



SURVEILLANCE BULLETIN

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NTRL TRAINS MICROSCOPISTS ON NEW TB EQA

NATIONAL TUBERCULOSIS REFERENCE LABORATORY

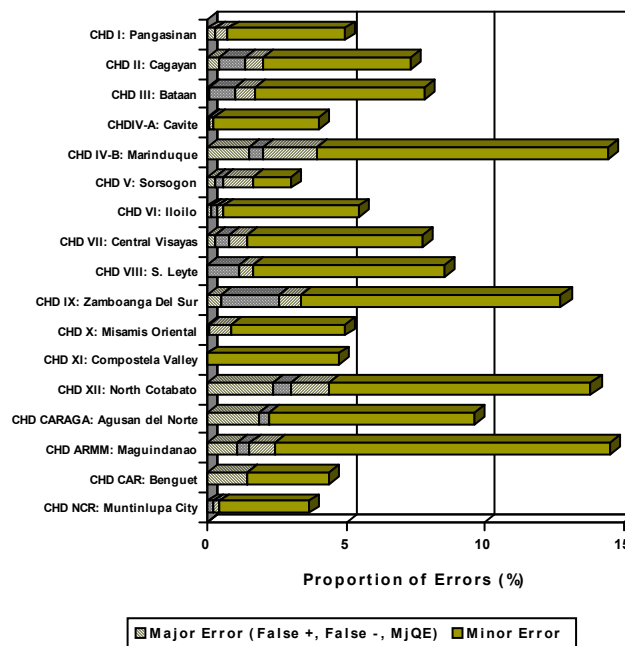
Tuberculosis continues to be a scourge to mankind. In the Philippines, it is still a public health threat making TB the 6th leading cause of morbidity and mortality. Since the direct sputum smear microscopy is the primary diagnostic tool in TB, a Quality Assurance System (QAS) is of prime importance to ensure that microscopy centers, in public and private sectors, are delivering quality and standardized laboratory services.

Recently, the Department of Health, with the cooperation of JICA, made a great effort for training microscopists on the "New External Quality Assessment for AFB Microscopy," recommended by the Association of Public Health Laboratories (APHL) and the WHO Western Pacific Regional Office. The New EQA focuses on slide rechecking (involves blinded re-examination by another technician/controller) of random samples of smears collected from individual test laborato-

ries. Sampling is made under strict statistical guidelines (LQAS) and takes no account

the smear positivity rate and workload of the test laboratory. (Continued in page 2)

2005 SLIDE READING QUALITY CHECK (Pilot Provinces)

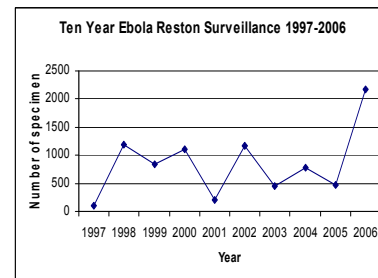


NO CASES OF EBOLA RESTON SINCE 1996

VETERINARY RESEARCH DEPARTMENT

After the outbreak in one monkey facility of Ebola Reston in 1996, surveillance was initiated in order to test the captured wild *Macaca fascicularis* which will eventually become breeders in monkey

facilities. Though there has been an increase in the number of samples tested, no case of Ebola Reston has been reported ever since in 1996.



NTRL (FROM PAGE 1)

In addition to measuring the accuracy of the result, the rechecking procedure can also be used to assess quality of specimens received, smear preparation technique and stain performance. *(Quality Assurance for Sputum Smear Microscopy, 2004)*

The implementation of the New EQA was first introduced in one province for each region to serve as a pilot/model area. The graphs below

show the EQA result of the pilot areas based on slide reading and smear quality check.

For the slide reading quality check, errors or discordant results are classified as major errors (false +, false -, major quantification error) and minor (quantification) errors. As the graph shows, pilot areas have at least 7-8 % errors in average; and from that, at least 2% major error. Though errors are unavoidable, the ultimate goal of EQA is to remove

the major errors and minor errors should be at least minimized.

The acceptable rate for smear quality check is ≥ 90%. The smears were assessed using the six check points, namely: specimen quality, staining, cleanliness, thickness, size and evenness. Slide reading results can also be influenced by the quality of smears prepared.

