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## **Editorial**

This volume of the journal contains the oration delivered by Prof. Dulitha Fernando titled “Urbanization and health” at the inauguration of the college sessions in year 2008. There are several original research articles which are of relevance and important public health issues are addressed.

The article on risk factors for spontaneous abortion will be helpful in planning preventive measures to minimize the incidence of abortion. Prevalence of betel chewing article highlights the importance of proper preventive programmes that should be carried out in order to reduce the oral carcinoma in the rural areas. The study on adolescents reports of parental socio economic status provides evidence to suggest that 15 year old adolescents in Sri Lanka could be relied on as proxies to provide accurate information about their parents occupational status. The article on suicide indicates in detail the relationship to different socio demographic variables and geographic regions with the changing trends of suicide rates in Sri Lanka. The article on access to health care focuses attention on possibilities to be considered in future policy planning which is an eye opener.

The article on collaboration between preventive and curative health sectors for maternal and child health demonstrates that there are certain practical steps that can be undertaken by the health department to improve better collaboration. The short communication on LANKAPHEIN highlights its vision, mission and its objectives and the activities carried out during the year since its inception.

Happy reading!

Sampatha Goonewardena  
Editor

URBANIZATION AND HEALTH

D. N. Fernando

According to the State of the World's Population Report 2007, published by the UNFPA, "In 2008, the world reaches an invisible but momentous milestone. For the first time in history, more than half its human population, 3.3 billion people will be living in urban areas. By 2030, this is expected to swell to almost 5 billion. Their future, the future of cities in developing countries, all depend on the decisions now made in preparation for this growth"<sup>1</sup>.

The definition 'urban' varies between countries. The term 'urbanism' refers to the associated set of living conditions, behaviours and values. Some of the criteria on which definition 'urban' is based include : population density, number of residents, percentage of the population not dependant on agriculture and provision of public utilities and services.

In Sri Lanka, we use the categorization based on the local government authority – those areas under Municipal Councils and Urban Councils are classified as Urban and those under Pradeshiya Sabhas , as rural. Whether this classification is appropriate or not is another issue.<sup>2</sup>

**Mega cities**

Globally much interest has been shown in mega cities, urban areas with a population of 10 million or more. In 1975, there were only 05 mega cities with nearly 20 mega cities, as at present and ( many of them in Asia), with the possible increase in the number to 23 by 2015. There are many concerns regarding the growth of mega cities , among them, focus on air pollution and its wide ranging consequences, traffic congestion are among the priorities. However, the smaller urban areas also deserve attention, as much of the urban population growth specially in smaller countries is likely to occur in smaller cities<sup>3</sup> This is true of Sri Lanka.

Urbanization and health are very closely linked and is a very broad topic, hence this presentation will focus on some future challenges to urban public health .

Health is defined by the World Health Organization as a "state of complete, physical, mental and social well being and not merely the absence of disease or infirmity". In recent years, this statement has been amplified to include the ability to lead a socially and economically productive life.

Health of individuals, families and communities is influenced by complex interactions between biological ( including heredity), environmental, social and behavioural factors.

Public Health is a multidisciplinary science which deals

with the determinants and defence of health at population level so as to impact upon and improve the health of individuals of that population.

Urbanization is linked with population changes, high population densities, changing patterns of employment, industrialization, environmental changes , food supply and nutrition, social behaviours. Urbanization involves relatively large, dense settlements of people some of them who have migrated from rural areas. In addition, there is a migrant population who travel to and from cities, who still needs some of the amenities provided by the urban environment . There is a mix of people from different ethnic groups, religions, cultures, social backgrounds who come into urban areas. Urban living is considered to represent the way of living in the modern age. One factor that is common among them is "to better themselves". Thus the changes that take place are linked to changed aspirations.

Many factors that influence health are different in urban situations. These factors could be broadly grouped under two headings, social and environmental, each group inter linked with the other.

**Social factors** could be considered under the following broad headings.

- Income, employment
- Family life
- Social support
- Social relationships
- Life styles
- Lack of facilities for leisure activities / inappropriate leisure activities
- Exposure to pathogens (organisms producing disease) and other negative health Influences
- Access to health services
- Availability of facilities for education, both formal and informal
- Availability of food, and other requirements, and opportunities for establishing for social relationships
- Social value systems where traditional value systems with traditional belief patterns and behaviour tend to be broken and new ideas and patterns of behaviour emerge.
- Community values – tendency to being more "self" oriented than community oriented

These influence - Opinions and values that have a

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Professor of Community Medicine , Department of Community Medicine, University of Colombo,

bearing on health, positively or negatively

### **Environmental factors**

Scientific evidence gained in the past decade has shown that various aspects of the built environment can have direct measurable effects on both physical and mental health, particularly among the low income communities.

**Housing** is of central importance. Ideally, it minimizes exposures, minimizes disease and injury and contributes to physical mental and social well being. Poor housing is associated with exposures to toxic products, asthma triggers and mental health stressors such as violence and social isolation. Negative health effects are linked to overcrowding, poor ventilation, dampness etc. Linked with housing are the facilities for recreation : Lack of recreational areas in congested overcrowded communities discourage physical activity which is important as a factor influencing physical, mental and social well being. In urban circumstances, these facilities tend to be limited and even when available, tend to be misused or under used.

Other environmental threats to health can be divided into traditional hazards associated with lack of development and modern hazards due to unsustainable development

**Traditional hazards** include: lack of access to safe drinking water, inadequate basic sanitation in the household and the community, indoor air pollution due to use of biomass fuel and inadequate solid waste disposal.

**Modern hazards** are related to development that lacks health and environmental safeguards and to unsustainable consumption of natural resources. Water pollution, indoor and outdoor air pollution from motor vehicles, industry etc. . In urban settings in many developing countries, both these types of hazards exists.

**Excreta and household waste** is a major concern in urban sector. It is not only the availability of systems for disposal of excreta and solid waste, but how effective they are in controlling environmental contamination of water, food etc. .

**Food** is essential for a healthy life. Thus contamination by biological, chemical agents is a major concern. Biological agents tend to pose acute hazards while chemical agents tend to have short term influences as well as long term influences, may be through long term low level exposures. An important area related to food in urban areas is the changing dietary pattern influenced by the social environment and the economic circumstances. Even though much of the negative health hazards can have stronger influences on urban poor, changing dietary patterns may influence all social groups, some the more affluent than the poor. Long term consequences of dietary practices predisposing to several chronic diseases e.g. obesity, cardiovascular

diseases, diabetes etc. are of concern.

Both the quality and the quantity of water available are of importance. .

To minimize negative health effects, it is necessary to understand the potential relationships between exposure and health conditions.

In terms of ill health and death, marginal urban populations seem to suffer from problems which are typical of developing countries as well as developed countries .

Disease pattern in urban areas could be broadly considered under three broad areas.

- Prevalence of diarrhoeal diseases, respiratory tract disorders ( including asthma) and \*Vector borne diseases, (acute respiratory diseases including asthma may be prevalent specially in the young age groups)
- The changing population structure and the variety of environmental hazards and stresses, life style changes including dietary practices account for an increase in non communicable diseases , chronic and neoplastic diseases , accidents and other conditions ,
- Health issues , some of which are related to social disruption and deviant behaviour such as alcoholism and drug addiction, mental illness, suicide and homicide, sexually transmitted diseases are also of concern.

Another important area is the health services availability and the way in which services are utilized. Usually, the facilities available in urban areas are better than those in the rural areas. .It would be easy to assume that the well known concentration of health facilities and services would be sufficient to guarantee benefits to all.

Experience in other countries have shown that city people are generally more sophisticated than those in rural areas. The sophistication lies in their 'perceived' better knowledge of health, their exposure to mass media and other exposures in their social life. Commercial advertisements leave their mark. Television brings them a romantic view of the hospitals, health services, which may raise false expectations. Expensive medical care may become a status symbol. Experience in other large cities show that city dwellers do not recognize the use of primary health care services. In this background, there are many challenges for urban public health. Let us take a brief look at the Sri Lankan situation related to urbanization.

According to 2001 Census, distribution of the population was as follows<sup>4</sup>

Urban 14.6, Rural 80.6, Estate 5.3

There is a decline in the % of population living in urban areas, compared to 21.5% in 1981.

There are 14 Municipal Councils(MCs) and 39 Urban Councils(UCs). The four MCs Colombo and surrounding areas had a population of 1.2 million. It is estimated that the population in the greater Colombo area is around 2 million. We do not have mega cities.

Data from the Consumer Finance and Socio economic surveys 2003 – 2004 are presented in Tables 1- 3 to show the current scenario related to availability of basic amenities<sup>2</sup>.

**Table 1 Types of housing**

Type of housing unit	Urban	Rural
Single house	79.7	96.4
Condominium / Flat	5.3	0.7
Attached house / annex	9.3	1.5
Row house	3.4	0.3
Shanty	2.0	0.6
Other	0.3	0.1

Source : The Consumer Finances and Household Survey, 2005.

**Table 2 Source of Water Supply**

Source	Urban	Rural
Pipe borne ( inside )	69.4	25.8
Pipe borne ( outside)	8.5	5.1
Own well	13.8	35.4
Common well	5.7	26.9
River /stream	-	2.5
Other	2.7	4.4

Source : The Consumer Finances and Household Survey, 2005.

**Table 3 Type of toilet facilities**

Type	Urban	Rural
Water seal	87.1	79.3
Pour flush	8.6	6.2
Pit	1.2	8.7
Bucket	0.3	0.5
None	2.8	5.6

Source : The Consumer Finances and Household Survey,2005.

Condominiums, flats, attached houses were commoner in the urban sector with 2% reported to be living in slums ( definition of ‘slum’ vary widely) and single houses are commoner among the rural sector. Pipe borne water was available to a higher proportion of households in the urban sector, with wells being the source of water in the rural sector.

Type of toilet facilities also differ between the two sectors with higher percentages of urban households having water seal and pour flush latrines compared to the rural sector. Percentage having no latrine facilities was lower in the urban sector.

In general, these indicate that at household level, availability of some facilities is sometimes better than in rural areas. However, this information does not give any indication of the ‘quality’ of these facilities nor on the peri- domestic environment and external environment which has a major influence on health.

#### Availability of health services

All higher level institutions both in the state and the private sector are in districts with a high urban population<sup>5</sup>. Some municipalities have their own primary care services , which provide curative and preventive services. Better in urban areas, for many reasons.

**Use of primary health care facilities :** As shown in Table 4, data from the Sri Lanka Demographic and Health survey 2007 shows that the use of family planning, is lower in the urban sector with use of immunization and antenatal care facilities being marginally low<sup>6</sup>.

**Table 4 Use of preventive health services**

Indicator	Urban	Rural
%using contraceptive method	59	79
- any method	69.6	53.7
- modern contraceptive method		
% of mothers who received antenatal care form a health professional	99.4	99.4
% of mothers whose last birth was protected for neonatal tetanus	89.9	90.8
% of children aged 12 – 23 months of age, given all vaccines	6.4	97.4

Source : Sri Lanka Demographic and Health Survey, 2007.

**Pattern of use of curative care :** The urban sector indicates a higher level of use of private sector services for curative care<sup>2</sup>

**Table 5 Source of treatment for illness reported within the 14 days**

Source of treatment	Urban	Rural
Private ( Western)	56.5	44.1
Private (Ayurvedic)	4.2	5.2
Government ( West-ern)	33.6	44.3
Government ( Ay-urvedic)	1.0	1.3
Others	1.1	2.2
No medication	3.5	3.5
Total	100	100

Source : The Consumer Finances and Household Survey, 2005.

**Morbidity information**

SLDHS 2007 provides data on the % of children under 5 years, reporting illnesses within the preceding 14 days. Data shows no difference in the % of children reporting such illnesses between the two sectors<sup>6</sup>

**Table 6 % of children < 5 yrs. of age, reporting illness within the 14 days preceding the survey**

Sector	ARI		Diarrhoea	
	No.	%	No.	%
Urban	31	3.6	30	3.5
Rural	236	3.6	187	3.5

Source : Sri Lanka Demographic and Health Survey, 2007.

Data on **communicable diseases at national level** are not available under the categories, urban and rural areas, but only under health areas / districts and this poses a limitation on making comparisons. As shown in Table 7, comparison of number of notified cases of selected diseases per 10,000 population from two predominantly urban districts with those from two rural districts show that the GI tract infections are commoner in rural areas and Dengue, an important problems in

urban areas<sup>7</sup>.

**Table 7 Number of cases of selected notifiable diseases/10,000 population from selected districts – 2008.**

	Dis-trict	Dys-enter-y	En-teric-fe-vers	Viral Hepa-titis	Den-gue
“Urb-an”	Co-lomb-o	1.6	0.6	0.7	8.4
	Gam-paha	1.6	0.4	1.0	4.8
“Rur-al”	Mon-eraga-la	9.2	1.5	1.2	1.6
	Pol-onnar-uwa	4.2	0.4	1.4	1.9

\* selected districts which have a predominantly urban and rural populations  
Source : Epidemiological Unit, Ministry of Health.

Prevalence of under nutrition reported in DHS 2007 shows that among under five children, the prevalence of under nutrition is lower in urban sector<sup>6</sup>. On the other hand, there is a need to focus attention on the problem of overweight among school children in urban sector. Based on a study on a nationally representative sample of 6,264 adolescents aged between 10 -15 years, Jayatissa ( 2006) reported that 5.3. % of the urban group were overweight compared to 1.7% among the rural adolescents<sup>8</sup>.

A study carried out in a multistage stratified probability sample of 1400 adults in the age group 20 – 64 years of age who were resident in the Colombo district over a period of one year, reported a prevalence of overweight of ( based on BMI ) 25% and 19% among males in the urban and rural sector respectively and the comparable figures for females being 28% and 25% for urban and rural sectors. Prevalence of abdominal obesity ( based on WC ) which is shown to have a strong association with several NCDs showed a prevalence of 4.7% and 2.5% among males in urban and rural sectors with a marked increase in that among females, 33% and 25% in the urban and the rural sectors respectively<sup>9</sup>

**Table 8 Prevalence of under nutrition among children < 5 years ( using WHO standards)**

Sector	% Ht.for age <2SD	% Weight for Height < 2SD	% weight for age <2SD
Urban	13.7	14.9	16.6
Rural	16.7	15.2	21.7

Source : Sri Lanka Demographic and Health Survey, 2007

This study also focused on some of the ‘obesogenic’ shifts in dietary composition described by Mendez and Popkin, 2004<sup>10</sup>. The study showed that the % of the study group who reported :

- Frequently eating out
- Over consumption of energy dense foods
- Inadequate fibre consumption
- Alcohol intake of >7 units per week and those with insufficient physical activity

were higher among the urban group compared to the rural group, this difference was present, both among males and females<sup>11</sup>

**Table 9 Information on selected ‘obesogenic factors’**

	Men		Women	
	Urban	Rural	Urban	Rural
% frequently eating out	49	31	30	15
% with over consumption of energy dense foods	26	19	21	16
% with inadequate fibre consumption	47	33	43	16
% with alcohol intake > 7units / week	52	45	6	3
% with insufficient physical activity	41	35	29	19

Source : Armabepola, Allender, Ekanayake, Fernando ( 2008)

These findings are based on a very detailed study of food consumption patterns and assessment of physical activities using validated instruments and criteria for categorization.

The data on monthly per capita consumption of food available from Consumer Finances and Socio Economic Survey <sup>2</sup>shows that when compared to the urban group, the rural group consumed more rice, vegetables and less bread, wheat flour, animal products, coconut and sugar ( Table 10).

**Table 10 % distribution of expenditure of food ( selected items)**

Food item	Urban	Rural
Rice	13.5	21.1
Bread	5.1	3.8
Wheat flour	7.0	3.9
Fish and sea-food	15.0	12.9
Fruits	11.1	11.9
Vegetables	7.8	9.0

Source : The Consumer Finances and Household Survey,2005

Data on expenditure on food also shows a similar trend ( Table 11) .These data support the findings of the above study.

**Table 11 Comparison between urban and rural sectors - Monthly per capita consumption of selected food items ( taking the urban consumption value as base value\*)**

Food item	Urban		Rural	
	Amo unt in gms.	*	Amo unt in gms.	*
Rice	6597	100	9190	139
Bread	2560	100	1684	66
Wheat flour	637	100	591	93
Meat and fish	1981	100	1436	73
Vegetables	2880	100	3278	114
Coconuts	451	100	292	65
Sugar	1412	100	1304	92

Source : The Consumer Finances and Household Survey,2005.

### Air pollution

Clean air is an important pre requisite of sustainable economic development and is a basic requirement for human health and welfare. Urban air pollutants contribute to atmospheric problems such as acidification and global climate changes which has impact on crop productivity, forest growth, biodiversity, buildings and cultural monuments.

In urban settings, both indoor and outdoor air pollution are important. Indoor pollution is mainly due to use of biomass fuels in ill ventilated dwellings situated in close proximity to one another. Outdoor air pollution is mostly due to vehicular fumes and industrial pollution.

In Sri Lanka, monitoring of air pollutants was intro-

duced in 1983, with assessment of lead levels. Study of blood lead levels of several categories of personnel with varying degrees of exposure to vehicular fumes was carried out. Highest blood levels were reported among traffic policemen and then, among three wheeler drivers<sup>12</sup>.

It has been reported that the National ambient Air Quality Standards were gazetted in December 1994 and in December 1996, regular monitoring was introduced by the National Building Research Organization (NBRO) Sri Lanka. The pollutants monitored on a routine basis are: Sulphur dioxide, Oxides of Nitrogen, Carbon monoxide and particulate matter<sup>13</sup>.

Annual averages of particulate Matter (PM<sub>10</sub>) from 1998 to 2005 show that these levels are much higher than the USEPA (United States Environmental Protection Agency) standards. Average values of concentration of SO<sub>2</sub> and NO<sub>2</sub> are below the Sri Lanka standard even though much variation is seen<sup>14</sup>.

Relationship between air pollution and respiratory tract disorders has been well documented. There are studies conducted in the Colombo metropolitan area report associations between the levels of pollutants and health problems related to the respiratory tract.

A study focusing on indoor air pollution was conducted in 397 households in a low income area in the Kotte MOH area. This study showed that high levels of particulate matter (PM<sub>10</sub>) was reported in 84% of households that used firewood, compared to 54% in households that used other fuels. The risk of residents reporting respiratory symptoms was 1.6. times higher among those resident in households with high PM<sub>10</sub> levels<sup>15</sup>. Senanayake et al (2001) reported a correlation between the pattern of pollution levels (SO<sub>2</sub> and NO<sub>2</sub>) and attendance rates for wheezing at the Children's Hospital in Colombo<sup>16</sup>.

In a literature review on health effects of outdoor air pollutants in Sri Lanka, Nanadsena (2006) reports a study carried out in Kandy district to study the effects of air pollution on respiratory health among a cohort of 1033 children. The findings showed that those who reported respiratory symptoms was higher in Kandy city compared to rural areas<sup>17</sup>.

USAID report on the 100 day programme referring to action taken to minimise pollution by introduction of unleaded petrol in June 2002, reported a reduction of lead levels in ambient air by 90%<sup>18</sup>.

Senanayake et al (2004) reported the reduction in the percentage of children with blood lead levels more than 10 ug/dl from 6% to 0%, from 1998 to 2003 – one year after the introduction of unleaded petrol<sup>19</sup>.

The two areas focused on in this presentation could be

considered as the tip of the iceberg. In many studies reported the world over, cities have been shown as breeding grounds for emerging and re emerging communicable diseases,- drug resistant TB, H5N1 pandemic and HIV/AIDS. Road traffic accidents is also a growing urban threat. Urban violence and crime, substance abuse, illicit drug use and all important areas of concern. Stresses related to urban life and its relationship to mental illness have been well documented.

Inequities exist within the urban sector and has been considered as a key issue in relation to health and health services. In many developing countries including ours., there is not much data on the within urban differentials of health status, determinants and outcomes.

