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ORIGINAL ARTICLE

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Measles Morbidity and Mortality in the  
Department of Child Health, Dr. Pirngadi  
General Hospital, Medan, in 1973-1977

by

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Abstract

*One hundred seventy-six cases with measles have been hospitalized at the Department of Child Health, Dr. Pirngadi General Hospital, Medan in 1973 — 1977.*

*The case fatality rate was 26.1%. The most frequent complications found were Pneumonia, Encephalitis, Diarrhea and Dehydration.*

*Age specific mortality, as expected, was highest in the 0 — 1 year age group (38.6%). A high proportion of the survivors (22.2%) showed recidual signs of brain damage and blindness.*

*This study proved that active immunization against measles in Indonesia must have priority.*

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## Introduction

Measles is an acute, highly contagious disease usually affecting preschool children. Over 95% of persons are infected prior to the age of 15 (Kempe et al., 1978). The very serious complications are the upper and lower respiratory tract. The common form are pneumonia and tonsillo-pharyngitis, due to bacterial infection occur 5-15% of all cases.

Kempe et al. (1978) stated that encephalitis occurred in 1:1000 instances of measles, 60% recovered completely, 25% had severe sequelae and the remainder 15% died.

According to Wong (1978) it is hard to introduce measles immunization amongst the Chinese because they still think that it is better for their children to contract measles naturally. In Indonesia there is less interest in measles (Setiady, 1978). May be all cases with measles complication are found in the family of low society that does not know hazard of the disease.

Gastrointestinal complication is the leading cause of death. Among 5 million of births in one year, is estimated 600,000 babies died before the age of one year; and out of this number 100,000 died due to communicable disease, which can be prevented by immunization (Setiady 1978). Most of the survivors suffered from sequelae because of brain damage (paralysis), blindness, undernourished and growth retardation (Ruuskanen et al., 1978).

Serological survey which was done by the Department of Child Health in Yogyakarta showed that 72.5% of children had measles antibodies at the age of 5 and 100% at the age of 12 years. The case fatality rate in the hospital in Indonesia is about 64%.

Measles is often regarded as an unimportant infectious disease (WHO, 1973). Available data showed that this is not true; but more reliable information on the frequency of complication, their sequelae and case fatality rate is required.

There are many factors influencing the clinical severity of measles such as age, distribution of population, the total child population, the age of maximum incidence of the disease, density of the population, environmental hygiene and exposure to bacterial infection, poor nutritional status (WHO, 1973).

The purpose of this study is to find out the mortality and morbidity of measles in order to know the main cause of death.

## Material and Methods

Survey was carried out amongst the children hospitalized in the Department of Child Health, Dr. Pirngadi General Hospital, between January 1973 until December 1977. In this retrospective study, all the recording-cards of the cases suffering from measles were collected.

The diagnosis of measles was based on: 1. Three days' prodrome consisted of fever, conjunctivitis, coryzae and cough. 2. Maculopapular, confluent rash over the face and body.

The criteria of measles encephalitis were based on the positive diagnosis of measles and loss of consciousness with the episode of convulsion, in which the cerebro-spinal fluid finding seemed to be normal.

Diarrhea was diagnosed by anamnesis or finding of more than 4 times of watery faeces.

### Results

Since January 1973 until December 1977, 176 cases of measles had been hospitalized with their complications. The case fatality rate was about 46 cases (26.1%). The most frequent complications were bronchopneumonia, encephalitis and diarrhea (Table 1).

TABLE 1 : Number of cases, complications and death from 1973 to 1977

Year	Total cases	Sex		C o m p l i c a t i o n			D e a t h	
		♀	♂	Br - Pne	Enceph	Diarr	No	%
1973	42	18	24	28	18	18	8	19
1974	16	4	12	12	5	3	3	18.8
1975	14	7	7	10	6	6	4	28.6
1976	68	32	36	53	19	15	20	38.2
1977	36	18	18	16	10	16	11	30.6
Total	176	79	97	119	58	52	46	26.1

Table 2 showed the cases, suffering from measles hospitalized in 1973, were 42 (1.9%); in 1974, 16 (1.1%); in 1975, 14 (0.8%); in 1976, 68 (4.4%) and in

1977, 36 cases (1.9%). This study conspicuously showed that the survivors suffering from residual signs were high (22.2%).

TABLE 2 : Number of cases that suffered from recidual signs

Years	Number of cases			Survivors		Death	
	Total	Measles	%	RS (-)	RS (+)	No.	%
1973	2169	42	1.9	26	8	8	19
1974	1455	16	1.1	7	6	3	37.5
1975	1739	14	0.8	6	4	4	28.5
1976	1556	68	4.4	30	18	20	26.5
1977	1916	36	1.9	22	3	11	8.5
Total	8809	176	2	91	39 (22.2%)	46	0.52

— R.S. : Recidual signs (brain damage or other sequelae).

