DEPARTMENT OF HEALTH

Biomonitoring Surveillance: Perspective from Minnesota

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Program background: 2007 state law

MN Statutes 144.995-144.998

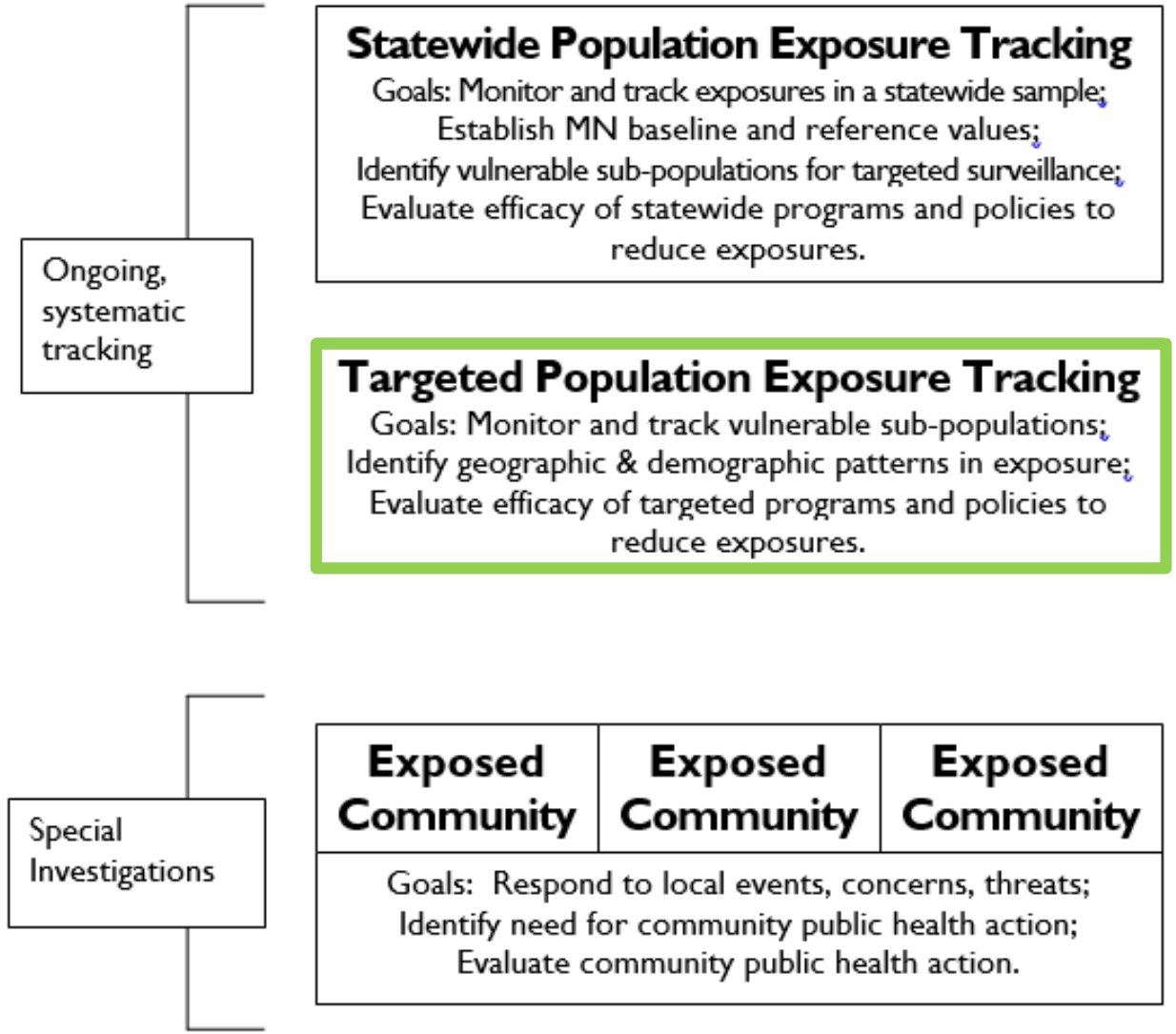
- Conduct pilot biomonitoring program of 4 projects in communities likely exposed to arsenic, mercury, PFAS, TBD
- Create Scientific Advisory Panel
- Develop recommendations for and implement an ongoing/base program
- Integrate with environmental health tracking

Strategic planning process: Phase I, vision & goals

Purposes

- Identify differences in the levels of chemicals in people among Minnesota's diverse populations, which may differ by income, ethnicity, culture, or geographic location
- Assess the need for public health policy and action
- Track changes over time to find out whether actions taken to reduce chemical exposures have been effective

Strategic planning process: Phase II, strategies



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Strategic planning process: Phase III, target populations

