

URBANIZATION AND HEALTH IN DEVELOPING COUNTRIES

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In 1975, 38.5% of the world population lived in urban areas; in 1990 this proportion was 42.7% and it is expected to reach 46.7% by the year 2000 and 60.5% by the year 2025. In the developing countries, the level of urbanization is expected to increase from 33.9% in 1990 to 39.5% by the end of the century, and to 56.9% by the year 2025. It is estimated that the number of urban poor in developing countries will have doubled between 1975 and the year 2000, from 35% to 77% of families, with a higher percentage for Africa and South Asia. This spectacular growth of urban poverty goes hand in hand with the general deterioration of living conditions. Although comprehensive statistics on urban poverty are lacking and national criteria used to define poverty differ, the number of people living in urban slums and shanty towns represents about one-third of the total population of cities in developing countries (1). This article focuses upon these poor urban populations in developing countries. The lifestyle of the urban poor is briefly commented upon, as well as the studies which shed light on the pattern of morbidity and mortality which might be associated with hazardous environmental conditions.

The lifestyle of the urban poor

The concept of marginality has been used to describe the lifestyle of the urban poor in developing countries. The large number of migrants who swarm to the cities are termed "socially marginal"; because they live in squatter settlements on the periphery of cities, they are also described as being "spatially marginal". Furthermore, as the urban poor may include a high proportion of illiterate and unskilled workers, the fact that they can find no secure employment is blamed on their own inadequacies; they are characterized as occupationally marginal and often said to contribute to "overurbanization". Finally, the fact that the urban poor are thought to be outside any political organization or structure means they are frequently characterized as being "politically marginal". These concepts have to be questioned. The stereotype of the migrants attracted by the bright lights has been seriously contradicted by many detailed empirical studies both of migration processes and of poor urban communities. Not only are migration flows, by and large, rational responses by people to changing economic circumstances but, in addition, natural increase is often a more import-

ant factor than net in-migration to a city's population growth. In some squatter settlements virtually all the inhabitants are relatively long-term urban dwellers. This makes the view that the problem is one of the peasant unable to integrate as a town-dweller appear increasingly untenable. The poor do participate in the economic and political life of their city. Authors like Peattie (2) have described how "the commerce of the central city streets and of the peripheral low income *barrios* just as much as the commerce of big shops is part of the general economy of the city, not a separate subeconomy". It is the fact that such a high proportion of the economically active populations in the cities of developing countries are self-employed or work in small-scale enterprises which largely escape recognition, regulation and government support which led to the description of such activities as being the "informal sector". This sector has been shown to be increasingly functional and useful to large-scale enterprises and to cities' economies in general in a number of ways. For example, many goods and services are produced very cheaply by industries relying heavily on the low-paid labour which they recruit from the so-called "informal sector". Therefore, any concept of the urban poor in developing countries being socially, economically and politically marginal is a myth. However, it can certainly be claimed that in health terms the urban poor are marginal as demonstrated by the statistics below.

The health of the urban poor

One key aspect of the lifestyle of the urban poor which is associated with ill-health is the environment in which they live. Below, we review some of the literature^c which shows that the urban poor have a different health profile to other urban groups both in terms of mortality and morbidity. Literature on causes of death in urban areas of developing countries is reviewed and followed by a review of literature on mortality and morbidity among particularly vulnerable groups within poor urban areas. Most of these studies are descriptive, but to conclude, some studies which have attempted to causally relate urban environmental conditions and mortality are presented.

The number of studies which shed light upon intra-urban differentials in health in developing countries has substantially increased during the last 5 years. For example, in Manila (3), the infant mortality rate (IMR) for the whole city was 76 per 1 000 against 210 per 1 000 in Tondo, a squatter area. Neonatal mortality in Manila was 40 per 1 000, while it was 105 per 1 000 in Tondo. In Buenos Aires^d mortality due to tuberculosis was 3 times higher in the peripheral areas than in the city as a whole. In Quito (4) the infant mortality rate in upper-class districts was under 5 per 1 000, while for infants of manual workers in squatter settlements it was 129 per 1 000. Similar differentials in IMR have been found in

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^c A more comprehensive literature review is available from the authors.

