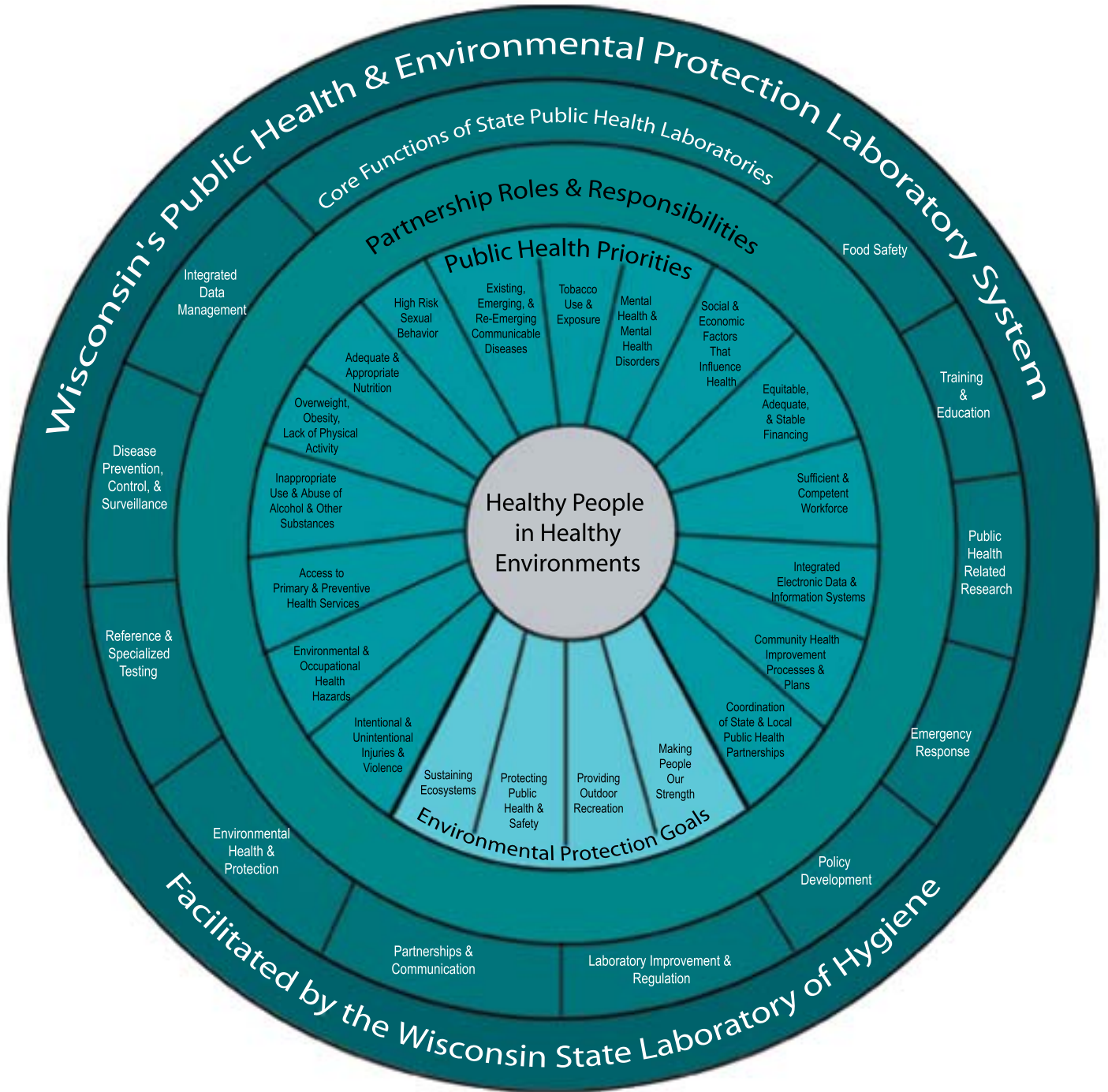


*Wisconsin State Laboratory of Hygiene*

**Annual  
Report  
2004**

*On Target For The Future*



Healthy People  
in Healthy  
Environments

Wisconsin's Public Health & Environmental Protection Laboratory System

Facilitated by the Wisconsin State Laboratory of Hygiene

Public Health Priorities

Environmental Protection Goals

Core Functions of State Public Health Laboratories

Partnership Roles & Responsibilities

# Letter from the Director

Dear Public Health System Partners,

Welcome to “On Target for the Future” -- the 2004 annual report of the Wisconsin State Laboratory of Hygiene (WSLH), the State’s public, environmental and occupational health laboratory.

The theme of this year’s annual report comes from a diagram depicting Wisconsin’s Public Health and Environmental Protection Laboratory System (see facing page). The diagram was created by WSLH staff and our Board as a visual representation of the collaborative efforts of public and private sector laboratories needed to meet Wisconsin’s public health priorities – set forth in the State health plan Healthiest Wisconsin 2010 -- and environmental protection goals – as defined by the Wisconsin Department of Natural Resources strategic plan -- and ultimately hit the bull’s-eye of helping achieve Healthy People in Healthy Environments.

The outer ring says “Facilitated by the Wisconsin State Laboratory of Hygiene,” which means the WSLH has accepted responsibility to bring the system partners together as members of a team. On the second ring you’ll see the 11 Core Functions of State Public Health Laboratories, developed by the Washington D.C.-based Association of Public Health Laboratories. These Core Functions define the unique value and role that state public health laboratories play in safeguarding the public’s health and the environment.

We at the WSLH recognize that while the Core Functions are the foundation of our responsibility as a state public health laboratory, we cannot and do not need to fulfill every aspect of every function alone. Our role is to ensure through a collaborative effort of laboratories around the state that these Core Functions are met, for the benefit of Wisconsin’s citizens and the environment in which they live, work and play.

