Pathfinder:
Routing Interviewers Efficiently For Field Studies

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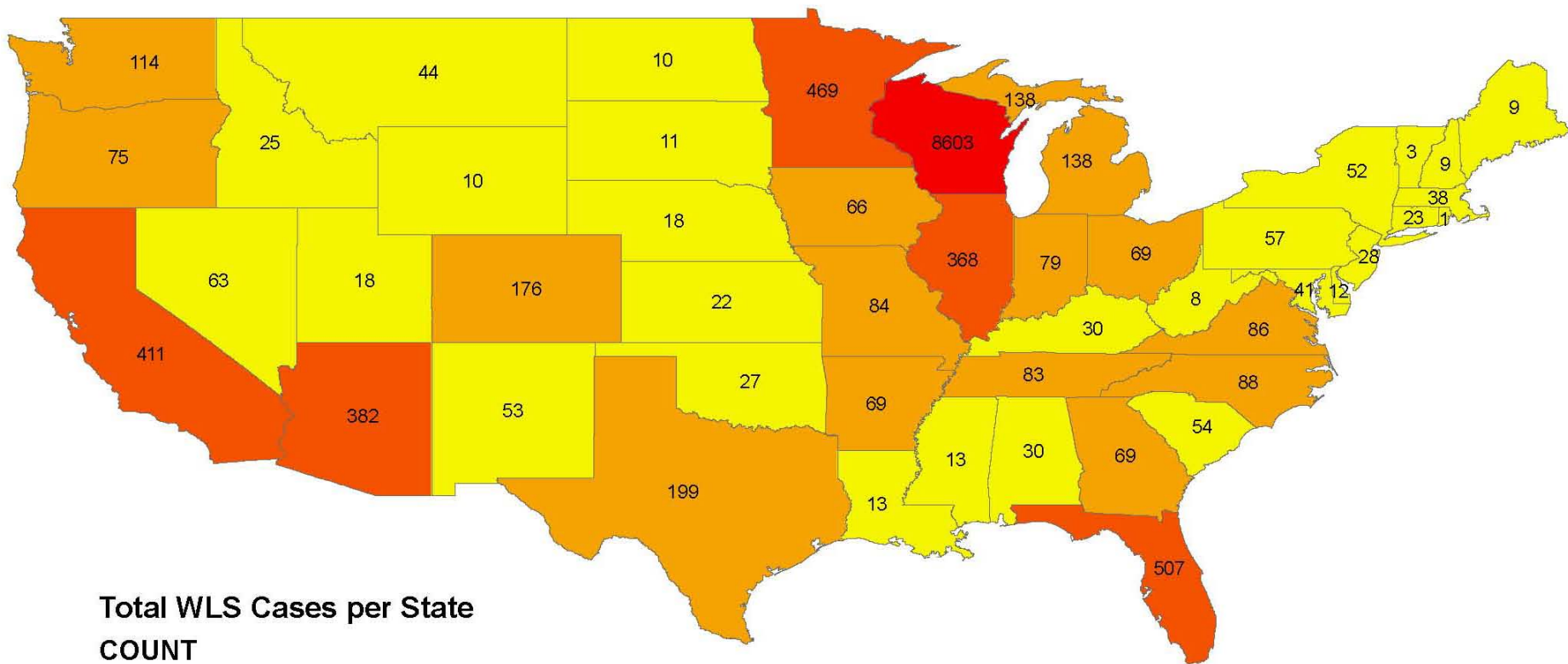Chicago May 17-19, 2010

Overview

- The most challenging CAPI wave in UWSC history
- Need for complex mapping tool
- Pathfinder description
- Demo

