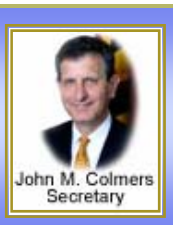

Maryland Department of
Health & Mental Hygiene
John M. Colmers, Secretary

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CRITICAL LINK

Building a world class organization
Healthy People Healthy Communities
Maryland Department of Health & Mental Hygiene

December 2007 Volume 11, Number 12

Legionellae: Ecology, Detection and Control

Over the past decade, several outbreaks of Legionnaire's disease have involved buildings in Maryland.[1] The bacteria that cause this disease are representatives of a group of microorganisms that survive as intracellular parasites in free-living protozoa. This family of bacteria, the *Legionellaceae*, was unknown until 1977, mostly because of its unique ecology. Alteration of the environment for human benefit using industrial technologies has led to an increase in opportunities for these microorganisms to cause human disease.

Legionnaire's disease is the pneumonic and more severe form of legionellosis. The other form of respiratory illness is Pontiac fever. There is now some evidence that Pontiac fever outbreaks may be associated with exposure to bacterial endotoxin.[2,3] Community based incidence studies[4] have estimated there are between 8,000 and 18,000 cases of legionellosis annually in the U.S. These studies have also shown that a majority of these cases are sporadic, with only about 4% involving outbreaks. The sources of sporadic, community-acquired cases are hard to identify due to the microorganism's ubiquitous nature. However, even though they are common in the environment, they do not cause frequent disease.[5] For more detailed information on the clinical and diagnostic aspects of legionellosis, the reader is referred to *Critical Link,* Volume 11, No. 5 (May, 2007).

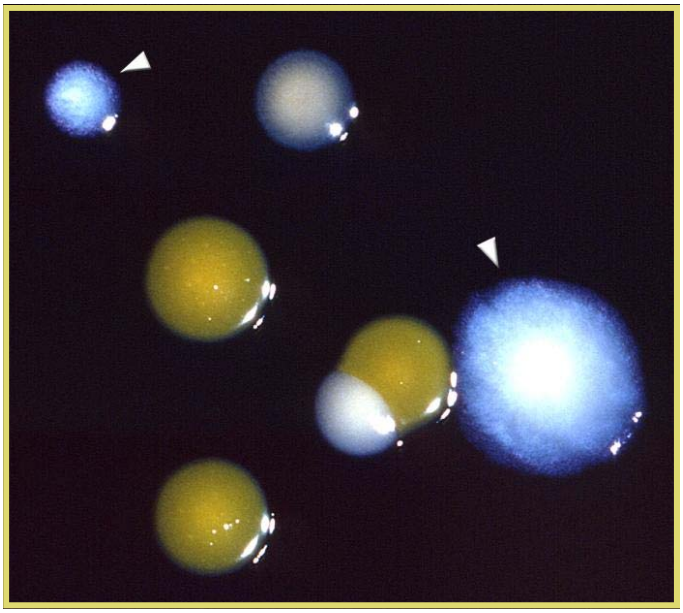

Figure 1: This image depicts two *Legionella pneumophila* bacterial colonies (arrowheads), amongst other bacterial colonies grown on BCYE (Buffered Charcoal Yeast Extract) agar, also known as *"Legionella agar."* Source: CDC Public Health Image Library

Members of *Legionella* are Gram-negative, obligately aerobic, rod-shaped, motile bacteria. There are currently 49 species making up 71 distinct serogroups in the genus. Around half of the 49 species of *Legionella*

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Legionellae: Ecology, Detection and Control

have been associated with human disease. However, a single species, *L. pneumophila*, causes about 90% of all documented cases of legionellosis. It is probable that most species can cause human disease under the right conditions, but many species are undetectable because they occur rarely and diagnostic antisera for many species and serogroups are not commercially available.

There also appear to be a number of unidentified legionellae that cannot be grown on routine *Legionella* media. These microorganisms have been named *Legionella*-like amoebal pathogens (LLAPs) due to their detection in protozoan cells.[6]

Although legionellosis can be readily treated with appropriate antimicrobials, methods to prevent transmission of the bacteria from the environment to susceptible hosts are much less efficient. The disease can occur when sufficient numbers of legionellae are aerosolized and subsequently inhaled. Since these bacteria are found primarily in freshwater environments, much of the following discussion is associated with microbiological examination of water.

Ecology

A conceptual chain of causation describing events that lead to an outbreak of legionellosis states[7] that legionellae must be present in an environmental reservoir, multiply from low to high concentrations, and be disseminated from a reservoir to expose susceptible individuals. This chain of events serves as a model to understand the epidemiology of legionellosis as well as development of prevention strategies.

Legionellae are hard to detect in the environment and even more difficult to detect clinically. Their fastidious nature is directly related to the fact that they derive nutrients from and multiply in an intracellular environment. The microorganisms multiply within free-living, single-cell protozoans. Legionellae reportedly multiply in 14 species of amoebae, two species of ciliated protozoa, and one of slime mold.[8] Although human phagocytes occasionally can become surrogates, protozoa appear to be the natural hosts of legionellae.

Several outbreaks of legionellosis have been associated with construction, and it was originally believed that the bacteria could survive and be transmitted to humans via soil. However, legionellae do not survive in dry environments, and these outbreaks were more likely caused by massive descalement of plumbing systems due to changes in water pressure during construction.[9,10]

Inhalation of legionellae in aerosolized droplets is the primary means of transmission for legionellosis. No person-to-person transmission of Legionnaires' disease has been documented. Two general types of devices have been implicated as sources of aerosol transmission. One type produces aerosols of contaminated potable water (e.g., showers, tap water faucets, respiratory therapy equipment). The other type involves nonpotable water (e.g., water cooling towers, whirlpool spas).

Detection

Culturing environmental samples for the presence of *Legionella* is required to establish the source of an outbreak of Legionnaires' disease, to determine the efficacy of a disinfection program, and to evaluate the potential of a device to transmit the disease. However, recommendations that call for the routine culturing of water samples in the absence of documented cases of legionellosis are highly controversial because detection of legionellae in an environmental source is not reliable evidence of the potential for disease.

There is general agreement that such environmental sampling can be beneficial in institutions housing individuals at very high risk for acquiring Legionnaires' disease. However, those undertaking such a monitoring program must understand that the objective must be the absence of detectable legionellae in the water systems. In addition, there are no data to show the frequency of testing or the appropriate number of sites to test. Knowing a scientifically based number of legionellae that are acceptable in water systems would be useful in

(Continued on page 3)

The services and facilities of the Maryland Department of Health and Mental Hygiene (DHMH) are operated on a nondiscriminatory 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.

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helping control the disease. Unfortunately, differences in building design, individual susceptibility, species and strain differences in virulence, and variations in aerosol mechanics preclude development of such a number. The number and types of sites that should be tested to detect legionellae must be determined on an individual basis because a diversity of plumbing, heating and air-conditioning systems occur in a variety of institutions, ranging from hospitals and retirement homes to hotels and industrial facilities.

