



# Michigan Chemical Exposure Monitoring (MiChEM)

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BIOMONITORING CALIFORNIA SCIENTIFIC GUIDANCE PANEL  
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Rachel Long, MSPH

# Overview

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## Objective

- Establish reference exposure levels for chemicals of concern based on a state-wide, representative sample of non-institutionalized adult Michigan residents

## Target population

- Adult, non-institutionalized Michigan residents
- Low-income adult, non-institutionalized Michigan residents

# Analytes

39 per- and  
polyfluoroalkyl  
substances (PFAS)

100 polychlorinated  
biphenyls (PCBs)

18 organochlorine  
pesticides (OCPs)

Heavy metals (As,  
Al, Mn, Cr, Se, Tl,  
Pb, Cd, Hg, and As  
and Hg species)

10 polybrominated  
diphenyl ethers  
(PBDEs)

2,2',4,4',5,5'-  
hexachlorobiphenyl  
(PBB-153)

# Estimated Sample Size

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Participants will be recruited from **54\*** Census tracts 2021 – 2023

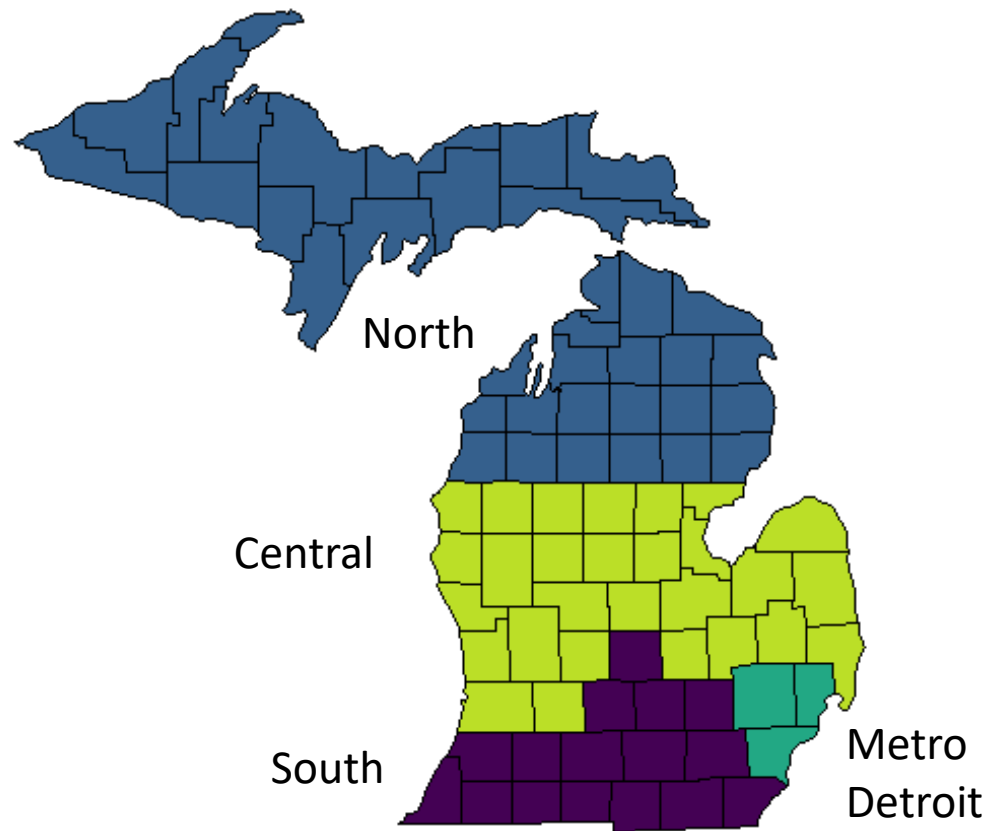
- **18\*** Census tracts each calendar year