The 2010 CAPI wave of the Wisconsin Longitudinal Study

- The WLS challenge
  - WI high school graduates of the class of 1957
  - UWSC conducted last two waves of WLS via CATI
  - N=12,500
  - In-home interview lasting 3 hrs
  - 9 anthropometric measures
  - DNA sample collection (saliva)
  - 60 Interviewers and 7 Team Leaders
- Located in WI and throughout the United States
  - How to keep travel costs down?
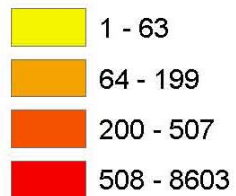 - How can we route Interviewers efficiently?
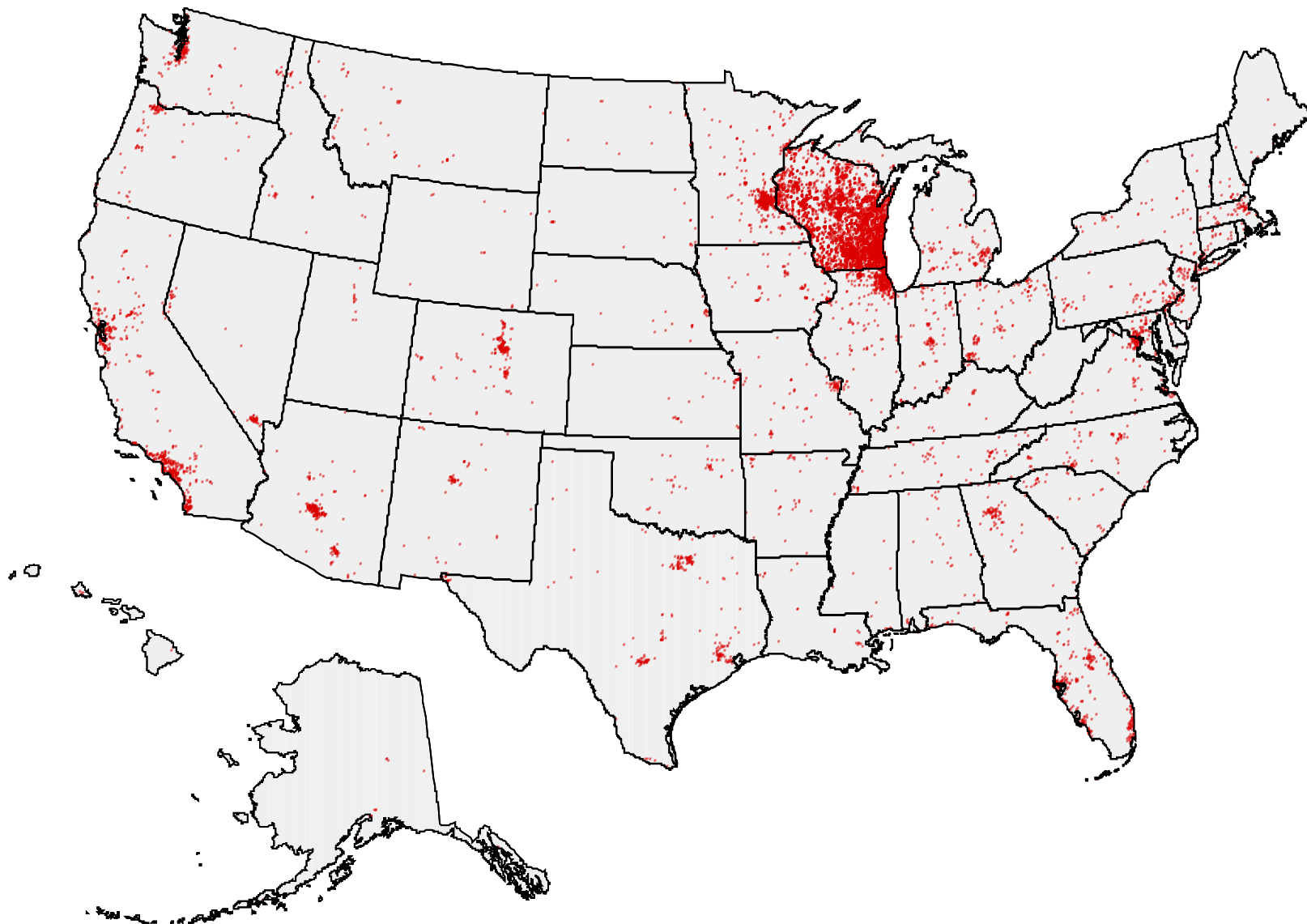
UWSC's history with CAPI studies

