

# Review of the Trends and Causes of Food Borne Outbreaks in Malaysia from 1988 to 1997

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## Summary

This paper examines the trend and possible contributing factors for the occurrence of the food borne diseases outbreaks in Malaysia. These diseases mainly are cholera, typhoid fever, hepatitis A, dysentery and food poisoning. The outbreaks still occur sporadically in certain high risk areas throughout the country. The incidence rate of all the other three major food borne diseases steadily declined from the year 1988 to 1997 except for food poisoning and cholera. Statistic of food poisoning from the year 1996 to 1997 showed that 66.5% of the outbreak occurred in schools whereas only 0.4% originated from the contaminated food sold at various public food outlets. The school age group is always more affected than the general population. Amongst the contributing factors identified are related to unhygienic food handling practices followed by inadequate safe water supply and poor environmental sanitation. A multisectoral approach between Ministry of Health and other government agencies or private agents needs to be undertaken in the management of the food borne diseases in order to curb the incidences of food borne diseases in Malaysia.

**Key Words:** Food borne diseases, Contributing factors, Multisectoral approach

## Introduction

Food borne diseases still persist as one of the major public health problems in Malaysia and other developing countries. These diseases are cholera, typhoid fever, hepatitis A, dysentery and food poisoning and are mainly related to poor sanitation<sup>1-3</sup>.

In Malaysia, these diseases have shown a declining trend over the last ten years. This is mainly related to the increase supply and usage of safe drinking water, improvement in personal and environmental hygiene including more priorities

are given to the hygienic practices of food handling<sup>4</sup>. Outbreaks still occur sporadically in certain high risk areas which needs to be explained and properly managed. The objective of this study is to describe the trends in food borne outbreaks in Malaysia and to identify the factors contributing to their occurrence.

## Materials and Methods

This is a cross-sectional study of secondary data. The data in this article were obtained from the ongoing data collection sources in the country

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including communicable disease cases monthly reports and outbreak reports from the states in the Disease Control Division, Department of Public Health, and hygienic level of food premises monthly report from the states in the Food Quality Control Division, Department of Public Health. The incidence rate of infection over time were calculated from communicable disease cases monthly reports for the year 1988 to 1997 while the incidence rates of cholera, food poisoning, typhoid and hepatitis A by state for the year 1996 to 1997.

Due to the limited availability of the outbreak reports, the analysis of data by place of occurrence of food poisoning and the analysis for typhoid and hepatitis A by age group as well as the analysis of the contributing factors were done only from 1996 to 1997. The hygienic level of the food premises throughout the country from 1996 to 1997 were assessed through a standard format (Ministry of Health) and graded accordingly into 4 groups, (i.e. 0% to 25% - poor grading, 26% to 50% - unsatisfactory grading, 51% to 75% - satisfactory grading and 76% to 100% - most satisfactory grading). All the data were gathered and analysed using Excel computer programme. For the statistical test, X<sup>2</sup> test is used to test the significant level of the comparative trend of typhoid and hepatitis A cases between the age groups.

The other limitation is the fact that this review is biased towards outbreaks or cases which were only reported in government health facilities. It is

acknowledged that a proportion of food borne outbreaks occurrence or food borne cases in general population were not reported.

## Results

### General food borne diseases

Table I shows the incidence rate of the food borne diseases in Malaysia from 1988 to 1997. The incidence rate of three major food borne diseases i.e. typhoid fever, dysentery and hepatitis A had steadily declined from the year 1988 to 1997, except for food poisoning and cholera. Food poisoning showed a remarkable increasing trend during the last few years especially in 1996 and 1997.

### Cholera

Table II shows the distribution of incidence rates of cholera and deaths in Malaysia by state, 1996 and 1997. In 1996, the highest incidence rate was recorded by Penang with 74.47 per 100,000 population (1 death) followed by Kedah with an incidence rate of 12.48 per 100,000 of population and Sabah with an incidence rate of 11.06 per 100,000 of population (1 death). More than 54 % of the cases are amongst the school age group with an incidence rate of 11.5 per 100,000 of population.