The increase in the urban share of the total population is inevitable, but it can also be positive. No country in the industrial age has achieved significant economic growth without urbanization. The potential benefits of urbanization far outweigh the disadvantages: the challenge is in learning how to exploit its possibilities<sup>1</sup>.

#### **Challenge: How to ensure a healthy living**

Improvements in the health status of a population cannot be achieved simply by expanding and developing the health services. This is specially true of the urban sector.

Prevention and control of disease and the promotion of health require a concerted effort for the improvement of human well being as a whole. In this task, 'health care services' has to be supported by improvements in the social, economic and environmental infrastructure, hence needs contributions from many sectors other than health.

Two main groups of inter-sectoral policies exist : one directed at improvement of the physical environment through improved basic health related amenities and the other aimed at ensuring that major environmental changes brought about by development do not intensify the existing health hazards or create new ones. Unplanned urbanization and industrialization are two major activities that needs to be considered.

Despite pronouncements on the value of integrated social, cultural and economic advances, development policies as they exist today in most countries pursues economic growth, without due considerations to their impact on health and environmental issues.

Social objectives are given a low priority because their impact on production cannot be readily proved quantitatively.

Thus, the biggest challenge is to ensure that the health component is placed in the proper context as a whole and other sectors are mobilised and motivated to lend their support towards improving health, this is specifically so, in improving urban health.

Political commitment is the key – development and urbanization are inter linked.

In this context, it is appropriate to quote Rudolfe Virchow 1848

“improvements in medicine would eventually prolong human life improvements in social conditions would achieve its results more rapidly and successfully”

Basically, development plans should take into consideration, the health implications of such plans and incorporate the required strategies / activities to minimize negative effects and enhance positive ones, this requires Inter sectoral collaboration.

**The challenge for the health sector per se include:** development of a clear health policy taking into consideration, the special circumstances, required for provision of health services to a major proportion of the urban populations and to focus on the following areas in the provision of health services :

- Focus on health promotion  
Improving the use of primary health care services  
Given the socio cultural setting, it will be necessary to use innovative approaches to achieve such goals. These will require:
- Orientation of health workers to work in urban settings
- Flexibility on service provision
- Community mobilization for better health in a social environment which favour negative health outcome
- Monitoring environmental risk factors

In 1992, The Report of the Presidential Task Force on Health Policy included a section on urban health<sup>20</sup>. The issues identified were:

- Need for improvement in the basic infrastructure to provide basic PHC services
- Improvement in the quality of services, specially environmental health, diseases surveillance, education for health promotion
- Improve Community participation in health
- Need for better collaboration between provincial health authorities and the municipal health authorities

These issues seem to continue to exist, may be with a different face, in changing social, economic and environmental circumstances.

History of urban health Services in Sri Lanka dates back to the colonial times, with the establishment of the Colombo Municipal Council under the Municipal Council Ordinance of 1865. Interestingly, this ordi-

nance identified among other activities, several aimed at promoting health and preventing disease. The contents referred to areas such as : environmental sanitation with emphasis on sewage disposal, vector control, food sanitation, minimizing overcrowding and providing legal action to ensure the above.

After nearly one and a half centuries, these address the major issues related to urban health, even though many changes have taken place in the urban sector, specially those related to development efforts.

I wish to conclude with a quote from the World health Report 1998<sup>21</sup>

“Urbanization holds out, both the promise of an unexpected future and the gross threat of unparalleled disaster”\* The challenge will be to ensure that the promise is fulfilled, to which health of the population is a must.

*\*\* A healthy city can only be achieved when health rates the high priority that it deserves in the complex issues of urban life”*

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# ADOLESCENTS' REPORTS OF PARENTAL SOCIO-ECONOMIC STATUS-ARE THEY REALLY VALID?

I Perera<sup>1</sup>, L Ekanayake<sup>2</sup>

## Abstract

### Objective:

To assess whether adolescents could be relied on as proxies to provide accurate information about their parental socio-economic status.

### Methodology:

A descriptive cross-sectional study was conducted among 1225, 15-year-olds selected from 42 schools in the Colombo district using a stratified cluster sampling technique. Data were collected by means of self-administered questionnaires to both adolescents and their parents.

### Results:

Response rates of adolescents regarding their parents' occupation status were very high. The strength of agreement between parental and adolescents reports was assessed using the Kappa statistic. The respective kappa statistics (95% CI) were 0.84 (0.82-0.86) for father's occupation and 0.85 (0.82- 0.88) for mother's occupation.

**Conclusion:** the results indicated that 15-year-old adolescents could be considered as proxies to provide accurate information about their parents' occupational status.

**Key words:** occupation, questionnaires, Kappa statistic, adolescents

## Introduction

A person's position in the social hierarchy is determined by various socio-economic measures. The classic three core socio-economic variables are the occupation status, level of income and education (1). Traditionally children and adolescents are assigned to socio-economic groups based on parental socio-economic characteristics such as father's/mother's occupation and their levels of education. Some researchers are of the opinion that in surveys of children and adolescents, all possible socio-economic information should be obtained from parents (2). However obtaining information from parents to classify children/adolescents into socio-economic groups in health research is cumbersome and costly (3,4). It may be due to this reason that parents are not included as respondents in many surveys of children/adolescents and information pertaining to parental socio-economic status is therefore obtained from children/adolescents.

Evidence related to the accuracy of children's proxy reports of parents' socio-economic status is inconclusive. In a Scottish study, West *et al.* (3) have shown that children young as 11 years could be considered as good proxy reporters of parental occupation and economic activity. Also it has been reported that children aged 11-12 years are able to describe their parents' occupational activity in sufficient detail in a survey setting (4). However, other studies have shown that children and young people

are unreliable proxy reporters of their parents' occupation (5). This highlights the need for validation of data obtained from children/adolescents regarding parental occupation/education to assess their accuracy as proxy reporters.

In Sri Lanka the practice has been to classify children/adolescents into different socio-economic groups based on parental occupational status as has been done in similar surveys elsewhere in the world. This information is usually obtained from children/adolescents themselves (6). However, to date no study in Sri Lanka has validated adolescents' reports of parental socio-economic status against similar information provided by parents. Therefore the aim of the present study was to assess whether adolescents could be relied on as proxies to provide accurate information about their parental socio-economic status.

## Methodology

The data for the present paper were obtained from a larger descriptive study that was conducted between May-December 2005 to assess socioeconomic inequalities in oral health.

The target population was 15-year-olds attending state, private and international schools in the Colombo district of Sri Lanka. As 15-year-olds constitute one of the index age groups stipulated by the WHO, it was considered appropriate to select this

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group for the study. Those students residing outside the Colombo district, not living with at least one parent and with learning difficulties were excluded from the sample. Hypothesis test for two population proportions was used to calculate the sample size. Using the caries prevalence rates of students whose fathers were professionals (41.93%) and non-professionals (68.54%) which were obtained from a pilot study, a level of significance of 5% and a power of 90%, a minimum of 72 students were needed per socioeconomic group. As there were six socioeconomic groups, the minimum sample size required was 432. A stratified cluster sampling method was used to select the sample. Thus it was necessary to make allowance for the design effect which was considered as 2. After making adjustments for the design effect and compensate for non-responses (30%) the sample size required was 1123. This was increased to 1225 for practical purposes.

As 15-year-olds are aggregated in the grade 10 class, this class was considered as the unit of cluster while the average size of a class (30) was considered as the cluster size. Thus 41 clusters were necessary to obtain the sample ( $1225/30=41$ ). For practical purposes the number of clusters was increased to 42. Since there were considerable variations in the number of grade 10 classes (1-8) and the number of students in a class (20-40) in the three types of schools, the clusters were allocated disproportionately for better representation (7). Thus the number of clusters allocated to state, private and international schools were 30, 9 and 3 respectively. Selection of clusters was done in two stages. In the first stage 30, 9 and 3 state, private and international schools with grade 10 classes were randomly selected from the respective sampling frames. At the second stage, clusters were identified from the selected schools. Two clusters per school were randomly selected from state schools with  $\geq 5$ , private schools with  $\geq 4$  and international schools with  $\geq 2$  grade 10 classes while one cluster each was selected from all other schools. All students who satisfied the inclusion criteria were included in the sample.

The data were collected by means of self-administered questionnaires to both students and their parents. The questionnaire to students was intended to obtain information related to occupational status of father and mother as well as other information required for the main study. The parental questionnaire included various questions to assess their socio-economic status. An open ended question was used to obtain information about parental occupation and later classified according to the method used in the Census of Population and Housing of 2000 (8) and included 6 major groups namely professional/managerial/upper level business; clerical/technical/middle level business; skilled/unskilled labour; unemployed (father only); housewife (mother); deceased/divorced/separated and missing/cannot code.

Stata 6.0 statistical software was used for data analysis. Agreements between parental responses and adolescent

responses were assessed using the Kappa coefficient. Ethical approval for the study was obtained from the Ethics Committee of the Faculty of Medicine, University of Colombo. Informed written consent was obtained from all participating children and their parents. Permission to conduct the study was obtained from the Director of Education and the principals of the respective schools.

## Result

For meaningful interpretation, the deceased/separated/divorced group was excluded limiting the analysis to 5 occupational groups.

Table 1 shows the distribution of parents' occupation status as reported by parents and adolescents. Response rates were very high; over 99% for parents and over 98% for adolescents. Overall, response rates were higher with respect to mother's occupation than father's occupation. Responses given by both parents and adolescents were almost similar with respect to all occupation categories.

Agreement between parents' and adolescents' responses about father's occupation is given in Table 2. The percentage of agreement between parents' and adolescents' responses was 90%. The strength of agreement as determined by the Kappa coefficient (95% CI) was 0.85 (0.83-0.88) and indicates almost perfect agreement.

The percentage of agreement between parents' and adolescents' responses with respect to mother's occupation was 92%. The Kappa coefficient (95% CI) indicated that the strength of agreement was 0.85 (0.82-0.88) and indicates almost perfect agreement (Table 3).

## Discussion

In the present study parental occupation status was considered as a measure of socio-economic status. Information pertaining to parental occupation was obtained separately from both adolescents and parents from self-administered questionnaires.

Response rates of adolescents regarding their parents' occupation status were very high and as in the study by West *et al.* (3), the proportion of missing data was negligible. However, the method of data collection differed between the two studies with West *et al.* (3) having used a "mini interview" format to obtain information about parental economic and occupational activity. In the present study, paternal and maternal occupation data were missing in only 1.6% and 1.1% of adolescent reports respectively. However in self-administered questionnaires to adolescents very often there are high proportions of non responses with respect parental occupation status thus limiting the number of cases available for analysis. In a study where the validity of Norwegian adolescents' reports of parental socio-economic status was assessed, Lien *et al.* (9) re-

**Table 1 Distribution of parents' occupation status according to parents and adolescents**

Occupation code	Father's occupation				Mother's occupation			
	Parent		Adolescent		Parent		Adolescents	
	N	%	N	%	N	%	N	%
Code 1	325	28.1	329	28.5	143	11.7	139	11.4
Code 2	266	23.0	251	21.7	101	8.3	99	8.1
Code 3	526	45.5	521	45.1	161	13.2	157	12.8
Code 4	30	2.6	36	3.0				
Code 5					813	66.6	813	66.6
Code 6	10	0.9	20	1.6	3	0.2	13	1.1
<b>Total</b>	<b>1157</b>	<b>100.0</b>	<b>1156</b>	<b>100.0</b>	<b>1221</b>	<b>100.0</b>	<b>1225</b>	<b>100.0</b>

Code 1=professional/managerial/upper level business; code 2= clerical/technical/middle level business; code 3= skilled/unskilled labour; code 4=unemployed; code 5= housewife code 6=missing/cannot code

**Table 2 Agreement between parents' and adolescents' responses about father's occupation status**

Parents response	Code 1		Code 2		Code 3		Code 4		Code 6		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Code 1	297	90.5	13	5.2	9	1.7	1	3.2	5	25.0	325	28.3
Code 2	16	4.9	226	90.4	20	3.9	1	3.2	2	10.0	2665	23.1
Code 3	12	3.7	11	4.4	484	93.4	7	22.6	8	40.0	522	45.5
Code 4	0	0.0	0	0.0	3	0.6	22	71.0	0	0.0	25	2.2
Code 6	3	0.9	0	0.0	2	0.4	0	0.0	5	25.0	10	0.9
<b>Total</b>	<b>328</b>	<b>100.0</b>	<b>250</b>	<b>100.0</b>	<b>518</b>	<b>100.0</b>	<b>31</b>	<b>100.0</b>	<b>20</b>	<b>100.0</b>	<b>1147</b>	<b>100.0</b>

Measure of agreement: Kappa coefficient (95% CI) = 0.85(0.83-0.88); P=<0.001% agreement=90%  
With perfect agreement in bold

**Table 3 Agreement between parents' and adolescents' responses about mother's occupation status**

Parents' response	Code 1		Code 2		Code 3		Code 5		Code 6		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Code 1	126	91.3	7	7.1	1	0.6	6	0.7	3	23.1	143	11.7
Code 2	8	5.8	83	83.8	4	2.6	3	0.4	3	23.1	101	8.3
Code 3	0	0.0	6	6.1	131	83.4	22	2.7	1	7.6	160	13.1
Code 5	4	2.9	3	3.0	21	13.4	781	96.2	3	23.1	812	66.6
Code 6	0	0.0	0	0.0	0	0.0		0.0	3	23.1	3	0.3
<b>Total</b>	<b>138</b>	<b>100.0</b>	<b>99</b>	<b>100.0</b>	<b>157</b>	<b>100.0</b>	<b>812</b>	<b>100.0</b>	<b>13</b>	<b>100.0</b>	<b>1219</b>	<b>100.0</b>

Measure of agreement: Kappa coefficient (95% CI) = 0.85 (0.82-0.88); P=<0.001 % agreement =92%  
With perfect agreement in bold

ported that parental information was missing in 11-16% of adolescents' reports. In a similar study on Spanish adolescents Pueyo *et al.* (10) reported that paternal and maternal occupation information were missing in 24% and 46% of adolescents reports. In fact, the problems associated with low response rates led Wardle *et al.* (11) to develop and recommend the home affluence scale based on material markers as a useful alternative to parental occupation when assessing socio-economic status of adolescents. It is noteworthy that of the adolescents who did not respond, in nearly 25%, their parents' were also non-responders. This supports Looker's (12) assumptions that it is not only children but some parents may also have difficulties in indicating their occupational status. The very high response rate of adolescents regarding parental occupation status in the present study could be attributed to the selective nature and particular procedures adopted in the collection of data. The study participants included those adolescents living at least with one parent. Thus the adolescents' ability to provide valid information could have been obviously influenced by the frequent contact with parents. As response rates were very satisfactory no further analysis was deemed necessary with respect to non-respondents.

The strength of agreement between parental and adolescents reports was assessed using the Kappa statistic and it was evident that they were high with narrow and significant confidence intervals. The respective kappa statistics (95% CI) were 0.84 (0.82-0.86) for father's occupation and 0.85 (0.82- 0.88) for mother's occupation. According to the interpretation of Kappa values suggested by Landis and Koch (13), a value between 0.81-1.0 indicates an almost perfect agreement. Thus in the present study, the strength of agreement between adolescent and parent reports on both father's and mother's occupation could be considered as almost perfect. Looker (12) in an impressive review assessed the evidence from thirty two studies and concluded that adolescents' proxy reports of parents' socio economic status are most accurate if respondents are high school seniors living at home and reporting about parental characteristics that are near in time such as occupation. Thus it is plausible that the high level of agreement between parental and adolescents' reports observed in the present study is due to the fact that the subjects of the study were high school students who were living with at least one parent and reporting about a present characteristic such as occupational status. As there were very strong agreements between adolescent and parent reports, this study indicates that 15-year-old adolescents could be regarded as valid proxy reporters of parental socio-economic status assessed by parental occupation. This finding is consistent with other studies which assessed the validity of adolescents as proxy reporters of parental socio-economic status. According to Ensminger *et al.* (14), adolescents and their mothers had high agreement on socio-economic measures. In a Scottish study (3) it has been reported that 11-year-olds could provide reliable and very valid information with regards to parental socioeconomic characteristics. Lien

*et al.* (9) have reported that the strength of agreement between adolescents' and parents' reports on parental occupation at ages 11, 13 and 15 were moderate to very good and there were no significant improvements in agreement when 13-year-olds were compared with 15-year olds. Further more, it has also been reported that Spanish adolescents could be considered as acceptable informants of paternal occupation status (10).

Confirming with the findings of Lien *et al.* (9), it was evident that the strength of agreement between adolescent and parent reports was similar whether it was related to the occupation of father's or the mother. This indicates that both father's and mother's occupation are equally valid to obtain information about the socio-economic position of Sri Lankan adolescents and there is no necessity to prefer one indicator over the other. On the other hand Pueyo *et al.* (10) have reported that paternal occupation was the most valid indicator to obtain information about the socio-economic position in Spanish adolescents.

The occupation status in the present study was determined by the response given to a single open ended question in both questionnaires. It would have been possible to reduce the missing/unclassifiable answers by including more specific questions regarding occupation status particularly in the questionnaire to the students.

In conclusion, the present study provided evidence to suggest that 15-year-old adolescents in Sri Lanka could be relied on as proxies to provide accurate information about their parents' occupational status.

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## RISK FACTORS FOR SPONTANEOUS ABORTION

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### Abstract

#### Objective:

To determine the risk factors for spontaneous abortion.

#### Study design:

A prospective cohort study was carried out in Sri Lanka from May 2001 to April 2002 to determine the risk factors for spontaneous abortion. Eight hundred and twenty pregnant mothers were recruited on or before 16 weeks of gestation and followed up until delivery. Socio-demographic, occupational exposures, psychosocial stress and physical activity in terms of posture during pregnancy were assessed. Logistic regression analysis was applied and results were expressed as odds ratios (OR) and 95% confidence intervals (95%CI).

#### Results:

Maternal age of > 35 years was a risk factor [OR 2.98; 95%CI: 1.07, 8.26] and walking > 2.5 hours/day was a protective factor [OR 0.31; 95%CI: 0.11, 0.92] for second trimester spontaneous abortions after controlling for confounding factors. Occupational exposures, psychosocial stress, alcohol consumption or exposure to passive cigarette smoke during pregnancy were not observed to have an association.

**Conclusions** Maternal age of >35 years was and less walking hours/day were risk factors for spontaneous abortion

**Key Words:** Cohort study, Risk factors, Spontaneous abortion

### Introduction

Spontaneous abortion is the most frequent cause of foetal loss. It is estimated that 10–15 percent of all clinically detected pregnancies end with a spontaneous abortion.<sup>1</sup> Spontaneous abortion causes greater consequences of psychological impact on maternal life and also affects the whole family.<sup>1,2</sup>

Hence it is important to understand the factors that lead to spontaneous abortion in order that preventive measures could be adopted before and during pregnancy. Over the recent years a number of studies on risk factors for spontaneous abortion have been published<sup>3,4</sup> The evaluated were mainly related to smoking, alcohol and caffeine consumption, and maternal variables. However the conclusions of these studies were controversial, because there were methodological variations and also lack of adjustment for potential confounding factors. Physical activity and psychosocial stress during pregnancy have been recognized as risk factors for adverse maternal and foetal outcomes such as pregnancy induced hypertension, pre-eclampsia, preterm birth and low birth weight<sup>5-10</sup>. Even though a few studies had assessed the effect of physical activity and psychosocial stress on spontaneous abortion, the conclusions were controversial.<sup>11,12</sup>

The objective of the present study was to determine the risk factors for spontaneous abortion as it would be helpful in planning preventive measures to minimize

the incidence of spontaneous abortion.

### Methods

A prospective cohort study was carried out in two Medical Officer of Health areas in the Gampaha District. The duration of the study was from May 2001 to April 2002. All women eligible to participate in the study were recruited on or before 16 weeks of gestation and followed until delivery. Exclusion criteria were age <15 years, rhesus negative blood group, a history of diabetes mellitus, hypertension, and major psychiatric conditions.

