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CRITICAL LINK

April 2008 Volume 12, Number 4

Tuberculosis (TB) Prevention and Control

March 24 was dedicated as "World TB Day" to commemorate the date in 1882 when Robert Koch announced the discovery of *Mycobacterium tuberculosis*[1] and to raise awareness of this deadly disease. Worldwide, an estimated two billion people are infected with TB, roughly one third of the world's population. In 2005, of the more than eight million people who became ill from this deadly disease, 1.6 million died.[1] There were nearly 14,000 cases of TB in the United States in 2006, of which 253 cases were identified in the State of Maryland.[2] Effective tuberculosis control depends on the collaborative efforts of professionals including clinicians, laboratorians and TB controllers. The Laboratories Administration's TB laboratory plays an important role in the control of TB by performing diagnostic procedures that are necessary to rapidly identify the pathogen, *Mycobacterium tuberculosis*.

Mycobacterium tuberculosis, also known as the tubercle bacillus, is a non-spore-forming bacillus (Figure 1). It grows slowly with a doubling time of 12-20 hours and may take several weeks to develop visible colonies (Figure 2). The principle risk for acquiring this pathogen is breathing in particles emitted in coughs and sneezes. A sneeze may contain over a million particles with diameters of less than 100 µ, with an average of 10 µ. A 10-µ droplet may carry 3 to 10 tubercle bacilli.[3]

Humans are readily infected with *M. tuberculosis* but in most cases the infection, usually in the lungs, stimulates activated macrophages to focus around the concentration of bacterial growth. The bacteria may be destroyed by this primary immune response, or growth of the pathogens within the macrophages may only be slowed and a scar-tissue barrier, known as a tubercle, may form around the

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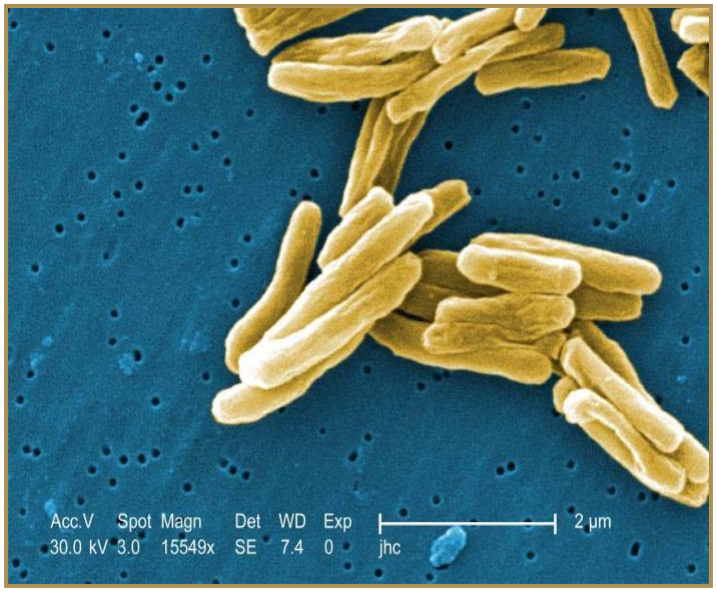

Figure 1. Scanning electron micrograph (SEM) depicts a number of Gram-positive *Mycobacterium tuberculosis* bacteria (under a high magnification of 15549x.) This bacterium ranges in length between 2 - 4 microns, and a width between 0.2 - 0.5 microns. (Source: CDC Public Image Library)

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Tuberculosis (TB) Prevention and Control

bacilli. At this phase of the disease, the patient may exhibit a positive tuberculin skin test reaction as a manifestation of cell mediated immunity against TB antigens. The tubercle usually prevents further spread of the pathogen but also provides a focus of bacilli protected from the patient's defense mechanisms. Such a person is said to harbor a latent TB infection (LTBI) that under various conditions can cause active disease years or decades later in life. However, in young children and immunologically impaired individuals, the infection can spread from the primary site, through the blood and into many tissues, resulting in a fatal infection.

Besides the identification of the individual TB patients, disease control calls for an extended investigation involving all the contacts of the patient to further search and identify potentially infected persons. This contact investigation plays a very important role in the control and prevention of this deadly disease. Contact investigations also aid in the prevention of future cases of TB by identifying and treating persons infected by the patient but who have not developed active disease. These contacts usually aquire latent TB infection (LTBI) and may be treated. Contact investigations are labor intensive and expensive, especially because the number of contacts is often large and geographically widespread.

A recent case of TB in Maryland demonstrates a successful model for collaboration. The timely and effective flow of information from private and public health laboratories to clinicians and TB controllers provided the basis for prompt treatment and control.

The patient visited the emergency room of a local hospital, presenting with long standing cough, shortness of breath and weight loss. Because the symptoms were highly suspicious for TB, he was admitted to an isolation room and started on anti-TB therapy. The patient's chest X-ray and CT scan revealed extensive bilateral upper lobe infiltrates with cavitation and a sputum smear was positive for acid fast bacilli (AFB). The hospital microbiology laboratory sent the concentrated sputum sediment to the Laboratories Administration's TB laboratory for nucleic acid amplification testing. The Laboratories Administration's TB laboratory confirmed the presence of *M. tuberculosis* complex ribosomal RNA by the Amplified Mycobacterium Tuberculosis Direct (MTD) assay (Gen-Probe,™ San Diego, California.) The positive test result was reported to the hospital, local health departments, and State TB control personnel within 48 hours of the specimen collection. The acid fast bacilli were later confirmed by culture to be *M. tuberculosis* complex on the twelfth day and found to be susceptible to all first line anti-TB drugs on the 22nd day.

