Two Applications of Respondent Driven Sampling: Ethnic Minorities and Illicit Substance Users

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Introduction

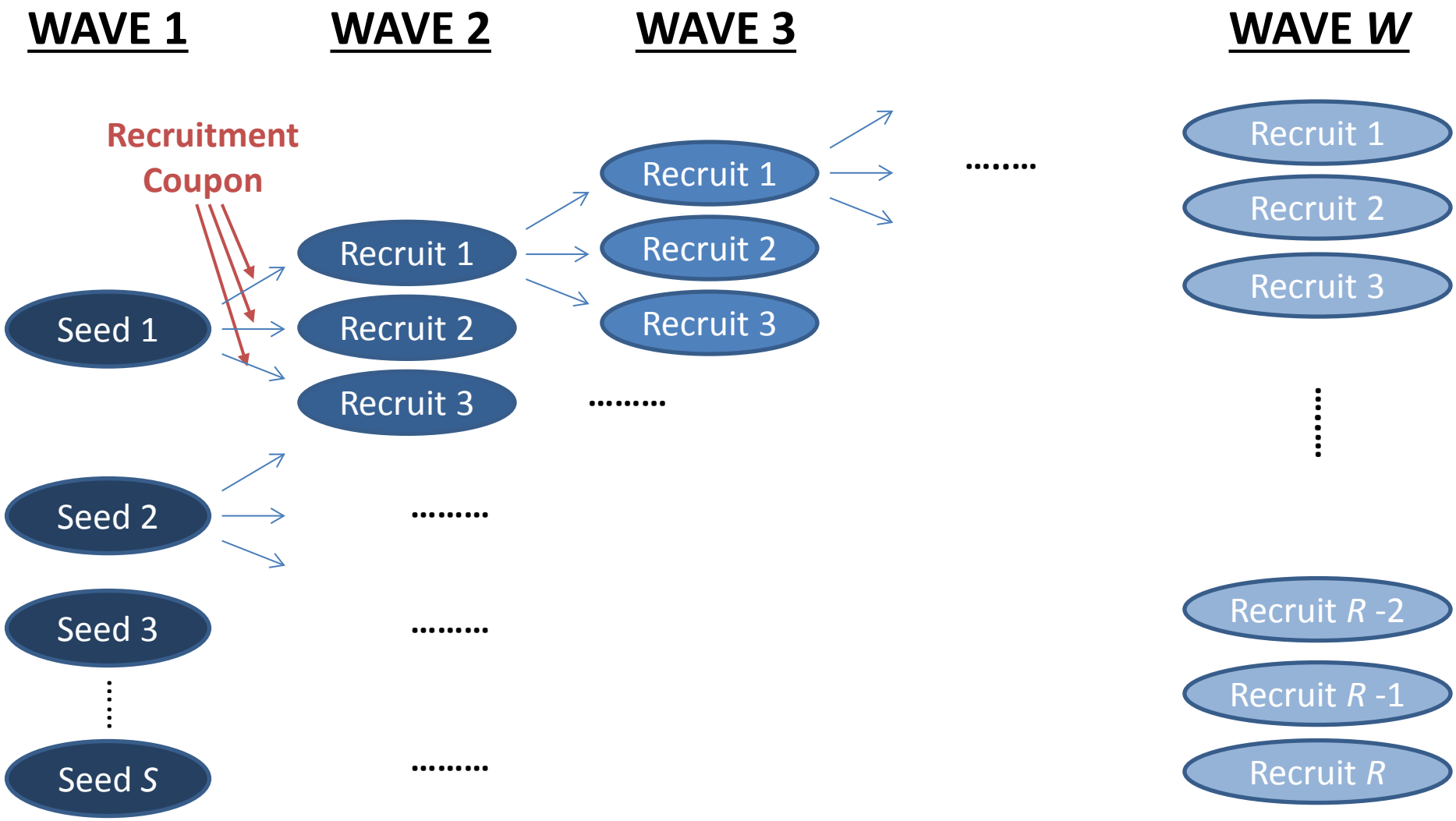
Respondent Driven Sampling – 1

- Growing interest in studying hard-to-reach, rare, elusive, hidden populations
  - HIV at-risk population: MSMs, Sex workers, IDUs
  - LGBT populations
  - Recent immigrants
- No clear and practical solution with probability sampling
  - High screening costs
  - Hesitant to be identified