In the next couple of pages, we’ll add detail to the Core Functions to help you better understand what’s expected of a state public health laboratory. We’ll also tell you a few stories about how WSLH staff have fulfilled some of those responsibilities in the past year.

The laboratory system diagram represents a guiding principle, not a completed activity. We at the WSLH will continue to expand collaborations with other laboratories and other public health workers so that our coordinated skills and resources result in improved health for all.

Thank you for being our partner in these integral activities.

Regards,



Ronald H. Laessig, Ph.D.  
Director, Wisconsin State Laboratory of Hygiene  
Professor of Pathology and Laboratory Medicine  
Professor of Population Health Sciences



Dr. Ronald Laessig, Ph.D., has served as the Director of the Wisconsin State Laboratory of Hygiene since 1980.

# Breaking Down the 11 Core Functions

## What are the 11 Core Functions of State Public Health Laboratories?

### Integrated Data Management

- Serve as focal point for the accumulation, blending and dissemination of scientific information in support of public health programs
- Provide for a statewide disease reporting network
- Linkage to national database systems
- Public health analysis and policy decisions
- Standardization of laboratory data formats
- Serve as an epidemiology resource

### Reference and Specialized Testing

- Serve as the state's primary reference laboratory to:
  - Confirm atypical lab test results
  - Test for, and aid in the diagnosis of, unusual pathogens
  - Provide toxicology testing
  - Test epidemiologically-significant specimens
  - Provide esoteric assays, otherwise unavailable

### Environmental Health and Protection

- Provide, or ensure, laboratory services that support:
  - Safe drinking water
  - Water quality
  - Air quality
  - Radiation control
  - Lead surveillance and abatement
  - Occupational health
  - Environmental monitoring

### Partnerships and Communication

- Develop statewide partnerships between state, county and city public health leaders, managed care, academia and private industry
- Participate in state strategic policy planning and development meetings
- Maintain strong communications with state, county and city health officers, state epidemiologists, STD and TB directors, maternal and child health directors, environmental program directors, legislators, state health budget personnel, other laboratory management staff and state leadership