- Many projects throughout the years
- Small in size compared to the WLS
- Mostly Midwest states (WI, IL, IA)
  - Midwest Young Adult study (MYA)
    - N=600
  - Milwaukee Area Renters Study (MARS)
    - N= 2,000
- With WLS, would have to think on a larger scale
- Sample points in all 50 states
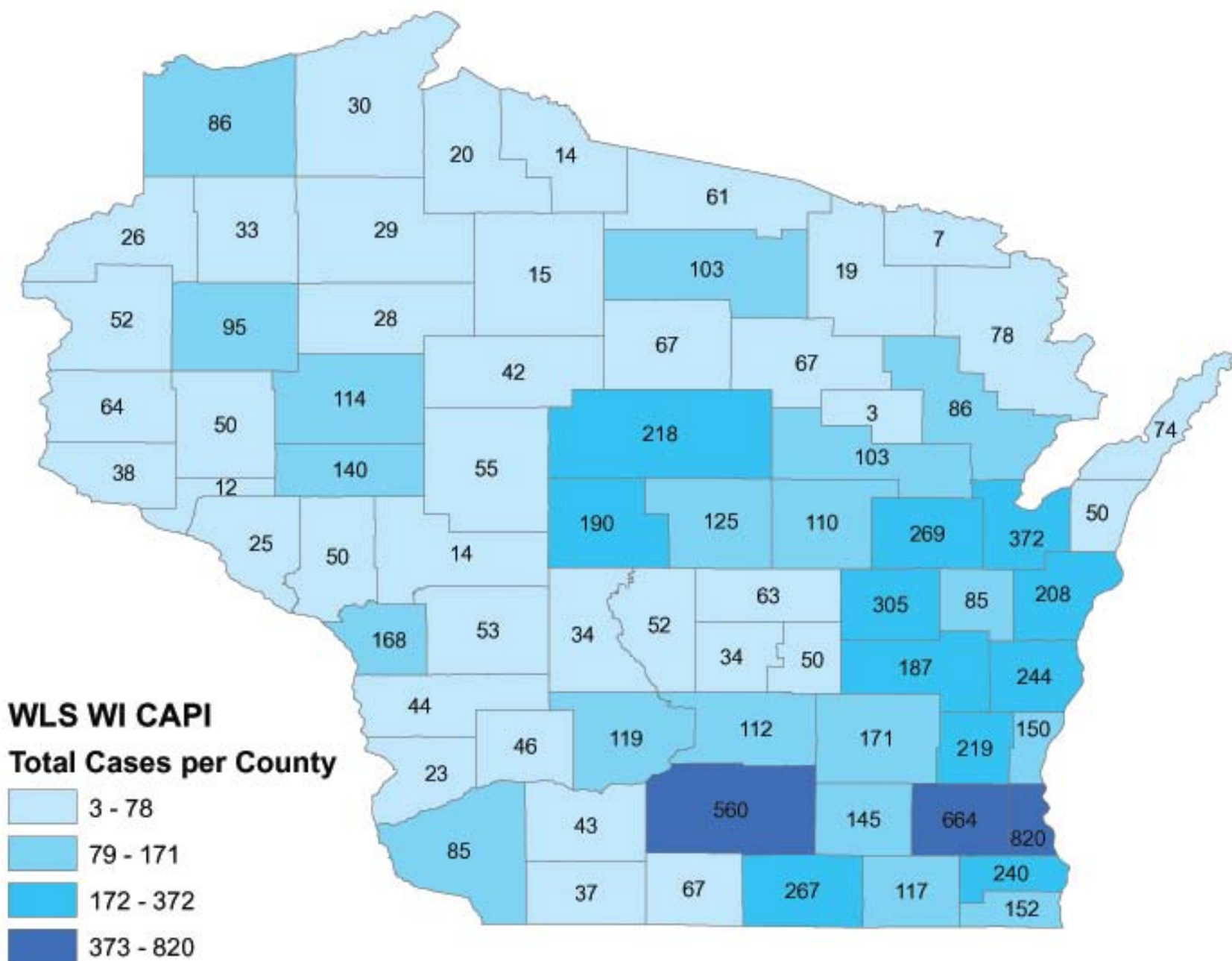- 66% sample in WI, 75% in Midwest; remaining sample scattered throughout the US