28% OF DOG SAMPLES POSITIVE FOR RABIES

VETERINARY RESEARCH DEPARTMENT

One hundred seventeen (28%) of a total of 418 dog samples submitted to the RITM rabies laboratory were found positive for rabies diagnosis last 2006. The laboratory performs both antigen and antibody detection for humans and animals. Fluorescent Antibody Test (FAT) is the method for routine antigen detection using brain sample while the Rapid Focus Fluorescence Inhibition Test (RFFIT) is the test for the detection of neutralizing antibody using serum or cerebrospinal fluid. Samples submitted from other animals including cat, hamster, monkey and rat, were found to be negative. A total of 466 samples were analyzed by the laboratory

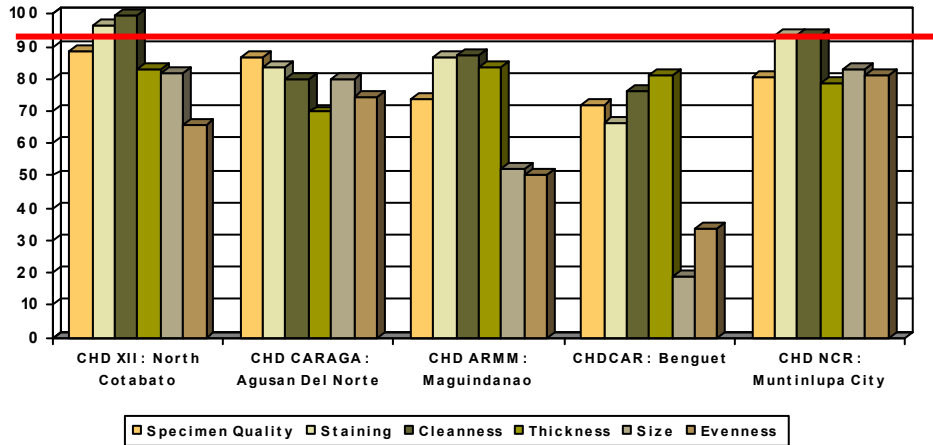
Table 1. Specimen Submitted for Rabies Diagnosis

Species	Number positive (%)	Number negative (%)	Not done*	Total (%)
Cat	0 (0.0)	39 (100.0)	0 (0.0)	39 (8.4)
Dog	117 (28.0)	296 (70.8)	5 (1.2)	418 (89.7)
Hamster	0 (0.0)	4 (100.0)	0 (0.0)	4 (0.9)
Monkey	0 (0.0)	4 (100.0)	0 (0.0)	4 (0.9)
Rat	0 (0.0)	1 (100.0)	0 (0.0)	1 (0.2)
TOTAL	117 (25.1)	344 (73.8)	5 (1.1)	466 (100.0)

