Maryland Department of
Health & Mental Hygiene
John M. Colmers, Secretary

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CRITICAL LINK

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Preparing the Laboratory Workforce

As the State training coordinator for Maryland's Laboratories Administration, I recently attended a national meeting entitled, "Preparing the Laboratory Workforce." The meeting was sponsored by the National Laboratory Training Network, the training arm of the Association of Public Health Laboratories. State training coordinators from the nation's public health laboratories met with laboratory science educators, representatives from the clinical laboratory industry, and laboratory outreach coordinators to share approaches to solving the problem of the current and future laboratory workforce shortage. This shortage is due to a myriad of causes, including an aging labor force, smaller generations following the current retiring generation, decreased attractiveness of the healthcare professions and the dissatisfaction of the current workforce. The meeting's speakers presented a broad range of possible solutions to the problem, including increasing the public's awareness of the role of the laboratory, getting the attention and interest of students early in their careers, broadening and diversifying recruiting efforts, and actively working to retain the current workforce.

Here are a few rather sobering facts on the current state of education and training in the laboratory field: "two-thirds of the nation's clinical laboratory science programs have been eliminated over the past thirty years; for every seven

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Pathogen Detection In Shellfish

It's summer in Maryland, a time when our citizens greatly increase their consumption of oysters, clams, and mussels. Unfortunately, if shellfish are not thoroughly heated before being eaten, consumers run a risk of disease. Bivalve shellfish, being stationary and filter feeders, can greatly concentrate and harbor pathogenic microflora from the water in which they live. Even after being properly cooked, shellfish, like most foods, can be recontaminated by improper handling or storage.

Current Standards

Outbreaks of human disease associated with the presence of enteric bacteria (e.g., *Salmonella* and *Shigella* species) in shellfish are fully documented. In 1925, the National Shellfish Sanitation Program (NSSP) was established to prevent shellfish-associated disease caused by enteric bacteria. In Maryland, we use the NSSP's bacteriological standards. These continue to be the gold standards to test shellfish and shellfish harvesting waters using the fecal coliform index.

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The Maryland State Laboratories Administration celebrates National Medical Laboratory Professionals Week. Meet some of our laboratory scientists and staff on page 3.

Pictured from left are Stephen Longdo, Benjamin Healey, Kimbery Karlinchak, Crystal Durham, Adam Newirth, and Keith Perkins.

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Preparing the Laboratory Workforce

laboratory scientists who wish to retire, there are only two properly trained to replace them; we must train 138,000 laboratory scientists by 2012, according to the U.S. Department of Health and Human Services. At the current rate, we will be lucky to have trained 42,000 by that time." (Abbott brochure 98-1383/R1-15).

Laboratory science educators' efforts to prepare laboratory professionals and narrow the future workforce gap include: introducing primary school students to laboratory science careers; offering experiential learning to secondary school students, such as Saturday science workshops; marketing educational programs to untapped under represented population segments; recruiting students for diversity, with a goal of mirroring the population being served; ensuring the presence of a college health professions advising office; updating and enhancing health careers web pages; and encouraging and supporting professional memberships for students.

The laboratory industry is also hoping to the increase the attractiveness and visibility of the laboratory profession. A speaker from Abbott Laboratories, a national supplier of laboratory testing equipment and supplies, presented an overview of initiatives Abbott is taking to highlight the role of the laboratory professional and to support laboratory science education. The "Labs are Vital™" marketing program uses entertaining posters strategically placed in public places to attract the attention of the general public as well as those who might be interested in laboratory science careers. In addition, Abbott is supporting laboratory education and training efforts with $1 million in instruments, reagents and service to accredited laboratory educational programs across the country. To learn more about the "Labs are Vital™" program, visit www.LabsAreVital.com.

Public health laboratory outreach coordinators shared the numerous approaches they're using to attract, recruit and retain employees. These include:

- participating in community events, increasing visibility in the community;
- making career day visits to schools;
- arranging job shadowing experiences for students in local high schools, giving students an opportunity to explore science related careers;
- mentoring secondary school science projects;
- developing summer programs, applied learning/ internships, experiential learning;
- including science teachers in summer programs, helping them to integrate career concepts into curriculum;
- providing funding for training/continuing education which serves to renew employees;
- building a career path for laboratory professionals;
- working to improve pay compared to the private sector; and
- addressing recruitment and retention problems related to intergenerational misunderstanding, by recognizing, understanding and accepting the sometimes conflicting values of the four generations in the workforce.

The take-home message from this meeting was that much can be done to reduce the laboratory workforce shortage. At the Maryland Laboratories Administration, addressing the laboratory workforce problem has been a priority of the Laboratories Administration management for quite some time. The Laboratories Administration continues to work to improve pay, solicit input from employees on ways to improve recruitment and retention, support funding for scientific graduate degrees for future laboratory leaders, and provide training experiences to scientific graduate and post doctoral students. In this way, the Administration hopes to improve the chances that some of these employees and students will choose to become the future leaders of the Laboratories Administration.

This article written by Sheila DeLaquil, Quality Assurance Officer for the Laboratories Administration.

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Pathogen Detection In Shellfish

For approved shellfish harvesting waters, the most probable number (MPN) for coliforms cannot exceed 70 per 100 ml. of water, and no more than 10% of the samples can exceed 230 per 100 ml. Shellfish meat may contain no more than 230 fecal coliforms per 100 g. These standards have been very effective in preventing disease outbreaks caused by enteric bacterial pathogens. However, there is no relationship between levels of coliform indicator bacteria in water or shellfish and the presence of human enteric viruses, naturally occurring marine *Vibrio* species, or enteropathogenic protozoa.

Currently the analytical complexities of detecting and identifying specific pathogens in shellfish, shellfish harvesting waters, and surface and well waters preclude the Laboratories Administration's Food and Shellfish Laboratory from performing such testing. Over the next few years the Environmental Microbiology Division plans to develop a Food and Water Special Investigations Laboratory that can perform these types of special studies. This article provides an overview of some common types of pathogens that may be associated with shellfish, and point out some of the major limitations and complexities that exist when attempting to detect specific shellfish pathogens.

Vibrio Species

Vibrios make up part of the normal estuarine flora and readily survive in both marine and estuarine environments. They also can be concentrated by shellfish during feeding.[1] Although sporadic cases have occurred, the U.S. has not experienced a major outbreak due to *V. cholerae* since 1911. Most sporadic cases have been associated with crabs or shrimp rather than with bivalve shellfish.[2]

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National Medical Laboratory Professionals Week 2007

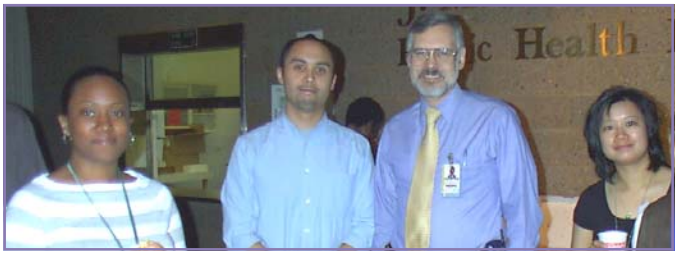
In celebration, Director Jack DeBoy, Deputies Michael Wajda and Dr. Bob Myers, and Division Chiefs Dr. Prince Kassim, Dr. Julie Kiehlbauch, and Dr. Fizza Majid provided coffee and donuts for Laboratories Administration employees.

