Housing, Health, and Well-Being
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Editorial

It is generally accepted that housing conditions influence the health and well-being of inhabitants. Nonetheless, amongst the numerous studies and overviews that have been published there is no consensus about the kinds of relationships between housing conditions and the health and well-being of residents. Reasons for this lack of consensus relate to the complex nature of the subject and the diverse approaches used to study it. However, in general, there are some pathological conditions that can be attributed to the quality of residential environments. For example, those conditions which define and are defined by certain kinds of construction materials (e.g., the release of toxic substances from asbestos products and lead base paints) as well as extant site conditions (e.g., insanitary and solid waste disposal). These kinds of housing conditions have been known to affect the health of residents since the mid-nineteenth century. However, since then, and especially during the second half of this century, it has become increasingly clear that it is not a simple matter to extract and isolate material housing conditions from other non-physical attributes which form an integral part of the lifestyle of the inhabitants and have an influence on their health and well-being. Inadequate nutrition, for example, and limited access to health services and medical care, have a very important role. Yet, can adequate nutrition only be considered in terms of socio-economic parameters, notably household poverty, or should seasonal variations in the supply of food, as well as the lack of sanitary facilities for storing and preparing food also be examined? Clearly, there are important conceptual notions that need to be examined if the relationships between housing, health and well-being are to be understood in a comprehensive way.

This collection of papers cannot provide a comprehensive overview of ongoing research and practice in this vast field of inquiry. In general, however, the papers in this issue illustrate a range of theoretical and methodological approaches commonly used as well as the complexity of their subjects of study. Moreover, given the broad geographical distribution of the contributors as well as the diversity of their academic training and professional practice, this collection indicates the large amount of interest in the subject area and the wide range of perspectives
used to examine it. Beginning with Giroult's paper, it is possible to grasp some of the key issues, especially in developing countries, where adequate environmental conditions and domestic services cannot be taken for granted. Some of these conditions are examined in more detail by Ekblad and Werne in their case study of urban development in Beijing, as well as Daly's paper on the implications of homelessness on human health and well-being. Whereas Ekblad and Werne focus on the elderly and children, Danermark and Ekström present a useful overview of the health effects of relocation on the elderly. Ranson shows the extent of accidents in domestic settings, the costs of which are frequently underestimated. Burton outlines the sources of human stressors in urban environments, and it is instructive to relate his approach to cities like Beijing, or other examples referenced in this issue. Raffestin and Lawrence present a set of concepts that enable us to examine these and other examples from an ecological perspective. They suggest that this perspective has been largely misconstrued, and how it can be applied in the future. The issue of regulation, especially of housing standards, is presented by Burridge and Ormandy, and illustrated by their study of legislation and policy in Britain. Last, but not least, Goldstein, Novick and Schaefer relate much of what has been stated in earlier papers, together with their own perspective, to a broader international perspective, grounded on the formulation of policies and their implementation. It is important to underline here that appropriate policies ought to be founded on an understanding of the contextual conditions (e.g., demographic, cultural, economic and political parameters) in which those policies will be applied.

There is no doubt that other case studies that examine, for example, different house types, ethnic groups, or habitats in other climatic zones, could also have been included in this special issue. However, it is not the aim of this publication to present a representative cross-section of ongoing studies, but those approaches and principles that can help to comprehend the complexity of the subject area, as well as indicate directions for future research and applications.

Roderick J. Lawrence
Université de Geneve
Health Aspects of Housing and Town Planning*

ERIC GIROUlt
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This paper presents an overview of those parameters that define health aspects of rural and urban housing. It begins with a brief historical account of the major preoccupations faced by those concerned with environmental health. It then examines how dwelling hygiene and safety can be ensured by accounting for biological, chemical, engineering and physical parameters that are relevant to human health and well-being in residential quarters. The author draws on his broad knowledge of studies funded and/or published by the World Health Organization to establish a range of principles that ought to be the goal for promoting health and well-being at the community or municipal level.

In the Middle Ages, the health problems caused by a lack of sanitation limited the size of towns, and overcrowding meant that urban populations were at great risk from epidemics of all types of infectious disease. Historians consider that as late as the sixteenth century mortality rates were higher in towns than in rural areas. The situation improved in the seventeenth and eighteenth centuries but deteriorated again in the nineteenth century, when the industrial revolution led to rapid urban growth and the appearance of new problems such as atmospheric pollution caused by industrial activities. The capital cities of Europe were ravaged by cholera epidemics in 1842 and 1843. Although at the time it was thought that cholera was transmitted by polluted air, these epidemics led to the establishment of the International Office for Public Health in Geneva, the forerunner of the World Health Organization (WHO). It also led to the famous discovery by Dr. Snow on the urban water cycle contribution to cholera transmission.

*This article is the edited version of a paper presented by the author during a seminar on health and the urban environment organized by the Centre for Human Ecology and Environmental Sciences at the University of Geneva from 10–18 April 1986.
Tuberculosis was the most feared disease in the nineteenth century; initially, it was recognized as being linked to poor urban housing and more particularly to overcrowding and inadequate heating, ventilation and exposure to sunlight. Work in Greenland over the past three decades gives a recent demonstration of the impact of good housing on tuberculosis control. Since the Danish Government took steps to move the local population from their traditional shanties to modern, healthy housing, tuberculosis (which was the most serious public health problem in Greenland) has virtually disappeared. Of course, other tuberculosis control measures (such as BCG vaccination) have been implemented at the same time as providing better housing. However, another trial in India showed that BCG vaccination alone was not enough to eradicate tuberculosis from shanty towns, without measures to improve nutrition and housing. Rickets was another nineteenth century disease directly linked to urban air pollution by smoke and to lack of sunshine in dwellings.

When we turn to the twentieth century, we see that health authorities and populations in industrialized countries are increasingly concerned at the spread of psychosocial diseases such as drug abuse and at the development of unhealthy lifestyles, the outward signs of which include smoking and a lack of physical exercise. New problems have arisen with regard to housing and work premises. These include the spread of infectious respiratory diseases through air conditioning systems and the pollution of indoor air by toxic chemicals from synthetic building materials, especially those used for insulation.

This paper is intended to present an overview of past and present health problems related to housing and work premises, on the one hand, and to the urban environment on the other.

Environmental Factors Affecting Respiratory Morbidity

Acute Respiratory Infections

These continue to be a major cause of morbidity in Europe and the principal cause of lost working days. Overpopulation and overcrowding, not only in buildings but above all on public
transport, play a predominant role in the transmission of respiratory infections.

The indoor and outdoor climates have repercussions mainly on germs-carrying individuals. The indoor parameters to be taken into consideration are ambient temperature, radiant temperature and relative humidity, with the latter being the most significant. Where the impact of radiant temperature is negligible, recommended values inside buildings are 40–65% humidity and a minimum ambient temperature of 12°C. A negative radiant temperature must be taken into consideration, however: people should not sit or lie within one metre of a cold surface, such as a window, and the distance should be increased if the window is large. The outdoor climate cannot be changed by individuals, and one must adapt to it by wearing suitable clothing. Nonetheless, the elderly and those suffering from respiratory infections are recommended not to be immobile for too long a period out-of-doors in cold weather.

Overcrowding plays a more important role in the transmission of acute respiratory infections than do the combined factors of humidity and temperature. A recent study gave the results as shown in Tables 1 and 2.

These figures show (a) that overcrowding is of considerable significance with regard to acute respiratory diseases, but of very little significance for chronic respiratory diseases such as asthma; and, (b) that the household sanitary facilities available are not an important factor for respiratory diseases, since there are fewer such diseases in the least well equipped houses (this would not be the case, of course, with enteric diseases).

Tuberculosis

From an historical point of view, it was recognized in the nineteenth century that people living in poorly ventilated, ill lit and inadequately heated slum housing were particularly susceptible to tuberculosis, and an inadequate diet was rightly acknowledged to be a contributing factor. Following the implementation of systematic campaigns, tuberculosis has now been virtually eradicated from the rich countries of Europe. However,
as mentioned earlier, two recent projects have again demonstrated that some environmental factors affect the prevalence of tuberculosis.

Table 1

**Percentage of Children Under 10 Years of Age Who Had Bronchitis, Pneumonia, or Asthma By the Number of People Per Room in Porto-Allegre, Brazil**

<table>
<thead>
<tr>
<th>Number of People per room in the family dwelling</th>
<th>% of total number of children under 10 years of age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bronchitis</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>5 or more</td>
<td>15</td>
</tr>
</tbody>
</table>

Source: Bulletin of the Pan American Health Organization, 1985

Table 2

**Percentage of Children Who Had Bronchitis, Pneumonia, or Asthma by Household Sanitary Facilities in Porto-Allegre, Brazil**

<table>
<thead>
<tr>
<th>Household sanitary facilities</th>
<th>Bronchitis % of total number of children</th>
<th>Pneumonia</th>
<th>Asthma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private flush toilet</td>
<td>22</td>
<td>24</td>
<td>119</td>
</tr>
<tr>
<td>Private latrine</td>
<td>25</td>
<td>31</td>
<td>71</td>
</tr>
<tr>
<td>Communal flush toilet</td>
<td>7</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Communal latrine</td>
<td>1</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: Bulletin of the Pan American Health Organization, 1985

In Greenland, Eskimos have traditionally lived in the type of shacks described by Paul-Emile Victor in his account of a winter spent with a Greenland family in 1935. Tuberculosis was the most important health problem until approximately 1960. The Danish Government then instituted a voluntary policy of resettling the population in modern, European-style housing. Although that policy can be criticized for not taking account of the local culture of the inhabitants, there is now virtually no tuberculosis in Greenland. Apart from improved housing, other medical measures have, also helped to achieve this.
A BCG vaccination programme sponsored by WHO in India did not lead to a marked reduction in tuberculosis prevalence, since no accompanying measures were taken to improve nutrition and housing for the population concerned.

