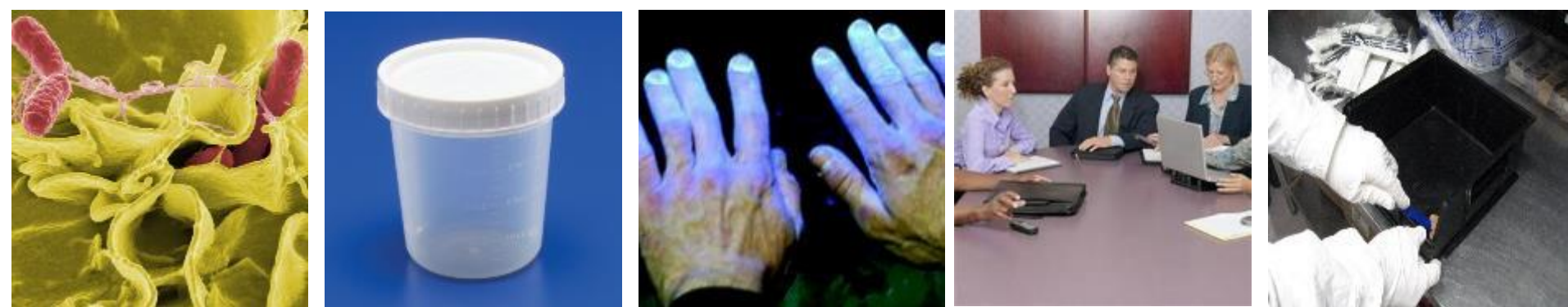


# Persistent *Salmonella* mbandaka in Michigan

## A Case Study in Outbreak Investigation

A Case Study in Outbreak Investigation Methods



LISA HAINSTOCK, R.S.