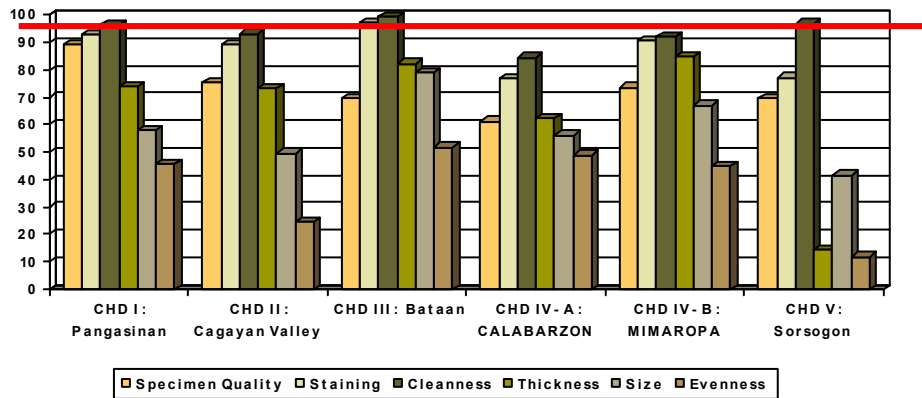
**Specimen not fit for examination*

A total of 466 samples were analyzed by the laboratory

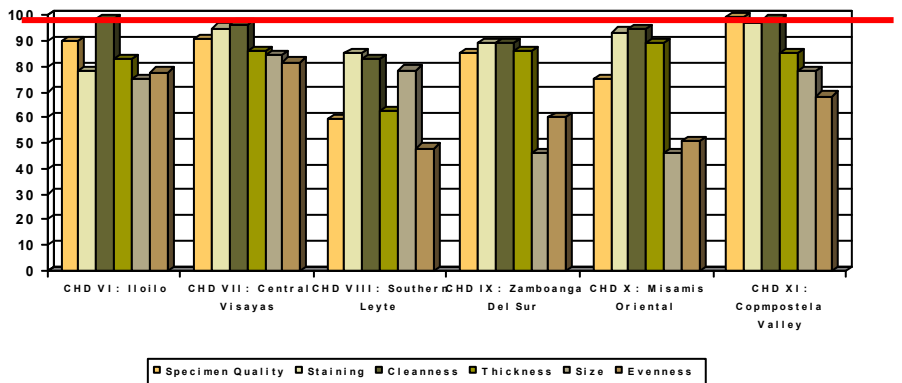
2005 SMEAR QUALITY CHECK (Pilot Provinces)



2005 SMEAR QUALITY CHECK (Pilot Provinces)



2005 SMEAR QUALITY CHECK (Pilot Provinces)



Pilot areas have at least 7-8 % errors in average; and from that, at least 2% major error.

NATURALLY-ACQUIRED *Plasmodium knowlesi* INFECTIONS IN HUMANS IN PALAWAN PHILIPPINES

PARASITOLOGY DEPARTMENT

Plasmodium knowlesi, a natural malaria parasite of macaque monkeys (*Macaca fascicularis*) was earlier reported in humans in Malaysia and Thailand. This simian parasite has been isolated in Philippine macaques as early as 1961 and 1978, but no indigenous human case has been reported in the country until now.

Blood films initially diagnosed as *P. malariae* collected from Palawan were sent out to the Malaria Research Centre at the University of Malaysia Sarawak (UniMAS) for DNA analysis of *Plasmodium* species by the polymerase chain reaction (PCR) using *P.*

knowlesi-specific primers developed by the UniMAS. PCR confirmed that 5 of the 12 samples analysed were *P. knowlesi*. The PCR results indicate that the range of human *P. knowlesi* infections extends from Malaysia and Thailand to the Philippines. It is an emerging threat to the community and non-immune travelers visiting the areas, heightening the potential for transmission of this zoonotic infection.

Current control measures should be strengthened, particularly the use of bed nets every night for all family members in endemic communities, strict implementation of policy

on prophylaxis for non-immune travelers coming to Palawan, in conjunction with other personal protection measures, and confirmation by PCR of microscopically-identified *P. malariae* in a local reference laboratory. *P. knowlesi* in humans can be underestimated from microscopic examination of blood films due to its morphological similarities to *P. malariae*, thus confirmation currently necessitates the use of molecular methods. Further studies on this zoonotic infection are needed to determine the true prevalence.

SEROPREVALENCE OF HEPATITIS B AND C IN DIFFERENT POPULATIONS

IMMUNOLOGY DEPARTMENT

The Hepatitis laboratory tested 2693 samples for Hepatitis B surface antigen, 1328 samples for Anti-HBs and 1372 samples for Anti-Hepatitis C Virus from January to October 2006. These were part of the studies in the seroprevalence of Hepatitis B & C among urban pregnant women, seroprevalence of Hepatitis B among street children and seroprevalence of hepatitis B & C in the urban community, Antipolo City.

Hepatitis B surface antigen was found in 6.6% of the respondents. Prevalence was highest among street children (8.8%) followed by respondents from the urban community (7.4%). Seroprevalence among pregnant women was found to be 6%.

A total of 182 RITM personnel volunteers were also tested for HBsAg and Anti-HBs, 146 for Anti-HCV. The personnel samples were included in the panel sera to be used for the evaluation of the diagnostic

reagent for the detection of HBsAg developed in the Hepatitis laboratory. (See table below)

Monalisa HBsAg Ultra, Monalisa Anti-HBs 3.0, from BIORAD, and MUREX Anti-HCV (Version 4.0) from Abbott were used in the study. All these reagents are enzyme-immunoassay based.