Generally, any source of water that may be aerosolized should be considered a potential source for the transmission of legionellae. The bacteria are rarely found in municipal water supplies and tend to colonize plumbing systems and point-of-use devices. To colonize a system, the bacteria must multiply, and this requires temperatures above 25°C.[12] This means legionellae are most commonly found in hot water systems. Since the bacteria do not survive drying, condensate from air-conditioning equipment, that frequently evaporates, is not a likely source.

An environmental sampling protocol for use when sampling within a hospital was published in 1987.[11] This protocol can serve as a prototype for identifying sampling sites in a variety of institutions. Two primary types of sample should be collected for the detection of legionellae. These are water samples and swabs of point-of-use devices or system surfaces.[13] Samplers should collect at least one liter of water in case it is necessary to concentrate the sample. If a water source has recently been treated with chlorine or bromine, 0.5 ml of 0.1 N sodium thiosulfate must be added to each one-liter sample to neutralize the disinfectant.

Swabs allow sampling of biofilms that frequently contain legionellae. Swabs can be taken from various points within plumbing systems or from surfaces of basins of cooling towers or spas. Swabs of faucet aerators and showerheads should be taken in conjunction with water samples from these sites and should be taken with the aerator or showerhead removed.

Swabs can be streaked directly onto an agar culture plate or submerged in a small volume of water taken at the same time to prevent drying during transport to the laboratory. All samples should be transported to the laboratory in insulated coolers as protection from extreme heat or cold. Samples that cannot be processed within 72 hours from the time of collection should be refrigerated.

Potable water samples generally have low bacterial concentrations and are either cultured directly or concentrated 10-fold or more by using either filtration or centrifugation. Non-potable waters, such as those from cooling towers, usually do not require concentration because they have high bacterial concentrations. For some water samples with high bacterial concentrations a selective procedure is required to reduce the number of non-*Legionella* bacteria before culturing. Non-*Legionella* bacteria can be selectively killed by acid pre-treatment or brief exposure to higher temperatures.[14] Legionellae are more resistant to lower pH and brief exposures to higher temperatures than many other freshwater bacteria.

The base media used to grow most legionellae is buffered charcoal yeast extract (BCYE) agar. Colonies of legionellae require approximately 72 hours to appear on BCYE agar but may require seven days or more. Culture plates should be examined with a dissecting microscope and light source (see figure 1). Colonies resembling legionellae can be presumptively identified by their

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requirement for L-cysteine. Subcultured colonies that grow on BCYE agar, but not on blood agar or BCYE without L-cysteine, are presumed to be legionellae.

Definitive identification can be completed by using a direct fluorescent antibody (DFA) or a slide agglutination test with specific antisera. However, the use of DFA is limited because there are no antisera that specifically react with all *Legionella* species. Reports on the sensitivity and specificity of DFA testing with environmental isolates are quite variable, and most studies indicate that the test is relatively insensitive and nonspecific.[15]

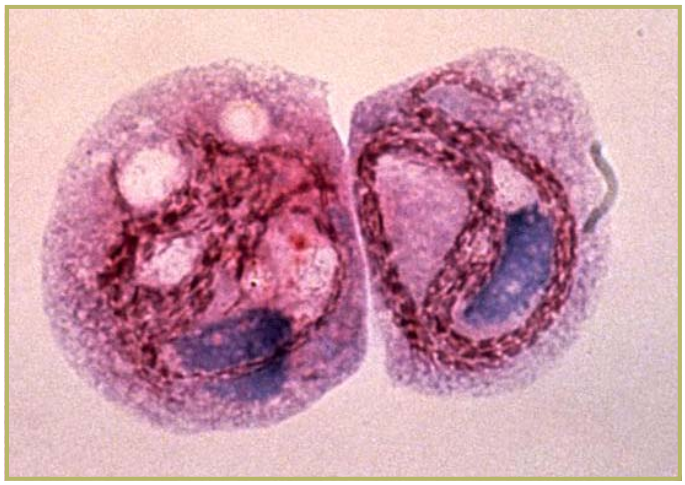

Figure 2: This photomicrograph depicts two ciliated *Tetrahymena pyriformis* protozoa containing red chains of intracellular *Legionella pneumophila* bacteria that are undergoing multiplication. Source: CDC Public Health Image Library

The use of PCR (polymerase chain reaction) to detect legionellae in the environment has proved valuable in some investigations of outbreaks.[16] Use of PCR to detect legionellae in the environment suggests up to 80% of freshwaters are positive while only 20-40% are positive by culture.[17-18] This discrepancy could be due to the presence of nonviable or injured microorganisms or the presence of related organisms that cannot be detected by conventional culture methods. Until there is a better understanding of the diversity and distribution of legionellae, results from non-culture-based methods must be interpreted cautiously. The Laboratories Administration uses a real-time PCR assay that can detect DNA from *Legionella spp.* and *Legionella pneumophila* in clinical specimens associated with outbreak investigations. However, this assay is not available for routine clinical diagnostic purposes or for testing environmental samples.

Environmental Control

Practical information on treatment processes that effectively control legionellae is limited. A number of biocides and other disinfection methods (e.g., heat eradication, UV radiation, ionization, ozonation) have been tested for their abilities to kill legionellae.[19] However, these types of studies have not resulted in effective prevention protocols. In the U.S., there currently are 13 guidelines that address prevention and control of legionellosis.[20] These guidelines address maintenance temperatures, biocide levels, and emergency procedures for a number of building water systems including potable systems, cooling towers, and heated spas. Legionellae are rarely isolated from water treatment plants. This is probably due to the lower temperatures of these waters. Legionellae are more frequently present in higher concentrations and detected in warm or thermally altered environments.[21]

Recent studies suggest that the use of monochloramine as the primary disinfectant for municipal water supplies may provide a community-based approach to controlling legionellae in potable water systems. One study[22] showed that hospitals supplied with drinking water treated with monochloramine were 10 times less likely to have an outbreak of Legionnaires' disease than those with water treated with chlorine as a primary disinfectant. In a later study[23] in Florida, the number of buildings positive for legionellae decreased from 19 of 96 (19.8%) to 6 of 96 (6.2%) one month after converting from free chlorine to monochloramine. In a similar study[24] in California, the number of colonized buildings decreased from 37 of 53 (70%) to 5 of 53 (9%) after conversion to monochloramine.

These studies strongly show that monochloramine reduces colonization of building potable water systems by legionellae. Twenty-three percent of U.S. municipalities currently use monochloramine as the primary disinfectant.[25] This use is primarily in response to EPA regulations that require reduction in levels of carcinogenic trihalomethanes produced by disinfectants.[25]

Practices to control legionellae in amplifying reservoirs consist of routine maintenance and emergency decontamination procedures. Maintenance of respiratory therapy equipment requires that potable water not be used to rinse the equipment before patient use.[26] Well-maintained equipment prevents excessive growth of legionellae. There are also a number of documents that address routine maintenance of cooling towers, evaporative condensers, and whirlpool spas. These are based on manufacturers' instructions involving cleaning and use of biocides.[20] There are also guidelines for controlling nosocomial legionellosis in hospitals and transplant facilities.[27-29]

The principal methods for disinfection of potable water systems are heat flushing with water maintained at 60°C or higher, hyperclorination, and physical cleaning of hot water tanks. Unfortunately, potable systems are

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Legionellae: Ecology, Detection and Control

easily recolonized and may require continuous interventions. Effective prevention strategies require more effective approaches to prevent amplification of legionellae in potential reservoirs. Questions concerning *Legionella* detection and control may be directed to the Laboratories Administration's Virology and Immunology Division (410-767-5772) or Environmental Microbiology Division (410-767-5074).

