

URBANIZATION AND HEALTH

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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"¹.

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.²

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 cities³ 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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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 follows⁴

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 amenities².

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 population⁵. 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 low⁶.

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 care²

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 sectors⁶

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, a an important problems in

urban areas⁷.

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 sector⁶. 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 adolescents⁸.

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 respectively⁹

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, 2004¹⁰. 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 females¹¹

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 ²shows 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 drivers¹².

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 matter¹³.

Annual averages of particulate Matter (PM 10) 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 SO₂ and NO₂ are below the Sri Lanka standard even though much variation is seen¹⁴.

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 (PM₁₀) 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 PM₁₀ levels¹⁵. Senanayake et al (2001) reported a correlation between the pattern of pollution levels (SO₂ and NO₂) and attendance rates for wheezing at the Children's Hospital in Colombo¹⁶.

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 areas¹⁷.

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%¹⁸.

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 petrol¹⁹.

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 possibilities¹.

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 health²⁰. 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 1998²¹

“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”*

References

1. State of the World Population 2007 – Unleashing the Potential of Urban Growth, United Nations Population Fund, 2007.
2. The Consumer Finances and Socio economic Survey 2003/04 Part I, Central Bank of Sri Lanka, July 2005.
3. Our cities, our health and our future – report on the Knowledge Network on urban settings, WHO Commission on Social Determinants of Health, WHO Centre for Health Development Kobe, Japan, 2007.
4. Statistical Abstract, Department of Census and Statistics 2001.
5. Ministry of Health, Annual Health Bulletin, 2003.
6. Sri Lanka Demographic and Health survey, Department of Census and Statistics, Preliminary Report 2008.
7. Epidemiological Unit, Ministry of Health, 2007.
8. Jaytissa Renuka, Ranbanda RM. Prevalence of challenging nutritional problems among adolescents in Sri Lanka. Food and Nutrition Bulletin 2006; 127(2)153 – 160.
9. Arambepola C. Abdominal obesity and its association with selected risk factors of coronary heart disease in an adult population in the district of Colombo. Thesis MD Community Medicine, Postgraduate Institute of Medicine, University of Colombo. 2004.
10. Mendez M and Popkin B Globalization, Urbanization and Nutritional changes in the developing world. Electronic Journal of Agricultural and Development Economics 2004 1 (2):

220 – 241.

11. Carukshi Arambepola , Steven Allender, Ruvan Ekanayake, Dulitha Fernando. Urban living and obesity: is it independent of the population and lifestyle characteristics. *Journal of tropical Medicine and International Health* 2008;13(4) : 448 – 457.
12. Arewgoda CM, Perera NS, Mathews DT. An assessment of blood lead levels of the population exposed to vehicle emissions Abstract published in the Proceedings of the 56th Annual Sessions of the Sri Lanka Association for the Advancement of Science, December 1994.
13. S. Chandrasiri Controlling automotive air pollution : The case of Colombo city 2003. [http.203.116.43.77.Publications/research/ACF/136.html](http://203.116.43.77.Publications/research/ACF/136.html).
14. Air Quality Management Centre (AIRMACK), Central Environmental Authority, 2007.
15. Lankatilake KN, Seneviratne R de A, Fernando DN. Indoor air quality and respiratory symptoms among children and women. Proceedings of the 56th Annual Session of the Sri Lanka Association for the Advancement of Science, December 2000.
16. Senanayake MP, Samarakkody RP, Sumanasena SP A relational analysis of acute wheezing and air pollution. *Sri Lanka Journal of Child health* 2001; 30 (2) : 66 – 68.
17. Siritunga TLJC, Kumarasiri RPK Illeperuma OA 2006. Effects of outdoor air pollution on the respiratory health of children in a rural and an urban area in the Kandy district quoted in Nandasena S. Effects of outdoor air pollutants in Sri Lanka - A Literature Review , Proceedings of the Second National Symposium on Air Resource Management in Sri Lanka, Colombo. 2006.
18. USAID, Sri Lanka, 100 days to cleaner air www.usaid.gov.
19. Senanayake MP , Rodrigo MDA, Malkanthi R Blood Lead levels of children before and after introduction of unleaded petrol. *Ceylon Medical Journal* 2004; 49 (2) : 60 – 61.
20. Report of the Presidential Task Force on Formulation of a National Health Policy for Sri Lanka July 1992. Department of Government Printing, Sri Lanka.
21. World Health Report 1996, World Health Organization, Geneva..