

The City of Milwaukee Public Health Laboratory Public Safety Presentation



Think Health 
Act Now!
CITY OF
MILWAUKEE
HEALTH DEPARTMENT

Steve Gradus, MT(ASCP), Ph.D., D(ABMM)
Laboratory Director

May 22, 2014

www.milwaukee.gov/healthlab

City of Milwaukee Public Health Laboratory *EST. 1872*

The early years:



~1910



Dr. Henry J. Wisniewski
Chief Virologist and
Laboratory Director
1952 - 1988



Laboratory Supports MHD Programs

Sexually Transmitted Disease

- Resistance surveillance: CDC

Foodborne Disease

Emergency Preparedness

Molecular diagnostics

- Real-time PCR (Bacterial and viral pathogens)
- Luminex (Respiratory virus surveillance; enteric pathogens)
- Molecular sequencing (ref. bacteria and fungus ID, TB, anti-viral resistance)

Communicable Disease

- Microbiology: includes TB
- Virology: culture & serology
- Surveillance programs: CDC, Wisc., W.H.O.

Waterborne Pathogens

- Cryptosporidium/Giardia/ Culturable Viruses

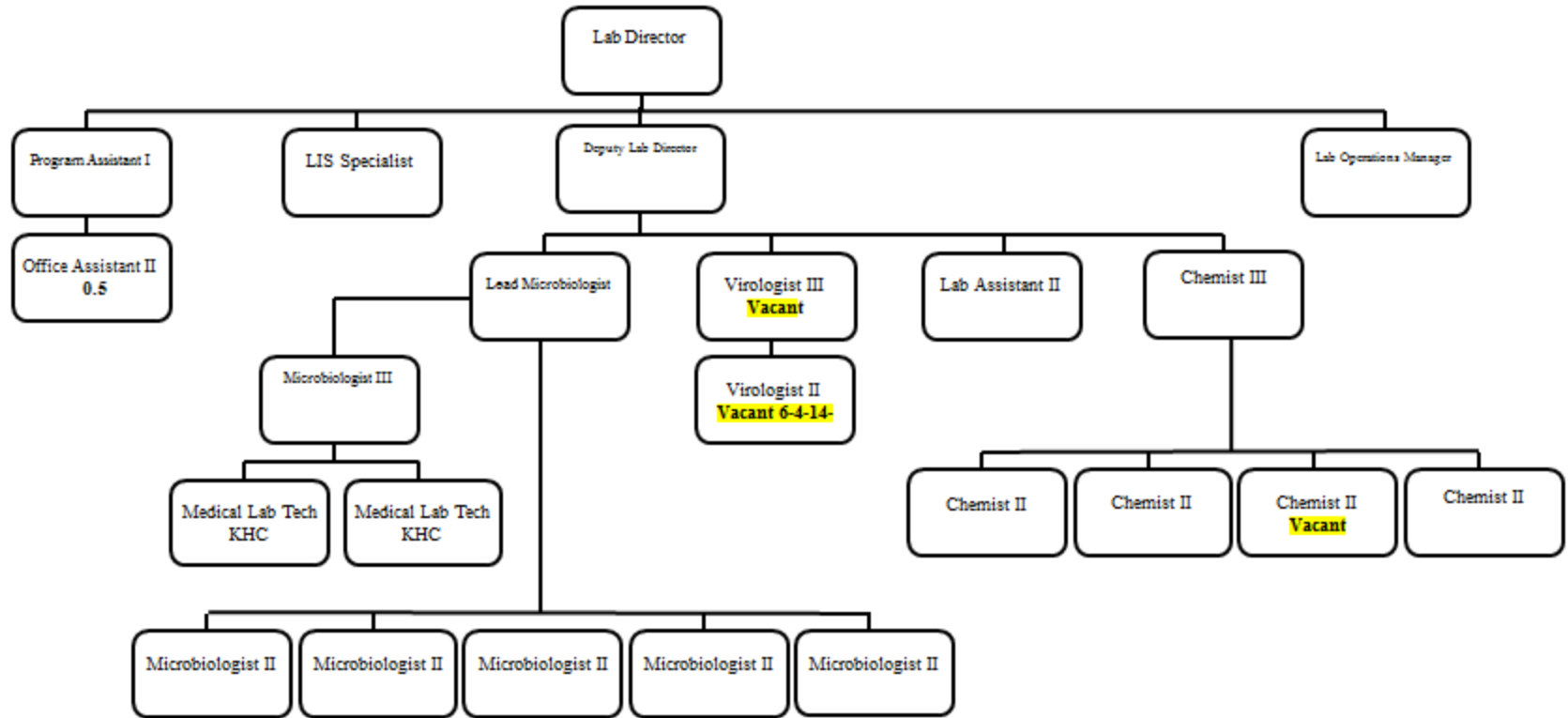
Water Quality – recreational/potable

Chemistry

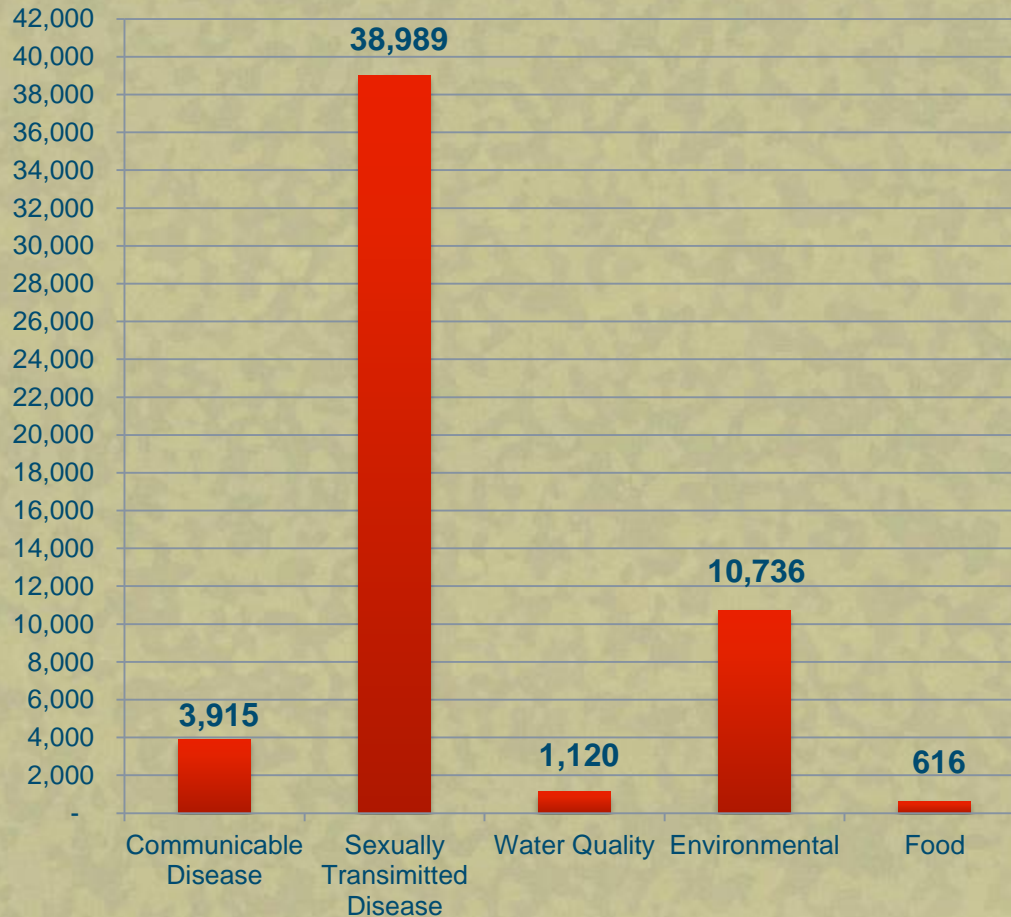
- Lead, Asbestos, Allergens, Env.
- AA's, GC/LC-MS

23 Staff 3 vacancies

**MHD Laboratory
Organizational Chart**

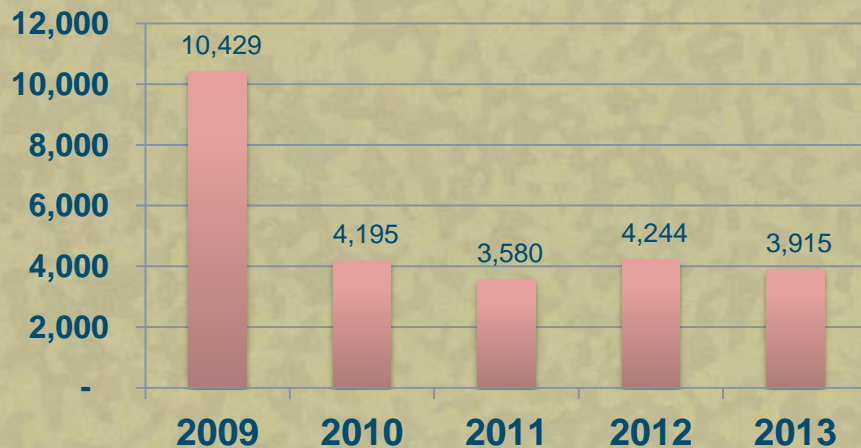


Samples Analyzed in 2013 (by category) (>55,000)

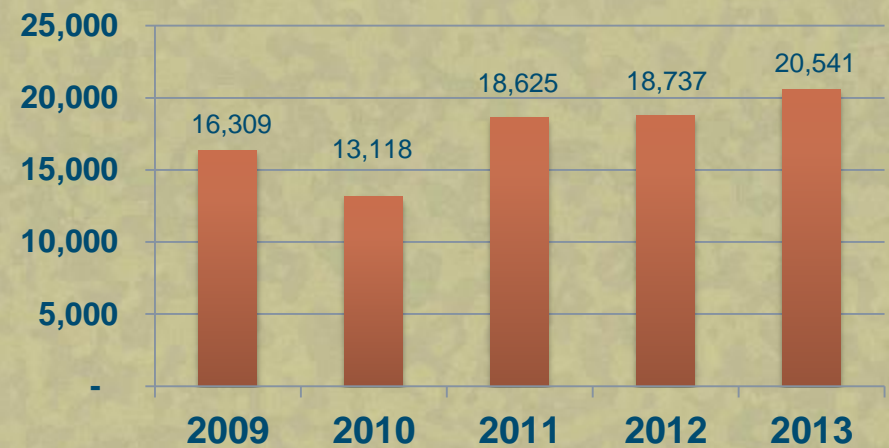


Communicable Disease & STD testing (2009-2013)

