Diarrheal Diseases

Coordinator: Howard E. Noyes, Ph.D., Chief, Department of Bacteriology & Mycology

Principal Investigators:
Pongsom Atthasampunna, M.D.[1]
Chiraphun Duangmani, M.D.
Prakit Kasemsarn, M.D.[2]
Udom Lexomboon, M.D., Ph.D.[2]
Howard E. Noyes, Ph.D.

Associate Investigators:
Panyasri Benjadol, M.S.
Santiparb Chaiwongkiath, M.D.[4]
Supanee Kethsuwan, M.D.[4]
Kanchana Leelasiri, B.S.
Lakshana Nagavajara, M.D.[3]
Swish Rardjamroensook, M.D., M.P.H.[5]
Pravit Songsaengterm, M.D.[3]
Veeravat Supradish, M.D.[3]
Susri Tondhavudho, M.D.[3]
Pairoj Tanvichien, M.D.[3]
Prapin Tugkanon, M.D.[3]
Pisut Uttamote, M.D.[4]
Ravi Vanichsarn, M.D.[4]

Assistant Investigators:
Yachai Ampaipast, B.S.
John C. Bell, SSG
Henry H. Higaki, MSG
Yupa Kasemsanta, P.H.N.
Tatsanee Occeño, B.S.
Pavanee Prayongratana, R.N.
Yongyuth Raengpradub, B.S.
Chantana Ratanavaraha, B.S.
Prani Ratarasarn
Chanphen Srimunta, B.S.
Ronald K. Stackhouse, SP5
Curtis A. Stewart, SP6
Tasna Tamaarree, Dip. Med. Tech.
Sunee Yuvachitti, R.N.

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1 On loan from Dept of Health, Ministry of Public Health, Thailand
2 Children's Hospital, Bangkok, Thailand
3 Samut–prakarn Provincial Hospital, Thailand
4 Ubol Provincial Hospital, Thailand
5 Health Officer, Ubol Province, Thailand

OBJECTIVE: Several related studies on diarrheal diseases include: (1) a continuing enteropathogen survey of stools from Thai and American patients: (2) monitoring of antibiotic sensitivity patterns of diarrheal agents of Thai children, (3) characterization of gram negative anaerobes in stools of patients with acute diarrhea; and (4) a clinical trial of iodochlorhydroxyquinoline (ICHQ) in hospitalized El tor cholera patients.

DESCRIPTION: (1) The enteropathogen survey study included specimens from inpatients and outpatients of both sexes from hospitals throughout Thailand. Most specimens were from patients hospitalized with diarrhea and were collected during the acute phase of the disease. The laboratory procedures were described in detail in the previous Annual Report. (2) The plate dilution technique was used to determine antimicrobial sensitivities of enteropathogens. (3) Stool specimens that were collected by a SMRL nurse from Thai children with acute diarrhea were brought to the laboratory for immediate processing. Pure cultures of obligate gram negative anaerobes were processed on the basis of colonial and microscopic morphology, 15 biochemical reactions and antimicrobial sensitivity patterns. (4) For the clinical trials of ICHQ all diarrheal patients admitted to Ubol Provincial Hospital during the cholera outbreak were considered and patients whose stool specimens were negative for agglutinable vibrios or who had received antimicrobials prior to hospitalization were deleted from the study. On admission suspected cholera patients received fluid and electrolyte replacements but no antimicrobials. Patients with odd admission numbers received drug A (ICHQ), those with even admission numbers drug B (placebo). The dosage of ICHQ was 250 mg every four hours for 72 hours in the form of tablets for adults and suspension for children 1—10 years of age. Rectal swabs were taken prior to initial medication and at 0600 daily thereafter. Assessment of therapeutic efficacy of ICHQ was by duration of vibrio excretion.

PROGRESS: 1. Results of examinations of 3,448 routine specimens from 1,891 individuals are included in this report. Most of the 3,317 specimens from Thai nationals were from patients in Children's Hospital, Bangkok, Thailand. Other specimens were collected from patients at the Royal Thai Army, Royal Thai Navy, Siriraj Hospitals, Bangkok and Phrabuddhabat Provincial Hospital. Most of the 130 specimens from U.S. personnel were from the U.S. Embassy Medical Unit, SMRL, and the 5th Field Hospital, all in Bangkok.