Figure 2. A close-up of a *Mycobacterium tuberculosis* culture revealing this organism's colonial morphology. Note the colorless rough surface, which are typical morphologic characteristics seen in *Mycobacterium tuberculosis* colonial growth. Macroscopic examination of colonial growth patterns is still one of the ways microorganisms are often identified. (Source: CDC Public Image Library)

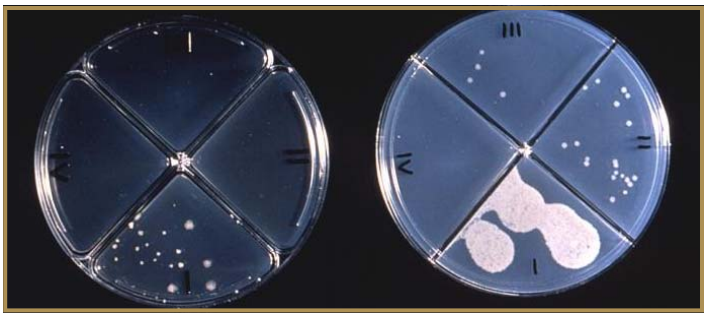

Figure 3. Culture plates revealing the results of a drug susceptibility test on *Mycobacterium tuberculosis* bacteria. (Source: CDC Public Image Library) The Laboratories Administration's TB Laboratory identified in January 2008 a strain in Montgomery County resistant to six different drugs (Streptomycin, Isoniazid, Rifampin, Rifabutin, Pyrazinamide, and Ethambutol) used to treat *Mycobacterium tuberculosis.*

A contact investigation ensued that included seven high-priority household and close social contacts. Only six were tested because one had a documented positive tuberculin skin test (TST) result before contact with the patient. All six contacts were TST positive. The investigation was expanded to include 54 high-priority workplace contacts. Of those tested, 39% (21/54) had positive tuberculin skin test results leading to further expansion of the investigation. An additional seven medium-priority contacts of extended family and friends and 143 low-priority workplace contacts were tested resulting in 15% (22/150) receiving a diagnosis of latent TB infection. In all, this investigation involved 37 job sites in Maryland, Virginia and the District of Columbia where the patient had worked. Although no additional cases of TB disease were identified, 49 contacts were found to be infected and 67% (33/49) agreed to begin treatment for LTBI. This investigation ultimately involved eight local health departments, two states, and the District of Columbia.[4]

Non-tuberculous pulmonary disease is more common than TB and when only the AFB smear result is available, the decision to initiate a contact investigation is difficult.

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MARYLAND

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Tuberculosis (TB) Prevention and Control

The collaboration and rapid turn around time for the MTD test result provided the necessary information to proceed with this investigation. Patient care and public health are improved when there is good communication and collaboration among those working in the public and private sector.

This article was written by Nancy Hooper.

References

[1] *MMWR.* 2008. 57 (No. 11) p.1

[2] *MMWR.* 2008. 55 (No. 53) p. 34

[3] Bloom, BR. 1994. *Tuberculosis: Pathogenesis, Protection, and Control*. ASM Press, Wash., DC, p. 48.

[4] *MMWR* February 1,2008/57(04);94-98.

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 1/01/08 - 1/31/08

ENTERIC BACTERIOLOGY

GENUS SEROVAR	SEX	AGE	#	JURISDICTION
CAMPYLOBACTER JEJUNI				
	M	0	1	ANNE ARUNDEL
	F	20	1	BALTIMORE
	M	0	1	BALTIMORE
	M	37	1	CHARLES
	F	3	1	MONTGOMERY
	M	0	1	MONTGOMERY
ESCHERICHIA COLI				
	F	57	1	BALTIMORE
	F	85	1	BALTIMORE
	F	66	1	BALTIMORE CITY
	M	51	1	BALTIMORE CITY
	F	41	1	BALTIMORE CITY
	F	0	1	BALTIMORE CITY
	U	0	1	OUT OF STATE
	U	1	1	OUT OF STATE
	U	1	1	OUT OF STATE
	U	0	1	UNKNOWN
	U	0	1	UNKNOWN
SALMONELLA BRAENDERUP				
	M	1	1	OUT OF STATE
SALMONELLA ENTERITIDIS				
	F	77	1	BALTIMORE
	M	53	1	FREDERICK
	M	25	1	BALTIMORE CITY
	F	101	1	BALTIMORE CITY
	F	60	1	BALTIMORE CITY
	F	0	1	BALTIMORE CITY
	M	0	1	BALTIMORE CITY
	F	27	1	BALTIMORE CITY
	F	0	1	BALTIMORE CITY
	F	60	1	BALTIMORE CITY
	M	1	1	BALTIMORE CITY
	M	4	1	BALTIMORE CITY
	M	5	1	BALTIMORE CITY
	M	60	1	BALTIMORE CITY
	U	0	1	BALTIMORE CITY
	F	0	1	BALTIMORE CITY
	F	17	1	BALTIMORE CITY
	F	34	1	BALTIMORE CITY
	F	58	1	BALTIMORE CITY
	M	0	1	BALTIMORE CITY
	M	3	1	BALTIMORE CITY
	M	15	1	BALTIMORE CITY
	M	33	1	BALTIMORE CITY
	M	79	1	BALTIMORE CITY

F	34	1	OUT OF STATE
U	0	1	UNKNOWN
M	36	1	UNKNOWN
SALMONELLA HAFERBREITE			
F	0	1	TALBOT
SALMONELLA IIIA 13,22:Z4,Z23:-			
U	0	1	UNKNOWN
SALMONELLA IV 45:G,Z51:--			
U	0	1	OUT OF STATE
SALMONELLA JAVIANA			
U	0	1	ANNE ARUNDEL
SALMONELLA MISSISSIPPI			
U	0	1	UNKNOWN
SALMONELLA NEWPORT			
U	76	1	OUT OF STATE
M	22	1	OUT OF STATE
U	0	1	UNKNOWN
U	0	1	UNKNOWN
SALMONELLA PANAMA			
M	0	1	BALTIMORE
M	42	1	BALTIMORE
F	9	1	BALTIMORE
SALMONELLA REDLANDS			
M	52	1	PRINCE GEORGE'S
SALMONELLA SER 4,12:I:-			
M	5	1	BALTIMORE
SALMONELLA SER 4,5,12:I:-			
M	0	1	HARFORD
SALMONELLA TENNESSEE			
F	0	1	ALLEGANY
SALMONELLA TYPHIMURIUM			
M	23	1	BALTIMORE
F	66	1	FREDERICK
U	0	1	UNKNOWN
SALMONELLA TYPHIMURIUM VAR COPENHAGEN			
F	62	1	BALTIMORE
M	73	1	WASHINGTON
M	51	1	BALTIMORE CITY
F	15	1	BALTIMORE CITY
M	0	1	OUT OF STATE
SALMONELLA WANDSWORTH			
U	0	1	UNKNOWN
U	0	1	UNKNOWN
U	0	1	UNKNOWN
SHIGELLA FLEXNERI IV:3,4			
M	40	1	OUT OF STATE
U	0	1	UNKNOWN
U	0	1	UNKNOWN
SHIGELLA SONNEI			
F	0	1	ANNE ARUNDEL
F	25	1	ANNE ARUNDEL
TOTAL		**77**	