Material for this article compiled by Jack DeBoy, Dr.P.H.

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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 09/01/07 - 09/30/07

ENTERIC BACTERIOLOGY

GENUS SEROVAR	SEX	AGE	#	JURISDICTION
CAMPYLOBACTER CURVUS				
	M	78	1	ANNE ARUNDEL
CAMPYLOBACTER JEJUNI				
	M	40	1	BALTIMORE
	M	58	1	CHARLES
	M	31	1	DORCHESTER
	M	60	1	HARFORD
	F	11	1	MONTGOMERY
	F	17	1	MONTGOMERY
	M	51	1	MONTGOMERY
	M	1	1	PRINCE GEORGE'S
CAMPYLOBACTER SPECIES				
	F	21	1	FREDERICK
SALMONELLA ANATUM				
	F	61	1	FREDERICK
SALMONELLA BARDO				
	F	24	1	WICOMICO
SALMONELLA BLOCKLEY				
	F	18	1	ANNE ARUNDEL
	U	70	1	OUT OF STATE
SALMONELLA BOVISMORBIFICANS				
	F	66	1	ANNE ARUNDEL
	U	2	1	MONTGOMERY
SALMONELLA BRAENDERUP				
	U	20	1	MONTGOMERY
SALMONELLA CHOLERAESUIS				
	M	76	1	CARROLL
SALMONELLA ENTERITIDIS				
	F	68	1	ANNE ARUNDEL
	M	21	1	ANNE ARUNDEL
	F		2	BALTIMORE
	F	13	1	BALTIMORE
	F	19	1	BALTIMORE
	F	34	1	BALTIMORE
	M	12	1	HOWARD
	M	9	1	PRINCE GEORGE'S
	M	16	1	TALBOT
	F		2	BALTIMORE CITY
	F	10	1	BALTIMORE CITY
	F	68	1	BALTIMORE CITY
	M		4	BALTIMORE CITY
	M	41	1	BALTIMORE CITY
	M	51	1	BALTIMORE CITY
	U	66	1	OUT OF STATE
SALMONELLA HARTFORD				
	M	26	1	ANNE ARUNDEL

SALMONELLA I ROUGH:NONMOTILE

F	64	1	BALTIMORE CITY

SALMONELLA JAVA

U		1	ALLEGANY
M	18	1	ANNE ARUNDEL
F	53	1	WASHINGTON
U		1	OUT OF STATE
U	6	1	OUT OF STATE

SALMONELLA JAVIANA

F		1	ANNE ARUNDEL
M	88	1	MONTGOMERY
F	2	1	WICOMICO
F	34	1	WORCESTER
F	4	1	OUT OF STATE
U	37	1	OUT OF STATE
M	55	1	UNKNOWN

SALMONELLA LINDENBURG

U	6	1	MONTGOMERY

SALMONELLA MONSCHAUI

F		1	BALTIMORE

SALMONELLA MONTEVIDEO

F	20	1	FREDERICK
M		1	FREDERICK

SALMONELLA NEWPORT

M		1	BALTIMORE
M	1	1	HOWARD
M	77	1	ST. MARY'S
F	9	1	WICOMICO
F	67	1	WICOMICO
M	63	1	WICOMICO
U		1	WICOMICO
F		1	BALTIMORE CITY
M	59	1	BALTIMORE CITY
U	44	1	OUT OF STATE
U	59	1	OUT OF STATE

SALMONELLA READING

U		1	ANNE ARUNDEL
M	10	1	BALTIMORE CITY

SALMONELLA SCHWARZENGRUND

M	1	1	OUT OF STATE

SALMONELLA TYPHI

F	10	1	HOWARD
F	12	1	PRINCE GEORGE'S

SALMONELLA TYPHIMURIUM

U	1	1	ANNE ARUNDEL
M	12	1	BALTIMORE
U	2	1	MONTGOMERY
F	48	1	PRINCE GEORGE'S
M	1	1	WASHINGTON
M		1	WICOMICO
M	66	1	WICOMICO
M	35	1	BALTIMORE CITY
M	12	1	OUT OF STATE
M	34	1	OUT OF STATE
U	2	1	OUT OF STATE
U	27	1	OUT OF STATE

SALMONELLA TYPHIMURIUM VAR COPENHAGEN

M	60	1	ANNE ARUNDEL

SALMONELLA UNTYPABLE

F	25	1	MONTGOMERY

SALMONELLA WELTEVREDEN

U	70	1	CECIL

SALMONELLA 4,12:i:-

M		1	BALTIMORE CITY

SALMONELLA 4,5,12:i:-

M	7	1	WASHINGTON
F	18	1	BALTIMORE CITY
F		1	UNKNOWN

SHIGELLA FLEXNERI II:3,4

M	20	1	MONTGOMERY

SHIGELLA SONNEI

M	13	1	HOWARD
F	4	1	MONTGOMERY
F	6	1	MONTGOMERY
U	2	1	MONTGOMERY
U	3	1	BALTIMORE CITY

VIBRIO ALGINOLYTICUS

M	9	1	BALTIMORE
M	34	1	BALTIMORE
U	67	1	DORCHESTER
U	10	1	OUT OF STATE

VIBRIO PARAHAEMOLYTICUS

F	70	1	PRINCE GEORGE'S
M	5	1	TALBOT

VIBRIO VULNIFICUS

U		1	ANNE ARUNDEL
M	75	1	WICOMICO

YERSINIA ENTEROCOLITICA

M	53	1	QUEEN ANNE'S

TOTAL **107**

ISOLATES – THROAT CULTURES

COUNTY	GROUP A[1]	NON-GROUP A
ALLEGANY	3	21
BALTIMORE CITY	0	2
BALTIMORE	0	1
SOMERSET	1	7
WICOMICO	5	8
TOTAL	**9**	**39**

[1] *Streptococcus pyogenes*

BACTERIOLOGY IDENTIFICATIONS
Referrals

GENUS SPECIES

SOURCE	#	JURISDICTION
HAEMOPHILUS INFLUENZAE SEROTYPE C		
BLOOD	1	ANNE ARUNDEL
HAEMOPHILUS INFLUENZAE SEROTYPE F		
BLOOD	2	BALTIMORE CITY
NEISSERIA MENINGITIDIS SEROGROUP B		
CSF	1	BALTIMORE CITY
TOTAL	**4**	