**Chronic Respiratory Diseases**

The determining environmental factor here is pollution of indoor and outdoor air; pollution in turn is related to ventilation conditions. A distinction should be made between atmospheric pollutants, which act as irritants on the respiratory tract, and those that have a short-term or long-term toxic effect, such as carcinogens. Irritants increase the sensitivity of the respiratory tract and of the lung alveolus to infections, toxics and carcinogens.

So far as outdoor air pollution is concerned, irritation is caused by dust, possibly in combination with $SO_2$; nitrogen oxides are also irritants of the eye and may lead to conjunctivitis. Toxic effects are caused by various chemical compounds, including CO, $SO_2$ and $NO_x$; carcinogenic effects are linked to aromatic compounds originating from industrial emissions, heating installations and vehicles. In other terms, the lifestyle of populations can have unforeseen harmful effects on human health and well-being.

With regard to indoor air, current problems are related to the use of synthetic building materials for coatings, paints, varnishes and, above all, for insulation. Formaldehyde, used in Canada for insulating houses, is an irritant of the respiratory tract whereas asbestos has been recognized as a carcinogen, acting in synergy with tobacco to increase lung cancer and causing a specific pleural cancer called mesothelomia. This subject is fully covered by many WHO reports (See European Guidelines for Indoor and Outdoor Air Quality, WHO Publication, Geneva 1987). Tobacco smoke is also a major cause of indoor pollution and a predominant factor to be taken into consideration when working out ventilation standards; its contribution to lung cancer is now well known.

Radon is another indoor air carcinogen, which acts through a radioactive emission inside the lungs and bronchus. Bed-rocks and building materials (stones, bricks and concrete) are sources of radon.
In the urban environment, the problem of indoor air quality is not restricted to dwellings but is also found in workplaces and commercial premises. The most worrying problem, and that on which the least work has been done, is indoor air pollution in transport facilities. The air in the passenger compartment of a car, especially in winter, contains relatively high concentrations of all the atmospheric pollutants emitted by a motor, from carbon monoxide to carcinogenic benzene compounds. In public transport facilities, the main factor is the presence of large numbers of people in a confined space. This encourages the transmission of acute respiratory diseases, especially in winter. The problem is also found in commercial premises.

When drawing up urban development plans, the risk of accidents involving suffocation and related to certain types of installation should not be overlooked. In addition to the conventional domestic accident of suffocation from carbon monoxide in dwellings with primitive heating systems, there is the permanent risk of a disaster, such as mass suffocation following a malfunction in the ventilation system of an underground car park or road tunnel.

**Prevention of Respiratory Diseases in Dwellings**

To reduce the hazards caused by large numbers of people in confined spaces, overcrowding must be avoided and dwellings should be designed with sufficient useable floor space, the ideal being one room per person.

Both indoor climate and air quality should also be improved by measures affecting heating, air conditioning and ventilation. So far as the indoor climate is concerned, efforts should be made to maintain the ambient temperature within the range of 16–25°C, with a humidity level of 40%–65%. Steps must also be taken to avoid radiant temperature effects, which may be listed under three headings: (a) the "greenhouse" effect, where large glazed surfaces are directly exposed to sunlight; in tropical or Mediterranean climates, this must be avoided by means of external passageways, balconies or shutters; (b) the "cold surface" effect, which creates a negative radiant temperature; the larger
the window, the further from it should beds and seats be placed; and, (c) the effect of condensation of humidity on cold surfaces, which must be avoided by limiting the temperature gradient and improving the insulation of external walls. (See WHO/EURO EH Document Series no. 16. Health Impact of Low Indoor Temperature, report on a WHO meeting).

To improve the quality of indoor air, the use of coatings, insulating panels, paints, varnishes or furnishings that release toxic emissions should be avoided, as should uncontrolled indoor combustion such as open fireplaces without canopies, heating systems with chimneys that are ineffective or not airtight and, in particular, tobacco smoke.

Technical specifications for ventilation are drawn up to meet the requirement of removing unpleasant odours and tobacco smoke. When these specifications are complied with, concentrations of other pollutants in indoor air can be maintained at an acceptable level. Wherever possible, natural ventilation should be preferred over artificial ventilation or forced air conditioning, primarily in order to avoid microbiological contamination of indoor air and the transmission of infectious respiratory diseases.

For technical reasons, air conditioning and artificial ventilation are unfortunately necessary in large buildings used as hotels, offices or department stores. Steps must be taken to prevent the transmission of diseases such as legionnaire’s disease, a form of pneumonia that affects middle-aged men in particular. It is virtually impossible to eliminate the Legionella bacterium by disinfection, but its circulation in ventilation and air conditioning systems can be avoided by proper maintenance and temperature adjustment. (See WHO/EURO EH Document Series no. 14. Environmental Aspects of the Control of Legionellosis, Report on a WHO meeting).

Prevention of Respiratory Diseases in the Urban Environment

The size and location of buildings affect the formation of eddies and local air flows under windy conditions. Violent flows
of air may have a negative impact on health, leading, for example, to respiratory diseases among children who play near buildings, especially those built on piles; the latter should therefore be avoided. In climates where high winds are common, it is worth using scale models to analyse the wind flows set up by the physical configuration of buildings and roads.

The control of urban air pollution is a crucial and specialized subject. Action must be taken to deal with point sources of pollution or disseminated emissions, to modify dispersion patterns and to mitigate unfavourable meteorological conditions. There are many technical measures that can be taken to reduce emissions from point sources such as major industrial plants. Dispersion can be improved through the use of tall chimneys, although wind tunnel tests must be made on scale models to ensure that such measures are really effective. Lastly, zoning can confine pollution-producing plants to industrial areas that are far from, and downwind of, residential districts. Especially in mountainous regions, however, wind tunnel tests must be made on scale models to ensure that zoning is effective. Even so, it may not be practicable, for instance when a heavy industrial plant must be linked to a fixed infrastructure such as a navigable waterway.

Zoning cannot be used with disseminated sources of pollution such as small workshops, domestic heating and vehicles, and it is extremely difficult to control such emissions at source. One effective solution for domestic heating is to develop district heating networks based on a central heat plant, where emissions can be more easily regulated and controlled. So far as vehicles are concerned, action can be taken to improve fuel quality, to ensure that motors are correctly tuned and emission standards complied with, and to modify the choice of vehicles available, in the worst cases by banning diesel motors or encouraging electric vehicles, for instance.

Although we cannot control general weather conditions, human action influences the micro-climate in cities. Periods of acute pollution occur when weather conditions are unfavourable: one example of this is the temperature inversion that occurs above a city in winter with calm weather (a winter high
pressure system) and heat rising from the city. In extreme cases, steps must be taken to reduce industrial activity, to limit the movement of traffic or to alter heating parameters, for instance by substituting a more expensive but cleaner fuel for that normally used.

As noted above, confined spaces are often more polluted than the outdoor air. The ventilation of public transport vehicles and their infrastructures (tunnels and underground stations) is far from satisfactory at peak periods. The situation is even worse with regard to road traffic and its underground infrastructures, tunnels and parking areas. Despite numerous encouraging experiments, a comprehensive system of efficient, safe and clean urban transport has still not been implemented at city scale, although encouraging systems do exist at pilot scale.

Environmental Factors Affecting Other Infectious Diseases

Enteric Diseases

Although enteric diseases are fortunately no longer encountered in Europe, it is worth recalling that most of them are related to poor household drinking-water and sanitation facilities. Sanitation is taken here to include the disposal of excreta, other liquid waste and solid waste including all household refuse. In this connection, it should be noted that most of the available statistics on housing hygiene refer to household sanitary facilities.

In the developing countries, however, the problem of enteric diseases continues to be of prime importance, and children are the first to suffer. A recent study of infant mortality in the shanty towns Pôrto Alegre (Brazil), published in the Bulletin of the Pan American Health Organization (1985), gave the following overall results: (a) overall infant mortality rate in Pôrto Alegre, 1980—33.9%; (b) infant mortality rate in non-shanty town infants—24.4%; (c) infant mortality rate in shanty town infants—75.5%. The infant mortality rate was thus three times higher in shanty towns; in Pôrto Alegre, fortunately, only 15.22% of the population live in such areas.

The following causes of infant mortality were found.
Table 3

Causes of Infant Mortality in Pôrta Alegre, Brazil

<table>
<thead>
<tr>
<th>Cause</th>
<th>Shanty town population %</th>
<th>Nonshanty town population %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abnormal pregnancy or birth</td>
<td>24.2</td>
<td>47.6</td>
</tr>
<tr>
<td>Pneumonia or influenza</td>
<td>28.6</td>
<td>14.8</td>
</tr>
<tr>
<td>Infectious intestinal diseases</td>
<td>13.7</td>
<td>7.2</td>
</tr>
<tr>
<td>Septicaemia</td>
<td>8.5</td>
<td>3.3</td>
</tr>
<tr>
<td>Congenital anomalies</td>
<td>4.7</td>
<td>16.9</td>
</tr>
<tr>
<td>Other causes</td>
<td>16.3</td>
<td>100.0</td>
</tr>
</tbody>
</table>


In absolute terms, infant mortality due to infectious intestinal diseases was 1.8% in "normal" neighbourhoods and 10.3% (i.e., six times greater) in shanty towns.

It should also be noted that the proportion of infant deaths due to infectious intestinal diseases in shanty towns (13.7%) was relatively low; this is due to the fact that most of the shanty town districts in this city have piped supplies of drinking-water. In the slum district of Moinho Arroyo, which does not have such facilities, infectious intestinal diseases accounted for 52.9% of infant deaths.

Table 4 shows UNICEF statistics on causes of mortality in preschool children (1-5 years) in urban fringe zones and rural areas in Turkey.