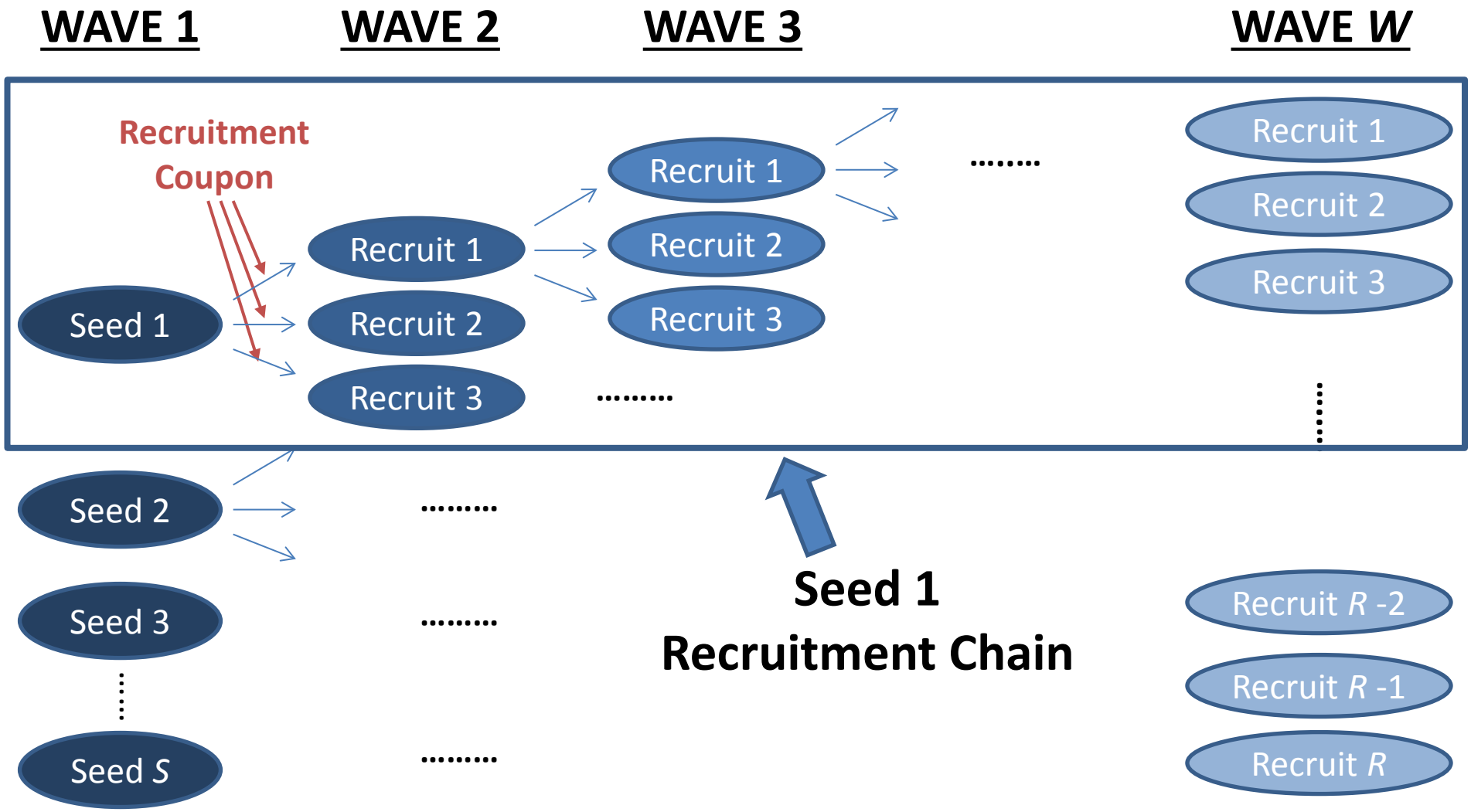
Respondent Driven Sampling – 2

- Proposed by Heckathorn (1997, 2002)
- Popular usage in public health
- Exploits social networks among rare population members for sampling purposes
  - Sampled members also play a role of a recruiter
  - Incentivized recruitment from own network through coupons and this continues in waves/chains
  - Recruitment assumed to be random within each individual's network and to follow memory-less Markov chain and reach equilibrium
    - Under these assumptions, unbiased estimators can be obtained after equilibrium using weights equal to the number of nodes for a subject's recruiter.

Respondent Driven Sampling – 3



Respondent Driven Sampling – 4



Network Sampling vs. RDS

Similar:

- Rely on social networks

Different:

- Network specification
  - NS: biological siblings, immediate family members
  - RDS: jazz musicians
- Who selects the sample
  - NS: researchers
  - RDS: study participants

Application 1:
Project PATH (Positive Attitudes Towards Health)

Funded by the National Science Foundation (GRANT NUMBER SES-1461470)