Funds for these studies were from the priority development assistance fund.

Hepatitis B surface antigen was found in 6.6% of the respondents

SEROPREVALENCE OF HEPATITIS B & C AMONG DIFFERENT POPULATION

SOURCE	HBsAg	POSITIVE		ANTI-HBs	POSITIVE		ANTI-HCV	POSITIVE	
		NO.	%		NO.	%		NO.	%
RITM PERSONNEL VOLUNTEERS	182	3	1.64%	182	76	41.70%	146	1	0.68%
URBAN COMMUNITY	828	61	7.36%	828	181	21.80%	787	4	0.50%
PREGNANT WOMEN	1364	82	6.01%	0	0	0	585	7	1.19%
STREET CHILDREN	501	44	8.78%	500	100	20.00%	0	0	0
TOTAL	2875	190	6.60%	1510	357	27.83%	1518	12	0.79%

MEASLES REFERENCE LABORATORY

VIROLOGY DEPARTMENT

In 1999, the laboratory-based measles surveillance and outbreak investigation system was put into place with sentinel hospitals identified in all regions, as part of the Philippine Measles Elimination Campaign launched in 1998. The primary target of this 10-year campaign is to eliminate indigenous measles cases by year 2008. The National Epidemiology Center and the RITM Virology Laboratory form the core of this surveillance, with the laboratory performing confirmatory tests of measles cases identified. In 2000, the Virology Laboratory was desig-

nated as the National Reference Laboratory for Measles and Other Exanthems and was recognized by WHO as the National Measles Laboratory.

A total of **114** serum specimens from suspected clinical cases of measles were received for confirmation, all coming from surveillance activities. No sample was submitted from measles outbreak investigations. Among the sentinel surveillance sites, NCR sent the most number (32, 28.1%) of specimens. No specimen was received from regions 8, 10, 12, CARAGA and ARMM. San

Lazaro Hospital (SLH) submitted 10 (8.8%) specimens, of which 3 samples accounted for the Measles IgM positive cases for 2006.

Three (3/114, 2.6%) were confirmed positive for Measles IgM. Six (6/114, 5.3%) specimens tested equivocal and 105 (92.1%) samples were found negative for Measles EIA IgM antibody. Forty three (43/114, 37.7%) samples were confirmed positive for Rubella, 65 (67.0%) samples were tested negative while 6 (5.3%) samples got equivocal results.

NATIONAL VOLUNTARY BLOOD SERVICES BLOOD PROGRAM REFERENCE LABORATORY

VIROLOGY DEPARTMENT

A total of **8783** referrals were received for the confirmation of HBV, HCV, HIV, syphilis, and malaria from January to December 2006. However, only **8737** were evaluable for confirmation. Of these, 4425 (50.6%) were from the NCR and the remaining 4312 (49.4%) were from 14 other regions. The rest of the specimens (46) were not appropriate

for testing due to insufficient quantity and the failure of some BSFs to include samples with the accompanying request forms. Confirmation of HBsAg reactivity remains to comprise the majority of requests (75.7%), consistent with the results of previous years.

HBsAg positivity confirmation still remains to be relatively high at 87.8%. HCV screening positivity has been low (27.7%). HIV positivity remains low as well at 4.5%. Syphilis TPPA reactivity was at 62.1%. The single sample referred for malaria confirmation was not appropriate for testing.

HBsAg positivity confirmation still remains to be relatively high at 87.8%

List of results by test requested, RITM, January to December 2006 (N=8783)

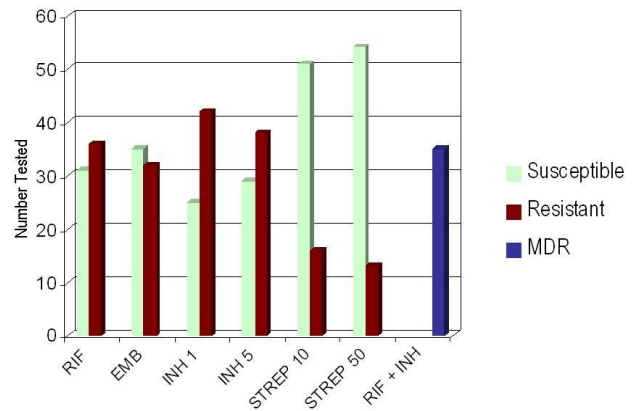
FINAL STATUS	HBV		HCV		HIV		Syphilis		Malaria		Total
	No	%	No	%	No	%	No	%	No	%	
Indeterminate			30	3.0	80	21.2					110
Negative	402	6.0	644	64.3	277	73.5	281	37.1			1604
Positive	5834	87.8	277	27.7	17	4.5	470	62.1			6598
Pending	381	5.7	42	4.2	2	0.5					425
Cancelled	30	0.5	8	0.8	1	0.3	6	0.8	1	100.0	46
TOTAL	6647	75.7	1001	11.4	377	4.3	757	8.6	1	0.0	8783