Michigan Department of Agriculture & Rural Development

Association of Food and Drug Officials Conference

Louisville, KY

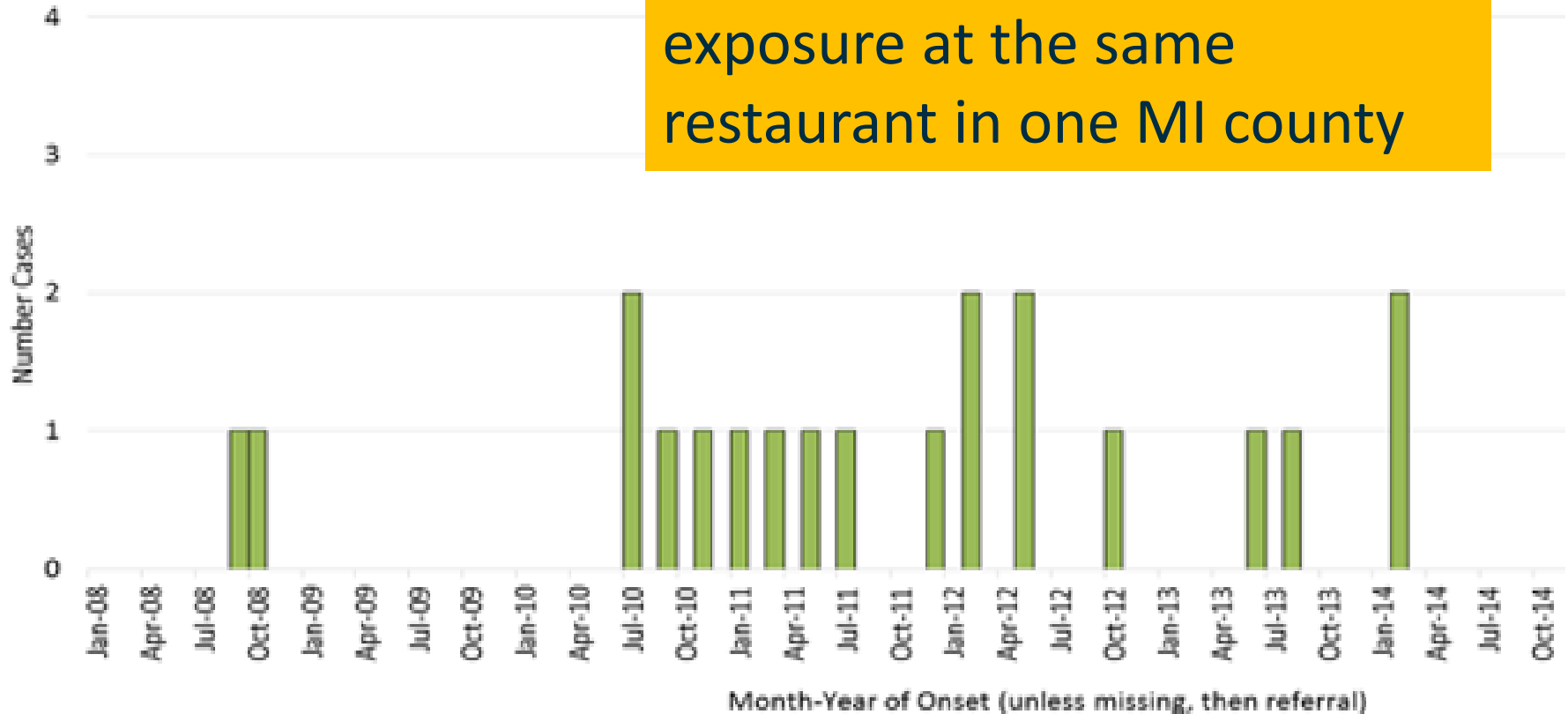
June 26, 2019

# Salmonella

- When stressed, *Salmonella* can develop resistance to harsh conditions, ie low  $A_w$ , temperature, pH, etc.
- Can survive in environmental niches for long periods of time
- Persistence in humans – often asymptomatic
  - “Typhoid” Mary Mallon-47 illnesses and 3 deaths
  - 2018 study showed range 30 days to 8.3 years  
<https://doi.org/10.1093/cid/civ1221>

# Salmonella mbandaka

26% of the cases report exposure at the same restaurant in one MI county



2008

2014

# Aug 2017

- 4 more cases in surrounding counties
- Whole genome sequence results showed that all four cases in the most recent cluster were considered to be within 0-6 SNPS, closely related.
- Specialized questionnaire used with newer cases
- 11 out of 29 reported eating at the implicated restaurant