Integrated  
Data  
Management

### Disease Prevention, Control and Surveillance

- Provide accurate analytical results in a timely manner for the assessment and surveillance of infectious, communicable, genetic and chronic diseases
- Serve as a center of expertise for the detection and identification of biologic agents of importance in human disease:
  - Sexually transmitted diseases
  - Diarrheal diseases
  - Parasitic & fungal diseases
  - Tuberculosis control
  - Rabies control
  - Viral diseases, including influenza
  - Vector-borne diseases
  - HIV/AIDs detection & control
  - Immunology & serology
  - Newborn screening
- Provide specialized tests for low-incidence, high-risk diseases such as tuberculosis, rabies, botulism and plague

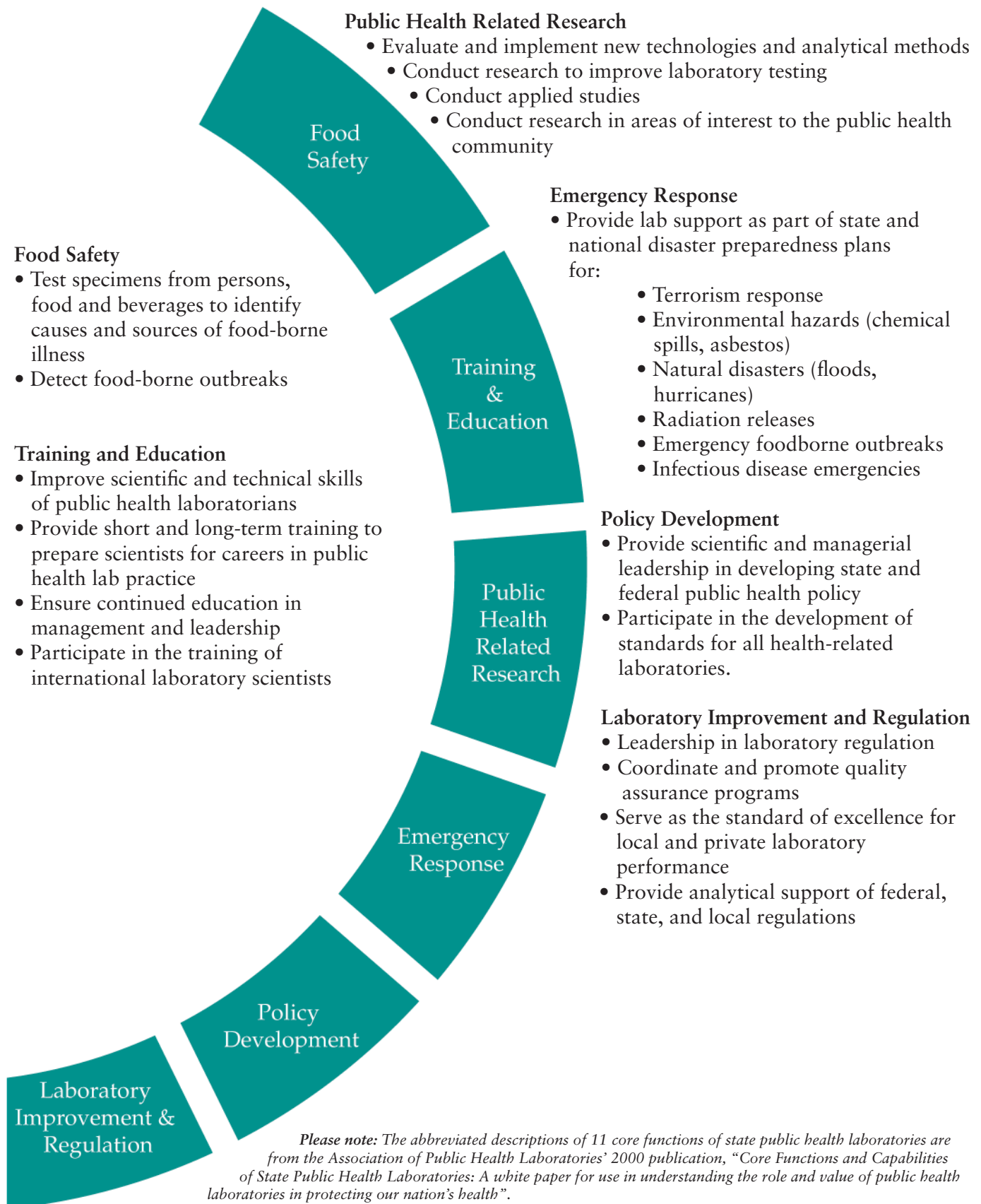
Disease  
Prevention,  
Control &  
Surveillance