The study instruments consisted of a questionnaire, which included four main components, namely general information which included socio demographic and pregnancy related data, details related to occupation and environmental exposures, Modified Life Events Inventory (MLEI) and General Health Questionnaire (GHQ 30). The latter two instruments were used to assess the psychosocial status of the women.

Socio demographic data included age, educational level and whether in paid employment or not. Pregnancy related data included details on present and past obstetric history. Details pertaining to occupation in terms of duration of work, exposure to physical hazards such as heat, noise and radiation and chemicals and the use of personal protective

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equipment were inquired from those who were in paid jobs. Duration of different postures adopted in terms of walking, sitting, standing and sleeping were inquired from all women irrespective of whether they were in paid employment or not. For working women the number of hours spent per day in each posture at the work place was considered in addition and standardized for number of working days to determine the number of hours spent per day in each posture.

All the above components of the questionnaire were administered at the time of recruitment to the study. Maternal weight and height, haemoglobin percentage, and blood pressure measurements were carried out according to a standard protocol. Spontaneous abortion was defined as the expulsion of foetus or parts of the foetus between the recruitment of participants (on average 12 weeks of gestation) and 28 weeks of gestation. Therefore the study dealt with the second trimester abortions.

Statistical analysis included univariate and multivariate logistic regression, which was carried out to determine the odds ratio for spontaneous abortions and each of the socio-demographic and maternal variables. Cut off values with regard to haemoglobin level, height, weight and pre pregnancy weight were determined by using receiver operator characteristic curves to get a more accurate estimate of the association.

For the multivariate analysis all the eligible socio-demographic and maternal variables were included. All variables were coded as zero and one. All eligible variables which had a probability of <0.25 were entered into the model simultaneously and then removed one by one if it was ineligible.<sup>12</sup> A two tailed probability of <0.05 was considered as significant.

## Results

The total number of women who attended the clinics during the period between May to August 2001 was 942. Forty five were not eligible (4.7%). Twelve were not willing to participate which gave a non participant rate of 1.3%. Nine twin and one triplet pregnancies were identified during the follow up and excluded. Finally a total of 875 women were available for the study. Outcome data were not available for additional 55 women. The latter computes a loss to follow up rate of 6.2%. Thus the final sample size left was 820 for the analysis. The total number of abortions among them was 42 (5.1%).

The mean age of the women was 27.6 years (SD±5.5years) whereas 89% were in the age group of 18 to 34 years. Ninety seven percent (97%) were Sinhalese since the study was carried out in a predominantly Sinhalese area. Seventy one percent (71%) had studied up to General Certificate Examination (ordinary level) while less than 1% only were found to have no schooling at all. Three hundred and forty one (46.2%) women were primiparous whereas 11 women (1.5%)

were grand multiparous. Sixty seven (9.2%) had body mass index (BMI) of <19.8 kg / m<sup>2</sup> and 25 (3.5%) a BMI of > 29 kg / m<sup>2</sup>. The mean haemoglobin (Hb%) level was 12.2 g/dl (SD 0.92g/dl). Fifty eight women (7%) had Hb% of less than 11g/dl at the booking visit.

In the univariate analysis maternal age >35 years was observed to be significantly associated with spontaneous abortion with an OR of 3.44 [95 % CI: 1.51, 7.83] (Table 1). None of the other variables given in Table 1 were significantly associated with spontaneous abortion.

For the multivariate analysis 760 women were included in the final model. Hosmer and Lemeshow test for goodness of fit was found to be satisfactory (p value 0.95). Number of events per variable was 8.2. Interactions were tested and it was not statistically significant. There was no collinearity between variables.

Multivariate analysis revealed that maternal age >35 years had a three fold risk for spontaneous abortion [OR 2.98; 95% CI: 1.07, 8.26] and walking >2.5 hours per day had 70% reduction of risk for spontaneous abortion [OR 0.31; 95% CI: 0.11, 0.92] after controlling for haemoglobin level, maternal age and sitting hours per day (Table 3).

## Discussion

In the present study walking for >2.5 hours/day was a protective factor for spontaneous abortion. Sitting for <3.5 hours/day was also a protective factor for spontaneous abortion, although it was not statistically significant. In other words our study showed that sedentary life was a risk factor for spontaneous abortion. Fenster had reported that standing hours, bending at work, hours spent doing housework and shift work were not associated with spontaneous abortion.<sup>11</sup> Fenster also showed that physical activity at work and at home combined together too had no effect on risk of spontaneous abortion.<sup>11</sup> Two other studies also revealed that occupation was not a risk factor for spontaneous abortion.<sup>3,14</sup> In contrast to the above studies, one study showed that unskilled occupation had 4.7 fold risk of spontaneous abortion (p <0.001) after controlling for confounders.<sup>15</sup>

In the present study no association was observed between work schedule and or work exposure and spontaneous abortion even in the univariate analysis. Talamanca reviewed the articles on spontaneous abortions and reported that irregular working hours may be a potential risk factor.<sup>16</sup>

A higher level of job stress was reported to be associated with spontaneous abortion with an OR of 1.28 [95% CI: 1.05, 1.57]<sup>17</sup>, nested case control study reported increased the risk of an adverse pregnancy outcome where it was observed to be

**Table 1 – Unadjusted Odds ratios for spontaneous abortion by selected socio-demographic and maternal variables**

Exposure variables		Spontaneous abortion		Odds Ratio	95% C.I.	P value
		Yes (n= 42)	No (n=778)			
Maternal Age * Years	> 35	8(19.5)	51(6.6)	3.44	1.51, 7.83	0.002
	≤ 35	33(82.1)	723(93.4)			
Maternal Height * c.m	≤153	21(53.8)	431(56.1)	0.91	0.48, 1.74	0.78
	>153	18(46.2)	337(43.9)			
Pre Pregnancy Weight * Kg	≤ 52	7(17.9)	270(35.0)	1.53	0.82, 2.86	0.18
	> 52	23(82.1)	501(65.0)			
BMI kg/m <sup>2</sup> *	≥ 26	7(17.9)	79(10.3)	1.90	0.8, 4.44	0.13
	< 26	32(82.1)	685(89.7)			
Parity	1	19(45.2)	359(46.1)	0.96	0.51, 1.79	0.90
	Others	23(54.8)	19(53.9)			
Past History of abortion	Yes	7(16.7)	128(16.5)	1.01	0.44, 2.33	0.97
	No	35(83.3)	650(83.5)			
Past history of LBW	Yes	2(4.8)	61(7.8)	0.58	0.13, 2.49	0.47
	No	40(95.2)	717(92.2)			
Hb% g/dl *	<12	7(20.0)	255(34.9)	0.46	0.20, 1.08	0.07
	≥12	28(80.0)	476(65.1)			
Education Up to Grade 5 Above	5	1(2.4)	38(4.9)	0.47	0.06, 3.54	0.46
	Above	41(97.6)	740(95.1)			
Per Capita Monthly * Income Rs.	≤1500	8(19.5)	197(25.4)	0.71	0.32, 1.56	0.40
	>1500	33(80.5)	579(74.6)			

\* Grand total does not add up to 820 due to non response, 95% CI: 95% Confidence Interval

**Table 2 - Unadjusted odds ratios for spontaneous abortion by other exposure variables**

Exposure variables	Spontaneous abortion		Odds Ratio	95% C.I.	P value
	Yes (n= 42)	No (n=778)			
Standing hours/day *	>2.5	10(24.4)	0.80	0.38, 1.66	0.55
	≤2.5	31(75.6)			
Walking hours/day *	>2.5	8 (19.8)	0.52	0.23, 1.14	0.10
	≤2.5	33 (80.5)			
Standing + Walking hours/day *	≥4	23(56.1)	0.77	0.41, 1.64	0.43
	<4	18(43.9)			
Sitting hours/day *	<3.5	10(24.4)	0.54	0.26, 1.13	0.10
	≥3.5	31(75.6)			
Sleeping hours/day	≤8	16(38.1)	1.17	0.61, 2.22	0.62
	>8	26(61.9)			
Work schedule and Exposure	Yes	4(9.5)	0.97	0.33, 2.79	0.80
	No	38(90.2)			
Employment Status *	Yes	7(16.7)	0.64	0.28, 1.47	0.29
	No	35(83.3)			
GHQ Score *	>5	15(35.7)	0.99	0.52, 1.90	0.98
	≤5	27(64.3)			
MLEI Score *	≥2	11(36.2)	1.49	0.73, 3.04	0.27
	<2	31(73.8)			
Passive Smoking	Yes	12(28.6)	1.54	0.77, 3.08	0.21
	No	30(71.4)			
Alcohol Consumption *	Yes	2(4.9)	1.48	36, 6.06	0.57
	No	39(95.1)			

\* Grand total does not add up to 820 due to non response, 95% CI: 95% Confidence Interval

**Table 3 Adjusted odds ratios for spontaneous abortion**

Exposure variable	b	SE	OR	95%CI	Prob
Walking > 2.5 hours/ day	- 1.16	0.55	0.31	0.11, 0.92	0.03
Sitting < 3.5hours /day	- 0.63	0.44	0.53	0.22, 1.26	0.15
Maternal age > 35 years	1.09	0.52	2.98	1.07, 8.26	0.04
Haemoglobin < 12g/dl	- 0.71	0.44	0.49	0.21, 1.15	0.10

b: Regression coefficient, SE: Standard Error, OR: Odds Ratio, 95% CI: 95% Confidence Interval, Prob: Probability

associated with spontaneous abortion with an OR. Since it was a case control study the reliability of information obtained was a limitation due to problems in recall.

In the present study occupational stress was not assessed separately. However it was revealed that psychosocial stress in terms of GHQ score of >5 or experience of <sup>3</sup>2 life events had no association with spontaneous abortion. In the study carried out by Schenker too, self-reported stress during pregnancy had no statistically significant association [OR 1.4; 95% CI: 0.8, 2.3] with spontaneous abortion.<sup>12</sup> This was consistent with the results of the present study.

We also reported a three fold risk of spontaneous abortion among women aged  $\leq 35$  years after controlling for walking, sitting hours and haemoglobin level. Our findings were consistent with the findings of another study which showed that age >24 years was a risk factor for spontaneous abortion.<sup>18</sup> In contrast to our study, four other studies had shown that maternal age was had no association with spontaneous abortion.<sup>3,14,15,19</sup>

Several studies had shown that cigarette smoking has no association with spontaneous abortion.<sup>3,4,14,18</sup> In two of those studies, cigarette smoking had not been associated with spontaneous abortion even in the univariate analysis.<sup>4,18</sup> One study had shown that smoking >19 cigarettes per day had an association with spontaneous abortion where the unadjusted odds ratio was 2.23 [95% CI: 1.05, 4.76]. However, after controlling for age, occupation, alcohol and caffeine consumption it had not remained significant [OR 0.95; 95% CI: 0.40, 2.20].<sup>14</sup> All respondents in our study sample were non smokers and passive cigarette smoking was assessed considering exposure to cigarette smoke both at home and at work place. However, passive smoking was not found to be associated with spontaneous abortion [OR 1.54; 95% CI: 0.77, 3.08].

Two studies had shown that alcohol consumption during pregnancy had no association with spontaneous abortion.<sup>3,19</sup> In the present study also it was shown that alcohol consumption during pregnancy had no association with spontaneous abortion [OR 1.48; 95% CI: 0.36, 6.06]. In contrast to our finding, a case control study had shown that consumption of alcohol of more than five units per week during pregnancy had a five fold risk of spontaneous abortion [95% CI: 2.87, 8.16] after controlling for age, parity, occupation, cigarette and caffeine consumption.<sup>14</sup> In our study population only 3.1% had taken alcohol and quantification of alcohol consumption did not allow for separate analysis because no one consumed alcohol regularly during pregnancy.

According to the present study there was no statistically significant association between primi parity and spontaneous abortion. Our findings are consistent with three other studies.<sup>3,14,19</sup> Yassin found that more than five pregnancies had a four fold risk of spontaneous abortion ( $p < 0.001$ ) controlling for potential confounding factors.<sup>15</sup> However in the present study, number of grand

multiparous women was inadequate for separate statistical analysis.

The present study also revealed that spontaneous abortion was not associated with a pre pregnancy BMI >26 kg/m<sup>2</sup> [OR 1.90; 95% CI: 0.81, 4.44]. Our findings are consistent with two other prospective studies, which had shown that BMI  $\leq 18.5$  kg/m<sup>2</sup> or <sup>3</sup>25 kg/m<sup>2</sup> was not associated with spontaneous abortion.<sup>3,19</sup>

The present study recruited women at their booking visit and thus the period of gestation on average was 12 weeks. All the 42 (5.1%) reported, were second trimester spontaneous abortions. Further, exclusion criteria applied at the recruitment were pre-existing diabetes mellitus and hypertension and multiple pregnancies which are known risk factors for spontaneous abortion. This explains the low spontaneous abortion rate in the present study.

### Conclusion

In conclusion, maternal age >35 years and sedentary lifestyle during pregnancy were risk factors for spontaneous abortion. There were no associations between BMI, primiparity, occupational exposures, psychosocial stress, alcohol consumption or exposure to passive cigarette smoke during pregnancy and spontaneous abortion.

### Acknowledgements

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# PREVALENCE OF BETEL CHEWING AMONG MALES IN COLOMBO AND POLONNARUWA DISTRICTS

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## Abstract

### Objectives

To assess the prevalence of betel chewing among adult males in a rural and urban district in Sri Lanka and describe the demographic characteristics of betel chewers.

### Methods

Betel use among 2684 males aged >18 years resident in a rural (Polonnaruwa) and urban (Colombo) district in Sri Lanka was assessed using multistage cluster sampling. Data on quantity and frequency of use was obtained using an interviewer administered questionnaire.

### Results

Prevalence of betel chewing was 17.6% in the rural and 1.7% in the urban district. In the rural district prevalence was significantly associated with age ( $p < 0.001$ ). In both districts prevalence was lowest among males between 18-24 years of age (2.7%) and highest among those aged > 65 years (36%). In both districts prevalence was significantly associated with income ( $p < 0.05$ ). Prevalence was highest among those with a monthly income <Rs.5000. In rural areas 23.8% of those with an income <Rs. 5000/month chewed betel while only 4.7% of those earning >Rs. 25000 a month chewed betel.

### Conclusions

There was a significant difference in prevalence of betel chewing between rural and urban areas. Betel chewing now remains mainly a habit of the elderly in rural areas.

**Key words:** Betel chewing, Sri Lanka, oral cancer

## Introduction

Betel chewing has been practiced for many centuries by people in South Asian countries. The composition of the betel quid varies according to the region. The basic betel quid is made up of betel leaves, areca nut and lime (aqueous calcium hydroxide paste). Dried tobacco leaves may be added to the quid<sup>1</sup>. Areca nut incorporated into betel quid is classified as a psychoactive substance. In India about 35-40% of tobacco consumption is in the form of smokeless tobacco which is mainly used in betel quid<sup>2</sup>.

The prevalence of betel use according to the National Oral Health Survey of 1994/1995 was 33.78% among 35-44 year olds and 47.7% among 45-74 year olds with an overall prevalence of 40.5% among 35-74 year olds<sup>3</sup>. In 1982, a study among Sri Lankan villagers found 54% of males and 42% of females to use betel regularly<sup>4</sup>. A study among tea estate labourers found that 92% with oral mucosal lesions reported betel quid chewing<sup>5</sup>. Population based studies in India, Nepal and Pakistan over the past 25 years have found 20-40% of those aged 15 years and over were betel quid or areca nut chewers<sup>1</sup>.

Association between betel chewing and oral cancer has been well established. Betel chewing also carries a high

risk for pre cancerous lesions. The areca nut used in the chew causes oral submucous fibrosis, a precancerous condition<sup>6</sup>. Betel quid, smoking and alcohol have a synergistic effect on the development of leukoplakia another pre cancerous condition. The risk for precancerous lesions were highest among betel chewers (OR 3.01) followed by smoking (OR 2.16) and alcohol (OR 1.41) among tea estate labourers<sup>5</sup>. Betel quid chewing is also associated with cancer of the pharynx and oesophagus<sup>7</sup>.

Since high rates of betel chewing have been reported in Sri Lanka previously and the association between betel chewing and poor oral health have been established we conducted a study to assess the prevalence of betel chewing and describe the characteristics of adult male betel chewers in a rural and an urban district.

## Methods

The study was carried out as part of a baseline survey on psychoactive substance use. A multistage cluster sampling was carried out in four Medical Officer of Health (MOH) areas in the Colombo and Polonnaruwa districts. The MOH areas surveyed were Nugegoda, Moratuwa, Thamankaduwa and Elahara. The study was conducted from May-August 2007. The study sample consisted of 2684 males over 18 years of age.

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Data was collected using an interviewer administered questionnaire which recorded self reports of quantity and frequency of alcohol, tobacco and betel use during the last 30 days. Verbal informed consent was obtained from all selected participants. Ethical Clearance for the study was obtained from Ethics Committee, Faculty of Medicine, University of Colombo.

#### Statistical analysis

Association between variables were explored using chi-squared statistics. Univariate logistic regression was used to calculate odds ratios for betel chewing.

## Results

### Study population

The study population consisted of 2684 males over 18 years. There were 1318 in the urban and 1366 in the rural groups. There was no significant difference in mean age between urban (40.9 years) and rural males (40.3 years) ( $t= 1.03, p=0.41$ ). The urban males had a significantly higher income ( $p<0.001$ ). In the rural sample 36.5% earned <Rs. 5000, and in the urban sample 9.8% earned <Rs. 5000. The percentage distribution by ethnic group was Sinhalese 92.1, Tamils 2.7, Moor 4.5 and oth-

**Table 1 Prevalence and odds ratio of betel chewing according to socio-demographic characteristics**

	Number surveyed	Prevalence of betel chewing		Odds ratios (95% confidence intervals) for betel chewing
		Urban % (95% CI) n=1318	Rural % (95% CI) n=1366	
<b>Race</b>				
Sinhala	2474	1.6 (0.88-2.31)	18.2 (16.1-20.3)	1.0
Tamil	73	1.6 (-1.56-4.68)	0	0.14 (0.02-1.0)
Moor	121	2.0 (-1.98-5.9)	6.6 (0.17-12.9)	0.41 (0.17-1.0)
Burgher	16	0	0	0
<b>Religion</b>				
Buddhist	2215	1.8 (0.98-2.65)	18.4 (16.24-20.47)	1.0
Hindu	48	2.3 (-2.37-7.02)	0	0.19 (0.27-1.4)
Muslim	121	2.0 (-1.98-5.9)	6.6 (0.17-12.95)	0.37 (0.15-0.92)
Catholic	187	0.7 (-0.66-2.0)	0	0
Christian	113	0	0	0
<b>Age</b>				
18-24 yrs	442	0	2.7 (0.56-4.9)	1.0
25-34 yrs	639	0.4 (-0.35-1.0)	10.4 (7.3-13.6)	4.72 (1.98-11.25)
35-44 yrs	582	2.5 (0.8-4.2)	21.2 (16.3-26.1)	8.97 (3.85-20.93)
45-54 yrs	477	1.7 (0.04-3.4)	20.2 (15.1-25.3)	9.08 (3.86-21.35)
55-64 yrs	324	2.9 (0.37-5.5)	31.4 (23.9-38.8)	14.21 (6.03-33.5)
>65 yrs	220	3.9 (-0.4-6.6)	36.0 (27.4-44.7)	19.85 (8.34-47.29)
<b>Income SLR</b>				
<Rs. 5000	628	5.4 (1.5-9.4)	23.8 (20.1-27.6)	1.0
Rs.5000-7999	513	1.7 (0.4-3.3)	16.7 (12.3-21.2)	0.43 (0.31-0.61)
Rs.8000-14999	901	1.9 (0.7-3.0)	15.2 (11.5-19.0)	0.31 (0.23-0.43)
RS.15000-24999	406	0	8.6 (4.3-13.0)	0.14 (0.08-0.25)
>RS.25000	176	0	8.6 (1.2-16.1)	0.06 (0.02-0.24)
Not recorded	60			
<b>Total</b>		<b>1.7 (0.92-2.27)</b>	<b>17.6 (15.6-19.7)</b>	

ers 0.6. The percentage distribution of the sample by religion was Buddhists 82.5, Christian 11.2, Muslim 4.5 and Hindu 1.8.