Communicable Disease

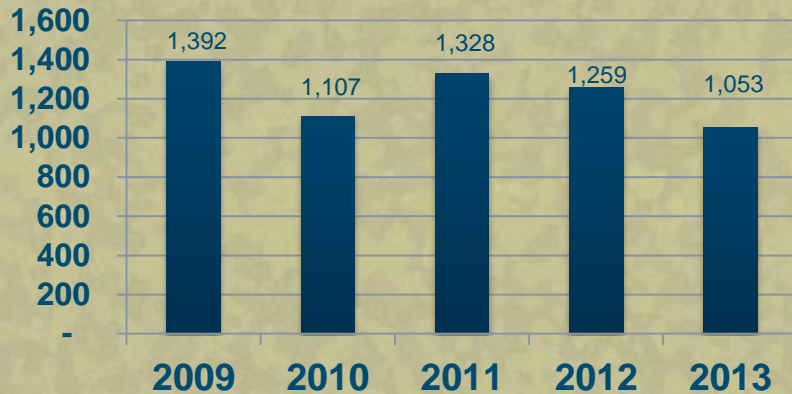


Chlamydia/Gonorrhea

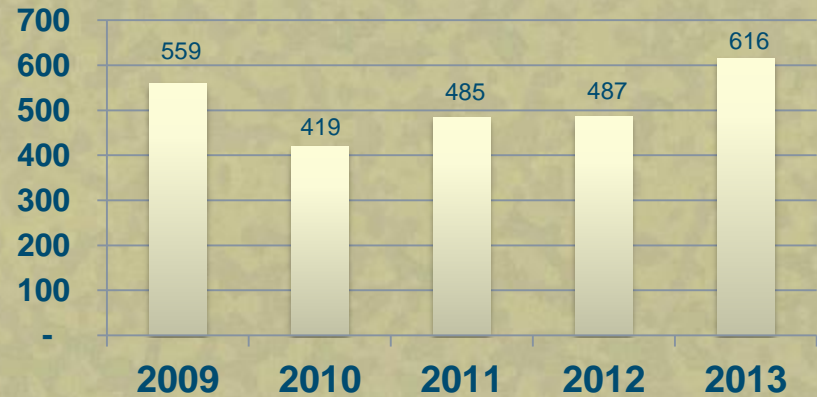


Water Quality, Food & Environmental Lead testing (2009-2013)

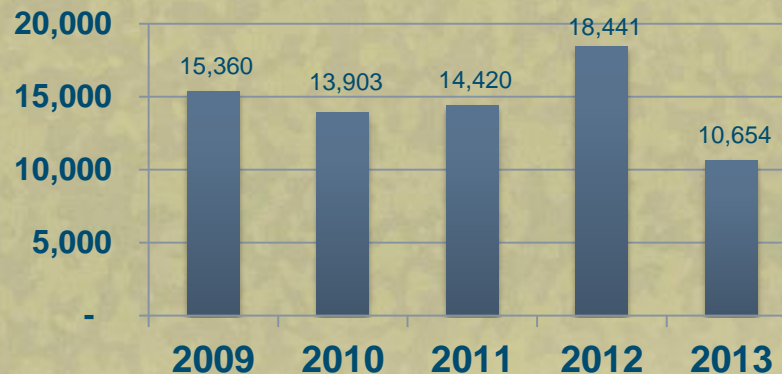
Water Quality



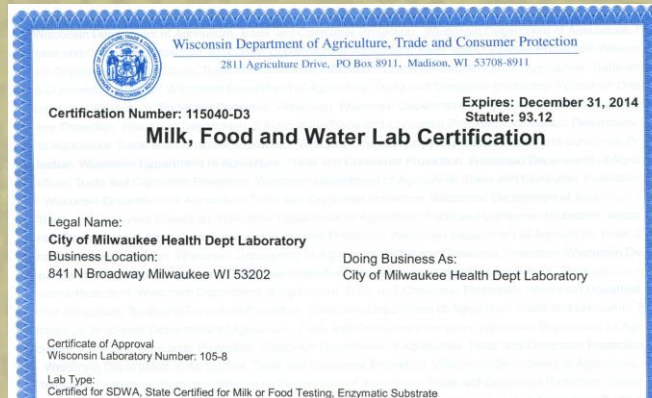
Food



Environmental Lead



Inspected & Regulated



City of Milwaukee Public Health Laboratory



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MHD Public Health Lab

Outbreak Investigations

2013/2014 Examples

Lab Investigations/Outbreaks 2013-2014 *(examples)*

MILWAUKEE · WISCONSIN
JOURNAL SENTINEL

Whooping cough on the rise, but majority of adults don't know their vaccine status

By Mark Johnson of the Journal Sentinel

June 18, 2013

After **beach water** warnings, inner harbor passes triathlon quality tests

By Stephanie K. Baer of the Journal Sentinel

July 21, 2013

20 cases of **Legionnaire's disease** investigated in Milwaukee County

By Karen Herzog of the Journal Sentinel

July 17, 2013

City reports eighth confirmed case of **mumps**

By Jesse Garza of the Journal Sentinel

May 12, 2014

19 cases of **Cyclospora illnesses** investigated in Wisconsin
Food-borne sickness linked to salad mix in other states