ISOLATES – THROAT CULTURES

COUNTY	GROUP A[1]	NON-GROUP A
ALLEGANY	0	7
SOMERSET	1	0
WICOMICO	1	6
BALTIMORE CITY	0	1
TOTAL	**2**	**14**

[1] *Streptococcus pyogenes*

BACTERIOLOGY IDENTIFICATIONS
Referrals

GENUS SPECIES	SOURCE	#	JURISDICTION
ACINETOBACTER LWOFFII			
	WOUND	1	ALLEGANY
CITROBACTER BRAAKII			
	URINE	1	ALLEGANY
CORYNEBACTERIUM SPECIES			
	URINE	2	BALTIMORE CITY
ENTEROBACTER CLOACAE			
	UNKNOWN	1	WICOMICO
ENTEROCOCCUS FAECIUM			
	UNKNOWN	1	WICOMICO
ESCHERICHIA COLI			
	BLOOD	4	ALLEGANY
	UNKNOWN	2	ALLEGANY
	URINE	13	ALLEGANY
	WOUND	1	ALLEGANY
GRAM NEGATIVE NON-FERMENTING ROD			
	WOUND	1	ALLEGANY
HAEMOPHILUS INFLUENZAE NON-TYPABLE			
	BLOOD	1	ANNE ARUNDEL
	BLOOD	1	BALTIMORE
	BLOOD	8	BALTIMORE CITY
	NASOTRACH	1	BALTIMORE CITY
	PERITONEAL	1	BALTIMORE CITY
	BLOOD	1	CARROLL
	BLOOD	1	CECIL
	BLOOD	1	FREDERICK
	BLOOD	5	MONTGOMERY
	CSF	1	MONTGOMERY
	BLOOD	1	WASHINGTON DC
HAEMOPHILUS INFLUENZAE SEROTYPE B			
	BLOOD	1	PRINCE GEORGE'S
HAEMOPHILUS INFLUENZAE SEROTYPE E			
	BLOOD	1	PRINCE GEORGE'S
HAEMOPHILUS INFLUENZAE SEROTYPE F			
	BLOOD	1	ANNE ARUNDEL
	BLOOD	3	BALTIMORE CITY
	BLOOD	2	CECIL
	BLOOD	2	CHARLES
	BLOOD	1	FREDERICK
	BLOOD	1	MONTGOMERY
	BLOOD	2	PRINCE GEORGE'S
	BLOOD	1	WASHINGTON
HAEMOPHILUS PARAINFLUENZAE			
	BLOOD	2	ALLEGANY
KLEBSIELLA OXYTOCA			
	URINE	1	ALLEGANY
KLEBSIELLA PNEUMONIAE			
	BIOPSY	1	ALLEGANY
	URINE	1	ALLEGANY
	DRAINAGE	1	WICOMICO
	UNKNOWN	1	WICOMICO
	URINE	1	WICOMICO
NEISSERIA MENINGITIDIS SEROGROUP W-135			
	CSF	1	HARFORD
PSEUDOMONAS AERUGINOSA			
	UNKNOWN	1	ALLEGANY
STAPHYLOCOCCUS AUREUS			
	SPUTUM	2	WICOMICO
	WOUND	3	WICOMICO
STENOTROPHOMONAS MALTOPHILIA			
	BLOOD	1	WICOMICO
TOTAL		**80**	