### Betel chewing

Prevalence of betel chewing in urban and rural areas is given in Table 1. Prevalence in the rural area (17.6 %) was significantly higher than in the urban areas (1.6%) ( $\chi^2=195.3$ ,  $df=1$ ,  $p<0.001$ ).

In rural areas prevalence of betel chewing was 18.2% among Sinhalese and 6.6% among Moors. In the rural areas prevalence of betel chewing was significantly associated with age ( $\chi^2=28.9$ ,  $df=6$ ,  $p<0.001$ ). Prevalence was lowest among males between 18-24 years of age (2.7%) and highest among over 65 years (36%). This increase in the prevalence with age was seen in the urban area too though the prevalence in all age categories was lower than in rural areas.

In both rural and urban areas prevalence was significantly associated with income ( $p<0.05$ ). In both study areas prevalence was highest among those with a monthly income < Rs.5000. In rural areas 23.8% of those with a monthly income <Rs. 5000 chewed betel while only 4.7% of those earning >Rs. 25000 a month chewed betel.

The odds of being a betel chewer increased with age, with the odds for those aged > 65 years being 19.85 compared to the reference group 18-24 years. Among income categories odds were highest for those with monthly income of <Rs. 5000.

Of the betel chewers 93.8% used it daily while only 5% used it less than 10 days a month. The mean number of betel quid used per day was 5.9 (SD 4.06).

### Association with tobacco and alcohol use

Alcohol consumption was more prevalent among betel users (32.4%) as compared to those who do not use betel (26.3%) (OR 1.35). Odds ratio of a smoker being a betel user was 0.71.

### Economic impact

Rural betel users spent significantly more on betel monthly (mean=Rs. 883) than urban users (mean=Rs.371) ( $t=3.75$   $p<0.001$ ). The highest mean expenditure on betel quid of Rs. 962 was by users in the rural areas earning < Rs. 5000 (Table 2). This accounts for 19.2% of their income. The amount spent by urban user in the same income category was only Rs. 307 a month.

### Discussion

Betel chewing was more prevalent in the rural compared to the urban district and prevalence increased with age. Highest prevalence was among the lowest income earners. In rural areas betel users with the lowest income spent a substantial proportion of their earnings on betel.

The prevalence of betel chewing in the current study is less than that reported in the National Oral Health Survey in 1994/1995 where 40.5% of those aged between 35-74 years chewed betel<sup>3</sup>. There could be many reasons for the lower prevalence in urban areas. Perceiving betel use as a habit of rural people and as an unfashionable habit as well as increased awareness of its association with oral cancer may be some of them. Low prevalence among the younger age group indicates that the habit is on the decline even in the rural areas.

The odds of a smoker being betel chewer (OR 0.71) indicates that smokers are less likely to use betel than non smokers. This could be because some males use betel instead of smoking. But betel chewing does not appear to replace the habit of alcohol use.

A limitation of the current study is that it did not record data about betel chewing among females. Previous studies have shown that usage among females was only slightly lower (42% vs. 54%)<sup>4</sup>.

Although betel chewing is lower now compared to

**Table 2 Mean expenditure on betel among users according to monthly income**

Income	Urban Rs.(SD)	Rural Rs.(SD)
<Rs. 5000	307 (239.9)	962 (720)
Rs.5000-7999	265 (141.1)	791 (497.3)
Rs.8000-14999	458 (311.9)	800 (511.5)
Rs.15000-24999	0	900 (617.1)
Rs.25000-39999	0	600 (212.1)
> Rs.40000	0	850 (86.6)
Mean	371 (267.4)	883 (622.5)

those from studies carried out 15 years ago it is still prevalent in rural areas. Oral cancer is one of the commonest cancers in South Asia where the habit of betel chewing is common. The primary risk factors for oral cancer are betel chewing, tobacco and alcohol<sup>4</sup>. All three are modifiable lifestyle risk factors. Population screening for oral cancer and pre-cancer could be more efficient if opportunistic screening of high-risk groups attending primary care services is carried out. Since betel chewing carries the highest risk for pre cancerous lesions and is a significant risk factor for oral carcinoma the current study helps identify groups with high rates of betel chewing where targeted screening programs could be carried out.

Amongst the poorest in rural areas betel chewing also contributes to poverty. It also underscores the need to incorporate betel chewing into substance use prevention programmes carried out in rural areas.

#### **Acknowledgement**

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# SUICIDE TRENDS IN SRI LANKA 1880- 2006; SOCIAL, DEMOGRAPHIC AND GEOGRAPHICAL VARIATIONS

N Thalagala

## Abstract

### Introduction

Sri Lanka is noted for high suicide rates for many decades. Suicide rates over time indicate an epidemic currently in the settling phase. Despite the availability of a rich source of official statistics since very early years, an in-depth analysis is yet to be carried out.

### Methodology

Suicide rates as reported to the Register general and Department of Police were compiled from 1880 to 2006. Then overall trends in suicide rates of Sri Lanka were described from 1880 to 2006. A more detailed analysis in relation to age, sex, ethnicity, religion, and geographical region are presented from 1961 to 2006.

### Results

The long standing suicide epidemic of Sri Lanka seems to have passed its peak in the mid twentieth century and presently is on declining phase. Older persons, those 60 years and above, shared the largest suicide burden through out the period. Suicides among youths were not on the rise as observed in many other countries. Male to female ratio of suicides were on the increase and lies in the range of 2 to 3. Sinhalese Buddhists had the highest suicide rate followed by the Sri Lankan Tamils who were predominantly Hindus. Moors, who follow Islam, had the lowest suicide rates. The rural agricultural districts such as Vavunia, Polonnaruwa, Anuradhapura, Kurunegala, Matale, and Kegalle reported higher rates than rest of the country.

### Conclusions

The suicide epidemic of the country seems to have past its' peak around the middle of the 20<sup>th</sup> century. Suicides among adult males have contributed to the major share of this rise in suicides. The general reduction of the suicide rates seen after mid nineteen nineties could be attributable to the policy thrusts initiated by the Presidential Taskforce on Suicide Prevention in 1997. Suicides remains to be a mental health priority even now.

### Keywords

suicide trends, suicide epidemiology, Sri Lanka mental health

### Introduction

Over 500,000 suicides which amount to more than 50% of world's suicides occur in Asia. For the past 3 decades, one of the Asia's leading suicide rates are being reported from Sri Lanka [1]. The overall suicide rate of Sri Lanka is shown to be on decline since 1995. Nevertheless, not much information is available on the variations in suicide rates among different demographic, social and geographical sectors of the country [2]. Despite the availability of suicide statistics by a number of socio demographic and geographical factors through the routine information system of the Department of Police, an organized analysis is yet to be carried out. An attempt is made in this article to describe the suicide trends in relation to selected social demographic and geographical characteristics using the official statistics and there by to generate an insight in to the changing patterns of the suicide epidemiology in the country.

### Methodology

The official statistics compiled by the Department of Police were analyzed to determine the time trends and

the socio-demographic and geographical differentials of suicide rates in Sri Lanka. Reporting of suicides to the police is mandatory in Sri Lanka and these reports are systematically collected in a data base at the Statistical Division of the Department of Police. The coverage of the reporting is considered satisfactory [3]. This data base allows the retrieval of data related to suicide by year, age, sex, ethnicity, religion, educational status, district, motive and mode of suicide. The study analyzed this data base to determine the suicide rates of Sri Lanka over time in relation to age, sex, ethnic, religious, and geographical characteristics. Suicide statistics from the Police data base were used as numerators while census based mid year population estimates were considered as denominators [4]. The parameter specific suicide rates were presented per 100,000 persons.

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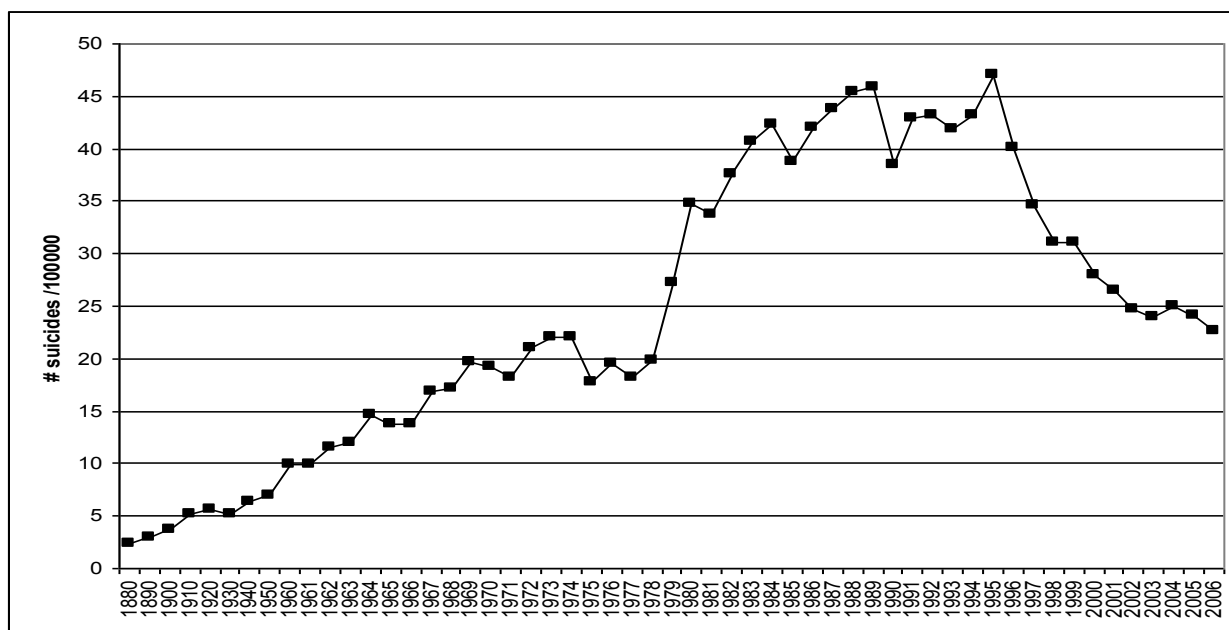
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## Results

### Overall Suicide Trends

Time series records on number of suicides in Sri Lanka are available since the year 1880. Analysis of number of suicide per 100000 persons indicates a gradual and consistent increase over a period of more than 10 decades, starting from 1880. During this period the national overall suicide rate has increased from 2.3 suicides per 100000 persons in 1880 to 21.2 suicides per 100000 persons in 1974. Thereafter, a dramatic increase is seen in the overall suicide rate of the country. This rapid rising trend persisted until the year 1995, in which the country reported a highest ever overall suicide rate of 47 suicides per 100000 persons. After 1995, suicide rate has started to decline and in the year 2006 it declined to 24 suicides per 100000 persons. Figure 1 and Table 1 show the time trends of the overall suicide rates of Sri Lanka for the past 125 years.

**Figure 1 Overall suicide rates in Sri Lanka since 1880 to 2006**



Source: Department of Police, Sri Lanka

**Table 1 Suicide rates (overall, male, female) in Sri Lanka by every 10<sup>th</sup> year since 1960 to 2005 and the male to female ratio of suicide rates**

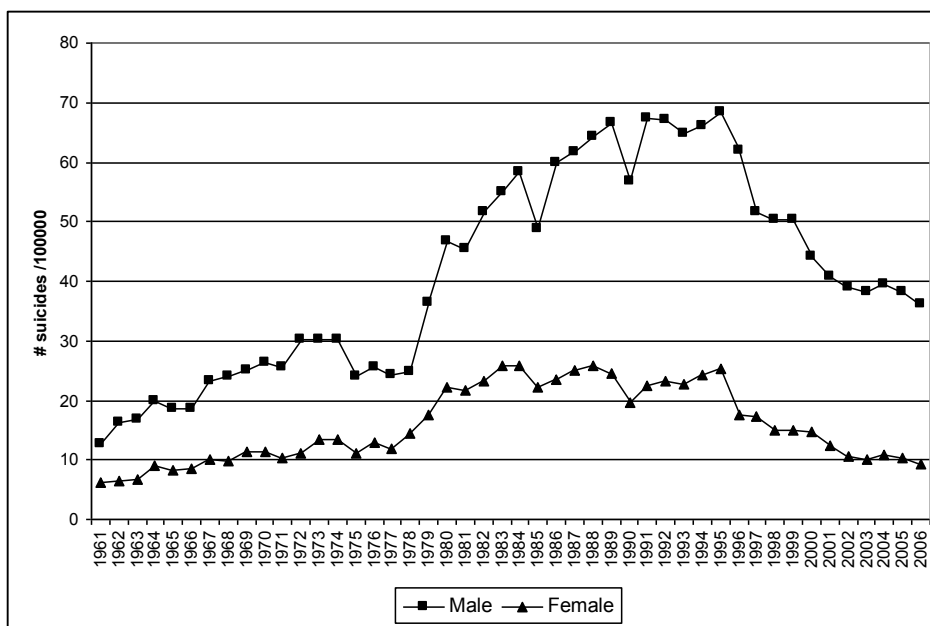
Year	Overall	Male	Female	Male/Female
1960	9.9	12.7	6.3	2.0
1965	13.7	18.7	8.2	2.3
1970	19.2	26.3	11.5	2.3
1975	17.7	24.0	11.1	2.2
1980	34.8	46.7	22.1	2.1
1985	38.7	48.8	22.3	2.2
1990	38.5	56.8	19.5	2.9
1995	47.0	68.3	25.2	2.7
2000	28.0	44.1	14.8	3.0
2005	24.1	38.2	10.4	3.7

Source: Department of Police Sri Lanka

### Suicide trends by Sex

On average both males and females have demonstrated similar patterns of rising and declining suicide trends throughout the period. However, the trend of male suicide rates showed relatively higher dynamics compared to those of females. The males to female ratio of suicides remain around the value of 2 for the period extending from 1961 to 1985. Thereafter a gradual increase in the gap between the male and female suicide rates was observed and at present the ratio remains around 4. The increase in gap has resulted from the relatively rapid increase of male suicide rates when compared to that of females during the period from 1980 to 1995. The highest ever male suicide rate of the country has been 68 suicides per 100000 males in the year 1995. However, the male suicide rate has declined to 36 suicides per 100000 males in the year 2006 (Figure 2).

**Figure 2 Suicide rates in Sri Lanka by Sex since 1961 to 2006**

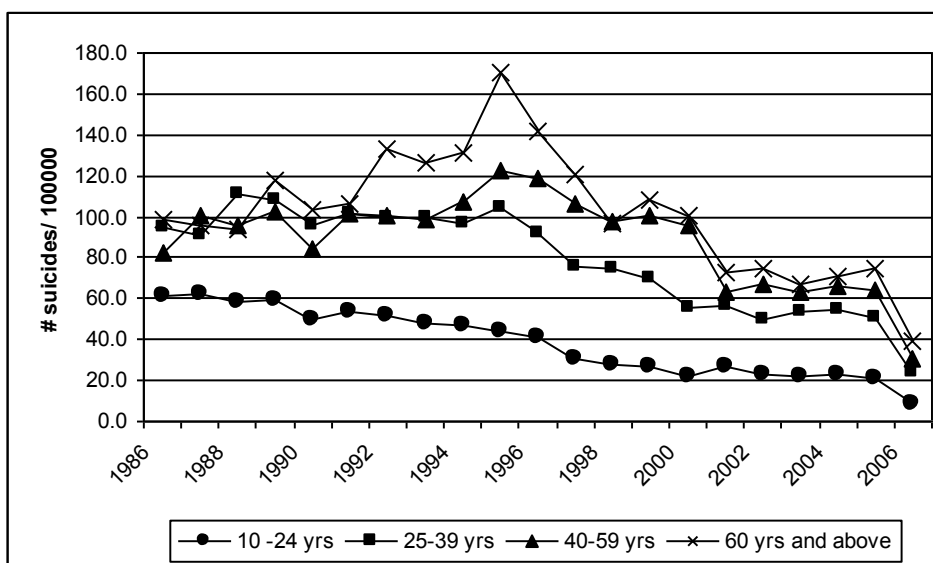


Source: Department of Police, Sri Lanka

### Suicide trends by age

Age specific suicide trends seemed to be different among males and females (Figures 3 & 4).

**Figure 3 Suicide Rates in Sri Lanka by Age among Males since 1986 to 2006**

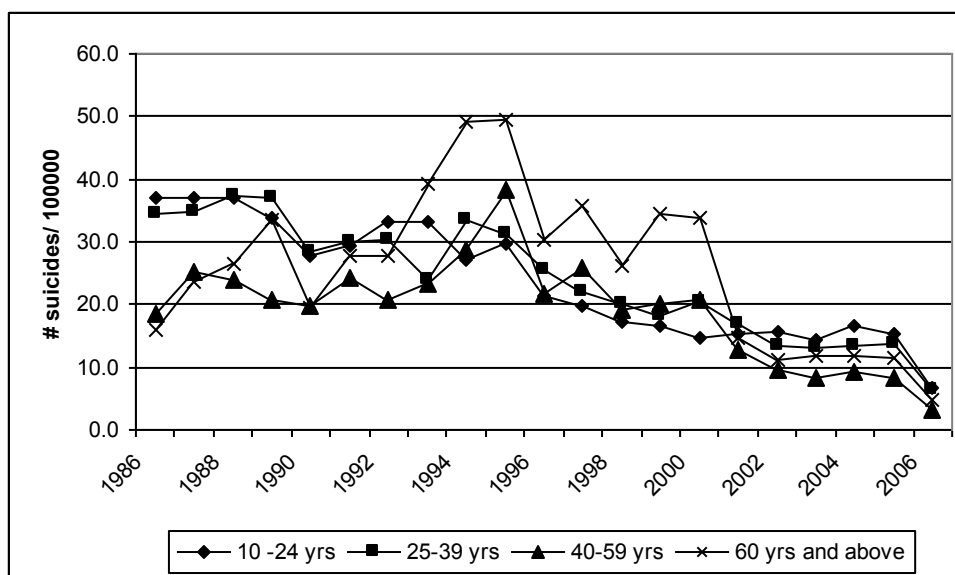


Source: Department of Police, Sri Lanka

Suicide rates of males observed to be directly proportional to age through out the period under study. The highest suicide rates were seen in the age group 60 and above in all the years since 1986 to 2006. The suicide rate of the age group 60 and above was at its peak in the year 1995 when it has risen to 170/100000 persons and it has come down to 39/100000 persons by the year 2006. The patterns of trends in suicide rates among males of different

two middle age groups (25 -39 years and 40-59 years) during the period from 1996 to 1998. After the year 2000, the suicide rates of two younger age groups (10 to 24 years and 25 to 39 years) have started to overrun the suicide rates of the other older age groups. However, at present suicide rates of all four age groups seems to converge and they record the lowest ever rates for the study period. In the year 2006, the lowest suicide rate, 3/100000

**Figure 4 Suicide Rates in Sri Lanka by Age among Females since 1986 to 2006**



(Source: Department of Police, Sri Lanka)

ages varied. Males who were in their youth (10 -24 years) have shown the lowest rates of suicide in all years since 1986. The highest rate pertaining to this age group was reported as 62/100000 in the year 1986 and the trend has been continuously declining until the year 2006, when it was reported as 9/100000. In all other age groups there has been an escalation of suicide rates since the year 1986 to 1995 followed by a declining trend. The highest amount of rise and decline of suicide rates over time was found in the oldest age group (60 & above) while it was lowest in the 25- 39 year age group.

