

CURRICULUM

PUMS Training Part II: Developing Research Questions

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LEARNING OBJECTIVES

1. Learn how to develop good research questions.
2. Understand how to build a research plan/proposal.
3. Practice using PUMS data to create and answer research questions.

DEVELOPING RESEARCH QUESTIONS

Most difficult part of conducting research

- Characteristics of good research questions
- Common pitfalls when developing questions
- Designing research projects

RESEARCH QUESTIONS

AIMS

- Based on theory and/or a strategy
 - Ex. Grounded theory or strategic initiative
- Measureable
- Testable
- Achievable
- Ethical

COMMON PITFALLS

#1. Sequence of Events



COMMON PITFALLS

- Starting with a data set and then developing a question
 - Limiting analysis to available variables
- Example: Measuring availability of mental health services
 - Could proxy with insurance as availability (PUMS), better to use supporting dataset with mental health resource data (SAMHSA)
 - Reduced-form models: usually less accurate unless using causal model to control for unmeasured variance

COMMON PITFALLS

#2. Too Broad of a question



COMMON PITFALLS

- Unfocused question
 - Broad scope of literature to review
 - Many outcomes and covariates to select
 - Project duration

COMMON PITFALLS

- Example: How does income impact health?
 - Conceptual model problems
 - Which income and health measurements should be used?
 - Do selected measurements comprehensively or partially reflect health and income?
 - What unobserved variance do we need to account for?

COMMON PITFALLS

#3. Too narrow of a question



COMMON PITFALLS

- Sample size problems
 - Protected, top or bottom coded out
 - Need to group in larger categories
 - Coding race to black/white/other due to small numbers of other races in a sample

COMMON PITFALLS

- Example: Are American Indian (AI) grandparents as caregiver households more likely to not have refrigerators than non-grandparents as caregiver households?
 - Sample size: Weighting could eliminate AI in some population samples
 - Measurement: Refrigerators common, bundle in other physical housing characteristics for analysis

QUESTION DESIGN

- Descriptive
 - Exploratory, grounded theory
- Hypothesis Testing
 - Conceptual model and testing plan
- Causal
 - Panel data, RCT, IV, or Diff-in-diff model

DESCRIPTIVE

- Profile of a group
 - Group characteristics and demographics
- Groundwork for further research
 - We know how many Kansas teachers are female:
More Kansas teachers are female than male.
 - Hypothesis testing, H_0 vs. H_1
- Not a causal framework

DESCRIPTIVE

- Example: Economic profile of two-income households in Douglas County.
 - Report on demographics, percentages, rates could lead to additional follow up research.
 - Hypothesis test: Two-income households are more likely to own their house than one-income households. H_0 vs. H_1

HYPOTHESIS TESTING

- Question design
 - Testable hypothesis: People over 65 are more likely to be disabled than people under 65. H_0 vs. H_1
- Conceptual model
 - Having a disability is more likely in people over 65
 - Other factors (race, education and occupation)
- Testing mechanism/variable distribution
 - Means test: Chi-square test (two categorical variables)
 - Regression: Logistic, categorical dependent variable

CAUSAL

- Statement of hypothesis
- Specify the statistical model
- Collection of data
- Estimation of parameters
- Hypothesis testing
- Forecasting or prediction

CAUSAL

- Example: Has health insurance coverage increased with the passing of the Affordable Care Act?
 - Difference-in-differences approach
 - Panel data (pre- and post-period)
 - Control for other factors/covariates

DESIGN DIFFERENCES

	Descriptive	Hypothesis Testing	Causal
Theory-based	Yes	Yes	Yes
Literature review	Yes	Yes	Yes
Means testing	No	Yes	Yes
Statistical model	No	Yes	Yes
Causal inference	No	No	Yes

RESEARCH EXAMPLE

- Siordia, C. (2015). Demographic, Economic, Household, and Health Profile of Grandparents Responsible for Grandchildren. *Journal of child and family studies*, 24(9), 2661-2667.

RESEARCH EXAMPLE

- Descriptive research
- PUMS data 2009 – 2011 (3-year sample)
- Purpose: To investigate characteristics of grandparents responsible for grandchildren by race-ethnic groups and the geographical distribution over the U.S. mainland.

