



Second-Best Ways to Meet Data Needs for Applied Health Research

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My Data-linkage Research Narrative

- Obesity: energy balance
 - time use: first-hand data; ATUS + ...
 - incentive design: first-hand data; synthetic population + company data
 - food environment: housing market data + FoodAPS
- Cancer screening, prevention and survivorship
 - Financial hardship screening: EHR + Clinical data + Registry
 - Tobacco risk and cost assessment: TRICARE claim + clinic + pharmacy

Health Equity & Health Disparity Research Framework

National Institute on Minority Health and Health Disparities Research Framework

		Levels of Influence*			
		Individual	Interpersonal	Community	Societal
Domains of Influence (Over the Lifecourse)	Biological	Biological Vulnerability and Mechanisms	Caregiver–Child Interaction Family Microbiome	Community Illness Exposure Herd Immunity	Sanitation Immunization Pathogen Exposure
	Behavioral	Health Behaviors Coping Strategies	Family Functioning School/Work Functioning	Community Functioning	Policies and Laws
	Physical/Built Environment	Personal Environment	Household Environment School/Work Environment	Community Environment Community Resources	Societal Structure
	Sociocultural Environment	Sociodemographics Limited English Cultural Identity Response to Discrimination	Social Networks Family/Peer Norms Interpersonal Discrimination	Community Norms Local Structural Discrimination	Social Norms Societal Structural Discrimination
	Health Care System	Insurance Coverage Health Literacy Treatment Preferences	Patient–Clinician Relationship Medical Decision-Making	Availability of Services Safety Net Services	Quality of Care Health Care Policies
Health Outcomes		 Individual Health	 Family/ Organizational Health	 Community Health	 Population Health

National Institute on Minority Health and Health Disparities, 2018

*Health Disparity Populations: Race/Ethnicity, Low SES, Rural, Sexual and Gender Minority