ISOLATION OF MYCOBACTERIUM SPP. BY THE MICROBIOLOGY LABORATORY OF THE RESEARCH INSTITUTE FOR TROPICAL MEDICINE FROM JANUARY TO DECEMBER OF 2005

VIROLOGY DEPARTMENT

A total of 550 samples from 396 patients were received and processed at the TB Laboratory Unit of the Microbiology Department, RITM from January 2005 to December 2005. Out of these samples, 482 specimens were of pulmonary origin, while 68 specimens were of extra-pulmonary including blood and CSF. Seventy-five samples positive for acid-fast staining (AFS) and 21 samples negative for AFS yielded TB culture positive. There were a total of 97 (18%) Myco-

bacteria isolated, 75 (77%) of which was *Mycobacterium tuberculosis* (MTB). Drug sensitivity testing on 67 MTB isolates yielded 36 (48%) isolates resistant to Rifampicin, 32 (43%) isolates resistant to Ethambutol, 42 (56%) resistant to Isoniazid, 16 (21%) resistant to Streptomycin, and giving a total of 35 (47%) multi-drug resistant TB, that is, resistant to both Rifampicin and Isoniazid.



Antibiotic Susceptibility Pattern of MTB Isolates in RITM, 2005; n=67

NATIONAL POLIO LABORATORY

VIROLOGY DEPARTMENT

The Virology Department serves as the National Polio Laboratory (NPL) for AFP Surveillance under the Department of Health National Plan of Action for Poliomyelitis Eradication, since 1991. It also participates in EPI meetings, Expert Panel Review of AFP Cases and re-orientation seminars for AFP Surveillance Staff and other health personnel. The laboratory continues to receive financial and technical assistance

from WHO-WPRO under the Global Polio Laboratory network.

The laboratory follows the standard procedures for poliovirus investigation as recommended by WHO. Poliovirus isolates are referred to the Victorian Infectious Disease Reference Laboratory (VIDRL), Australia Regional Reference Laboratory for intratypic differentiation to determine whether they are

wild, Sabin-like or a drifted vaccine type (VDPV) in origin. Samples requiring further confirmation are sent to NIID, Tokyo, Japan. It regularly receives proficiency panel as part of Quality Assurance and submit to an on-site review as a requirement for WHO accreditation.

A total of **914** specimens were received from 457 cases from January to December 2006. Three (3) cases

were found positive for Sabin-like poliovirus. NPEV rate remains low at 7.2% (66/914).

The laboratory undergoes annual accreditation under the World Health Organization. Proficiency panel was received last June 8, 2006 and the laboratory performance was at 100%

Distribution of specimens by isolate, RITM, January to December 2006

RESULT	CASE		STOOL	
	No	%	No	%
COXSACKIE B	3	0.7	6	0.7
ECHO 11	5	1.1	8	0.9
ECHO 12	1	0.2	2	0.2
ECHO 25	1	0.2	2	0.2
ECHO 29	1	0.2	2	0.2
ECHO 3	1	0.2	2	0.2
ECHO 30	1	0.2	2	0.2
ECHO 33	1	0.2	1	0.1
ECHO 6	1	0.2	1	0.1
NEGATIVE	428	93.7	843	92.2
NPEV	11	2.4	40	4.4
POLIO 1,2,3 Sabin-like	1	0.2	2	0.2
POLIO 2 Sabin-like	1	0.2	2	0.2
POLIO 2,3 Sabin-like	1	0.2	1	0.1
TOTAL	457	100.0	914	100.0

