DHS
HRA
NYCHA
HPD

ACTIONABLE RESEARCH

ADMINISTRATION OF CHILDREN SERVICES

DESIGN STUDY OF DUAL SYSTEMS YOUTH GRANT (PHASE II)

In collaboration with Cal State L.A. University, analyze administrative data sets to explore various questions related to the prevalence of dual-system youth, their characteristics, and trajectories. (Funded by the Office of Juvenile Justice and Delinquency Prevention)

**ACS
DOC
DOP
LAW DEPT.**

TRACKING EDUCATION AND LABOR OUTCOMES OF FOSTER YOUTH

Funded by the Conrad Hilton Foundation, the study will enable NYC to understand the long-term educational and employment outcomes of foster youth and to measure the extent to which recent and upcoming policy changes and initiatives are having the intended positive effects.

**ACS
DOE**

NYC COMMUNITY ATLAS

This atlas includes 59 Community Disctrict profiles reflecting their varied characteristics. Each profile starts with a demographic overview and description of community boundaries, and then presents sections organized around the core components of the Two-Generational (2Gen; Children-Parents) and Three-Generational Approach (3Gen; Children-Parents-Grandparents).

**ACS
DOE
CITY,
NATIONAL**

ACTIONABLE RESEARCH

DEPARTMENT OF HEALTH AND MENTAL HYGIENE

PECO IDENTIFICATION SYSTEM

A methodological approach in identifying high concentrations of vulnerable populations to assist Post-Emergency Canvassing Operations (PECO).

**DOHMH
HRA
DHS
ACS
DOF**

COMMUNITY HEALTH IMPROVEMENT INFORMATION SYSTEM

Through a Robert Wood Johnson Foundation DASH grant, constructed a dataset of DOHMH health data combined with other HHS data at the NTA level. The dataset allows the City to develop comprehensive community health profiles, better align services to the needs of communities, and track progress of initiatives over time.