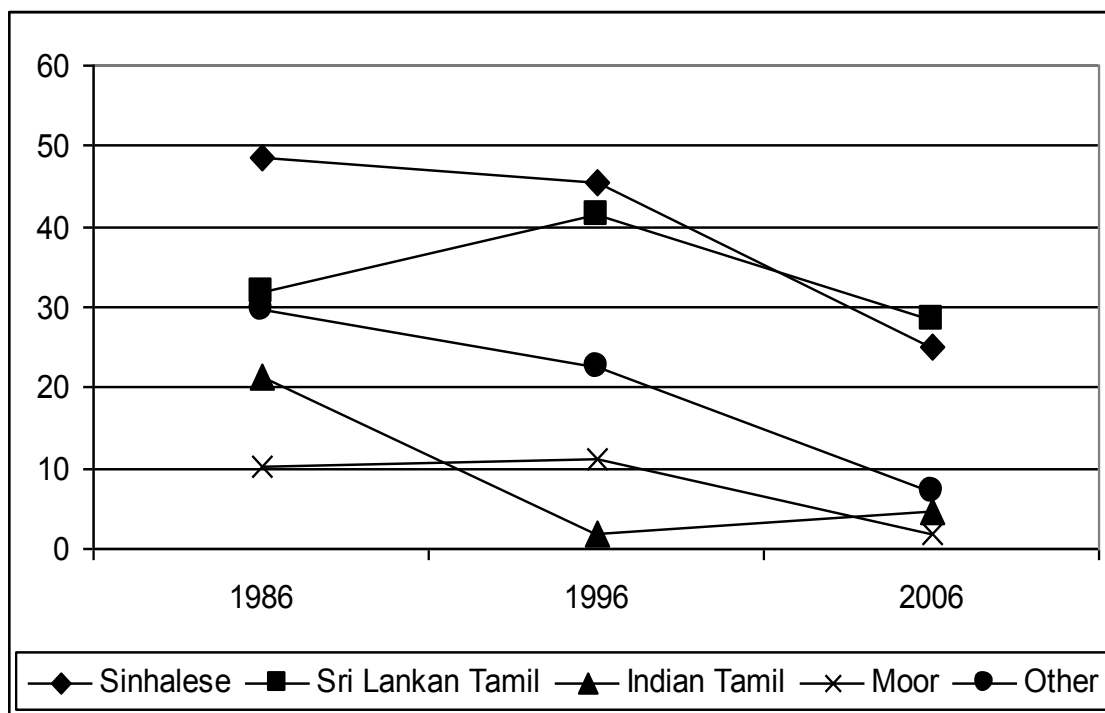
Pattern of suicide trends among females were distinctly different from that of males. During the initial 3 year period from 1986 -1998, the suicide rates of females were inversely proportional to the age with the lowest suicide rates were seen among females in the age group 60 years and above. During this period the highest age specific suicide rate was reported by the females in the youngest age group (10 -24 years). This pattern seemed to gradually invert over time. By the year 1995, the rates became directly proportional to age. During the period from 1995 to 2000 suicide rates pertaining to all age groups have declined. Those in higher age groups reported relatively higher suicide rates, with a slight inversion of this age: rate relationship was observed in

persons was seen among the females in the 40 to 59 years age group while the highest rate for the same year, 7 /100000 persons was reported from females in the age group 10 -24 years. The corresponding rates for the same age categories for the year 1995 where the highest ever suicide rates were reported were 38/ 100000 and 50/ 100000 respectively.

**Suicide trends by Ethnicity**

A distinct ethnic difference is seen in the vulnerability to suicides amongst Sri Lankan people. The time trends in suicide rates among different ethnic groups of Sri Lanka since 1986 to 2006 is presented in Figure 5.

**Figure 5 Suicide Rates in Sri Lanka by Ethnicity since 1986 to 2006**



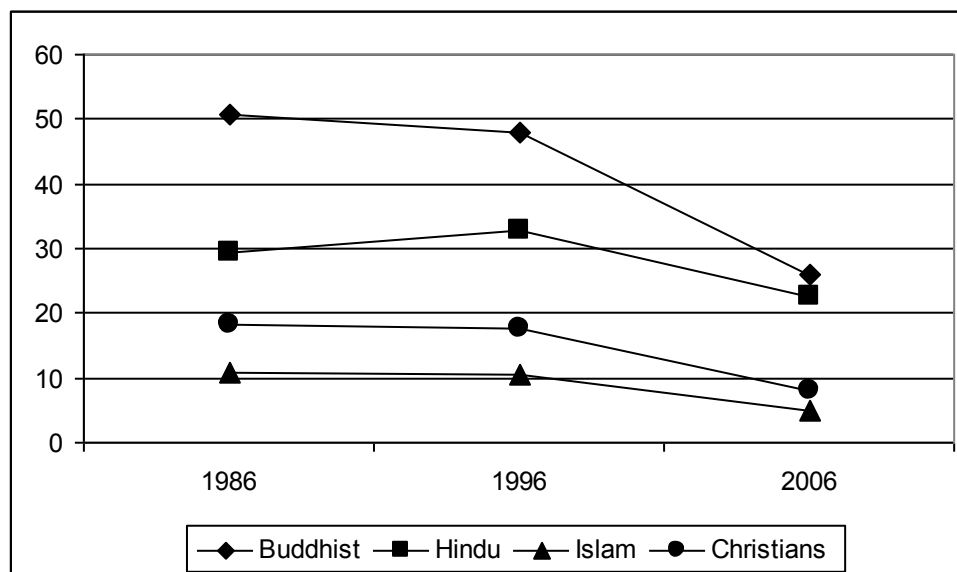
Source: Department of Police, Sri Lanka

The suicides rates were highest among the Sinhalese until around the year 2000 and afterwards, the suicide rates of Sri Lankan Tamils became the highest. The suicide rates for Sinhalese have declined from 49 / 100000 persons in the year 1986 to 25/100000 persons in the year 2006. The rates for Sri Lankan Tamils has risen from 32/100000 persons in the year 1986 to 42/100000 persons in the year 1996 thereafter declining to 28/100000 persons in the year 2006. Moors recorded the lowest suicide rates except in the mid study period, around 1996, where the rates of Indian Tamils declined to the lowest level of 2/100000 persons. In the year 1986 the suicide rate for Moors, 10/100000 persons which was the lowest rate for that year, has risen to 11/100000 in the year 1996 and at present it remains at 2 /100000 persons as the lowest ethnic specific suicide rate of the country. Except among Indian Tamils the time trend of corresponding suicide rates seemed to follow the time trends of the overall national suicide rates. The minority ethnic groups that mainly comprises of Malays, Burghers and other types of Eurasians has shown a moderate suicide rate thorough out the period. The suicide rate for this group has declined from 30/100000 persons in the year 1986 through 23/100000 persons in 1996 to 7/100000 persons in the year 2006.

#### **Suicide trends by Religion**

Distinct religious differences in suicide vulnerability among Sri Lankan people is indicated in Figure 6. The Buddhist has been the most vulnerable population while followers of Islam were the least vulnerable group through out the 20 year period of observation. In the year 1986 the Buddhists were having the highest suicide rate of the country which was 51/100000 persons while that of Moors were 11/100000 persons. Suicide rates of both these religious groups were declining since 1986 and the rates for Buddhists and Moors in the year 2006 were 26/100000 and 5 /100000 persons respectively.

**Figure 6 Suicide Rates in Sri Lanka by Religion since 1986 to 2006**



Source: Department of Police, Sri Lanka

Hindus had the second highest suicide rate of the country through out the period. A considerably higher gap between the suicide rates of Buddhists (51/100000 persons in 1986) and Hindus (29/100000 persons) in the year 1986, has seemed to have narrowed down gradually. The corresponding rates of Buddhists and Hindus in the year 1996 were 48/100000 and 33/100000 persons respectively. At present, in the year 2006, Buddhists' suicide rate was 26/100000 persons and that of the Hindus' was 23/100000 persons. Since 1986 to 1996 the suicide rates among Christians remained more or less stable at the rate of 18/100000 persons and there after the rate has declined to 8/100000 persons in the year 2006.

#### **Suicide trends by geographical distribution**

A marked district variation was seen in the suicide rates (Figure 7). In analyzing the district based differences, the annual suicide rates from 1997- 2004 were averaged to reduce the inter-district random variations over time. The districts with the highest suicide rates for the period include Vaunia, Polonnaruwa, Anuradhapura, Kurunegala, Matale and Kegalle. In these districts the suicide rates ranged from 59 to 83 /100000 persons. The districts of Badulla, Monaragla, Rathnapura, Galle, Puttlum and Batticaloa comprised the regions with second highest suicide rates (43 to 58 /100000 persons). The lowest range of suicide rates, 22 to 42 /100000 persons was reported from Western Province (Colombo, Kaluthara and Gampaha Districts), Central Province (Kandy and Nuwara Eliya districts) and Eastern Provinces (Trincomalee and Ampara districts).

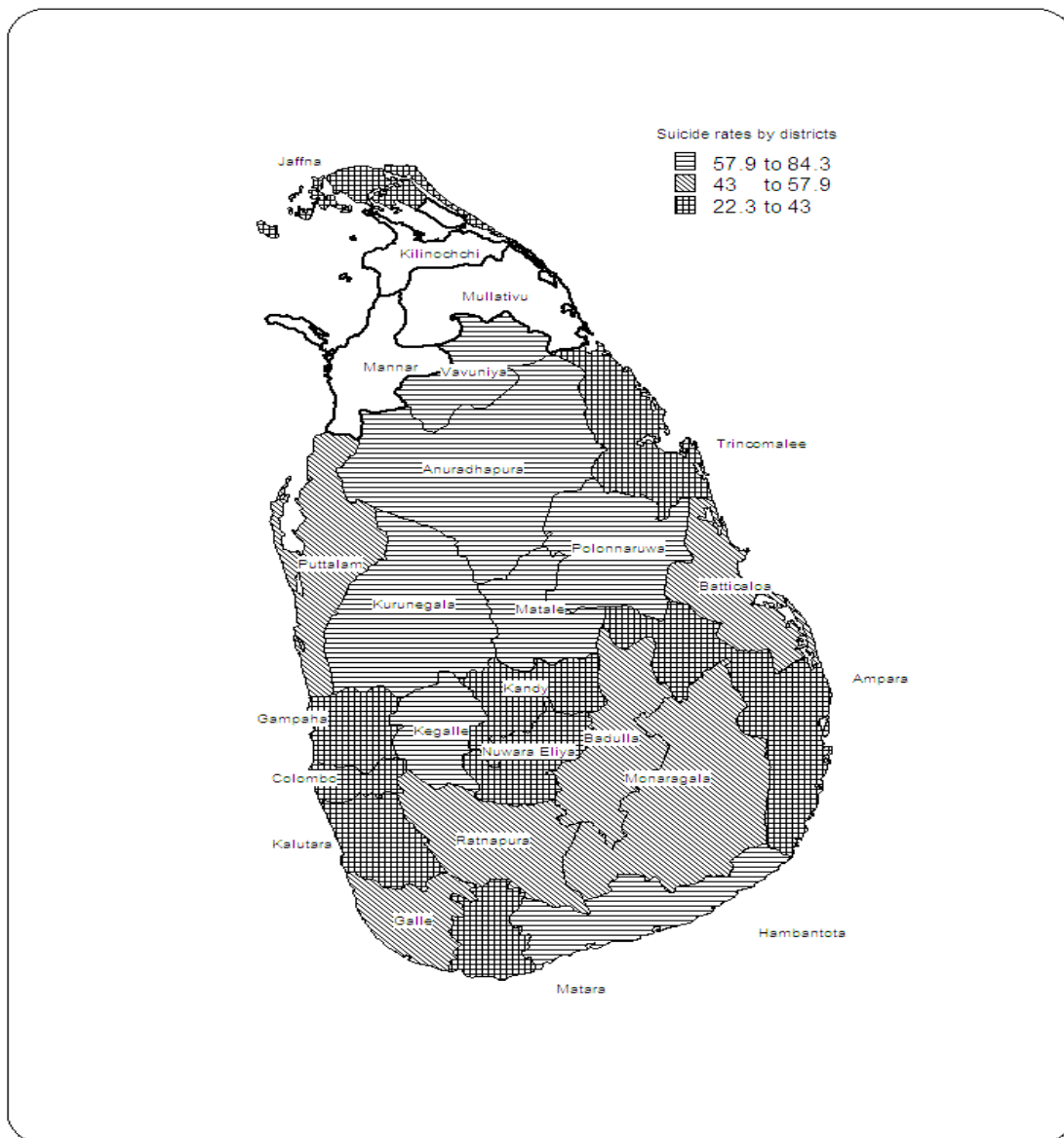
#### **Discussion**

The analysis of suicide rates indicates a significant variation of suicide vulnerability among the people from different segments of population and times. The

suicide epidemic of the country seems to have past its' peak around the middle of the 20<sup>th</sup> century. This peak was seen in all different segments of the population except among male youth, who experienced a continuously declining trend in their suicide rates.

A markedly rapid escalation is seen in suicide rate in Sri Lanka starting from early nineteen seventies that was sustained until mid nineteen nineties. Suicides among adult males have contributed to the major share of this rise in suicides. It is important to explore the possible contextual factors that would have influenced this escalation. After the independence the socio economic state of the country was gradually heading for a depression. The economic depression would have exerted its maximum impact during early nineteen seventies. The rapid population increase, high level of unemployment, increased in-migration, loosening of closely knit family and community structure could have collectively led to an increase in general societal stress which was beyond the threshold limits of some vulnerable people. The majority of suicides during this period were reported from the new agricultural settlement areas. The establishment of agricultural schemes, especially the Mahaweli Scheme, was carried out in a somewhat rapid phase. The majority of early settlers were adult males who left their families to a relatively isolated socio cultural environment in which they would have missed the rich social capital that prevailed in their original society. This kind of secluded environment is known to create an anomic status in which the suicide proneness was reported to be high [5].

**Figure 7 Average suicide rates by districts -1997 to 2004**



After 1996 there have been a number of strategic attempts that aimed to reduce uprising suicide rates. In the year 1997, responding to the alarms made by experts and to the outcries of general public, the Government established a Presidential Committee to study the problem and to propose an appropriate national action plan for suicide prevention. Alongside with this initiative a number of public and private organizations had embarked on suicide prevention activities. This has resulted in various interventions that included; creation of public awareness, restriction of the availability of pesticides solutions, encouraging the destruction of the plant, “Yellow Oleander”, the seeds of which was commonly used as a mode of suicide, and training of health personnel, teachers and other gate keepers on suicide [2]. Unfortunately hardly any systematic evaluations

were carried out to assess the impact of these efforts. However, these interventions would have at least had partial contributions to the general reduction of the suicide rates seen after mid nineteen nineties.

In general suicide rates were highest among the oldest age group (60 years and above). This pattern has been maintained over time among males and females. However, in recent years, after 2001, the suicide rates of female youth (15 to 24 years) and females in 25-39 year age group have overcome those of the females who were older (40- 59 years and 60 years and above). Both these trends are important concerns to the suicide prevention activities as the present demographic structure of the country comprises a considerably higher proportion of older persons (8 %) and youths (24%) [6].

Males were always having comparatively higher suicide rates than females. However, it should be noted that Sri Lankan female suicide rates were considered as the world highest female suicide rates when it was at its peak (25/100000 persons) in the year 1995. At present the female suicide rate has come down to 10/100000 persons. When the countries suicide rate was at its peak the male to female ratio of suicide rates were 2.7 where as at present time it has risen to 3.8. However, it should be noted that this increase in the gap is due to the relatively faster declining of the female suicide rates when compared to that of the males. Important observations are seen in the sex specific youth suicide rates. During the period under consideration, the suicide rates among the male youths were on the declining and those rates were always lower than the corresponding male suicide rates of older age groups. Until the year 2000, female youth were also demonstrating a declining pattern of suicide rates. However, thereafter they seem to have lost the resilience. At present highest female suicide rates are reported from the female youth. Similar kind of rising pattern of youth female suicide rates were reported in the western parts of the world in early sixties and it was attributed to the changing roles of women in those societies. The gender related societal changes resulting from the effects of globalization, and increased opportunities to women resemble the context prevailed in the West during nineteen sixties. In present setup female youth tend to have more freedom, opportunities, and unmet aspirations than their predecessors. While these factors facilitate gender equality and equity, it could also create situations of unrest and unsupportive circumstances leading to stressful lives [7].

In Sri Lanka religion and ethnicity go hand in hand. The majority of Sinhalese are Buddhist while the majority of Tamils are Hindu's. Almost all Moors follow Islam. The smaller proportion of Sinhalese and Tamils and most people from the "Others" groups who are predominantly Burghers and Malay are Christians. Sinhalese Buddhists had demonstrated the highest suicide rates through out the period of analysis, followed by Tamil Hindus. The Moors have the lowest suicide rates. The control exerted through specific religious preaching on self-harm and social interactions associated with religious activities have been attributed as the possible reasons for the variations seen in religion specific suicide rates [7-9]. Buddhists and Hindus consider committing suicide as a mortal sin. They consider one's life is predominantly one's own responsibility and individuals are considered, personally responsible for positive and negative outcomes in their lives. Finally the responsibility of self-harm is vested upon the individuals. In contrast, Islamic tradition considers suicide as a violation of the divine command that one has to accept life's events as it is. This makes an act of suicide a revolt against God. It is believed the perpetrator of such an act has to face the Gods wrath. Christianity while condemning suicide as a mortal sin and also shares beliefs related to the Gods role in life as Muslims. This fundamental difference in Islam and Christianity with Bud-

dism and Hinduism in relation to interpretation of life's events and suicide seem to have a significant role in suicidal behavior [3]. It was reported that that high rates of depression and suicide were common in cultures that induce high levels of guilt in their members as they consider themselves personally responsible for their life's experiences. On the other hand a low incidence of suicide was found in cultures with strong magico- religious beliefs and with belief systems that attribute misfortune to supernatural forces such as God that are beyond the individual's control [10]. It may be interesting to further explore the religious influence on suicide in a country with multi religious society like Sri Lanka.

District based suicide rates indicate that the leading suicide rates of the country are reported from the main agricultural districts; Polonnaruwa, Anuradhapura, Vaunia, Kurunegala, Matale and Kegalle. The most frequent explanation given to the preponderance of suicidal behavior in the agricultural regions of the country were the poverty associated life stressors among the residents in these districts and the free availability of extremely lethal pesticide solutions that people use as the most common mode of suicide [11-15]. Recently, long term chronic exposure to low doses of organophosphate pesticides was incriminated as a potential cause of depression and impulsivity and subsequently suicides [16]. The use of precautionary measures in pesticide spraying is reported as minimal in Sri Lanka due to many reasons such as lack of awareness, environmental constraints such as high humid conditions, and peer pressure. Organophosphate compounds are the most commonly used pesticides in Sri Lanka [17]. This context makes the exposure to low dose organophosphate pesticides for longer periods among farmers a common place and provided the above hypotheses is true, this may be an important factor that causes high suicide rates in the agricultural areas of the country. The districts in Western and Central Provinces had shown the lowest suicide rates. These regions represent the most socio economically developed regions of the country. The districts of Ampara and Trincomalee also belong to the region with the lowest suicide rates. Predominant presence of Muslims who had lower suicide rates would have been the reason for the low suicide risk among this region despite high prevalence of agriculture settlements.

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# EVALUATION OF CERVICAL SCREENING COVERAGE IN KALUTARA DISTRICT

D T P Liyanage<sup>1</sup>, R De A Seneviratne<sup>2</sup>

## Abstract

### Objective:

To determine the cervical screening coverage of women 40-60 years in Kalutara District since the inception of the programme in 1996.