Reference &  
Specialized  
Testing

Environmental  
Health &  
Protection

Partnerships &  
Communication

# On Target for the Future



# Achieving the Core Functions at the WSLH



## Exercise Tests Bioterrorism Laboratory Response Across Wisconsin

Just in Case, Just in Time -- While it might sound like the latest slogan for a national transportation company, this phrase is the two-tiered communication philosophy of the Wisconsin Laboratory Response Network (WLRN), created and coordinated by the Wisconsin State Laboratory of Hygiene.

As the lead terrorism and emergency response laboratory in the state, the WSLH's emergency response staff have spent the past several years strengthening relationships with the 125 sentinel clinical laboratories around Wisconsin.

These sentinel labs are associated with hospitals, clinics and local public health departments and serve as the laboratory front line in emergency response.

The role of sentinel laboratory staff is to "rule out" whether a patient specimen contains a bioterrorism agent. If they can't rule it out, they send the specimen to the WSLH for further testing.

The WSLH can access its two partner reference laboratories in the state – Marshfield Clinical Research Foundation and City of Milwaukee Health Department – in a large-scale emergency. The WSLH, the sentinel and reference laboratories comprise the Wisconsin Laboratory Response Network.

The "Just in Case, Just in Time" philosophy developed out of conversations between WSLH and sentinel laboratory staff. "Just in Case" refers to WSLH efforts to prepare sentinel labs for their emergency response role by providing monthly training audio conferences, making in-lab visits and distributing educational materials, including the Integrated Laboratory Response Plan (ILRP). The ILRP combines material from the Centers for Disease Control and Prevention with Wisconsin-specific information on how sentinel laboratories should respond in an emergency.

"Just in Time" is a promise made by the WSLH that when a terrorism threat/event or public health emergency occurs, we will provide the sentinel laboratories and our reference lab partners with the specific information they need to respond.

In July 2004, 21 sentinel laboratories around the state practiced their response plans as part of a WSLH-sponsored pilot exercise. Each laboratory received a simulated bacteria culture of a bioterrorism agent with accompanying scenario to trigger the notification and referral process described in the ILRP. The response entailed: (1) emergency notification to the WSLH of a "suspect isolate"; (2) a return call from WSLH staff directing the sentinel lab staff to package and ship the "specimen"; (3) "specimen" shipping; and (4) receipt of the "specimen" at the WSLH.

This unique exercise focused on Wisconsin's laboratory response plan, not laboratory testing. Participants were very enthusiastic about the exercise, saying it was very useful for their laboratories and showed them what it might be like in an actual emergency event.

The WSLH plans to provide additional exercises like this one to assess and enhance emergency laboratory response in Wisconsin.



## Specialized Equipment Serves “Dual Use” in Laboratories of the WSLH

What do 2,000-year-old bones from Celtic skeletons, blood from elderly people and air samples collected by the Wisconsin Department of Natural Resources have in common?

They all are being analyzed at the Wisconsin State Laboratory of Hygiene as part of “dual use” research using instrumentation the WSLH received for chemical terrorism response.

