WEEKLY EPIDEMIOLOGICAL REPORT

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Ministry of Healthcare and Nutrition
231, de Saram Place, Colombo 01000, Sri Lanka
Tele: + 94 11 2695112, Fax: +94 11 2696583, E mail: epidunit@sltnet.lk
Epidemiologist: +94 11 2681548, E mail: chepid@sltnet.lk

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Food borne outbreak in Trincomalee: (Part 2)

(**Continued from the previous issue**)
Time from the exposure to wheat based products and manifestation of symptoms were not indicated in the BHT. This information was available for some patients and also obtained from inward patients. Thus, using information of 36 patients fitting into the case definition, an epidemic curve was prepared on the assumption that there could be a possible relationship between exposure and manifestation of symptoms. Epidemic curve prepared is given in the figure 2.

Figure 2 :
Duration of onset of symptoms from the moment of suspected exposure

If the assumption were to be correct, mode incubation period was 240 minutes (4 hours) while median incubation period and mean incubation periods were 248.5 minutes (4 hours and 9 minutes) and 258.6 minutes (4 hours and 19 minutes) respectively.

Confirmation of the aetiology :
Clinical specimens had been collected by the clinicians for bacteriology and chemical analysis. Post mortem specimens collected by the JMO as well as the raw materials for wheat based products from bakeries collected by Medical Officer of Health were dispatched to the government analyst and the bacteriology/mycology section of the Medical Research Institute to trace the possible contaminant.

Formulation of the hypothesis :
First cluster of patients
More than one case of food poisoning associated in time and place is sufficient to be considered as an outbreak (epidemic). In this regard, first four cases admitted to the Trincomalee hospital can be considered as a separate incident of a food borne outbreak from the rest of the 144 cases based on the different clinical picture (absence of fever, low incidence of vomiting, and severe diarrhea leading to dehydration) seen among four affected individuals and the rest. It is apparent that the incriminated products from the incriminated baker were responsible for the disease in four said patients with an attack rate of 100%. The case fatality ratio is 25%. It is difficult to say if the product was contaminated before or after purchasing. However, considering the fact that there was no clustering of similar cases with products obtained from the incriminated bakers among the affected at the hospital, it is highly likely that the contamination occurred during long term retaining of the product in the sea by fishermen. Fishermen had consumed the product after five hours of its purchase while the inland friends had consumed those 15 hours after purchase. It is essential to bear in mind that the product might have been prepared several hours before its availability for purchase. Incubation period of this outbreak was in the range of 5 hours to 15 hours. The clinical symptoms are suggestive of a probable bacterial aetiology or an effect of toxins produced by a pathogen as the aetiology of this outbreak.

Second cluster of patients
It can be concluded that the second incident of 143 cases is not related to the first outbreak. However, The admission of 143 with acute symptoms to the hospital following consumption of bakery products during a short period of time in a particular locality is consistent with a possible outbreak. This is further validated by the common exposure to wheat based products. Although there is a common food source, the continuation of the previously described outbreak involving four fishermen can be excluded strongly based on the clinical picture. Affected individuals had consumed a wide variety of foods from different sources and geographically, victims were from different places. If wheat based products were to be suspected as the incriminated food item, the possibility of contamination of these products in a large number of bakeries is possible as affected have consumed food purchased from different places.