### Methodology:

Cervical screening which is conducted in Well Woman Clinics (WWC), involves both visual inspection of the cervix and Pap smear testing. A descriptive cross sectional survey was conducted to assess the cervical screening coverage achieved since the inception of the programme and to assess the quality of services. The area investigated was the Kalutara district and individual MOH (Medical Officer of Health) areas within it. Data of screened females between 33 to 63 years were obtained from the records maintained in the WWClinics

### Results

The results were expressed as a percentage of the total 40-60 females in the District and individual MOH areas. The cervical screening coverage in Kalutara District was 2.2% since the inception of the programme. Although the coverage was low, a rising trend of cervical screening from 1996 was observed particularly after the year 1998. Only three MOH areas out of 7 conducted more than 4 WWClinics per month, which is the recommendation of Ministry of Health. Seventy four percent (1135) of total screenings (1535) were performed in those three clinics. Only one MOH area conducted an out-reach clinic. Five MOH areas conducted the clinics in combination with Maternal and Child Health/Family Planning (MCH/FP) clinics, while the other two MOH areas conducted separate WWClinics. The highest cumulative coverage was observed in Bulathsinhala MOH area (9.3%) where there were more than 4 WWclinics per month and clinics were conducted separately.

### Conclusion

The low cervical screening coverage of 2.2% over a 5 year period in Kalutara District resembled the cervical screening coverage pattern in other developing countries. Cervical screening coverage could be increased by increasing frequency and number of clinics especially in the periphery and conducting WWClinics separately without combining with MCH/FP Clinics.

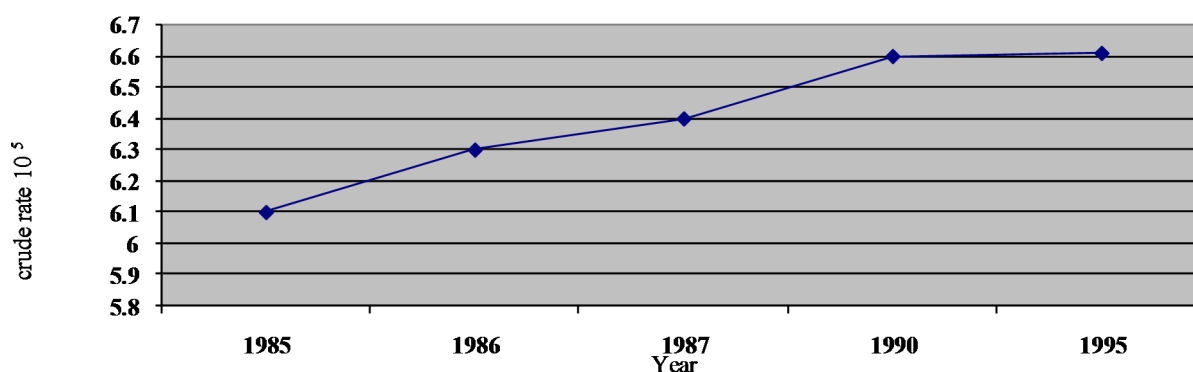
### Key words

Cervical screening, Well Woman Clinics, evaluation, coverage

## Introduction

Cervical cancer is a major health problem among females in Sri Lanka. It accounts for 17.7 % of all cancers among females (1). It is the second commonest malignancy among females and the incidence was 6.6 per 10<sup>5</sup> population in 1995 (2) and shows a rising trend (Figure I).

Figure 1 - Crude rate of cervical cancer incidence



Crude rate (Number of cervical cancer cases per 10<sup>5</sup> mid year population at risk)

Source: Cancer Registry (1990)

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Prevention of cervical cancer depends on early detection of cases through screening and treatment by radical surgery and radiotherapy. The 5-year survival rate is virtually 100% for carcinoma in situ while in cases diagnosed in an advanced invasive stage it is less than 35% (3).

Pre cancerous stages in carcinoma of cervix exist for long duration time. Hence, this disease is appropriate for detection by a screening program at very early stages. Early detection of precancerous stages by well-organized screening programmes has been shown to be effective in reducing morbidity and mortality from the disease. In Nordic countries, Iceland, Finland and Sweden the cumulative cervical cancer mortality rates fell by 84%,50% and 34% respectively between 1965 and 1982(4) following the screening programmes.

The Ministry of Health of Sri Lanka with the assistance of United Nations Population Fund (UNFPA) set up 300 WWClinics in the country to conduct cervical screening. The first WWClinic was established in June 1996 in the Kalutara District.

The objective of the cervical screening programme is to reduce the morbidity and mortality from the disease. Hence, at the completion of five years of the programme it is necessary to evaluate the population coverage, quality of services, appropriate documentation, and correct referral and follow up of high-risk people (3). This paper presents the findings of population screening coverage in the Kalutara district.

### Methodology

The data relevant to coverage and quality of care were obtained by retrieving information from the WW Clinic registers maintained in the respective MOH areas.

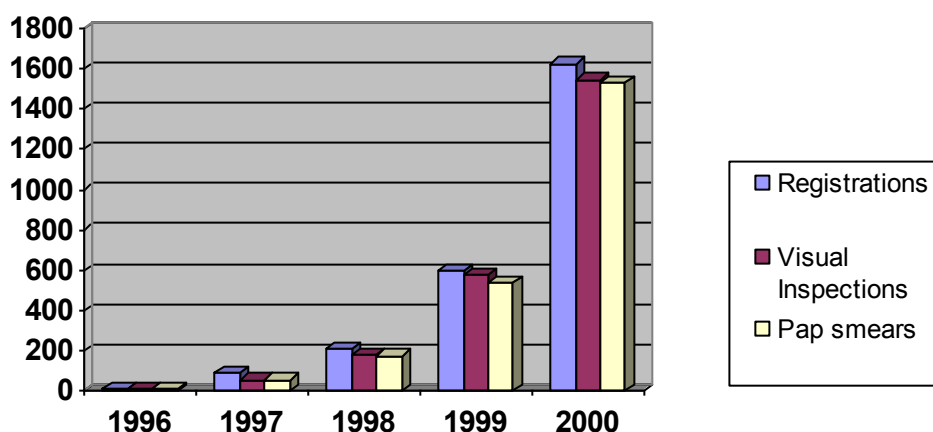
Number of registrations, visual inspections and Pap smears performed each year from 1996 to 2000 were collected and these data were stratified to three different age groups (<39 yrs, 40-59 yrs, >60 yrs). The details of each WWClinic such as the year of commencement, availability of trained staff and facilities were recorded.

### Results

Three of the 7 MOH areas conducted more than 4 WWClinics per month. Only one MOH area had one outreach WWClinic. Two MOH areas conducted WWClinics separately as a single clinic, and the other five MOH areas conducted the clinics in combination with Maternal and Child Health / Family Planning clinics.

The statistics from the Deputy Provincial Director of Health Kalutara showed that there were 69225 females between 40-60 years of age, eligible for cervical screening in the district. Cervical screening is either visual inspection or visual inspection and Pap smear testing. Registrations and cervical screening carried out in W.W.Clinics in MOH areas by year is shown in figure 2.

**Figure 2 - Registrations and cervical screening carried out in the WWClinics in Kalutara District by year**



Although few cervical screening had been carried out initially it was observed to improve gradually with time and markedly after the year 1998. The increasing trend of cervical screening observed in the district, from 1996 to 2000 is statistically significant (Visual Inspections- $c^2$  for trend =3396, df = 4, p=.000 and for Pap Smear  $c^2$  for trend =3408, df = 4, p= .000).

The highest percentage of clients was registered in Bulathsinhala MOH area (27.1%) and the lowest in Walalawita (4%).

Out of the 2373 screened females in the district, Pap smears were performed among 2310 (91%) clients and visual inspections had been carried out on the other 63 (9%). The cervical screening started in 1996 in Agalawatta MOH area and it was restricted to visual inspections without Pap smear testing due to lack of equipment. For the period of study maximum number of Pap smears (29.8%) was taken at Bulathsinghala and minimum at Bandaragama (3.9%).

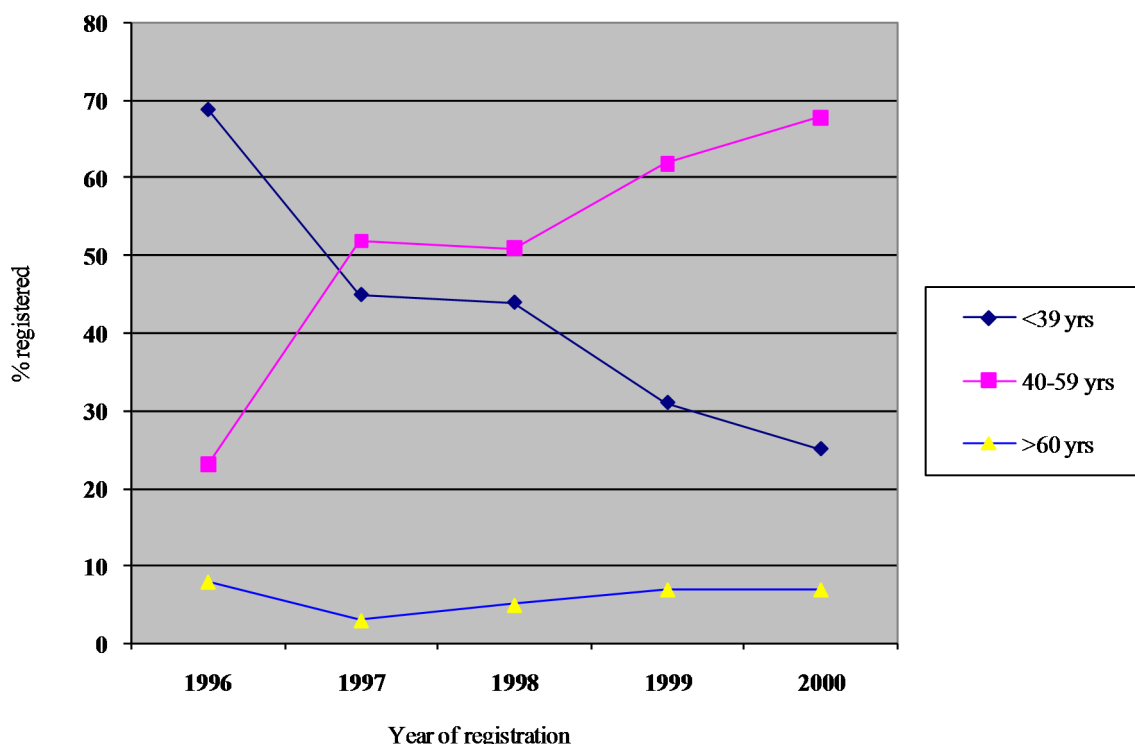
Percentage registrations of clients by age group in the WWClinics from 1996 to 2000 are illustrates in figure 3.

The registration of target age group (40-60 yrs) had increased from 23% in 1996 to 68% in 2000 while registration of females under 39 years had declined to 25% from 69% for the same period as par with departmental guidelines.

#### Evaluation of cervical screening coverage

Cervical screening coverage for the period 1996-2000, in individual MOH areas and in Kalutara district is shown in table I.

**Figure 3 - % of clients registered in W.W.Clinics in Kalutara District by age and year**

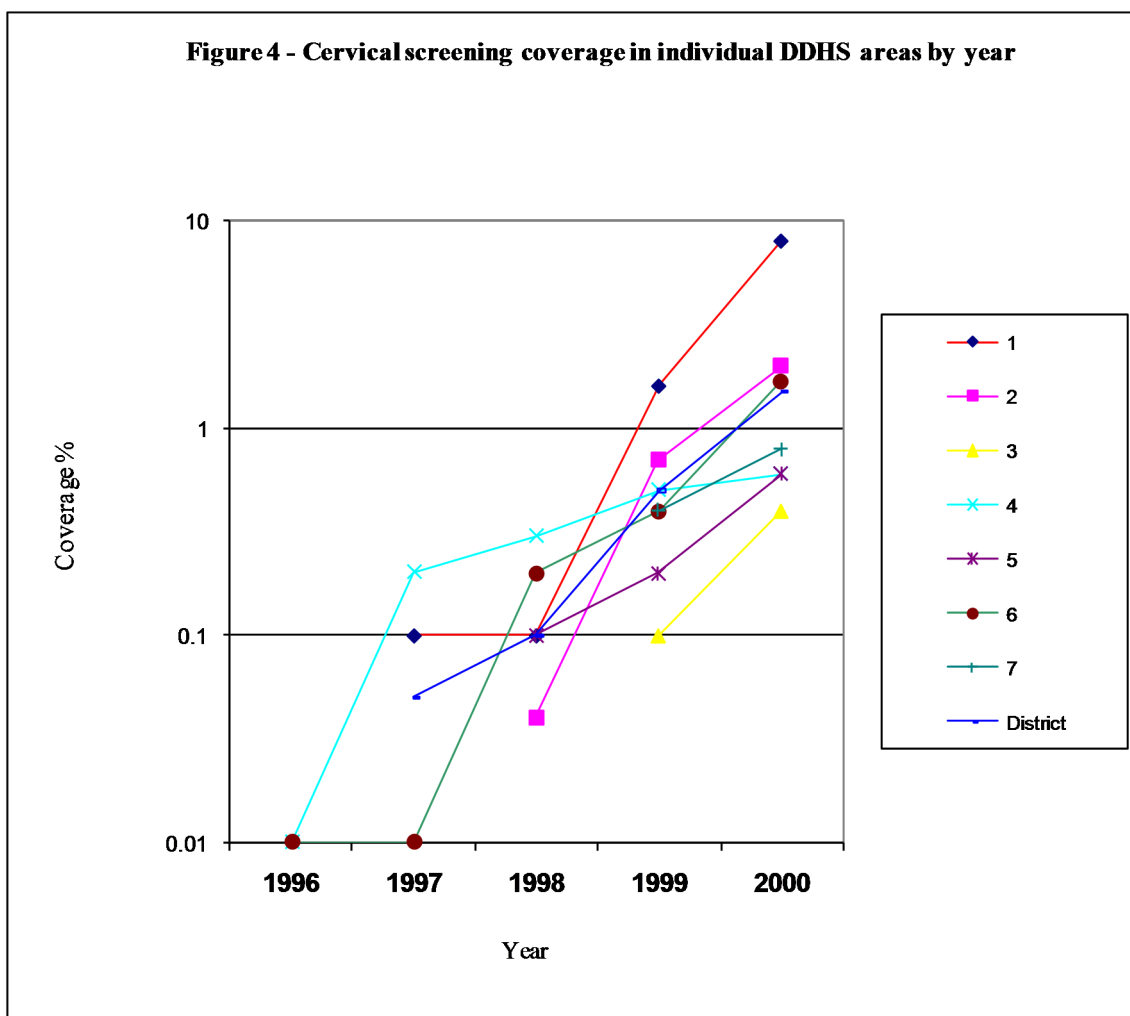


**TABLE 1 CERVICAL SCREENING COVERAGE BY MOH AREAS AND BY YEAR**

MOH area	Year																	
	1996			1997			1998			1999			2000			1996-2000		
	A	B	C%	A	B	C%	A	B	C%	A	B	C%	A	B	C	A	B	C
Bulathsinhala	5044	0	0	5044	6	0.1	5038	5	0.1	5033	85	1.6	4948	375	8	5044	471	9.3
Horana	12881	0	0	12881	0	0	12881	6	0.04	12875	91	0.7	12784	280	2	12881	377	3
Bandaragama	11156	0	0	11156	0	0	11156	0	0	11156	14	0.1	11142	55	0.4	11156	69	0.6
Panadura	18025	2	.01	18023	31	.2	17992	60	0.3	17932	97	0.5	17835	101	0.6	18025	291	2
Matugama	9238	0	0	9238	0	0	9238	9	0.1	9229	20	0.2	9209	52	0.6	9238	81	1
Agalawatta	8197	1	.01	8196	1	.01	8195	20	0.2	8175	31	0.4	8144	138	1.7	8197	191	2.3
Walawatta	4684	0	0	4684	0	0	4684	0	0	4684	18	0.4	4666	37	0.8	4684	55	1.2
Total	69222	3	0.00	69219	38	.05	69181	100	.1	69171	356	0.5	68815	1038	1.5	69222	1535	2.2

A-Number of females eligible for screening B- Number of eligible females screened C- Cervical Screening Coverage

Cervical screening coverage in the Kalutara district is 1.5% in 2000. Cumulative coverage for the five-year period (1996-2000) is 2.2%, the highest cumulative coverage of 9.3% is observed in Bulathsinhala MOH area, where WWClinic conducted as a single clinic.



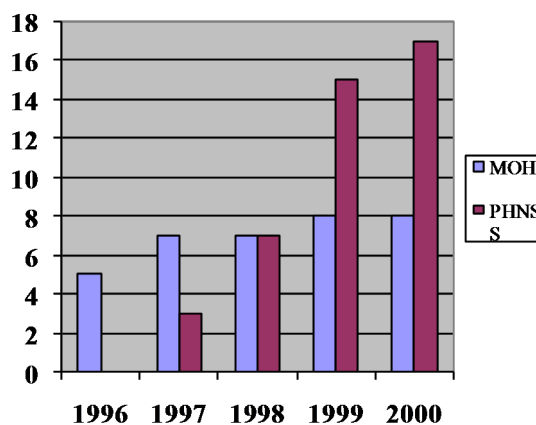
Although the screening coverage is low there is a gradual improvement over the years and this trend is shown in figure 4.

**Availability of trained staff to perform cervical screening**

Distribution of trained staff to perform cervical screening from the year 1996 to 2000 is shown in figure 5.

MOOH were trained on cervical screening from the year 1996 onwards. Subsequently Public Health Nursing sisters too were trained to perform cervical screening and by 1998 all the MOH areas in the district had trained PHNSS (figure5).

**Figure 5 - Distribution of trained MOOH and PHNSS in Kalutara District 1996-2000**



## Discussion

The cervical screening coverage pattern resembles with that of other developing countries where only 5% of the target females had been screened in a five-year period (1). Hence, programme modification is needed to increase the cervical screening coverage.

Although the coverage was low, the present study observed an obvious rising trend of cervical screening from 1996, mostly marked after the year 1998 with the training of PHNSS in Kalutara District. Therefore PHNSS training could be considered as a useful strategy to increase cervical screening coverage.

Out of the total 2373 cervical screenings carried out during 1996 to 2000 in WWClinics, 172 (3%) were identified as abnormal on visual inspection. Therefore visual inspection of cervix is a useful alternative strategy to Pap smear testing. This has been recommended by World Health Organization in resource poor setting (5). Accordingly, one MOH area only visual inspections had been carried out for some time till the equipment was available.

In 1996, 23% of the clients were between 40-60 years of age which was the target age of the screening programme. In 2000, it had risen to 68% indicating that the programme was progressing to achieve the objectives of the National Cervical Screening Programme laid down by the Ministry of Health. Since the development of cervical cancer directly related to the sexual activity, it is recommended to lower the inception of screening to 35 years.

Low cervical screening coverage could be rectified by increasing frequency and number of clinics especially in the periphery. Highest cervical screening coverage was shown in an area where the WWClinic was conducted as a single clinic. Hence, it shows the necessity of conducting W.W.Clinics on separate days without combining with MCH/FP Clinics.

## Acknowledgement

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## ACCESS TO CARE IN A PLURAL HEALTH SYSTEM: CONCERNS FOR POLICY REFORMS

M C Weerasinghe<sup>1</sup>, D N Fernando<sup>2</sup>

### Abstract

#### Objectives:

To examine accessibility to first contact healthcare in rural Sri Lanka in terms of physical proximity to service provider and out of pocket cost on such services in order to provide insights for future policy directions.

#### Methodology:

A community based and an institutional based survey was carried out in a rural district. A total of 1200 households were included in the community survey and 2221 patient encounters in both western and Ayurveda / traditional medical facilities were selected for institution based survey. Data was collected from the chief female occupant of the household and patients in the health institutions using an interviewer administered questionnaire.

#### Results:

On average all possible healthcare facilities were located within 6km of a household while most frequently visited facility indicated bypassing of a closer facility. Cost of seeking treatment from private facilities was over 7 times higher than the state facilities, less than 5% utilized of non western healthcare facilities.