- Focus on people and communities most vulnerable to effects of chemicals and on those least able to modify their environment to avoid exposure
  - Children and newborns
  - Pregnant women and the developing child
  - Women of childbearing age
  - Disadvantaged communities

Post-Strategic planning

- Not able to fully implement targeted surveillance model due to budget constraints
- Projects focused on specific communities/ target populations
- Used different approaches to incorporate population-based sampling

Healthy Kids Minnesota

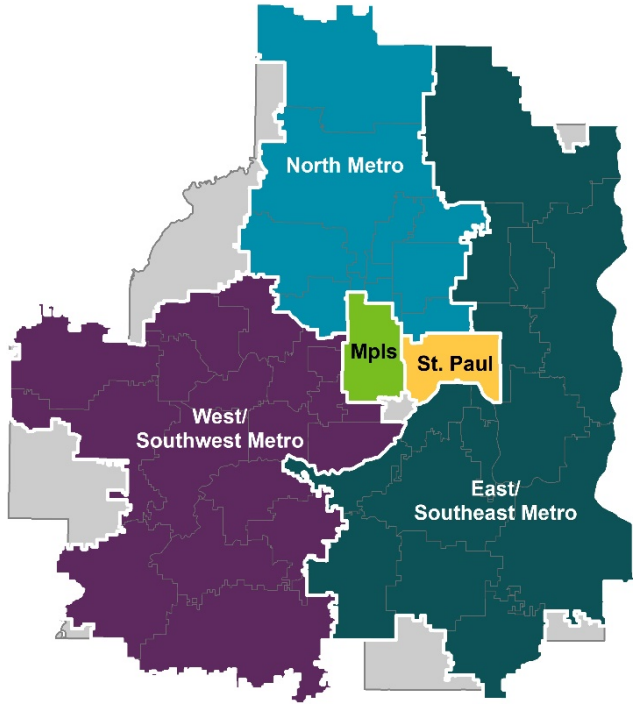
- Establish a statewide surveillance program in preschool-age children
- Divide state into 5 regions, recruit kids from 1 non-Twin Cities Metro and 1 Metro region each year (500-600 kids/yr)
- Partner with counties, school districts, Tribal nations
- Possible with funding from CDC cooperative agreement

Model: Healthy Rural and Urban Kids 2018

- Recruited 232 kids (3-6 years) from 2 communities: North-Central MN counties, N Minneapolis zip codes
- Recruitment by Early Childhood Screening (ECS) staff
- ECS a universal pre-kindergarten screening program
- At appointment, families interviewed, child gave urine
- Participation rates of 75% urban, 78% rural

Healthy Kids Minnesota regions

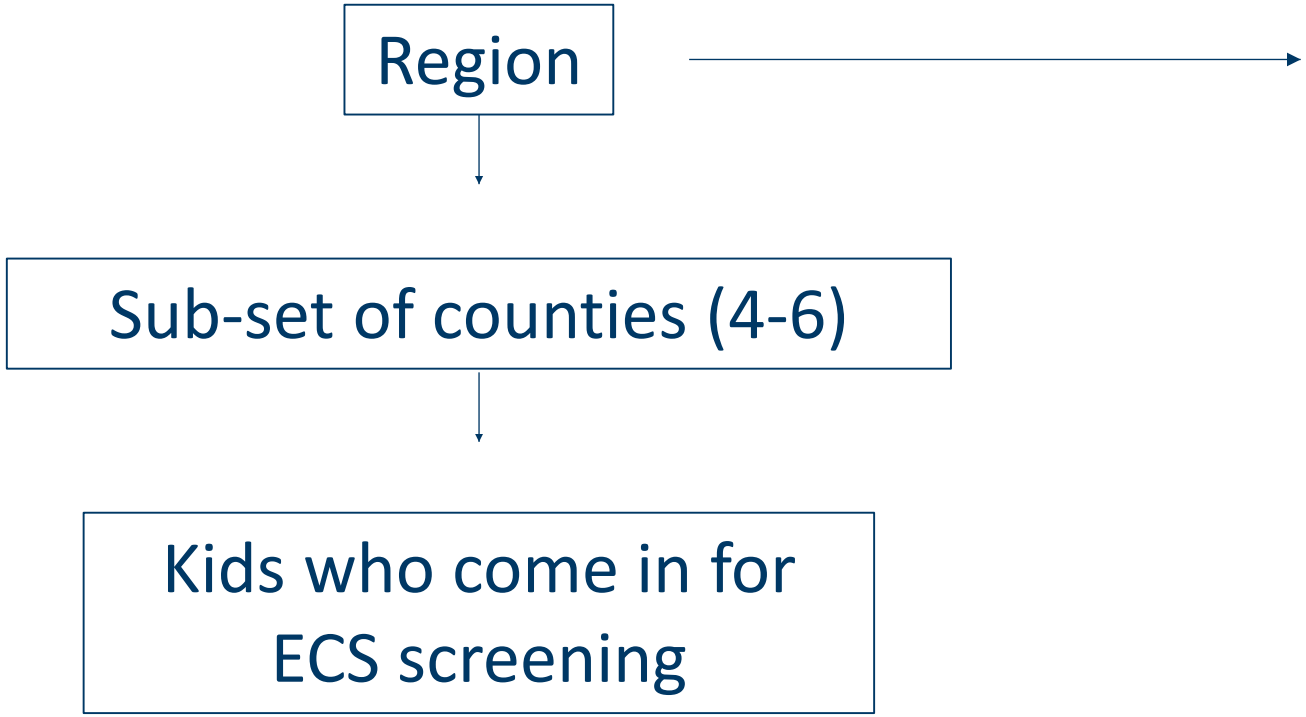
Region	Population	# counties
Central	758,017	14
Northeast	325,303	7
Northwest-West Central	399,474	21
Southeast	508,015	11
Southwest-South Central	508,842	27