Isolations of enteropathogenic bacteria are summarized in Table 1. Approximately 7.7% of the specimens yielded Salmonellae; 2.3% yielded Shigellae, and 10.7% of those tested yielded Enteropathogenic Escherichia coli (EEC). The predominance of Salmonellae isolates from Thais is consistent with recovery rates found during the preceeding six years. Most of the Salmonellae isolates, representing 23 species, were Salmonella panama and Salmonella derby. There were no isolates of Salmonella javiana, the predominant organism the previous year, and isolates of Salmonella typhosa remained low, as has been the case for the last eight years.

Eleven species were represented among the 70 Shigellae isolates. There were 24 isolates of Shigella sonnei form I followed by decreasing frequency of isolation by Shigella flexneri 2, Shigella sonnei form II and Shigella flexneri 3. Shigellae were isolated throughout the year and no specific outbreaks were noted. Serotypes 0119:B14, 025:B19:B23 and 0127:B8 were the predominant isolates of Enteropathogenic Escherichia coli in those children (less than 5 years old) checked for these organisms. No agglutinable vibrios have been isolated since September 1969.

Studies were done on the evaluation and comparison of 4 enrichment broths reputed to facilitate higher isolation rates of enteropathogens from rectal swabs or stool cultures. Overall, preliminary findings indicate that results obtained with tetrathionate broth, Hajna broth, Rappaport broth, and Selenite F broth are all inferior to results obtained by direct streaking of the specimen. Among plate media the largest number of salmonella and shigella isolates were from SS agar followed in terms of decreasing isolates by XLD, DC and MC agars. The evaluation continues.

2. In vitro sensitivities were determined for 208 isolates of Salmonellae, 157 isolates of Shigellae and 392 isolates of Enteropathogenic E. coli during this period (Tables 2—7). Overall these studies indicate that by far the most effective antimicrobials studied were colimycin and furazolidone followed in order of

decreasing effectiveness by ampicillin, neomycin, oxytetracycline and chloramphenicol. All isolates of Shigellae and Salmonellae were either very sensitive or very resistant to ampicillin. All but 3 isolates of S. panama, the enteropathogen isolated most frequently during this period, were completely resistant to ampicillin. Enteropathogenic E. coli isolates tended to be more resistant than Salmonellae or Shigellae isolates. Based on these and prior in vitro studies the use of chloramphenicol or tetracycline is not indicated for therapy of most cases of acute diarrhea in Thailand.

3. The gram–negative, non–sporulating anaerobic or filamentous bacteria have been little studied and are poorly understood, even though they are known as one of the predominant–if not the predominant–members of the normal intestinal flora of man and despite their being the causal pathogen in serious diseases of man and animals. Some reports indicate they outnumber coliforms 100 to 1 in the human bowel. The theory has been advanced that they act as "stabilizers" of bowel ecology and diarrheal diseases can be associated with changes of their types and numbers in the gastrointestinal tract. Among other gaps in our knowledge of these organisms, their classification is uncertain. This portion of the study is being done to characterize these organisms preliminary to determining their roles, if any, in diarrhea of children. A total of 368 isolates representing 11 species of these obligate gram–negative anaerobes have been studied in terms of morphology and biochemical reactions (Table 8). Some of the identifications are tentative because of variable reactions within designated species. Antimicrobial studies of these isolates indicate that most were sensitive to lincomycin and erythromycin, sensitivities to penicillin G were variable and most organisms were very resistant to polymyxin B, kanamycin, colimycin and neomycin. Correlation of these isolates to recognize enteropathogens from these patients has not been completed.

4. The trial of iodochlorhydroxyquine (ICHQ) in El tor cholera cases at Ubol Provincial Hospital was continued until the end of the outbreak in mid–July 1969. The results of the study are summarized in Table 9. The range of duration of vibrio excretion was from less than one day to 9 days in both control and drug groups. The mean duration of excretion in the ICHQ group was 4.08 days while that of the control was 5.25. Forty–four percent of the drug group was vibrio–free within 3 days of treatment as compared with only 28% of the control groups. After one week, 28% of the control patients were still excreting vibrios but only 8% of the drug group were positive. There were 3 relapses after sodium sulfate purging in the ICHQ group and 2 in the control group.