Table 4

Causes of Mortality in Preschool Children in Urban Fringe Zones

<table>
<thead>
<tr>
<th>Cause</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enteric diseases</td>
<td>56</td>
</tr>
<tr>
<td>Respiratory diseases</td>
<td>29</td>
</tr>
<tr>
<td>Domestic and other accidents</td>
<td>11</td>
</tr>
<tr>
<td>Other causes</td>
<td>4</td>
</tr>
</tbody>
</table>

From the point of view of health indicators, the prevalence of typhoid and paratyphoid diseases is regarded as closely related
to the quality of drinking-water; cholera is a symptom of a very low level of sanitation; diarrhea is the main cause of infant mortality from enteric diseases; salmonella outbreaks testify to a low level of food hygiene; and intestinal parasitic diseases are a reflection of both improper excreta disposal and poor food hygiene.

**Prevention of Enteric Diseases at Home and in the Urban Environment**

The elementary rules of domestic hygiene are applicable here.

Piped supplies of drinking-water prevent not only the transmission of waterborne diseases (typhoid, cholera, etc.) but also the spread of skin diseases. Good personal hygiene clearly depends on the washing facilities (shower or bath) available. Even in Europe, periodic cases of hair lice in schoolchildren do happen. Sanitary facilities should be provided. These include the disposal of sewage by main drains or septic tanks and the collection and disposal of household refuse. Sanitary facilities are commonly found in the countries of Europe, but become ineffective when not used correctly or inadequately maintained (e.g., dirty or blocked flush toilets, septic tanks not emptied regularly, refuse chutes used for loose refuse).

Domestic food hygiene must be maintained. Perishable food should be protected from insects, rodents, spoiling or contamination by the use of suitable refrigerators or larders. Dishes must be thoroughly washed.

Domestic insects, acarians and rodents must be controlled, especially in hot climates. Food can be contaminated by rats and mice, flies and cockroaches and by many other insects such as weevils. The first steps in the control of insects and rodents must be to dispose of leftover food and to block up lodging sites in walls, etc., with pesticides being used only as a last resort.

In housing complexes and municipalities, the control of enteric diseases rests on the same basic principles: safe water supplies, the collection and treatment of liquid and solid waste, the control of insects and rodents, and epidemiological surveil-
lance. Basic hygiene in low-cost housing complexes is currently deteriorating throughout Europe, and the same may be said of many municipalities, where the cleaning of streets and open spaces leaves much to be desired. (See the Report of the WHO/Council of Europe Conference on the Health in Towns, held in Vienna, Austria 24–26 May 1988).

Parasitic Diseases

At least three types of parasitic disease linked to poor housing hygiene may be distinguished: Chagas' disease, intestinal parasitic diseases and parasitic zoonoses. In addition, poor housing hygiene may encourage the spread of parasitic diseases by insects or through food.

Chagas' disease is a trypanosomiasis transmitted by an arachnid called the "Kissing bug" found throughout tropical America. The vector lodges in the cracks and walls and partitions. The simple measures of replacing mud huts with concrete or stone houses or of replastering internal partitions will eliminate the vectors' lodging places and thus remove the risk of transmission of the disease.

Intestinal parasitic diseases, especially in rural areas, are the result of poor sanitation, such as where the cesspool of a latrine contaminates the plants in a vegetable garden.

Parasitic zoonoses, including leishmaniasis (transmitted by dogs) and psittacosis (transmitted by birds), are the result of human beings and domestic animals living in the same premises. Unless domestic animals are closely monitored by a veterinarian, such proximity should be avoided. Bacterial or viral infections are also transmitted by ticks found on pets.

Poor domestic food hygiene also promotes the occurrence of parasitic zoonoses transmitted in meat (trichinosis, tapeworm infections, etc.). Conversely, good domestic hygiene helps to control parasitic diseases transmitted by insects. For example, in tropical areas, windows must be protected by mosquito nets, walls sprayed with insecticides twice a year, and pools of stagnant water and certain types of plants in gardens must be avoided. These precautions are also worth taking in some Mediterranean countries.

Good municipal hygiene also includes the control of insects that are vectors of disease and of other animals harmful to
health. In Europe, in addition to controlling insects and rodents, stray cats and dogs should be impounded so as to prevent rabies. In tropical areas, steps must be taken to prevent the formation of stagnant pools of waste water in which \( \text{aN IIG IH} \) \( I \), the vector of filariasis, can breed. It is clear that the domestic control of insects, rodents and other harmful animals will be ineffective unless accompanied by measures at municipal level.

There is currently a tendency in Europe to underestimate the role played by insects and domestic animals in the transmission of infections. In addition to the damage done by flies, mosquitos, cockroaches, fleas, bugs and lice, it is worth noting that lice transmit typhus, canine ticks transmit a rickettsial disease and, historically, rat fleas transmitted the plague. To this list may be added the allergies caused by acarians, called house mites, in bed linen. However, other allergens are found in house dust or coming from indoor mould and fungi. Good domestic hygiene, together with good personal hygiene, can undoubtedly make a major contribution to the eradication of domestic insects and pests; both of these depend on an adequate supply of water.

Architects should avoid creating lodging sites for insects or rodents. For instance, exposed runs of water pipes and, in particular, of electric cables offer shelter for cockroaches; hollow floors are breeding sites for mice; and rats can feed on the piles of rubbish that accumulate at the bottom of refuse chutes if the premises are not accessible, well lit and easy to clean.

Dermatoses

Many skin diseases are the result of poor personal or domestic hygiene, which in turn are due to a lack of water, sanitary facilities or health education. The urban environment also favours the transmission of venereal diseases (which are also dermatoses) through prostitution; the latter is itself a product of psychosocial stress in the urban environment (see below). Today the AIDS transmission is facilitated by poor physical and social urban environment. Narcotic addicts who are the main risk group concentrate in decayed city centres.
Environmental Factors Affecting Chronic Diseases

Cancers and the Urban Environment

Some epidemiological studies or analysis of clusters of diseases seem to show that exposure to low doses of a combination of toxic chemicals leads to a higher incidence of various types of cancer. The well-known case of the Love Canal site near Niagara Falls, U.S., is an example of such a cluster of diseases. Among the epidemiological studies, mention should be made of the study carried out by the Scottish Home and Health Department and documented by the International Agency for Research on Cancer in its scientific publication No. 72, *Atlas of cancer in Scotland 1975-1980*. This study shows markedly higher rates of certain cancers in industrialized urban areas such as Greater Glasgow, where the effect of smoking is combined with the carcinogenic effect of low concentrations of a large number of toxic chemicals. Toxicological studies are a tool to identify carcinogenicity of individual chemicals, and epidemiological studies may identify some synergies in carcinogenicity, but in the urban or indoor environment we are not faced with noticeable concentrations of a limited number of pollutants but with a cocktail of minute concentrations of a large number of pollutants, of which a certain percentage are carcinogens.

The various types of ionizing radiation and some nonionizing radiation also have a carcinogenic effect. However, it has not been proved that human exposure to either ionizing or nonionizing radiation is higher in towns than elsewhere, but exposure to radon is definitely a problem of the indoor environment.

Cardiovascular Diseases and Urban Stress

City life and the attendant negative factors, especially noise and overcrowding on public transport facilities, have a psychological and physiological impact known as stress. It has not been proved that stress is the cause of cardiovascular conditions. On the other hand, it has been epidemiologically demonstrated that it makes such conditions worse. Reducing stress implies, among other things, action on the causative environmental factors such as noise or traffic problems. Reduced stress would also have a positive effect on the number of accidents and mental disorders.
Mental Health and Psychosocial Stress

The environmental factors involved in psychosocial stress include overpopulation, noise, air pollution, unpleasant odours, humidity, overcrowded public transport, dirty roads and a lack of parks, cultural amenities and sports facilities.

Within people's homes, overcrowding, noise and decayed buildings in a poor maintenance state are all stress factors. Outside the home, the quality of architectural design and town pattern affect urban stress; living in high-rise buildings, delayed low-cost housing and underprivileged suburban areas, etc., have been held responsible for causing psychosocial stress.

Psychosocial stress in urban areas is a contributing factor to mental disorders. For instance, nervous breakdown is far more frequent in congested major urban centres, and the other indicators of mental health are all worse in large cities (suicides, divorce rates, drug addiction, etc.)

Accidents and Disasters

Accidents are one of the most frequent causes of death and injury in cities. These include all kinds of domestic accident, the main victims of which are preschool children and the elderly, while traffic accidents account for most of the accidents that occur outside the home.

In homes, the likelihood of a fall may be reduced by properly designed staircases, balconies and windows, but the two most dangerous rooms are the kitchen and the bathroom, in that order. Burns, electrical shocks, suffocation and poisoning are due to poor heating, lighting and cooking equipment, inadequately maintained electrical or plumbing systems, lack of closed cupboards for storing toxic cleaning products, use of toxic paints, plasters or varnishes, the purchase of dangerous or toxic domestic furniture or fittings, etc. There is an extensive body of literature on this subject which has been summarized by Ranson in this issue.

Outside the home, in addition to traffic or transport accidents (an extensively researched area and one where town planning can clearly have a positive effect), other potential disasters must be taken into consideration. These might include fires, flooding, earthquakes or a major industrial accident. There are a
number of possible causes of the latter, ranging from an explosion in a chemical plant to a traffic accident involving a truck transporting toxic chemicals. All these disasters can be prevented by the town planner or the municipal authorities. Technical measures are available to prevent such events or to alleviate their harmful repercussions. Anti-seismic construction criteria and technology do exist.

Other Chronic Diseases

Among the many chronic conditions related to poor housing hygiene or an unsatisfactory urban environment, one problem now solved is that of rickets, a condition caused by inadequate exposure to sunlight, air pollution or a lack of windows exposed to sunshine. Present-day problems include increased exposure to all types of chemical pollutants and the repercussions of such exposure on many chronic diseases, such as restrictive or obstructive respiratory diseases, cancers, cardiovascular disorders, neurocerebral disorders.