#### Conclusion:

Physical proximity of facilities to the households and free of charge services of state health services may not guarantee their utilization. There is also a possibility of disappearance of plural nature of the health system in Sri Lanka giving away to a single dominant system.

#### Key words:

Sri Lanka, Accessibility, Plural medicine, Health system, Health seeking

### Introduction

This paper examines access to first contact healthcare in rural Sri Lanka in terms of physical proximity to service provider and out of pocket costs incurred on such services in order to provide insights for future policy directions. Determining the access to healthcare services in a plural health system raises many questions. 1. Does availability of facilities close to the household grantee that the community uses them? 2. Does the availability of free of charge services in close proximity shift communities away from private healthcare providers? 3. Is affordability a concern when using state healthcare services claimed to be free of charge? 4. Does the availability of different modalities of treatment improve the access to care? Health seeking behavior of a rural district in Sri Lanka was examined to explore these concerns.

Sri Lanka is known to be a country with a plural health system where western style medical practice coexists with Ayurveda, Unani, Sidha, indigenous forms of treatment along with many ritualistic healing practices (1-3). Sri Lanka is spending US\$42 per capita on health where total expenditure on health is 4.1% of the GDP (4). The state provides about 49% of this amount, and the rest is accounted for by non governmental funds. Over 90% of the non government funds comes from out of pocket expenditures of households. The trends in financing the health sector further indicate that the share

of out of pocket expenditure is rising annually, surpassing 50% of the total health expenditure of the country (4). Although Sri Lanka is better off than some least developed countries that spend US\$ 11 per capita on health, its health expenditure is lower than the middle income countries that spend US\$ 93 on the same (5). As Nichter (6) pointed out, multiple therapy systems and diversity of health behavior patterns being norm for many countries, resource allocation becomes further complicated in a plural setup. Hence, understanding the plural nature of Sri Lankan healthcare arena is fundamental for effective planning.

The Western medicine system was introduced to Sri Lanka under colonial rule after 1500A.D. and has since become the main mode of healthcare in the country (2). It comprises both state and private sector establishments. Ministry of Health is operating the state sector healthcare services through a chain of hospitals and many agencies working on preventive and promotive care. First contact care services are provided through out patient departments (OPD) in the hospitals and dispensaries and those services are claimed to be free of charge at the point of delivery (7). Private sector western healthcare services comprise few hospitals mainly located in urban centers and many private dispensaries operated by western trained practitioners around the

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country. Government doctors have the privilege of doing private consultations in after working hours and the private sector mainly operates through those part time private practitioners.

There is a separate ministry to develop the indigenous medical systems in the country. According to the Ayurveda Act of 1961, Ayurveda includes all the medical systems indigenous to Asian countries and recognized as such by respective governments (8). There is a chain of state hospitals and dispensaries around the country that provides Ayurveda /traditional medical care. There are many private Ayurveda/ traditional practitioners functioning around the country on their own. Some of them are registered with the department of Ayurveda with formal qualifications while others continue their ancestral traditions of healing that had existed for generations (9). Although there is no formal system to register or recognize ritualistic healers, they exist in most of the villages around the country and practice as healers in conjunction with their primary task of acting as spiritual middle man between variety of deities and human beings (10-12).

The information on how physical proximity to facilities and expenses incurred influence the selection of health-care facilities is vital for decisions on effective resource allocation in development and expanding of health services to peripheral areas of the country. This need is further emphasized by the strategic framework proposed to improve health sector in the country for the next decade (13). Hence, this study focused on accessibility in terms of physical proximity to service provider and out of pocket expenditure on healthcare in a rural district in Sri Lanka.

### **Methods**

The study employed both a community based household survey and an institutional based survey in the rural sector of the Kegalle District in Sri Lanka. This approach enabled answers to two dimensions of the research question: the community survey focused the physical proximity of healthcare facilities to households while institutional survey inquired the expenses incurred in utilizing such facilities.

For the community based survey, the sample was selected to represent the households in the rural sector of the district of Kegalle. The 'household' was identified as the study unit and was defined as members of a family residing in that housing unit for more than six months duration. Usage of western medical facilities by households was the key variable in calculating the sample size. As this proportion varies for different illnesses and as a satisfactory estimate was not available in the literature, 0.5 was used as the proportion of households using western medical facilities in an illness episode to maximize the sample size (14). In addition, to minimize a design effect in multistage sampling 2 was used as the correction factor in calculating final sample size (15). The sample size was 1200 households which were

selected using a multistage probability sampling method. The staging was done according to the hierarchy of administrative structure of the district. A district comprises of several Divisional Secretary (DS) areas while a DS is divided into several dozens of Grama Niladari (GN) divisions which are the smallest administrative units. There are several census blocks in a GN division. In stage one, five out of 11 DS areas of the district were selected according to Probability Proportionate to Size (PPS). In the second stage 50 out of 324 GN divisions in five DS divisions were selected using PPS. In the next stage, two census blocks of each GN division was selected by simple random sampling. Household lists of the census block prepared for the 2001 census were used as the sampling frame to select the households within each census block. Twelve households from each census block were chosen according to systematic sampling. Thus, twenty four households were selected from each GN division. The Chief female occupant of the household, defined as an adult female in the household who is considered by the other members of the household to be the key female member involved in decision-making was identified as the respondent for the study.

For the institutional based survey, the study population was identified as patients attending first contact medical care facilities in the state and private sector institutions providing Western and Ayurveda/ traditional medical care in the Kegalle district. Patients who were residents of the rural sector of Kegalle district for a minimum of six months and attending out patient department of that particular institution for the first time during the current illness episode were included in the sample. When the study unit was a child below the age of 15 years or the patient was physically not fit, or not mentally sound to decide on the treatment action the information was obtained from the guardian. Two stage stratified random sampling method was used to select the state sector institutions in both western and Ayurveda. In the first stage institutions were stratified according to the Ministry of Health classification (7). Institutions were selected randomly from, each stratum. In the second stage 10% of patents attending the Western OPD facilities and 30% attending Ayurveda facilities for the first time for an illness episode during a week were identified from each institution. Patients were selected using systematic sampling. The number of patients to be included in the sample from each institution was decided using the average out patient department attendance per week in the previous year. A higher percentage of patients attending Ayurveda were selected in order to compensate for the low numbers attending those facilities for treatment.

There was no formal system of registration for private medical practitioners. Hence, lists of private

practitioners of both Western and Ayurveda/traditional were prepared with the help of the field-level health staff of the district to be used as sampling frames. Private sector facilities were restricted to 10 Western practitioners and eight Ayurveda / traditional practitioners due to financial and logistic constrains. They were randomly selected from the list prepared by field staff. As satisfactory records on patient attendance were not maintained in private facilities, every third patient attending to a clinic session and confirming to the eligibility criteria was enrolled into the study.

Eight state-western healthcare institutions, four state-Ayurveda healthcare facilities, ten western private practitioners and eight private-Ayurveda/ traditional practitioners were included in the sample of institutions selected for the study. In all institutions/ practitioners, three clinic sessions were surveyed. Altogether, two thousand two hundred and twenty one patients attending 90 clinic sessions in 30 institutions/practitioners were included.

Interviewer administered questionnaires were used as data collecting instruments. In the household survey the respondent was asked the distances and the time taken to reach the closet healthcare provider. The questionnaire inquired information regarding utilization of five categories of healthcare providers namely, state and private western type care providers, state and private Ayurveda / traditional care providers and ritualistic healer. The most frequently visited healthcare facility by the family members during the preceding six months was also inquired.

In the institutional survey, out of pocket cost for the visit for healthcare provider was inquired from each patient. The information was collected on transport costs, provider's fees, additional costs on investigations, additional costs on drugs /supplies and incidental costs for the visit. Transport costs included two way costs to and from the healthcare facility and when applicable to the accompanying person/s. The median for each component of the costs were calculated considering the number of patients who had to bear that specific cost on the visit to the healthcare provider. The total cost for the visit was calculated by accumulating the component costs of each patient and presented as per capita out of pocket cost for a selected type of healthcare facility.

## Results

### Household survey

The results of the household survey are given in the Table 1. On average ritualistic healer was the closest to the household while state Ayurveda facility was most distantly placed. As expected from the distance, ritualistic healer could be reached in least time while state Ayurveda facility took the longest time to reach. Furthermore, on average all possible types of healthcare services were located within six kilometers of households and that a free of charge state facility was within five kilometers. All types of facilities could be reached on

average within 0.69hours (42 minutes) of travel from the household.

When the respondents were asked about the most frequently visited healthcare facility by the family members during the preceding six months, 65.5% indicated that it was state western facility while 29.5%, 1.3%, 1.2% and 0.2% attended private sector western healthcare provider, private Ayurveda / traditional provider, state Ayurveda facility, and ritualistic healer respectively. Rest of the householders had not attended any of the facilities during the six months period. Table 2 shows the distance traveled to the most frequently visited healthcare facility during the preceding six months. Most frequently visited facility by the households indicated that they had chosen a more distantly located one than the nearest available facility. This was common to all types of healthcare facilities. Although the numbers were small, for private Ayurveda / traditional it was twice the distance for the nearest while it was as much as three times for ritualistic healer. In private western facility they had traveled 1.7 times the nearest facility and state western facility it was close to 1.3 times.

### Institutional survey

The findings on cost incurred by patients for the visit are presented in Table 3. Seeking treatment in private facilities in western and Ayurveda systems were 8 times and 7 times higher when considering median costs than using the state sponsored free healthcare services. The cost incurred for provider fees stands out as the highest expenditure for a visit in the private sector in both western and Ayurveda/traditional systems. In addition, median costs of all other components were also high in private healthcare services compared to state facilities. No investigations were ordered in the Ayurveda /traditional facilities.

## Discussion

Health facilities of all types were available in close proximity to households. In addition, the householders were aware of these facilities. The findings in this study pertaining to geographical access were consistent with two previous studies done in Sri Lanka, namely Manpower in health sector 1975 (16) and Health strategy and financing survey 1992 (17). Considering the limited resources at disposal for the state in managing the health of the people in a less developed country, the availability of healthcare facilities in such proximity to household would be viewed as outstanding. Substantial improvements in the health indicators of Sri Lanka during the last four decades (7) would provide evidence for improved geographical access to health care.

Although the physical proximity to health facilities was viewed as satisfactory, the utilization pattern raised several concerns. The findings suggest that

**Table 1. Distance and time taken to reach the closest health care provider of each category from the households (n=1200 households).**

Category of provider	Distance to the closest health care provider (km)			Time taken to reach the closest health care provider (hours)	
	Households responded <sup>a</sup>	Min/Max	Mean (SD)	Min/Max	Mean (SD)
Private -Ayurveda / Traditional	1164	0.01-30	3.18 (3.45)	0.01-6.0	0.50 (0.4)
State-Ayurveda	1191	0.01-30	5.71 (4.74)	0.01-6.25	0.69 (0.44)
Private -Western	1199	0.01-35	3.10 (2.88)	0.02-5.0	0.49 (0.37)
State -Western	1200	0.1-35	4.86 (3.52)	0.05-7.0	0.64 (0.48)
Ritualistic healer	1054	0.01-14.4	1.24 (1.52)	0.01-5.0	0.34 (0.3)

<sup>a</sup> Only the households able to provide the information is included

**Table 2 Distance to the most frequently visited healthcare facility during the six months preceding the study by members of household (n=1200 households)**

Category of provider	Distance traveled to reach health care provider (km)		
	No of households	Min/Max	Mean (SD)
Private -Ayurveda /Traditional	15	0.1-60	8.77 (15.44)
State-Ayurveda	14	1.0-50	9.10 (12.33)
Private -Western	355	0.01-100	5.22 (10.07)
State -Western	787	0.01-125	6.20 (8.95)
Ritualistic healer	2	4.0-5.0	4.5 (0.70)

**Table 3 Cost incurred by a patient for the visit by type of the facility<sup>a</sup> (n=2221 patients)**

Type of facility	No of patients	Transport Median (min/max)	Investigations <sup>b</sup> Median (min/max)	Provider fees Median (min/max)	Additional drugs/supplies <sup>c</sup> Median (min/max)	Incidental <sup>d</sup> Median (min/max)	Total cost Median (min/max)
Private - Ayurveda / Traditional (PA)	153	36 (0-800)	–	130 (20-430)	72.50 (10-1200)	40 (12-100)	224 (0-1500)
State-Ayurveda (SA)	346	24 (0-890)	–	–	20 (10-200)	30 (5-50)	30 (0-1090)
Private – Western (PW)	676	20 (0-500)	100 (50-700)	100 (20-650)	80 (3-800)	30 (15-103)	180 (0-1000)
State-Western (SW)	1046	16 (0-214)	90 (24-400)	–	30 (2-180)	25 (3-100)	22 (0-410)

<sup>a</sup> Cost are given in Sri Lankan Rupees

<sup>b</sup> Number of patients incurred additional investigations costs (PW-55, SW -11)

<sup>c</sup> Number of patients incurred additional drugs/supplies costs (PA-48, SA-31, PW-242, SW-202)

<sup>d</sup> Number of patients incurred incidental costs (PA-31, SA-96, PW-43, SW-259)

the phenomenon of bypassing the closest health facility occur in out patient services. This phenomenon was common to all types of healthcare facilities. Hence, it was evident that providing healthcare facilities closer to households alone would not improve access to such facilities unless the issue of bypassing is adequately addressed. Resources spent on maintaining a widely distributed provider network is unlikely to be justified in the long run if some facilities are over utilized while many others are underutilized. The possibility of rationing of services in healthcare due to increased demand in Sri Lanka is already documented (18). The phenomenon of bypassing a closer facility to attend a more distance one could further increase the demand on certain facilities, thus leading to rationing of services. Apart from rationing of services deterioration in quality of services could follow.

The cost incurred in private health services was many times higher than the state health services. Although the distance to the state Western facility is 56% higher at mean values compared to the private Western facilities, actual difference is only 1.76 Km. Thus, it would be reasonable to assume that cost of care would likely to shift communities away from the private sector. To the contrary, one third of the population visited private institutions more frequently than the free of charge state facilities. As Russell pointed out, building a relationship with a particular doctor over a period of time is important for patients for continuity of care (19). In the current arrangement of state facilities in Sri Lanka, it is not possible to build up a trust relationship with a particular provider. No mechanism exists to designate a practitioner to follow up a group of patients for continued care in a primary care setting. However, the private practitioners enjoy that opportunity to function as the "family doctor" of a household. On the other hand quality of services at the OPD in the state institutions particularly relating to client satisfaction was low (20). Hence, the perception of improved quality of private sector healthcare services increases the likelihood of those facilities being chosen despite the deterrent affect of high cost (17). Furthermore, out patient departments in state hospitals operates from 8.00 am to 4.00pm while the facilities are closed on Saturday evenings and Sundays. As most Western private facilities operate as part time practices of government doctors, they functions after hours when state facilities are closed. Difference in the functioning hours of two types of facilities is also likely to play a role on the differential access to state and private healthcare facilities.

As mentioned above state health services were claimed to be free of charge at the point of delivery. Patients did not have to pay for the physician service, supplies or for investigations done at the state facilities in both Western and Ayurveda / traditional systems. However, as shown in the Table 3 it was evident that consumers who opted for the free health services offered by the government had to bear substantial costs in seeking treatment from the state facility. Many patients had to bear the

cost of investigations and additional drugs / supplies prescribed by the state facilities that had to be purchased in the private sector. This suggests that although the physician services were free of charge, patients had to bear a part of the direct medical cost themselves. On the other hand transport cost and incidental cost, mostly on food, was indirectly related to the distance traveled to reach the facility and the time spent on the visit. Hence, the factors that propagate the bypass phenomenon of closer facilities in search for more distant ones which were related to the health system itself could be held at least partly accountable for this additional expenditure on treatment seeking. Therefore, the background costs in seeking treatment in a state facility deflate the true meaning of the "free of charge" services. Poverty statistics indicated that 27.5% of households in Kegalle district lived below the official poverty line of Sri Lanka (21). Considering the economic back ground of the population it is likely that healthcare cost may act as a deterrent for using services even in state facilities.

Waxler (22) observed that western biomedicine was well established in Sri Lanka while Ayurveda flourishes as large proportion of population used and believed it to be effective. However, this study pointed that even in the rural sector less than 5% of households frequently utilized Ayurveda / traditional treatment. Consumer finance and socio-economic survey of Sri Lanka had also predicted a decline in the usage of non western healthcare facilities (23). This suggests a paradigm shift from a plural healthcare system towards a singular dominant system in Sri Lanka. High costs for Ayurveda drugs / supplies and substantial transport costs coupled with incidental costs due to gross underutilization of village level providers amounts to higher total cost for a visit compared to Western healthcare facilities. The shift of communities from Ayurveda /traditional healthcare, points to increasing demand for Western healthcare that leads to further rationing of services. Apart from the direct impact on healthcare, underutilization of Ayurveda / tradition care also suggests movement away from the existing cultural ideologies. Kleinman (24) proposed that health systems are articulated as cultural systems. Hence, disappearance of certain health systems may also challenge underline cultural norms that leads to further polarization of the health seeking behavior patterns and having negative consequences towards access to healthcare.

The evidence suggests that the policy makers and implementers in Sri Lanka need to examine the current provisions of healthcare services in terms of accessibility and affordability. As shown earlier, availability of wide network of facilities and notion of free services at the point of delivery in the state sector does not necessarily mean that the issues of accessibility and affordability are adequately

addressed. There is enough room for improvement. Measures are needed to optimize the utilization of existing services while reducing the financial burden on the consumer and the health system.

In order to reduce the out of cost expenditure in seeking treatment, alternative options for healthcare financing need to be pursued. Only a small proportion of non governmental funding is coming from employers, commercial insurance and non profit organizations at present (4). It is unrealistic to expect a substantial involvement of those sectors in sharing healthcare spending in the near future. Hence, increased allocation and efficient distribution of government resources in the health sector would be vital to maintain the improvements achieved in the health status of the population during the last four decades in the country. Developing essential service packages, optimal utilization of existing healthcare facilities, creating a local level family practitioner network for primary care, adherence to treatment guidelines to minimize wastage on drugs / supplies and investigations, redefining the opening hours of state facilities and regulatory process to streamline the private sector healthcare institutions would have a positive impact on the financial burden particularly on rising out of pocket expenditure on healthcare.

Absence of a referral system in both state and private sector has influenced phenomenon of bypassing. This has caused mal utilization of facilities leading to rationing of services and unnecessary financial burden on the consumer. Introduction of a strict referral system would curtail the trend of bypassing the nearest facility particularly for minor illnesses that can be managed at local clinics. Cross referral mechanism between state / private and between Western / Ayurveda - traditional would facilitate better utilization of facilities and providing the clients more options and better access to healthcare.

It is estimated that 16000 Ayurveda / traditional practitioners are in the country and only a fraction of them practicing regularly (25). Utilizing this readily available human resource in catering to primary care at village level would ease the burden on the state run health facilities and improving the access to healthcare (26). Proper training opportunities and systematic registration system of practitioners would likely to enhance their recognition in the community, thus improving utilization.

### **Conclusion**

This paper explored access to healthcare in terms of physical proximity to the provider and the affordability of such services. The paper suggests that physical proximity of facilities and free of charge status of state health care services *per se* does not guarantee their utilization. It also indicated the possibility of transition from medical pluralism to a single dominant system of healthcare in the country and how would it affect access to healthcare. Finally, the paper focused attention on

possibilities to be considered in future policy discussions on healthcare reforms in Sri Lanka.