ISOLATES – MISCELLANEOUS

GENUS SPECIES

SOURCE	#	JURISDICTION
ACINETOBACTER CALCOACETICUS-BAUMANNII COMPLEX		
PENIS	1	CECIL
TOE	1	FREDERICK
ACTINOMYCES MEYERI		
BLOOD	1	BALTIMORE CITY
BACILLUS SPECIES		
FOOT	1	FREDERICK
TOE	2	FREDERICK
BREVIBACTERIUM SPECIES		
BLOOD	1	BALTIMORE CITY
CITROBACTER KOSERI		
TOE	1	FREDERICK
CLOSTRIDIUM SPECIES		
BLOOD	1	BALTIMORE CITY

CLOSTRIDIUM SUBTERMINALE		
BLOOD	1	BALTIMORE CITY
CORYNEBACTERIUM SPECIES		
BLOOD	3	BALTIMORE CITY
FOOT	1	CARROLL
TOE	2	FREDERICK
NIPPLE	1	GARRETT
WOUND	1	PRINCE GEORGE'S
CORYNEBACTERIUM XEROSIS		
BLOOD	1	BALTIMORE CITY
ENTEROBACTER SPECIES		
BLOOD	1	BALTIMORE CITY
ENTEROCOCCUS CLOACAE		
BLOOD	1	BALTIMORE CITY
ENTEROCOCCUS FAECALIS		
PORTA-CATH TIP	1	BALTIMORE CITY
TOE	2	FREDERICK
FOOT	1	FREDERICK
ESCHERICHIA COLI		
PENIS	1	FREDERICK
EAR	1	SOMERSET
GARDNERELLA VAGINALIS		
VAGINAL	1	BALTIMORE CITY
VAGINAL	1	CECIL
VAGINAL	1	PRINCE GEORGE'S
VAGINAL	5	SOMERSET
KLEBSIELLA PNEUMONIAE		
BLOOD	1	BALTIMORE CITY
PENIS	1	CECIL
MORGANELLA MORGANII		
TOE	1	FREDERICK
PANTOEA AGGLOMERANS		
TOE	1	FREDERICK
PROTEUS MIRABILIS		
BLOOD	1	BALTIMORE CITY
HIP	1	CARROLL
PROTEUS SPECIES		
BLOOD	1	BALTIMORE CITY
VAGINAL	1	SOMERSET
PSEUDOMONAS AERUGINOSA		
NARES	1	CARROLL
SPUTUM	1	CARROLL
TOE	2	FREDERICK
FOOT	1	FREDERICK
EAR	1	SOMERSET
PSEUDOMONAS PUTIDA		
BLOOD	1	BALTIMORE CITY
RHIZOBIUM RADIOBACTER		
BLOOD	1	BALTIMORE CITY
STAPHYLOCOCCUS AUREUS		
WOUND	1	BALTIMORE
CSF	1	BALTIMORE CITY
JAW	1	CARROLL
SPUTUM	1	CARROLL
PENIS	1	CECIL
FOOT	2	FREDERICK
TOE	4	FREDERICK
ABSCESS	1	PRINCE GEORGE'S
WOUND	2	PRINCE GEORGE'S
PENIS	1	SOMERSET
STAPHYLOCOCCUS EPIDERMIDIS		
BLOOD	1	BALTIMORE CITY
STAPHYLOCOCCUS SPECIES		
WOUND	1	BALTIMORE
BLOOD	4	BALTIMORE CITY
FOOT	1	CARROLL
HIP	1	CARROLL
FOOT	2	FREDERICK
TOE	5	FREDERICK
NIPPLE	1	GARRETT
WOUND	1	PRINCE GEORGE'S
STAPHYLOCOCCUS WARNERI		
BLOOD	1	BALTIMORE CITY
STENOTROPHOMONAS MALTOPHILIA		
BLOOD	1	BALTIMORE CITY
STREPTOCOCCUS BETA-HEMOLYTIC GROUP A		
CSF	1	BALTIMORE CITY
STREPTOCOCCUS BETA-HEMOLYTIC GROUP B		
VAGINAL	1	ANNE ARUNDEL
BLOOD	1	BALTIMORE CITY
VAGINAL	1	BALTIMORE CITY
PENIS	1	CECIL
FOOT	1	FREDERICK
VAGINAL	3	HOWARD
VAGINAL	12	PRINCE GEORGE'S
VAGINAL	5	SOMERSET
PENIS	1	SOMERSET
STREPTOCOCCUS INTERMEDIUS		
BLOOD	1	BALTIMORE CITY
STREPTOCOCCUS ORALIS		
BLOOD	1	BALTIMORE CITY
STREPTOCOCCUS VIRIDANS GROUP		
BLOOD	1	BALTIMORE CITY
TOTAL	**115**	

SEXUALLY TRANSMITTED DISEASES

GENUS SPECIES	SEX	#	JURISDICTION
NEISSERIA GONORRHEAE			
	F	2	ALLEGANY
	M	4	ALLEGANY
	F	4	ANNE ARUNDEL
	M	4	ANNE ARUNDEL
	F	1	BALTIMORE
	M	1	CALVERT
	F	3	CHARLES
	M	1	CHARLES
	F	0	DORCHESTER
	M	2	DORCHESTER
	M	1	HARFORD
	F	1	KENT
	M	1	KENT
	F	2	MONTGOMERY
	M	5	MONTGOMERY
	F	27	PRINCE GEORGE'S
	M	49	PRINCE GEORGE'S
	F	0	SOMERSET
	M	1	SOMERSET
	F	1	TALBOT
	M	0	TALBOT
	F	2	WASHINGTON
	F	1	WICOMICO
	M	11	WICOMICO
	F	0	WORCESTER
	M	2	WORCESTER
	F	1	BALTIMORE CITY
	M	8	BALTIMORE CITY
TOTAL		**135**	
CHLAMYDIA TRACHOMATIS			
	F	4	ALLEGANY
	M	2	ALLEGANY
	F	18	ANNE ARUNDEL
	M	10	ANNE ARUNDEL
	F	19	BALTIMORE
	M	9	BALTIMORE
	F	3	CALVERT
	M	1	CALVERT
	F	1	CAROLINE
	M	1	CAROLINE
	F	3	CARROLL
	M	3	CARROLL

F	1	CECIL
M	2	CECIL
F	10	CHARLES
M	7	CHARLES
F	1	DORCHESTER
M	3	DORCHESTER
F	12	FREDERICK
M	1	FREDERICK
F	9	HARFORD
M	7	HARFORD
F	4	HOWARD
M	3	HOWARD
F	1	KENT
M	1	KENT
F	13	MONTGOMERY
M	8	MONTGOMERY
F	56	PRINCE GEORGE'S
M	15	PRINCE GEORGE'S
F	2	QUEEN ANNE'S
F	2	ST. MARY'S
F	5	SOMERSET
M	1	SOMERSET
F	3	TALBOT
M	1	TALBOT
F	5	WASHINGTON
M	3	WASHINGTON
F	18	WICOMICO
M	10	WICOMICO
F	1	WORCESTER
F	7	BALTIMORE CITY
M	23	BALTIMORE CITY
F	4	OUT OF STATE
M	4	OUT OF STATE
TOTAL	**317**	