Other Fundamental Characteristics: Sex and Gender, Disability, Geographic Region

WHO Framework of Social Determinants of Health

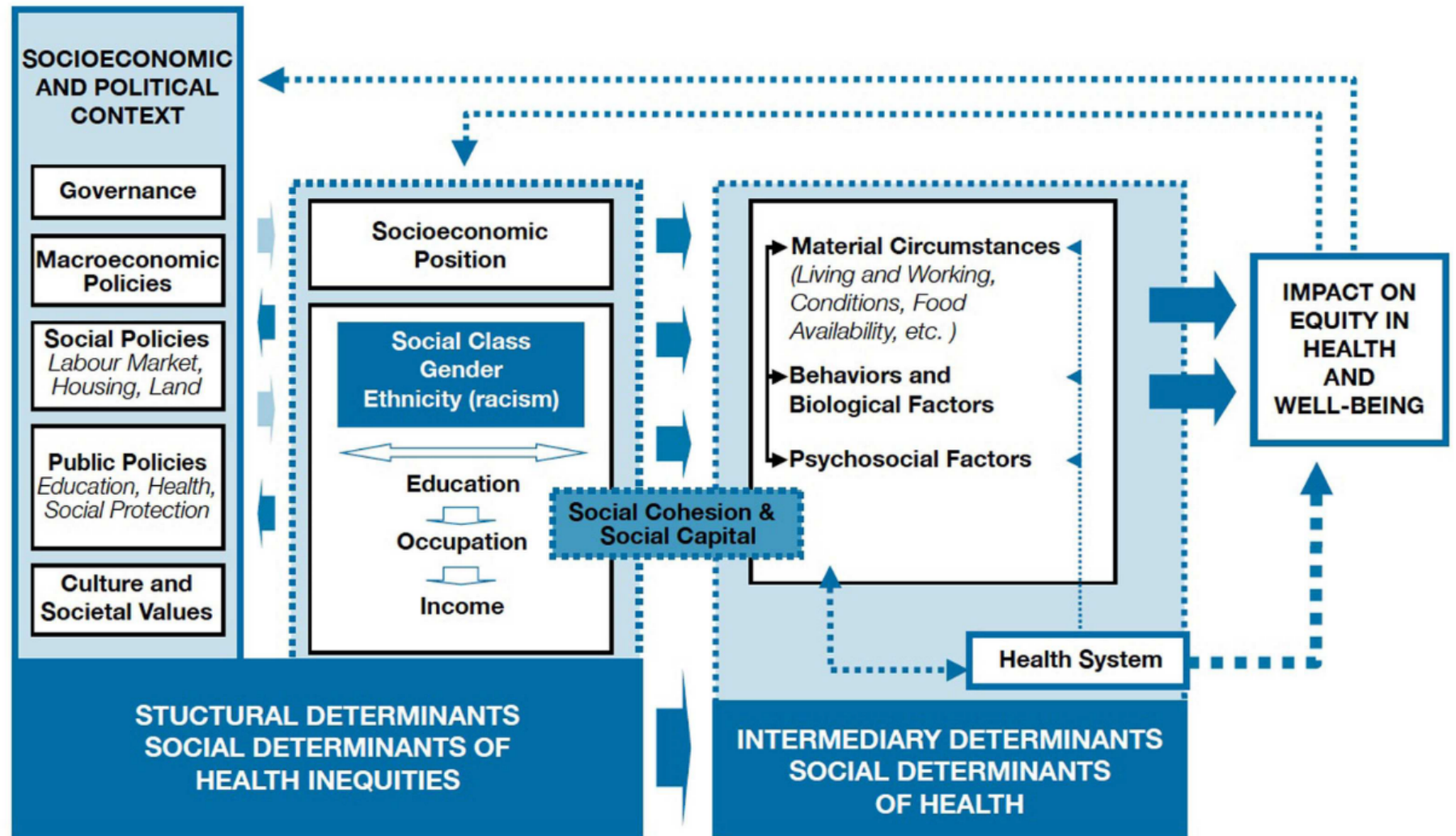


FIGURE 1 | WHO framework of social determinants of health [World Health Organization (WHO), 2010]. Permission was granted to reproduce this diagram as it was originally published by the World Health Organization (WHO; 2010) on page 6 in *A Conceptual Framework for Action on the Social Determinants of Health*.

Structural Models Route:

- Identify mechanisms: outcomes — preferences — relevant factors (e.g., SDOH)
 - Enable examinations of counterfactual policies and external validity
 - Quantify net impacts
 - Separate short-term (can be used to validate reduced form findings) and long-term effects
 - Enable economically meaningful interpretation of data
- Demand for data is high!