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## COLLABORATION BETWEEN PREVENTIVE AND CURATIVE HEALTH SECTORS FOR MATERNAL AND CHILD CARE

R Hettiarachchi

### **Introduction**

Collaboration is the process whereby health care professionals jointly manage care. The goal of collaboration is to share authority while providing quality care within each individual's professional scope of practice<sup>1</sup>. In discussing collaboration of maternal and child care, there are several general considerations, which should be mentioned briefly before turning to any of the details. The first general consideration is the value of establishing personal contact between individuals concerned in attaining 'collaboration'. Taking the time and trouble to sit down and hear the other person's problems and point of view is important in providing quality maternal and child care to the same community.

Vertical integration of services for mothers and newborns is the rational linking together of services at community level, health centre level and at the first referral hospital. Effective prenatal care and safe normal deliveries cannot be achieved without the development of services in the community and health centre. If mothers and newborns are going to benefit from both, there needs to be a referral system linking the two levels, good communication between them and clearly understood protocols indicating when the services of one or the other is required<sup>2</sup>.

It has become clear that teamwork among midwives, obstetricians, and paediatricians can improve the well being of mother and their newborns. When the pregnant woman and her husband appreciate and understand that collective care is available, they can face the months of pregnancy and the outcome of labour with confidence and without fear. The midwife needs to cooperate completely in antenatal care and can assist in allaying the expressed and unexpressed fears of the woman, her husband, and the rest of the family. The midwife, in cooperation with an obstetrician, is the ideal person to prepare the woman intellectually and emotionally for childbirth<sup>2</sup>. Teamwork is productive and saves both time and money. Midwives and doctors need to cooperate in educating the public that better care in pregnancy, delivery and puerperium diminishes the death rate of mothers and infants<sup>1</sup>.

In Sri Lanka, public health midwives, who are the backbone of the national health care delivery system, have contributed to the reduction of the maternal mortality rate to one of the lowest in all of the developing countries<sup>3</sup>. In addition, there is a standard system for referral and back referral of pregnant mother during antenatal,

natal and postnatal care from community health care to hospitals. However, there is no formal method for Public Health Midwives (PHMM) to discuss the matters arising during antenatal and postnatal care with obstetricians and paediatricians and give feedback. In my opinion it is very important to have regular and formal method to share the antenatal, natal and postnatal experience for further improvement of quality of maternal health care.

A study conducted in Nigeria on causes of maternal mortality in a semi-urban Nigerian setting by using focus group discussions with pregnant mothers, community leaders and health care workers identified that a lack of coordination between different levels of care as one of the factors for delaying or preventing effective care and treatment for women with pregnancy-related complications<sup>4</sup>.

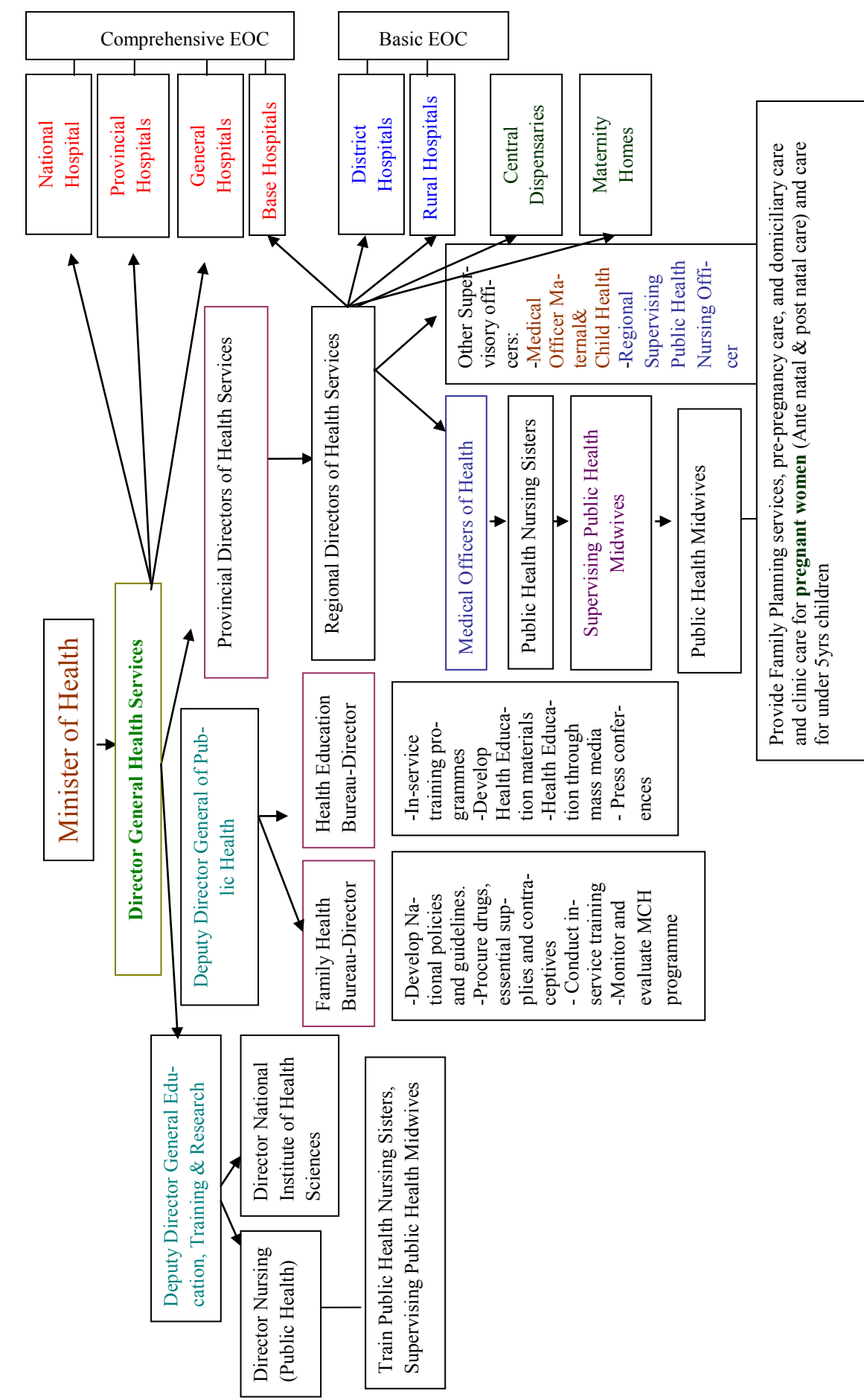
A significant proportion of the perinatal mortality in developing countries may be associated with basic errors or omission in health service delivery. These deaths become readily apparent when perinatal mortality is audited and deaths are classified according to avoidability<sup>3,5</sup>.

Policy implementation in any health care system relies upon provider commitment. Policies that do not address the organizational, professional and social contexts are unlikely to achieve successful implementation. When barriers to policy implementation exist in any of these contexts, the policy may fail to meet its objectives. Policy makers need to carefully consider not only the intent and objectives of a policy, and the evidence for and against alternative approaches, but also the contextual barriers faced by policy implementers<sup>6</sup>.

### **Overview of the Family Health programme in Sri Lanka**

Presently, in Sri Lanka Family Health services are delivered to the whole population through the well planned system integrating every aspects of both curative and preventive health services (see figure 01).

**Figure 01-Organizational Structure of the Ministry of Health Sri Lanka to Provide Maternal and Child Care Services**



The National Family Health Programme is aimed at improving the health and wellbeing of mothers and children and thereby improves the quality of life of the family.

Family Health covers a wide spectrum of services comprising:

1. Maternal care – pre-pregnancy, antenatal, natal and post-natal care
2. Family Planning services
3. Infant and child care
4. Special services to improve nutritional status of pregnant mothers and children
5. Care of the school children and the adolescents
6. Women's reproductive health care

The Department of health services provide Preventive Health Services (Public Health) and Curative Care Services through an island wide network of health institutions. There are teaching Hospitals (TH), General Hospitals (GH), Provincial Hospitals (PH), Special Hospitals, Base Hospitals (BH), District Hospitals (DH), Peripheral Units (PU), Rural Hospitals (RU), Maternity Homes (MH) to provide obstetric care for pregnant mothers and paediatric services for children. The state health services provide free medicine and care to all the patients who are attending the different facilities to obtain services.

The preventive health services provide comprehensive preventive care through well-developed infrastructure of Community Health Centres, Medical Officer of Health (MOH) Offices, and regional officers of seven control programmes of seven selected communicable diseases. Maternal and Child Health Services provide through domiciliary care and clinic care by PHMM under the guidance and support of Medical Officers of Health (MOH) and other field staff.

#### **Administrative Structure in delivering health care**

The present administrative structure can be classified into four levels namely, the national, provincial, district and divisional levels. Director General of Health Services (DGHS) is the chief administrator of health services at national level and there are eight Provincial Directors of Health Services (PDHS) to administer provinces. Districts and Divisions are under the purview of Regional Directors of Health Services (RDHS) and Medical Officers of Health (MOH) respectively.

All the Teaching and General Hospitals are directly under the purview of Director General of Health Services and Provincial Hospitals are under the Provincial Directors. Base Hospitals, District hospitals and other small hospitals are under the Regional Directors of Health Services. The provincial councils are responsible for providing preventive and curative health care services to the population in the respective provinces through PDHS, RDHS and MOH.

The RDHSS and MOOH are responsible for the provision of comprehensive health care including maternal

and child care services to the community at the district and divisional levels. While RSHSS have administrative power over the preventive and curative services, MOOH have administrative power only over the preventive services.

#### **An integrated approach to health care**

As a medical doctor I have worked in both curative and preventive health sectors in Sri Lanka. I observed that when providing maternal and child health care, the coordination between health care providers in the preventive sector and hospitals is unsatisfactory. Furthermore, there is poor collaboration between the administrators of hospitals and administrators of public health care units.

Public Health Midwives are the grass root care providers who deliver maternal and child health service to the community. They work under the administration of Medical Officers of Health who are responsible for preventive health care at divisional levels. Hospital doctors, nurses and midwives work under the administration of the head of a hospital. As a rule heads of institutions of both preventive and curative sectors are invited for the review meetings in their respective institutions. However, participation at these meetings depends on the personal interest of the administrators since their attendance is not mandatory, thus affecting the quality of maternal and childcare. Therefore, I would like to investigate this problem with scientific evidence in order to make suggestions to improve the quality of maternal and childcare.

Too often, public health staff and hospitals work in the same community are almost unknown to one another. Often, hospital staff has little knowledge about the community health problems, which the public health institution is struggling. In turn, the public health institution is equally unaware of the problems facing the hospitals. The first step in reducing this gap is for a health department representative with a background to fully appreciate the situation to approach the chief of the obstetrics department with a definite proposal for joint participation in a community-based maternity programme. An ideal person to perform this function would be one of the previously mentioned individuals belonging to both the hospital and public health staff. This reduces the amount of time and resources required and the rewards are great.

There are additional ways to bring the public health staff and hospital staff together. Opportunity to attend hospital staff conferences, ward rounds, etc., can be arranged for the public health staff. When this is done, care should be taken to see that public health staff is met their arrival at the hospital and introduced to the members of the hospital staff, instead of being left to wander around.

Another action plan, with advantages will be to arrange senior or house staff obstetricians from hospitals to visit rural settings. The specialist takes with him his knowledge and experience, and at the same time will gain valuable insight into the many deficiencies existing in small communities. This will eliminate the false concept of the practice of medicine in general and obstetrics in particular if one's entire experience is limited to the four walls of a hospital.

In summary, I have tried to indicate that there are certain practical steps which can be taken by health departments today to produce a real and working collaboration in maternal and child care.

### **Conclusion**

1. Different administrative bodies manage prevention and curative health sectors
2. There is no proper coordination between primary health workers in preventive sector and hospital health workers
3. Lack of proper coordination between preventive and curative sectors negatively effect for the quality of health service provided for the community
4. Proper coordination between hospitals and divisional level public institutions can be achieved by introducing simple strategies
5. Effective referral system is needed to improve quality of maternal and child care.

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**LANKAPHEIN**  
N. Gunawardena

In accordance with a decision made by the South East Asian Public Health Institutions Network (SEAPHEIN) was established in 2004, the Sri Lanka Chapter of the Network, LANKAPHEIN was inaugurated on the 22<sup>nd</sup> September 2008, during the Annual Academic Sessions of the College of Community Physicians of Sri Lanka. The first meeting of LANKAPHEIN was held on 03<sup>rd</sup> November 2008.

The meeting was chaired by Prof. A.R. Wickramasinghe President, The College of Community Physicians of Sri Lanka and Prof. Dulitha Fernando focal point for Sri Lanka to the SEAPHEIN (South East Asia Public Health Education Institutes Network). Prof. Hasbulla Thabrany, current Chairperson of SEAPHEIN and Dr. Agostinno Borra, Country Representative to Sri Lanka, World Health organization participated as the guests of honour. Invitees from medical faculties that conduct training programmes on public health, units of Ministry of health that provide training in public health and individuals who have made a significant contribution to public health education and training in the country were present at the meeting.

Prof. A.R. Wickramasinghe welcomed the gathering. Prof. Thabrany explained the aims, goals and activities of the SEAPHEIN. Dr. Agostinno Borra congratulated Sri Lanka for taking up the initiative to establish a public health education institutes' network and pledged the support of World Health Organization in the coming years. Prof. Dulitha Fernando, explained the history of SEAPHEIN and its activities and the objectives of the local networks to be established in the member countries.

Prof. A.R. Wickramasinghe read out the Charter of LANKAPHEIN which was formally adopted. According to the charter the secretariat of LANKAPHEIN will function under the auspices of the College of Physicians in Sri Lanka for the initial three years and will be located at the Public Health Lounge.

**Vision**

To be a collaborative network of Public Health Education Institutes in Sri Lanka for strengthening Public Health capacity.

**Mission**

To promote collaboration for partnership of Sri Lankan member institutes to improve and sustain the quality and relevance of Public Health education to address the increasing challenges for the improvement of health in Sri Lanka.

**Objectives**

The Network seek to share its resources on order to achieve the following objectives:

1. To make public health education programmes relevant to meet the health challenges in the country.
2. To establish collaborative programmes in education and training.
3. To provide evidence-based and new knowledge through research within the country and to promote the use of research finding in decision making.
4. To strengthen the capacity and resources of member institutes through faculty and student exchange of information, learning materials and methods.
5. To facilitate the implementation of accreditation process and quality assurance in public health education in the country.
6. To assist with consultation, advocacy and provision of technical advice to improve national public health education in the country.
7. To promote leadership development for practice and policy making in public health.
8. To establish link with SEAPHEIN and other multilateral and bilateral organizations and institutions.

**Strategies**

The general strategies of the network will be to facilitate the following:

1. Development of curricula and continuing education programmes, re-orient learning methods and conduct research to refine curricula in public health in Sri Lanka.
2. Creation of information systems in line with education needs in Sri Lanka.
3. Establishment of partnerships and strengthening existing programmes.
4. Prioritization and promotion of conduct of research in public health in Sri Lanka, compiling a bibliography of public health research and building comprehensive capacity among stakeholders in all stage of research.
5. Institutionalization of programmes for capacity building, inventorisation of available resources (human and other) and learning material resources and identifying needs for staff and student exchange within institutions in Sri Lanka.
6. Development of institutional accreditation mechanisms by establishing a Sri Lankan quality assurance and accreditation council for public health.

6. Organization of consultative meetings on priority areas of public health programmes and health care in Sri Lanka
7. Promotion of leadership and management skills at national, provincial and district levels.
8. Promotion of the concept of learning organizations.

### **Membership**

A public health educational institute is defined as an institute or a Faculty of a University having a Department of Community Medicine/Public Health or equivalent that provides education or training in public health as a main function or engages in such activities as a substantial part of its routine work. Units in the Ministry of Health providing education or training in public health may be considered as independent institutes.

### **Types of Members**

#### **Ordinary members**

The following may become ordinary members on application and approval of the Steering Committee of LANKAPHEIN

A Faculty in an University that conducts programmes on Public Health

An unit of the Health Ministry that provides in Public Health or is engaged in teaching or training in Public Health

Other institutes that engage in teaching or training in Public Health as a substantial function.

#### **Affiliate members:**

An institute that engages in teaching or training in Public Health as a minor function may be invited to be an affiliate member.

#### **Honorary members:**

Honorary Membership may be granted to an official holding an important position related to education and training in Public Health or to an individual who has made a significant contribution to Public Health in Sri Lanka.

#### **Activities for 2008/2009**

1. To revise the curriculum for MSc Community Medicine/ MD Community Medicine
2. To provide a platform for exchange of information on training programmes in public health by the partner institutions
3. To conduct tutor training programmes for tutor staff of NIHS
4. To develop a database of training programmes in the field of Public health
5. To develop collaborative research programmes
6. Develop criteria for accreditation of Public health Institutions
7. To develop a website for LANKAPHEIN

## **Information for authors**

### **Journal of the College of Community Physicians of Sri Lanka**

The Journal of the College of Community Physicians of Sri Lanka is the official publication of the College of Community Physicians of Sri Lanka, established in 1995. The journal will publish articles relevant to the discipline of Community Medicine. Two independent referees will review all articles. Materials submitted for publication in the journal should not be submitted for publication elsewhere without the editor's permission.

#### **1. Content**

The journal will publish the following categories of articles:

1. Presidential address of the College
2. Original Research articles (2,500 words without tables & diagrams Maximum of five tables & two diagrams)
3. Review/Update articles (2,500 words)
4. Continuing Medical Education articles
5. Health Systems articles
6. Reports, communications and letters (Short communications 1,500 words & Research letters 750 words)

#### **2. Guidelines for submission of a manuscript for Publication**

Three copies of the manuscript should be submitted. They should be typed with double spacing on A4 (11" x 8.5") size paper with the 1.5" left hand and 1" right hand margin. All pages must be numbered in sequence.

The manuscript should be accompanied by a cover letter that the paper has not been published elsewhere nor submitted to another journal for consideration of publication. The name, full mailing address and telephone number of the corresponding author should be given. All authors should sign the covering letter stating that they agree to transfer copyright to the College of Community Physicians of Sri Lanka, if the article is accepted for publication. A letter of ethical clearance should be attached. All authors should declare any conflict of interest. Contribution of authors for the research should be mentioned if there is more than one author.

Neither the editor nor publisher accepts responsibility for the views of authors expressed in their articles. The Editor reserves the right to make amendments to the papers submitted although, whenever possible, they will seek the author's consent to any changes made.

#### **3. Organization of the manuscript**

The sections should be arranged in the following sequence with each section starting on a new page.

##### **3.1 Title page**

Title page should show main title, sub-titles if any, authors listed in the form and order in which they are to appear in the published article, institutional affiliation/s of author/s and the number of words in the manuscript exclusive of abstract, references, acknowledgements and tables.

##### **3.2 Abstract**

Abstract should be limited to 200 words organized into objectives, methodology, results and conclusions. Immediately below the abstract 3-6 key words that identify the main topics in the paper should be given.

##### **3.3 Text**

Text should be arranged under introduction, methodology, results, discussion, conclusions and acknowledgements. Acknowledgements should be limited only to persons who have contributed to the scientific content, provided financial or technical support.

##### **3.4 References**

Referencing should be by numbers (Vancouver system) in the order in which they are cited in the text. Use Arabic numerals within parentheses. Do not superscript. For further details of the Vancouver system refer: International Committee of Medical Journal Editors. Uniform requirements for manuscripts submitted to biomedical journals. *British Medical Journal* 1 988; 296; 401-5.

List all authors when six or fewer. When seven or more list only the first six and add *et al.* Give complete name of the journal, year of publication, volume, first and the last page numbers.

e.g.

Belsey MA. The epidemiology of favism. *Bulletin of the World Health Organization* 1973; 48: 10-13.

##### **3.5 Tables**

All tables must be typed double spaces, each on a separate sheet of paper and numbered using Arabic numerals in the order in which they are cited in the text.

### **3.6 Figures**

Figures should be numbered in the order in which they are cited in the text. Once a manuscript has been accepted for publication it should be preferably submitted in a 3 ½ inch floppy diskette, as a document on Word, in font Times New Roman size 12. Tables should not be typed using Table format.

Correspondence on publications should be addressed to:

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