In 1997, the highest incidence rate was recorded by Sabah with 6.91 per 100,000 of population (1 death) followed by Sarawak with an incidence rate of 5.99 per 100,000 population (2 deaths) and

**Table I**  
**Incidence Rate of the Food Borne Diseases in Malaysia, 1988 - 1997**

Diseases	Incidence Rate (per 100,000 populations)									
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Cholera	4.44	2.24	11.53	2.77	3.87	5.13	2.67	10.9	7.02	1.80
Dysentery	4.56	3.62	3.05	2.38	2.1	1.35	0.77	0.75	0.56	0.60
Hepatitis A	11.65	10.12	7.04	9.16	8.69	4.72	2.05	2.06	4.01	1.57
Food Poisoning	9.68	10.2	6.69	6.01	5.31	8.44	6.28	7.08	15.29	31.08
Typhoid	10.2	10.21	12.38	10.99	9.76	7.43	5.27	4.46	4.5	3.24

*Disease Control Division, Department of Public Health, Ministry of Health Malaysia*

**Table II**  
**Distribution of Incidence Rates of Cholera and Deaths in Malaysia by State, 1996 and 1997**

State	Incidence Rate (per 100,000 populations)	1996 No. of Death	Incidence Rate (per 100,000 populations)	1997 No. of Death
Perlis	4.22	0	0.00	0
Kedah	12.48	0	0.00	0
Penang	74.47	1	0.08	0
Perak	2.59	0	0.48	0
Selangor	0.34	0	0.93	1
Federal Territory Kuala Lumpur	0.37	0	2.98	0
Negeri Sembilan	0.13	0	0.49	0
Malacca	0.17	0	0.17	1
Johore	0.08	0	0.04	1
Pahang	0.16	0	0.32	0
Terengganu	1.27	0	0.00	0
Kelantan	0.92	0	0.00	0
Sabah	11.06	1	6.91	1
Sarawak	0.47	0	5.99	2
Malaysia	7.02	2	1.80	6

*Disease Control Division, Department of Public Health, Ministry of Health Malaysia*

Federal Territory of Kuala Lumpur with an incidence rate of 2.98 per 100,000 population. About 42% of the cases are also amongst the school age group with an incidence rate of 2.35 per 100,000 of population.

### Food Poisoning

Table III shows the distribution of incidence rates of food poisoning in Malaysia by state from 1996 to 1997. The incidence rate has increased over the last two years from 15.29 in 1996 to 31.08 in 1997. In 1996, the highest incidence rates were recorded by the states of Malacca, Johore, Federal Territory, Terengganu, Kelantan and Pahang with an incidence rates of more than 15 per 100,000 of

population. In 1997, the highest incidence rates were recorded by Kedah, Malacca, Terengganu, Kelantan and Pahang with an incidence rates of more than 40 per 100,000 of population.

Table IV shows the number of the food poisoning cases in Malaysia from 1996 to 1997, according to the place of occurrence. Statistics of food poisoning from the year 1996 to 1997 shows that 66.5% of the outbreak occurred in primary and secondary schools. Other institutions which comprises of educational institutions like universities, colleges and training centres contributed the second highest whereas only 0.4% originated from contaminated food sold at various public food courts.

**Table III**  
**Distribution of Incidence Rates of Food Poisoning in Malaysia by State, 1996 and 1997**

State	1996 Incidence Rate (per 100,000 populations)	1997 Incidence Rate (per 100,000 populations)
Perlis	0.00	14.72
Kedah	7.44	62.54
Penang	2.73	21.17
Perak	3.94	26.30
Selangor	1.10	28.47
Federal Territory Kuala Lumpur	17.88	6.55
Negeri Sembilan	10.53	18.63
Malacca	197.05	47.94
Johore	19.85	26.74
Pahang	15.49	53.92
Terengganu	17.29	51.86
Kelantan	15.73	48.65
Sabah	8.96	13.48
Sarawak	11.36	32.44
Malaysia	15.29	31.08

*Disease Control Division, Department of Public Health, Ministry of Health Malaysia*

### **Typhoid**

Table V shows the Distribution of incidence rates of Typhoid in Malaysia by state from 1996 to 1997. The incidence rate has decreased over the last two years from 4.5 in 1996 to 3.24 in 1997. In 1996, the highest incidence rates were recorded by the states of Terengganu, Kelantan, Kedah, Sabah and Perlis with an incidence rates of more than 4.0 per 100,000 of population. In 1997, the highest incidence rates were also recorded by Kelantan, Terengganu, Perlis and Sabah with an incidence rates of more than 4.0 per 100,000 of population.

