WEEKLY EPIDEMIOLOGICAL REPORT

A publication of the Epidemiological Unit,

Ministry of Healthcare & Nutrition

231, de Saram Place,Colombo 01000, Sri Lanka.

Tele:(+94-011)2695112/681548/4740490/4740492,E-Mail:epidunit@sltnet.lk

Epidemiologist:(+94-011) 4740491,E-mail:chepid@sltnet.lk, Web: www.epid.gov.lk

Vol. 35 No. 49 **29th November – 05th December 2008**

WER SRI LANKA 2008

Indoor air pollution - An overlooked misery (Part I)

There is consistent evidence that indoor air pollution is responsible for a number of health consequences including premature death. Women and children in developing countries and in poor urban communities are the most affected. However, in most countries the extent of this problem has not been explored adequately. This is Part I of an article on overview of health effects of indoor air pollution.

The deleterious and disastrous effects of fire, experienced as bush fires would have been interwoven with life and death of man and animal in the prehistoric era, probably from the very beginning of its existence. However, since the discovery of uses and how to control fire, it has been inseparable from the day to day life of those who lived in early civilizations. Since then fire has become an essential element or commodity of human society.

Fire is useful in processing and preserving food and improves food safety. It also enables men to consume a wider range of foodstuff which would not be possible otherwise. Light and heat protected men from hostile environment. It also aided them to make the environment safe and convenient to live in. Heat from fire allowed people to get warmth in cold climates. Thus, since very early stages of human civilization fire has become an integral part of human life.

But fire is most likely responsible for the first ever anthropogenic pollution of the environment, i.e. air pollution. This is very obvious by the soot observed in caves where there are evidence of very early human settlements. The amount of soot suggests that there was a very high degree of pollution probably due to the inadequate air circulation within caves making smoke to stagnate inside.

Although there are much less-polluting alternatives to cook and get light and warmth, mainly by means of using electricity, solar power or fuel gas, these facilities have not been penetrated into all social strata in all countries. Most disadvantaged are in underdeveloped countries where people still use fire generated by combustion of organic materials like firewood to cook their food, to get light and warmth and also to make the environment safe from enemies. While the main determinant is poor socio-economic conditions they live in, lack of knowledge and cultural practices also play a significant role to continue some of these practices. The end result would be long term health effects which may even lead to premature death.

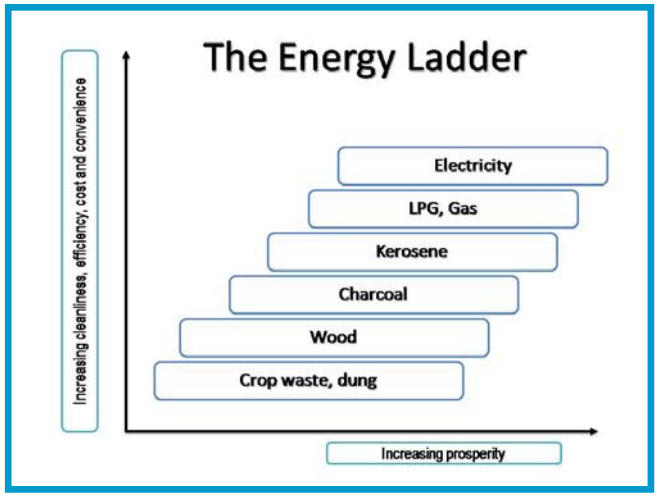
In urban settings ambient air pollution by automobile exhausts and industrial emissions are the prime important, but in rural settings indoor air pollution caused by combustion of biomass fuels far outweighs ambient air pollution. Even in urban areas especially in poor households indoor air pollution could be contributing significantly.

It is estimated that in developing countries indoor air pollution is responsible for about 1.8 million deaths and over 50 million disability adjusted life years lost (DALYs). These figures account for 4.7% of total deaths and 4% of DALYs lost. This health burden is comparable

Contents ***Page***

with those of tobacco use and they are only exceeded by those of malnutrition (16%), unsafe water and sanitation (9%), and unsafe sex(4%).

A pollutant released indoors is 1000 times more likely to reach people's lungs than a pollutant released outdoors. In developed countries there are several substances including radon, asbestos, volatile organic compounds, pesticides, heavy metals, animal dander, mites, moulds, and tobacco smoke which raise concerns as air pollutants and are having significant health effects. However, in developing countries, the single most important group of indoor air pollutant is the combustion products of unprocessed solid biomass fuels utilized for cooking and heating. Smoke from biomass fuels contain many products that can affect human health. These include particulates, carbon monoxide, nitrous oxide, formaldehyde and benzo(*a*)pyrene, benzene, and many others.