By Karen Herzog of the Journal Sentinel

Aug. 13, 2013

Environmental Sources of *Legionella*

20 cases of Legionnaire's disease investigated in Milwaukee County

By Karen Herzog of the Journal Sentinel

July 17, 2013



Biofilm



Legionella growth on BCYE media



Environmental Sampling



Amoeba amplifying Legionella

Notes from the Field: Increase in Reported Legionellosis — Milwaukee, Wisconsin, June–September 2013
MMWR- Weekly- January 24, 2014 / 63(03);63-63

Cyclospora Outbreak 2013

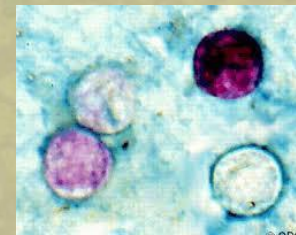
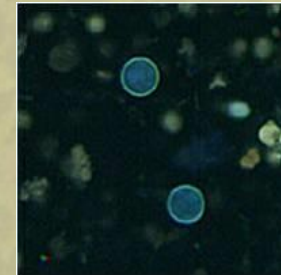
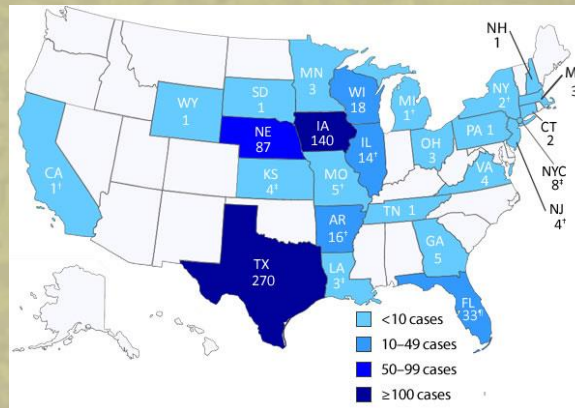
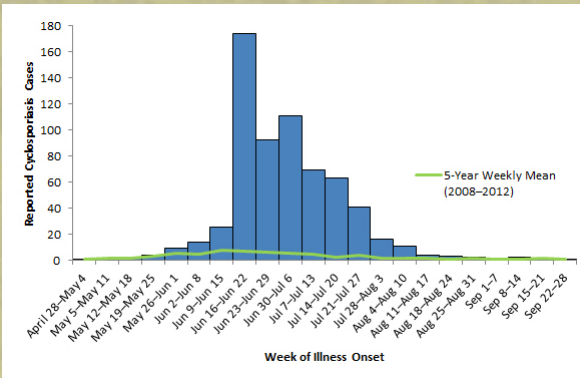
MILWAUKEE · WISCONSIN
JOURNAL SENTINEL



19 cases of Cyclospora illnesses investigated in Wisconsin Food-borne sickness linked to salad mix in other states

By Karen Herzog of the Journal Sentinel

Aug. 13, 2013

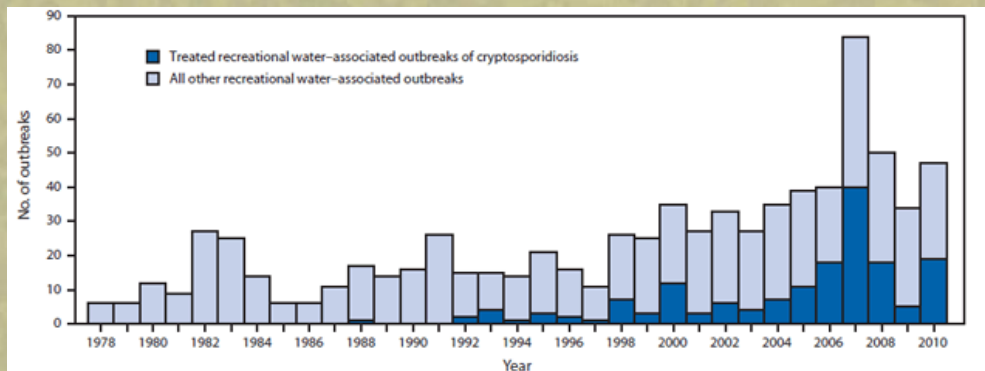


MHDL: Jul.–Sept., 132 specimens, S.E. Wisc., 4 pos.

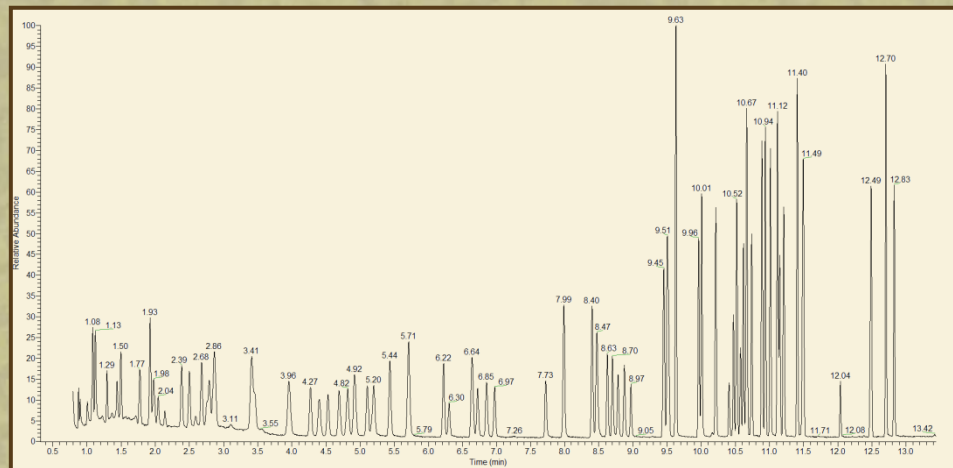
Pool water suspected in North Shore Cryptosporidium cases