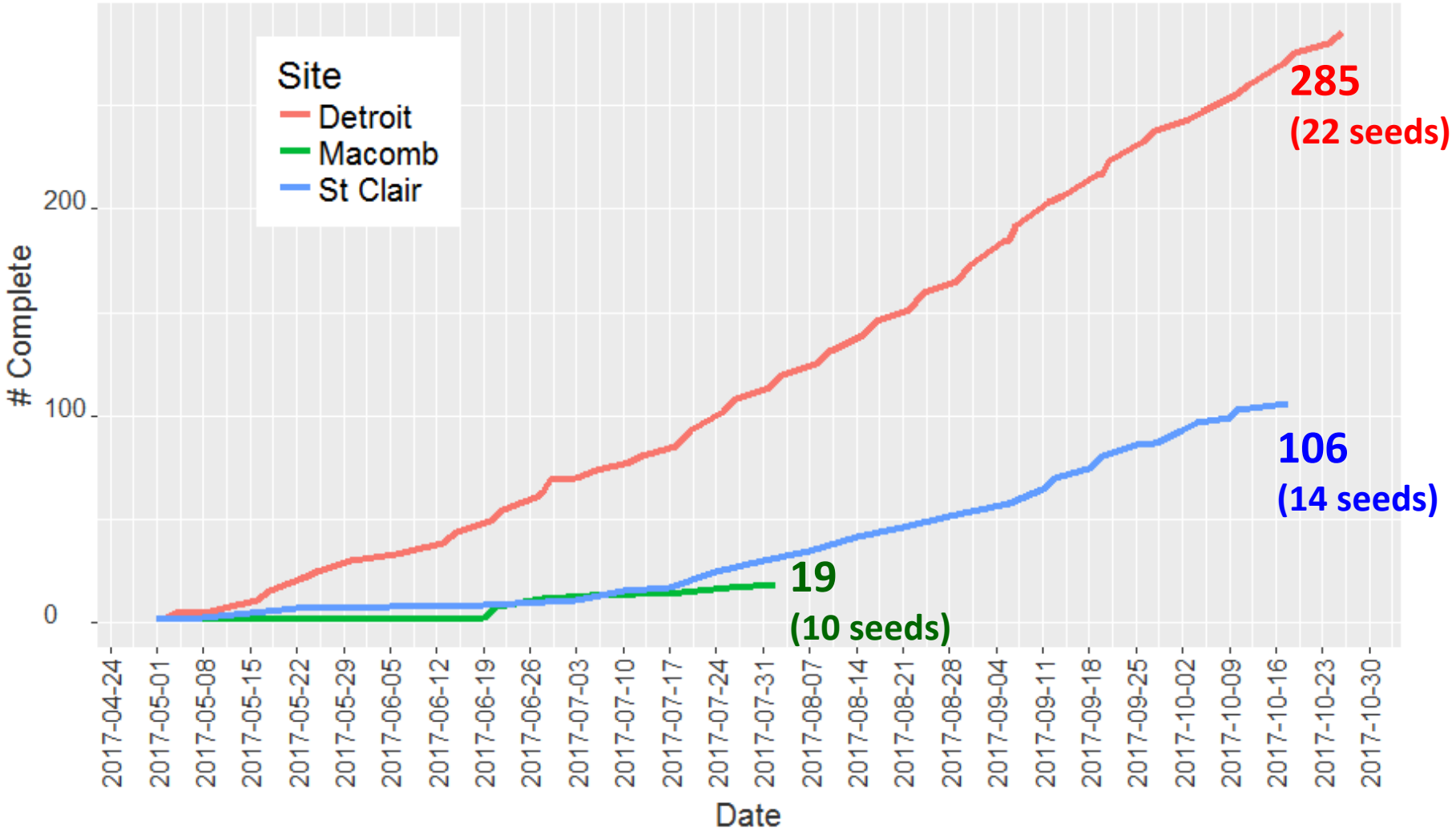
PATH Data Collection

- Injection drug users in Southeast Michigan
- Phone screener

  → In-person screener + Main interview + ~3 Coupons

  → In-person follow-up interview
- Data collection sites
  - Detroit: Urban; Tues, Thur @ Detroit Center
  - Macomb: Suburban; Weds @ County PH Depart
  - St. Clair: Rural; Mon (+Weds) @ County PH Depart
  - 4 interviewers rotating between sites
- Field Period: 5/1/2017 – 10/31/2017