**DOHMH
DHS
HRA
ACS**

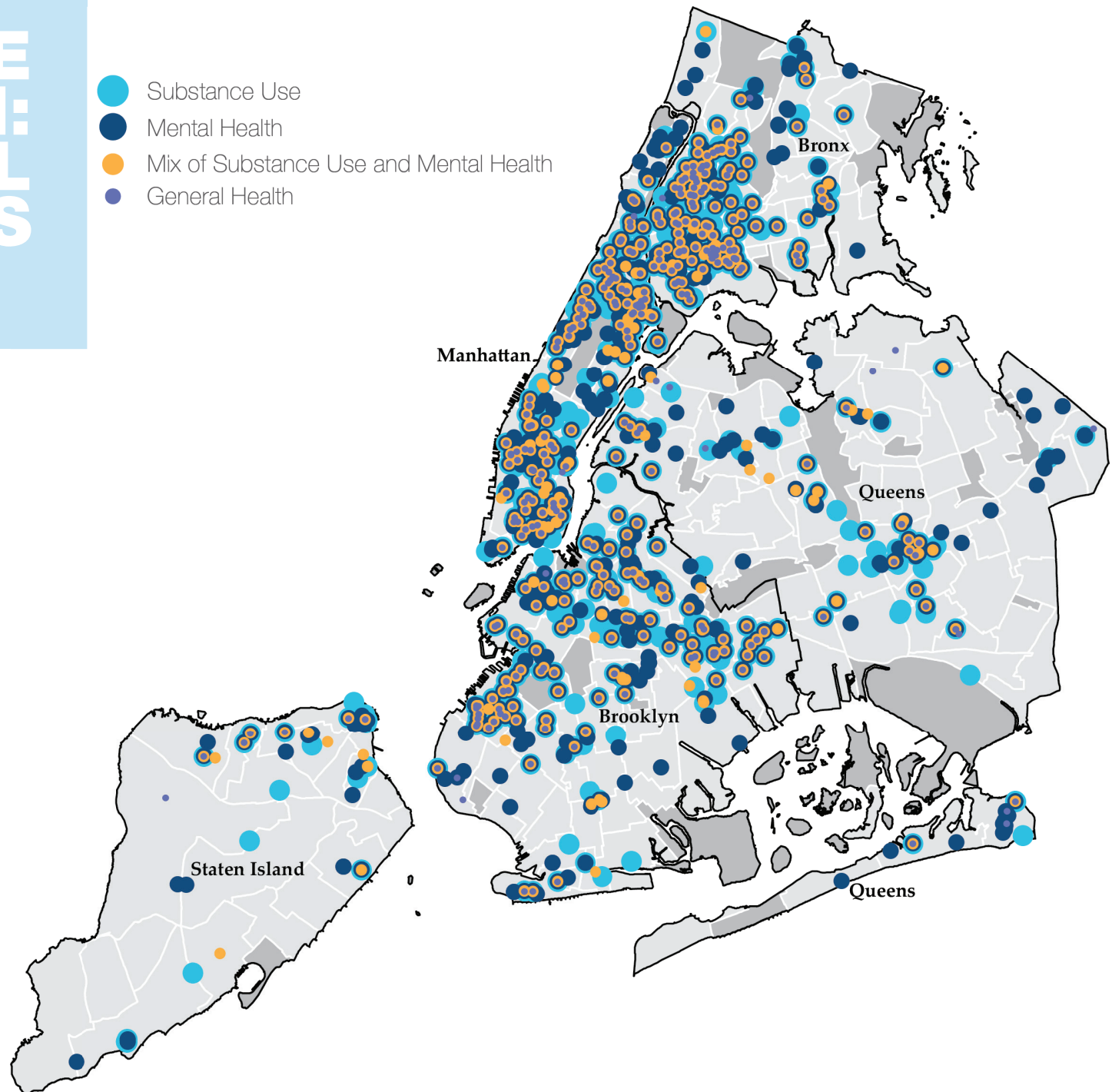# ACTIONABLE RESEARCH COLLABORATIONS WITH ACADEMIA

NYC WELL-BEING INDEX

CIDI commissioned a Capstone team from Columbia University's School of International and Public Affairs (SIPA) to create a place-based index of socio-economic well-being in NYC communities.The use of a well-being index, a composite measure, integrates data on a range of indicators to approximate the well-being of New Yorkers.

AGENCY, CITY, STATE, NATIONAL DATASETS

ACTIONABLE RESEARCH: MAYORAL INITITAVIES

Legend:
- ● Substance Use
- ● Mental Health
- ● Mix of Substance Use and Mental Health
- ● General Health

Thrive NYC is a comprehensive mental health roadmap for New York City to raise awareness among New Yorkers about the prevalence and treatment of mental health issues.

CIDI supported Thrive NYC by creating a collection of maps to illustrate the location of mental health and substance use facilities in New York City. These maps also highlight the variation across neighborhoods in access to care.

Bronx

Manhattan

Queens

Brooklyn

Staten Island

Queens

ACTIONABLE RESEARCH: AN EXAMPLE

A TYPOLOGY OF TRANSITION-AGE YOUTH

INTRODUCTION

Young adulthood is a challenging time of transition. Youth who do not have appropriate supports may be at risk of housing instability or homelessness.

It is important to match youths' needs with available housing placements and other services and to understand gaps in services.

A typology of youths' outcome trajectories can help understand differences in system use across different domains and be used to prioritize youth with specific risk factors for housing resources.

A TYPOLOGY OF TRANSITION-AGE YOUTH

RESEARCH QUESTIONS

What are the primary patterns of service use for youth once they exit DHS or DYCD homeless shelters or ACS foster care?

What early service use and demographic factors predict these patterns?

Which housing intervention (i.e., subsidized housing or supportive housing) leads to more stable patterns of service use?

Do these patterns differ based on exit system (e.g., foster care or different types of homeless shelters)?