From 2–18 July 1969 we conducted an investigation of cholera carriers among the food handlers in restaurants and food vendors in Ubol city in cooperation with the Ubol Provincial Health Office. One rectal swab was taken from each of the food handlers by the health workers, put into alkaline peptone tubes, and processed by SMRL personnel. El Tor vibrios were not isolated but there were 19 isolates of non–agglutinable (NAG) vibrios from 362 food handlers in the 97 restaurants and food shops examined. The distribution of Heiberg groups of the NAG vibrio isolates are shown in Table 10.

SUMMARY: Salmonella panama and Salmonella derby were the enteropathogens isolated most frequently from Thai children with acute diarrhea. Most enteropathogens tested were sensitive in vitro to colimycin and furazolidone and resistant to kanamycin, neomycin, oxytetracycline and chloramphenicol. Stools from Thai children with acute diarrhea were cultured for obligate gram negative anaerobic organisms. The 368 isolates represented 11 species and were resistant to most antimicrobials used to treat diarrhea. The trials of iodochlorhydroxyquinoline (ICHQ) as a vibriocidal agent in cholera patients were completed during this period. It was shown that ICHQ shortened the duration of vibrio excretion but was considered inferior to other antimicrobials such as tetracycline, chloramphenicol, kanamycin and erythromycin. No cholera carriers among food handlers in Ubol at the end of the cholera outbreak were found.

Table 1. Enterobacteriaceae Isolated from Acute Diarrhea Cases in Thailand
(1 April 1969–31 Mach 1970)

Month	Thai Nationals					American Nationals				
	No. of Specimens	No. of Patients	Salmonellae	Shigellae	Vibrios	No. of Specimens	No. of Patients	Salmonellae	Shigellae	Vibrios
April 1969	207	125	10	11	2	35	35	6	2	0
May	268	142	10	1	5	42	42	1	2	0
June	222	114	3	3	1	16	16	1	2	0
July	331	201	25	12	0	9	9	0	0	0
August	365	180	30	5	0	6	6	0	0	0
September	404	179	52	3	2	9	9	0	0	0
October	262	141	47	4	0	3	3	1	1	0
November	368	179	28	6	0	1	1	0	0	0
December	159	96	4	4	0	1	1	0	0	0
January 1970	213	127	9	5	0	5	4	0	0	0
February	225	121	24	8	0	1	1	0	0	0
March	293	156	14	8	0	3	3	0	1	0
Totals	3317	1761	256	70	10	131	130	9	8	0

Table 2.

SENSITIVITIES OF ENTERIC ORGANISMS TO COLIMYCIN
(1 April 1969–31 March 1970)