Denise Shackleford, Christina Aduna, and Carol Hogan

Shirley Wise and Darlene Zeller

Mihrigul Prince and Jenny Chen

Sheila DeLaquil and Georgia Corso



Lynette Chandler, Anthony Valdez, Director Jack DeBoy, and Li Si Lee

Pauline Comer, Geral Gross, and Cherilyn Pointer

Secretary John Colmers, Tina Wiegand, and Fizza Majid

Jonathan Johnston, Amit Trivedi, and Rolf Rauh

Rita Leffers, Fatima Pervez, and Barbara Haransky

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Outbreaks associated with *V. parahaemolyticus* have been uncommon in the U.S. The first major recorded outbreak occurred here in Maryland, involved 320 people, and was associated with recontamination of crabs after they were steamed.[3] Two recent outbreaks involved eating raw oysters in the Pacific Northwest in 1997 and eating bivalve mollusks from Long Island Sound in 1998. Before these last two outbreaks, most cases had been due to mishandling, improper refrigeration, insufficient cooking, or cross-contamination. In the 1997 and 1998 outbreaks water temperatures were significantly higher by 1-5°C than in previous years. Because vibrio populations increase in response to warmer water temperatures, outbreaks could be an increasing problem as this cycle of global warming continues. [Editor's Note: The July 2007 issue of the *Critical Link* will carry an article focused on *V. parahaemolyticus*.)

V. vulnificus, the most serious of the pathogenic vibrios in the U.S., is responsible for 95% of all seafood-related death in this country. Primary septicemia, due to *V. vulnificus* and associated with eating raw oysters, although uncommon, has a fatality rate around 60%. This bacterium can also cause wound infections when sea water or estuary water comes in contact with breaks in the skin.

Viruses

Enteric viruses (e.g., hepatitis A virus, hepatitis E virus, human calciviruses, astroviruses) are more resistant than bacterial pathogens to common sewage treatment processes, including chlorination. Enteric viruses have been reported in laboratory studies to survive from 2-130 days in seawater, far longer than coliform bacteria in similar environments.[4] For this reason and others, the fecal coliform index is inadequate to monitor for the presence of viral contamination in shellfish.

Hepatitis A virus (HAV) is probably the most serious viral illness contracted by consuming contaminated shellfish. Outbreaks of HAV infections associated with shellfish consumption were not report in the U.S. until the early 1960s. Many cases associated with bivalve mollusks have since been reported. HAV causes a greater incidence of symptomatic infections (up to 95% during outbreaks) than do enteroviruses.

Epidemiological estimates now suggest human gastrointestinal viruses are a more significant cause (up to 60%) of food-borne disease than previously believed.[5] For example, in the U.S. outbreaks caused by Norwalk-like virus (NLV) have been linked to shellfish harvested from approved waters, grossly fecally contaminated waters, malfunctioning boat sewage disposal systems, and ill shellfish harvesters who routinely discharged their sewage overboard.[2]

Enteropathogenic Protozoa

Protozoan parasites (e.g., *Giardia* and *Cryptosporidium* species) can occur in shellfish-growing waters due to livestock-farm runoff or treated and untreated sewage contamination. Bivalve shellfish are able to concentrate *Giardia* and *Cryptosporidium*. Studies have also found *Cryptosporidium* oocysts to be stable for 4-12 weeks in artificial seawater with detection of oocysts in Eastern oysters harvested from commercial sites in the Chesapeake Bay.[6] Further studies[7,8] suggest all types of bivalve shellfish may behave as vectors for *Giardia* and *Cryptosporidium*.

General Methods and Limitations

The methods for recovery and identification of shellfish-related pathogens differ for bacteria, viruses, and protozoa. However, all follow the same general steps:[2]

- Sample collection and shucking;
- Meat homogenization;
- Virus extraction, cultural enrichment of bacteria, or nucleic acid extraction and concentration;
- Removal of assay inhibitors; and
- Assay by conventional or molecular methods.

Sample collection, shucking, and homogenization must be performed aseptically in all analyses. A main difference between methods designed for virus and protozoa detection, from that for bacteria, is that the former require purification and concentration of the pathogens outside the food matrix before testing.

Purification and concentration of viruses and pathogenic protozoa are rarely standard or simple procedures. Furthermore, they affect the efficiency of recovery of the pathogens and influence the sample-associated toxicity or inhibition of the assay. Many methods for bacterial pathogens may be somewhat standardized (e.g., cultural enrichment steps to increase pathogen numbers). However, these same methods can be complicated by a pathogen's fastidiousness and ability to enter a viable but nonculturable state, and by high numbers of background microflora. For subsequent molecular detection, methods of nucleic acid extraction and concentration also affect detection. In all cases assay inhibitors must be removed before performing molecular methods.

Bacterial Pathogens by Culture

Detecting bacterial pathogens from shellfish and water samples is more difficult than detecting pathogens from clinical specimens because food samples contain high numbers of contaminants and the target organisms often exist in relatively small numbers and in a poor physiological state or in a viable but nonculturable state. Despite these hurdles, successful cultural methods[9] have been developed for the detection of culturable forms of pathogenic *Vibrio* species in shellfish.

Enteric Viruses by Cell Culture

Shellfish extracts from extraction and concentration or adsorption-elution concentration procedures can be tested for viruses using conventional mammalian cell culture techniques. There are two basic types of methods:

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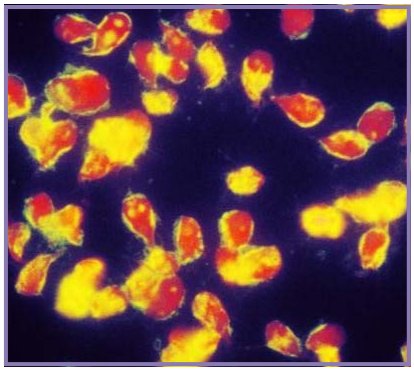
1) quantifiable 50% tissue culture infective dose (TCID) or most probable number (MPN) methods, and 2) enumerative plaque assay methods. The TCID and MPN methods rely on widespread cytopathic effects on a cell monolayer. Enumerative methods detect localized monolayer damage (plaques) under an agar overlay. Specific target viruses require specific cell types. There is no single cell culture system that will detect a majority of the many different human enteric viruses that potentially can contaminate shellfish. Most studies on the incidence of enteric viral contamination in shellfish have been limited to the enterovirus family because they are easier to detect in mammalian cell culture. However, many important shellfish-borne enteric viruses do not replicate (e.g., NLVs), or replicate poorly (HAV, astroviruses) in all currently used mammalian cell cultures.[2] Additional limitations of this detection methodology include lengthy assay time and high cost.

Protozoans by Indirect Methods

Giardia and *Cryptosporidium* species cannot be cultured like bacteria and require indirect methods of detection. Traditionally, detection of protozoal parasites from concentrated water samples has relied on immunofluorescent staining of filtered sample concentrates.



A photomicrograph of a positive indirect immunofluorescence test for *Giardia lamblia*. (Photo courtesy of CDC PHIL.)

In instances where this method has been applied to shellfish, samples have been prepared for immunofluorescence by washing dissected gill tissue in phosphate buffered saline[6,8] or by using the alkaline digestion method of Toro et al.[10]

Pathogen Detection by Molecular Methods

Nucleic acid amplification depends upon techniques such as polymerase chain reaction (PCR) and reverse-transcription PCR (RT-PCR). In most cases, before using these techniques, prior cultural enrichment of up to 24 hours (e.g., vibrios from marine environments and from oyster meat[11,12]) enhances the sensitivity for detecting viable organisms. Nucleic acid amplification techniques are still the best way to meet the sensitivity limits needed to assay for viable but nonculturable pathogens and virus contamination in shellfish and for environmental samples. Nonetheless, molecular methods sometimes can result in a reduction of overall detection time even with an additional 24 hour enrichment. Newer multiplex instrumentation is also allowing for simultaneous detection of multiple pathogens and for selecting specific pathogens within a group.

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Molecular techniques also present a number of disadvantages such as not being able to distinguish viable from nonviable organisms. Environmental samples usually need extensive preparation and cleaning before performing a detection assay. In addition, most assays do not provide quantitative results, and, when they are quantitative, are usually very target-specific.[2] Also, the need to confirm the identity of PCR amplification products by DNA hybridization methods is very important because shellfish matrices are known to promote non-specific DNA amplification and false-positive results.[13]

Shellfish meat is a chemical by complex matrix with many compounds that can interfere with PCR methods. Approaches are required to minimize this problem and are grouped into two categories. The first category, direct nucleic acid extraction, involves isolating and purifying viral nucleic acids from shellfish meat before assaying using RT-PCR. The second category, virion concentration, concentrates the viruses from the food matrix before RNA extraction and nucleic acid amplification with RT-PCR.