By Karen Herzog of the Journal Sentinel

Sept. 27, 2013



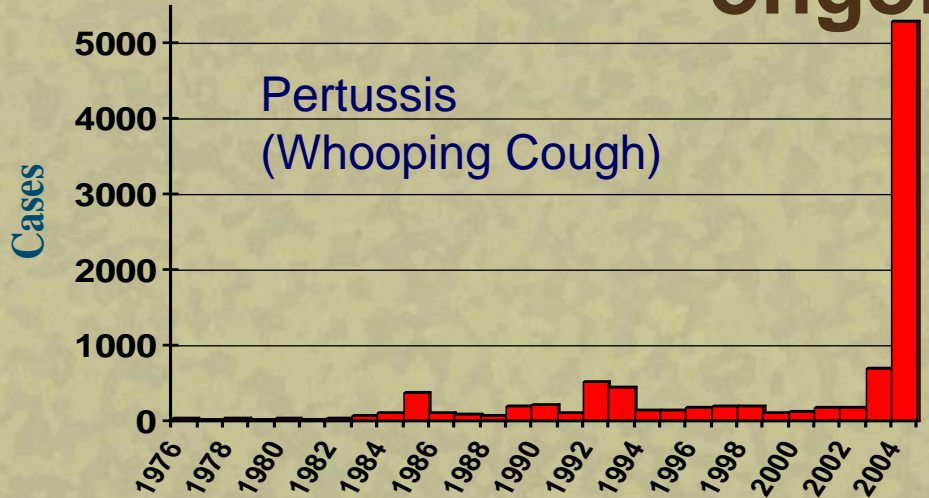
Volatile Organic Compound Investigations Drinking Water 2013:



- **Drinking Water Odor complaints:**
 - **Local School**
 - **Residential**
- **Investigations: Multiple departments**
 - **Water Works**
 - **Plumbing inspectors**
 - **MHD env. scientists/inspectors**
 - **Dept. Neighborhood Services**
 - **MHD laboratory**
- **Temporary issue resolved**

- **GC-MS Chromatogram
of 10 PPB Standard**
- **Capability**
- **82 VOCs examined**

Pertussis Mumps Measles Outbreaks – Milwaukee & Wisconsin ongoing cases



MILWAUKEE · WISCONSIN
JOURNAL SENTINEL

City reports eighth confirmed case of mumps

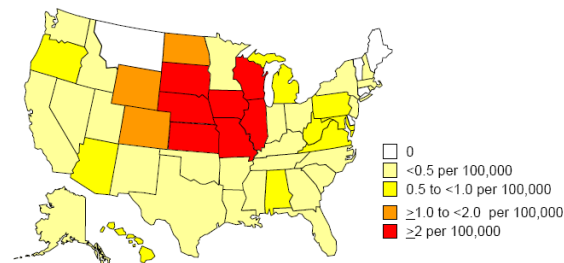
By Jesse Garza of the Journal Sentinel

May 12, 2014

ISSUES:

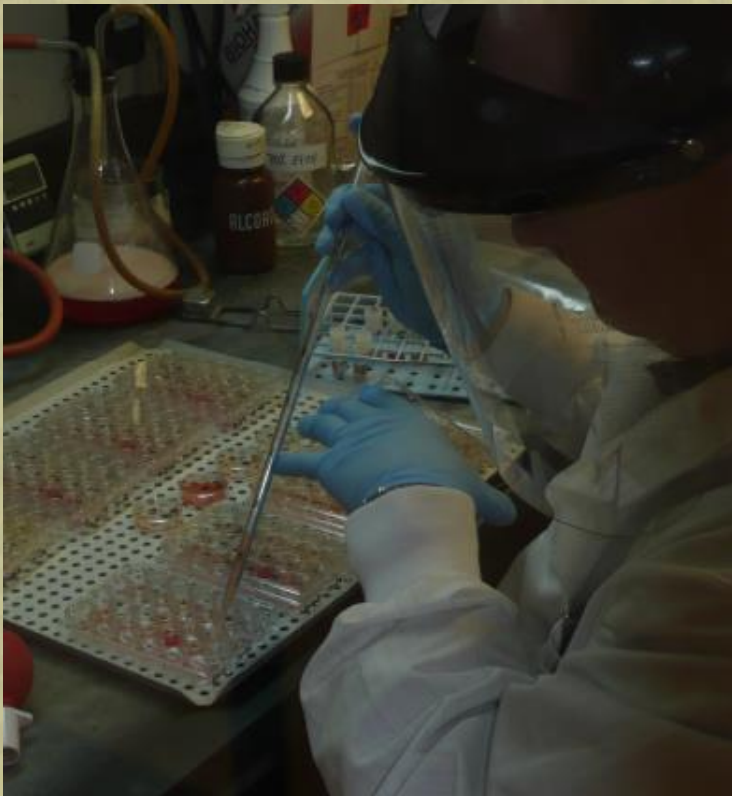
- Immune response
- Highly tested and vaccinated populations
- Changing clinical picture
- Diagnostic tools

Incidence of Mumps by State, United States, January 1 – October 14, 2006 (n=5824)



Milwaukee County Medical Examiner

Virus-related Infant Deaths



MSNBC News

Print | Email | Alerts

HEALTH

Children's Health

New virus suspected in two SIDS cases

Deaths of Wisconsin babies linked to new germ

The Associated Press
Updated: 5:37 p.m. ET Sept. 1, 2004

MILWAUKEE - A virus recently discovered in Japan is suspected in two "crib deaths" in Wisconsin, raising new questions about how many of these mysterious tragedies might be caused by germs.