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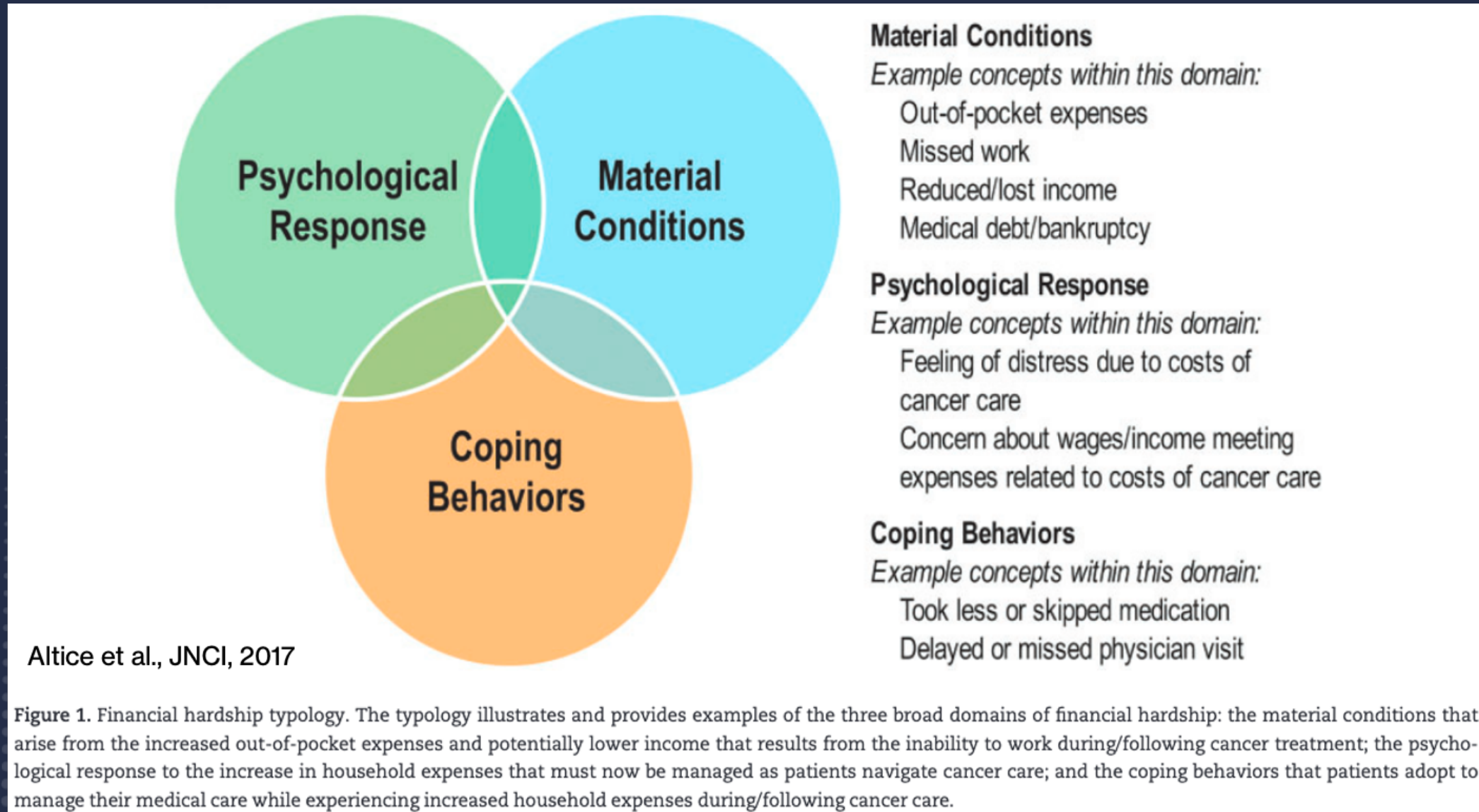
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Secondary Health Data Linkage

- Linked secondary health data provides longitudinal health and social data on large populations with relatively low-cost
- Challenges
 - Rates of completeness (e.g., missing not at random; clinical burden)
 - Data coding consistency (w/i and b/w institutions)
 - Multi-institution care cases
 - Identifier uniqueness (e.g., last name change due to marriage)
 - Access (HIPAA guarded)