Any material derived from plants or animals which is deliberately burnt by man is called biomass fuels. The most commonly used material is wood, but animal dung and crop residues are also used widely in some communities. Theses are the most basic and cheapest fuels. However, they are the least efficient and also produce pollutants most. Coal is more efficient than these but less efficient than kerosene oil or gas fuels including liquefied petroleum gas (LPG). Electricity is the most efficient and cleanest energy source. Liquid fuels like kerosene oil, if not used with proper combustion technologies, will not be as efficient as it should be. For example, kerosene oil in a pressurized burner is very efficient and hardly produces any pollutants; if used in a wick burner it will be sooty and smoky. With the development of societies there will be a transition up the so-called 'energy ladder' to fuels which are progressively more efficient, cleaner and convenient but expensive. However, most of these relatively efficient fuel sources are unaffordable to poor communities and they have to largely depend on biomass fuels.

Over the past few centuries about half of the world population could make transition from traditional biomass fuel such as wood, animal dung, crop residues etc., to fossil fuels and electricity. The remaining half, around 3000 million people, almost all from developing countries still continue to use biomass fuel often in open fire or inefficient stoves. It is important to emphasize that most households may be using a combination of fuels. For example electricity for lighting and gas for cooking. In most instances, this interchanges particularly use of fuels down the ladder may be a reflection of poor socio economic status. For example, a household where kerosene oil is used for lighting may be using fire wood for cooking.

Compared to developed countries, per capita use of energy in underdeveloped countries is much lower. However, due to the large size of population these countries use a substantial proportion of global energy. Unlike in industrialized countries where a larger proportion of energy usage is for industries, in underdeveloped countries a larger share of energy usage is for household consumption for lighting, cooking and warming in colder climates.

The proportion of global energy derived from biomass fuels has fallen from 50% in 1900 to 13% in 2000. However, there is evidence that their use is now increasing among the poor. In Sri Lanka, the household sector energy consumption accounts for 52% of the total energy consumption while industrial and transport sector consume 25% and 23% of energy respectively. Fuel wood is the source for 53% of the total energy consumption in the country. Out of the total energy supply, the household sector consumes 76% and the rest by the industrial sector. According to available calculations, nearly 80% of the population still relies on the unprocessed fuel wood for cooking and 20-30% utilizes fossil fuels such as kerosene or non-fossil fuels including plant based fuels for illuminating houses.

Over 25% of all households in Sri Lanka are deprived of electricity. There is a marked geographical variation as the availability of electricity in households in Colombo district is 95.5%, in Gampaha 90.9% and in Kalutara 90.0% while in Vavuniya, Moneragala, Batticaloa, and Polonnaruwa it is only 43.8%, 44.6%, 56.9% and 57.9% respectively.

References

Bruce N, Perez-Padilla R and Albalak R (2000). Indoor air pollution in developing countries: a major environmental and public health challenge. *Bulletin of the World Health Organization* 78 (9): 1078-92.

Bruce N (2002). Household energy & public health. Available at: *www.sparknet.info.*

Mahanama K R R (2008) Cooking or being cooked. *Economic Review* 34 (3 & 4): 18-23.

This article was prepared by Dr Sudath Samaraweera, Consultant Community Physician.

Table 1: Vaccine-preventable Diseases & AFP

22nd - 28th November 2008 (48thWeek)

Disease	No. of Cases by Province									Number of cases during current week in 2008	Number of cases during same week in 2007	Total number of cases to date in 2008	Total number of cases to date in 2007	Difference between the number of cases to date between 2008 & 2007
	W	C	S	N	E	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	02 GL=1 MT=1	00	00	00	00	00	00	02	05	91	82	+11.0%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	01	00	-
Measles	00	00	00	00	00	00	00	00	00	00	01	108	77	+40.3%
Tetanus	00	00	00	00	00	00	00	00	00	00	00	36	32	+12.5%
Whooping Cough	00	00	00	00	00	00	00	01 MO=1	00	01	01	48	45	+06.7%
Tuberculosis	130	20	06	00	04	00	00	00	00	160	158	7735	9030	-14.3%

Table 2: Newly Introduced Notifiable Disease

22nd - 28th November 2008 (48thWeek)

Disease	No. of Cases by Province									Number of cases during current week in 2008	Number of cases during same week in 2007	Total number of cases to date in 2008	Total number of cases to date in 2007	Difference between the number of cases to date between 2008 & 2007
	W	C	S	N	E	NW	NC	U	Sab					
Chicken-pox	15	17	18	01	02	09	05	08	12	87	52	5075	3154	+60.9%
Meningitis	04 KL=4	03 ML=3	01 HB=1	00	00	03 KR=2 PU=1	01 PO=1	03 BD=3	02 RP=1 KG=1	17	13	1219	688	+77.2%
Mumps	07	11	11	00	02	02	01	04	01	39	27	2729	2018	+35.2%

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.