N per Census tract: **20\***

Total N: **1,080\*** over three years

\*Subject to change

# Sampling



## First stage:

- Unequal probability sampling of Census tracts within strata

## Second stage:

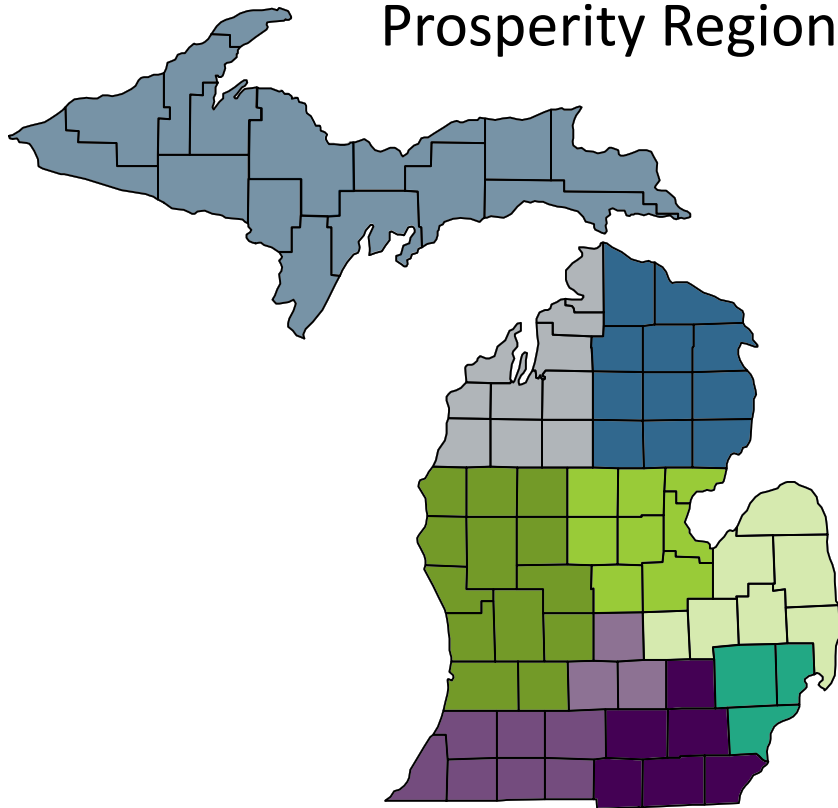
- Simple random sampling of households within a selected Census tract

## Third stage:

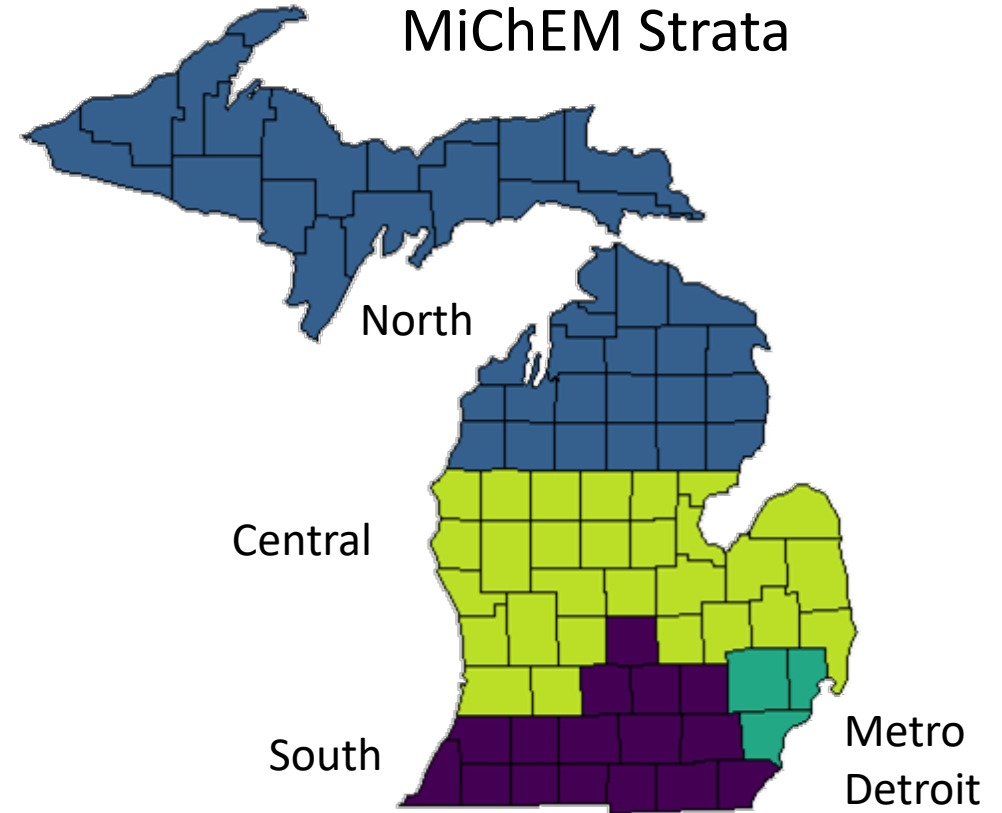
- Simple random sampling of one adult per selected household