Social Disorders

As mentioned earlier, psychosocial stress has an impact on mental diseases, i.e., on disorders that require the services of a psychiatrist or psychoanalyst. In addition, however, it also affects social disorders that are apparent in such phenomena as: criminal and delinquent behaviour, especially among young people; assaults, rapes and insecurity psychoses; intolerance, xenophobia and racism; and a general feeling of unease or ill health.

Even though appropriate architecture or town planning can help to control these social "diseases", their prevention depends primarily on action far beyond the scope of the architect or town planner, which requires a joint approach of the socioeconomic-psychological aspects as well as of the physicochemical-biological ones.

The WHO Regional Office for Europe has launched a "Health Cities" project, which is aimed at reducing both urban psychosocial stress and the ensuing mental, physical and social diseases through action to promote health, improve the environment and attain sociological balance.
Special Requirements of High-Risk Groups

The profile of a high-risk group obviously depends on the hazard under consideration; for accidents, the groups include young children, the elderly and the disabled; for respiratory diseases, they are infants, the elderly and those suffering from chronic respiratory diseases (e.g., asthmatics); for psychosocial stress, single people, immigrants or people in resettlement schemes are the most vulnerable groups.

The problem of adapting housing and urban facilities to the needs of these special groups must be tackled. Technical documents are available that lay down the rules for designing housing for the elderly or disabled and for planning urban transport systems accessible by them. For instance, lifts must allow access for wheelchairs and prams. It is generally accepted that the elderly and disabled must be given ground-floor accommodation in normal housing rather than housed separately from the general population.

The problem of rural migrants or immigrants is largely a sociological one. The solution implies teaching them how to live in a large city and in modern accommodation. This should include health education and community development actions.

One group that has been badly overlooked by modern town planning is children of all ages, whether in large families, young families or one-parent families. Their specific problems are receiving even less attention than those of the elderly and disabled, and as things stand at the moment major cities cannot be said to be designed for children. This is why the Healthy Cities project has developed the so-called "Kid place survey" to access their needs.

From Disease Prevention to Health Promotion

The above considerations have referred to diseases and accidents in relation to what dwellings and town planning can do to prevent them. Another more positive approach is to consider what adequate housing can do to enhance the health of the general population, not only considering the absence of disease or infirmity but the necessary action on the fundamental determinants of health. This is what is called health promotion, and the Healthy Cities project is nothing else than a health promotion project developed at municipal level.
Prevention measures are actions performed by the public health services to prevent risk groups getting a disease or having an accident; health promotion measures are intersectoral actions carried out by professionals or services apparently not related to public health and directed towards the general population to enhance its health status.

It is clear that architects, town planners, construction engineers, city engineers and social scientists or workers are key actors in health promotion activities. It is also clear that, even if it is out of the scope of chemical epidemiological studies, a high quality of the urban physical environment, the balance of the urban ecosystem, comfortable and health dwellings, social harmony, economic prosperity, intensive cultural life and attractive architecture are all contributors to health promotion.

Synthesis of the Main Aspects of Housing

Hygiene

The following principles are relevant to dwelling hygiene and safety.

(1) The shelter function of the dwelling, its structural stability, its ability to protect its inhabitants against meteorological and other external intrusions. The layout of the dwelling, including space and density considerations.

(2) The sanitary equipment of the dwelling, drinking-water supply, connection to sewers, garbage disposal, availability of toilets and bathroom.

(3) The indoor climate of the dwelling: (a) physical parameters: ambient and radiant temperature, humidity and dampness, vibration (noise) and radiation (lighting and radon), dust and micro-fibres; (b) chemical parameters: indoor pollution from human physiology, from heating, cooking and working, toxic chemicals from paints, varnish, insulation materials, carpets and furniture, bad smells; (c) biological parameters: pathogens in aerosols, house mites, allergens from moulds and fungi, transmission of acute respiratory diseases by improper air-conditioning system and through overcrowding; and, (e) engineering aspects of a healthy indoor climate: ventilation requirements, natural versus mechanical ventilation, domestic heating system, natural sunlight through windows, anti-noise windows, etc.
(4) The safety of the dwelling and domestic accidents: (a) fall-downs—safety of stairs, balconies, windows; (b) burns—safety of heating and cooking systems, fire protection; (c) electric shocks—safety of electric appliances; (d) dangerous places—kitchen, bathroom, stairs; and (e) safe handling of domestic products, including toxic chemicals.

(5) Public health problems linked to housing hygiene and safety: (a) domestic accidents: risk groups – preschool children and the elderly; prevention methods: safe architecture, safe furniture, safe electrical heating and cooking equipment; health education: safe handling of toxic chemicals in the home, good maintenance of electrical cooking and heating equipment; (b) acute respiratory diseases: main factors – poor ventilation, poor heating, excessive humidity, overcrowding in the home; however, in big cities, public transportation plays a major role in transmission of acute respiratory diseases; (c) enteric diseases: due to poor water supply and sanitation or in Europe more often due to unhealthy food handling and storage in the home; (d) kitchen: the most hazardous place in the home; (e) other infectious or parasitic diseases are transmitted in the home by domestic pets, rodents, insects and acaria, especially in warm climates; (f) chronic respiratory diseases or long-term cancerogenic risks will result from poor indoor air quality (dust, chemicals, radon, fibres); and, (g) mental disorders linked to overcrowding, lack of privacy, excessive noise, impact of seeing rodents and insects in the home, impact of decaying structures, bad smells and dirtiness.

(6) The hygiene of the indoor environment (dwellings, offices, shops, sports halls, etc.) is of the utmost importance in cold climates where people spend little time outdoors. Current health research concentrates on: (a) ventilation and air-conditioning requirements; (b) risk assessment of physical factors such as radon and fibres (asbestos); and, (c) risk assessment of chemical factors such as formaldehyde, tobacco smoke, carbon monoxide and nitrogen dioxide.

The subject of housing hygiene and healthy buildings has recently been given priority in Europe, as shown by the success of the "Healthy Building" Congress organized in Stockholm, Sweden, 4–8 September 1988 by the Centre international du Bâtiment and sponsored by WHO.
References


This paper summarizes and comments on the research on the relationship between relocation and morbidity/mortality among the elderly. In the present state of research there are not sufficient grounds for the drawing of general conclusions. On the other hand there is good reason for assuming that relocation under certain circumstances and for certain groups does lead to ill-health and to an increase in mortality. There is a lack of studies devoted to systematic investigation of the influence of such conditions. Various designs and methods have been used, and this reduces comparability. There is also a lack of theoretically guided empirical investigations. Research on relocation among the elderly needs to include recognition of the importance of the meaning of home for the elderly, and of the concept of control.

Elderly people and relocation is a significant research field due to some important trends in many countries.

Demographic development in Sweden, as in many other countries (for example the United States), is such that the proportion of the elderly is constantly increasing. In 1984 almost 1.5 million (17%) of the Swedes were more than 64 years old. The number of persons over 80 will rise from 300,000 (1984) to 440,000 by the end of the century — a rise approaching 50%. For some time deinstitutionalization of the care of the aged has been in progress in Sweden. Briefly, the number of places at institutions has not risen since the mid-70s. The degree of coverage for those who are 65 or over has now gone down to the 1965 level. This deinstitutionalization is planned to proceed with increasing rapidity. There are also good reasons for assuming that the aged

1. The paper is based on a research report within the project “Relocation, housing renewal and the health of the elderly”, funded by the Delegation for Social Research, Ministry of Social Affairs, and the Swedish Council for Building Research.
are going to become less adequately equipped for coping with extensive intrusion into their immediate environment — because, for instance, the number of single persons without children is increasing rapidly. The often important social network formed by relatives can become weaker in the future. Furthermore, moving can cause deterioration in another type of social network — the local one formed by neighbours.

To these trends should be added the fact that towns are developed and renewed — and sometimes at a high tempo. New buildings go up, old ones are modernized or are torn down to make room for thoroughfares and office blocks and so on — and these changes involve the constant relocation of human beings. Sweden is just one among a number of West European countries that have had a drop in housing production since the beginning of the 70s. Sweden has therefore oriented its housing policy towards a renovation programme. At the end of 1983 the Swedish parliament approved a 10-year programme with the aim of stimulating housing modernization. The effect of this has been a rapid increase in the number of improved dwellings (about 30,000 per year). The modernization process usually has the consequence that tenants have to move. Their relocation is sometimes voluntary but is most often forced. For a few it is a question of a shorter or longer period away, but as a rule there is no going back to the original flat. However, at the end of 1988 the state loan conditions for modernization became less advantageous, and there is an expectation of a decline in modernization activity in favour of new construction. Elderly people also move from home to home in order to adjust their housing to new life conditions. Moving to institutions, or from one institution to another, because of changes in health or in environment is also common. For some people the move is welcome, but for others it represents a forcible separation from a well-developed and effective social network, and from memories and personal history.

This article summarizes and comments on the research on the relationship between relocation and morbidity/mortality among the elderly. We present a number of studies divided into three categories according to type of relocation involved: (a) inter- and intrainstitutional, (b) from home to institution, and (c)
Relocation and Health Effects on the Elderly

from home to home. (By home is here meant housing to which no social and medical service is connected.) This is followed by a discussion of the main direction of research. We stress the importance of the development of theory, and the importance of studies rooted in theory, and we devote the last parts of the paper to two concepts that we consider important with regard to the desired development of theory: the meaning of home and control.