The cases mark the first time the virus has been identified in the United States. Whether it killed the babies is not clear, but both were sick before they died and had signs of disease in their lungs.

Sudden infant death syndrome — also called "crib death" for the devastating way it is usually discovered — is a catch-all term for unexplained deaths in children less than a year old. About 2,200 occur each year in the United States, mostly involving babies between 2 and 4 months old.

Brain or breathing abnormalities, genetic mutations and birth defects are possible causes. The risk rises if babies live with smokers, are put to sleep on their stomachs, or are bundled in too

advertisement

Confused About Statin Medications?
CHECK OUT Dr Benjamin Ansell's Discussion:

presented by AstraZeneca

GET THE LATEST HEALTH NEWS ON NBC NEWS

9/1/2004

http://www.msnbc.msn.com/id/5888987/

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"The findings and conclusions in this report are those of the author(s) and do not necessarily represent the views of CDC and other contributing agencies."

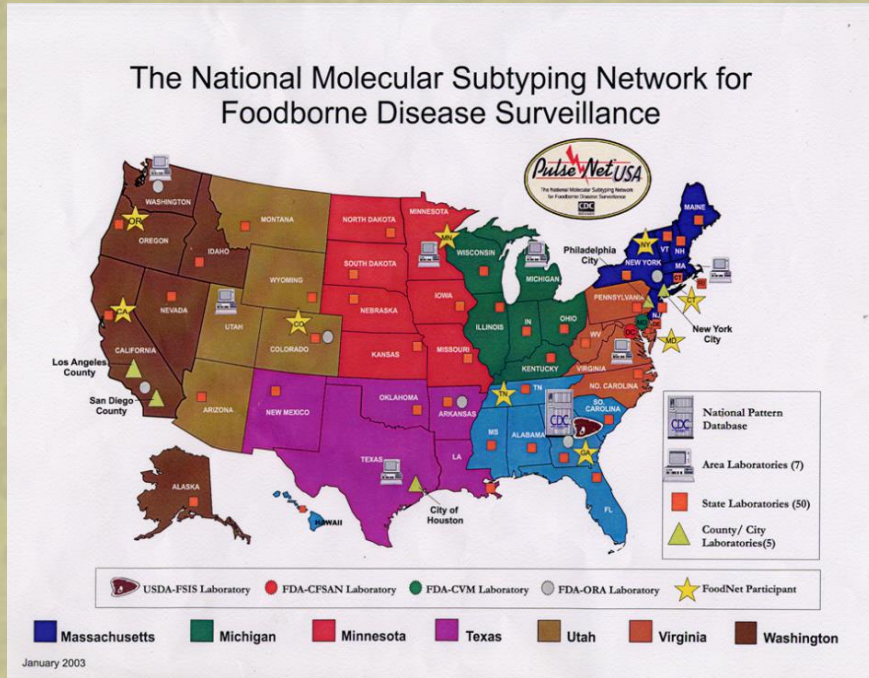


Lead Safe Housing Units

- As of June 30, 2013, a total of 16,482 housing units in the City of Milwaukee have been made Lead Safe through the efforts of our program.



Microbial “Fingerprinting” National Databases *Tracking Outbreaks*



Enteric Bacterial Surveillance

- Real-time data exchange
- Rapid genotyping
- Geographically clusters (food) source
- Identification of emerging strains