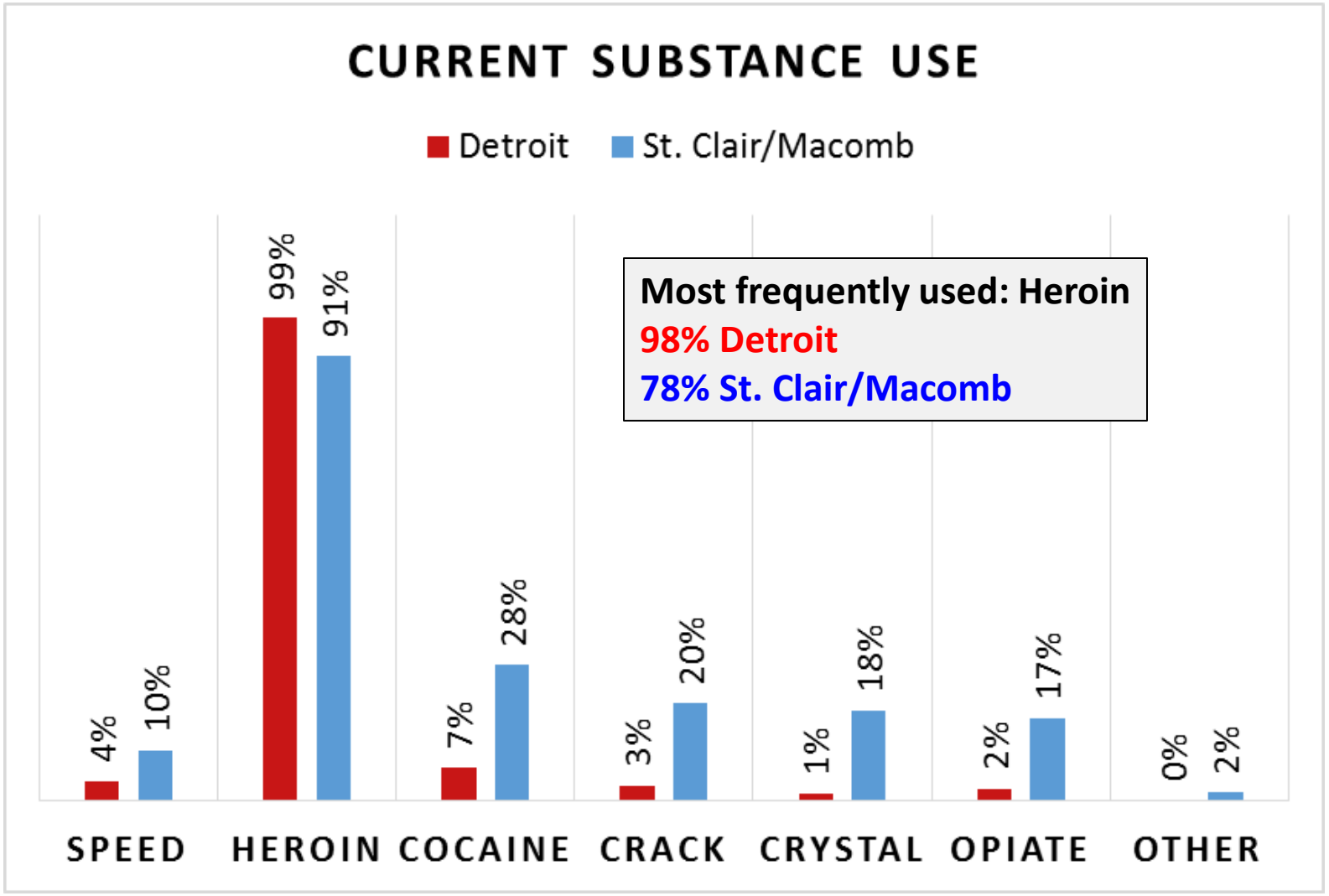
PATH Data Collection Progress



Demographics

	Detroit	St Clair/ Macomb
Age (avg)	56 yrs	40 yrs
Age: <30 years old	2%	32%
Male	68%	53%
Non-Hispanic White	11%	73%
Non-Hispanic Black	81%	16%
Education: <High School	32%	18%
Employed	8%	18%
Ever homeless past 12 mos	40%	56%

Substance Use



Application 2:
Health and Life Study of Koreans (HLSK)

Funded by the National Science Foundation (GRANT NUMBER SES-1461470)

HLSK

한인 건강생활 연구
Health and Life Study of Koreans

- Targets foreign-born Korean American adults in
  - Los Angeles County
  - State of Michigan
- Web-RDS survey

  http://sites.lsa.umich.edu/korean-healthlife-study/
  - Unique number required for participation
  - Incentive payment through checks
- Target n=800 (currently ~600)
- Benchmarks from American Community Survey

HLSK Formative Research

- 3 rounds of focus group discussions
  - ~30 participants; 2 rounds in Korean and 1 in English
  - Discussion focused on
    - Web surveys