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Pathogen Detection In Shellfish

There have been few studies performed to detect parasitic protozoa from shellfish using molecular methods. However, at least one published study[14] detected *Cryptosporidium parvum* in commercial shellfish. The authors used pooled hemolymph and gill washings, an extraction for nucleic acids, and PCR amplification of target gene sequences.

There are still many hurdles to be overcome before molecular methods are applicable to both special studies and routine monitoring. Some continuing problems include a lack of simple and rapid extraction procedures, simple and reliable methods to remove a wide variety of enzymatic inhibitors, and standard methods applicable to multiple target pathogens and multiple shellfish species. Just as important is the lack of quantitative methods to assess naturally occurring levels of contamination from levels associated with human illness.

Conclusion

Analytical technologies needed to detect and identify pathogens associated with shellfish and shellfish waters are currently available. However, much epidemiological research (e.g., quantitative dose-response data involving various environments and environmental matrices) and simplified procedures are still needed before current and new technologies can be used reliably to identify sources of sporadic outbreaks or monitor for abnormal levels of contamination involving shellfish.

This article compiled by Jack DeBoy, Dr.P.H.

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Lab Mutual Aid Bill Signed into Law

At the end of April Governor O'Malley signed the "Public Health Laboratories—Mutual Aid Bill." This new law authorizes DHMH's Secretary to establish and carry out mutual aid agreements between the Laboratories Administration and public health laboratories in other states.

If Maryland's central public health laboratory is forced to shut down for more than a day or two by an explosion, fire, internal flooding, heating-ventilation-air conditioning breakdown, or by microbial or chemical contamination, Maryland would need support from other states. Otherwise our State could not continue such essential, analytical services as screening for hereditary disorders in newborns, testing drinking water, identifying cases of tuberculosis and sources of foodborne outbreaks, and testing white powders, environmental samples, and human specimens for agents of biological and chemical terrorism.

Receiving and providing public health laboratory testing under a mutual aid agreement, to be truly useful, must provide for sending some State employees as well as test samples and specimens out of State, and accepting scientists and test materials from another state. House Bill 0344-2007 makes this possible. It ensures that laboratory scientists and other emergency essential laboratory employees required to work out of State will continue to serve as State employees on official business and still be eligible for all of their State entitlements (e.g., salary, health benefits, insurance) while on such temporary duty.

A past example of the need for interstate laboratory support resulted from the flooding in Missouri in 1993. It forced the Missouri Public Health Laboratory to shut down and send some of its scientists to work, off and on over several weeks, at the Texas Department of Health and Human Services' Laboratory Services Section. Another example of a shutdown involved the New York City Public Health Laboratory during the anthrax event in 2001, when part of that laboratory became contaminated with anthrax spores. More recently, after the New Orleans Public Health Laboratory was closed by Hurricane Katrina, the Iowa State Laboratory jumped in to provide newborn screening for Louisiana.

The Department also supported this new law because it will augment the Department and State's emergency preparedness and response program. It will increase government efficiency in an emergency by allowing reliable mutual aid agreements to be put in place before an actual emergency occurs. It will also permit a narrower, laboratory-based public health response without requiring the Governor to declare a major state of emergency.

Maryland is the first state to pass this type of law and we are hopeful that House Bill 0344-2007 will be used as a model by other states seeking similar legislation. In the meantime, the Laboratories Administration is working with other states to develop standardized text for a mutual aid agreement that will be accepted and used by many other states once they possess similar laws.

This article written by Dr. Jack DeBoy

Laboratory Statistics

NS – Not Speciated
NT – Non-Typeable
VRE – Vancomycin Resistant
SP – Species
NG – No Growth

* This genus has recently been given a new genus name. The genus name in parenthesis is the old name.
** Formerly a part of the *Trichosporon beigelii* complex.
***Alpha streptococci other than *S. pneumoniae* and *Enterococcus.*

REPORTED 3/01/07 - 3/31/07

ENTERIC BACTERIOLOGY

GENUS SEROVAR	SEX	AGE	#	JURISDICTION
CAMPYLOBACTER JEJUNI				
	F	20	1	CALVERT
	F	18	1	HARFORD
SALMONELLA ALACHUA				
	F	2	1	BALTIMORE
SALMONELLA BARDO				
	M	1	1	TALBOT
SALMONELLA BRAENDERUP				
	F	15	1	BALTIMORE CITY
SALMONELLA COELN				
	M	17	1	HARFORD
SALMONELLA ENTERITIDIS				
	M	48	1	ALLEGANY
	M	2	1	BALTIMORE
	M	80	1	PRINCE GEORGE'S
	M	4	1	ST. MARY'S
	M	39	1	ST. MARY'S
	M	47	1	WASHINGTON
	M		2	BALTIMORE CITY
	M	51	1	BALTIMORE CITY
	U		1	BALTIMORE CITY
	U	1	1	BALTIMORE CITY
	U	7	1	BALTIMORE CITY
	U		2	UNKNOWN
SALMONELLA LITCHFIELD				
	F	1	1	PRINCE GEORGE'S
SALMONELLA NEWHAW				
	M	78	1	CHARLES
SALMONELLA PARATYPHI B				
	F	6	1	FREDERICK
	F	6	1	BALTIMORE CITY
SALMONELLA SAINTPAUL				
	M	36	1	BALTIMORE
	F	1	1	WICOMICO
SALMONELLA TENNESSEE				
	F	4	1	BALTIMORE
	M	9	1	BALTIMORE
	F		1	WASHINGTON
	F		1	BALTIMORE CITY
	U	60	1	OUT OF STATE
SALMONELLA TYPHI				
	M	45	1	HOWARD
	M	9	1	MONTGOMERY
	M	70	1	MONTGOMERY
SALMONELLA TYPHIMURIUM				
	F	2	1	ALLEGANY
	M	4	1	BALTIMORE
	M	1	1	HOWARD
	F	29	1	MONTGOMERY
	U		1	BALTIMORE CITY
SALMONELLA TYPHIMURIUM VAR COPENHAGEN				
	F	1	1	WICOMICO
	F	5	1	WICOMICO
	U		1	OUT OF STATE
SALMONELLA UNTYPABLE				
	M	34	1	CARROLL
	M	37	1	PRINCE GEORGE'S
	F	1	1	ST. MARY'S
	F	77	1	TALBOT
	F	33	1	OUT OF STATE
	U	1	1	OUT OF STATE
SALMONELLA VIRCHOW				
	M	21	1	BALTIMORE
SALMONELLA 4,12:i:-				
	F	3	1	BALTIMORE CITY
	F	64	1	BALTIMORE CITY
SHIGELLA FLEXNERI II:3,4				
	F	6	2	PRINCE GEORGE'S
	M	2	1	PRINCE GEORGE'S
SHIGELLA FLEXNERI VAR Y -:3,4				
	M	37	1	BALTIMORE CITY
SHIGELLA SONNEI				
	U	1	1	OUT OF STATE
VIBRIO PARAHAEMOLYTICUS				
	F	33	1	PRINCE GEORGE'S
TOTAL			**57**	

ISOLATES – THROAT CULTURES

COUNTY	GROUP A[1]	NON-GROUP A
ALLEGANY	1	16
ANNE ARUNDEL	0	1
BALTIMORE CITY	0	4
BALTIMORE	0	2
MONTGOMERY	6	4
PRINCE GEORGE'S	1	3
SOMERSET	2	2
WICOMICO	4	3
TOTAL	**14**	**35**