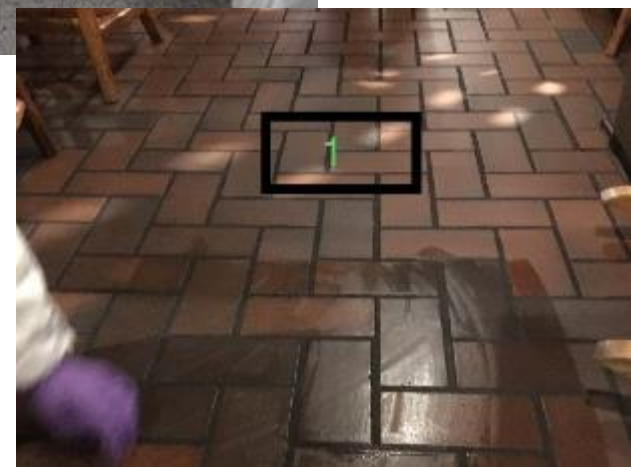
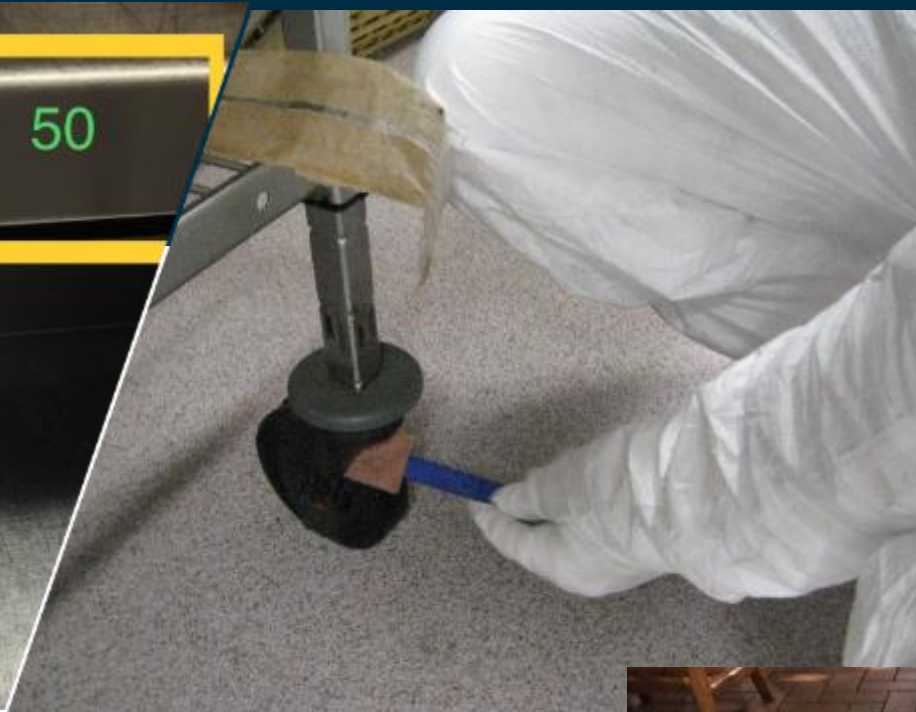
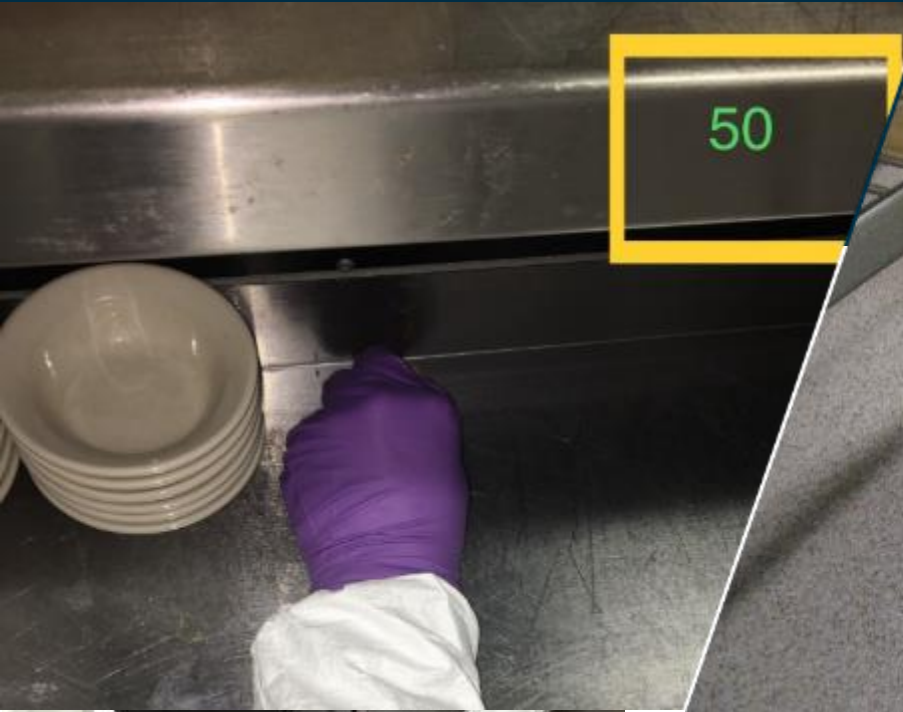
# Environmental Assessment

10/31-MDARD and LHD – look for possible salmonella harborage locations and potential sites for future env. sampling

- Power washing
- Wheeled carts
- Cleaning/sanitization
- Cleaning equipment storage
- Poor food handling/storage practice
- Multiple other potential contributing factors







# Employee Testing

- The Restaurant reserved a room at a local hotel to house LHD and Facility staff to dispense stool collection materials and collect stool
- 101 employees tested between 6/7-10
- Firm continued paying workers while clinical testing proceeded







# The End of the Story

- 11/29 – Restaurant voluntarily closes permanently



# Outbreak Summary

- 35 lab confirmed cases *S mbandaka*
- Onset range: Sept 2008-Sept 2018
- All cases were matched via PFGE and WGS
- 16 reported eating at the restaurant (47%)
  
- Official Contributing factors included:
  - Infectious workers
  - Food prep practices supporting proliferation
  - Other promotion/allowance of microbial growth
  - Other process failures

# Lessons Learned by This investigation

- Consider environmental sampling and employee testing sooner rather than later – legal authority??
- Get corporate officials involved earlier
- Be willing to challenge internal policy and positions - what's in the best interest of public health?
- Don't give up-there is a reason why illness keeps occurring