ISOLATES – MISCELLANEOUS

GENUS SPECIES	SOURCE	#	JURISDICTION
ACINETOBACTER LWOFFII			
	BLOOD	2	BALTIMORE CITY
ARCANOBACTERIUM PYOGENES			
	BLOOD	1	BALTIMORE CITY
BACILLUS SPECIES			
	BLOOD	2	BALTIMORE CITY
BREVIBACTERIUM GROUP B			
	BLOOD	1	BALTIMORE CITY
CITROBACTER FARMERI			
	BLOOD	1	BALTIMORE CITY
CORYNEBACTERIUM ACCOLENS			
	BLOOD	1	BALTIMORE CITY
CORYNEBACTERIUM AFERMENTANS			
	BLOOD	1	BALTIMORE CITY
CORYNEBACTERIUM SPECIES			
	HEEL	1	FREDERICK
	TOE	2	FREDERICK
	THIGH	1	MONTGOMERY
ENTEROBACTER CLOACAE			
	WOUND	1	CECIL
	NARES	1	WASHINGTON
ENTEROCOCCUS DURANS			
	BLOOD	1	BALTIMORE CITY
ENTEROCOCCUS FAECALIS			
	BLOOD	1	BALTIMORE CITY
ESCHERICHIA COLI			
	BLOOD	2	BALTIMORE CITY
	ULCER	1	BALTIMORE CITY
	FINGER	1	FREDERICK
GARDNERELLA VAGINALIS			
	CERVIX	1	FREDERICK
	ENDOCERVICAL	1	PRINCE GEORGE'S
KLEBSIELLA OXYTOCA			
	THROAT	1	FREDERICK
KLEBSIELLA PNEUMONAIE			
	BLOOD	1	BALTIMORE CITY
PSEUDOMONAS AERUGINOSA			
	ULCER	1	BALTIMORE CITY
	FINGER	1	FREDERICK
SERRATIA LIQUEFACIENS			
	BLOOD	1	BALTIMORE CITY
SERRATIA MARCESCENS			
	FOOT	1	FREDERICK
STAPHYLOCOCCUS AUREUS			
	LIP	1	BALTIMORE
	BLOOD	4	BALTIMORE CITY
	CSF	1	BALTIMORE CITY
STAPHYLOCOCCUS AUREUS BETA LACTAMASE NEGATIVE			
	WOUND	2	FREDERICK
STAPHYLOCOCCUS AUREUS BETA LACTAMASE POSITIVE			
	WOUND	3	BALTIMORE
	WOUND	1	BALTIMORE CITY
	CHIN	1	CARROLL
	HAND	1	CARROLL
	LEG	1	CARROLL
	NECK	1	CARROLL
	SCALP	1	CARROLL
	WOUND	1	CARROLL
	LESION	1	CECIL
	FOOT	1	FREDERICK
	TOE	1	FREDERICK
	ULCER	1	FREDERICK
	BOIL	1	PRINCE GEORGE'S
STAPHYLOCOCCUS AURICULARIS			
	BLOOD	2	BALTIMORE CITY
STAPHYLOCOCCUS EPIDERMIDIS			
	BLOOD	3	BALTIMORE CITY
STAPHYLOCOCCUS SPECIES CONGULASE NEGATIVE			
	HAND	1	ALLEGANY
	WOUND	1	ALLEGANY
	BLOOD	4	BALTIMORE CITY
	CSF	1	BALTIMORE CITY
	NODULE	1	BALTIMORE CITY
	TOE	1	BALTIMORE CITY
	ARM	1	CARROLL
	FOOT	1	FREDERICK
	TOE	3	FREDERICK
	CHEST	1	MONTGOMERY
	SKIN	1	MONTGOMERY
	THIGH	1	MONTGOMERY
STREPTOCOCCUS ACIDOMINIMUS			
	BLOOD	1	BALTIMORE CITY
STREPTOCOCCUS BETA-HEMOLYTIC GROUP B			
	VAGINA	3	ANNE ARUNDEL
	BLOOD	2	BALTIMORE CITY
	VAGINA	1	HOWARD
	ENDOCERVICAL	3	PRINCE GEORGE'S
	VAGINA	13	PRINCE GEORGE'S
STREPTOCOCCUS BETA-HEMOLYTIC GROUP G			
	BLOOD	1	BALTIMORE CITY
STREPTOCOCCUS BETA-HEMOLYTIC NOT GROUP A,B,C,D,F,G			
	BLOOD	1	BALTIMORE CITY
STREPTOCOCCUS INTERMEDIUS			
	BLOOD	3	BALTIMORE CITY
STREPTOCOCCUS MITIS			
	BLOOD	1	BALTIMORE CITY
STREPTOCOCCUS NON-HEMOLYTIC			
	CSF	1	BALTIMORE CITY
STREPTOCOCCUS ORALIS			
	BLOOD	1	BALTIMORE CITY
STREPTOCOCCUS SALIVARIUS			
	BLOOD	1	BALTIMORE CITY
TOTAL		**106**	

SEXUALLY TRANSMITTED DISEASES

GENUS SPECIES	SEX	#	JURISDICTION
SYPHILIS SEROLOGY			
	M	1	ALLEGANY
	F	3	ANNE ARUNDEL
	M	1	ANNE ARUNDEL
	F	5	BALTIMORE
	M	4	BALTIMORE
	F	9	BALTIMORE CITY
	M	30	BALTIMORE CITY
	F	1	CHARLES
	M	2	CHARLES
	F	1	HOWARD
	F	4	MONTGOMERY
	M	3	MONTGOMERY
	F	6	PRINCE GEORGE'S
	M	19	PRINCE GEORGE'S
	F	1	TALBOT
	F	1	WASHINGTON
	M	2	WASHINGTON
	F	5	WICOMICO
TOTAL		**98**	
NEISSERIA GONORRHEAE			
	F	1	ANNE ARUNDEL
	F	3	BALTIMORE
	M	2	BALTIMORE
	F	1	CARROLL
	M	1	CECIL
	F	1	CHARLES
	M	1	CHARLES
	F	1	FREDERICK
	M	1	FREDERICK
	F	2	MONTGOMERY
	F	11	PRINCE GEORGE'S

M	18	PRINCE GEORGE'S
F	2	ST. MARY'S
M	1	ST. MARY'S
M	1	BALTIMORE CITY
TOTAL	**47**	

CHLAMYDIA TRACHOMATIS

F	2	ALLEGANY
M	2	ALLEGANY
F	16	ANNE ARUNDEL
M	12	ANNE ARUNDEL
F	18	BALTIMORE
M	14	BALTIMORE
F	5	BALTIMORE CITY
M	31	BALTIMORE CITY
F	1	CALVERT
M	4	CALVERT
F	4	CAROLINE
F	6	CARROLL
M	2	CARROLL
F	7	CECIL
M	3	CECIL
F	13	CHARLES
M	3	CHARLES
F	2	DORCHESTER
M	2	DORCHESTER
F	10	FREDERICK
M	1	FREDERICK
F	7	HARFORD
M	10	HARFORD
F	4	HOWARD
M	2	HOWARD
F	2	KENT
M	1	KENT
F	18	MONTGOMERY
M	22	MONTGOMERY
U	1	MONTGOMERY
F	46	PRINCE GEORGE'S
M	27	PRINCE GEORGE'S
M	1	QUEEN ANNE'S
F	2	SAINT MARY'S
M	2	SAINT MARY'S
M	1	SOMERSET
F	3	TALBOT
M	1	TALBOT
F	4	WASHINGTON
M	2	WASHINGTON
F	14	WICOMICO
M	10	WICOMICO
F	4	WORCESTER
TOTAL	**342**	