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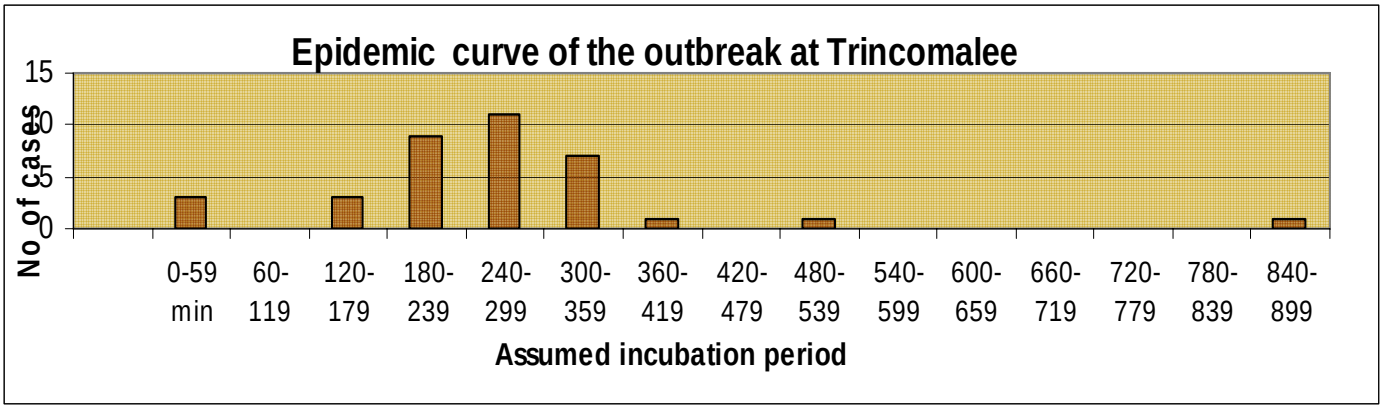

The possible explanation then is the use of contaminated raw materials used in widespread bakeries which have come from a common source. With these circumstances, a hypothesis that wheat based products (bread and buns) would have been the source of infection for the second cluster of patient was made.

Testing the hypothesis

To test this hypothesis, a case control study was carried out enrolling cases as well as controls from the same school considering the fact that majority of patients being school children. The ability to meet many of them at one point (school) was an additional factor for selecting cases and controls from schools. The school Cases were selected with at least one of the symptoms of abdominal pain, giddiness, nausea or vomiting while controls were age and sex matched school children from the same school without signs and symptoms. Information related to the crude exposure status to buns and breads were collected as they had been the main incriminated food items. However, due to limited availability of time and absence of some cases in schools, it was possible to identify only 15 affected children and 14 controls from schools. Odds ratios for the exposure to bread was 0.26 (95% confidence interval – 0.05-1.3) where as the same for exposure to bun was 1.33 (95% confidence interval – 0.24-7.4). Both estimates were statistically not significant. However the numbers were too small for a statistically powerful analysis.

If this hypothesis is correct, this should be a common source outbreak and as such cases should be continued to be reported. However, this was not observed at the time of investigation on 25th of March. Public health authorities needed to enhance surveillance to detect clustering of more cases compatible with case definition in the following days to exclude this possibility. Investigation of raw materials selected from various bakers was also needed for either confirmation or negation of raw material contamination as the reason for the outbreak

Conclusion:

First four reported cases were a point source food borne out break. The source of outbreak was buns purchased in the morning from a bakery in the main street. Clustering of other 143 cases was not related to the first event. It was highly possible that the source of outbreak was contaminated raw materials. Can there be an alternative explanation for this cluster ?. If this was a food borne outbreak, the epidemic curve suggested that it was a point source epidemic. However, the investigation negated this possibility as commonality in the incriminated food was not found. Unfolding of the event implied that it was not a common source epidemic either. In which case, based on evidence of key informants that there was a panic in schools and in the town following the initial outbreak. It was reasonable to believe that there was a possibility of people (predominantly school children) who consumed wheat based products being admitted to the hospital due to fear. This was further proved by the admission of 14 patients without any symptom and a wide variability of symptom complex. Predominance of vague symptoms, mild course of the purported disease in absolute majority, median age of 11 years, and the occurrence of admission of the majority of patients from 10 am to 1 pm led to a strong suspicion as to if this was due to panic. However, this conclusion can be reached only after excluding contamination of raw materials used in bakeries in the town.

Recommendation:

To continue to look for additional cases admitted to the hospital in the following days. Following case definition was suggested for this purpose.

"**Any individual with symptoms of abdominal pain, giddiness, nausea and vomiting developed after 23. March after having consumed wheat based products in the Trincomalee town ".**

To visit daily to the hospital for surveillance and prompt investigation of cases, if new cases are clustered, by the MOH staff .