SYPHILLIS SEROLOGY

M	2	ALLEGANY
F	2	ANNE ARUNDEL
M	1	ANNE ARUNDEL
F	5	BALTIMORE
M	7	BALTIMORE
F	9	BALTIMORE CITY
M	25	BALTIMORE CITY
M	1	CARROLL
M	1	DORCHESTER
M	1	HOWARD
M	6	MONTGOMERY
F	5	PRINCE GEORGES
M	10	PRINCE GEORGES
U	1	PRINCE GEORGES
F	1	WASHINGTON
F	1	WICOMICO
M	2	WICOMICO
TOTAL	**80**	

PENICILLIN RESISTANT GONORRHEA STATISTICS

REPORTED QUARTERLY
FOR JULY 2007 THROUGH SEPTEMBER 2007

NO PENICILLIN RESISTANT GONORRHEA REPORTED

MYCOBACTERIOLOGY

GENUS SPECIES

SEX	AGE	#	JURISDICTION
MYCOBACTERIUM TUBERCULOSIS			
M	38	1	PRINCE GEORGE'S
M	42	1	BALTIMORE CITY
MYCOBACTERIUM TUBERCULOSIS COMPLEX			
F	35	1	BALTIMORE
F	76	1	BALTIMORE
M	75	1	BALTIMORE
M	48	1	CHARLES
M	42	1	HARFORD
M	59	1	HOWARD
F	25	1	MONTGOMERY
F	62	1	MONTGOMERY
M	22	1	MONTGOMERY
M	31	2	MONTGOMERY
M	47	1	MONTGOMERY
M	55	1	MONTGOMERY
M	83	1	MONTGOMERY
M	86	1	MONTGOMERY
M	93	1	MONTGOMERY
U	41	1	MONTGOMERY
F	18	1	PRINCE GEORGE'S
F	23	1	PRINCE GEORGE'S
F	51	1	PRINCE GEORGE'S
M	24	2	PRINCE GEORGE'S
M	25	1	PRINCE GEORGE'S
M	29	1	PRINCE GEORGE'S
M	47	1	PRINCE GEORGE'S
F	42	1	WASHINGTON
F	25	1	BALTIMORE CITY
M	38	1	BALTIMORE CITY
M	42	1	BALTIMORE CITY
M	58	2	BALTIMORE CITY
F	72	1	OUT OF STATE
M	54	1	OUT OF STATE
MYCOBACTERIUM AVIUM COMPLEX			
F	78	1	ALLEGANY
F	90	1	ALLEGANY
M	35	1	ALLEGANY
F	25	1	BALTIMORE
F	40	1	BALTIMORE
F	69	1	BALTIMORE
M	32	1	BALTIMORE
F	84	1	CARROLL
M	42	1	DORCHESTER
F	61	1	FREDERICK
F	68	1	FREDERICK
F	81	1	FREDERICK
M	44	1	HOWARD
M	72	1	HOWARD
F	72	1	MONTGOMERY
M	47	1	MONTGOMERY
M		1	WASHINGTON
M	76	1	WASHINGTON
F	28	1	BALTIMORE CITY
F	41	1	BALTIMORE CITY
F	49	1	BALTIMORE CITY
F	61	1	BALTIMORE CITY
F	75	1	BALTIMORE CITY
F	78	1	BALTIMORE CITY
M	37	1	BALTIMORE CITY
M	43	1	BALTIMORE CITY
M	56	1	BALTIMORE CITY
M	68	1	OUT OF STATE
MYCOBACTERIUM CHELONAE			
M	37	1	OUT OF STATE
MYCOBACTERIUM FORTUITUM			
M	45	1	MONTGOMERY
M	33	1	OUT OF STATE
M	42	1	OUT OF STATE
MYCOBACTERIUM FORTUITUM COMPLEX			
F	16	1	ANNE ARUNDEL
F	50	1	HARFORD
M	65	1	HARFORD
F	81	1	MONTGOMERY
F	23	1	PRINCE GEORGE'S
M	55	1	PRINCE GEORGE'S

M	18	1	BALTIMORE CITY
F	67	1	OUT OF STATE
M	41	1	OUT OF STATE
MYCOBACTERIUM GORDONAE			
F	30	1	MONTGOMERY
M	31	1	MONTGOMERY
M	73	1	MONTGOMERY
F	65	1	PRINCE GEORGE'S
M	48	1	QUEEN ANNE'S
M	76	1	BALTIMORE CITY
M	54	1	OUT OF STATE
MYCOBACTERIUM KANSASII			
M	51	1	BALTIMORE
M	25	1	PRINCE GEORGE'S
M	63	1	PRINCE GEORGE'S
TOTAL		**86**	

MYCOBACTERIUM SUSCEPTIBILITY RESULTS

DURING SEPTEMBER, 2007, SUSCEPTIBILITY RESULTS ON 26 ISOLATES OF *M. TUBERCULOSIS* COMPLEX * WERE IDENTIFIED.

TOTAL: 7 DRUG RESISTANT STRAINS FOUND

#	COUNTY	DRUG
1	BALTIMORE	® to STREPTOMYCIN
1	CHARLES	® to ISONIAZID and STREPTOMYCIN
2	MONTGOMERY	® to STREPTOMYCIN
2[A]	PRINCE GEORGE'S	® to STREPTOMYCIN
1	HOWARD	® to RIFAMPIN