Region	Population
East-Southeast Metro	793,029
Minneapolis	399,943
North Metro	762,399
St. Paul	295,043
West-Southwest Metro	679,923

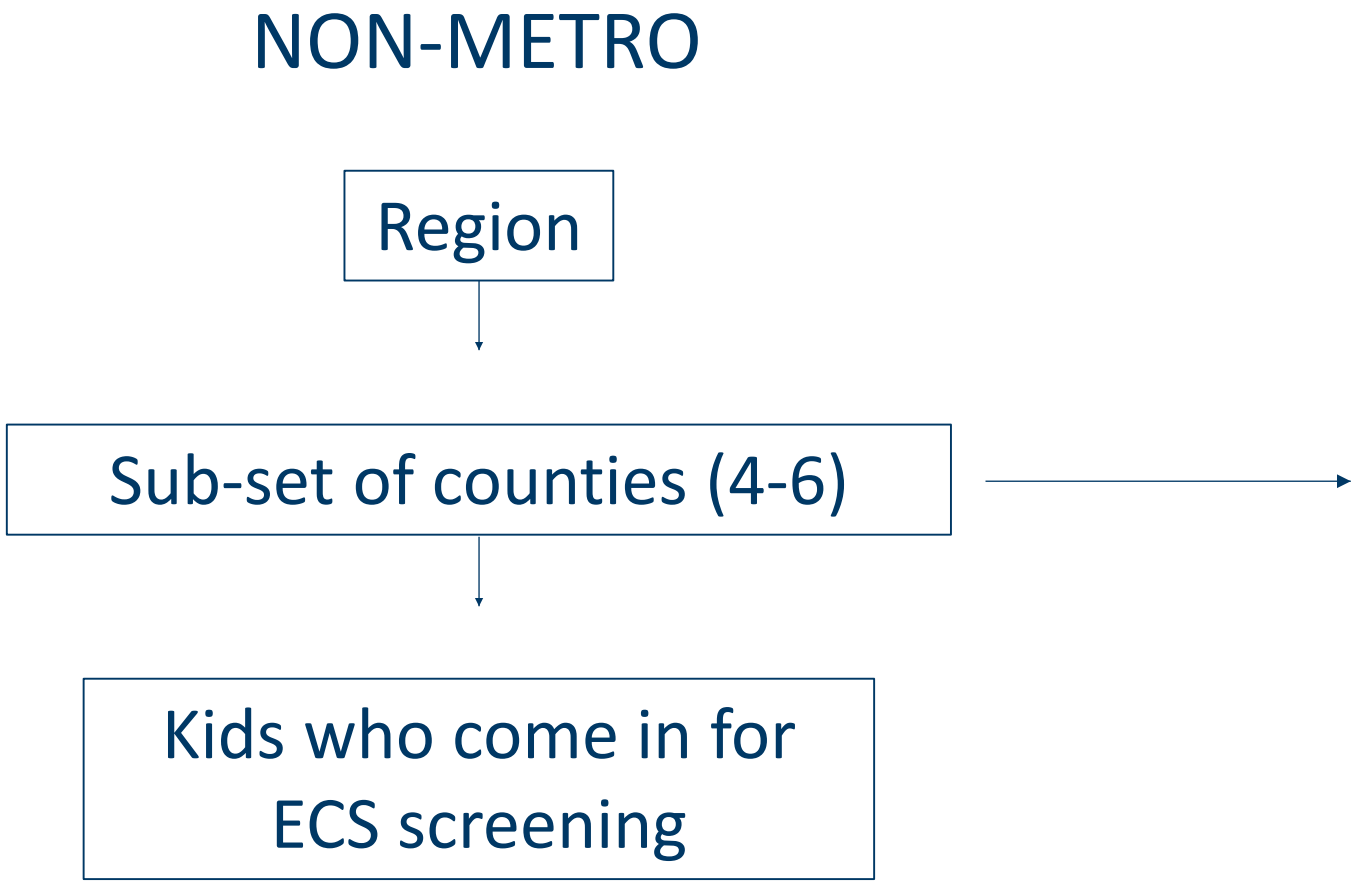
3-stage sampling plan

NON-METRO



- Primary sampling unit
- Will reach all regions over 5 years

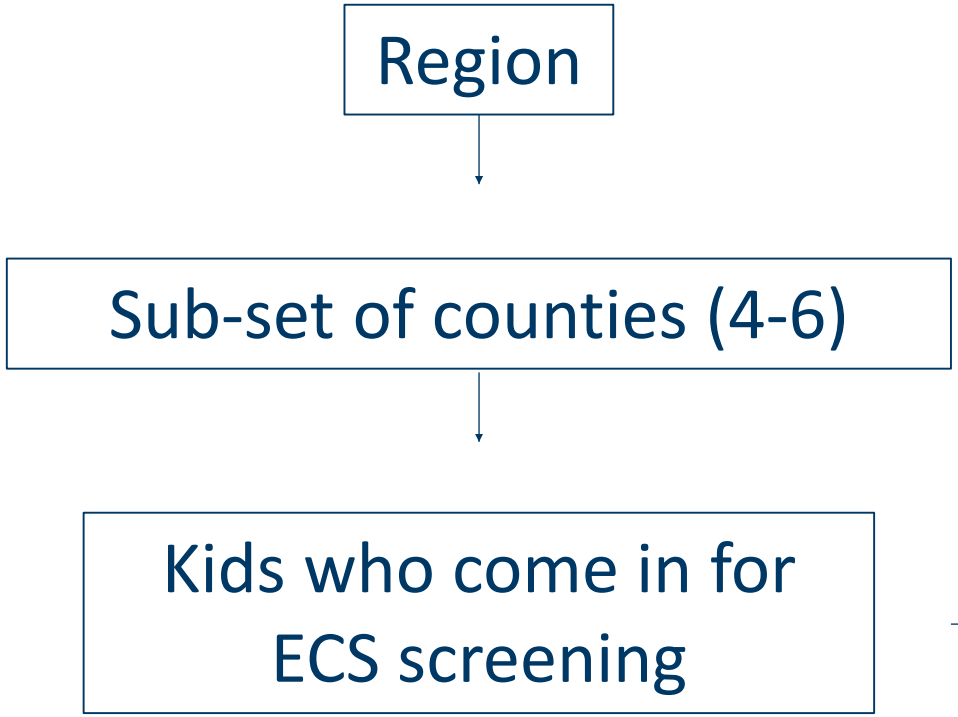
3-stage sampling



- Secondary sampling unit
- Use 3-tiered approach:
  1. Lg pop centers: with certainty
  2. Mid-size pop centers: 1-2
  3. Rural parts of counties: ~2
- Use random selection when possible, but also consider local interest, geographic coverage, demographics, health equity
- Compare demographics of sample of counties to region

3-stage sampling

NON-METRO



- Tertiary sampling unit
- Sampling depends on size of county – offer to all, or a sample
- Space recruitment over 6 months
  - Target # kids/county per month
  - Recruit first X# kids
  - Over-sampling?
- Calculate participation rates, characterize refusals
- Compare demographics of sample of kids to county/region

Trade-offs: Target population (kids) v. larger population

Pros

- Ability to focus on key group of concern
- More economically/logistically feasible, allows us to build capacity
- Can tailor outreach materials/messaging

Cons

- Not getting estimates for full state population
- May miss important exposures/disparities in other age groups
- Urine sample only, no PFAS

Trade-offs: Recruit through existing program v. new

Pros

- Economically efficient/viable
- More successful recruitment – trust in the community
- Buy-in from partners, also important audience for results and advocates for program

Cons

- Don’t have as much control
- Not perfect sampling method as local programs vary

Trade-offs: Regional v. statewide approach

Pros

- Regional results important to local partners
- Better ability to engage in community outreach
- Can more feasibly pair with broader EH outreach

Cons

- Longer time window for statewide estimate
- Time trends more challenging to interpret

Take-aways for biomonitoring surveillance

- Possible to do population-based recruitment with targeted approach and incorporate into studies/projects at all levels
- Trade-off between true statewide and targeted approach only thing feasible for our program
- Recruiting through existing infrastructure much more effective and efficient for us
- Budget funding cycles make planning for true surveillance challenging

Acknowledgements

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Thank you.

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