A TYPOLOGY OF TRANSITION-AGE YOUTH

SAMPLE

▶ 18 to 21 years old when they exited from one of the systems listed below
▶ Exited between July 2011 and 2013
▶ Outcome period was three years after exit

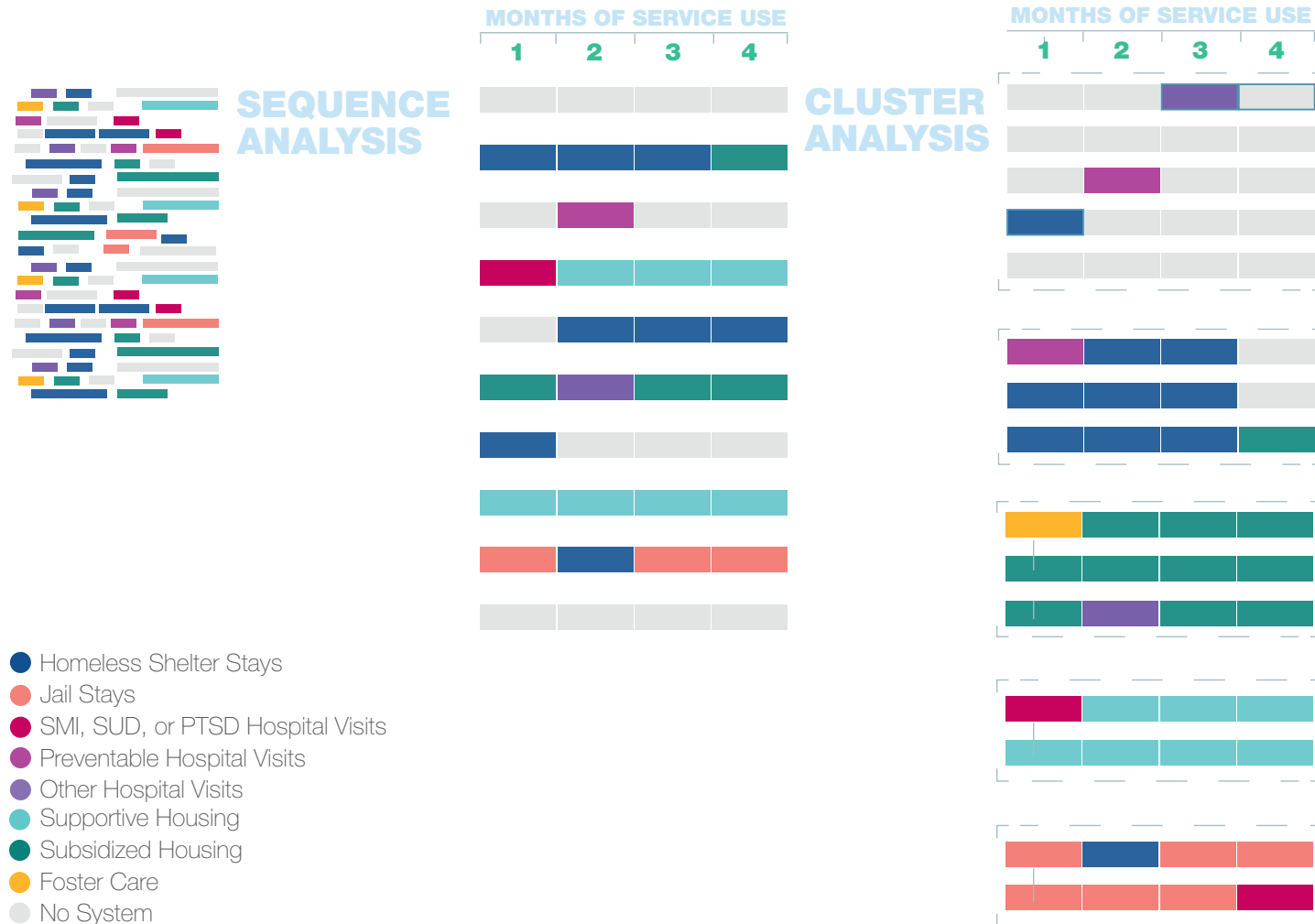### ADMINISTRATION FOR CHILDREN'S SERVICES (ACS)