^d Bianco, M. *Health and its care in greater Buenos Aires*. Paper prepared for the joint UNICEF/WHO meeting on primary health care in urban areas, Geneva, 25-29 July 1983. (WHO document SHS/HSR/83.1, 1983).

Colombo (5) and Porto Alegre (6). In Pelotas (Brazil) (7) the perinatal mortality rate in families with less than one minimum salary per capita was 45 per 1 000 but where the income was more than 10 minimum salaries per capita, it was 13 per 1 000. These studies show that mortality rates are associated with socioeconomic status or geographical area, which is a proxy for socioeconomic status in the case of slums, shanty towns and squatter settlements. Caution is needed in comparing results of studies which present mortality rates, as the methods used may differ (for example, facility-based data collection or community-based household survey data). Many of these studies are from Brazil where registration of death is more complete than in African or Asian countries. In addition, urbanization is at a more advanced stage in Brazil and has therefore attracted the attention of numerous researchers. The main picture that emerges from studies of this kind is the link between poverty and mortality, but without reference to intermediate variables.

Similar studies exist which point to intra-urban differentials in morbidity. A large number of studies have established the greater prevalence of diarrhoea and various helminthic infections in environments which have poorer housing, water and sanitation facilities. For example, in São Paulo (8) the incidence of diarrhoea in the lowest socioeconomic stratum was 13.1 episodes per 100 children-months compared with 9.6 episodes in the next stratum and 3.6 episodes in the upper stratum. In Addis Ababa (9) a morbidity survey with a four-week recall period in low and high socioeconomic *Kebeles* (neighbourhoods) found that 20% in the poor *Kebele* reported diarrhoea and other abdominal conditions against 11% in the higher socioeconomic *Kebele*. In Panama City (10), of 1 819 infants presenting at clinics with diarrhoeal diseases, 46% came from slums, 23% came from shanty towns while none came from the better housing areas. Turning to helminths, studies in Durban (11), Singapore (12), Guatemala (13) and Seoul (14) have all found a higher prevalence of *Ascaris* and *Trichuris* in poorer parts of the city as compared to more wealthy parts. Studies on intra-urban differentials in diseases transmitted by airborne infections are rare. Nutritional status receives substantial attention in urban health research, perhaps because there are now clear guidelines on how to measure it. A number of studies (15-21^a), provide a clear picture of intra-urban differentials in nutritional status, with poorer groups being at a distinct disadvantage in nutritional terms.

When examining causes of death in urban areas of developing countries, the many different ways of classifying causes of death lead to problems when comparing the results of different studies or health information systems. However, studies examined present a general picture of urban populations suffering "the worst of both worlds". They experience the problems of underdeveloped populations (deaths from infectious diseases and a predominance of post-neonatal deaths over neonatal deaths) and the problems of industrialized populations (deaths from neoplasms, heart disease and accidents). For example, in Porto Alegre (6) it was found that post-neonatal mortality predominated over neonatal mortality in the shanty towns and vice versa in other urban areas. 65% of deaths in non shanty-town

infants were caused by problems of gestation, delivery or the puerperium, and only 25% by pneumonia, influenza, infectious intestinal diseases or septicaemia. In contrast, 51% of shanty-town infant deaths were due to these latter causes. The relative mortality from these causes was also higher in the shanty towns. In São Paulo (22), infectious diseases accounted for one-third of all infant deaths in the peripheral poorer areas. Neonatal deaths predominated over late infant deaths in the more affluent areas, while the reverse was true for the periphery. While cardiovascular deaths were the leading cause of death in all subareas of the city, they made up 20% of deaths in the core area and 10% of deaths in the poorer peripheral area.