PENICILLIN RESISTANT GONORRHEA STATISTICS

REPORTED QUARTERLY
NO REPORT THIS MONTH

MYCOBACTERIOLOGY

GENUS SPECIES

SEX	AGE	#	JURISDICTION
MYCOBACTERIUM ABSCESSUS			
M	87	1	MONTGOMERY
M	18	1	BALTIMORE CITY
MYCOBACTERIUM AVIUM COMPLEX			
M	50	1	ALLEGANY
F	70	1	BALTIMORE
F	82	1	BALTIMORE
M	69	1	BALTIMORE
F	84	1	BALTIMORE
F	84	1	FREDERICK
M	37	1	FREDERICK
M	78	1	FREDERICK
M	79	1	FREDERICK
M	87	1	FREDERICK
F	92	1	HARFORD
M	44	1	MONTGOMERY
M	22	1	PRINCE GEORGE'S
F	43	1	WASHINGTON
F	59	1	WICOMICO
M	0	1	WICOMICO
M	44	1	WICOMICO
M	64	1	WICOMICO
F	48	1	BALTIMORE CITY
F	44	1	BALTIMORE CITY
F	55	1	BALTIMORE CITY
F	26	1	BALTIMORE CITY
M	55	1	BALTIMORE CITY
M	46	1	BALTIMORE CITY
M	63	1	BALTIMORE CITY
M	63	1	BALTIMORE CITY
MYCOBACTERIUM BOVIS			
M	70	1	OUT OF STATE
MYCOBACTERIUM CHELONAE			
M	43	1	MONTGOMERY
MYCOBACTERIUM FORTUITUM			
M	41	1	BALTIMORE
F	81	1	MONTGOMERY
F	66	1	MONTGOMERY
M	22	1	PRINCE GEORGE'S
F	24	1	WICOMICO
M	76	1	BALTIMORE CITY
F	48	1	OUT OF STATE
F	84	1	OUT OF STATE
M	48	1	OUT OF STATE
MYCOBACTERIUM GORDONAE			
M	67	1	BALTIMORE
F	52	1	CARROLL
M	73	1	CARROLL
M	71	1	CARROLL
F	76	1	FREDERICK
M	88	1	FREDERICK
M	83	1	MONTGOMERY
F	81	1	MONTGOMERY
M	43	1	MONTGOMERY
M	87	1	MONTGOMERY
M	72	1	MONTGOMERY
M	22	1	PRINCE GEORGE'S
M	36	1	PRINCE GEORGE'S
M	58	1	PRINCE GEORGE'S
M	29	1	PRINCE GEORGE'S
F	44	1	PRINCE GEORGE'S
F	74	1	WICOMICO
F	57	1	WICOMICO
M	39	1	BALTIMORE CITY
F	43	1	BALTIMORE CITY
M	53	1	BALTIMORE CITY
M	47	1	BALTIMORE CITY
MYCOBACTERIUM MALMOENSE			
F	83	1	MONTGOMERY
MYCOBACTERIUM MARINUM			
F	44	1	CALVERT
M	47	1	BALTIMORE CITY
M	66	1	BALTIMORE CITY
MYCOBACTERIUM TUBERCULOSIS			
F	77	1	CALVERT
M	41	1	HARFORD
F	83	1	MONTGOMERY
M	55	1	MONTGOMERY
M	72	1	MONTGOMERY
M	28	1	MONTGOMERY
M	51	1	MONTGOMERY
M	49	1	PRINCE GEORGE'S
M	0	1	BALTIMORE CITY

M	55	1	BALTIMORE CITY
M	27	1	BALTIMORE CITY
M	67	1	OUT OF STATE
MYCOBACTERIUM TUBERCULOSIS COMPLEX			
F	76	1	BALTIMORE
M	72	1	BALTIMORE
F	77	1	CALVERT
M	40	1	CECIL
M	37	1	CHARLES
F	28	1	HOWARD
F	27	1	MONTGOMERY
F	72	1	MONTGOMERY
M	20	1	MONTGOMERY
M	28	1	MONTGOMERY
M	51	1	MONTGOMERY
F	30	1	MONTGOMERY
F	67	1	MONTGOMERY
M	24	1	MONTGOMERY
M	45	1	MONTGOMERY
M	55	1	MONTGOMERY
M	22	1	MONTGOMERY
M	72	1	MONTGOMERY
M	28	1	PRINCE GEORGE'S
M	49	1	PRINCE GEORGE'S
M	26	1	PRINCE GEORGE'S
M	32	1	PRINCE GEORGE'S
F	27	1	BALTIMORE CITY
F	52	1	BALTIMORE CITY
F	23	1	BALTIMORE CITY
M	42	1	BALTIMORE CITY
M	55	1	BALTIMORE CITY
M	55	1	BALTIMORE CITY
M	38	1	OUT OF STATE
M	31	1	OUT OF STATE
MYCOBACTERIUM XENOPI			
M	80	1	WICOMICO
NON-PHOTOCHROMOGENIC MYCOBACTERIA			
F	76	1	BALTIMORE
M	62	1	BALTIMORE
F	66	1	FREDERICK
RAPIDLY GROWING MYCOBACTERIA			
M	83	1	MONTGOMERY
M	43	1	MONTGOMERY
F	61	1	PRINCE GEORGE'S
TOTAL		**114**	

MYCOBACTERIUM SUSCEPTIBILITY RESULTS

DURING JANUARY, 2008, SUSCEPTIBILITY RESULTS ON 19 ISOLATES OF *M. TUBERCULOSIS* COMPLEX * WERE IDENTIFIED.