[1] *Streptococcus pyogenes*

BACTERIOLOGY IDENTIFICATIONS
Referrals

GENUS SPECIES	SOURCE	#	JURISDICTION
BACILLUS SPECIES			
	BLOOD	1	ALLEGANY
HAEMOPHILUS INFLUENZAE NON-TYPEABLE			
	BLOOD	3	BALTIMORE CITY
HAEMOPHILUS INFLUENZAE SEROTYPE F			
	BLOOD	1	CECIL
	BLOOD	2	MONTGOMERY
NEISSERIA MENINGITIDIS SEROGROUP C			
	BLOOD	1	CARROLL
	SYNOVIAL FLUID	1	CARROLL
NEISSERIA MENINGITIDIS SEROGROUP Y			
	BLOOD	1	MONTGOMERY
STAPHYLOCOCCUS AUREUS			
	BLOOD	2	WICOMICO
TOTAL		**12**	

ISOLATES – MISCELLANEOUS

GENUS SPECIES	SOURCE	#	JURISDICTION
ALCALIGENES XYLOSOXIDANS			
	TOE	1	FREDERICK
BACILLUS SPECIES			
	BLOOD	1	BALTIMORE CITY
	WOUND	1	FREDERICK
	FOOT	1	FREDERICK
	TOE	2	FREDERICK
CORYNEBACTERIUM STRIATUM			
	BLOOD	1	BALTIMORE CITY
CORYNEBACTERIUM STRIATUM SPECIES			
	URETHRA	1	CECIL
	TOE	1	FREDERICK
	ULCER	1	FREDERICK
ENTEROBACTER AEROGENES			
	BLOOD	1	BALTIMORE CITY
ENTEROBACTER CLOACAE			
	FOOT	1	FREDERICK
ENTEROCOCCUS FAECALIS			
	BLOOD	3	BALTIMORE CITY
	TOE	2	FREDERICK
ESCHERICHIA COLI			
	BLOOD	1	BALTIMORE CITY
	SPUTUM	1	FREDERICK
	WOUND	1	FREDERICK
GARDNERELLA VAGINALIS			
	VAGINAL	9	SOMERSET
KLEBSIELLA OXYTOCA			
	BLOOD	1	BALTIMORE CITY
	FOOT	2	FREDERICK
LACTOBACILLUS SPECIES			
	BLOOD	3	BALTIMORE CITY
PANTOEA AGGLOMERANS			
	TOE	1	FREDERICK
PROTEUS MIRABILIS			
	WOUND	1	MONTGOMERY
PROTEUS SPECIES			
	VAGINAL	1	PRINCE GEORGES
	VAGINAL	2	SOMERSET
STAPHYLOCOCCUS AUREUS			
	BLOOD	4	BALTIMORE CITY
	CSF	1	BALTIMORE CITY
	SKIN	1	BALTIMORE CITY
	ABSCESS	1	CARROLL
	SKIN	1	CARROLL
	FOOT	1	FREDERICK
	TOE	8	FREDERICK
	LESION	1	PRINCE GEORGE'S
	VAGINAL	1	SOMERSET
STAPHYLOCOCCUS HAEMOLYTICUS			
	BLOOD	1	BALTIMORE CITY
STAPHYLOCOCCUS SIMULANS			
	BLOOD	1	BALTIMORE CITY
STAPHYLOCOCCUS SPECIES			
	WOUND	2	BALTIMORE
	BLOOD	2	BALTIMORE CITY
	EYE	1	CARROLL
	PENIS	1	CECIL
	URETHRA	2	CECIL
	ULCER	1	FREDERICK
	SKIN	1	FREDERICK
	WOUND	1	FREDERICK
	SKIN	1	PRINCE GEORGE'S
STREPTOCOCCUS ALPHA-HEMOLYTIC			
	BLOOD	2	BALTIMORE CITY
	URETHRA	1	CECIL
STREPTOCOCCUS BETA-HEMOLYTIC GROUP B			
	VAGINAL	4	ANNE ARUNDEL
	TOE	1	FREDERICK
	VAGINAL	2	HOWARD
	VAGINAL	6	MONTGOMERY
	VAGINAL	4	PRINCE GEORGE'S
	VAGINAL	1	SOMERSET
STREPTOCOCCUS INTERMEDIUS			
	BLOOD	1	BALTIMORE CITY
STREPTOCOCCUS NON-HEMOLYTIC			
	BLOOD	3	BALTIMORE CITY
STREPTOCOCCUS ORALIS			
	BLOOD	1	BALTIMORE CITY
STREPTOCOCCUS SANGUIS			
	BLOOD	1	BALTIMORE CITY
TOTAL		**100**	

SEXUALLY TRANSMITTED DISEASES

GENUS SPECIES	SEX	#	JURISDICTION
NEISSERIA GONORRHEAE			
	M	2	ALLEGANY
	F	3	ANNE ARUNDEL
	M	8	ANNE ARUNDEL
	U	2	ANNE ARUNDEL
	F	4	BALTIMORE
	M	3	BALTIMORE
	F	2	CALVERT
	F	1	CAROLINE
	M	5	CAROLINE
	F	2	CHARLES
	M	2	CHARLES
	F	1	HARFORD
	M	4	HARFORD
	F	0	DORCHESTER
	M	1	DORCHESTER
	F	1	HARFORD
	M	4	HARFORD
	F	1	HOWARD
	F	1	KENT
	M	0	KENT
	F	3	MONTGOMERY
	M	7	MONTGOMERY
	F	16	PRINCE GEORGE'S
	M	38	PRINCE GEORGE'S
	F	1	QUEEN ANNE'S
	M	0	QUEEN ANNE'S
	F	1	ST. MARY'S
	M	1	ST. MARY'S
	F	1	SOMERSET
	M	0	SOMERSET
	F	0	TALBOT
	M	1	TALBOT
	F	1	WICOMICO
	M	5	WICOMICO
	F	1	WORCESTER
	M	1	WORCESTER
	F	1	BALTIMORE CITY
	M	1	BALTIMORE CITY
TOTAL		**126**	
SYPHILIS SEROLOGY			
	F	2	ALLEGANY
	M	2	ALLEGANY
	F	8	ANNE ARUNDEL
	M	4	ANNE ARUNDEL

U	2	ANNE ARUNDEL
F	10	BALTIMORE
M	11	BALTIMORE
U	1	BALTIMORE
M	1	CALVERT
F	1	CARROLL
M	1	CARROLL
F	1	CECIL
F	1	CHARLES
M	1	CHARLES
F	1	DORCHESTER
F	2	FREDERICK
M	1	FREDERICK
M	1	HARFORD
U	1	HARFORD
F	2	HOWARD
M	3	HOWARD
F	7	MONTGOMERY
M	6	MONTGOMERY
U	1	MONTGOMERY
F	14	PRINCE GEORGE'S
M	29	PRINCE GEORGE'S
U	1	PRINCE GEORGE'S
U	1	SOMERSET
F	1	TALBOT
F	1	WASHINGTON
M	3	WASHINGTON
F	2	WICOMICO
M	4	WICOMICO
U	1	WICOMICO
F	31	BALTIMORE CITY
M	47	BALTIMORE CITY
U	4	BALTIMORE CITY
F	2	OUT OF STATE
U	1	OUT OF STATE
TOTAL	**213**	

CHLAMYDIA TRACHOMATIS

F	5	ALLEGANY
M	10	ALLEGANY
F	22	ANNE ARUNDEL
M	18	ANNE ARUNDEL
F	31	BALTIMORE
M	20	BALTIMORE
F	6	CALVERT
M	2	CALVERT
F	6	CAROLINE
M	3	CAROLINE
F	4	CARROLL
M	2	CARROLL
F	2	CECIL
M	4	CECIL
F	16	CHARLES
M	2	CHARLES
F	1	DORCHESTER
M	2	DORCHESTER
F	9	FREDERICK
M	4	FREDERICK
M	1	GARRETT
F	9	HARFORD
M	5	HARFORD
F	9	HOWARD
M	6	HOWARD
F	5	KENT
M	4	KENT
F	36	MONTGOMERY
M	24	MONTGOMERY
F	74	PRINCE GEORGE'S
M	23	PRINCE GEORGE'S
F	3	QUEEN ANNE'S
M	1	QUEEN ANNE'S
F	4	ST. MARY'S
M	5	ST. MARY'S
F	3	SOMERSET
M	2	SOMERSET
F	2	TALBOT
M	4	TALBOT
F	4	WASHINGTON
M	1	WASHINGTON
F	19	WICOMICO
M	4	WICOMICO
F	6	WORCESTER
M	5	WORCESTER
F	11	BALTIMORE CITY
M	27	BALTIMORE CITY
F	2	OUT OF STATE
M	4	OUT OF STATE
TOTAL	**472**	