Research on the relationship between relocation and the health of the aged started in 1945 with a study presented by Camargo and Preston. Their findings indicated that relocation to an institution led to an increase in mortality among the aged, and this was supported by Josephy (1949) and Whittier & Williams (1956). These three studies were the first in an American research tradition in this field. Since then, to the best of the authors' knowledge, at least about 50 studies have been presented, and they have been covered in a number of surveys (see e.g., Blenker, 1967; Borup, Gallego, & Heffernan, 1979; Borup, 1983; Bourestom, 1984; Coffman, 1981; Kasl, 1972; Lawton, 1977; Pastalan, 1983; Rowland, 1977; Schooler, 1976). Some of the conclusions are in conflict with one another. Despite the very large body of empirical evidence, no consensus has been reached as to whether relocation causes an increase in morbidity and mortality. The disagreement is illustrated by the debate which took place in The Gerontologist at the beginning of the 80s. From a research overview Borup et al. (1979) draw the conclusion that "the data overwhelmingly support the premise that relocation does not influence mortality" (p. 139). One practical implication, according to Borup, is that relocation programmes should not be based on the false assumption that relocation leads to an increase in mortality. This position was attacked by researchers in a number of articles. Bourestom and Pastalan (1981), for instance, write: "We regard these recommendations as dangerously irresponsible and intend to show how the conclusions upon which they are based are naive and fallacious" (p. 4).

Inter- and Intraintitutional Relocation

Research in this field has been dominated by quantitative studies and by analyses of the statistical correlation between (on
the one hand) inter- and intranstitutional relocation and (on the other) mortality/morbidity. There are two principal designs for such investigations: (a) baseline, in which the movers are followed over time and compared before and after the relocation, and (b) experimental, in which the movers are compared with a matched control group. With the latter design there is in general a greater possibility of drawing causal conclusions. In Table 1 are shown 33 studies of the correlation between relocation and mortality, with one or the other of the two designs.

Table 1

Studies of the Relationship between Inter- or Intratitutional Relocation and Mortality among the Elderly

<table>
<thead>
<tr>
<th>Study</th>
<th>Type of relocation</th>
<th>Size of group</th>
<th>Design</th>
<th>Increased mortality?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aleksandrowicz</td>
<td>Interinst.</td>
<td>40</td>
<td>Baseline</td>
<td>Yesa)</td>
</tr>
<tr>
<td>Aldrich &amp; Mendkoff</td>
<td>Interinst.</td>
<td>121</td>
<td>Baseline</td>
<td>Yes</td>
</tr>
<tr>
<td>Pihkanen &amp; Landenpera</td>
<td>Interinst.</td>
<td>108</td>
<td>Experimental</td>
<td>No</td>
</tr>
<tr>
<td>Miller &amp; Lieberman</td>
<td>Interinst.</td>
<td>45</td>
<td>Baseline</td>
<td>Nob)</td>
</tr>
<tr>
<td>Jasnau</td>
<td>Interinst.</td>
<td>247</td>
<td>Baseline</td>
<td>Yes</td>
</tr>
<tr>
<td>Novick</td>
<td>Interinst.</td>
<td>125</td>
<td>Baseline</td>
<td>No</td>
</tr>
<tr>
<td>Stotsky</td>
<td>Interinst.</td>
<td>141+65</td>
<td>Experimental</td>
<td>No</td>
</tr>
<tr>
<td>Killian</td>
<td>Interinst.</td>
<td>79+65</td>
<td>Experimental</td>
<td>Yes</td>
</tr>
<tr>
<td>Markus et al.</td>
<td>Interinst.</td>
<td>199+167</td>
<td>Baseline</td>
<td>Yes/No^c)</td>
</tr>
</tbody>
</table>

2. Like Borup et al. (1979), we include studies with different designs under the heading Baseline studies. Most of them are real baseline comparisons, but there are a few with a similar design, e.g., comparisons with a known mortality rate for a larger population of which the relocated persons were a sample, or with a relocated group during a single premove time span equal to the postmove study period (for further details, see Coffman, 1981).
<table>
<thead>
<tr>
<th>Study</th>
<th>Institution Type</th>
<th>Sample Size</th>
<th>Experimental/Control</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lieberman et al. (1971)</td>
<td>Interinst.</td>
<td>93</td>
<td>Experimental</td>
<td>No</td>
</tr>
<tr>
<td>Ogren &amp; Linn (1971)</td>
<td>Interinst.</td>
<td>30</td>
<td>Experimental</td>
<td>No</td>
</tr>
<tr>
<td>Goldfarb et al. (1972)</td>
<td>Interinst.</td>
<td>70</td>
<td>Experimental</td>
<td>No</td>
</tr>
<tr>
<td>Silverstone &amp; Kirschner (1974, in Borup &amp; Gallego, 1981)</td>
<td>Interinst.</td>
<td>ni&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Baseline</td>
<td>No</td>
</tr>
<tr>
<td>Markson &amp; Cumming (1974)</td>
<td>Interinst.</td>
<td>494</td>
<td>Experimental</td>
<td>No</td>
</tr>
<tr>
<td>Bourestom &amp; Pastalan (1975, in Coffman, 1981)</td>
<td>Interinst.</td>
<td>61+53+38+34</td>
<td>Experimental</td>
<td>Yes/No&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Pastorello (1975)</td>
<td>Interinst.</td>
<td>200</td>
<td>Baseline</td>
<td>No</td>
</tr>
<tr>
<td>Zweig &amp; Csank (1976)</td>
<td>Interinst.</td>
<td>347</td>
<td>Baseline</td>
<td>No</td>
</tr>
<tr>
<td>Gutman &amp; Herbert (1976)</td>
<td>Interinst.</td>
<td>81</td>
<td>Baseline</td>
<td>No</td>
</tr>
<tr>
<td>Watson &amp; Buerkle (1976)</td>
<td>Intrainst.</td>
<td>71</td>
<td>Baseline</td>
<td>No</td>
</tr>
<tr>
<td>Pablo (1977)</td>
<td>Intrainst.</td>
<td>52</td>
<td>Experimental</td>
<td>Yes</td>
</tr>
<tr>
<td>Raasoch et al. (1977, in Borup, 1983)</td>
<td>Intrainst.</td>
<td>ni</td>
<td>ni</td>
<td>No</td>
</tr>
<tr>
<td>Pino et al. (1978)</td>
<td>Intrainst.</td>
<td>25+25</td>
<td>Experimental</td>
<td>No</td>
</tr>
<tr>
<td>Kowalski (1978)</td>
<td>Interinst.</td>
<td>157</td>
<td>Baseline</td>
<td>No</td>
</tr>
<tr>
<td>Silberstein (1979, in Coffman, 1981)</td>
<td>Interinst.</td>
<td>137</td>
<td>Baseline</td>
<td>No</td>
</tr>
<tr>
<td>Borup et al. (1979)</td>
<td>Interinst.</td>
<td>326</td>
<td>Experimental</td>
<td>No</td>
</tr>
</tbody>
</table>
a) Aleksandrowicz (1961) indicates that there is a positive correlation between relocation and mortality, but the population studied was too small for this conclusion to be reliable. However, Borup (1983) and Coffman (1981) stress that the study does not show an increase in mortality, while Lawton & Nahemow (1973) and Pastalan (1983) stress the opposite.

b) Four out of 45 patients died within 18 weeks of having moved — which does not constitute a significant increase in mortality. Yet, e.g., Bourestom (1984) takes this as an example of a study that does indicate such an increase.

c) Two groups were studied — one for which the relocation involved a radical change of environment, and one for which the change was only moderate. In the first group, but not in the second, there was increased mortality as compared with a control group.

d) Certain studies we have had access to only by way of other surveys. Where for this reason information is lacking, we here write “ni” (“no information”).

e) A group of 40 movers were studied, but mortality was compared with regard to all the patients in the institution — and we are not told how many of them there were.

f) In one of the four groups that moved, mortality increased as compared with a control group.

The majority (approx. 73%) of the studies in Table 1 do not confirm the hypothesis that relocation leads to an increase in mortality. In most of the previous research reviews little or no attention has been paid to the fact that the studies are of very different quality. For instance Borup et al. (1979) draw the conclusion that their hypothesis, that relocation does not influence mortality, can be supported by the argument that 75% of all
studies, and 85.7% of the studies utilizing an experimental design, do not show any significant increase of mortality among the movers. However, because of the different methodological quality of the studies it is not possible to make such a general statement. Studies like Ogren & Linn (1971) are given the same importance as Marlow (1974). In the former, which shows no increase in mortality, only 30 persons were studied, with an experimental design. In the latter there was a follow-up of 1100 patients who moved from a hospital. Comparisons were made between this group and a control group of patients who did not move. The results indicate that moving caused an increase in mortality and also a deterioration in the functional capacity and physical and mental health of many of the survivors.

But what of the relationship between methods and results in the studies presented in Table 1? Two crucial factors regarding the possibility of drawing causal conclusions are: (a) design — where the experimental design, including a matched control group, is in general the most appropriate; (b) size of the group — where the number of people involved in the study limits the possibility of finding significant correlations. Table 2 shows (to the extent that the requisite information is available) (a) how many studies have one type of design and how many the other, (b) how many of each type involve groups of up to 100 persons and how many involve groups of over 100, and (c) how many of each of the different types indicate a positive correlation between relocation and an increase in mortality.

Table 2

Proportion of the Studies That Have Indicated a Positive Correlation between Relocation and Increased Mortality, Divided According to Design and to Size of Group Investigated

<table>
<thead>
<tr>
<th>Size of group</th>
<th>Design Baseline</th>
<th>Experimental</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experimental</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-100</td>
<td>1 of 5 (20%)</td>
<td>1 of 5 (20%)</td>
<td>2 of 10 (20%)</td>
</tr>
<tr>
<td>101–</td>
<td>3 of 10 (30%)</td>
<td>4 of 8 (50%)</td>
<td>7 of 18 (39%)</td>
</tr>
<tr>
<td>Total</td>
<td>4 of 15 (27%)</td>
<td>5 of 13 (38%)</td>
<td>9 of 28 (32%)</td>
</tr>
</tbody>
</table>
Thus when it comes to the studies that support the hypothesis of a positive correlation between relocation and increased mortality, there is a greater proportion of those involving over 100 persons than of those involving up to 100. Furthermore it can be seen that the hypothesis gets a larger percentage of support from the studies that have an experimental design than from those that have a baseline design. Only eight of the 28 studies both have an experimental design and involve a group of over 100 persons — and half of them show an increase in mortality.