TOTAL: 5 DRUG RESISTANT STRAINS FOUND

#	COUNTY	DRUG
1	PRINCE GEORGE'S	® to ISONIAZID and STREPTOMYCIN
1	PRINCE GEORGE'S	® to STREPTOMYCIN and RIFABUTIN
1[A]	MONTGOMERY	® to STREPTOMYCIN, ISONIAZID, RIFAMPIN, RIFABUTIN, PYRAZINAMIDE, and ETHAMBUTOL
1[B]	MONTGOMERY	® to PYRAZINAMIDE
1	OUT OF STATE (VIRGINIA)	® to STREPTOMYCIN

[A] Meets the case definition of Multi-Drug Resistant Tuberculosis (MDRTB)
[B] Probable *M. bovis*

® 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
ACID FAST BACILLI			
M	43	1	BALTIMORE CITY
ACREMONIUM SPECIES			
F	62	1	TALBOT
M	21	1	WICOMICO
ALTERNARIA			
F	79	1	BALTIMORE CITY
ASPERGILLUS FLAVUS			
M	46	1	ALLEGANY
M	81	1	ANNE ARUNDEL
F	85	1	TALBOT
ASPERGILLUS FLAVUS GROUP			
F	49	1	CARROLL
ASPERGILLUS FUMIGATUS			
M	73	1	ANNE ARUNDEL
U	0	1	ANNE ARUNDEL
M	51	1	CECIL
F	41	1	CHARLES
F	65	1	CHARLES
F	94	1	MONTGOMERY
M	44	1	PRINCE GEORGE'S
M	80	1	PRINCE GEORGE'S
F	66	1	BALTIMORE CITY
M	64	1	BALTIMORE CITY
ASPERGILLUS GLAUCUS			
U	30	1	ALLEGANY
ASPERGILLUS NIGER			
F	60	1	CARROLL
F	79	1	CHARLES
F	69	1	PRINCE GEORGE'S
F	69	1	TALBOT
U	0	1	BALTIMORE CITY
ASPERGILLUS SPECIES			
M	71	1	WICOMICO
ASPERGILLUS USTUS			
U	0	1	WASHINGTON
ASPERGILLUS VERSICOLOR			
F	37	1	ALLEGANY
F	63	1	ANNE ARUNDEL
F	79	1	CHARLES
F	64	1	MONTGOMERY
U	51	1	TALBOT
U	0	1	WASHINGTON
BIPOLARIS			
M	66	1	TALBOT
CANDIDA ALBICANS			
M	70	1	CALVERT
M	25	1	CARROLL
F	17	1	CECIL
F	20	1	CECIL
M	74	1	MONTGOMERY
F	34	1	MONTGOMERY
F	71	1	MONTGOMERY
F	77	1	MONTGOMERY
M	37	1	MONTGOMERY
M	53	1	MONTGOMERY
F	30	1	MONTGOMERY
F	24	1	PRINCE GEORGE'S
M	44	1	PRINCE GEORGE'S
F	69	1	PRINCE GEORGE'S
M	74	1	PRINCE GEORGE'S
F	50	1	PRINCE GEORGE'S
M	56	1	PRINCE GEORGE'S
F	49	1	PRINCE GEORGE'S
M	0	1	PRINCE GEORGE'S
F	22	1	PRINCE GEORGE'S
F	26	1	PRINCE GEORGE'S

	F	17	1	PRINCE GEORGE'S
	F	19	1	PRINCE GEORGE'S
	F	20	1	PRINCE GEORGE'S
	F	22	1	PRINCE GEORGE'S
	F	23	1	PRINCE GEORGE'S
	F	18	1	PRINCE GEORGE'S
	F	20	1	PRINCE GEORGE'S
	F	18	1	SOMERSET
	U	59	1	BALTIMORE CITY
	F	65	1	BALTIMORE CITY
	M	54	1	BALTIMORE CITY
	M	59	1	BALTIMORE CITY
	M	62	1	BALTIMORE CITY
	M	63	1	BALTIMORE CITY
	M	79	1	BALTIMORE CITY
CANDIDA GLABRATA				
	M	76	1	MONTGOMERY
	F	29	1	MONTGOMERY
	F	39	1	MONTGOMERY
	U	59	1	BALTIMORE CITY
	F	65	1	BALTIMORE CITY
	M	54	1	BALTIMORE CITY
	M	62	1	BALTIMORE CITY
	M	26	1	BALTIMORE CITY
CANDIDA PARAPSILOSIS				
	F	73	1	PRINCE GEORGE'S
	M	62	1	BALTIMORE CITY
CANDIDA SPECIES				
	F	61	1	CALVERT
CANDIDA TROPICALIS				
	F	94	1	MONTGOMERY
	M	62	1	BALTIMORE CITY
CHAETOMIUM				
	U	0	1	PRINCE GEORGE'S
CHRYSOSPORIUM SPECIES				
	M	42	1	CHARLES
	M	85	1	CHARLES
CLADOPHIALOPHORA SPECIES				
	M	62	1	TALBOT
CLADOSPORIUM SPECIES				
	F	66	1	ALLEGANY
CRYPTOCOCCUS NEOFORMANS				
	M	76	1	BALTIMORE CITY
EXOPHIALA				
	F	0	1	WICOMICO
	M	55	1	WICOMICO
MICROSPORUM CANIS				
	U	0	1	ALLEGANY
	F	20	1	ALLEGANY
	M	0	1	ALLEGANY
MOULD				
	F	48	1	BALTIMORE
	U	78	1	TALBOT
	M	54	1	TALBOT
	F	0	1	WICOMICO
	M	0	1	WICOMICO
	M	80	1	WICOMICO
	M	62	1	BALTIMORE CITY
NIGROSPORA SPECIES				
	U	56	1	TALBOT
PENICILLIUM SPECIES				
	M	60	1	ALLEGANY
	M	40	1	ANNE ARUNDEL
	F	48	1	CARROLL
	M	46	1	MONTGOMERY
	F	69	1	PRINCE GEORGE'S
	M	27	1	PRINCE GEORGE'S
	U	0	1	PRINCE GEORGE'S
	F	47	1	TALBOT
	U	0	1	WASHINGTON
PHOMA				
	U	0	1	PRINCE GEORGE'S
RHIZOPUS ORYZAE				
	M	55	1	TALBOT
SCEDOSPORIUM PROLIFICANS				
	F	48	1	CARROLL
SCOPULARIOPSIS BRUMPTII				
	F	63	1	ANNE ARUNDEL
SCOPULARIOPSIS SPECIES				
	F	72	1	ALLEGANY
SCYTALIDIUM				
	U	0	1	WICOMICO
STACHYBOTRYS				
	U	0	1	WASHINGTON
SYNCEPHALASTRUM RACEMOSUM				
	F	33	1	BALTIMORE CITY
TRICHOPHYTON MENTAGROPHYTES				
	F	20	1	ALLEGANY
	M	0	1	WICOMICO
TRICHOPHYTON RUBRUM				
	U	89	1	CARROLL
	U	0	1	WICOMICO
	F	35	1	WICOMICO
	F	48	1	BALTIMORE CITY
TRICHOPHYTON SPECIES				
	F	63	1	ANNE ARUNDEL
TRICHOPHYTON TONSURANS				
	M	7	1	CALVERT
	U	5	1	TALBOT
	U	6	1	TALBOT
TOTAL			**128**	