Table VI shows the trend of typhoid in Malaysia between the age group of 5 to 19 years and other ages from 1996 to 1997. The incidence rate amongst those between the ages of 5 to 19 years are always

higher than the incidence rates of the other age groups of population ( $X^2=51.38$ ,  $df=1$ ,  $p<0.001$ ).

### **Hepatitis A**

Table VII shows the distribution of incidence rates of Hepatitis A in Malaysia by state from 1996 to 1997. The incidence rate has also decreased over the last two years from 4.01 in 1996 to 1.57 in 1997. In 1996, the highest incidence rates was recorded by Kelantan with an incidence rate of 41.53 per 100,000 of population and other states like Terengganu, Perlis and Kedah with an incidence rates of more than 2.0 per 100,000 of population. In 1997, the highest incidence rates were also recorded by Terengganu, Kelantan, Perlis and Sabah.

**Table IV**  
**Number of the Food Poisoning Cases in Malaysia, from the Year 1994 to 1997,**  
**according to the Place of Occurrence**

Place	1996	1997	Total	
			No.	%
Primary school	1228	1979	3207	31.8
Secondary school	876	2626	3502	34.7
Private residence	12	47	59	0.5
Food court	0	27	27	0.3
Other institution	792	1512	2304	22.9
Public gathering	400	533	933	9.3
Unknown	21	27	48	0.5
Total	3329	6751	10,080	100

*Disease Control Division, Department of Public Health, Ministry of Health Malaysia*

**Table V**  
**Distribution of Incidence Rates of Typhoid in Malaysia by State, 1996 and 1997**

State	1996	1997
	Incidence Rate (per 100,000 populations)	Incidence Rate (per 100,000 populations)
Perlis	4.69	4.14
Kedah	6.51	1.24
Penang	1.65	0.41
Perak	2.11	1.58
Selangor	1.41	0.87
Federal Territory Kuala Lumpur	3.68	3.78
Negeri Sembilan	1.13	0.25
Malacca	1.91	0.86
Johore	0.48	0.20
Pahang	3.30	1.05
Terengganu	10.02	5.74
Kelantan	22.18	14.03
Sabah	4.80	7.88
Sarawak	2.24	3.22
Malaysia	4.5	3.24

*Disease Control Division, Department of Public Health, Ministry of Health Malaysia*

**Table VI**  
**Comparative trend of Typhoid in Malaysia between the age group 5 - 19 years and other ages, 1996 - 1997**

Age	1996		1997	
	IR	No. of Cases	IR	No. of Cases
5 - 19	6.22	433	6.27	445
Other ages	3.66	520	1.77	259

*Disease Control Division, Department of Public Health, Ministry of Health Malaysia*  
 IR: Incidence rate (per 100,000 of population)

**Table VII**  
**Distribution of Incidence Rates of Hepatitis A in Malaysia by State, 1996 and 1997**

State	1996	1997
	Incidence Rate (per 100,000 populations)	Incidence Rate (per 100,000 populations)
Perlis	4.22	1.38
Kedah	2.46	0.46
Penang	1.32	0.33
Perak	0.53	1.05
Selangor	0.96	0.67
Federal Territory Kuala Lumpur	0.59	0.07
Negeri Sembilan	0.25	0.25
Malacca	0.35	0.00
Johore	0.64	0.04
Pahang	0.66	0.32
Terengganu	8.75	12.91
Kelantan	41.53	6.63
Sabah	1.63	1.91
Sarawak	0.10	0.20
Malaysia	4.01	1.57

*Disease Control Division, Department of Public Health, Ministry of Health Malaysia*

Table VIII shows the trend of hepatitis A in Malaysia between the age group of 5 to 19 years and other ages from 1996 to 1997. The trend also showed that the incidence rate amongst

those between the ages of 5 to 19 years (i.e. the school age group) is always higher than the incidence rates of the general population ( $X^2 = 5.21$ ,  $df=1$ ,  $p<0.05$ ).