      → URL, Web site contents, etc.
    - Concept of RDS
    - Coupons

      → Up to 2 coupons

      → “Expire” in 2 weeks
    - Level of incentives

      → $20 for main, $5 for follow-up, $0 for recruitment

한인 건강생활 연구
Health and Life
Study of Koreans

HLSK Data Collection

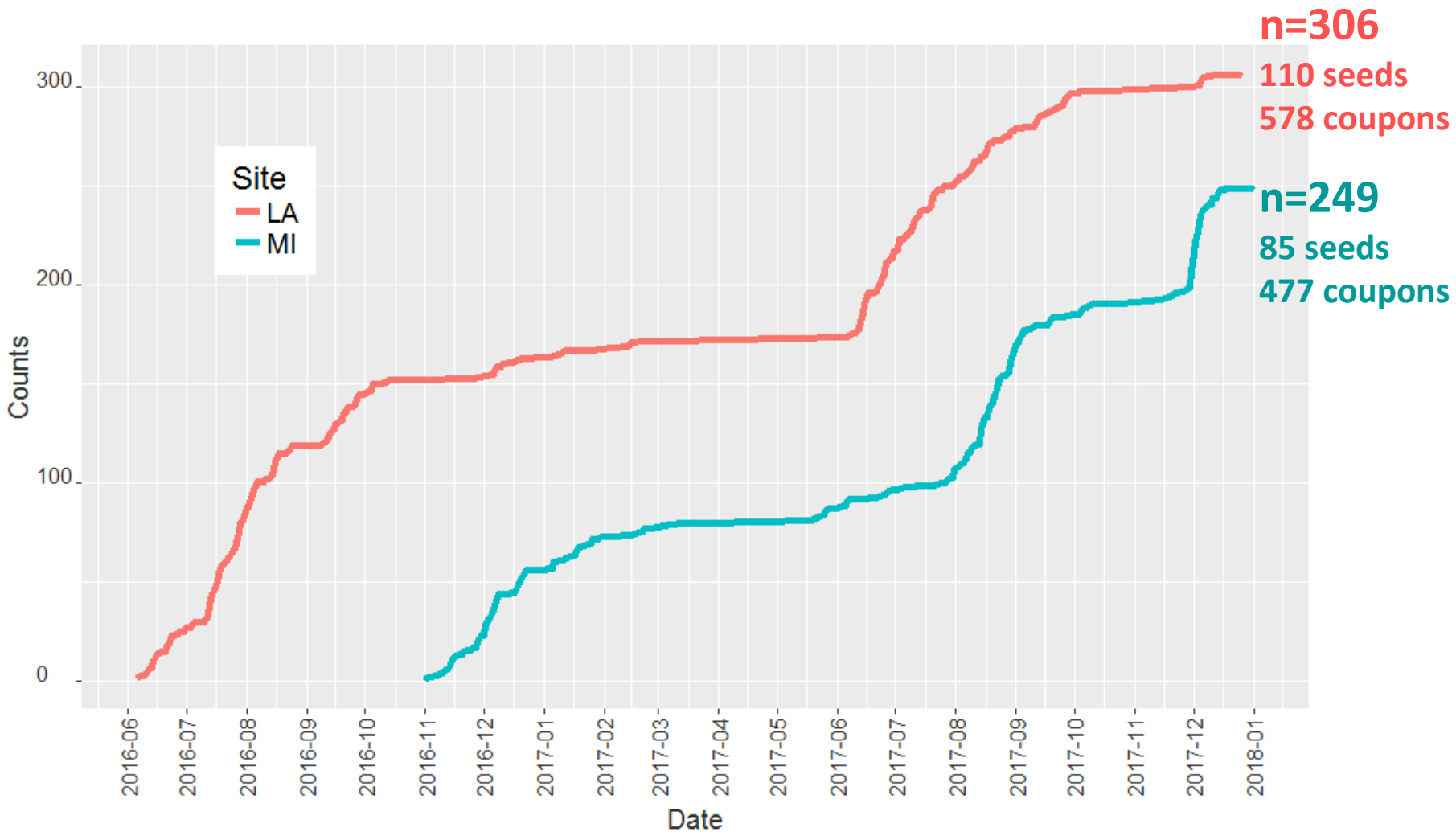
- Started with 12 seeds in LA in June 2016
- MI added in November 2016

- LA seeds (initially)
  - Recruited through referral
  - Balanced on gender, age, dominant language
  - In-person introduction about the study

→ It became clear the protocols would not work
  - Provide recruitment incentives
  - Add more seeds