Total WLS Cases per State

COUNT

- 1 - 63
- 64 - 199
- 200 - 507
- 508 - 8603

WLS WI CAPI

Total Cases per County

- 3 - 78
- 79 - 171
- 172 - 372
- 373 - 820

Identifying the need

- How do we route Interviewers precisely and efficiently?
- Need for a robust mapping tool
- WLS Sample:
    - High-density areas
        - Scheduling 2 appointments a day
    - Low-density areas
        - How to efficiently route Interviewers to keep costs down
- How can we incorporate cost-checking of travel into our quality control process?
- Visual representation of caseload of Interviewers for trip planning purposes

Options we researched

- Microsoft Streets and Trips
- Google Maps, Mapquest, other online mapping tools
- GPS devices like Garmin
- Physical maps and atlases

Microsoft Streets and Trips

Pros	Cons
User friendly	Released yearly; goes out of date
Software installed and runs off of laptop	Construction developments and changes to routes may not be up to date
Does not need internet connection	Must data-enter all address info by hand

Googlemaps/Mapquest, other free online mapping sites

Pros	Cons
User friendly	Requires internet connection
Little training necessary; most field interviewers have used in past	Must data-enter all address info by hand

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GPS devices (Garmin)

Pros	Cons
Proven track record of success by current CAPI crew; recommended by other survey centers	Expensive
Does not require opening laptop if lost (compared to Microsoft Streets and Trips)	Must data-enter all address info by hand

Paper maps and atlases

Pros	Cons
Does not require internet connection	Paper maps often not detailed enough; rural routes and country roads
More user friendly (dependant on preference)	Less user friendly (dependant on preference)

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Identifying a need

- None of these tools perfect
- Not in project budget to purchase GPS units
- Common deficiency:
  - All of these tools require Interviewers to enter address data
  - Millions of keystrokes over course of 2 year field period
  - Introduces data entry error
  - Inefficient

"Pathfinder" is born

- UW Applied Population Lab
  - Department in Rural Sociology at UW Madison
  - Unite applied demography with spatial information and analysis
- Create a tool that interviewers could use to route interviews
- Cure the common deficiency
  - Pre-load all existing WLS sample address information
  - Interviewers would not have to data enter
  - All sample was traced a month and a half before

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Pathfinder: What is it?

- Mapping software that is integrated with our project management database (Access)
- "Mash up" of Googlemaps and Mapquest APIs (application programming interfaces)
  - APIs allow for other programs (like Pathfinder) to interact with that application
  - Pulls maps from Googlemaps
  - Calculates the most efficient route using Mapquest

Pathfinder: How does it work?

- Interviewer's caseload is viewable on map
  - Supervisor can view all case assignments by Interviewer
- Visual as to where cases are and which ones could be included in a route
  - Flexibility of creating and saving multiple routes to find the most efficient path
- Example use:
  - Interviewer schedules a morning interview
  - Checks Pathfinder to see which cases in the area could be scheduled for an afternoon interview
  - Attempts to schedule afternoon interview for efficient routing

Pathfinder: How does it work?

- Routes selected by shortest overall time, not distance
- Interviewers submit mapped routes with timesheets
- Team Leaders can check the routes against the Interviewer's expense reports
- Freshness of data
  - New address information found by Interviewer
  - Interviewer synchronizes with server
  - New info is updated in CASES within one hour

DEMO

Summary

- Interviewers have other mapping resources available to them, however…
  - Must turn in Pathfinder maps with their timesheets to be paid
  - Quality control for travel expenses is easy to conduct
- Pathfinder has also been extremely useful in other ways
  - Identifying ideal interviewer location for future hires
  - Monitoring Interviewer's caseload
  - Reassigning cases from one Interviewer to another

Thank You!

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