**Table VIII**  
**Comparative Trend of Hepatitis A in Malaysia between the Age Group 5 - 19 years and Other Ages, 1996 - 1997**

Age	1996		1997	
	IR	No. of Cases	IR	No. of Cases
5 - 19	7.87	548	3.14	445
Other ages	2.12	301	1.10	162

*Disease Control Division, Department of Public Health, Ministry of Health Malaysia*  
 IR: Incidence rate (per 100,000 population)

**Table IX**  
**Contributing Factors for the Occurrence of Food Borne Outbreaks in Malaysia, for the year 1996 - 1997**

Contributory factor	No. of Outbreak*	Percentage
Unhygienic food handling	241	92.3
Poor environmental sanitation	8	3.1
Inadequacy of safe water supply	8	3.1
Imported case (foreigners)	4	1.5
Total	261	100

*Disease Control Division, Department of Public Health, Ministry of Health Malaysia*

\* 5 Major food borne diseases: cholera, food poisoning, typhoid, hepatitis A and dysentery

**Table X**  
**Hygienic Level of Food Premises in Malaysia, for the Year 1996 and 1997**

Year	Hygienic Level (%)									
	0 - 25		26 - 50		51 - 75		76 - 100		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
1996	536	1.3	4,458	10.8	28,523	69.1	7,750	18.8	41,267	100
1997	934	1.9	5,733	11.7	31,654	64.8	10,549	21.6	48,870	100
Total	1,470	1.6	10,191	11.3	60,177	66.8	18,299	20.3	90,137	100

*Food Quality Control Division, Department of Public Health, Ministry of Health Malaysia*

### Contributing factors

Table IX shows the contributing factors for the occurrence of food borne outbreaks in Malaysia, for the year 1996 - 1997. Food borne outbreaks and particular food poisoning episodes were mainly attributed to unhygienic food handlers practises.

Table X shows the hygienic level of food premises in Malaysia for the year 1996 and 1997. Amongst them, 11,661 (12.9%) fall into the unsatisfactory grading (50% marks and below).

## Discussion

Although the overall picture of food borne diseases has shown a declining trend over ten years (1988 - 1997), outbreaks still occur sporadically in certain high risk areas. Several factors were identified as contributory factors for the occurrence of the food borne diseases in Malaysia. Namely unhygienic food handling practices, poor environmental sanitation and inadequacy of safe drinking water supply in the slum and squatter areas. Recent trends however showed that unhygienic food handling practices is the commonest contributing factor for the food borne outbreaks in Malaysia as compared previously<sup>4,6,7</sup>.

Poor environmental sanitation and inadequacy of safe drinking water supply support the higher occurrences of food borne diseases in traditional areas or less developed states like Sabah, Sarawak, Kelantan, Terengganu and Kedah. Most of the areas affected by food borne diseases outbreaks are squatter and slum areas like fishing villages with congested living conditions and lack of basic sanitary facilities like portable water and sewerage. Cholera outbreaks occurs sporadically in areas with poor or inadequate safe drinking water supply and environmental sanitation. This includes squatter areas, slum areas or areas where water rationing were implemented especially during droughts. Fishing villages like Miri in Sarawak, Tawau in Sabah and Tumpat in Kelantan had also been reported with cholera outbreak<sup>4,6,7</sup>.

In the last two years, outbreaks of cholera appeared to occur in non traditional areas reflecting the changing high risk outbreak scenario from rural to urban population as a result of compromised food sanitation, changing of dietary lifestyles and rural-urban migration. With regard to the changing of dietary lifestyles, more people tend to eat outside for their convenience and indirectly exposed themselves to unhygienic food premises<sup>4</sup>.

In urban areas like the Klang Valley, Penang Island and a few other towns, the occurrence of food borne diseases were contributed by three

main factors leading to unhygienic food handling practices. They are unlicensed food handlers without proper medical check-up and training prior to their employment, unhygienic food premises, and ineffectiveness of law enforcement related to food hygiene.

An outbreaks of cholera in Penang in 1996 and Klang Valley at the end of 1997, were proven to be related to unhygienic food handling practices. This outbreaks were due to contaminated black jelly and ice, and 'nasi lemak' sold at a street food stall. Food poisoning which was solely related to unhygienic food handling practices showed a remarkable increasing trend since the last few years especially in the year 1996 and 1997. More than 50% of the outbreaks occurred in schools. These outbreaks were related to unhygienic food handling practices amongst the school canteen operators. The majority of the food borne disease cases (especially for food poisoning) are amongst the school age group<sup>4</sup>.

In Malaysia, licensing of the food premises are mostly carried out by various local authorities or town boards as required by the Local Government Act before they are allowed to operate their food premises. Before issuing or renewing their license, the physician should medically certify all food handlers working with those premises as healthy. In the absence of proper registration of all food premises and handlers nationwide, it was difficult to know their exact number. It is estimated that there are at least 200,000 food premises and 1.2 million food handlers in Malaysia today. However, less than 30% of food premises in Malaysia were examined and hygienically evaluated<sup>5</sup>.