Table 3: Laboratory Surveillance of Dengue Fever

22nd - 28th November 2008 (48th Week)

Samples	Number tested		Number positive *		Serotypes									
					D_1		D_2		D_3		D_4		Negative	
	GT	AH	GT	AH	GT	AH	GT	AH	GT	AH	GT	AH	GT	AH
Number for current week	00	00	00	00	00	00	00	00	00	00	00	00	00	00
Total number to date in 2008	124	160	09	25	00	00	06	10	01	09	00	00	02	00

Sources: Genetech Molecular Diagnostics & School of Gene Technology, Colombo [GT] and Genetic Laboratory Asiri Surgical Hospital [AH]

* Not all positives are subjected to serotyping.

NA= Not Available.

Data Sources:

Weekly Return of Communicable Diseases: Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis, Chickenpox, Meningitis, Mumps.

Special Surveillance: Acute Flaccid Paralysis.

National Control Program for Tuberculosis and Chest Diseases: Tuberculosis.

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

22nd - 28th November 2008 (48th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encepha-litis		Enteric Fever		Food Poison-ing		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Human Rabies		Returns Re-ceived Timely*
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	18	1509	7	272	0	15	5	180	0	139	19	1020	0	7	2	112	0	0	**92**
Gampaha	4	910	1	217	0	20	0	57	0	104	9	798	0	7	10	189	0	7	**93**
Kalutara	5	446	14	333	1	14	5	74	4	44	8	634	0	4	1	44	0	2	**92**
Kandy	13	310	1	303	1	10	0	63	0	99	6	500	1	96	0	126	0	2	**76**
Matale	8	161	5	217	0	4	1	52	0	16	19	760	0	2	0	30	0	0	**75**
Nuwara	0	28	20	283	1	5	4	253	0	168	3	70	0	43	0	107	0	1	**100**
Galle	1	101	8	198	1	22	0	18	5	50	6	426	0	15	0	8	0	5	**88**
Hambantota	3	99	3	126	0	8	0	8	4	20	10	122	2	98	1	17	0	1	**91**
Matara	8	333	8	218	0	14	0	36	0	15	10	476	0	227	0	14	0	1	**88**
Jaffna	0	60	0	150	0	4	0	255	0	20	0	1	0	157	0	38	0	0	**0**
Kilinochchi	0	0	0	151	0	0	0	1	0	4	0	2	0	0	0	2	0	0	**0**
Mannar	0	25	1	27	0	6	0	158	0	0	0	0	0	1	0	16	0	1	**25**
Vavuniya	0	12	1	70	0	3	0	15	1	23	0	6	0	1	0	5	0	0	**100**
Mullaitivu	0	0	0	59	0	0	0	16	0	13	0	0	0	1	0	10	0	1	**0**
Batticaloa	0	86	9	222	0	7	0	31	0	30	1	11	0	0	0	95	0	10	**64**
Ampara	0	33	0	263	0	0	0	9	0	285	0	25	0	0	0	13	0	0	**57**
Trincomalee	4	185	1	120	0	1	0	13	0	14	1	32	0	17	0	15	0	0	**80**
Kurunegala	4	345	10	250	0	16	2	54	2	29	9	680	0	30	1	81	0	9	**95**
Puttalam	1	284	14	161	0	10	1	159	0	41	0	66	0	38	1	34	0	5	**100**
Anuradhapu	0	119	3	151	0	10	0	12	0	16	7	249	0	11	0	15	0	3	**63**
Polonnaruw	0	64	0	135	0	1	0	28	0	23	9	80	0	1	0	21	0	0	**86**
Badulla	6	102	7	499	0	9	1	126	0	112	1	72	2	121	13	170	0	1	**93**
Monaragala	0	60	5	354	0	4	2	54	2	123	1	94	0	105	1	55	0	2	**91**
Ratnapura	4	286	5	406	0	33	1	53	4	84	5	236	1	81	1	59	0	0	**83**
Kegalle	6	422	3	307	0	25	2	86	0	17	7	566	1	69	9	517	0	1	**100**
Kalmunai	0	38	17	303	0	2	2	16	0	16	0	3	0	3	0	27	0	0	**54**
SRI LANKA	**85**	**6018**	**143**	**5795**	**4**	**243**	**26**	**1827**	**22**	**1505**	**131**	**6929**	**7**	**1135**	**40**	**1820**	**0**	**52**	**79**

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 06 December, 2008 Total number of reporting units =309. Number of reporting units data provided for the current week: 243

PRINTING OF THIS PUBLICATION IS FUNDED BY THE UNITED NATIONS CHILDREN'S FUND (UNICEF).

Comments and contributions for publication in the WER Sri Lanka are welcome. However, the editor reserves the right to accept or reject items for publication. All correspondence should be mailed to The Editor, WER Sri Lanka, Epidemiological Unit, P.O. Box 1567, Colombo or sent by E-mail to chepid@sltnet.lk.

ON STATE SERVICE

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