In addition to examining intra-urban differentials in mortality, morbidity and causes of death, it is useful to examine these factors within vulnerable groups in the city in order to learn which part of the population is most at risk. Infants and children up to 5 years living in slums, squatter settlements or shanty towns are dying from the same infectious diseases as their rural counterparts — measles, diarrhoea, malaria and acute respiratory infections (23-25). Many of these diseases are associated with environmental problems, but this link is not explicitly addressed in the studies. There are considerably fewer data on children between the ages of 5 and 19. More research is needed in this area. One of the few studies that does focus on children in this age group (24) found that the leading cause of death in 5-14 year-olds in the state capitals of Brazil was motor-vehicle accidents (20% of deaths). The leading cause of death for 15-19 year-olds was homicide (12.4% of total deaths), followed by malignant neoplasms. *Annex Table i* summarizes studies which measure the morbidity of particular groups in the urban environment. Most of this literature selects children as the study group. A large number of studies find high prevalence of diarrhoea and helminthic infection in the slum or squatter children. Many of these studies also measure nutritional status and find high rates of malnutrition (34%-77%). Within this category of studies, a particularly wide range of countries is represented. Out of the 22 studies, only 2 examine childhood respiratory infection. This is another indication of the need for further research on this health problem. The other two vulnerable groups covered in *Annex Table i* are women and workers in particular occupations. Occupational health is a specialized field and a comprehensive literature search was not undertaken for this article.

What is the link between these reviewed studies on mortality and morbidity of the urban poor and the lifestyle that they lead, in particular the environment in which they live? Studies which attempt to establish the causal links between urban health and the urban environment are fewer in number than the descriptive analyses which have been reviewed above. One reason for this is the complexity of the acknowledged synergism of physical, social, economic, political and cultural elements in the urban ecosystem. *Annex Table ii* shows some recent studies on urban mortality which have attempted to establish a hierarchy of interacting causal variables. Many of these studies relate to water supply and sanitation facilities.

Conclusions

As this literature review has shown, most of the studies focusing upon the health of the urban poor

^a World Bank. *Health policy in Brazil: adjusting to new challenges*. Washington D.C., World Bank, Population and Human Resources Division, 1989. (Draft document).

in developing countries concentrate on the environmental conditions in which they live. The environmental conditions of the urban poor are one of the main hazards of the lifestyle of poor urban residents. However, other aspects of their way of life, or lifestyle, have implications for their health. Issues such as smoking, diet, alcohol and drug abuse, and exposure to occupational hazards have received much

less attention in the literature, and there is an urgent need for more research in these areas. The lifestyle of the urban poor is complex and dominated by poverty. Any intervention programme which either addresses environmental conditions or attempts to alter the health-related behaviour of the urban poor must therefore take the constraint of poverty into account.

ANNEX

Table i. Summary of literature on morbidity among vulnerable groups in urban areas of developing countries