Example 1: Financial Hardship Screening Algorithm



Data Sources

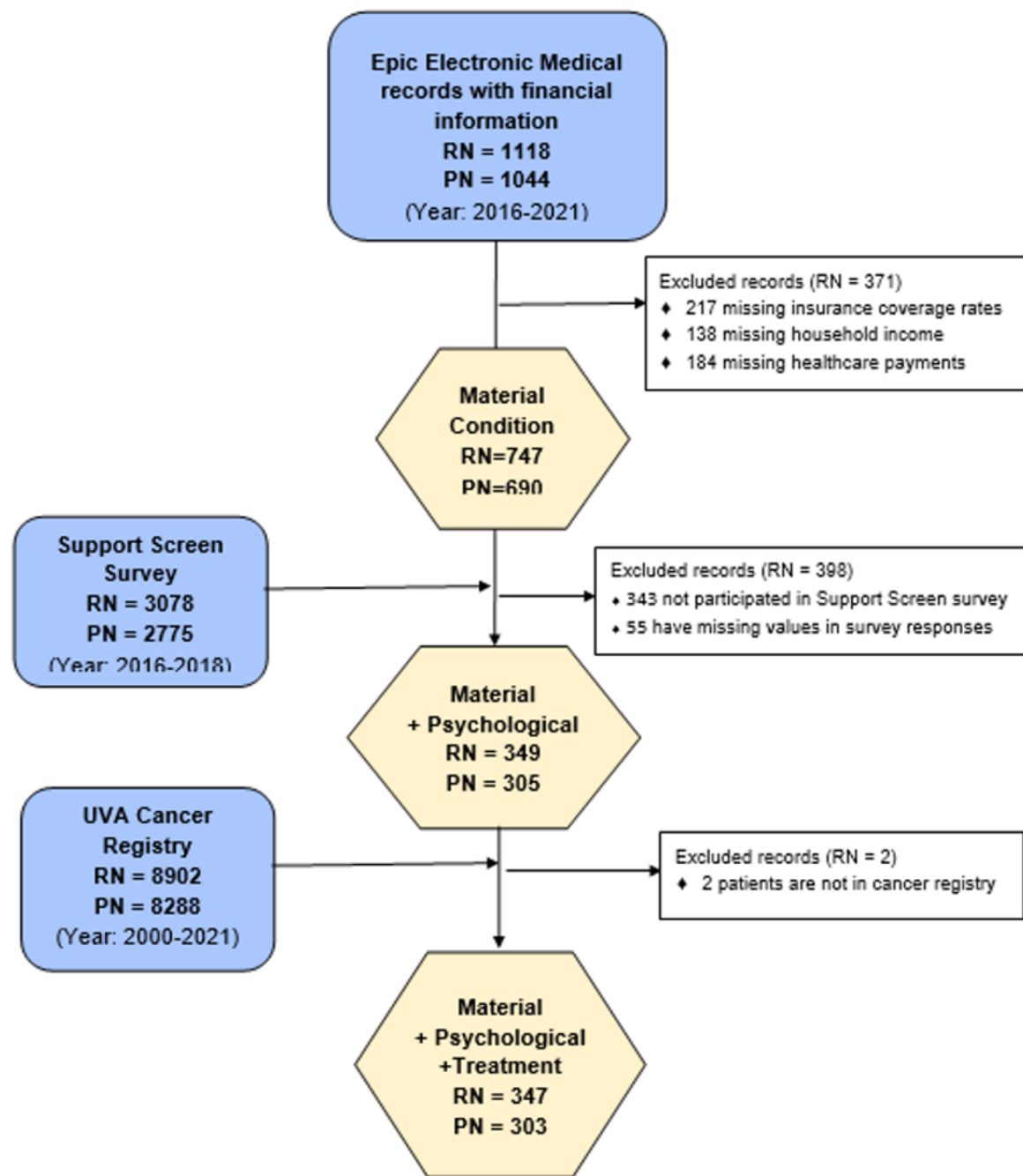
- Material conditions: UVA Health electronic health record [on-going by encounter]
 - Key variables: **income**, out-of-pocket payments, insurance, financial assistance
- Psychological responses: UVA Cancer Center data [once a year by encounter]
 - Key variables: distress (emotional, financial, treatment, energy)
- Coping behaviors: UVA cancer registry [updated monthly]
 - Key variables: radiation, chemotherapy, hormone therapy, immunotherapy treatment adherence; overall compliance status

● **Merged by unique Medical Record Number!**



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Note:

RN: record numbers

PN: patient numbers

RN > PN: some patients have more than one record



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Figure 1. Consort flow diagram for analyzed sample and data sources.

Key Findings

- Long-term cancer survivors and >65 years olds show lower levels of material deprivation
- OOP insurance coverage inclusion eliminate cancer type and stages difference
- Psychosocial deprivation is more severe than material deprivation
- Psychosocial hardship leads material hardship by about 1 to 2 years
 - Early intervention focusing on stress management is more effective
- Current screening missed: younger & higher income & lower insurance coverage



Access



- Interdisciplinary team
- Cross-institutional collaboration initiatives
- CDC site for SDOH data sources

About

The integrated Translational Health Research Institute of Virginia (iTHRIV) is a transformational cross-Commonwealth collaboration that leverages the latest advances in data science to accelerate innovation in health-related research and facilitate team science. Partners within iTHRIV include Carilion Clinic, Inova Health System, the University of Virginia, and Virginia Tech, as well as affiliates the Center for Open Science and the UVA Licensing & Ventures Group.