Just as the WSLH is the lead laboratory for bioterrorism response in the state, it is also the lead chemical terrorism response laboratory. Over the past two years, the WSLH has received funding from the Centers for Disease Control and Prevention and the Department of Homeland Security to add new technology in order to fulfill this responsibility.

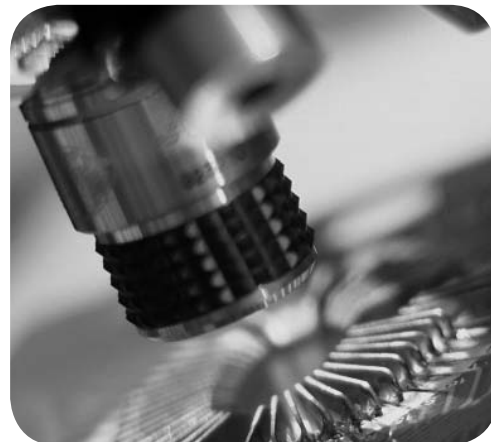
Representing a veritable alphabet soup of acronyms, the state-of-the-art equipment – such as GC/MS, ICP/MS, ICP/Hi Res MS and LC/MS/MS – will allow WSLH staff to assist our local, state and national partners in responding to a chemical terrorism event or other disaster, such as a train derailment or chemical spill.

The instruments are also being utilized for “dual use” purposes in a variety of research projects. Dual use is the foundation for most of the public health infrastructure improvements that have been funded by CDC and Homeland Security dollars, with the idea being that instrumentation and expertise shouldn't sit idle waiting for a terrorism event or emergency to occur. A sample of activities with which the WSLH is involved include:

- **ICP/MS (Inductively Coupled Plasma Emission/Mass Spectrometer)**
  - **Terrorism/Emergency Response Use:** Test blood for heavy metals (lead, mercury, arsenic, etc.)
  - **Dual Use:**
    1. As part of a University of Wisconsin Department of Population Health Studies pilot project, WSLH staff are testing the blood of elderly people to investigate a possible link between mercury levels in blood and cardiovascular health.
    2. As part of an NIH-funded cancer grant at the UW, WSLH staff are analyzing urine samples for cadmium and other chemicals.
- **GC/MS (Gas Chromatograph/Mass Spectrometer) with air canister autosampler**
  - **Terrorism/Emergency Response Use:** Analyze air samples from locations where an unknown (or known) trace elements release has occurred.
  - **Dual Use:** WSLH staff are analyzing air samples collected at the Wisconsin DNR air sample monitoring sites.

WSLH staff also have helped design response equipment. The WSLH and our partners in the Wisconsin Regional Level A Hazardous Materials Teams worked with an air sampling canister manufacturer to design an air sampling canister that HazMat Team members can operate when dressed in their Level A personal protection suits. Each Level A Team now carries a canister with their standard equipment. The HazMat teams also have satellite connection with WSLH chemists and other partners that allows for uninterrupted communication to help guide these first responders as they respond to an incident.

And what about those 2,000-year-old bones? Utilizing the ICP/Hi Res MS (Inductively Coupled Plasma Emission/High Resolution Mass Spectrometer), WSLH staff are working with our UW partners to determine the levels of lead, cadmium and other trace elements in Celtic skeletons. The Celts were one of the first populations to use the smelting process for the recovery of metals from ore. The purpose of this research is to determine if there is a genetic link between the exposure to lead and cadmium in this ancient population to the occurrence of cystic fibrosis in the modern day population.



# Achieving the Core Functions at the WSLH



## WSLH Joins International Partnership of Science and Law Through ROSITA2 Project

Working together with European researchers and law enforcement officials on two continents, the WSLH's Forensic Toxicology program has established Wisconsin as an American site for the ROSITA2 project.