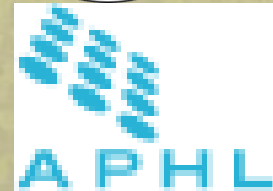
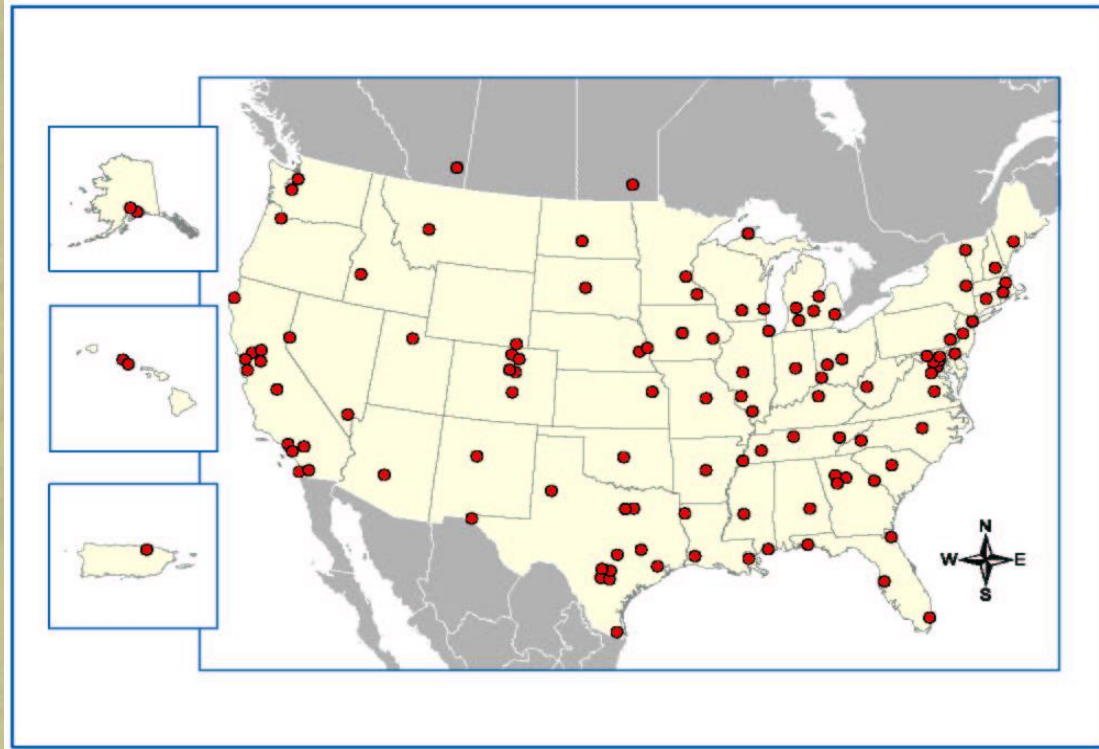
CaliciNet

National Norovirus Outbreak Network

- Launched in March 2009
- Improve laboratory surveillance of norovirus detection and typing
- Real-time data exchange at the state and national level
- Standardization and quality control (certification, annual proficiency)
- Link geographically different clusters of illness to a common (food or water) source
- Identify new emerging norovirus strains

Vega et al., 2011

The Laboratory Response Network



- 140 federal, state and local labs in 50 states and abroad
- National labs – CDC, military – perform definitive testing.
- Reference labs – BSL-3 labs capable of confirmatory testing for agents

Zilber School of Public Health & becoming an Academic H.D.

JOSEPH J. ZILBER SCHOOL of
PUBLIC HEALTH

UNIVERSITY of WISCONSIN
UWMILWAUKEE



Nwamaka Igbokwe, Ph.D. Student (UWM & Lagos, Nigeria)

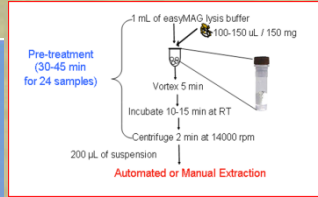


- **Characterization, Antimicrobial Resistance and Molecular Profiling of Clinical and Environmental *Escherichia coli* Isolated from Lagos, Nigeria & Milwaukee WI**
- **Multiplex detection of gastrointestinal pathogens from Lagos, Nigeria (validation and use of of Luminex GI Pathogen Panel)**
- **Characterization of pathogenic *E. coli* Lagos, Nigeria**

Innovative–Developmental Public Health Tools: 1st PH Lab in the Nation: 1 Test = 19Targets Corporate Interests = Enhanced Revenue



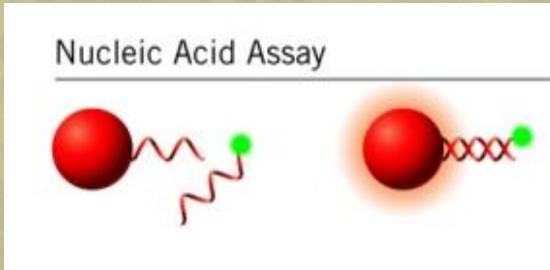
Stool specimen



Nucleic Acid Extraction



Target amplification



Target hybridization



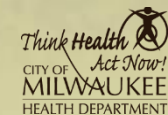
Target detection

Data Analysis and Report

Total Assay Time: ~5 hours

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Dr. Sanjib Bhattacharyya

Association of Public Health Laboratories 2013 National Emerging Leader Award



Community Engagement System Assessment: 2010 – 2014

73 Stakeholders, >40 Agencies

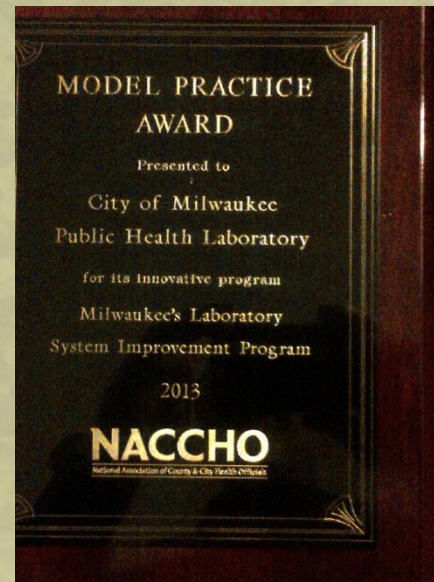


Strategic Direction & grant support
2011-2012-2013:

- Workforce Development
- Research
- <http://city.milwaukee.gov/LSIP>

Advisory Committee (14):

June –August – September - December





Growing Healthy Soil for Healthy Communities

Children's Environmental Health Sciences Core
Center

Translational Research Committee

July 30, 2013

MHDL presents: **Student Career Forum: 4/25/13**

UWM-Zilber School of Public Health

Milwaukee Laboratory System Improvement Program
(APHL/CDC Grant funded)

Do you enjoy science?