# Geographic Strata

Prosperity Regions

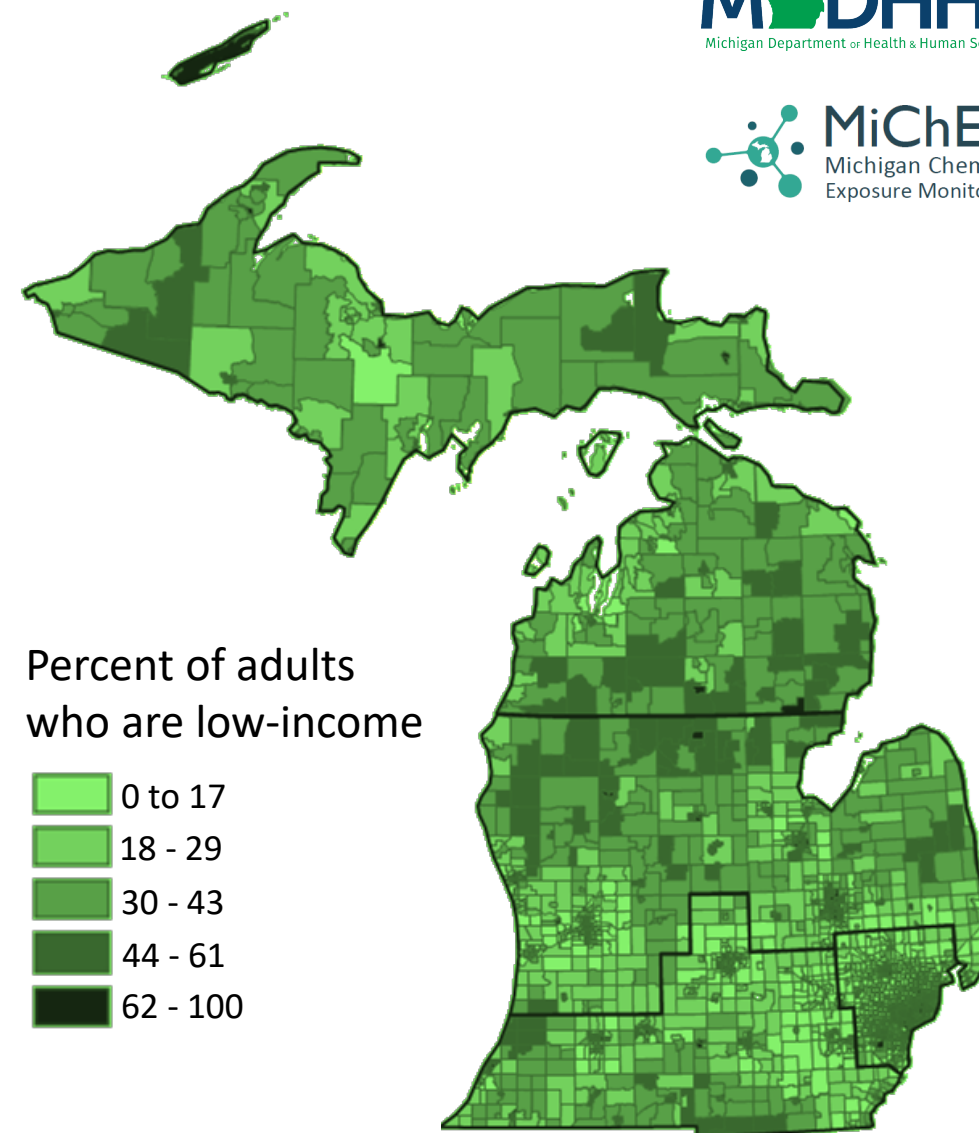
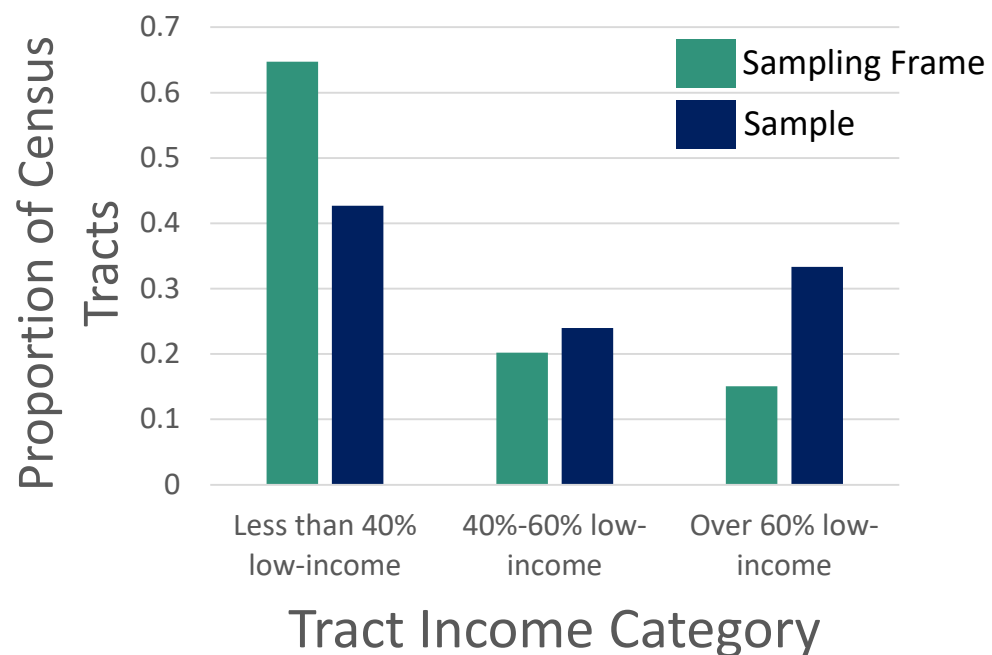