We do not agree with Borup et al. that relocation has no influence on mortality. As Rowland (1977) points out, there are two studies that stand out as having the best experimental design: Aldrich & Mendkoff, (1963) and Killian (1970). Both studies give support to the hypothesis that relocation to another institution leads to an increase in mortality (Rowland, 1977, p. 363). If there are studies of very high quality which do support it, this is enough to demonstrate that Borup et al. are wrong, regardless of what percentage of studies support or do not support the hypothesis.

Relocation from Home to Institution

Table 3 offers a summary of the studies that concern the relationship between mortality and relocation to an institution, senior housing or the like — though, as before, it is a question just of studies that have either an experimental or a baseline design.

None of the studies in Table 3 indicates a positive correlation between relocation and increased mortality.

Several studies with a design other than baseline or experimental show a high mortality after relocation to an institution. Ferrari (1963) compares mortality in two groups that moved to an institution, one voluntary and the other not; 16 of 17 in the latter group died within ten weeks. Schulz & Aderman (1973) present results showing a higher mortality in a group that moved to an institution from their homes, than in a group that came from another institution. Kral, Grad, & Berenson (1968) followed 54 elderly people — 24 men and 30 women — who moved to an institution. Four of the men died during the first six months, and ten had died within 23 months. These studies,
which do not compare mortality before and after the move or use a control group of nonmovers, cannot be treated as equal in value to the other studies (those in Table 3), without the methodological drawbacks being considered.

Table 3

<table>
<thead>
<tr>
<th>Study</th>
<th>Type of relocation</th>
<th>Size of group</th>
<th>Design</th>
<th>Increased mortality?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lieberman (1961)</td>
<td>To inst.</td>
<td>782</td>
<td>Baseline</td>
<td>No&lt;sup&gt;a)&lt;/sup&gt;</td>
</tr>
<tr>
<td>Costello &amp; Tanaka (1961)</td>
<td>To inst.</td>
<td>454</td>
<td>Baseline</td>
<td>No&lt;sup&gt;a)&lt;/sup&gt;</td>
</tr>
<tr>
<td>Carp (1974)</td>
<td>Senior housing</td>
<td>204</td>
<td>Experimental</td>
<td>No</td>
</tr>
<tr>
<td>Lawton &amp; Yaffe (1970)</td>
<td>Senior housing</td>
<td>129</td>
<td>Experimental</td>
<td>No</td>
</tr>
<tr>
<td>Wittels &amp; Botwinick (1974)</td>
<td>Senior housing</td>
<td>462</td>
<td>Experimental</td>
<td>No</td>
</tr>
<tr>
<td>Kasl et al. (1980)</td>
<td>Senior housing</td>
<td>225</td>
<td>Experimental</td>
<td>No</td>
</tr>
</tbody>
</table>

<sup>a</sup> Both Lieberman and Costello & Tanaka measured the mortality in a group which moved to an institution. They compared the mortality before and after the relocation. In both cases mortality was considerably higher after the move, and several authors have taken the two studies as supporting the hypothesis that relocation leads to an increase in mortality (Bourestom, 1984; Blenker, 1967; Lawton & Yaffe, 1970). But different lengths of time were being compared — the period of waiting was appreciably shorter. If the same lengths of time are compared, the results do not support the hypothesis.

For example Kasl, Ostfeld, Brody, Shell, & Price (1980) illustrate that mortality can be too crude an indicator of the effects of relocation. The study shows no significantly higher mortality among those that have moved. But the move did have a negative effect on health (measured by a number of indicators, e.g., self-rating on health status, nursing home admissions, hospitalizations and doctor's visits).

In the category home to institution we also find a Swedish study (Toyama, 1988) of 14 households that moved into warden-assisted flats. For some of the elderly the move had very negative health consequences.
Relocation within the Community

Surprisingly few studies are to be found in this category, and none of them take up the effects in terms of mortality. There are two studies reported before 1980 that are concerned with the effects of relocation on health: Kasteler, Gray & Carruth (1968) and Schooler (1976). Their results support the hypothesis that there is an increase in morbidity in the group relocated.

During the 1980s three American investigations of this type of relocation have been reported. Their results are to some extent in conflict with one another. Ferraro (1982) studied the effects of relocation on both functions and health, measured by four indicators: disability, ADL-functions, number of days spent ill in bed, and number of days spent ill in a hospital or other medical institution. The main conclusion from Ferraro’s study is that all four variables are strongly correlated with relocation. Eckert & Haug (1984) followed a group of the elderly who moved between various urban residential hotels. There was no change in the people’s own view of their health, but a deterioration with regard to ADL-functions. In mental health there was in fact an improvement. Also the results of an investigation by Dimond, McCance & King (1987a, 1987b) indicate relocation as having both positive and negative effects.

Recently quite a number of Swedish case-studies have been carried out, all of them in connection with relocation caused by urban renewal. In Danermark (1985) are presented a number of cases where relocation had negative consequences. Ekström & Kullberg (1987) report a survey involving interviews with 38 elderly people who were forced to move because of rebuilding. Some of the people experienced stress and anxiety at the prospect of moving and/or because of not being happy in their new accommodation. In the case of a few the stress was followed by a decline in health. Some of these people died just before or soon after the move. Similar findings are reported by Öresjö (1988) from a study of urban renewal in a neighbourhood unit Öresjö writes that “the physical and mental stress associated with rebuilding has led to a deterioration in the health and well-being of several of those affected” (p. 65).
Direction for Future Research

It seems perfectly clear that the question as to whether or not there is a positive correlation between relocation and mortality/morbidity is not the fruitful one. What is fundamental, as Bourjesson and Pastalan (1981) put it, is the question "under what conditions and with what kinds of population are those negative or positive effects most likely to be observed" (p. 5).

The factors influencing the outcome of a relocation have in many studies been characterized as having to do with (a) individual characteristics, (b) the environmental change, and (c) voluntariness. The first category includes variables like sex, age, and health. In the second category the change is operationalized in terms of moving from home to home, from home to institution and between institutions. The third category concerns whether or not relocation is voluntary.

Kasl (1972) concludes that several characteristics negatively influence the effects:

...being male, older, and in poor health; living alone and having few contacts with friends and kin; in poor financial circumstances and of lower social class; having lived in an old neighbourhood a long time; of low morale and life satisfaction; reacting to move with depression; giving-up; and hopelessness-helplessness. (p. 381)

But the very broad range of research that we have summarized provides little knowledge of the processes, of the often complex causal mechanisms, whereby relocation affects the health of the elderly. The research offers little in the way of a convincing explanation of how and why the characteristics mentioned by Kasl influence the consequences of moving. The main reason for this is that the research — like research within the field of social medicine in general — has almost exclusively been a question of quantitative studies and of analyses of statistical correlation, without roots in a developed theory (Diderichsen & Janlert, 1982). It is because of this bias that relocation has to a large extent come to be looked upon as a relatively unequivocal dependent variable. Few studies have gone with any depth into the various meanings that relocation has for the elderly (Redfoot, 1987).
Our survey of more than three decades of research in this field demonstrates with great clarity that there is very little new knowledge to be acquired from a continued atheoretical gathering of data with the aid of quantitative methods. If there is to be a development of knowledge concerning the complex causal mechanisms that lie behind the observed statistical relationships, what is needed is (a) studies grounded in theory, and (b) deeper process-oriented case-studies.

In the realm of psychology several theories and theoretical models have been developed that explicitly take up the question of the health and well-being of the elderly in relation to their environment and to changes in this environment — for instance Lawton’s adaption theory, Kahana’s person-environment congruence model and the cognitive stress theory of Lazarus and his colleagues at Berkeley (See, e.g., Lawton, 1977, Kahana, 1975 and Lazarus & Folkman, 1984). These theories/models have been developed in relation to, and have been used as points of departure for, empirical studies in various fields — though only by way of exception studies of the effect of relocation on the health of the elderly (McCracken, 1986). We find the cognitive stress theory especially valuable. It lays great emphasis on the processes whereby events and situations acquire meaning for, and are handled by, the individual. Central to it are such concepts as cognitive appraisal, coping and control. It has not only a psychological and physiological level, but also a sociological one — and even though the latter level occupies a subordinated position and remains undeveloped, this theory nevertheless has greater depth and explanatory power than Lawton’s theory and Kahana’s model. Both of the latter focus almost exclusively on the psychological level, proceeding from traditional stimulus-response models to putting the individual’s adaption at the centre.

There is a particular lack of sociological contributions to the development of theory in this field. In the rest of this article we introduce two concepts which we think are important in such development: The meaning of home and control.

The Meaning of Home for Older People

In our survey we found only one study that is systematically related to the extensive research that has been carried out
regarding the meaning of home, despite the fact that there is good reason to believe that this has great explanatory value (Toyama, 1988). We contend that relocation has to a great extent a different meaning, and is to a great extent differently perceived, depending on the meaning and the importance of the original and the new home to the mover and on his or her life-situation.

Relatively few of the many studies of the meaning of home have focussed on the circumstances of the elderly (Despres, 1989), but a number of researchers have pointed out that the home often has great importance for these people. Taking as our point of departure certain general categories of the meaning of home that are presented by Despres (1989), we now go on to summarize a few of the results of this research.

Home as Permanence and Continuity

A lot of elderly people have lived in one and the same place for many years, or if nothing else they have established their home for a long period. Thus the home and the surroundings are often very familiar indeed, involving deep roots and a host of memories. This is pointed out by Sixsmith (1986 and 1988) who on the basis of a survey writes as follows: "To illustrate, older people are likely to have lived in their present home for a long time and thus have many associated memories. They are surrounded by their possessions, which contribute to a feeling of familiarity" (Sixsmith, 1986, p. 338).

