

THE FUNCTION OF UNDISCIPLINED CHILDREN UNDER THE  
COMMONS AND UNDISCIPLINED VICTORIES IN THE BATTLE

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Lung function of kindergarten children living near sawmills and wood-based factories in Terengganu / Liew Hooi Ling.



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**LUNG FUNCTION OF KINDERGARTEN CHILDREN LIVING NEAR  
SAWMILLS AND WOOD-BASED FACTORIES IN TERENGGANU**

**By  
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**Research Report submitted in partial fulfillment of  
the requirement for the degree of  
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**DEPARTMENT OF BIOLOGICAL SCIENCES  
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## TABLE OF CONTENTS

APPROVAL FORM	i
ACKNOWLEDGEMENT	ii
CONTENTS	iii
LIST OF TABLES	v
LIST OF FIGURES	vi
LIST OF PLATES	vii
LIST OF ABBREVIATIONS	viii
ABSTRACT	ix
ABSTRAK	x
<b>CHAPTER</b>	
<b>1.0 INTRODUCTION</b>	<b>1</b>
<b>2.0 LITERATURE REVIEW</b>	<b>4</b>
2.1 Air Quality in Malaysia	4
2.2 Human Respiratory System	8
2.2.1 Respiratory Structure	8
2.2.2 Gas Exchange in the Alveoli of Lungs	9
2.3 Sawmills and Wood-based Factories: Impact on Health	10
2.3.1 Respirable Particulate Matter (PM)	10
2.3.2 Wood Dust	11
2.3.3 Endotoxins and (1→3)-β-D-glucans	12

2.4 Air Pollution	13
2.2.1 Outdoor Pollution	14
2.2.2 Indoor Pollution	16
2.2.3 Effects on Children Health	18
<b>3.0 MATERIALS AND METHODS</b>	<b>20</b>
3.1 Study Location	20
3.2 Study Subjects	20
3.3 Questionnaires	22
3.4 Statistical Analysis	22
3.5 Spirometry Test	23
3.6 Road Observation	24
<b>4.0 RESULTS</b>	<b>26</b>
4.1 Characteristics of the study locations	26
4.2 Study subjects	31
4.2.1 Male kindergarten children	32
4.2.2 Female kindergarten children	39
<b>5.0 DISCUSSION</b>	<b>46</b>
<b>6.0 CONCLUSION</b>	<b>50</b>
<b>7.0 RECOMMENDATIONS</b>	<b>51</b>
<b>REFERENCES</b>	<b>52</b>
<b>APPENDICES</b>	<b>55</b>
<b>CURICULUM VITAE</b>	<b>68</b>



## LIST OF TABLES

Tables	Page
4.1 Number of vehicles (included cars, motorcycles and lorry) passed in an hour.	27
4.2 Physical characteristics and spirometry values of male kindergarten children (mean $\pm$ SEM)	32
4.3 Partial correlation coefficient between age, height and weight and lung function in male kindergarten children	34
4.4 Prevalence of respiratory symptoms and diseases in male kindergarten children	36
4.5 The male kindergarten children lung function as related to their parent's smoking habits	38
4.6 The male kindergarten children lung function as related to the exposure to their parent's smoking habits	38
4.7 Physical characteristics and spirometry values of female kindergarten children (mean $\pm$ SEM)	39
4.8 Partial correlation coefficient between age, height and weight and lung function in female kindergarten children	41
4.9 Prevalence of respiratory symptoms and diseases in female kindergarten children	43
4.10 The female kindergarten children lung function as related to their parent's smoking habits	45
4.11 The female kindergarten children lung function as related to the exposure to their parent's smoking habits	45

## LIST OF FIGURES

Figures	Page
2.1 Continuous air quality monitoring (CAQM) stations in the Peninsular	7
2.2 The respiratory tracts of human	8
4.1 Spirometry measurements of the male children in both areas	33
4.2 The FEV <sub>1</sub> % value of the male children in both areas	33
4.3 Respiratory symptoms of the male children in both areas	37
4.4 Spirometry measurements of the female children in both areas	40
4.5 The FEV <sub>1</sub> % value of the female children in both areas	40
4.6 Respiratory symptoms of the female children in both areas	44