ROSITA, or Roadside Testing Assessment, is designed to test devices that detect drugs in oral fluid for roadside use by law enforcement officers. Laura Liddicoat, the WSLH Forensic Toxicology Program Supervisor, felt that Wisconsin and the WSLH would be a good fit as a US site for the second round of this international drugged-driving project.

"The overall goal is to provide officers with another tool to detect drugged drivers at the roadside," Liddicoat said. "Officers often see an impaired driver, with little or no alcohol present, but don't have that extra training or ability to connect the impairment to drugs other than alcohol. This gives them an easy-to-use tool right there in the field."

After attending the Society of Forensic Toxicology's (SOFT) national meeting in 2003, Liddicoat volunteered to be an American coordinator due to the ongoing successful partnership of the WSLH and Wisconsin's law enforcement departments.

Sponsored by the European Commission abroad and the White House Office of National Drug Control Policy (ONDCP), the National Institute on Drug Abuse (NIDA) and the National Highway Traffic Safety Administration (NHTSA) here in the United States, Wisconsin joins Washington, two Florida counties and Salt Lake City, Utah, as domestic sites.

Wisconsin has six sub-sites throughout the state: Dodge County, Green Bay/DePere, La Crosse, Manitowoc/Two Rivers, Waukesha and Wausau. Within these areas, approximately 12 law enforcement agencies and 47 officers or Drug Recognition Experts are participating with Liddicoat in the project.

Each site requires 500 subjects over two nine-month periods with both oral fluid specimens using the test devices and urine and/or blood specimens from each subject to verify the accuracy of the oral fluid device. However, compared to their European counterparts, American law enforcement officers face a tougher challenge finding willing subjects.

European officers can set up roadblocks to catch suspected drugged drivers and do not require consent from possible subjects. In comparison, US officers must receive consent from their subjects, which often proves difficult when your subject is likely uncooperative and possibly facing arrest.

Despite the challenges, Liddicoat credits the Laboratory's involvement in the ROSITA2 program for opening new doors to the WSLH.

Working with Dr. Alain Verstraete, the EU coordinator from Ghent University in Belgium, and Dr. Michael Walsh, the US coordinator from the ONDCP, the WSLH has earned greater recognition for its work in forensic toxicology both nationally and internationally. Her work as coordinator has earned Liddicoat an opportunity to speak at this year's SOFT conference.

Here at home, the WSLH is continuing to build more successful partnerships with local law enforcement agencies around our state as science and law partner together to address drugged driving on our roadways.



## Wisconsin and WSLH Hit Hard By Pertussis

Generally considered a childhood illness easily controlled by vaccination, pertussis took the nation, especially Wisconsin, by surprise with its persistent and debilitating coughing fits this past year.

More commonly known as whooping cough, there were 18,957 reported cases of pertussis in the United States in 2004, up from 9,784 in 2003, according to the Centers for Disease Control. Wisconsin led the nation with 5,162 cases in 2004, nearly one-third of the country's total.

As pertussis (*Bordetella pertussis*) continued to spread, the number of possible cases being tested at the State Laboratory of Hygiene grew with it.

Hit hardest during the summer and fall months, the WSLH's Communicable Disease Division (CDD) tested more than 6,900 specimens by culture method and more than 15,000 specimens by real-time Polymerase Chain Reaction (PCR), a method of DNA testing, from May through October of 2004.

"We maintained our 24-hour turnaround time and our staff really did a great job," said Dr. Dave Warshauer, the assistant director of the WSLH's CDD. "We put in lots of overtime hours to keep up, but the staff did excellent work."

Tracing back to an initial outbreak of pertussis among Fond du Lac, Wis., teens in November of 2003, the number of specimens being sent to the WSLH on a daily basis for testing has grown exponentially. Normally, the laboratory runs its pertussis tests twice a week. To keep up with demand, however, CDD ran the tests six times per week and provided staff during the typically quiet weekend shifts.

Additionally, the PCR and culture results were continuously posted to Wisconsin's Health Alert Network so public health workers could readily access the updated information.