MYCOBACTERIOLOGY

GENUS SPECIES	SEX	AGE	#	JURISDICTION
MYCOBACTERIUM TUBERCULOSIS				
	M	73	1	MONTGOMERY
	M	34	1	PRINCE GEORGE'S
	M	47	1	PRINCE GEORGE'S
	M	40	1	BALTIMORE CITY
MYCOBACTERIUM TUBERCULOSIS COMPLEX				
	M	23	2	ANNE ARUNDEL
	U	88	1	ANNE ARUNDEL
	F	35	1	BALTIMORE
	M	36	1	BALTIMORE
	M	45	1	BALTIMORE
	M	50	1	BALTIMORE
	M	91	1	BALTIMORE
	M	49	1	CECIL
	F	11	1	MONTGOMERY
	F	55	1	MONTGOMERY
	F	76	1	MONTGOMERY
	F	78	1	MONTGOMERY
	F	86	1	MONTGOMERY
	M	21	2	MONTGOMERY
	M	24	1	MONTGOMERY
	M	39	1	MONTGOMERY
	M	55	1	MONTGOMERY
	M	73	1	MONTGOMERY
	F	24	1	PRINCE GEORGE'S
	F	28	1	PRINCE GEORGE'S
	F	33	1	PRINCE GEORGE'S
	M	21	1	PRINCE GEORGE'S
	M	27	1	PRINCE GEORGE'S
	M	28	2	PRINCE GEORGE'S
	M	34	1	PRINCE GEORGE'S
	M	47	1	PRINCE GEORGE'S
	M	49	1	PRINCE GEORGE'S
	M	50	1	PRINCE GEORGE'S
	M	66	1	PRINCE GEORGE'S
	M	78	1	PRINCE GEORGE'S
	M	72	1	WICOMICO
	M	21	1	BALTIMORE CITY
	M	28	1	BALTIMORE CITY
	M	50	1	BALTIMORE CITY
	M	22	1	OUT OF STATE
MYCOBACTERIUM ABSCESSUS				
	M		1	ANNE ARUNDEL
	F	24	1	PRINCE GEORGE'S
	F	74	1	BALTIMORE CITY
MYCOBACTERIUM AVIUM COMPLEX				
	M	50	1	ALLEGANY
	F	67	1	ANNE ARUNDEL
	M	92	1	ANNE ARUNDEL
	F	48	1	BALTIMORE
	M	1	1	BALTIMORE
	M	63	1	BALTIMORE

M	94	1	BALTIMORE
M	81	1	CARROLL
M	76	1	CECIL
F	69	1	MONTGOMERY
F	51	1	PRINCE GEORGE'S
M	41	1	PRINCE GEORGE'S
F	78	1	TALBOT
F	66	1	WASHINGTON
F	72	1	WICOMICO
F	73	1	WICOMICO
F	36	1	BALTIMORE CITY
F	43	2	BALTIMORE CITY
F	54	1	BALTIMORE CITY
M	30	1	BALTIMORE CITY
M	43	1	BALTIMORE CITY
M	45	1	BALTIMORE CITY
M	50	1	BALTIMORE CITY
M	53	1	BALTIMORE CITY
M	57	1	BALTIMORE CITY
F	49	1	OUT OF STATE
F	60	1	OUT OF STATE
MYCOBACTERIUM FORTUITUM			
F	34	1	OUT OF STATE
MYCOBACTERIUM FORTUITUM COMPLEX			
M	52	1	ANNE ARUNDEL
F	35	1	BALTIMORE
F	37	1	BALTIMORE
M	57	1	HARFORD
F	26	1	HOWARD
M	55	1	MONTGOMERY
F	24	1	PRINCE GEORGE'S
M	55	1	OUT OF STATE
M	61	1	OUT OF STATE
MYCOBACTERIUM GORDONAE			
M	59	1	MONTGOMERY
M	72	1	PRINCE GEORGE'S
F	27	1	BALTIMORE CITY
M	39	1	BALTIMORE CITY
MYCOBACTERIUM KANSASII			
M	30	1	HARFORD
F	35	1	BALTIMORE CITY
M	30	1	BALTIMORE CITY
M	46	1	BALTIMORE CITY
MYCOBACTERIUM MARINUM			
M	48	1	BALTIMORE
M	53	1	BALTIMORE CITY
TOTAL		**93**	

MYCOBACTERIUM SUSCEPTIBILITY RESULTS

DURING THE MONTH OF MARCH, 2007, WE REPORTED SUSCEPTIBILITY RESULTS ON 20 ISOLATES OF *M. TUBERCULOSIS* COMPLEX.*

2 DRUG RESISTANT STRAINS WERE IDENTIFIED:

#	JURISDICTION	DRUG RESISTANCE
1	MONTGOMERY	® to STREPTOMYCIN and ISONIAZID
1	MONTGOMERY	® to STREPTOMYCIN

* *Mycobacterium tuberculosis* complex consists of:
M. tuberculosis
M. bovis
M. bovis, BCG
M. africanum
M. microti
M. canettii

® RESISTANT

MYCOLOGY

GENUS SPECIES	SEX	AGE	#	JURISDICTION
ACID FAST BACILLI				
	F	35	1	BALTIMORE
	F	22	1	CARROLL
	M	61	1	OUT OF STATE
ASPERGILLUS FLAVUS				
	M	6	1	CALVERT
ASPERGILLUS FUMIGATUS				
	F	73	2	ANNE ARUNDEL
	U		4	ANNE ARUNDEL
	F	37	1	CAROLINE
	F	23	1	FREDERICK
	M	67	1	FREDERICK
	F	71	1	MONTGOMERY
	F	56	1	PRINCE GEORGE'S
	F	70	1	PRINCE GEORGE'S
	M	43	1	PRINCE GEORGE'S
	F	70	1	BALTIMORE CITY
	M	69	1	BALTIMORE CITY
	M	76	1	OUT OF STATE
ASPERGILLUS NIGER				
	F	57	1	ALLEGANY
	M	72	1	ANNE ARUNDEL
	F	90	1	CHARLES
	U		1	BALTIMORE CITY
ASPERGILLUS OCHRACEUS				
	U		1	BALTIMORE CITY
ASPERGILLUS USTUS				
	U		1	BALTIMORE CITY
ASPERGILLUS VERSICOLOR GROUP				
	U		1	ANNE ARUNDEL
CANDIDA ALBICANS				
	F	27	1	ANNE ARUNDEL
	F	30	1	ANNE ARUNDEL
	F	18	1	BALTIMORE
	F	24	1	BALTIMORE
	M	61	1	BALTIMORE
	F	39	1	CALVERT
	M	71	1	CALVERT
	M	53	1	CARROLL
	F	71	1	CHARLES
	F	85	1	CHARLES
	F	22	1	HOWARD
	F	19	2	MONTGOMERY
	F	20	1	MONTGOMERY
	F	28	2	MONTGOMERY
	F	35	1	MONTGOMERY
	F	36	1	MONTGOMERY
	F	39	1	MONTGOMERY
	F	43	1	MONTGOMERY
	F	47	1	MONTGOMERY
	M	78	1	MONTGOMERY
	U	30	1	MONTGOMERY
	U	73	1	MONTGOMERY
	F	18	1	PRINCE GEORGE'S
	F	20	1	PRINCE GEORGE'S
	F	22	1	PRINCE GEORGE'S
	F	40	1	PRINCE GEORGE'S
	F	51	1	PRINCE GEORGE'S
	F	52	1	PRINCE GEORGE'S
	F	56	1	PRINCE GEORGE'S
	F	60	1	PRINCE GEORGE'S
	F	67	1	PRINCE GEORGE'S
	F	70	1	PRINCE GEORGE'S
	F	72	1	PRINCE GEORGE'S
	F	77	1	PRINCE GEORGE'S
	M	41	1	PRINCE GEORGE'S
	M	46	1	PRINCE GEORGE'S