While commending the MOH/SPHI/PHII for initiating the investigation of outbreak in a scientific manner and collecting relevant specimens, it is recommended that it be a continuous process till the outbreak is confirmed "non existing".

District public health authorities should have a meeting with bakery owners to explain the situation and allowing them to continue production under hygienic conditions. Following up of patients will give a clue as to if any closure of bakeries is necessary depending on accumulation of new cases. This opportunity should be used for educating food establishments including producers to highlight the importance of food safety.

People should be made aware of the situation and the fact that there is no need to panic specially in consuming wheat based products. However, the opportunity should be utilized for highlighting the need for complying with food safety measures in general.

Regional Epidemiologist should assist the PDHS & RDHS to follow up the aetiology having liaised with the MRI and government analyst.

This article is based on the outbreak investigation report made by Dr. Ranjan Wijesinghe, Consultant Epidemiologist. Editor wishes to thank Dr. Upekha Seneviratne, the Research Assistant , Epidemiology Unit for her support in preparing this article.

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Table 1: Vaccine-preventable Diseases & AFP

28th March - 03rd April 2009 (14th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2009	Number of cases during same week in 2008	Total number of cases to date in 2009	Total number of cases to date in 2008	Difference between the number of cases to date in 2009 & 2008
	W	C	S	N	E	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 GM=1	00	00	00	00	00	00	00	00	01	03	20	21	-4.8%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	-
Measles	00	00	01 MT=1	03 VA=3	00	00	00	00	01 RP=1	05	04	41	35	+17.1%
Tetanus	00	00	00	00	01 KM=1	00	00	00	00	01	00	08	11	-27.2%
Whooping Cough	01 GM=1	00	00	00	00	00	00	00	00	01	03	20	11	+81.9%
Tuberculosis	162	14	11	16	25	32	00	14	32	306	271	2303	2427	-5.1%

Table 2: Newly Introduced Notifiable Disease

28th March - 03rd April 2009 (14th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2009	Number of cases during same week in 2008	Total number of cases to date in 2009	Total number of cases to date in 2008	Difference between the number of cases to date in 2009 & 2008
	W	C	S	N	E	NW	NC	U	Sab					
Chickenpox	28	11	36	502	16	13	24	4	11	645	157	4299	1714	+150.8%
Meningitis	00	07 KD=3 ML=3 NE=1	01 HB=1	00	01 BT=1	02 PU=1 KR=1	03 AP=2 PO=1	01 BD=1	07 KG=5 RP=2	22	36	287	502	-42.8%
Mumps	04	04	20	02	01	02	03	03	07	46	50	511	665	-23.15%
Leishmaniasis	00	01 ML=1	08 MT=4 HB=4	00	00	00	04 AP=2 PO=2	00	00	13	Not available*	315	Not available*	-

Key to Table 1 & 2

Provinces: W: Western, C: Central, S: Southern, N: North, E: East, NC: North Central, NW: North Western, U: Uva, Sab: Sabaragamuwa.

DPDHS Divisions: CB: Colombo, GM: Gampaha, KL: Kalutara, KD: Kandy, ML: Matale, NE: Nuwara Eliya, GL: Galle, HB: Hambantota, MT: Matara, JF: Jaffna, KN: Killinochchi, MN: Mannar, VA: Vavuniya, MU: Mullaitivu, BT: Batticaloa, AM: Ampara, TR: Trincomalee, KM: Kalmunai, KR: Kurunegala, PU: Puttalam, AP: Anuradhapura, PO: Polonnaruwa, BD: Badulla, MO: Moneragala, RP: Ratnapura, KG: Kegalle.

Data Sources:

Weekly Return of Communicable Diseases: Diphtheria, Measles, Tetanus, Whooping Cough, Chickenpox, Meningitis, Mumps.

Special Surveillance: Acute Flaccid Paralysis.

Leishmaniasis is notifiable only after the General Circular No: 02/102/2008 issued on 23 September 2008.

National Control Program for Tuberculosis and Chest Diseases: Tuberculosis.