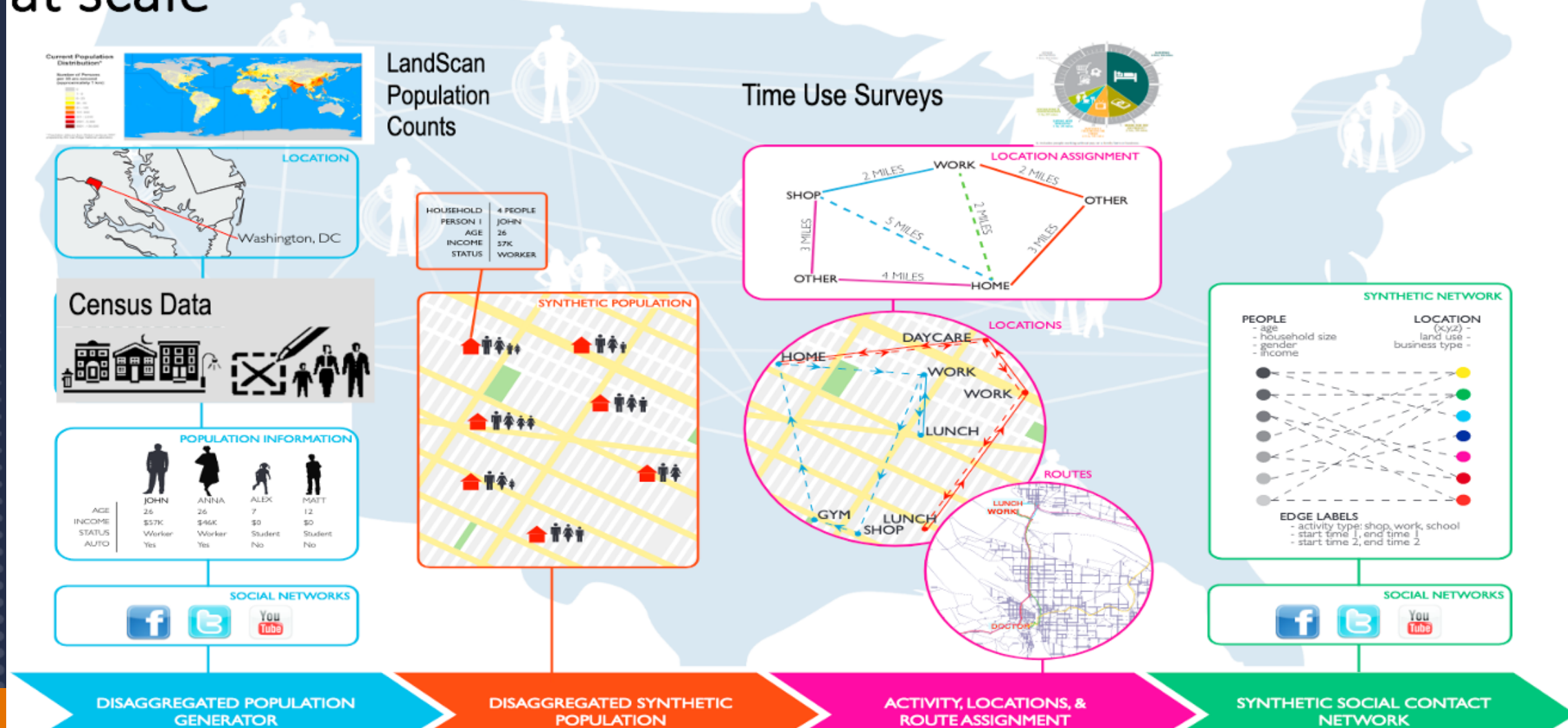


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Example 2: Synthetic Population and Usage

Constructing synthetic multi-scale synthetic networks at scale



THANK YOU!

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