[A] Two isolates from the same patient

® RESISTANT

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

MYCOLOGY

GENUS SPECIES	SEX	AGE	#	JURISDICTION
AEROBIC ACTINOMYCETES				
	M	68	1	CAROLINE
ALTERNARIA SP				
	F	32	1	BALTIMORE
ASPERGILLUS FLAVUS				
	U		1	ANNE ARUNDEL
ASPERGILLUS FUMIGATUS				
	F		1	ANNE ARUNDEL
	F	49	1	MONTGOMERY
	M	68	1	MONTGOMERY
	F	69	1	PRINCE GEORGE'S
ASPERGILLUS NIGER				
	M	10	1	TALBOT
ASPERGILLUS VERSICOLOR GROUP				
	F		1	ANNE ARUNDEL
	F	51	1	ANNE ARUNDEL
	F	59	1	ANNE ARUNDEL
	F	65	1	ANNE ARUNDEL
	F	77	1	ANNE ARUNDEL
	M		2	ANNE ARUNDEL
	U		1	ANNE ARUNDEL
	F	44	1	BALTIMORE CITY
BIPOLARIS SP				
	M	65	1	ANNE ARUNDEL
	F	47	1	PRINCE GEORGE'S
	M	63	1	TALBOT
CANDIDA ALBICANS				
	F	20	1	ANNE ARUNDEL
	F	20	1	BALTIMORE
	F	35	1	CALVERT
	M	54	1	CALVERT
	F	62	1	CARROLL
	M	20	2	CECIL
	U	21	1	CECIL
	F	53	1	FREDERICK
	M	40	1	FREDERICK
	F	49	1	MONTGOMERY
	M		1	MONTGOMERY
	M	36	1	MONTGOMERY
	M	39	1	MONTGOMERY
	M	46	1	MONTGOMERY
	M	51	1	MONTGOMERY
	M	59	1	MONTGOMERY
	F	13	1	PRINCE GEORGE'S
	F	17	1	PRINCE GEORGE'S
	F	18	1	PRINCE GEORGE'S
	F	19	1	PRINCE GEORGE'S
	F	20	1	PRINCE GEORGE'S
	F	21	1	PRINCE GEORGE'S
	F	24	1	PRINCE GEORGE'S
	F	46	1	PRINCE GEORGE'S
	F	59	1	PRINCE GEORGE'S
	F	63	1	PRINCE GEORGE'S
	M	19	1	PRINCE GEORGE'S
	M	49	1	PRINCE GEORGE'S
	M	75	1	PRINCE GEORGE'S
	M	77	1	PRINCE GEORGE'S
	M	82	1	PRINCE GEORGE'S
	M	90	1	PRINCE GEORGE'S
	F	17	2	SOMERSET
	F	18	5	SOMERSET
	F	19	4	SOMERSET
	F	20	3	SOMERSET
	F	21	2	SOMERSET
	F	22	1	SOMERSET
	M	20	1	SOMERSET
	F	29	1	BALTIMORE CITY
	F	74	1	BALTIMORE CITY
	M	46	1	BALTIMORE CITY
	M	81	1	BALTIMORE CITY
	M	33	1	OUT OF STATE
	M	54	1	OUT OF STATE
CANDIDA FAMATA (T. CANDIDA)				
	F	82	1	BALTIMORE CITY
CANDIDA GLABRATA				
	F	85	1	ALLEGANY
	F	79	1	ANNE ARUNDEL
	M	78	1	BALTIMORE
	F	45	1	CALVERT
	M	67	1	BALTIMORE CITY
CANDIDA KRUSEI				
	F	65	1	CARROLL
CANDIDA PARAPSILOSIS				
	F	60	1	FREDERICK
	M	54	1	FREDERICK
	F	17	1	PRINCE GEORGE'S
	M	83	1	BALTIMORE CITY
CANDIDA SP				
	M	59	1	BALTIMORE
CANDIDA TROPICALIS				
	M	63	1	ANNE ARUNDEL
	F	63	1	PRINCE GEORGE'S
CHRYSOSPORIUM SP				
	F	43	1	CARROLL
	M		1	WICOMICO
CLADOSPORIUM SP				
	M	69	1	MONTGOMERY
	F	42	1	TALBOT
CURVULARIA SP				
	M	42	1	PRINCE GEORGE'S

M	53	1	PRINCE GEORGE'S
M	43	1	OUT OF STATE
EXOPHIALA SP			
U	2	1	ANNE ARUNDEL
GEOTRICHUM PENICILLATUM			
M	48	1	CALVERT
GEOTRICHUM SP			
M	58	1	BALTIMORE CITY
NOCARDIA ASTEROIDES COMPLEX			
M	55	1	BALTIMORE
M	65	1	BALTIMORE
F	54	1	BALTIMORE CITY
NOCARDIA SP			
M	55	1	TALBOT
M	58	1	BALTIMORE CITY
PENICILLIUM SP			
M	59	1	MONTGOMERY
M	69	1	MONTGOMERY
M	71	1	MONTGOMERY
M	75	1	PRINCE GEORGE'S
F	44	1	TALBOT
PICHIA OMERHI			
M	75	1	BALTIMORE CITY
PITHOMYCES SP			
F	42	1	WICOMICO
RHIZOPUS STOLONIFER			
F	50	1	ALLEGANY
RHODOTORULA SP			
F	57	1	PRINCE GEORGE'S
F	19	1	SOMERSET
M	83	1	BALTIMORE CITY
STREPTOMYCES SP			
F	60	1	MONTGOMERY
TRICHODERMA SP			
M	25	1	BALTIMORE CITY
TRICHOPHYTON MENTAGROPHYTES			
M	69	1	ALLEGANY
TRICHOPHYTON RUBRUM			
F	65	1	ALLEGANY
TRICHOPHYTON TONSURANS			
M	5	1	ALLEGANY
F	6	1	BALTIMORE
TOTAL		**123**	

PARASITOLOGY

GENUS SPECIES	#	JURISDICTION
PROTOZOA		
BALANTIDIUM COLI	2	BALTIMORE CITY
ENDOLIMAX NANA	1	MONTGOMERY
	1	PRINCE GEORGE'S
ENTAMOEBA COLI	2	MONTGOMERY
	1	PRINCE GEORGE'S
GIARDIA LAMBLIA	2	MONTGOMERY
	1	PRINCE GEORGE'S
	1	ST. MARY'S
IODAMOEBA BUTSCHLII	2	MONTGOMERY
	1	PRINCE GEORGE'S
TOTAL	**14**	
NEMATODES		
ENTEROBIUS VERMICULARIS	1	CARROLL
	1	KENT
HOOKWORM	1	PRINCE GEORGE'S
TOTAL	**3**	
CESTODES		
HYMENOLEPIS NANA	1	MONTGOMERY
TOTAL	**1**	

ARTHROPOD IDENTIFICATION

NONE

TICK IDENTIFICATION

NONE

WATER MICROBIOLOGY

	# TESTED	**# NON-COMPLIANT**
COMMUNITY	2	1
NON-COMMUNITY	228	75
TOTAL	**230**	**76**

FOOD SAFETY

FOOD AND SHELLFISH MICROBIOLOGY

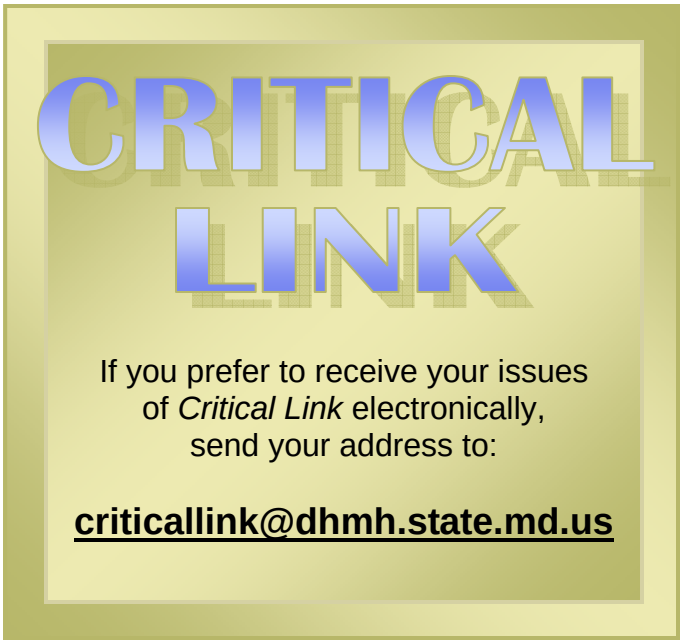
	# OF SAMPLES	**NOTABLE PATHOGENS**
FOOD	2	0
		# STANDARDS EXCEEDED *
CRABMEAT	6	0
		# STANDARDS EXCEEDED **
SHELLFISH	3	0
SHELLFISH GROWING WATERS	303	
TOTAL	**314**	**0**