Table 3: Laboratory Surveillance of Dengue Fever

28th March - 03rd April 2009 (14th Week)

Samples	Number tested	Number positive	Serotypes *				
			D1	D2	D3	D4	Negative
Number for current week	01	00	00	00	00	00	00
Total number to date in 2009	27	03	00	00	03	00	00

Sources: Genetic Laboratory, Asiri Surgical Hospital

* Not all positives are subjected to serotyping.

NA= Not Available.

Table 4: Selected notifiable diseases reported by Medical Officers of Health

28th March - 03rd April 2009 (14th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human Rabies		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	23	562	3	51	0	5	1	65	0	12	10	132	0	2	5	26	0	3	**77**
Gampaha	10	295	0	39	1	6	0	19	0	9	3	79	0	3	0	27	0	1	**57**
Kalutara	6	161	1	87	0	3	1	24	0	6	2	54	0	0	0	4	0	1	**67**
Kandy	21	540	11	110	0	1	3	12	0	52	3	68	5	39	2	15	0	0	**80**
Matale	20	197	0	27	0	0	0	14	0	5	11	148	0	2	0	2	1	2	**92**
Nuwara Eliya	0	20	5	115	0	0	2	59	0	20	0	16	2	19	1	21	0	0	**77**
Galle	3	36	5	60	1	7	0	0	0	5	4	55	0	2	0	6	0	3	**84**
Hambantota	1	43	0	26	0	6	0	2	0	5	2	17	1	29	0	7	0	0	**100**
Matara	3	174	10	102	0	2	0	4	0	4	4	59	1	54	0	5	0	0	**82**
Jaffna	0	7	1	33	0	3	2	70	0	19	0	0	1	81	1	7	0	1	**38**
Kilinochchi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Mannar	0	3	2	13	0	0	0	56	0	4	0	0	0	0	0	14	0	0	**75**
Vavuniya	0	4	40	76	0	1	2	4	0	2	0	2	0	0	0	0	0	0	**50**
Mullaitivu	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**0**
Batticaloa	14	208	3	41	0	9	0	5	0	5	0	2	0	0	0	2	0	1	**73**
Ampara	1	25	1	11	0	0	0	5	4	4	0	6	0	0	0	4	0	0	**43**
Trincomalee	5	64	1	28	0	1	2	2	0	0	0	1	0	4	1	4	0	0	**70**
Kurunegala	12	229	3	51	0	3	1	17	0	1	4	37	1	42	0	20	1	4	**84**
Puttalam	1	49	3	44	0	5	0	36	0	0	1	37	0	20	2	5	0	1	**78**
Anuradhapura	5	104	3	28	0	3	0	3	0	2	0	61	1	22	0	4	0	0	**74**
Polonnaruwa	2	22	2	12	1	2	0	10	0	6	1	36	0	0	1	4	0	0	**71**
Badulla	0	22	3	75	0	2	0	16	0	13	0	32	1	22	4	75	0	0	**80**
Monaragala	0	10	0	15	0	0	0	7	0	2	0	5	1	29	0	13	0	0	**55**
Ratnapura	7	79	7	189	0	13	1	22	0	2	3	31	1	12	0	6	0	1	**78**
Kegalle	13	280	2	36	0	3	1	13	0	1	2	34	0	9	6	53	0	1	**73**
Kalmunai	1	71	0	46	0	1	0	5	0	1	0	2	0	1	0	3	0	0	**54**
SRI LANKA	**148**	**3205**	**106**	**1317**	**3**	**76**	**16**	**471**	**04**	**180**	**50**	**914**	**15**	**392**	**23**	**327**	**2**	**19**	**72**

Source: Weekly Returns of Communicable Diseases (WRCD).
*Dengue Fever / DHF refers to Dengue Fever / Dengue Haemorrhagic Fever.
**Timely refers to returns received on or before 03rd April, 2009 Total number of reporting units =311. Number of reporting units data provided for the current week: 223
A = Cases reported during the current week. B = Cumulative cases for the year.

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ON STATE SERVICE

Dr. P. PALIHAWADANA
EPIDEMIOLOGIST
EPIDEMIOLOGY UNIT
231, DE SARAM PLACE
COLOMBO 10