Wisconsin's network of laboratories also shone during the autumn peak of the pertussis epidemic. The WSLH handles the majority of pertussis testing across the state, but the Children's Hospital of Wisconsin and the Marshfield Clinic also provided PCR testing.

Furthermore, laboratory partners at the Milwaukee City Health Laboratory and St. Mary's Hospital in Madison processed more than 800 parasitology specimens to help the staff of the WSLH during the brunt of the pertussis outbreak.

"What we're really dealing with here is waning immunity," said Dr. Jeff Davis, chief medical officer with the Wisconsin Division of Public Health, in a recent *New York Times* article. "The disease puts tremendous pressure on state health departments."

Among Wisconsin's general population, there was a 17-fold increase in reported incidence among people under the age of 20 and, more specifically, a four- to nine-fold increase among older children and adolescents ages 10-19 last fall. Children are generally vaccinated at age seven, but this protection begins to wane after three to five years, thus creating a vulnerable population of adolescents and adults.

The Wisconsin Division of Public Health is working closely with all local health departments in the affected counties to stem the outbreak and increase awareness among the general public.



# WSLH Leadership



**WSLH Board members:** (front, L to R) D. Turski, M. Kopecky, S. Buroker; (back, L to R) G. Million, J. Stanley, D. Berwanger, R. Bagley, D. Taylor, M. Russell. Not pictured: D. Bazzell, H. Bostrom.



**WSLH Administration:** (front, L to R) M. Buechner, P. Hintzman, T. Burk, W. Sonzogni; (back, L to R) J. Chapin, D. Hassemer, R. Laessig, D. Kurtycz, P. Shult

## 2003–04 WSLH Board Members

Member Name	Represents	Title	Term Expires
Robert Bagley	Local Public Health Departments	Laboratory Director, City of Racine Health Department	May 1, 2005
David Berwanger	Private Env. Testing Laboratories	Laboratory Director, CT Laboratories (Baraboo, Wis.)	May 1, 2007
George Million	Public Member	Retired, Marathon County Health Department	May 1, 2007
Michael Russell	Occupational Health Laboratories	Senior Industrial Hygienist Lead Occupational Safety & Health Auditor, Earth Tech, Inc.	May 1, 2006
John Stanley	Medical Examiners and Coroners	Dane County Coroner	May 1, 2007
David Taylor	Public Member	Director of Special Projects, Madison Metropolitan Sewerage District	May 1, 2006
Dr. Deborah Turski	Clinical Laboratory Physicians	Associated Pathologists, St. Mary's Hospital	May 1, 2007

*The following WSLH Board Members are Agency or University Appointed with No Official Expiration Date.*

Member Name	Appointed By	Represents
Darrell Bazzell	University of Wisconsin System	President Kevin P. Reilly
Herb Bostrom	Department of Health & Family Services	Secretary Helene Nelson
Susan Buroker	Department of Agriculture, Trade & Consumer Protection	Secretary Rod Nilsestuen
Mary Jo Kopecky	Department of Natural Resources	Secretary P. Scott Hassett