MiChEM Strata



# Sampling: First Stage

Geographic stratification with sampling proportional to percent of adults who are low-income



# Second and Third Stage Sampling and Recruitment: Overview



- Community outreach will be conducted in selected tracts
- Project invitations will be sent to selected households
  - Potential participants will provide census of interested adults in the household (online or by phone)
  - One adult per household will be selected to proceed to the exposure survey and appointment at the mobile clinic
- Participants will receive a gift card worth up to \$65



# Second and Third Stage Sampling and Recruitment: Phased Approach

Target sample size per tract: 20 adults

**Phase 1:** Assuming  
10% response rate

Household  
Selection  
(200  
households)

Project  
Invitation  
(200  
households)

Participant  
Selection  
(20 adults)

Survey and  
Clinic  
Reminders  
(20 adults)

Survey Data  
and Specimen  
Collection  
(1 adult)

**Phase 2:** Assuming  
0.5% response rate

Household  
Selection  
(3,800  
households)

Project  
Invitation  
(3,800  
households)

Participant  
Selection  
(380 adults)

Survey and  
Clinic  
Reminders  
(380 adults)

Survey Data  
and Specimen  
Collection  
(19 adults)

# Project Invitation



**Delivery method:** Mail

## Contents:

- Notification that the household has been selected
- Instructions on how to complete census and exposure survey (online or by phone)
- Instructions for clinic appointment
- Instructions for informed consent and healthcare provider authorization

# Survey and Clinic Reminders

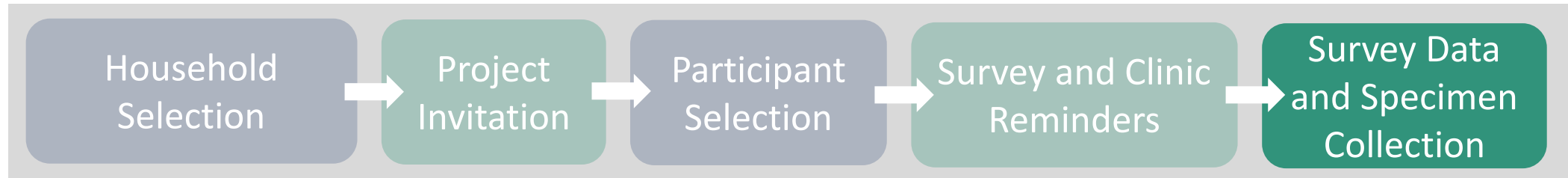


**Delivery method:** Mail (survey reminder); text, email, or phone (clinic reminder)

## Contents:

- Instructions on how to complete census and exposure survey and make clinic appointment
- Whom to contact for assistance