INFLUENZA REFERENCE LABORATORY/ NATIONAL INFLUENZA CENTER

VIROLOGY DEPARTMENT

The World Health Organization (WHO) coordinates a Global Influenza Surveillance Network to gather data on influenza activity and collects annual information on the influenza viruses which have been isolated to enable to formulate recommendations to vaccine manufacturers for the composition of flu vaccine. The RITM Virology Laboratory was recognized as a participating laboratory in the WHO Network since 1998 when Influenza Virus surveillance was initiated through the support of Pasteur Merieux Caunnaught (PMC) and the WHO Regional Reference Laboratory for Influenza Viruses, Melbourne, Australia. It was only in 2004, that RITM was recognized as a WHO National Influenza Center. Through the joint support received from DOH-RITM, Aventis Pasteur and the WHO Regional Reference Laboratory, Australia, influenza virus surveillance activities continue. The surveillance has expanded last April 2006 to 4 sites in Muntinlupa City.

In 2004, a proposal for expansion of the current surveillance was submitted to the Centers for Disease Control and Prevention and the grant was subsequently awarded last September 2004. The expanded surveillance recently started in August 2005 in the National Capital Region. To date, there are 21 sites in Metro Manila and 6 other provinces (Regions 3, 5, 7, 9, 10 and CAR). A proposal for further expansion to 4 more regions (Regions 1, 2, 6 and 12) will be submitted by mid of this year.

A total of **5959** specimens were submitted last 2006 from both surveillance programs. The most number of specimens were submitted from May to November. Of the 5959 specimens, respiratory viruses were isolated from 868 (14.6%), 5091 (85.4%) were found to be negative. Influenza A accounts for the most number of isolates (362, 41.7%), with the highest number isolated from July to September. Influenza B was

isolated in 176 (20.3%) with the highest yield in September. One hundred fifty three (153, 17.6%) specimens were found positive for Adenovirus, with the highest number isolated in May.

Majority of the isolates came from the under-two age group, accounting for 37.3% (2221) of the total number of positive isolates, followed by the 2-5 age group (2138, 35.9%).

Influenza A New Caledonia was the most predominant strain for 2006 (226, 57.5%). A new strain, Influenza A Solomon Islands, was identified in 14 of the isolates.

**Influenza A New
Caledonia was the
most predominant
strain for 2006
(57.5%)**

SUSCEPTIBILITY OF MALARIA VECTORS TO ITN'S AND IRS

ENTOMOLOGY DEPARTMENT

Major vector control intervention for malaria includes the use of insecticide treated nets (ITN's) and indoor residual sprays (IRS) of houses in endemic areas. To ensure that the insecticides used in the treatment of mosquito nets and in spraying houses indoors remains effective against the primary malaria vector *Anopheles flavirostris*, susceptibility data is needed. Using the standard WHO procedure for the Susceptibility (WHO, 1975), six sites namely; Isabela, Occidental Mindoro, Palawan, Agusan del Sur, Davao del Sur and Zam-

boanga Sibugay (Figure 1) were visited from 2005 to 2006 to conduct tests against seven commonly used insecticides (alphacypermethrin, cyfluthrin, deltamethrin, etofenprox, lambdacyhalothin and permethrin). Results show that different strains of *An flavirostris* remains susceptible to the said compounds based on recorded 100 % mortality after 24 hours and computed lethal Time (LT).

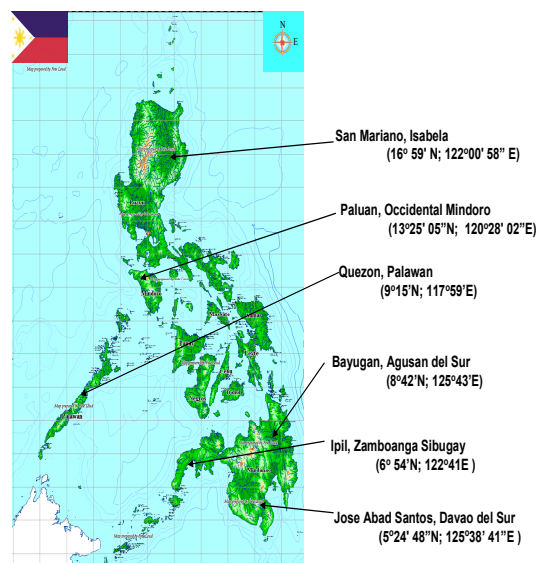


Figure 1. Map of the Philippines showing the study sites for the Monitoring of insecticide susceptibility/resistance.