— Death : Case fatality rate.

With regard to the age, the highest incidence and mortality rate are below

the age of 5 years (see table 3). No measles have been found in cases above the age of 12 years. The most frequent complications were pneumonia, acute encephalitis and diarrhea.

TABLE 3 : Number of cases and mortality rate with regard to the age

Age (yrs)	Number of cases in						Death	
	1973	1974	1975	1976	1977	Total	No.	%
— 1	11	2	4	16	11	44	15	34.1
1 — 2	21	5	5	21	12	62	19	30.6
2 — 5	6	5	7	24	7	49	10	20.4
5 — 12	4	4	—	7	6	21	2	9.5
12 —	—	—	—	—	—	—	—	—

### Discussion

Measles is geographically more frequently found in developing countries, in some of which it is the most serious of common infectious diseases of child-

hood (David Morley, 1973); but it is too often regarded as an unimportant infection (WHO, 1975). Until now the interest in measles in our country is relatively small. It is probably because children suffering from measles mostly came

from the lower social-economic groups or by any reason they could not reach the clinics (WHO, 1975).

In our study the mortality rate is still excessively high; 26.1% of all cases with measles or about 40 per 8809 of all hospitalized children for the 5 years' period. There is much concern in Latin America about the importance of measles as a cause of mortality in children under 5 years of age especially in undernourished groups (Setiady, 1978). We found that the most frequent complication is bronchopneumonia (142 cases). The death number due to bronchopneumonia alone were 11 cases (18.0%), whereas due to bron and encephalitis 12 cases (42.9%) and chapneumonia with diarrhea were 11 cases (47.8%) (see table 4). This table showed that 39 out of 46 deaths were complicated by bronchopneumonia.

In developed countries, however, bronchopneumonia is no longer a frequent cause of death following measles; and in recent survey measles bronchopneumonia was observed only in 3% of previous healthy children (Morley, 1973).

The second frequent complication was encephalitis; often with a progressive course and fatal outcome. Encephalitis following measles in our finding were 54 cases (30.7%). The death number due to encephalitis alone was about 3 cases (18.7%), while due to both broncho-pneumonia and encephalitis 12 cases (42.9%), and due to bronchopneumonia with diarrhea were 11 cases (47.8%), and due to broncho-pneumonia

encephalitis and diarrhea were 5 cases (71.4%) (see table 4).

Because of lack of facilities for autopsy and electro-encephalogram studies in our hospital, the encephalitis was only diagnosed due to convulsive episodes and coma associated with measles, which is frequently found in children with severe measles (Morley, 1973). In our study the encephalitis was an acute type. We found 54 cases of measles complicated by encephalitis, of which 21 cases died and 33 cases suffered from severe sequelae of brain damage. In this study we also found 6 cases suffering from blindness due to keratitis. Overall result of our analysis on hospitalized measles showed that 26.1% (46 cases) died, 22.2% (39 cases) had severe sequelae, and the remainder 51.7% (91 cases) recovered completely. In this survey we found that the cases of measles which have ambulatory treatment were 383 cases, so that the total number of measles were 559 cases, whereas measles encephalitis were 54 cases or 9.7%. This number was conspicuously high compared to the statement of Kempe et al. (1978) that measles encephalitis occurred in 1:1000 instances of measles.

Another serious complication of measles is diarrhea, which in our finding were 52 cases (29.5%). The death number due to only diarrhea following measles were 3 cases (17.6%). In Africa measles being complicated by diarrhea was considered more severe and fatal than pneumonia amongst children (Morley, 1973).

TABLE 4 : Measles, complications and mortality

Measles & Complications	Total cases	Deaths	
		No.	%
Measles	21	—	—
Measles br. pn.	61	11	18.0
Measles encep.	16	3	18.6
Measles diarr.	17	3	17.6
Measles br. pn. + encep.	28	12	42.9
Measles br. pn. + diarr.	23	11	47.8
Measles br. pn. + encep. + diarr.	7	5	71.4
Measles encep. + diarr.	3	1	33.3
T o t a l :	176	46	26.1

In U.S.A. death occurred in one of a thousand reported cases of measles. The cause was usually neurological or respiratory complication (Kempe et al., 1978). Here in the Department of Child Health, Dr. Pirngadi General Hospital Medan, death occurred in 5 of a thousand reported hospitalized cases and the cause of death was usually res-

piratory and gastrointestinal complication.

#### Conclusion

This study conspicuously proves that the morbidity and case fatality rate of measles are still high: 2% and 26.1% respectively. Until now active immunization against measles has not been available in the hospital.

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