In an article based on a survey of 522 men and women in three towns in England, Saunders (1988) writes: "The importance of the home increases as people get older. Not surprisingly, perhaps, older people express stronger emotional attachment to their homes than younger people do, and they also appear more firmly committed to staying in them" (p. 10).

Attachment to home and reluctance to move are related by Saunders to "the longer period of residence built up by older people (i.e., they have had more opportunity to 'put down roots'), and in part to the greater proportion of time spent in the home as people get older" (p. 11). Saunders also says that older people regard the home as an embodiment of past memories. Golant (1984) presents a survey of 400 elderly people living in Evanston, a small urban middle-class municipality just north
of Chicago. The results show that the majority of the old people were satisfied with, proud of, and had good memories about, their communities, neighborhoods, and dwellings, which is to say that they had very positive territorial experience. Golant gives seven types of explanation for this experience. Two of the explanations have to do with the fact that the elderly have often lived longer in the same dwelling and/or neighbourhood than have the young. Golant says, firstly, that: "...older residents have had more time to adapt, adjust, or accommodate their needs and goals to their existing environments. /.../ they have developed stronger social and psychological attachments to their place of residence". (p. 211).

Secondly, he says that:

...longtime occupancy in one environment increases the probability of cumulated positive (territorial) memories. Thus, the greater environmental satisfaction expressed by older people is due, in part, to their ability to selectively recall and reconstruct a lifetime of favorable environmental experiences that reinforce their present positive feelings and beliefs about their territorial environment. (p. 212).

In a study of elderly persons in a rural northern Appalachian community in the USA Rowles (1983) identifies three dimensions of the ties that elderly people have to their environment: (a) "physical insideness", referring to the person’s familiarity with the physical environment, (b) "social insideness", referring to the person’s rootedness by way of the social network and the local community, and (c) "autobiographical insideness", referring to the sense of belonging to a place, deriving from a series of events, experiences and memories that over the years have become associated with the place. These dimensions are based more or less on the assumption that the elderly have lived a long time in one and the same place.

Home as a Symbol — a Reflection of One’s Ideas and Values

Especially for elderly people the home also has a symbolic value and is of great importance with regard both to the creation
and to the maintenance of personal identity (Golant, 1984; Sixsmith, 1988; and Howell, 1982). Howell thinks that in particular the way in which the elderly evaluate an environment, together with the way in which they react to change in the environment, is determined by their endeavour to defend their identity:

As the individual ages, moves successively through phases of the life-cycle, the perception of risk in the environment changes from that of physical hazard or challenges to mastery, to that of affirming or defending identity. The issue which adult individuals confront, in a highly mobile or rapidly changing physical environment, is how to maintain themselves in historical perspective. (Howell, 1982, p. 21)

**Home as Security and Control and Home as a Place for Privacy and Independence**

In the above-mentioned study Golant (1984) says that one reason why the residential environment has a special salience for the elderly is that it represents something predictable and controllable. This is important inasmuch as the elderly in other respects often live in greater insecurity and uncertainty than do the young, for instance because of the greater risk of poor health, loss if independence and so on.

Willocks, Peace & Kellaher (1987) and Sixsmith (1988) also identify control, security, privacy and independence as important dimensions of the meaning of home for older people.

Within the privacy of home, an older person can control, and often conceal, declining capacities in the management of daily living. /.../ The ability to continue to master the physical environment despite frailty confers power upon the individual, and this in turn can enhance personal capacity to interact beyond the locus of home. Moreover, such abilities will reinforce an older person’s confidence to manage. (p. 7)

**Home as a Centre of Activities and Home as Relationships**

It is in generally the case that the time people spend at home increases with age, whereby correspondingly less time is spent in shops, on journeys, in parks, etc. (Andersson, 1988).
According to the so-called disengagement theory, originally formulated by Cumming & Henry (1961), old age involves a reduction of people’s interaction with the surrounding society. As they advance in years, people maintain fewer and fewer roles through which they participate in and influence society, becoming at the same time less active in the roles they do maintain. This development is taken as being matched by a corresponding reduction in society’s expectations. The theory is that the disengagement enables the individual to attain an equilibrium with society, and that this equilibrium represents the most satisfactory way of coming to terms with aging (Lehr & Rudinger, 1969).

The disengagement theory has been criticized for its assumption that reduced activity with age is bound up with well-being. The so-called activity theory stresses on the contrary that the elderly benefit from being able to maintain activities and social contacts. The reduction of roles, for instance through retirement or the death of a spouse, is regarded as involuntary and negative (Olsen, Trampe & Hansen, 1976 and Teeland, 1979).

Common to these theories, though, is that they indicate that old age usually leads people to abandon the roles which previously have been the basis for social relations and participation in society. Teeland (1978) is of the opinion that the latter part of most people’s lives, at least in urban industrial societies, can be described as a chain of losses:

In the middle of their 60s the occupational role for the man, but increasingly for the woman too, is lost via retirement. After retirement and past the 70 years of age mark, the losses may come quickly. Someone from the category, brothers, sisters, and friends will be lost by sickness or death. More significantly, the retirement couple will be divided by the death of one of the spouses. (p 151)

These social losses could — at least to some extent — be replaced by new activities and new relationships, but the probability is that for many of the elderly it means that their own home becomes more important. Elm Willcocks, Peace and Kellaher (1987) report that “...home will represent, for many, the one remaining domain through which they can connect with the wide context” (p. 7).
It goes without saying that the elderly cannot be treated as a
homogeneous group. Factors such as health, gender and socio-
economic situation can be very important with regard to what
importance the home has for various groups of old people.
People's health and economic situation determine for instance
what their possibilities are of maintaining activities outside the
home that can make the role of the home less decisive. When it
comes to the aspect of gender, there are for instance studies
which indicate that elderly women spend more of their time at
home than do elderly men, which can mean that women are
more tied to the home and in this sense more vulnerable to
environmental change (Walldén 1975).

By attending to the meaning of home for various groups of
the elderly we can thus find explanations of the oft-observed
statistical correlation between (on the one hand) such variables
as sex, age and class belonging and (on the other) changes in
health in connection with moving.

The Importance of Control

We contend that the concept of control is of fundamental
importance when it comes to the relationship between relocation
and the health of the elderly. Present-day research gives support
to the idea that loss of control can cause stress and ill-health, and
that variations in control are decisive with regard both to
whether an event is perceived as stressful and to whether any
stress that occurs leads to a deterioration in health (see e.g.,
Rodin, 1986).

In the research concerning the relationship between reloca-
tion and ill-health controllability has often been studied in terms
of voluntary/involuntary relocation. Many scholars contend
that the degree of voluntariness is decisive with regard to
the effect of relocation on the health of the elderly (see e.g.,
Bourestom & Pastalan, 1981; Kasl et al., 1980; Rowland, 1977;
Toyama, 1988).

While many of these studies can be criticized on meth-
odological grounds and are not in total agreement, the
weight of the evidence strongly suggests that voluntary
versus involuntary participation is an important factor in
relocation outcomes. Moreover, this appears to be the case
whether the relocation is within the community, from home to institution, or from one institution to another (Bourestom, 1984, p. 70).

The research offers examples of relocation being caused by circumstances that the persons affected have had little chance of influencing. In Kasteler (1968), Brand & Smith (1974), and a number of Swedish case-studies (Danermark, 1985; Ekström & Kullberg, 1987 and Öresjö, 1988) there are accounts of compulsory relocation because of urban renewal, and in all these cases there were negative effects. Aldrich & Mendkoff (1963), Killian (1970) and Marlow (1974, in Bourestom, 1984 and Coffman, 1981) show an increase in mortality when patients are forced to move from one institution to another (i.e., when the first one was shut down). Correspondingly, a number of studies show that if relocation is voluntary there is no increase in mortality (see e.g., Lawton & Yaffe, 1970; and, Wittels & Botwinick, 1974) or indeed any negative effect on health (see e.g., Storandt & Wittels, 1975; and Lawton & Cohen, 1974).

In certain studies there is a comparison of persons who moved voluntarily and persons who had no choice. Smith and Brand (1975) compare two groups that moved to an institution, one of them voluntarily from home and the other involuntarily from other institutions. The proportion of the first group that evinced better life-satisfaction after the move was significantly greater than the proportion of the second group that did so. However, it is uncertain to what extent this can be related to the degree of voluntariness. Ferrari (1963) compares two groups that moved from home to an institution — one group that did not regard themselves as having any alternative, and one group that did. During the first ten weeks after the move 16 of the 17 (94%) in the first group died, but only one of the 38 (2.6%) in the second group. But one major defect of this study is that there is no information regarding the people's state of health.

Schulz & Brenner (1977) are among the few that have related the large number of empirical studies of the relationship between relocation and mortality/morbidity to a theoretical framework. They take it that controllability and predictability are two important mediators of individual response to stressful
events. From the theoretical perspective they formulate the following hypotheses: (a) "The greater the choice the individual has, the less negative the effects of relocation. Thus, voluntary relocatees should fare better than involuntary relocatees" (p. 324); and (b) "The more predictable a new environment is, the less negative the effects of relocation" (p. 324).

Schulz and Brenner's survey of research gives support to these hypotheses. At the same time they stress that none of the studies in their survey was specially designed to test the theory of controllability and predictability. Some researchers argue that the notion of predictability is closely tied with the concept of control (See, e.g., Rodin, 1986).

Even though there seems to be general agreement that the concept of control is a fruitful point of departure in the study of the effect of relocation on the health of the elderly, the theoretical model is still underdeveloped. The researchers, including Schulz and Brenner, tend for the most part to treat control as a dichotomous variable — voluntary versus involuntary relocation — and the concept has not been related to other important variables. The degree of control that can be exercised by the individuals over a change in their environment depends on quite a number of factors: the reasons for the move, who took the initiative, who makes the final decision, coping strategy, etc.