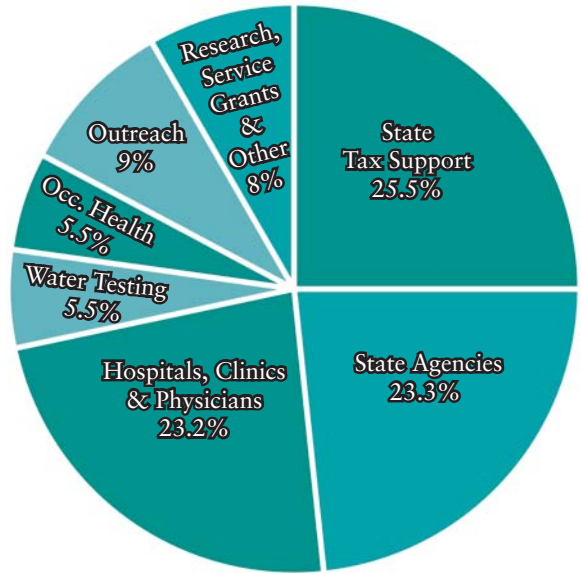
## 2003–04 WSLH Administration

Name	Title
Ronald H. Laessig, Ph.D.	Director
Daniel Kurtycz, M.D.	Medical Director & Director, Disease Prevention Division
Peggy Hintzman, MBA	Associate Director & Director, Resource Division
Mark Buechner, CPA	Chief Fiscal Officer
Terry Burk, CIH	Director, Wisconsin Occupational Health Laboratory Assistant Director, Environmental Health Division
John Chapin, M.S.	Director, Public Health Informatics & Surveillance Division
David J. Hassemer, M.S.	Director, Laboratory Improvement Division
Peter A. Shult, Ph.D.	Director, Communicable Diseases Division
William C. Sonzogni, Ph.D.	Director, Environmental Health Division

# WSLH Financial Information: 2003-04

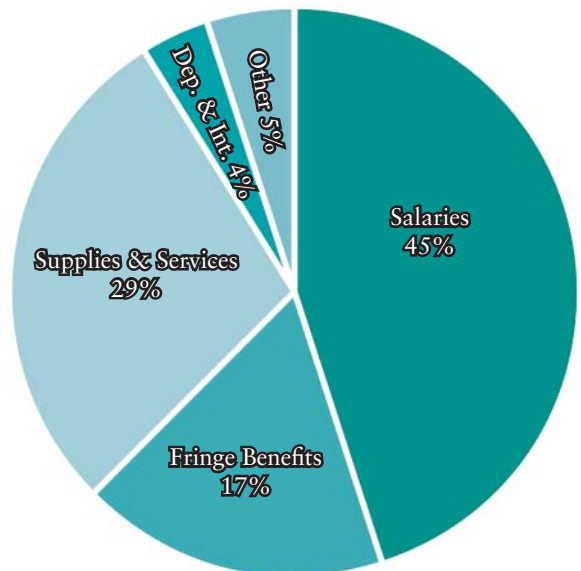
## Revenues

	(000's)
State Tax Support	\$8,314
Laboratory service fees from:	
State Agencies	7,753
Hospitals, Clinics, Physicians	7,710
Environmental/Water Testing Services	1,827
Occupational Health Services	1,897
Outreach Programs	3,001
Research, Service Grants, and Other	2,694
<b>Total Revenues</b>	<b>\$33,196</b>



## Expenses

	(000's)
Salaries	\$13,961
Fringe Benefits	5,368
Supplies and Services	8,854
Depreciation and Interest	1,236
Other Expenses	1,708
<b>Total Expenses</b>	<b>\$31,127</b>



Net Increase in Assets \$2,069\*

\*Includes \$1.14 million in equipment purchased with Homeland Security Funding.



Administration &  
Clinical Laboratory Divisions  
465 Henry Mall  
Madison, WI 53706  
(888) 494-4324

Environmental Health Division  
2601 Agriculture Drive  
Madison, WI 53718  
(888) 442-4618

Please visit the WSLH Web site at:  
<http://www.slh.wisc.edu>

Annual Report produced by the WSLH Public Affairs Department  
© 2005 UW Board of Regents

Writer/Designer: Jessica D. Burda; Writer/Editor: Jan Klawitter; Editors: Peggy Hintzman and WSLH Staff; The photo of the State Capitol Building and biohazard card are used courtesy of Jeff Miller, University Communications, UW-Madison.



University of Wisconsin – Madison  
465 Henry Mall  
Madison, WI 53706-1578

Nonprofit Org. U.S. Postage PAID Madison, WI Permit No. 658
-------------------------------------------------------------------------

**ADDRESS SERVICE REQUESTED**