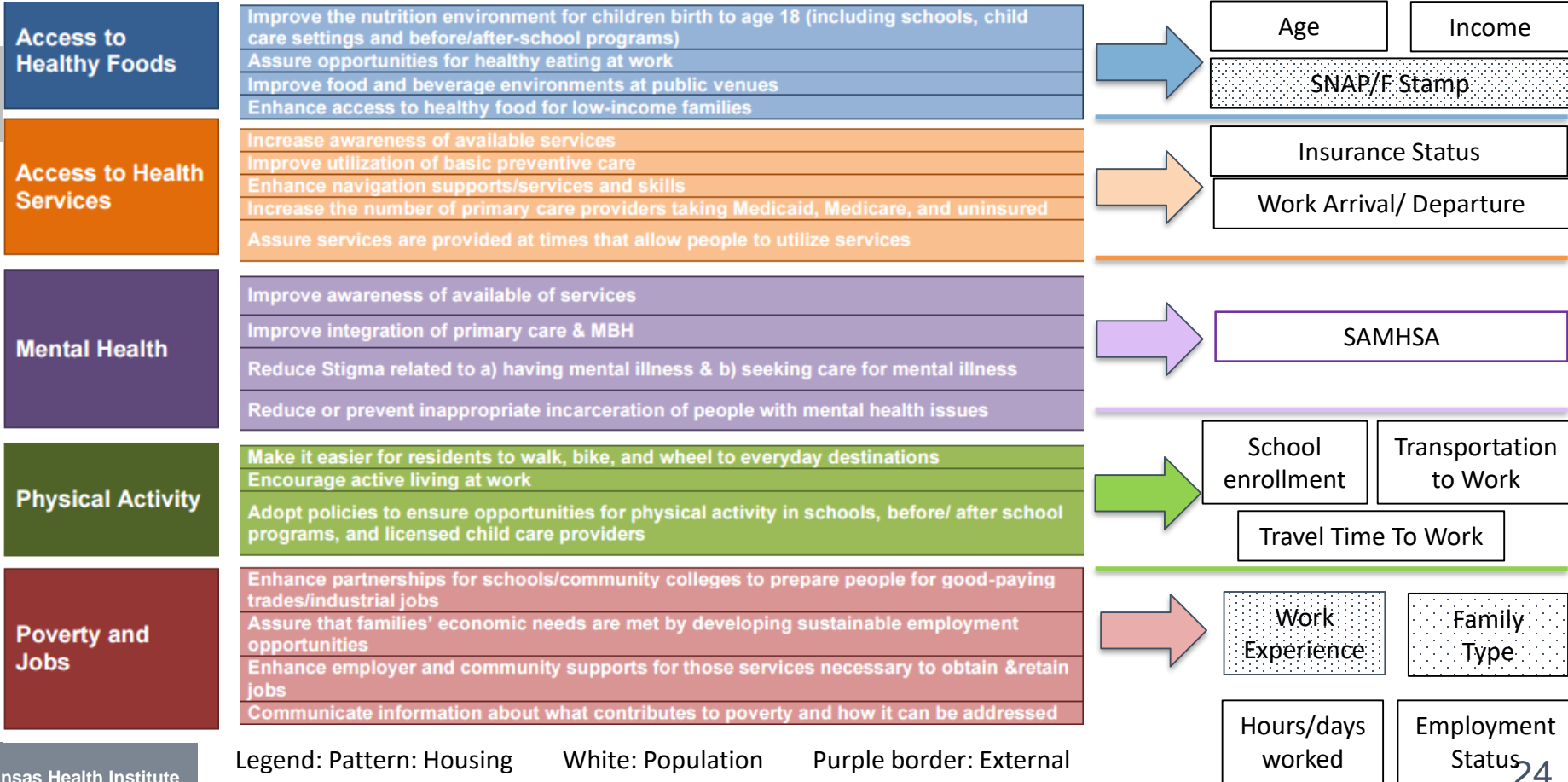
RESEARCH EXAMPLE

- Methods
 - Continental (mainland) United States
 - Race groups: Non-Latino (NL) White, NL Black, NL Other, Mexican-Latino, Non-Mexican Latino
 - Identified grandparents as responsible for grandchildren by survey question response
 - Also reported grandparent only (no other parent)
 - Home ownership: mortgage, own, rent or rent-free
 - Length of ownership: When moved in (categorical)

PUMS RESEARCH QUESTION REVIEW

- Outcomes: How do you want to report/use data?
 - Person-level questions
 - Are teachers in Kansas predominately male or female?
 - Household question
 - Economic profile of two-income households in Douglas County
- Household Programs: Reliable/stable housing
- Personal Programs: Addressing education rates

DOUGLAS COUNTY COMMUNITY HEALTH PLAN



Legend: Pattern: Housing White: Population Purple border: External

PUMS RESEARCH

EXAMPLE 1

- Strategic Initiative: Assure services are provided at times that allow people to use them
 - Descriptive design
 - What factors do we need to consider to allow people to use services?
 - PUMS variables that can be used: work arrival, work departure, transportation to work, travel time to work, occupation (proxy for hourly/salary or if paid leave available)
 - Measure availability of services. Other data sources? Provider/facility registry (services and hours)

PUMS RESEARCH

EXAMPLE 2

- Strategic Initiative: Assure that families economic needs are met by developing sustainable employment opportunities.
 - Could be a causal model if we are measuring an intervention of program (IV or diff-in-diff model)
 - PUMS variables that can be used: Hours/days worked, employment status, employment tenure, housing characteristics (one- or two-income families, residence tenure-stabilization)
 - Outcome choices: Household or individual level? How do you want to report outcome?

Thank you.

ANY QUESTIONS?

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