## **LIST OF PLATES**

<b>Plates</b>	<b>Page</b>
3.1 Male study subject	21
3.2 Female study subject	21
3.3 Vitalograph Spirometer	25
4.1 Sawmill in Tok Jembal	28
4.2 Sawmill in Batu Enam	28
4.3 Double-lane main road adjacent to kindergarten in Gong Badak	29
4.4 Construction site located in Tok Jembal	29
4.5 A village setting located around kindergarten in Kuala Nerus	30
4.6 The surrounding in Seberang Takir	30

## LIST OF ABBREVIATIONS

### Abbreviations

VC	Vital Capacity
FVC	Forced Vital Capacity
FEV <sub>1</sub>	Forced Expiratory Volume in one second
FEV <sub>1</sub> %	Percentage of FEV <sub>1</sub> / FVC
PM <sub>10</sub>	Particulate matter with an aerodynamic diameter less than 10µm
NH <sub>3</sub>	Ammonia
SO <sub>2</sub>	Sulfur dioxide
N <sub>2</sub>	Nitrogen
NO <sub>2</sub>	Nitrogen dioxide
O <sub>2</sub>	Oxygen
O <sub>3</sub>	Ozone
TSP	Total Suspended Particulate Matter
CO	Carbon monoxide
ppbv	Part per billion
RSP	Respirable particles
PAHs	Polycyclic Aromatic Hydrocarbons

## ABSTRACT

Emissions from sawmills and wood-based factories have long been associated with ambient air pollution. The smoke and chemicals emitted by these factories have significantly affected human respiratory health. A study has been conducted to evaluate spirometric lung function of a total of 200 kindergarten children, aged 5 and 6 years living near sawmills and wood-based factories as well as children living in residential areas further away from such factories in Terengganu. The respiratory symptoms were surveyed (questionnaires) and the lung function (VC, FVC, FEV<sub>1</sub>) measured using a spirometer. Children between the areas showed no significant differences in age, height and weight. As expected, the lung function of the children living near sawmills showed significantly lower values than those in the reference area (control area). A higher prevalence of respiratory symptoms was found in children living close to the factories. It could be concluded that exposure to emissions from sawmills and wood-based factories might reduce the lung function of children living in the area.

## **ABSTRAK**

Pembuangan sisa dari kilang-kilang menggergaji dan kilang-kilang kayu telah lama dikaitkan dengan pencemaran udara persekitaran. Asap dan bahan kimia yang dibuang oleh kilang-kilang ini secara signifikannya, mengganggu kesihatan respirasi manusia. Satu kajian telah dijalankan untuk menilai fungsi spirometrik paru-paru bagi sejumlah 200 kanak-kanak tadika yang berumur 5 dan 6 tahun yang tinggal berhampiran dengan kilang-kilang menggergaji dan kilang-kilang kayu serta yang tinggal di kawasan perumahan yang jauh dari kawasan perkilangan di Terengganu. Simptom respirasi ditentukan melalui soal selidik sementara fungsi paru-paru diukur menggunakan spirometer (VC, FVC, FEV<sub>1</sub>). Kanak-kanak di kedua-dua kawasan ini masing-masing tidak menunjukkan perbezaan yang signifikan terhadap faktor umur, tinggi dan berat. Seperti yang dijangkakan, fungsi paru-paru kanak-kanak yang tinggal berhampiran dengan kilang-kilang menggergaji adalah lebih rendah daripada yang tinggal di kawasan rujukan. Kadar bagi simptom respirasi adalah lebih tinggi di kawasan terganggu. Kesimpulannya, pendedahan kepada pencemaran udara oleh kilang-kilang menggergaji dan kilang-kilang kayu mungkin merendahkan fungsi paru-paru kanak-kanak yang tinggal di kawasan berhampiran.