M	57	1	PRINCE GEORGE'S
M	66	1	PRINCE GEORGE'S
M	70	1	PRINCE GEORGE'S
M	78	1	PRINCE GEORGE'S
M	82	1	PRINCE GEORGE'S
M	86	1	PRINCE GEORGE'S
F	18	4	SOMERSET
F	20	2	SOMERSET
F	21	5	SOMERSET
F	22	1	SOMERSET
F	25	1	SOMERSET
M	24	1	SOMERSET
F	70	1	BALTIMORE CITY
F	74	1	BALTIMORE CITY
F	82	1	BALTIMORE CITY
M	36	1	BALTIMORE CITY
M	67	1	BALTIMORE CITY
M	69	1	BALTIMORE CITY
U	64	1	BALTIMORE CITY
F	27	1	OUT OF STATE
CANDIDA GLABRATA			
F	35	1	ANNE ARUNDEL
F	67	1	PRINCE GEORGE'S
M	86	1	PRINCE GEORGE'S
F	32	1	BALTIMORE CITY
CANDIDA KRUSEI			
F	43	1	TALBOT
CANDIDA LAMBICA			
M		1	ALLEGANY
CANDIDA PARAPSILOSIS			
F	43	1	PRINCE GEORGE'S
M	54	1	OUT OF STATE
CANDIDA TROPICALIS			
M	52	1	BALTIMORE
F	60	1	MONTGOMERY
F	39	1	PRINCE GEORGE'S
M	87	1	PRINCE GEORGE'S
CHAETOMIUM SP			
M	57	1	ALLEGANY
CLADOSPORIUM SP			
U		1	BALTIMORE CITY
CRYPTOCOCCUS NEOFORMANS			
M	22	1	PRINCE GEORGE'S
FUSARIUM SP			
M	53	1	ANNE ARUNDEL
F	40	1	TALBOT
NOCARDIA NOVA			
F	70	1	WICOMICO
PENICILLIUM SP			
M	72	1	ANNE ARUNDEL
M	54	1	CHARLES
F	53	1	MONTGOMERY
M	77	1	MONTGOMERY
M	65	1	QUEEN ANNE'S
F	65	1	TALBOT
M	55	1	TALBOT
M	67	1	TALBOT
U		1	BALTIMORE CITY
F	61	1	OUT OF STATE
PHOMA SP			
F	39	1	PRINCE GEORGE'S
RHIZOPUS ORYZAE			
U	73	1	MONTGOMERY
RHODOCOCCUS SP (NOT R. EQUI)			
F	54	1	PRINCE GEORGE'S
RHODOTORULA MUCILAGINOSA			
M	68	1	CARROLL
SACCHAROMYCES CEREVISIAE			
F	95	1	BALTIMORE
M	61	1	BALTIMORE
SCOPULARIOPSIS SP			
F	62	1	TALBOT
TRICHODERMA SP			
M	60	1	BALTIMORE CITY
TRICHOPHYTON MENTAGROPHYTES			
M	40	1	ALLEGANY
TRICHOPHYTON RUBRUM			
F	64	1	ALLEGANY
M	75	1	ANNE ARUNDEL
U		1	ANNE ARUNDEL
U		1	WICOMICO
F	57	1	BALTIMORE CITY
TRICHOPHYTON TONSURANS			
F	4	1	BALTIMORE
M	7	1	PRINCE GEORGE'S
F	73	1	TALBOT
M	4	1	TALBOT
U	5	1	TALBOT
U	3	1	BALTIMORE CITY
YEAST-LIKE ORG(NOT C. ALBICANS)			
F	67	1	CARROLL
TOTAL		**142**	

PARASITOLOGY

GENUS SPECIES	#	JURISDICTION
PROTOZOA		
BLASTOCYSTIS HOMINIS	1	BALTIMORE CITY
	1	MONTGOMERY
	1	QUEEN ANNE'S
DIENTAMOEBA FRAGILIS	1	QUEEN ANNE'S
ENDOLIMAX NANA	1	FREDERICK
	6	MONTGOMERY
	2	PRINCE GEORGE'S
	1	WICOMICO
ENTAMOEBA COLI	1	CARROLL
	1	PRINCE GEORGE'S
ENTAMOEBA HARTMANNI	1	CARROLL
GIARDIA LAMBLIA	1	MONTGOMERY
TOTAL	**18**	
NEMATODES		
ASCARIS LUMBRICOIDES	1	WICOMICO
ENTEROBIUS VERMICULARIS	1	ST. MARY'S
ENTEROBIUS VERMICULARIS	1	WASHINGTON
NECATOR AMERICANUS	1	PRINCE GEORGE'S
TOTAL	**4**	

ARTHROPOD IDENTIFICATION

NO SPECIMENS RECEIVED

TICK IDENTIFICATION

NO SPECIMENS RECEIVED

WATER MICROBIOLOGY

	# TESTED	**# NON-COMPLIANT**
COMMUNITY	7	3
NON-COMMUNITY	224	33
TOTAL	**231**	**36**

FOOD SAFETY

FOOD AND SHELLFISH MICROBIOLOGY

	# OF SAMPLES	NOTABLE PATHOGENS
FOOD	0	0
		# STANDARDS EXCEEDED *
CRABMEAT	0	0
		# STANDARDS EXCEEDED **
SHELLFISH	0	0
SHELLFISH GROWING WATERS	191	
TOTAL	**191**	**0**