Vulnerable group: children

Author(s)	Year	Location	Group	Findings/comments
Auer ^a	1989	Manila, Philippines	Smokey Mountain scavengers	<i>Helminths and nutrition</i> : survey of 238 slum children 8 months - 15 years. Prevalence of <i>Trichuris</i> 92%. <i>Ascaris</i> 80%. hookworm 10%. 84% had at least 2 species of parasites. <i>E. Colli</i> 32%. <i>E. histolytica</i> 21%. <i>Giardia</i> 20%. Height-for-age of 77% of children aged 8 months - 11 years was more than 2 S.D.'s below the median of reference (NCHS).
Bhainagar & Dosaij (26)	1986	Delhi, India	Slum children	<i>Diarrhoea</i> : incidence of diarrhoea averaged 8 episodes per child per year. Highest incidence (12) was in slum with poorest sanitary conditions.
Bundy et al. (27)	1988	Kuala Lumpur, Malaysia	Slum children	<i>Helminths</i> : survey of 1 574 slum children, prevalence of <i>Trichuris</i> 63%. <i>Ascaris</i> 50%, hookworm 5%.
Burton (28)	1976	Lima, Peru	Squatter children	<i>Nutrition</i> : 34% of children were malnourished (Gomez I, II, III), 56% had at least one type of intestinal parasite.
Chac-Tai (29)	1989	Macao City, Macao	School-children	<i>Helminths</i> : 1 309 schoolchildren. Prevalence of <i>Ascaris</i> 13%. <i>Trichuris</i> 11%. Piped water and piped sewage, cement roads were available. Association of infection was found with Chinese vegetables (night soil was used as fertilizer) and transmission via immigrants.
Deborah et al. (30)	1986	Ludhiana, India	Slum children	In the division of Ludhiana least well served by water and sanitation facilities. 55% of children aged 6-42 months were malnourished; 34% of these were severely malnourished. Proportionately, females were more malnourished. Female children of rural migrants were more severely malnourished than other children measured. 55% of malnourished children had history of recent diarrhoeal disease.
Fashuyi (31)	1988	Lagos, Nigeria	School-children	<i>Helminths</i> : 94.7% of pupils at school in an urban slum in Iwaya, Lagos, were infected with helminth ova compared to 51.8% of schoolchildren in a rural area. Worm infection rates and load were heavier in Iwaya children.
Forrester et al. (32)	1988	Coatzacoalcos, Mexico	Shanty town	<i>Helminths</i> : 2 098 individuals (90% response for 428 households). High incidence of <i>Ascaris</i> and <i>Trichuris</i> . Heavily infected individuals were grouped in households.
Giugliani et al. (33)	1987	Porto Alegre, Brazil	Children > 1	<i>Nutrition</i> : case-control study of malnourished and normal children in a squatter settlement. Found social determinants were stronger antecedent of malnutrition than biological determinants. History of diarrhoea and respiratory infection were also important antecedents of malnutrition.
Greenberg et al. (34)	1989	Kinshasa, Zaire	Children	<i>Malaria</i> : 38% of hospital admissions children were malaria cases. There was a 21% case-fatality rate. Over 70% of child malaria cases were children <5. Over 80% of those who died were also < 5. Increase in malaria admissions is related to the emergence of chloroquine-resistant malaria in Kinshasa.
Grinstein et al. (35)	1989	Buenos Aires, Argentina	Slum children < 2	<i>Diarrhoea</i> : diarrhoea was twice as common in children aged < 2 as in other age groups. Rotavirus was identified in 5.5% of cases.
Hettiarachi et al. (36)	1989	Galle, Sri Lanka	Slum children < 14	<i>Helminths</i> : prevalence of intestinal parasites was 95%. <i>Trichuris</i> 95%; <i>Ascaris</i> 69%; <i>Necator</i> 17%.
Meeham (37)	1990	Shanghai, China	Slum infants	<i>Breast-feeding</i> : exclusive breast-feeding of infants by urban mothers for at least 4 months had declined from 59% in 1950 to 35% in 1974 and 12% in 1984. The author notes the importance of breast-feeding in protecting health of infants.