Distribution of specimens by isolate and by month, RITM, January to December 2006 (N=5959)

ISOLATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Influenza A						1	3	2	2	4		2	14
A/New Caledonia/20/99(H1N1)-like					21	71	85	43	5	1			226
A/New York/55/2004(H3N2)-like								26	36	20	18	7	107
A/Solomon Islands/3/2006(H1N1)-like							14						14
A/Wisconsin/67/2005(H3N2)-like						1							1
Sub-total					21	73	102	71	43	25	18	9	362
Influenza B									1				1
B/Malaysia/2506/2004-like						2	12	28	54	36	18	2	152
B/Shanghai/361/2002-like	2					1		4	9	4	3		23
Sub-total	2					3	12	32	63	40	21	2	175
Adenovirus	20	12	14	13	36	9	7	6	14	7	10	11	159
Enterovirus	5	4	2	2	3	8	4			2	8	7	45
HSV-1	7	4	4	5	8	3	1	2	2	4	4	2	46
Parainfluenza 3	5	8	12	11	16	5	5	2	1	1	3		69
Rhinovirus	1	2					1						4
RSV											5	7	15
Negative	196	140	155	179	541	473	500	653	763	571	596	324	5091
TOTAL	236	168	187	209	624	574	631	766	886	652	664	362	5967

*8 specimens have mixed infections

Antimicrobial resistance rates by disc diffusion, Department of Health Antimicrobial Resistance Surveillance, January to December 2005

A. Enteric Pathogens	Percent resistance (N)					
	Ampicillin	Chloramphenicol	Ciprofloxacin	Cotrimoxazole	Tetracycline	Nalidixic Acid
1. <i>Salmonella typhi</i>	0.9 (337)	0.3 (326)	--	0.3 (331)	--	--
2. <i>Nonthyphoidal salmonella</i>	29.0 (102)	14.0 (103)	4.0 (98)	28.0 (94)	--	--
3. <i>Shigella</i>	74.0 (19)	43.0 (21)	4.0 (24)	46.0 (22)	--	19.0 (16)
4. <i>Vibrio cholera</i>	--	0.5 (209)	--	16.0 (162)	0.9 (211)	--

B. ARI Pathogens	Percent resistance (N)								
	Ampicillin	Cefuroxime	Chloramphenicol	Ciprofloxacin	Co-amoxiclav	Cotrimoxazole	Erythromycin	Penicillin	Ampisulbactam
1. <i>Streptococcus pneumoniae</i>	--	--	4.0 (182)	--	--	16.0 (164)	--	193 (11.0)	--
2. <i>Haemophilus influenzae</i>	10.0 (145)	--	20.0 (143)	--	--	15.0 (146)	--	--	--
3. <i>Moraxella catarrhalis</i>	16.0 (343)	--	--	--	7.0 (307)	50.0 (341)	332 (32.0)	--	--

C. Staphylococci & Enterococci	Percent resistance (N)						
	Ampicillin	Benzylpenicillin	Ciprofloxacin	Cotrimoxazole	Erythromycin	Oxacillin	Vancomycin
1. <i>Staphylococcus aureus</i>	--	96.0 (1979)	1725 (11.0)	9.0 (1587)	14.0 (1681)	31.0 (2061)	0.0 (2041)
2. <i>Staphylococcus epidermidis</i>	--	92.0 (1577)	--	44.0 (1206)	60.0 (1206)	63.0 (1622)	0.0 (1623)
3. <i>Enterococcus faecalis</i>	5.0 (325)	--	--	--	--	--	2.0 (325)