▶ Foster Care

DEPARTMENT OF YOUTH AND COMMUNITY DEVELOPMENT (DYCD)

▶ Runaway and Homeless Youth (RHY) Crisis Shelter

▶ Transitional Independent Living (TIL) Program

DEPARTMENT OF HOMELESS SERVICES (DHS)

▶ Single Adult (SA) Shelter

▶ Adult Families (AF) Shelter

▶ Families with Children (FWC) Shelter

ANALYSIS

SEQUENCE
ANALYSIS

CLUSTER
ANALYSIS

MONTHS OF SERVICE USE
1 2 3 4

MONTHS OF SERVICE USE
1 2 3 4

- Homeless Shelter Stays
- Jail Stays
- SMI, SUD, or PTSD Hospital Visits
- Preventable Hospital Visits
- Other Hospital Visits
- Supportive Housing
- Subsidized Housing
- Foster Care
- No System

OUTCOME GROUPS

CONSISTENT SUPPORTIVE HOUSING
N=187
2%

Resided in supportive housing as a head-of-household during their three-year outcome period.

CONSISTENT SUBSIDIZED HOUSING
N=764
9%

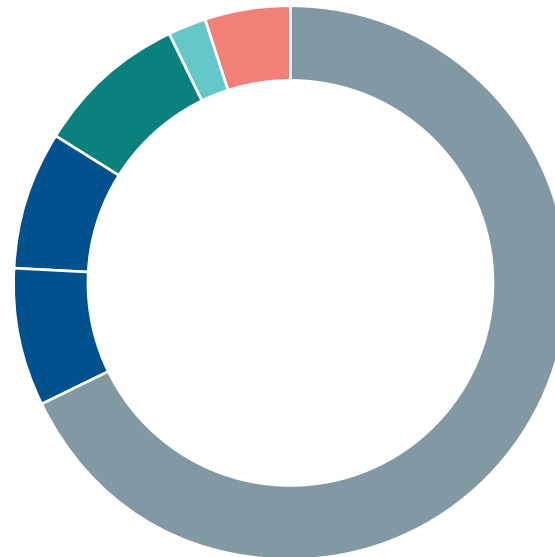Resided in subsidized housing, such as public housing or tenant- or project-based vouchers, as a head-of-household during their three-year outcome period.
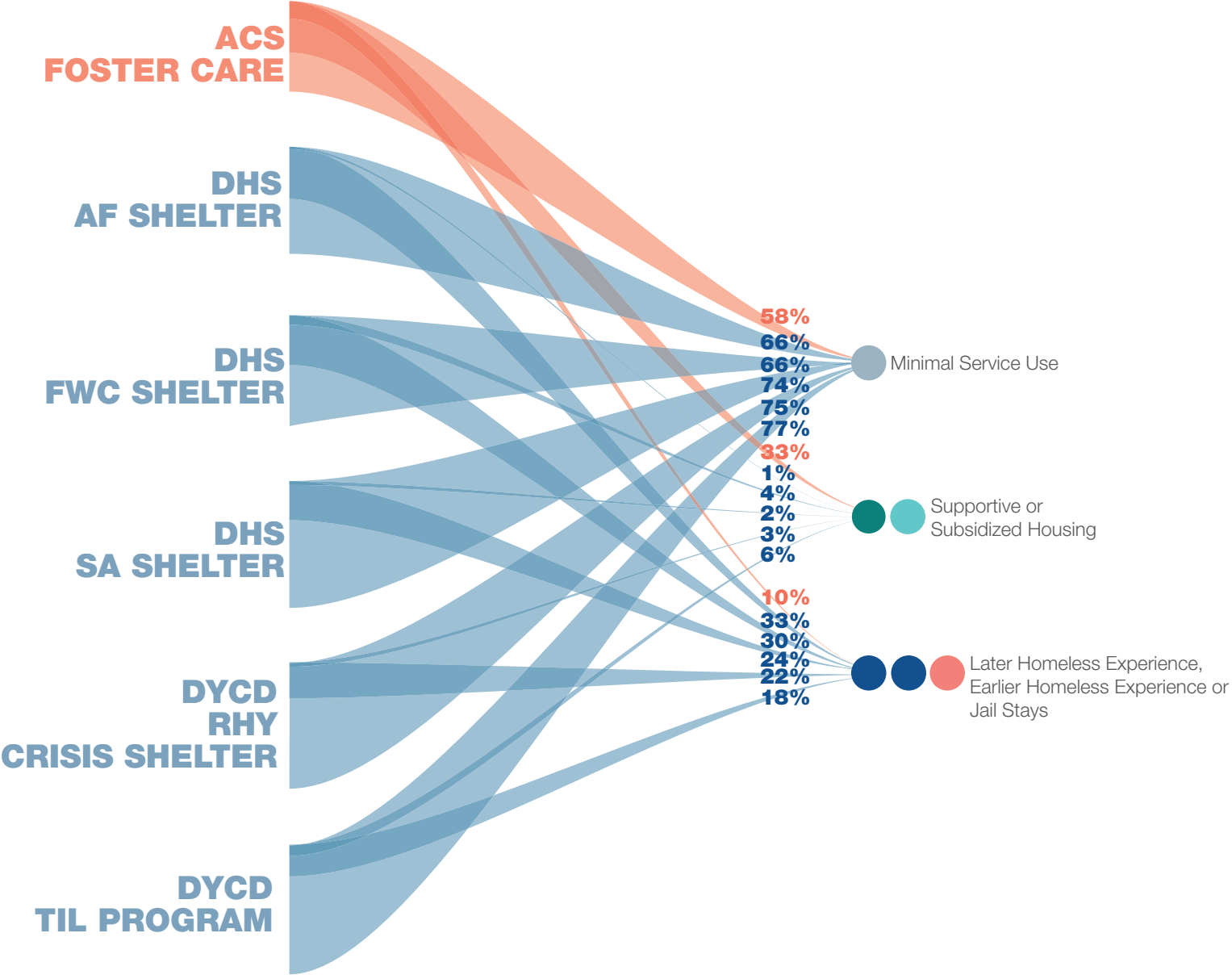
EARLIER HOMELESS EXPERIENCE
N=723
8%