Author(s)	Year	Location	Group	Findings/comments
Osinusi & Oyejide (38)	1989	Ibadan, Nigeria	Slum children 0-5	<i>Morbidity</i> : the most common illness symptoms in children were nasal discharge (30 incidences per 100 child-days), coughs (12) and fever (10). There was a higher incidence of fever, skin rash and diarrhoea in the dry season. The authors suggest shortage of water as a factor. The highest incidence of diarrhoea occurred in children aged 7-12 months and the highest skin rash incidence in children aged 37-60 months.
Pandey et al. (39)	1987	Nepal (general)	Children < 2	Found a direct relation between reported hours per day near the stove by infants < 2 and episodes of life-threatening <i>acute respiratory infection</i> .
Prabhakar Rao et al. (40)	1988	Pondicherry, India	Slum children 0-10	<i>Nutrition</i> : in a slum in Pondicherry, children showed malnutrition levels of 39% (Grade I), 38% (Grade II), and 15% (Grade III). 67% of children had single or multiple parasites. 76% had coughs and 53% fever.
De Romana et al. (41)	1989	Lima, Peru	Slum children (newborn)	<i>Respiratory infection</i> : in Huascar, a periurban slum, there was 28% prevalence of upper respiratory tract infection and 15.5% prevalence of diarrhoea. Rates of stunting and wasting in children increased progressively during the first year of life, despite average birthweight.
Reichenheim & Ebrahim (42)	1986	Fortaleza, Brazil	Slum children	<i>Nutrition</i> : in 4 squatter areas in Fortaleza, 50% of families had per capita income of less than one-third of minimum wages. Low intake of nutrients was due to missed meals, small meal volumes and low nutrient density in meals. Over 50% of children were consuming only 5 food types although 26 were available in the same price range. The authors conclude that 'choice' of foods could be improved even in poor urban families.
Reichenheim & Harpham (43)	1989	Rio de Janeiro Brazil	Children < 5	<i>Accidents</i> : in a survey of a slum found the age of the child was the most important determinant of accidents. Peaks in accidents were in the second or fifth year of life. Other associated factors were having a mother living with a partner, having a mother under stress or depressed, and being separated from mother for at least half the week because of the mother's need to work.
Sabir ^a	1984	Lahore, Pakistan	Slum children	<i>Nutrition</i> : 73% children were malnourished (Gomez) and 61% stunted (Waterlow).
Stanton et al. (44)	1987	Dhaka, Bangladesh	Squatter children	77% of children had <i>scabies</i> within a one-year study period; 16% infested for more than 6 months.
Stanton et al. (45)	1989	Dhaka, Bangladesh	Squatter children < 6	In a study of 343 children in 51 slums, stool samples of children with and without diarrhoea were taken. 51% of routine stools had parasites and 42% of diarrhoeal stools were infected. <i>Ascaris</i> and <i>Trichuris</i> accounted for 80% of parasites in both stools. The authors note that parasite infections in urban Bangladesh are high and not necessarily diarrhoea-related. Pathogens found by this study were not similar to rural infections found in Bangladesh.
<i>Vulnerable group: women</i>				
Bisharat & Zagha ^c	1986	Amman, Jordan	Female children in slums	<i>Nutrition</i> : in 1981 28% of male children aged 3 were below 90% of their reference weight-for-age, but 46% of females were below 90% of weight-for-age norm.
Gao et al. (46)	1987	Shanghai, China	Women	<i>Indoor pollution</i> : prolonged exposure to oil volatiles from cooking at high temperature may be related to increased risk of lung cancer. Risks rose with frequency of cooking, with reported smokiness of the house and with reported eye irritation during cooking. Risks were highest with exposure to rapeseed-oil fumes.
Giugliani et al. (33)	1987	Porto Alegre, Brazil	Mothers slum dwellers	45% of mothers in a squatter settlement were regular smokers. 58% suffered from medical problems such as <i>anaemia</i> , <i>hypertension</i> , <i>urinary infection</i> and <i>sexually transmitted disease</i> . One-third of squatter settlement families described alcoholism as a serious problem.
Sathyamala (47)	1987	Bhopal, India	Women	<i>Gynaecological disease</i> : following gas exposure, Bhopal, women had leucorrhoea (94%); pelvic inflammatory disease (79%) and excessive bleeding (46%).
Sierra et al. (48)	1989	Costa Rica	Women	<i>Cancer</i> of the colon and breast is twice as common among urban women as among rural women in Costa Rica.