* LISTERIA INNOCUOU

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
HERPES SIMPLEX UNTYPABLE				
	F	35	1	CARROLL
	F	21	1	PRINCE GEORGE'S
	U	27	1	BALTIMORE CITY
	U	28	1	BALTIMORE CITY
SUBTOTAL			**4**	
HERPES SIMPLEX I				
	F	24	1	ANNE ARUNDEL
	F	17	1	BALTIMORE
	F	20	1	BALTIMORE
	F	19	1	CHARLES
	F	23	1	FREDERICK
	F	22	1	GARRETT
	F	21	1	HARFORD
	F	33	1	HOWARD
	F	18	2	PRINCE GEORGE'S
	F	20	1	PRINCE GEORGE'S
	M	21	2	PRINCE GEORGE'S
	F	17	1	TALBOT
	F	21	1	BALTIMORE CITY
	F	22	1	BALTIMORE CITY
	M	23	1	BALTIMORE CITY
	U		1	BALTIMORE CITY
	U	18	2	BALTIMORE CITY
SUBTOTAL			**20**	
HERPES SIMPLEX II				
	F	19	1	ALLEGANY
	F	21	1	ANNE ARUNDEL
	F		1	BALTIMORE
	F	19	1	BALTIMORE
	F	21	1	BALTIMORE
	F	22	1	BALTIMORE
	F	23	1	BALTIMORE
	F	24	1	BALTIMORE
	M	29	1	BALTIMORE
	F	20	1	CARROLL
	F	29	1	CHARLES
	M	20	1	CHARLES
	F	26	1	FREDERICK
	F	18	1	HARFORD
	F	35	1	HARFORD
	M	21	1	HARFORD
	F	45	1	MONTGOMERY
	M	43	1	MONTGOMERY
	F	18	1	PRINCE GEORGE'S
	F	22	1	PRINCE GEORGE'S
	F	36	1	PRINCE GEORGE'S
	M	21	1	PRINCE GEORGE'S
	M	34	1	PRINCE GEORGE'S
	M	36	1	PRINCE GEORGE'S
	M	37	1	PRINCE GEORGE'S
	M	42	1	PRINCE GEORGE'S
	F	27	1	ST. MARY'S
	F	21	1	WICOMICO
	F	23	1	WICOMICO
	M	38	1	WICOMICO
	F		1	BALTIMORE CITY
	F	15	1	BALTIMORE CITY
	F	17	1	BALTIMORE CITY
	F	19	2	BALTIMORE CITY
	F	20	2	BALTIMORE CITY
	F	21	1	BALTIMORE CITY
	F	23	1	BALTIMORE CITY
	F	25	1	BALTIMORE CITY
	F	37	1	BALTIMORE CITY
	F	50	1	BALTIMORE CITY
	M	18	1	BALTIMORE CITY
	M	19	3	BALTIMORE CITY
	M	29	1	BALTIMORE CITY
	M	30	1	BALTIMORE CITY
	M	42	1	BALTIMORE CITY
	M	46	1	BALTIMORE CITY
	M	47	1	BALTIMORE CITY
	M	68	1	BALTIMORE CITY
	U	23	1	BALTIMORE CITY
	U	27	2	BALTIMORE CITY
	U	30	1	BALTIMORE CITY
SUBTOTAL			56	
TOTAL			80	

VIRAL HEPATITIS

ORGANISM	# OF SPECIMENS	POSITIVES	JURISDICTION
HEPATITIS A			
	1	0	ANNE ARUNDEL
	5	0	BALTIMORE
	1	0	BALTIMORE CITY
	1	0	CALVERT
	3	0	CARROLL
	2	0	HARFORD
	3	1	MONTGOMERY
	4	0	PRINCE GEORGES
	1	0	QUEEN ANNES
	1	0	TALBOT
	2	0	WICOMICO
SUBTOTAL	**24**	**1**	
HEPATITIS B			
	71	0	ALLEGANY
	73	2	ANNE ARUNDEL
	80	3	BALTIMORE
	770	9	BALTIMORE CITY
	5	0	CALVERT
	46	0	CARROLL
	164	3	CECIL
	2	0	CHARLES
	91	0	FREDERICK
	16	0	GARRETT
	87	0	HARFORD
	43	1	HOWARD
	4	0	KENT
	334	7	MONTGOMERY
	500	10	PRINCE GEORGES
	5	0	QUEEN ANNES
	2	0	SAINT MARYS
	3	0	SOMERSET
	14	0	TALBOT
	4	0	UNKNOWN
	44	1	WASHINGTON
	138	1	WICOMICO
SUBTOTAL	**2,496**	**37**	
HEPATITIS C			
	72	7	ALLEGANY
	87	31	ANNE ARUNDEL
	68	3	BALTIMORE
	310	113	BALTIMORE CITY
	5	0	CALVERT
	39	9	CARROLL
	81	16	CECIL
	2	0	CHARLES
	104	1	FREDERICK
	17	0	GARRETT

	37	5	HARFORD
	20	4	HOWARD
	5	0	KENT
	30	0	MONTGOMERY
	224	5	PRINCE GEORGES
	4	1	QUEEN ANNES
	2	0	SAINT MARYS
	2	0	SOMERSET
	14	0	TALBOT
	2	0	UNKNOWN
	22	3	WASHINGTON
	19	1	WICOMICO
SUBTOTAL	**1,166**	**199**	
TOTAL	**3,686**	**237**	

RABIES

SOURCE	**#**	**JURISDICTION**
BAT	1	BALTIMORE
	3	CARROLL
	1	FREDERICK
	1	MONTGOMERY
FOX	1	FREDERICK
	1	HARFORD
	1	MONTGOMERY
	1	BALTIMORE CITY
OTHER	1	GARRETT
RACCOON	1	ANNE ARUNDEL
	1	BALTIMORE
	1	CARROLL
	1	CECIL
	1	DORCHESTER
	1	FREDERICK
	2	GARRETT
	3	HARFORD
	6	MONTGOMERY
	1	PRINCE GEORGE'S
	3	QUEEN ANNE'S
	1	ST. MARY'S
	1	TALBOT
	1	WICOMICO
	2	WORCESTER
	2	BALTIMORE CITY
SKUNK	1	ALLEGANY
	2	CHARLES
	2	DORCHESTER
	1	PRINCE GEORGE'S
TOTAL POSITIVES	**45**	
TOTAL SPECIMENS	**397**	

CHLAMYDOPHILIA (CHLAMYDIA) PSITTACI

REPORTED QUARTERLY
FOR JULY 2007 THROUGH SEPTEMBER 2007

NO SPECIMENS RECEIVED

CD4 FLOW CYTOMETRY WORKLOAD

REPORTED QUARTERLY
COMPARING JULY 1, 2007 THROUGH SEPTEMBER 30, 2007 TO
JULY 1, 2006 THROUGH SEPTEMBER 30, 2006

CASE DEF.	LEVEL 1 <14%	LEVEL 2 28%-14%	LEVEL 3 ≥29%	TOTAL
7/07 - 9/07	340	598	315	**1,253**
7/06 - 9/06	379	615	353	**1,347**