STANDARDS

*CRABMEAT-FRESH
ESCHERICHIA COLI = LESS THAN 36 MPN/100 GRAM
STANDARD PLATE COUNT = LESS THAN 100,000 PER GRAM

** SHELLFISH
FECAL COLIFORMS = LESS THAN 230 MPN/100 GRAM
STANDARD PLATE COUNT = LESS THAN 500,000 PER GRAM

VIRUS ISOLATION

ISOLATE	SEX	AGE	#	JURISDICTION
INFLUENZA A				
	F	21	1	ALLEGANY
	F	30	1	ANNE ARUNDEL
	F	2	1	CALVERT
	F	83	1	CALVERT
	F	93	1	CALVERT
	F	17	1	CAROLINE
	F	32	1	CAROLINE
	F		1	MONTGOMERY
	F	20	1	PRINCE GEORGE'S
	F	21	1	PRINCE GEORGE'S
	F	22	1	PRINCE GEORGE'S
	F	26	2	PRINCE GEORGE'S
	M	18	1	PRINCE GEORGE'S
	M	19	1	PRINCE GEORGE'S
	M	20	3	PRINCE GEORGE'S
	M	21	3	PRINCE GEORGE'S
	M	22	1	PRINCE GEORGE'S
	M	23	1	PRINCE GEORGE'S
	U		1	PRINCE GEORGE'S
	M	21	1	BALTIMORE CITY
	F	20	1	OUT OF STATE
	M	20	1	OUT OF STATE
SUBTOTAL			**27**	
INFLUENZA B				
	F	46	1	MONTGOMERY
	F	18	1	PRINCE GEORGE'S
	F	19	1	PRINCE GEORGE'S
	F	22	1	PRINCE GEORGE'S
	M	18	1	PRINCE GEORGE'S
	M	19	1	PRINCE GEORGE'S
	M	20	1	PRINCE GEORGE'S
	M	21	2	PRINCE GEORGE'S
	U	20	1	PRINCE GEORGE'S
	F	12	1	WASHINGTON
	F	14	2	WASHINGTON
	M	7	1	WASHINGTON
	M	10	1	WASHINGTON
	F		1	BALTIMORE CITY
	F	20	1	BALTIMORE CITY
	M	19	1	BALTIMORE CITY
	M	21	1	BALTIMORE CITY
SUBTOTAL			**19**	
PARAINFLUENZA TYPE 3				
	M	20	1	PRINCE GEORGE'S
SUBTOTAL			**1**	
HERPES SIMPLEX UNTYPABLE				
	U	25	1	BALTIMORE
	F	88	1	CALVERT
	F	93	1	CALVERT
	F	26	1	PRINCE GEORGE'S
	M	18	1	TALBOT
	F		1	BALTIMORE CITY
	F	26	1	BALTIMORE CITY
SUBTOTAL			**7**	
HERPES SIMPLEX I				
	F	25	1	ANNE ARUNDEL
	F	21	1	BALTIMORE
	F	24	1	BALTIMORE
	F	25	1	BALTIMORE
	F	22	1	CARROLL
	F	22	1	FREDERICK
	F	18	1	HARFORD
	F	18	1	PRINCE GEORGE'S
	M	22	1	PRINCE GEORGE'S
	F	27	1	WICOMICO
	M	25	1	WICOMICO
	F	17	1	BALTIMORE CITY
	F	29	1	BALTIMORE CITY
	U	17	1	BALTIMORE CITY
SUBTOTAL			**14**	
HERPES SIMPLEX II				
	F	19	1	ALLEGANY
	F	20	1	ALLEGANY
	F	21	1	ALLEGANY
	F		1	ANNE ARUNDEL
	F	19	1	ANNE ARUNDEL
	F	22	1	ANNE ARUNDEL
	F	23	1	ANNE ARUNDEL
	F	24	2	ANNE ARUNDEL
	F	26	1	ANNE ARUNDEL
	F	33	1	ANNE ARUNDEL
	F	34	1	ANNE ARUNDEL
	F	20	1	BALTIMORE
	F	21	1	BALTIMORE
	F	32	1	BALTIMORE
	F	46	1	BALTIMORE
	M	26	1	BALTIMORE
	F	48	1	CALVERT
	M	23	1	CARROLL
	F	25	1	CHARLES
	M	29	1	CHARLES
	F	35	1	FREDERICK
	F	24	1	HARFORD
	F		1	KENT
	F	17	1	KENT
	F	51	1	KENT
	F	26	1	MONTGOMERY
	F	30	1	MONTGOMERY
	F	51	1	MONTGOMERY
	M	41	1	MONTGOMERY
	M	42	1	MONTGOMERY
	F	18	1	PRINCE GEORGE'S
	F	20	1	PRINCE GEORGE'S

F	25	5	PRINCE GEORGE'S
F	28	1	PRINCE GEORGE'S
F	30	1	PRINCE GEORGE'S
F	33	1	PRINCE GEORGE'S
F	35	1	PRINCE GEORGE'S
F	39	1	PRINCE GEORGE'S
M	21	1	PRINCE GEORGE'S
M	23	1	PRINCE GEORGE'S
M	27	1	PRINCE GEORGE'S
M	38	2	PRINCE GEORGE'S
F	21	1	SOMERSET
F	20	1	TALBOT
F	25	1	TALBOT
F	28	1	WASHINGTON
F	31	1	WASHINGTON
F	35	1	WICOMICO
F	23	1	WORCESTER
F		1	BALTIMORE CITY
F	18	1	BALTIMORE CITY
F	19	1	BALTIMORE CITY
F	20	1	BALTIMORE CITY
F	21	3	BALTIMORE CITY
F	23	1	BALTIMORE CITY
F	24	2	BALTIMORE CITY
F	29	1	BALTIMORE CITY
F	34	1	BALTIMORE CITY
F	37	1	BALTIMORE CITY
F	42	1	BALTIMORE CITY
F	46	1	BALTIMORE CITY
M		1	BALTIMORE CITY
M	21	2	BALTIMORE CITY
M	22	3	BALTIMORE CITY
M	23	1	BALTIMORE CITY
M	24	1	BALTIMORE CITY
M	26	3	BALTIMORE CITY
M	27	1	BALTIMORE CITY
M	32	1	BALTIMORE CITY
M	37	1	BALTIMORE CITY
M	41	1	BALTIMORE CITY
M	42	1	BALTIMORE CITY
M	58	1	BALTIMORE CITY
U	22	1	BALTIMORE CITY
F	20	1	OUT OF STATE
SUBTOTAL		**89**	
ROTAVIRUS			
U	34	1	BALTIMORE CITY
SUBTOTAL		**1**	
TOTAL		**158**	

VIRAL HEPATITIS

ORGANISM	# OF SPECIMENS	POSITIVES	JURISDICTION
HEPATITIS A			
	2	0	ALLEGANY
	2	0	ANNE ARUNDEL
	19	0	BALTIMORE
	1	0	CALVERT
	1	0	CARROLL
	1	0	HARFORD
	2	0	MONTGOMERY
	1	0	PRINCE GEORGE'S
	1	0	QUEEN ANNE'S
	1	0	TALBOT
	1	0	WICOMICO
	4	0	BALTIMORE CITY
SUBTOTAL	**36**	**0**	
HEPATITIS B			
	28	0	ALLEGANY
	142	3	ANNE ARUNDEL
	112	1	BALTIMORE
	5	0	CALVERT
	13	0	CAROLINE
	41	0	CARROLL
	113	1	CECIL
	7	0	CHARLES
	1	0	DORCHESTER
	136	2	FREDERICK
	6	0	GARRETT
	63	3	HARFORD
	45	1	HOWARD
	2	0	KENT
	367	5	MONTGOMERY
	342	4	PRINCE GEORGE'S
	7	0	QUEEN ANNE'S
	2	0	ST. MARY'S
	4	0	SOMERSET
	18	0	TALBOT
	50	1	WASHINGTON
	153	0	WICOMICO
	5	0	WORCESTER
	412	10	BALTIMORE CITY
	20	0	OUT OF STATE
	2	0	UNKNOWN
SUBTOTAL	**2,096**	**31**	
HEPATITIS C			
	27	6	ALLEGANY
	146	45	ANNE ARUNDEL
	110	20	BALTIMORE
	5	0	CALVERT
	13	1	CAROLINE
	35	6	CARROLL
	48	4	CECIL
	6	1	CHARLES
	134	4	FREDERICK
	6	0	GARRETT
	29	5	HARFORD
	19	1	HOWARD
	3	0	KENT
	47	3	MONTGOMERY
	185	4	PRINCE GEORGE'S
	8	0	QUEEN ANNE'S
	4	0	ST. MARY'S
	12	2	SOMERSET
	17	0	TALBOT
	64	22	WASHINGTON
	32	4	WICOMICO
	2	1	WORCESTER
	420	112	BALTIMORE CITY
	13	0	OUT OF STATE
	3	2	UNKNOWN
SUBTOTAL	**1,388**	**243**	
TOTAL	**3,520**	**274**	

The Critical Link is accessible at:

http://www.dhmh.state.md.us/labs/html/critical-link.html

RABIES

SOURCE	#	JURISDICTION
BAT	1	MONTGOMERY
CAT	2	BALTIMORE
	1	CECIL
DOG	1	QUEEN ANNE'S
FOX	1	CARROLL
GROUNDHOG	1	HOWARD
RACCOON	1	ANNE ARUNDEL
	2	BALTIMORE
	1	CARROLL
	1	DORCHESTER
	3	FREDERICK
	1	GARRETT
	2	HARFORD
	1	HOWARD
	1	KENT
	1	MONTGOMERY
	1	PRINCE GEORGE'S
	1	QUEEN ANNE'S
	2	SOMERSET
	1	BALTIMORE CITY
	2	UNKNOWN
SKUNK	1	CAROLINE
	1	CHARLES
	1	FREDERICK
	2	ST. MARY'S
TOTAL POSITIVES	**33**	
TOTAL SPECIMENS	**307**	