Organisms	No. of strains tested	Inhibited at mcg/ml									
		0.78	1.56	3.12	6.25	12.5	25	50	100	200	> 200
Salmonella typhi	5	5	—	—	—	—	—	—	—	—	—
S. kentucky	2	2	—	—	—	—	—	—	—	—	—
S. derby	55	48	7	—	—	—	—	—	—	—	—
S. moscow	3	3	—	—	—	—	—	—	—	—	—
S. weltevreden	15	13	2	—	—	—	—	—	—	—	—
S. oslo	4	4	—	—	—	—	—	—	—	—	—
S. panama	55	50	5	—	—	—	—	—	—	—	—
S. muenchen	1	1	—	—	—	—	—	—	—	—	—
S. stanley	8	5	3	—	—	—	—	—	—	—	—
S. senftenberg	1	1	—	—	—	—	—	—	—	—	—
S. lexington	6	4	2	—	—	—	—	—	—	—	—
S. heidelberg	2	2	—	—	—	—	—	—	—	—	—
S. typhimurium	7	6	1	—	—	—	—	—	—	—	—
S. bovismorbificans	2	2	—	—	—	—	—	—	—	—	—
S. virchow	4	4	—	—	—	—	—	—	—	—	—
S. tennessee	2	1	1	—	—	—	—	—	—	—	—
S. tananarive	7	6	1	—	—	—	—	—	—	—	—
S. anatum	4	3	1	—	—	—	—	—	—	—	—
S. meleagridis	2	2	—	—	—	—	—	—	—	—	—
S. enteritidis	1	1	—	—	—	—	—	—	—	—	—
S. newlands	11	9	2	—	—	—	—	—	—	—	—
S. newport	11	9	2	—	—	—	—	—	—	—	—
S. paratyphi B	6	4	2	—	—	—	—	—	—	—	—
S. montevideo	1	1	—	—	—	—	—	—	—	—	—
S. claibornei	3	1	2	—	—	—	—	—	—	—	—
Shigella sonnei, form I	35	35	—	—	—	—	—	—	—	—	—
Sh. sonnei form II	7	7	—	—	—	—	—	—	—	—	—
Sh. flexneri 1	9	9	—	—	—	—	—	—	—	—	—
Sh. flexneri 2	49	48	1	—	—	—	—	—	—	—	—
Sh. flexneri 3	22	22	—	—	—	—	—	—	—	—	—
Sh. flexneri 4	7	7	—	—	—	—	—	—	—	—	—
Sh. flexneri 6	1	1	—	—	—	—	—	—	—	—	—
Sh. boydii 1	4	4	—	—	—	—	—	—	—	—	—
Sh. boydii 2	4	4	—	—	—	—	—	—	—	—	—
Sh. boydii 4	1	1	—	—	—	—	—	—	—	—	—
Sh. boydii 5	3	3	—	—	—	—	—	—	—	—	—
Sh. dysenteriae 1	2	2	—	—	—	—	—	—	—	—	—
Sh. dysenteriae 2	3	3	—	—	—	—	—	—	—	—	—
Sh. dysenteriae 4	4	4	—	—	—	—	—	—	—	—	—
Sh. dysenteriae 6	1	1	—	—	—	—	—	—	—	—	—
Sh. dysenteriae 7	1	1	—	—	—	—	—	—	—	—	—
Aeromonas sp.	1	1	—	—	—	—	—	—	—	—	—

Table 3.

SENSITIVITIES OF ENTERIC ORGANISMS TO FURAZOLIDONE
(1 April 1969–31 March 1970)

Organisms	No. of strains tested	Inhibited at mcg/ml									
		0.78	1.56	3.12	6.25	12.5	25	50	100	200	> 200
Salmonella typhi	5	5	—	—	—	—	—	—	—	—	—
S. kentucky	2	2	—	—	—	—	—	—	—	—	—
S. derby	55	53	2	—	—	—	—	—	—	—	—
S. moscow	3	3	—	—	—	—	—	—	—	—	—
S. weltevreden	15	11	4	—	—	—	—	—	—	—	—
S. oslo	4	3	—	—	1	—	—	—	—	—	—
S. panama	55	50	5	—	—	—	—	—	—	—	—
S. muenchen	1	1	—	—	—	—	—	—	—	—	—
S. stanley	8	8	—	—	—	—	—	—	—	—	—
S. senftenberg	1	1	—	—	—	—	—	—	—	—	—
S. lexington	6	3	3	—	—	—	—	—	—	—	—
S. heidelberg	2	2	—	—	—	—	—	—	—	—	—
S. typhimurium	7	7	—	—	—	—	—	—	—	—	—
S. bovismorbificans	3	2	1	—	—	—	—	—	—	—	—
S. virchow	4	4	—	—	—	—	—	—	—	—	—
S. tennessee	2	2	—	—	—	—	—	—	—	—	—
S. tananarive	7	7	—	—	—	—	—	—	—	—	—
S. anatum	4	4	—	—	—	—	—	—	—	—	—
S. meleagridis	2	2	—	—	—	—	—	—	—	—	—
S. enteritidis	1	1	—	—	—	—	—	—	—	—	—
S. newlands	11	11	—	—	—	—	—	—	—	—	—
S. newport	11	11	—	—	—	—	—	—	—	—	—
S. paratyphi B	6	6	—	—	—	—	—	—	—	—	—
S. montevideo	1	1	—	—	—	—	—	—	—	—	—
S. claibornei	3	2	1	—	—	—	—	—	—	—	—
Shigella sonnei form I	34	33	1	—	—	—	—	—	—	—	—
Sh. sonnei form II	10	10	—	—	—	—	—	—	—	—	—
Sh. flexneri 1	9	6	3	—	—	—	—	—	—	—	—
Sh. flexneri 2	49	46	3	—	—	—	—	—	—	—	—
Sh. flexneri 3	22	19	—	3	—	—	—	—	—	—	—
Sh. flexneri 4	7	7	—	—	—	—	—	—	—	—	—
Sh. flexneri 6	1	—	—	1	—	—	—	—	—	—	—
Sh. boydii 1	4	4	—	—	—	—	—	—	—	—	—
Sh. boydii 2	4	4	—	—	—	—	—	—	—	—	—
Sh. boydii 4	1	1	—	—	—	—	—	—	—	—	—
Sh. boydii 5	3	3	—	—	—	—	—	—	—	—	—
Sh. dysenteriae 1	2	2	—	—	—	—	—	—	—	—	—
Sh. dysenteriae 2	3	—	1	—	2	—	—	—	—	—	—
Sh. dysenteriae 4	5	5	—	—	—	—	—	—	—	—	—
Sh. dysenteriae 6	1	1	—	—	—	—	—	—	—	—	—
Sh. dysenteriae 7	1	1	—	—	—	—	—	—	—	—	—
Aeromonas sp.	1	1	—	—	—	—	—	—	—	—	—