NEWBORN & CHILDHOOD SCREENING

STATISTICS FOR SEPTEMBER 2007

PRESUMPTIVE POSITIVES	
DISORDERS	**#**
PHENYLKETONURIA	2
MAPLE SYRUP URINE DISEASE	11
HOMOCYSTINURIA	1
TYROSINEMIA	3
ARGININEMIA	1
CITRULLINEMIA	0
GALACTOSEMIA	3
BIOTINIDASE DEFICIENCY	0
HYPOTHYROIDISM	90
HEMOGLOBIN -DISEASE	13
HEMOGLOBIN -BENIGN	397
CONGENITAL ADRENAL HYPERPLASIA (CAH)	38
CYSTIC FIBROSIS	5
FATTY ACID OXIDATIONS	10
ORGANIC ACIDEMIAS	14
ACYLCARNITINE - BORDERLINE	3
ACYLCARNITINE - OTHERS	6

MONTHLY TOTALS	
# OF SPECIMENS SCREENED	11,207
NUMBER OF TESTS	774,058
% OF UNSATISFACTORY SPECIMENS	3.95

YEAR-TO-DATE CONFIRMED CASES	
CONDITIONS	**# CONFIRMED**
MCAD	2
3MCC	1
SCAD	2
VLCAD	2
GA-I	0
3-HYDROXY 3 METHYLGLUTARYL COA LYASE DEFICIENCY (HMG)	1
MAPLE SYRUP URINE DISEASE	1
PKU- CLINICALLY SIGNIFICANT	2
VARIANT HYPERPHENYLALANINEMIA - NOT CLINICALLY SIGNIFICANT	2
GALACTOSEMIA- CLASSICAL GALT DEFICIENCY	1
GALACTOSEMIA - VARIANT	1
BIOTINIDASE DEFICIENCY	0
GALACTOSE EPIMERASE DEFICIENCY	0
GALACTOSE TRANSFERASE DEFICIENCY (GALT CLASSICAL)	1
PARTIAL BIOTINIDASE DEFICIENCY	2
CAH- CLASSICAL SALT WASTING	2
CAH-NON-CLASSICAL	0
HYPOTHYROIDISM - PRIMARY	7
HYPOTHYROIDISM - SECONDARY	1
OTHER HYPOTHYROIDISM	3
SICKLE CELL DISEASE -SS	10
SICKLE CELL DISEASE -SC	5
SICKLE CELL DISEASE -S BETA THALASSEMIA	2
CYSTIC FIBROSIS	2

HIV ANTIBODY SCREENING – BLOOD (SEPTEMBER 2007)

SPECIMEN SOURCES	TOTAL	POSITIVE EIA	%	POSITIVE WB	%
HEALTH DEPARTMENTS AND CLINICS	2,339	95	4.06%	84	88.42%
HOSPITALS	110	8	7.27%	8	100.00%
DETENTION CENTERS	626	8	1.28%	6	75.00%
PRIVATE PHYSICIANS	11	0	0.00%	0	100.00%
STUDENT HEALTH CLINICS	269	1	0.37%	0	0.00%
EMPLOYEE HEALTH CLINICS	8	0	0.00%	0	0.00%
AUTOPSIES	304	19	6.25%	8	42.11%
ORGAN/TISSUE DONORS	51	0	0.00%	0	0.00%
TOTAL	**3,718**	**131**	**3.52%**	**106**	**80.92%**

ENVIRONMENTAL CHEMISTRY

SAMPLES	# NON-COMPLIANT	# TESTED
ASBESTOS		
AIR	0	0
BULK	10	17
AIR QUALITY		
$PM_{2.5}$	0	429
PM_{10}	0	37
RADIATION		
AIR/CHARCOAL FILTERS	0	64
MILK	0	4
WIPES	0	66
RAW WATER	0	12
VEGETATION	0	0
OTHER	0	1
DRINKING WATER		
METALS		
COMMUNITY	3	13
NON-COMMUNITY	1	3
PRIVATE WELLS	77	222
PESTICIDES & PCBs		
COMMUNITY	0	37
NON-COMMUNITY	0	25
PRIVATE WELLS	0	2
VOLATILE ORGANIC COMPOUNDS		
COMMUNITY	1	401
NON-COMMUNITY	0	31
PRIVATE WELLS	0	192
RADIATION		
COMMUNITY	22	65
NON-COMMUNITY	0	0
PRIVATE WELLS	3	14
INORGANICS		
COMMUNITY	0	2
NON-COMMUNITY	3	44
PRIVATE WELLS	3	223
FOOD CHEMISTRY		
SUSPECTED TAMPERING	0	0
MICROSCOPIC FILTH	0	0
LABELING	0	0
SURVEILLANCE	0	2
CHEMICAL CONTAMINATION	0	0

LEAD ENVIRONMENTAL

TEST	#	ELEV	BRL	UNSAT
TOTAL PAINT	9	3	2	0
TOTAL SOIL	13	8	1	0
DUST				
FLOOR	486	55	390	0
SILL	630	23	510	0
WELL	295	33	156	0
OTHER	25	6	18	0
TOTAL DUST	1,436	117	1,074	0
GRAND TOTAL	1,458	128	1,077	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

LEAD SCREENING - BLOOD LEAD

CLASS		RANGE ug/dl	# TESTED
MARYLAND			
	I	<10	134
	IIA	10-14	1
	IIB	15-19	4
	III	20-44	15
	IV	45-69	0
	V	>69	0
TOTAL			**154**
WASHINGTON DC			
	I	<10	75
	IIA	10-14	0
	IIB	15-19	0
	III	20-44	0
	IV	45-69	0
	V	>69	0
TOTAL			**75**

VIRAL LOAD SPECIMENS (SEPTEMBER 2007)

HIV–1 RNA Copies/ml	$<10^3$	$10^3 – 10^4$	$10^4 – 10^5$	$>10^5$	Totals
ALLEGANY COUNTY HEALTH DEPT.	12	1	0	0	13
BALTIMORE COUNTY HEALTH DEPT.	1	0	0	1	2
CARROLL COUNTY HEALTH DEPT.	1	1	0	0	2
DORCHESTER COUNTY HEALTH DEPT.	0	0	0	1	1
FREDERICK COUNTY HEALTH DEPT.	2	0	0	1	3
HOWARD COUNTY HEALTH DEPT.	0	0	1	0	1
MONTGOMERY COUNTY HEALTH DEPT.	91	10	17	7	125
PRINCE GEORGE'S COUNTY HEALTH DEPT.	66	3	10	8	87
WASHINGTON COUNTY HEALTH DEPT.	0	0	1	0	1
WICOMICO COUNTY HEALTH DEPT.	3	1	3	1	8
SUBTOTAL	176	16	32	19	243
DEPARTMENT OF CORRECTIONS	89	27	29	14	159
GRAND TOTAL	265	43	61	33	402

MAILING LABEL

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