In view of this above scenario, the strategies have to be formulated or have to be strengthened to prevent and control food borne outbreaks in the country. The management of food borne diseases is better handled through a multisectoral approach. This is due to the multiple causative factors that could lead to the outbreaks. The health department, local authority, public works

department and other private organizations should work together to improve food handling practices and to ensure the adequate supply of safe drinking water and to improve the environmental sanitation. Rural Environmental Sanitation and Water Supply Programme (BAKAS Programme) was a Ministry of Health project carried out with the objective of providing hygienic latrines and safe drinking water supply to the rural poor. To date, 98% of the population have hygienic latrines and more than 85% receive safe drinking water supplied by Department of Water Supply<sup>8</sup>.

Currently, the improvement in the hygienic practices of food handling was carried out mainly by the Ministry of Health and local authority staff. The Food Quality Control Division, Ministry of Health of Malaysia have produced guidelines on the hygienic status evaluation of food premises. Those premises failing to achieve the above 50% hygienic level will be ordered to temporarily close under The Food Act 1983 and clean up their premises before permission is given again. The Control and Prevention on Communicable Diseases Act 1988 required closure order to be delivered to those premises involved with any diseases outbreak. Currently local authorities have structured food court areas sold or rented to hawkers with basic amenities. Licenses will be issued when they fulfilled requirements set up by them. Those premises found to be unlicensed or unhygienic would also compounded under The Local Government Act, 1976.

Till now, health education to the public still plays the most important role especially on food hygiene, personal hygiene, environmental sanitation, and in the control and prevention of food borne disease outbreaks. The Health Education and Communication Center (HECC) of the Public Health Department has been educating the public on health. The Health Education Team is one of the important and compulsory teams to be set-up in any outbreaks faced by the district. This team is designated to coordinate and implement all health education activities to the

public, institution or organization in accordance with the control and investigation team. Health education activities are usually implemented via government mass media, exhibitions, small group discussion or role-play.

Currently, the typhoid vaccine is given to all food handlers as a prophylaxis for typhoid fever. Every food handler was obliged to be vaccinated before they can be given a license by the local authority to handle food for the public. Two tablets stat dose of vibramycin are given to the close contacts and food handlers in the areas where cholera outbreak has occurred. No other prophylaxis is given for other kinds of food borne diseases in this country. As a policy in Malaysia, all cases and carriers of typhoid and cholera should be admitted to the hospital for treatment and isolation. They will only be discharged after 3 consecutive stool examinations show negative results. These stool examinations taken at least 24 hours after completed scheduled treatment.

For the treatment of food borne disease cases, chloramphenicol for typhoid and vibramycin for cholera are still the drug of choice in Malaysia unless resistance developed. Other drugs will be used depending on their sensitivity. There are no actual figure pertaining to the existence of resistance towards chloramphenicol and vibramycin. Recently in Kelantan there were 24% cases of Cholera that were resistant to vibramycin. Other states, did not report such problems<sup>4</sup>.

All medical practitioners who diagnose or treat food borne diseases are obliged to notify such cases to the nearest health officer as soon as possible. Failure to do that means they are exposing their self to the law punishable under the Prevention and Control of Communicable Diseases Act 1988. The above steps ensure that prompt control of all communicable diseases outbreak. From this notification through out the country, also the weekly and monthly national surveillance of communicable diseases will be monitored at the state and national level.

For the future, the Ministry of Health with the concerted effort from Ministry of Housing and Local Government, Ministry of Education and Ministry of Public Work will be proposing an integrated national plan to curb the incidences of food borne diseases in Malaysia. Amongst the objectives of this plan are to increase the knowledge and awareness of the general population and food handlers particularly their role in preventing food borne diseases, to strengthen the law enforcement related to food hygiene, and to strengthen the existing strategies. The Ministry of Health Malaysia also is in the process of updating and publishing national

guidelines for the control and prevention of food borne diseases in Malaysia. Computerization programme integrating all states is on its way. With that, data could be compiled systematically as fast as possible.

In conclusion, food borne diseases are still a major public health problem in Malaysia. More effective strategies or strengthening of the existing strategies are needed to curb the incidences of food borne diseases with full support from other government agencies or private agencies as well as the general population.

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