Table 4.

SENSITIVITIES OF ENTERIC ORGANISMS TO AMPICILLIN
(1 April 1969–31 March 1970)

Organisms	No. of strains tested	Inhibited at mcg/ml									
		0.78	1.56	3.12	6.25	12.5	25	50	100	200	> 200
Salmonella typhi	5	5	—	—	—	—	—	—	—	—	—
S. kentucky	2	2	—	—	—	—	—	—	—	—	—
S. derby	55	52	—	—	—	—	—	—	—	—	3
S. moscow	3	3	—	—	—	—	—	—	—	—	—
S. weltevreden	15	12	—	—	—	—	—	—	—	1	2
S. oslo	4	4	—	—	—	—	—	—	—	—	—
S. panama	55	2	—	1	—	—	—	—	—	—	52
S. muenchen	1	1	—	—	—	—	—	—	—	—	—
S. stanley	8	8	—	—	—	—	—	—	—	—	—
S. senftenberg	1	1	—	—	—	—	—	—	—	—	—
S. lexington	6	5	—	—	—	—	—	—	—	—	1
S. heidelberg	2	2	—	—	—	—	—	—	—	—	—
S. typhimurium	6	5	—	—	—	—	—	—	—	—	1
S. bovismorbificans	3	3	—	—	—	—	—	—	—	—	—
S. virchow	4	3	1	—	—	—	—	—	—	—	—
S. tennessee	2	2	—	—	—	—	—	—	—	—	—
S. tananarive	7	6	—	—	—	—	—	—	—	—	1
S. anatum	4	3	—	1	—	—	—	—	—	—	—
S. meleagridis	2	2	—	—	—	—	—	—	—	—	—
S. enteritidis	1	1	—	—	—	—	—	—	—	—	—
S. newlands	11	11	—	—	—	—	—	—	—	—	—
S. newport	11	11	—	—	—	—	—	—	—	—	—
S. paratyphi B	6	6	—	—	—	—	—	—	—	—	—
S. montevideo	1	—	—	—	—	—	—	—	—	—	1
S. claibornei	3	3	—	—	—	—	—	—	—	—	—
Shigella sonnei form I	33	21	6	2	—	—	—	—	—	2	2
Sh. sonnei form II	10	1	5	1	—	—	—	—	—	1	2
Sh. flexneri 1	9	8	—	—	—	—	—	—	—	1	—
Sh. flexneri 2	49	44	1	2	1	—	1	—	—	—	—
Sh. flexneri 3	22	18	1	—	—	—	—	—	3	—	—
Sh. flexneri 4	7	4	2	—	—	—	—	—	—	—	1
Sh. flexneri 6	1	1	—	—	—	—	—	—	—	—	—
Sh. boydii 1	3	2	—	—	—	—	—	—	—	1	—
Sh. boydii 2	4	3	—	1	—	—	—	—	—	—	—
Sh. baydii 4	1	1	—	—	—	—	—	—	—	—	—
Sh. boydii 5	3	2	—	—	1	—	—	—	—	—	—
Sh. dysenteriae 1	2	1	—	—	—	—	1	—	—	—	—
Sh. dysenteriae 2	3	—	—	—	—	—	—	—	—	3	—
Sh. dysenteriae 4	5	—	—	—	—	1	—	—	—	3	1
Sh. dysenteriae 6	1	1	—	—	—	—	—	—	—	—	—
Sh. dysenteriae 7	1	1	—	—	—	—	—	—	—	—	—
Aeromonas sp.	1	1	—	—	—	—	—	—	—	—	—