Author(s)	Year	Location	Group	Findings/comments
Tidke et al. (49)	1986	Bombay, India		<i>Poliomyelitis</i> : A community lameness survey of slums. In 1986, paralysed children < 6, male: female impairment ratio was 1.5:1. Authors observe this could be due to higher case-fatality in females.
World Bank ^d	1989	Cubatao, Brazil	Pregnant women	Proximity to petrochemical plants is correlated with <i>spontaneous abortions</i> .
<i>Vulnerable group: occupation</i>				
Zhao-Yi Xu (50)	1989	Shenyang, China	Manual workers	Study found a threefold increase in lung-cancer risk among men working in the non-ferrous smelting industry with heavy exposure to inorganic arsenic.
Zicker et al. (51)	1990	Goiania, Brazil	Active manual workers	Found seroprevalence of <i>Trypanosoma cruzi</i> infections of 12.6% of manual workers screened. Of these infected cases, 44.4% showed ECG abnormalities compared to 15.1% ECG abnormality prevalence in workers without infection.
Zicker (52)	1988	Goiania, Brazil	Workers	Found <i>Chagas disease</i> was the cause of 4.2% of all sickness benefits and 9.1% of invalidity claims. Rate of 4 212 potential future productive years of life lost per 10 000 workers per year. Cases of Chagas were younger, involved in 'heavy' activities, and were more recent migrants to the city than the control group.

^a AUER, C. *Health problems (especially intestinal parasitoses) of children living in Smokey Mountain, a squatter area of Manila, Philippines*. Basel: Swiss Tropical Institute, Department of Public Health and Epidemiology, 1989. (MSc thesis).

^b SAJJAR, N. I. *Why do girls die more? Sex differences in growth and child-rearing practices in a slum area in Lahore*. London: Tropical Child Health Unit, Institute of Child Health, 1984. (MSc thesis).

^c BISHARAT, L. & ZAGHA, H. *Health and population in squatter areas of Amman: a reassessment after four years of upgrading*. Urban Development Department, Amman Hashemite Kingdom of Jordan, 1986. (Draft document).

^d WORLD BANK. *Health policy in Brazil: adjusting to new challenges*. Population and Human Resources Division, Washington D.C., World Bank, 1989. (Draft document).

Table ii. Summary of studies which attempt to causally relate urban environmental conditions and mortality

Author(s)	Year	Location	Findings/comments
Merrick (53)	1983	Brazil	Increased access to piped water accounted for about 20% of observed decline in infant deaths. However, increased maternal education accounted for 34% of mortality decline – more than any other factor.
Monteiro & Benicio (54)	1989	São Paulo, Brazil	Reduction in infant mortality between 1973 and 1986 linked with improved water supply and sanitation.
Pickering (55)	1985	Bakau, Gambia	Retrospective study of child mortality < 3. Found risk of death in households using public taps twice as high as for those with yard connection.
Tecke & Shorter (56)	1984	Amman, Jordan	Squatter settlements. Determinants of infant mortality (in order) were: mother's education, housing quality, head's occupation and household income. Housing quality was major determinant of personal hygiene.
Timaeus & Hill (57)	1985	Adana, Turkey	In a survey of 745 households, child and infant mortality was strongly associated with overall dwelling quality (as measured by building material) and sanitation facilities (as measured by presence of inside toilet); source of drinking water was an important independent variable.
Victoria et al. (58)	1988	Pelotas, Porto Alegre, Brazil	Infants in houses sharing a tap with neighbours are more likely to die of diarrhoea (even after adjusting for confounding factors) than those from houses with in-house piped water. Infants from houses using public standpipe or well are 4.8 times more likely to die of diarrhoea than those from houses with in-house piped water (result significant at 1% level).