PARASITOLOGY

GENUS SPECIES	#	JURISDICTION
PROTOZOA		
BLASTOCYSTIS HOMINIS	1	HOWARD
	4	MONTGOMERY
	2	PRINCE GEORGE'S
DIENTAMOEBA FRAGILIS	3	HOWARD
ENDOLIMAX NANA	3	HOWARD
	4	MONTGOMERY
	5	PRINCE GEORGE'S
ENTAMOEBA COLI	7	HOWARD
	1	MONTGOMERY
	3	PRINCE GEORGE'S
IODAMOEBA BUTSCHLII	1	MONTGOMERY
HELMINTHS		
HOOKWORM EGGS	1	HOWARD
ENTEROBIUS VERMICULARIS	1	CARROLL
TOTAL	**36**	

ARTHROPOD IDENTIFICATION

NONE

TICK IDENTIFICATION

NONE

WATER MICROBIOLOGY

	# TESTED	**# NON-COMPLIANT**
COMMUNITY	4	0
NON-COMMUNITY	523	64
TOTAL	**527**	**64**

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	235	
OTHER†	2	0
TOTAL	**237**	**0**

†**CLOSTRIDIUM** BOTULINUM TOXIN / TYPE B INFANT BOTULISM

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
COXSACKIEVIRUS B1				
	M	5	1	BALTIMORE CITY
	U	0	1	BALTIMORE CITY
	F	48	1	BALTIMORE CITY
	M	18	1	BALTIMORE CITY
	M	26	1	BALTIMORE CITY
SUBTOTAL			**5**	
INFLUENZA A VIRUS				
	M	28	1	CALVERT
	F	17	1	WICOMICO
	M	25	1	WICOMICO
	F	22	1	BALTIMORE CITY
	F	25	1	BALTIMORE CITY
	M	27	1	BALTIMORE CITY
	M	0	1	BALTIMORE CITY
SUBTOTAL			**7**	
TOTAL			**12**	

NOTE: HERPES SIMPLEX STATISTICS CANNOT BE REPORTED THIS MONTH BECAUSE WE ARE TRANSITIONING TO A NEW COMPUTER SYSTEM. WE HOPE TO HAVE HSV STATISTICS BACK BY NEXT MONTH.

VIRAL HEPATITIS

ORGANISM	# OF SPECIMENS	POSITIVES	JURISDICTION
HEPATITIS A			
	6	0	BALTIMORE
	1	0	CARROLL
	3	0	HARFORD
	1	0	MONTGOMERY
	2	0	PRINCE GEORGE'S
	1	0	QUEEN ANNE'S
	1	0	WICOMICO
	2	0	WORCESTER
SUBTOTAL	**17**	**0**	
HEPATITIS B			
	55	0	ALLEGANY
	81	2	ANNE ARUNDEL
	45	1	BALTIMORE
	815	15	BALTIMORE CITY
	11	0	CALVERT
	42	0	CARROLL
	104	0	CECIL
	2	0	CHARLES
	68	0	FREDERICK
	11	0	GARRETT
	34	1	HARFORD
	46	2	HOWARD
	237	7	MONTGOMERY
	350	6	PRINCE GEORGE'S
	2	0	QUEEN ANNE'S
	4	0	SAINT MARY'S
	1	0	SOMERSET
	8	0	TALBOT
	2	1	UNKNOWN
	43	0	WASHINGTON
	125	1	WICOMICO
	1	0	WORCESTER
SUBTOTAL	**2,087**	**36**	
HEPATITIS C			
	45	3	ALLEGANY
	89	27	ANNE ARUNDEL
	37	4	BALTIMORE
	288	107	BALTIMORE CITY
	12	3	CALVERT
	40	4	CARROLL
	79	9	CECIL
	2	0	CHARLES
	69	1	FREDERICK
	15	0	GARRETT
	17	1	HARFORD
	8	0	HOWARD
	29	2	MONTGOMERY
	162	0	PRINCE GEORGE'S
	2	0	QUEEN ANNE'S
	4	0	SAINT MARY'S
	2	1	SOMERSET
	9	0	TALBOT
	2	1	UNKNOWN
	42	5	WASHINGTON
	30	1	WICOMICO
	1	1	WORCESTER
SUBTOTAL	**984**	**170**	
TOTALS	**3,088**	**206**	

RABIES

SOURCE	#	JURISDICTION
BAT	1	MONTGOMERY
CAT	1	ALLEGANY
	1	CARROLL
	1	FREDERICK
COW	2	FREDERICK
FOX	1	CECIL
	1	CHARLES
	1	FREDERICK
	1	HARFORD
	1	ST. MARY'S
HORSE	1	FREDERICK
RACCOON	4	BALTIMORE
	1	CARROLL
	1	CHARLES
	3	FREDERICK
	1	GARRETT
	2	HARFORD
	2	HOWARD
	3	MONTGOMERY
	1	PRINCE GEORGE'S
	1	QUEEN ANNE'S
	2	ST. MARY'S
SKUNK	2	CHARLES
	1	DORCHESTER
	1	MONTGOMERY
TOTAL POSITIVES	**37**	
TOTAL SPECIMENS	**282**	

CHLAMYDOPHILIA (CHLAMYDIA) PSITTACI

REPORTED QUARTERLY
NO REPORT THIS MONTH

CD4 FLOW CYTOMETRY WORKLOAD

REPORTED QUARTERLY
NO REPORT THIS MONTH

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.