Table 5.

SENSITIVITIES OF ENTERIC ORGANISMS TO NEOMYCIN
(1 April 1969–31 March 1970)

Organisms	No. of strains tested	Inhibited at mcg/ml									
		0.78	1.56	3.12	6.25	12.5	25	50	100	200	> 200
Salmonella typhi	5	4	—	1	—	—	—	—	—	—	—
S. kentucky	2	2	—	—	—	—	—	—	—	—	—
S. derby	55	38	11	3	—	1	—	—	—	2	—
S. moscow	3	2	1	—	—	—	—	—	—	—	—
S. weltevreden	15	6	4	1	—	—	—	—	—	1	3
S. oslo	4	—	3	1	—	—	—	—	—	—	—
S. panama	55	—	2	6	—	1	—	—	—	6	40
S. muenchen	1	—	1	—	—	—	—	—	—	—	—
S. stanley	8	3	5	—	—	—	—	—	—	—	—
S. senftenberg	1	—	—	1	—	—	—	—	—	—	—
S. lexington	6	4	2	—	—	—	—	—	—	—	—
S. heidelberg	2	—	—	2	—	—	—	—	—	—	—
S. typhimurium	7	4	3	—	—	—	—	—	—	—	—
S. bovismorbificans	3	2	1	—	—	—	—	—	—	—	—
S. virchow	4	3	1	—	—	—	—	—	—	—	—
S. tennessee	2	1	1	—	—	—	—	—	—	—	—
S. tananarive	7	2	5	—	—	—	—	—	—	—	—
S. anatum	4	—	3	1	—	—	—	—	—	—	—
S. meleagridis	2	2	—	—	—	—	—	—	—	—	—
S. enteritidis	1	1	—	—	—	—	—	—	—	—	—
S. newlands	11	8	1	1	—	—	—	—	—	—	1
S. newport	11	5	4	2	—	—	—	—	—	—	—
S. paratyphi B	6	5	1	—	—	—	—	—	—	—	—
S. montevideo	1	—	—	—	—	1	—	—	—	—	—
S. claibornei	3	—	1	2	—	—	—	—	—	—	—
Shigella sonnei form I	34	6	11	11	2	—	—	—	—	—	4
Sh. sonnei form II	10	1	2	2	—	—	—	—	—	1	4
Sh. flexneri 1	9	—	—	6	2	1	—	—	—	—	—
Sh. flexneri 2	48	2	6	20	10	9	1	—	—	—	—
Sh. flexneri 3	22	2	7	11	1	1	—	—	—	—	—
Sh. flexneri 4	7	—	—	3	—	4	—	—	—	—	—
Sh. flexneri 6	1	—	1	—	—	—	—	—	—	—	—
Sh. boydii 1	4	—	1	1	—	—	—	—	—	—	2
Sh. boydii 2	4	—	—	2	2	—	—	—	—	—	—
Sh. boydii 4	1	—	—	1	—	—	—	—	—	—	—
Sh. boydii 5	3	3	—	—	—	—	—	—	—	—	—
Sh. dysenteriae 1	2	1	—	1	—	—	—	—	—	—	—
Sh. dysenteriae 2	3	—	—	—	—	—	—	—	—	1	2
Sh. dysenteriae 4	4	1	—	2	1	—	—	—	—	—	—
Sh. dysenteriae 6	1	—	1	—	—	—	—	—	—	—	—
Sh. dysenteriae 7	1	1	—	—	—	—	—	—	—	—	—
Aeromonas sp.	1	1	—	—	—	—	—	—	—	—	—

Table 6.