Do you like helping people?



Learn more about careers in

Laboratory Science

What: Laboratory Science Career Forum

When: Thursday, April 25, 2013
8:30 am – 1:30 pm

Where: UWM Zilber School of Public Health
1240 N. 10th Street

How: Contact the City of Milwaukee
Health Department Laboratory at **414-286-3526**
or **mhdlab@milwaukee.gov**

Space is limited.
Don't miss this unique opportunity
to learn from local experts!



50 Undergraduate students

12 Laboratory Professionals
Speaking, including:

- Crime Lab
- Clinical microbiologist
- Medical Examiner
- Agriculture lab
- Sewage treatment lab
- Water research lab
- Public health lab
- BioTech industry lab
- Academic lab
- BioMolecular lab

Workforce Development MHDL Internships with Academic Partners

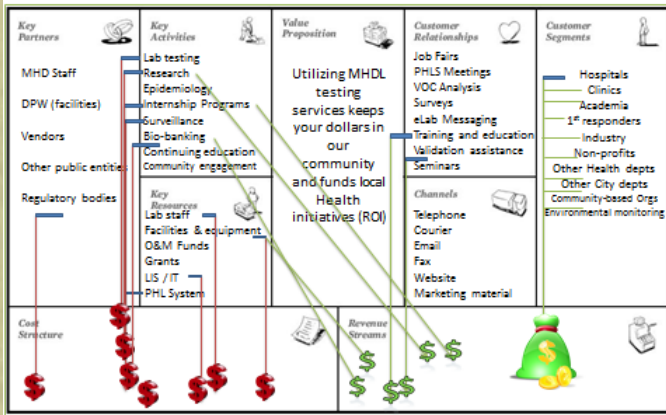
Recent Interns @ MHDL

Alverno, UWM, MATC,
Cardinal Stritch

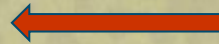


The Future

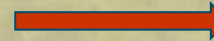
Public Health Laboratory Business Model Strategic Map



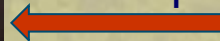
Voice of the Customer



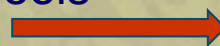
ASQ – LEAN Tools



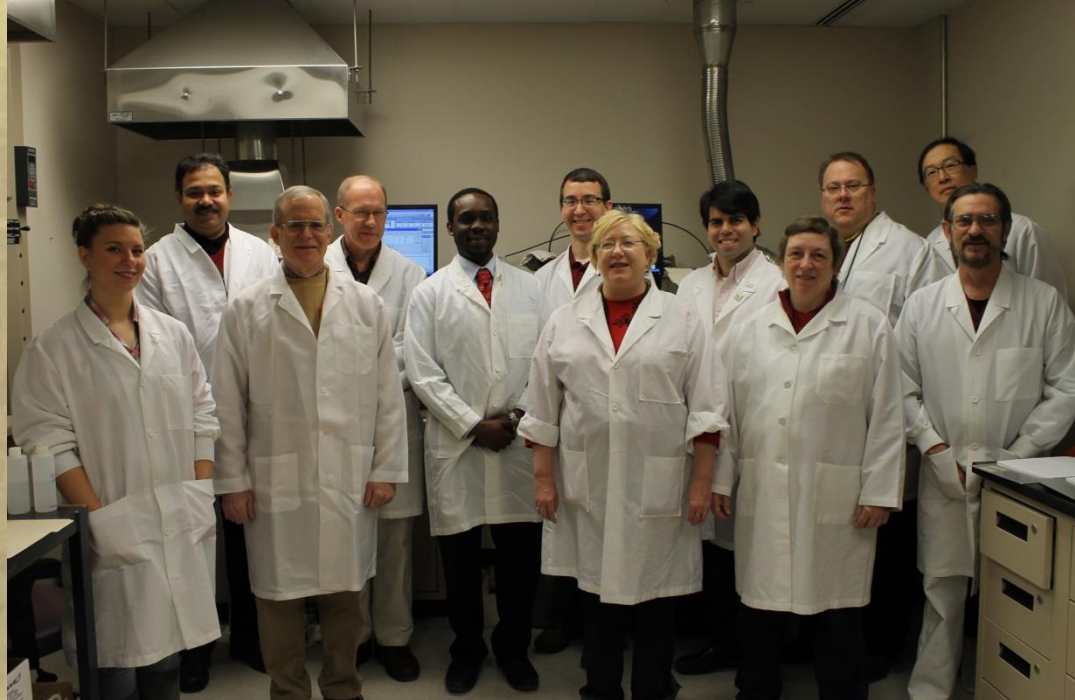
Students & Workforce Development



Collaborations for Applied Research:
Developing Public Health Tools



Thank you !
www.milwaukee.gov/healthlab



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MILWAUKEE
HEALTH DEPARTMENT

Tom Barrett, Mayor
Bevan K. Baker,
Commissioner of Health
www.milwaukee.gov/health

Steve Gradus, MT(ASCP), Ph.D.
Laboratory Director

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May 22, 2014