# Data Collection: Exposure Survey



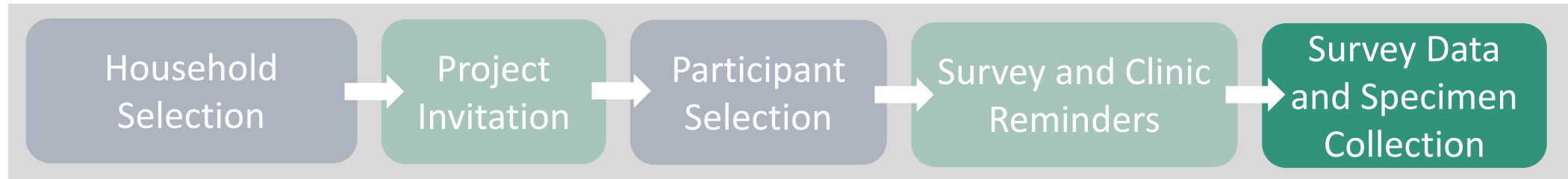
## Includes questions on:

- Water source
- Diet
- Occupation and hobbies
- Smoking
- Pregnancy and childbirth
- Demographics

## Participants choose modality:

- Online (default)
- Phone

# Data Collection: Mobile Clinic

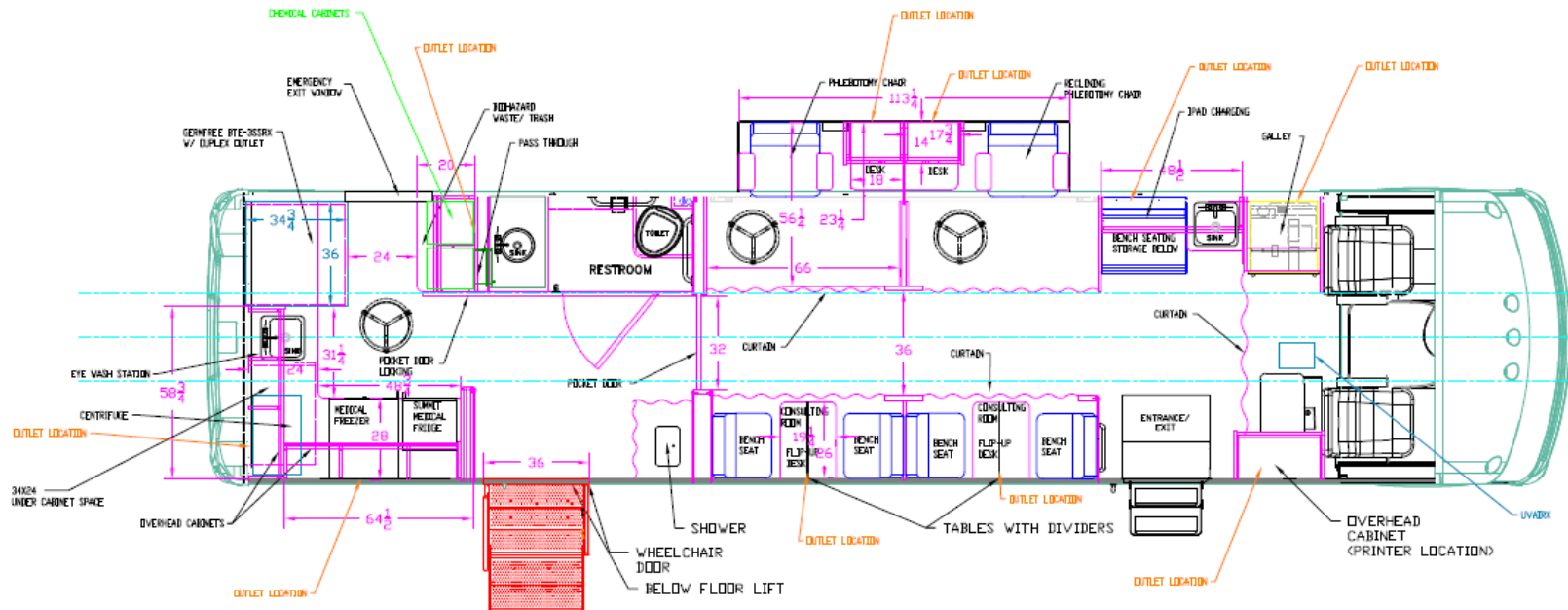


## Clinic Survey

- Addresses safety and factors that affect exposure short-term (e.g. fish consumption)

## Specimen Collection

- Blood and urine collected and processed in mobile clinic



# Fielding Periods Each Year

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- Slow rollout of Phase 1 and 2 recruitment in one tract starting May-June\* 2021
- Phase 1 and 2 recruitment in remaining 17 tracts will be staggered over the year

\*Subject to change

# Results

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- Participants will receive packet of complete results unless they opt out
  - Will also receive notification of results above clinically-relevant thresholds (phone call and letter)

# THANK YOU

RACHEL LONG

LONGR5@MICHIGAN.GOV

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