SENSITIVITIES OF ENTERIC ORGANISMS TO OXYTETRACYCLINE

(1 April 1969–31 March 1970)

Organisms	No. of strains tested	Inhibited at mcg/ml									
		0.78	1.56	3.12	6.25	12.5	25	50	100	200	>200
Salmonella typhi	4	—	—	2	1	1	—	—	—	—	—
S. kentucky	2	—	—	—	—	—	—	—	—	—	2
S. derby	55	—	1	42	5	5	—	—	—	—	2
S. moscow	3	—	—	2	1	—	—	—	—	—	—
S. weltevreden	15	—	—	9	2	1	—	—	—	—	3
S. oslo	4	1	1	2	—	—	—	—	—	—	—
S. panama	55	3	7	38	1	1	—	—	—	—	5
S. muenchen	1	—	—	1	—	—	—	—	—	—	—
S. stanley	8	—	1	4	2	1	—	—	—	—	—
S. senftenberg	1	—	—	1	—	—	—	—	—	—	—
S. lexington	6	—	—	3	2	1	—	—	—	—	—
S. heidelberg	2	—	—	2	—	—	—	—	—	—	—
S. typhimurium	7	1	—	1	2	1	1	—	—	—	1
S. bovismorbificans	3	—	1	1	—	—	—	—	—	—	1
S. virchow	4	—	—	3	—	—	1	—	—	—	—
S. tennessee	2	—	—	—	1	1	—	—	—	—	—
S. tananarive	7	—	1	1	1	3	—	—	—	—	1
S. anatum	4	—	—	2	1	—	1	—	—	—	—
S. meleagridis	2	—	—	—	—	2	—	—	—	—	—
S. enteritidis	1	—	—	—	1	—	—	—	—	—	—
S. newlands	11	—	1	4	4	2	—	—	—	—	—
S. newport	11	—	—	4	2	5	—	—	—	—	—
S. paratyphi B	6	—	—	3	2	—	—	—	—	—	1
S. montevideo	1	—	—	—	—	—	—	—	—	—	1
S. claibornei	3	—	—	3	--	—	—	—	—	—	—
Shigella sonnei form I	34	—	1	4	—	—	1	14	5	2	7
Sh. sonnei form II	10	—	—	—	—	—	—	—	3	—	7
Sh. flexneri 1	9	—	—	—	1	—	—	1	—	—	7
Sh. flexneri 2	49	8	2	3	1	11	16	3	2	2	1
Sh. flexneri 3	22	—	—	1	—	—	1	3	—	11	6
Sh. flexneri 4	7	—	—	—	—	—	—	3	1	—	3
Sh. flexneri 6	1	—	—	—	—	1	—	—	—	—	—
Sh. boydii 1	4	—	1	1	—	—	—	—	—	1	1
Sh. boydii 2	4	—	1	—	—	—	—	—	—	—	3
Sh. boydii 4	1	—	—	1	—	—	—	—	—	—	—
Sh. boydii 5	3	—	—	2	—	1	—	—	—	—	—
Sh. dysenteriae 1	3	—	—	1	—	—	—	—	1	—	1
Sh. dysenteriae 2	3	—	—	—	—	—	—	—	—	2	1
Sh. dysenteriae 4	4	—	1	—	—	—	—	—	—	—	3
Sh. dysenteriae 6	1	—	1	—	—	—	—	—	—	—	—
Sh. dysenteriae 7	1	—	—	1	—	—	—	—	—	—	—
Aeromonas sp.	1	1	—	—	—	—	—	—	—	—	—

Table 7.