HLSK Data Collection Progress

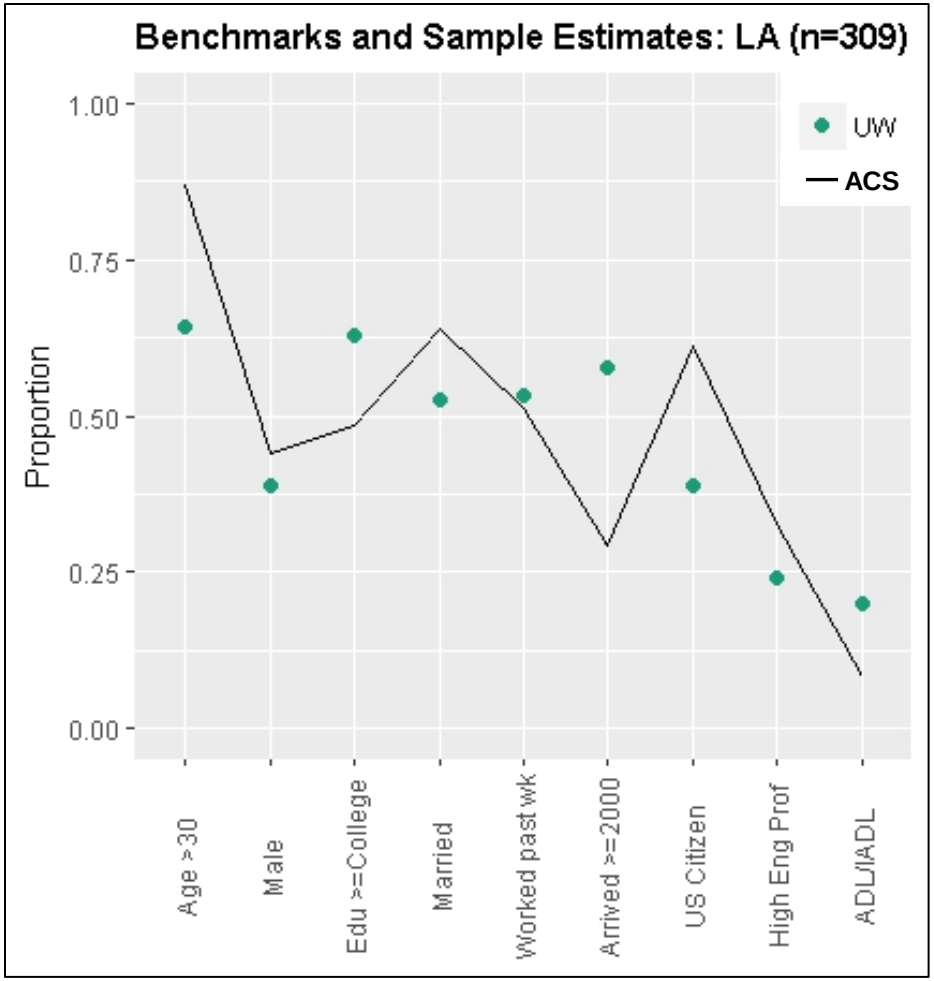
한인 건강생활 연구
Health and Life Study of Koreans

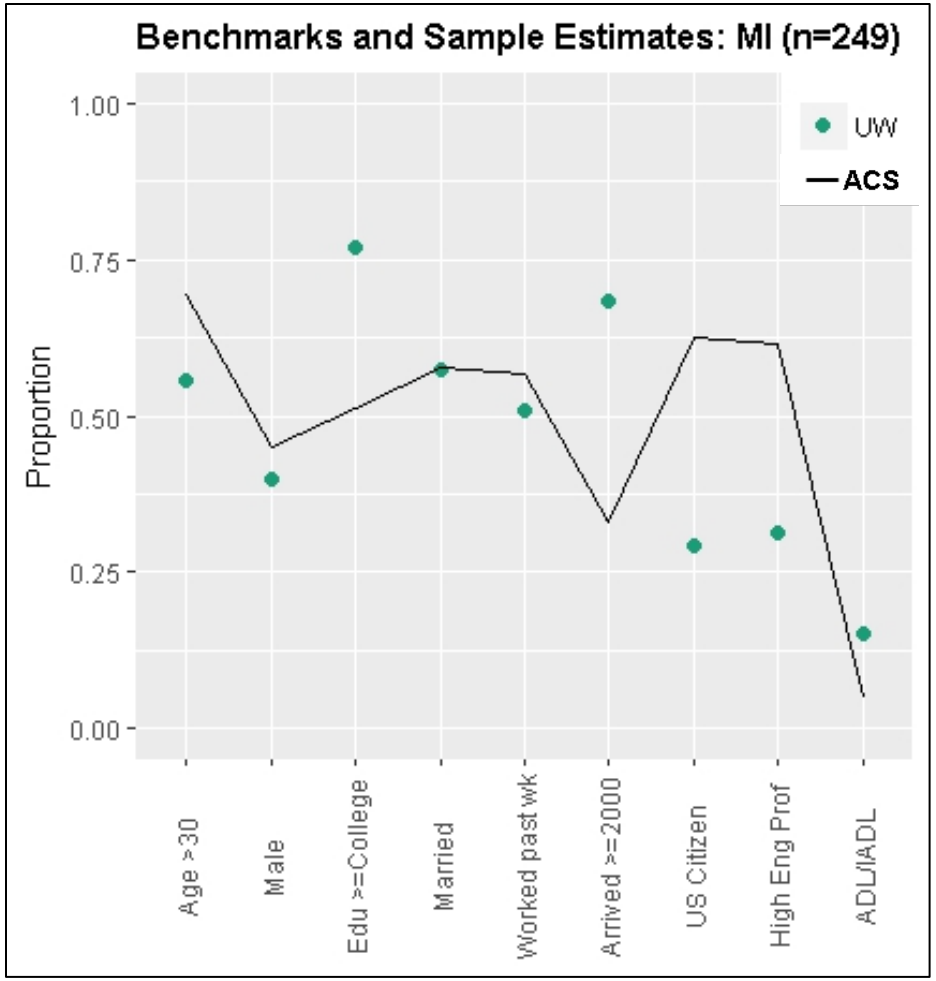


HLSK vs. ACS – 1

- American Community Survey 2011-2015 data
- HLSK sample estimates
  - Unweighted (UW)
  - RDS-I
  - Weighted: RDS-II
  - Weighted: Post-stratification (PS) by age, sex, educ
  - Weighted: RDS-II + PS