NEWBORN & CHILDHOOD SCREENING

STATISTICS FOR JANUARY 2008

PRESUMPTIVE POSITIVES

DISORDERS	#
PHENYLKETONURIA	0
MAPLE SYRUP URINE DISEASE	2
HOMOCYSTINURIA	19
TYROSINEMIA	13
ARGININEMIA	4
CITRULLINEMIA	2
GALACTOSEMIA	1
BIOTINIDASE DEFICIENCY	3
HYPOTHYROIDISM	72
HEMOGLOBIN -DISEASE	22
HEMOGLOBIN -BENIGN	459
CONGENITAL ADRENAL HYPERPLASIA (CAH)	43
CYSTIC FIBROSIS	5
FATTY ACID OXIDATIONS	13
ORGANIC ACIDEMIAS	29
ACYLCARNITINE - BORDERLINE	5
ACYLCARNITINE - OTHERS	14

MONTHLY TOTALS

# OF SPECIMENS SCREENED	10,659
NUMBER OF TESTS	122,521
% OF UNSATISFACTORY SPECIMENS	2.7

YEAR-TO-DATE CONFIRMED CASES

CONDITIONS	# CONFIRMED
MCAD	0
3MCC	0
SCAD	1
VLCAD	0
GA-I	0
MAPLE SYRUP URINE DISEASE	0
PKU- CLINICALLY SIGNIFICANT VARIANT	1
PKU- NOT CLINICALLY SIGNIFICANT VARIANT	1
GALACTOSEMIA- CLASSICAL GALT DEFICIENCY	0
GALACTOSEMIA - VARIANT	1
BIOTINIDASE DEFICIENCY	0
GALACTOSE EPIMERASE DEFICIENCY	0
PARTIAL BIOTINIDASE DEFICIENCY	0
CAH- CLASSICAL SALT WASTING	0
CAH-NON-CLASSICAL	0
HYPOTHYROIDISM - PRIMARY	4
OTHER HYPOTHYROIDISM	1
SICKLE CELL DISEASE -SS	0
SICKLE CELL DISEASE -SC	0
SICKLE CELL DISEASE -S BETA THALASSEMIA	0
CYSTIC FIBROSIS	1

ENVIRONMENTAL CHEMISTRY

SAMPLES	# NON-COMPLIANT	# TESTED
ASBESTOS		
AIR	0	0
BULK	3	17
AIR QUALITY		
$PM_{2.5}$	0	816
PM_{10}	0	0
RADIATION		
AIR/CHARCOAL FILTERS	0	80
MILK	0	4
WIPES	0	36
RAW WATER	0	12
VEGETATION	0	0
OTHER	0	1
DRINKING WATER		
METALS		
COMMUNITY	7	15
NON-COMMUNITY	3	9
PRIVATE WELLS	66	206
PESTICIDES & PCBs		
COMMUNITY	0	24
NON-COMMUNITY	0	32
PRIVATE WELLS	0	0
VOLATILE ORGANIC COMPOUNDS		
COMMUNITY	1	202
NON-COMMUNITY	0	10
PRIVATE WELLS	0	190
RADIATION		
COMMUNITY	11	28
NON-COMMUNITY	0	0
PRIVATE WELLS	3	4
INORGANICS		
COMMUNITY	0	3
NON-COMMUNITY	5	329
PRIVATE WELLS	10	230
FOOD CHEMISTRY		
SUSPECTED TAMPERING	0	0
MICROSCOPIC FILTH	0	0
LABELING	0	0
SURVEILLANCE	0	0
CHEMICAL CONTAMINATION	0	1
TOTAL	**109**	**2,249**

LEAD ENVIRONMENTAL

TEST	#	ELEV	BRL	UNSAT
TOTAL PAINT	1	1	0	0
TOTAL SOIL	2	0	2	0
DUST				
FLOOR	283	21	248	0
SILL	571	18	469	0
WELL	208	16	128	0
OTHER	11	2	8	0
TOTAL DUST	1,073	57	853	0
GRAND TOTAL	**1,076**	**58**	**855**	**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	95
	IIA	10-14	3
	IIB	15-19	11
	III	20-44	12
	IV	45-69	0
	V	>69	0
TOTAL			**121**
WASHINGTON DC			
	I	<10	29
	IIA	10-14	1
	IIB	15-19	0
	III	20-44	0
	IV	45-69	0
	V	>69	0
TOTAL			**30**

HIV ANTIBODY SCREENING – BLOOD (JANUARY 2008)

SPECIMEN SOURCES	TOTAL	POSITIVE EIA	%	POSITIVE WB	%
HEALTH DEPARTMENTS AND CLINICS	2,165	106	4.90%	101	95.28%
HOSPITALS	168	8	4.76%	8	100.00%
DETENTION CENTERS	572	10	1.75%	9	90.00%
PRIVATE PHYSICIANS	9	0	0.00%	0	0.00%
STUDENT HEALTH CLINICS	191	3	1.57%	2	66.67%
EMPLOYEE HEALTH CLINICS	11	0	0.00%	0	0.00%
AUTOPSIES	341	16	4.69%	11	68.75%
ORGAN/TISSUE DONORS	77	2	2.60%	2	100.00%
TOTAL	**3,534**	**145**	**4.10%**	**133**	**91.72%**

VIRAL LOAD SPECIMENS (JANUARY 2008)

HIV–1 RNA Copies/ml	$<10^3$	$10^3 – 10^4$	$10^4 – 10^5$	$>10^5$	Totals
ALLEGANY	8	1	1	1	11
CARROLL	2	0	0	0	2
MONTGOMERY	96	15	23	6	140
PRINCE GEORGE'S	42	7	17	10	76
WASHINGTON	5	1	1	0	7
WICOMICO	2	1	0	0	3
SUBTOTAL	**155**	**25**	**42**	**17**	**239**
DEPARTMENT OF CORRECTIONS	71	20	31	12	134
GRAND TOTAL	**226**	**45**	**73**	**29**	**373**

MAILING LABEL

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