D. Enterobacteriaceae	Percent resistance (N)										
	Amikacin	Ampicillin	Ampisulbactam	Cefuroxime	Ciprofloxacin	Ceftriaxone	Cephalothin	Gentamicin	Cotrimoxazole	Cefepime	Imipenem
1. <i>E. coli</i>	6.0 (3756)	78.0 (4057)	27.0 (3162)	20.0 (1845)	39.0 (3651)	10.0 (3565)	48.0 (2399)	24.0 (3970)	67.0 (3562)	6.0 (3494)	--
2. <i>Klebsiella</i>	13.0 (2901)	--	38.0 (2463)	33.0 (1215)	30.0 (2599)	23.0 (2746)	44.0 (1142)	27.0 (2770)	--	11.0 (2803)	0.6 (3096)
3. <i>Enterobacter</i>	16.0 (2092)	--	--	--	21.0 (1961)	24.0 (1961)	77.0 (1119)	30.0 (2067)	--	10.0 (1978)	2.0 (2277)

E. Gram negative nonfermentative bacilli	Percent resistance (N)									
	Amikacin	Cefepime	Ceftazidime	Ciprofloxacin	Gentamicin	Imipenem	Netilmicin	Piper-Tazo	Tobramycin	
1. <i>Pseudomonas aeruginosa</i>	17.0 (2928)	15.0 (2808)	16.0 (3005)	23.0 (2764)	26.0 (2808)	18.0 (3057)	17.0 (1165)	10.0 (2000)	19.0 (1387)	
2. <i>Acinetobacter</i>	36.0 (2067)	23.0 (1967)	29.0 (2088)	33.0 (1982)	41.0 (1972)	17.0 (2170)	24.0 (511)	27.0 (1765)	27.0 (742)	

F. <i>Neisseria gonorrhoeae</i>	Percent resistance (N)						
	Cefixime	Ceftriaxone	Ciprofloxacin	Ofloxacin	Penicillin	Spectinomycin	Tetracycline
	0.0 (201)	0.0 (225)	49.0 (219)	51.0 (195)	86.0 (216)	1.0 (203)	61.0 (219)

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2005 ANTIMICROBIAL RESISTANCE SURVEILLANCE DATA

ANTIMICROBIAL RESISTANCE SURVEILLANCE REFERENCE LABORATORY

The Antimicrobial Resistance Surveillance Reference Laboratory released its 2005 report on resistance data for several bacterial pathogens. These include enteric pathogens, ARI pathogens, Staphylococci and other Gram positive cocci, Gram negative bacilli and *Neisseria gonorrhoeae*.

Resistance rates for all *Salmonella typhi* isolates to ampicillin, chloramphenicol, and cotrimoxazole remained low (less than 1%). Thus, the report recommended that these three antibiotics could still be used as therapy for suspected uncomplicated typhoid fever.

Nontyphoidal *Salmonellae* was found to have higher resistance rates to chloramphenicol (14%), ampicillin (29%), cotrimoxazole (28%), and ciprofloxacin (4%) compared to rates for *S. typhi*. It was noted that fluororoquinolones and 3rd generation cephalosporins are better treatment options for this organisms though there exists a small proportion of fluoroquinolone resistant nontyphoidal *Salmonella*.

The report also recommended that ciprofloxacin and nalidixic acid still is the drug of choice for treatment of suspected shigellosis in adults and children, respectively, even though resistance to these antibiotics was now found. This is until these findings can be confirmed by further evidence.

Tetracycline and chloramphenicol remained good treatment options for cholera as resistance to these antibiotics remained low.

Infections secondary to *Streptococcus pneumoniae* can still be covered with penicillin or chloramphenicol though the report recommended close monitoring of the changing trends in view of increasing resistance particularly to penicillin.

Ampicillin was recommended as the best treatment option for *Hemophilus influenzae* due to the increasing resistance rates to cotrimoxazole and chloramphenicol.

Overall Methicillin-Resistant *Staphylococcus aureus* (MRSA) rate significantly increased to 34% from 18% in 2004. The report recommended a possible shift from oxacillin to vancomycin in areas where MRSA rates exceed 20%.

Hospitals were also instructed to base their treatment recommendations for Enterobacteriaceae on their institution's prevailing resistance patterns as this was variable from hospital to hospital.

Finally, Cefixime and ceftriaxone remain the empiric antibiotics of choice for gonococcal infections.

The report was analyzed from 29,782 isolates submitted by 17 sentinel sites all over the country. There was an increase in the number isolates reported for 2005.

For detailed antimicrobial resistance data, please refer to the tables in Page 9.