CHLAMYDOPHILIA (CHLAMYDIA) PSITTACI

REPORTED QUARTERLY
FOR JANUARY 2007 THROUGH MARCH 2007

NO SPECIMENS RECEIVED

PENICILLIN RESISTANT GONORRHEA STATISTICS

REPORTED QUARTERLY
FOR JANUARY 2007 THROUGH MARCH 2007

NO PENICILLIN RESISTANT GONORRHEA REPORTED

CD4 FLOW CYTOMETRY WORKLOAD

REPORTED QUARTERLY
COMPARING JANUARY 2007 THROUGH MARCH 2007 TO
JANUARY 2006 THROUGH MARCH 2006

CASE DEF.	LEVEL 1	LEVEL 2	LEVEL 3	TOTAL
	≥29%	28%-14%	<14%	
1/07 - 3/07	365	730	407	**1502**
1/06 - 3/06	374	699	337	**1410**

NEWBORN & CHILDHOOD SCREENING

STATISTICS FOR MARCH 2007

PRESUMPTIVE POSITIVES

DISORDERS	#
PHENYLKETONURIA	10
MAPLE SYRUP URINE DISEASE	8
HOMOCYSTINURIA	3
TYROSINEMIA	5
ARGININEMIA	0
CITRULLINEMIA	1
GALACTOSEMIA	4
BIOTINIDASE DEFICIENCY	2
HYPOTHYROIDISM	63
HEMOGLOBIN -DISEASE	18
HEMOGLOBIN -BENIGN	288
CONGENITAL ADRENAL HYPERPLASIA (CAH)	74
CYSTIC FIBROSIS	3
FATTY ACID OXIDATIONS	16
ORGANIC ACIDEMIAS	78
ACYLCARNITINE - BORDERLINE	11
ACYLCARNITINE - OTHERS	29

MONTHLY TOTALS

# OF SPECIMENS SCREENED	11,617
NUMBER OF TESTS	823,324
% OF UNSATISFACTORY SPECIMENS	1.9

YEAR-TO-DATE CONFIRMED CASES

CONDITIONS	# CONFIRMED
MCAD	2
3MCC	0
SCAD	0
VLCAD	1
GA-I	1
MAPLE SYRUP URINE DISEASE	1
PKU- CLINICALLY SIGNIFICANT VARIANT	1
VARIATANT HYPERPHENYLALANINEMIA - NOT CLINICALLY SIGNIFICANT	2
GALACTOSEMIA- CLASSICAL GALT DEFICIENCY	0
GALACTOSEMIA - VARIANT	0
BIOTINIDASE DEFICIENCY	0
GALACTOSE EPIMERASE DEFICIENCY	0
PARTIAL BIOTINIDASE DEFICIENCY	1
CAH- CLASSICAL SALT WASTING	1
CAH-NON-CLASSICAL	0
HYPOTHYROIDISM - PRIMARY	3
OTHER HYPOTHYROIDISM	3
SICKLE CELL DISEASE -SS	8
SICKLE CELL DISEASE -SC	1
SICKLE CELL DISEASE -S BETA THALASSEMIA	1
CYSTIC FIBROSIS	1

LEAD SCREENING - BLOOD LEAD

CLASS		RANGE ug/dl	TESTS # of
MARYLAND			
	I	<10	241
	IIA	10-14	12
	IIB	15-19	11
	III	20-44	8
	IV	45-69	0
	V	>69	0
TOTAL			**272**
WASHINGTON DC			
	I	<10	0
	IIA	10-14	0
	IIB	15-19	0
	III	20-44	0
	IV	45-69	0
	V	>69	0
TOTAL			**0**

ENVIRONMENTAL CHEMISTRY

SAMPLES	# NON-COMPLIANT	# TESTED
ASBESTOS		
AIR	0	0
BULK	8	18
AIR QUALITY		
$PM_{2.5}$	0	432
PM_{10}	0	0
RADIATION		
AIR/CHARCOAL FILTERS	0	72
MILK	0	4
WIPES	0	229
RAW WATER	0	12
VEGETATION	0	0
OTHER	0	15
DRINKING WATER		
METALS		
COMMUNITY	4	5
NON-COMMUNITY	4	5
PRIVATE WELLS	81	241
PESTICIDES & PCBs		
COMMUNITY	0	60
NON-COMMUNITY	0	56
PRIVATE WELLS	0	0
VOLATILE ORGANIC COMPOUNDS		
COMMUNITY	0	92
NON-COMMUNITY	0	87
PRIVATE WELLS	0	217
RADIATION		
COMMUNITY	21	49
NON-COMMUNITY	0	0
PRIVATE WELLS	0	0
INORGANICS		
COMMUNITY	0	8
NON-COMMUNITY	8	116
PRIVATE WELLS	6	236
FOOD CHEMISTRY		
SUSPECTED TAMPERING	0	0
MICROSCOPIC FILTH	0	4
LABELING	0	0
SURVEILLANCE	0	7
CHEMICAL CONTAMINATION	0	0
TOTAL	**132**	**1,965**

LEAD ENVIRONMENTAL

TEST	#	ELEV	BRL	UNSAT
TOTAL PAINT	**12**	**3**	**1**	**0**
TOTAL SOIL	**4**	**1**	**2**	**0**
DUST				
FLOOR	360	40	283	0
SILL	657	21	435	0
WELL	254	15	149	0
OTHER	16	3	12	0
TOTAL DUST	**1,287**	**79**	**879**	**0**
GRAND TOTAL	**1,303**	**83**	**882**	**0**

INTERPRETATION OF RESULTS:

# = Number of Samples Received
ELEV= Elevated
BRL= Below Reporting Limit
UNSAT = Unsatisfactory
PAINT Positive in excess of 0.5%
SOIL Action level 400 - 5,000 ppm
DUST Clearance limits: Floor/Other 40 ug/sq ft
Window Sill 250 ug/sq ft
Window Well 400 ug/sq ft

The services and facilities of the Maryland Department of Health and Mental Hygiene (DHMH) are operated on a non-discriminatory basis. This policy prohibits discrimination on the basis of age; ancestry; color; creed; marital status; mental or physical disability; national origin; race; religious affiliation, belief, or opinion; sex; or sexual orientation and applies to the provisions of employment and granting of advantages, privileges and accommodations. The Department, in compliance with the Americans with Disabilities Act, ensures that qualified individuals with disabilities are given an opportunity to participate in and benefit from DHMH services, programs, benefits, and employment opportunities.

VIRAL LOAD SPECIMENS (MARCH 2007)

	HIV–1 RNA COPIES/ML				
JURISDICTION	**$<10^3$**	**10^3-10^4**	**10^4-10^5**	**$>10^5$**	**TOTALS**
ALLEGANY CO	9	0	1	0	10
BALTIMORE CO	4	0	0	0	4
CHEVERLY CTR	51	11	13	8	83
DYER/CLINTON CTR	12	1	1	0	14
FREDERICK CO	0	0	1	0	1
MONTGOMERY CO	91	16	18	8	133
SOMERSET CO	0	1	0	0	1
SPRINGFIELD HOSP	1	0	0	0	1
WICOMICO CO	1	0	0	0	1
SUBTOTAL	169	29	34	16	248
DOC	106	20	30	12	168
TOTAL	**275**	**49**	**64**	**28**	**416**

HIV ANTIBODY SCREENING – BLOOD (MARCH 2007)

SPECIMEN SOURCES	TOTAL	POSITIVE EIA	%	POSITIVE WB	%
HEALTH DEPARTMENTS AND CLINICS	2,722	129	4.74%	118	91.47%
HOSPITALS	160	12	7.50%	12	100.00%
DETENTION CENTERS	590	11	1.86%	10	90.91%
PRIVATE PHYSICIANS	17	0	0.00%	0	0.00%
STUDENT HEALTH CLINICS	290	0	0.00%	0	0.00%
EMPLOYEE HEALTH CLINICS	1	0	0.00%	0	0.00%
AUTOPSIES	305	14	4.59%	9	64.29%
ORGAN/TISSUE DONORS	62	1	1.61%	0	0.00%
TOTAL	**4,147**	**167**	**4.03%**	**149**	**89.22%**

MAILING LABEL

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