Experienced homelessness in a DYCD or DHS shelter earlier in the three-year outcome period (i.e. within 6 months of exit).

FREQUENT JAIL STAYS
N=459
5%

Had multiple and frequent jail stays over the three-year outcome period.

LATER HOMELESS EXPERIENCE
N=675
8%

Experienced homelessness in a DYCD or DHS shelter later in the three-year outcome period (i.e. 1-2 years after exit).

WHOLE SAMPLE
n=8,795

MINIMAL SERVICE USE
N=5,987
68%

Used minimal services during the three-year outcome period, including homeless services, foster care, jail, hospitals, subsidized housing or supportive housing.

EXIT SYSTEM TYPOLOGIES

ACS
FOSTER CARE

DHS
AF SHELTER

DHS
FWC SHELTER

DHS
SA SHELTER

DYCD
RHY
CRISIS SHELTER

DYCD
TIL PROGRAM

58%
66%
66%
74%
75%
77%

Minimal Service Use

33%
1%
4%
2%
3%
6%

Supportive or
Subsidized Housing

10%
33%
30%
24%
22%
18%

Later Homeless Experience,
Earlier Homeless Experience or
Jail Stays

PREDICTIVE FACTORS

▲ INCREASES THE PROBABILITY OF BEING IN A GROUP
▼ DECREASES THE PROBABILITY OF BEING A GROUP

	MINIMAL EXPERIENCE	LATER HOMELESS EXPERIENCE	EARLIER HOMELESS EXPERIENCE	CONSISTENT SUBSIDIZED HOUSING	CONSISTENT SUPPORTIVE HOUSING	FREQUENT JAIL STAYS
DEMOGRAPHICS AND EXIT SYSTEM						
Gender: Female (compared to Male)	▼	▲		▲	▼	▼
Gender: Transgender (compared to Male)	▼					▲
Race: Black/African American (compared to White)	▼				▲	▲
Exit Age (older)	▼		▼	▲	▲	▼
Exit System: DHS AF Shelter (compared to ACS Foster Care)		▲	▲	▼	▼	
Exit System: DHS FWC Shelter (compared to ACS Foster Care)	▲	▲	▲	▼	▼	
Exit System: DHS SA Shelter (compared to ACS Foster Care)	▲	▲	▲	▼	▼	▲
Exit System: DYCD RHY Crisis Shelter (compared to ACS Foster Care)	▲	▲	▲	▼		
Exit System: DYCD TIL Program (compared to ACS Foster Care)		▲	▲	▼		
PREVIOUS SYSTEM USE						
Multi-system use	▼	▲		▲		▲
Number of months in ACS Foster Care		▼	▼		▲	
Number of movements in ACS Foster Care						▲
Number of months in a homeless shelter as a child				▼		
Number of stays in a homeless shelter as an adult	▼		▲	▼		
Receiving temporary rental assistance upon exit from a DHS shelter				▼		
Number of months in the justice system				▼	▼	
Number of stays in the justice system				▼	▼	▲
Ever having a jail or detention stay for a felony	▼	▼	▼			▲
Ever having a jail or detention stay for a misdemeanor	▼	▼				▲
Having a hospital visit for SMI/SUD/PTSD	▼		▼		▲	▲

A TYPOLOGY OF TRANSITION-AGE YOUTH

IMPLICATIONS

Services can be **BETTER MATCHED TO YOUTH'S NEEDS** based on information from the service use profiles of each group.

Services and resources can be **BETTER TARGETED TO YOUTH** who need them based on information from the predictive factors.

High rates of hospital use across all groups may indicate a need for better engagement and access to primary care.

A **COORDINATED ENTRY SYSTEM** should ensure youth can access all resources regardless of which system they enter through.

ACTIONABLE RESEARCH: AN EXAMPLE

PREDICTING FAMILY HOMELESSNESS USING MACHINE LEARNING

BACKGROUND

CIDI partnered with NYU's Furman Center to combine data on human services with data on buildings and neighborhoods to evaluate the potential for using administrative data and machine learning techniques to predict families' risk of homelessness.

METHOD

This study uses administrative data on receipt of public assistance, including cash assistance and Medicaid, linked to information on homeless shelter applications and stays, building characteristics, and neighborhood characteristics.

We apply predictive tools from machine learning to predict who will apply to or enter shelter.

For each year, we train models on a random subset of families using only information available at that point in time, attempting to predict future shelter application.

PREDICTING FAMILY HOMELESSNESS USING MACHINE LEARNING: FINDINGS

1 HOW WELL CAN WE PREDICT FAMILY SHELTER APPLICATION?

INDIVIDUALS: Our model performs over 20 times better than random guessing among HRA benefits recipients depending on the size of the homeless population targeted.

BUILDINGS: Our model performs over 20 times better than random guessing among all residential buildings in New York City.

2 WHAT ARE THE MOST IMPORTANT PREDICTORS?

INDIVIDUALS:

Previous application to shelter
Living in a building that previously housed a homeless family
Receipt of family assistance

BUILDINGS:

Rates of shelter entry in the neighborhood
Housing code violations
Emergency repairs

PREDICTING FAMILY HOMELESSNESS USING MACHINE LEARNING: FINDINGS

3 HOW WELL CAN WE PREDICT FAMILY SHELTER CAN PREDICTIONS GUIDE PREVENTION OUTREACH?

INDIVIDUALS: We can identify high risk families that are roughly 1.5 times more likely to apply for shelter within 24 months than families currently seeking Homebase assistance.

BUILDINGS: Our building predictions are 30% more accurate at identifying buildings with high-risk families than comparison models using only the information currently used to direct building outreach.

WWW.NYC.GOV/CIDI