SENSITIVITIES OF ENTERIC ORGANISMS TO CHLORAMPHENICOL

(1 April 1969–31 March 1970)

Organisms	No. of strains tested	Inhibited at mcg/ml									
		0.78	1.56	3.12	6.25	12.5	25	50	100	200	>200
Salmonella typhi	5	1	1	3	—	—	—	—	—	—	—
S. kentucky	2	2	—	—	—	—	—	—	—	—	—
S. derby	55	10	24	12	3	4	1	—	—	—	1
S. moscow	3	2	—	1	—	—	—	—	—	—	—
S. weltevreden	15	2	4	3	2	1	—	—	1	1	1
S. oslo	4	—	4	—	—	—	—	—	—	—	—
S. panama	55	1	7	21	8	12	5	—	1	—	—
S. muenchen	1	—	—	1	—	—	—	—	—	—	—
S. stanley	8	1	4	3	—	—	—	—	—	—	—
S. senftenberg	1	—	—	1	—	—	—	—	—	—	—
S. lexington	6	1	2	3	—	—	—	—	—	—	—
S. heidelberg	2	—	2	—	—	—	—	—	—	—	—
S. typhimurium	7	1	3	2	—	—	—	—	—	—	1
S. bovismorbificans	3	1	1	—	1	—	—	—	—	—	—
S. virchow	4	1	1	1	1	—	—	—	—	—	—
S. tennessee	2	—	—	2	—	—	—	—	—	—	—
S. tananarive	7	5	2	—	—	—	—	—	—	—	—
S. anatum	4	1	—	1	1	—	1	—	—	—	—
S. meleagridis	2	—	1	—	—	1	—	—	—	—	—
S. enteritidis	1	—	—	—	1	—	—	—	—	—	—
S. newlands	11	1	5	4	1	—	—	—	—	—	—
S. newport	11	1	4	6	—	—	—	—	—	—	—
S. paratyphi B	6	1	1	3	—	1	—	—	—	—	—
S. montevideo	1	—	—	—	—	—	—	—	—	—	1
S. claibornei	3	1	—	—	2	—	—	—	—	—	—
Shigella sonnei form I	34	2	3	—	—	—	—	—	1	3	25
Sh. sonnei form II	10	—	—	—	1	1	—	1	—	—	7
Sh. flexneri 1	9	1	—	—	—	1	—	—	4	—	3
Sh. flexneri 2	49	10	1	—	—	1	—	5	25	5	2
Sh. flexneri 3	22	1	—	—	—	—	1	—	1	12	7
Sh. flexneri 4	7	—	—	—	—	1	—	—	—	—	6
Sh. flexneri 6	1	—	—	—	—	—	—	1	—	—	—
Sh. boydii 1	4	1	1	—	—	—	1	—	—	—	1
Sh. boydii 2	4	1	—	—	—	—	—	—	—	2	1
Sh. boydii 4	1	—	—	1	—	—	—	—	—	—	—
Sh. boydii 5	3	1	1	—	—	1	—	—	—	—	—
Sh. dysenteriae 1	2	—	—	1	—	—	—	—	—	1	—
Sh. dysenteriae 2	3	2	—	1	—	—	—	—	—	—	—
Sh. dysenteriae 4	4	1	1	—	—	—	—	—	—	—	2
Sh. dysenteriae 6	1	1	—	—	—	—	—	—	—	—	—
Sh. dysenteriae 7	1	—	—	—	—	1	—	—	—	—	—
Aeromonas sp.	1	1	—	—	—	—	—	—	—	—	—

Table 8. Obligate Anaerobes from Stools of Thai Children with Acute Diarrhea

Organism	Number of isolates
Bacteroides fragilis	86
Bacteroides incommunis*	76
Bacteroides variabilis*	58
Dialister pneumosintes	56
NCDC group F–2*	45
Bacteroides oralis	20
Bacteroides melaninogenicus	12
Fusobacterium fusiforme	10
Bacteroides corrodens	2
Sphaerophorus necrophorus	2
Bacteroides terebrans	1

* National Communicable Disease Center Classification scheme.

Table 9. Effect or Iodochlorhydroxyquine (ICHQ) on Vibrio Excretion of Cholera Patients in Thailand 1968–1969

Treatment groups	No. of Patients Excreting Vibrios Through Day										
Day	0	1	2	3	4	5	6	7	8	9	10
ICHQ	39	36	31	30	22	16	11	6	3	1	0
Control	29	26	25	22	21	18	15	10	8	4	0

Table 10. Distribution of NAG Vibrios Isolated from Food Handlers, Ubol City July 1969

Heiberg group	No.
I	5
II	6
III	0
IV	1
V	7
VI	0
Total	19