SUMMARY

In developing countries the level of urbanization is expected to increase to 39.5% by the end of this century and to 56.9% by 2025. The number of people living in slums and shanty towns represent about one-third of the people living in cities in developing countries. This article focuses upon these poor urban populations and comments upon their lifestyle and their exposure to hazardous environmental conditions which are associated with particular patterns of morbidity and mortality. The concept of mar-

ginality has been used to describe the lifestyle of the urban poor in developing countries. This concept is critically examined and it is argued that any concept of the urban poor in developing countries being socially, economically or politically marginal is a myth. However, it can certainly be claimed that in health terms the urban poor are marginal as demonstrated by some of the studies reviewed in this article. Most studies of the health of the urban poor in developing countries concentrate on the environ-

mental conditions in which they live. The environmental conditions of the urban poor are one of the main hazards of the lifestyle of poor urban residents. However, other aspects of their way of life, or lifestyle, have implications for their health. Issues such

as smoking, diet, alcohol and drug abuse, and exposure to occupational hazards, have received much less attention in the literature and there is an urgent need for more research in these areas.

RÉSUMÉ

Urbanisation et santé dans les pays en développement

Selon toute attente, les pays en développement auront atteint un niveau d'urbanisation de 39.5% avant la fin du siècle et de 56.9% d'ici 2025. Dans les pays en développement, la vie dans les taudis et les bidonvilles concerne environ un tiers des citoyens. Cet article met l'accent sur les populations urbaines défavorisées; on trouvera une série de commentaires sur leur mode de vie et leur exposition aux risques liés à l'environnement, associé à des modèles particuliers de morbidité et de mortalité, dans lequel ces populations évoluent. Le concept de marginalité a été utilisé pour décrire le mode de vie des populations urbaines défavorisées dans les pays en développement. Ce concept fait l'objet d'un examen critique, et on soutient dans cet article que tout concept selon lequel les populations urbaines défavorisées

sont — aux niveaux social, économique et politique — marginaux, constitue un mythe. Quoi qu'il en soit, il peut certes être affirmé qu'au niveau sanitaire les populations urbaines défavorisées sont marginales, comme cela a été démontré dans certaines études examinées dans cet article. La plupart des études sur la santé des populations urbaines défavorisées mettent l'accent sur les mauvaises conditions d'hygiène dans lesquelles elles vivent. Toutefois, d'autres aspects de leur mode de vie peuvent être nuisibles à la santé. Il a été fait beaucoup moins cas, dans les différentes études, des risques liés au tabagisme, à une alimentation déséquilibrée, à l'abus d'alcool et de drogue, ainsi qu'à l'exposition à des accidents professionnels; il devient très urgent d'effectuer de plus amples recherches en la matière.

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LIFESTYLES AND HEALTH

CONTENTS

Page

Demonstration projects for the integrated prevention and control of noncommunicable diseases (INTERHEALTH programme): epidemiological background and rationale. INTERHEALTH Steering Committee

48

The lifestyle concept and health education with young people. Don Nutbeam, Leif Aaro & Bente Wold

55

Urbanization and health in developing countries. Trudy Harpham & Carolyn Stephens

62

A cross-cultural pilot study on alcohol education and young people. Cheryl L. Perry & Marcus Grant

70

The role of lifestyle in the prevention of cerebrovascular diseases (summary). R. Labauge & F. Aboobaker-Labauge

79

Tobacco consumption among Spanish women (summary). Mercedes de Onis & José Villar

87

The medium is not the message. Nedd Willard

89

MODES DE VIE ET SANTÉ

SOMMAIRE

Pages

Projets de démonstration pour la lutte intégrée contre les maladies non transmissibles (programme INTERHEALTH): considérations épidémiologiques [résumé]. INTERHEALTH Steering Committee

52

Le concept de mode de vie et l'éducation sanitaire chez les jeunes [résumé]. Don Nutbeam, Leif Aaro & Bente Wold

60

Urbanisation et santé dans les pays en développement [résumé]. Trudy Harpham & Carolyn Stephens

67

Etude pilote transculturelle sur l'éducation scolaire antialcool [résumé]. Cheryl L. Perry & Marcus Grant

72

Mode de vie et prévention des accidents vasculaires cérébraux. R. Labauge & F. Aboobaker-Labauge

74

La consommation de tabac chez la femme espagnole. Mercedes de Onis & José Villar

80

[Le support n'est pas le message] [anglais seulement]. Nedd Willard

89