HLSK vs. ACS – 2


Benchmarks and Sample Estimates: LA (n=309)
Proportion
1.00
0.75
0.50
0.25
0.00
UW
ACS
Age >30
Male
Edu >=College
Married
Worked past wk
Arrived >=2000
US Citizen
High Eng Prof
ADL/IADL


Benchmarks and Sample Estimates: MI (n=249)
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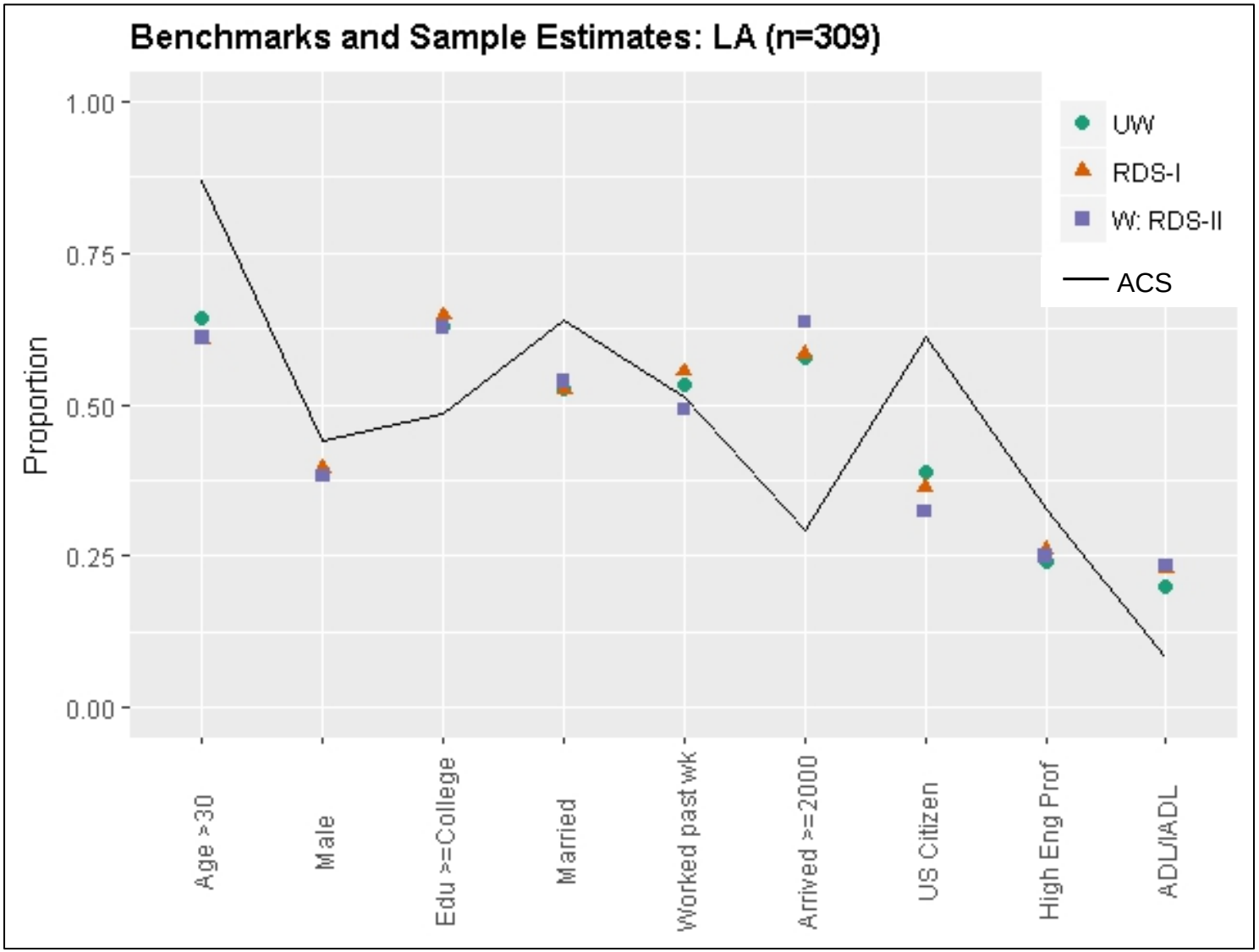
HLSK vs. ACS – 3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W: RDS-II
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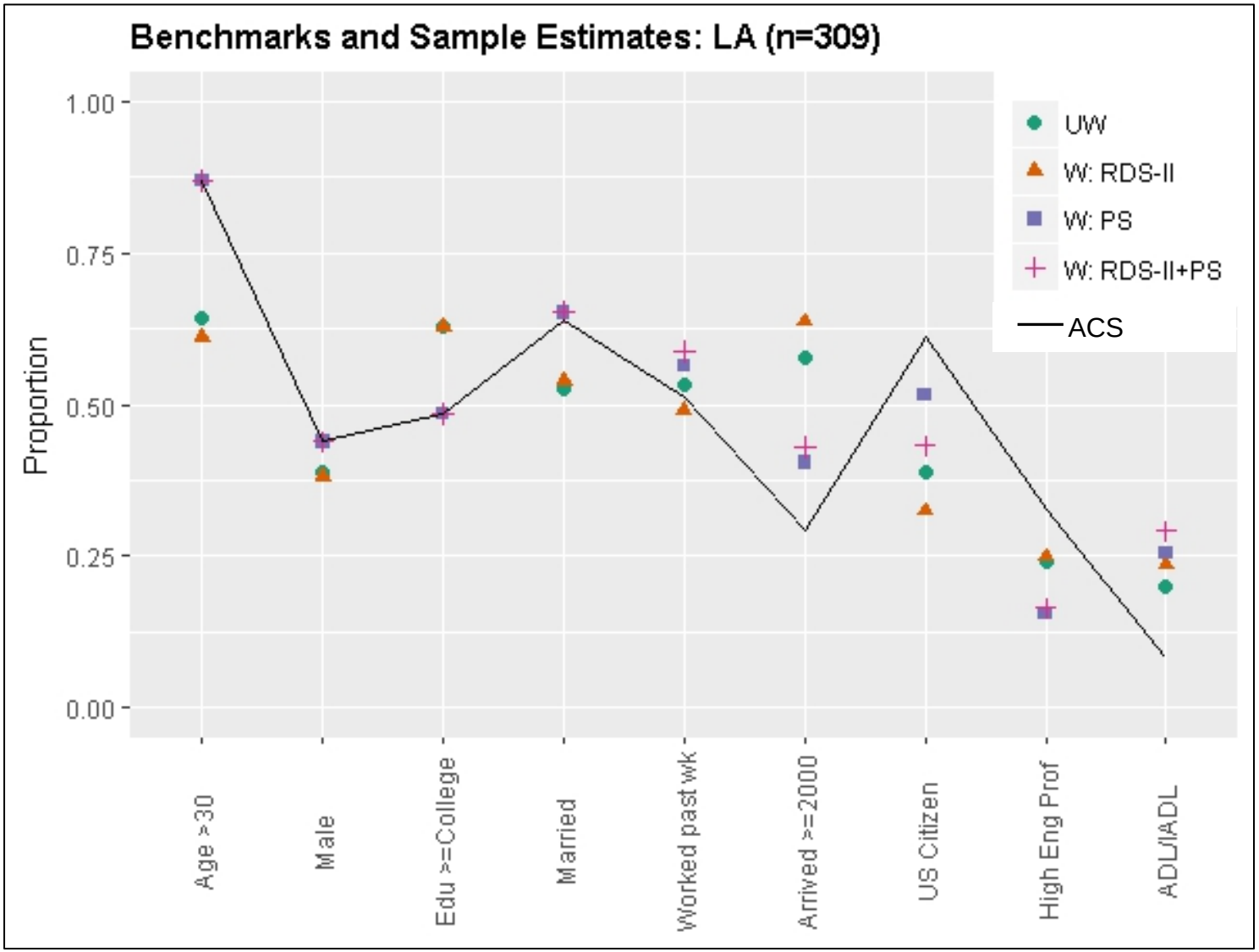
Benchmarks and Sample Estimates: LA (n=309)
Proportion
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0.75
0.50
0.25
0.00
UW
W: RDS-II
W: PS
W: RDS-II+PS
ACS
Age >30
Male
Edu >=College
Married
Worked past wk
Arrived >=2000
US Citizen
High Eng Prof
ADL/IADL

Summary

What did we learn?

- Non-cooperation is an issue for generating long chains (memorylessness unlikely)
- Had to improvise to make RDS "work"
- Sample size (hence, chain length) is a random variable affected by many (mostly unknown) factors
- Inferences limited
- YET, difficult-to sample groups can be recruited
  - E.g., highly-educated young recent immigrants

Where should we go?

- Non-cooperation is critical for
  - meeting theoretical assumptions (hence, inferences)
  - study design
  - replications of the same study

- Yet to be addressed in the literature and accounted for in inferences

Thank you

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