The concept of control has been developed to become a central concept in the field of psychologically-oriented stress research, and also a central concept in the accompanying formation of theory (Rodin, 1986, Wills, 1985 and Lazarus & Folkman, 1984). Control is, in this case, principally a matter of the way in which individuals cope with a stress situation that has already arisen.

Further development of theory should add a sociological perspective to the achievements in the field of psychology. In the first place it is essential to focus on the prerequisites for, and the importance of, collective action. In the second place it is essential that the possibilities of such action are looked upon as decisive with regard to what the people's environment is actually like and the shape in which various events appear (including whether or not they give rise to stress). In the third place it is essential that the degree of control be related to people's social
and economic situation. Several researchers indicate, for instance, that there is a strong correlation between control and social support (Syme, 1986, Wills, 1985 and Krause, 1987). In an effort to take research concerning the relationship between social support and health one stage further, Syme (1986) argues that social support — at least in certain connections — should be regarded as one component of a more general concept, control over one’s destiny. Syme is of the opinion that this concept can also be used to explain the well-documented circumstance that people in the lowest socio-economic groups often have the highest rates of morbidity and mortality. Finally, it must be taken into consideration that people’s control is structurally determined. Both people’s conception of their own power of control, and also their actual possibilities of taking action by which to obtain and maintain control of a situation, are closely related to the prevailing power relations in society.

Conclusions

The review indicates that American research is very dominant in this field. Particular attention has been accorded to relocation to, between, and within institutions. Mortality is the commonest dependent variable, but various measures of physical and mental health have also been used. The results of this relatively comprehensive empirical research, which was begun in the mid-40s, are far from unequivocal: there is disagreement as to what conclusions can be drawn.

In the present state of research there are not sufficient grounds for the drawing of general conclusions. On the other hand there is good reason for assuming that relocation under certain circumstances and for certain groups does lead to ill-health and to an increase in mortality. The relationship between relocation on the one hand, and ill-health and mortality on the other, is very complicated. The research indicates a series of factors that are assumed to be of great significance, but there is a lack of studies devoted to systematic investigation of the influence of such factors. Various designs and methods (including measuring instruments) have been used, and this reduces comparability. Furthermore many studies are deficient in both design and method. There is also a lack of theoretically guided
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empirical investigations. The aim in many studies seems to have been restricted to finding statistical correlation between relocation and mortality/morbidity.

Despite the great importance of home for the elderly, few studies have focused on it. Previous research indicates that relocation has a different meaning and is differently perceived, depending on the meaning and importance of the original and the new home to the mover and on his or her life-situation. In order to develop theories and research in this field, research on relocation among the elderly needs to include recognition of the importance of the meaning of home for the elderly.

We also argue that the concept of control is fundamental in this field of research. Control over the environment and over processes like relocation is of great importance. Traditionally, control has been introduced in the research by studying voluntary and involuntary moves. However, the concept has to be elaborated to be a useful tool in the research. For instance, it is necessary to consider factors like the conditions for and importance of collective action, the social and economic situation of the elderly, and the opportunities for individuals and groups to control the environment and the process (whereby it needs to be remembered that such control is structurally determined). This implies the importance of relating the social and material conditions of the elderly to a structural level of analysis.

References


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Housing and Health in Beijing: Implications of High-rise Housing on Children and the Aged.

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The authors are at present engaged in a Swedish-Chinese interdisciplinary and crosssectional project on housing and health in Beijing. This article is concerned with a literature review on the topic and general observations during two recent visits to China.

After some basic assumptions concerning high-rise dwellings, private space and life style, this paper contains explicit comparisons of the design, use and experience of traditional courtyard houses, flats in mid-rise and high-rise buildings as well as a comparison of two vulnerable groups, i.e., children and elderly residents.

The article ends with a discussion, and the authors conclude that city planning without involvement of specialists from the field of psychological factors and environmental health (i.e., a matter not only of quantity but also of quality) will provide an inadequate environment for the development of children and care of the elderly.

The aim of the article is to give an outline of, as well as a presentation of the first phase of a project entitled “Effects of various types of city dwellings on family functions and the health of children and the elderly in the People’s Republic of China”. The article is based on general observations from two visits to China in December-87 and October-88 completed with some findings in the literature on the implications of urbanization on dwelling, health and well-being. The second phase of the project is to start analyzing the systematic measurements from the field study. The systematic measurements have not yet
been analysed. This will start in spring 1989 and will last about one year.¹

We assume that change from traditional dwellings to mid- and high-rise dwellings, as it is presently carried out, implies changes in both the private space and the lifestyle of Chinese families (especially the young and elderly). From our preliminary and general observations during two visits in Beijing we have come to the following basic assumptions:

(a) Rapid changes in the built environment demand a lot of mental activity in the sense that the inhabitants must appropriate (Korosec-Serfaty, 1976) the new environment and learn how to use and live “together” with it. The individual capability for this kind of adaptation and assimilation is usually high when the individual is young but becomes very low among elderly persons (refer to diagram 1).

(b) Rapid, radical and extensive changes to the built environment make a lot of people lose their “home-feeling”. Cultural and individual identities will be put under stress and partly lose their connections with the built environment. The cultural heritage and earlier appropriated knowledge, concerning the environment, will extensively be useless in new high-rise residential areas (refer to diagram 1).

(c) The built environment may help, counteract, or make it difficult to satisfy the needs of human beings of contact (seeing, listening to, speaking with or interacting with others) and of privacy (being able to screen oneself off from others and from external influences), experiences (to be able to see, hear, etc.) play and development, structure (to be able to guide, to be able to place things in the environment in relation to myself), identification and aesthetic (symbols, order and values of the building).

(d) The building environment may variously and to a varying degree satisfy the needs of the supply of social and commercial services, places of work, cultural and recreational activities as well as collective transport facilities.

¹ This article is descriptive. The data from the field study mentioned in the text is not finalized. Therefore statistical comparisons are excluded in this version.
Diagram 1. Capacity for environmental appropriation through the life span.

1. The assumptions (1) and (2) could in a simple form be illustrated by a diagram. Individual capacity for environmental appropriation is indicated on the Y-axis. On the X-axis, time (age) is visualized. The capacity of environmental appropriation is best when the individual is between 5 and 20 years old and the most intensive period is probably between eleven and fifteen years of age. Afterwards the capacity decreases and in the last part of the life cycle it is very low. If the environment changes fast and radically when the person has passed the peak of her capacity, her relation to the new environment will be correspondingly reduced. The older the individuals are the more they will became strangers in a changing environment.

In this article we make an explicit comparison between the old traditional house type, the one-storey courtyard house, and the modern flats in mid- or high-rise buildings. We also pay attention to the different ways of living in the two kinds of houses and the impact upon children and the elderly.
A Swedish-Chinese Joint Project

The authors are engaged in an epidemiological research collaboration between the Department of Stress Research, Karolinska Institutet, Stockholm and the Institute of Mental Health, Beijing Medical University. Today some of the collaboration also includes the Department of Architecture at Chalmers University of Technology in Göteborg and the Department of Architecture at Tsinghua University in Beijing. The project has been approved by the Ministry of Health in Beijing and is funded by the Swedish Council of Building Research for a period of three years.

The project endeavours to bring about interdisciplinary and cross-sectional epidemiological research collaboration and result utilization.

In the project we have selected 120 three-generation households, comprising approximately 600 persons in Beijing in an area called Western District, well known to the collaborating Chinese researchers. The Western District is comprised of a little more than 30 neighbourhood committees. Among those, five were selected by representative sampling. Each household includes at least one person from the oldest generation, and a child 14 years old or younger. The household should have been living in the same place for not less than 18 months. The sample of households represents three types of dwellings with 40 households selected from each type:

(a) *Dwellings in traditional courtyard houses* dating back to the time before 1949 (usually one-storey buildings around an open quadrangular courtyard, often very densely populated and without modern conveniences)

(b) *Dwellings in mid-rise buildings* (flats in 3–6 storey houses, usually constructed in the first decades after 1949)

(c) *Dwellings in high-rise buildings* (flats in 7–20 storey houses erected from 1977).

Such a small sample cannot possibly be representative for Beijing and still less for China in general, but it still represents three of the most common dwelling types in large contemporary Chinese cities.
The questionnaires were administered in structured interviews by two medical doctors (one asking, one recording). The documentation of the physical environment, including inside measurements and time-space diaries, was carried out by two architects. The field-study is finished and the analysis of the data started during Spring 1989.

Some Facts about Housing in Beijing

The People’s Republic of China has the world’s largest rural population, in absolute figures as well as a portion of the total population. An enormous surplus of labour results from the current rapid mechanization and modernization of Chinese agriculture. Half the population is 21 years or less, and mean length of life is increasing, so the population is sharply increasing: during the next 14 years there will be an increase of 200 to 300 million people. At the same time, the rapid expansion of light industry creates a huge demand for labour, primarily in small- and middle-size towns. Together, these developments are predicted to cause a wave of urbanization and crowding without a counterpart in history (Levi and Tseng, 1983; Ekblad, 1985). At present, rapid urbanization has increased the urban population to roughly 40% of China’s total population (Lavely, 1989). The term urbanization in China concerns an intermediate sector that is neither city nor farm, i.e., farmers who leave the land to ply trades in market centers in rural areas (i.e., towns). The world’s largest and oldest agrarian state will become a predominantly nonagricultural society. A housing shortage will become a real and acute social problem. Yet, the results of published studies on crowding, density and absolute numbers are not clear. However, Chinese families, appear to manage without the negative effects of crowding that might cause serious stress in Western societies (Mitchell, 1971; Andersson, 1972). The urbanization process has established city populations, i.e., “floating population” of temporary migrants who lack permanent urban registration. Official data indicate that the floating population makes up approximately 10% of the urban population in Beijing. The Chinese government undertook a number of programmes as part of its activities for the International Year of Shelter for the Homeless during last year, 1987. (Some facts about Beijing are found in Table 1 in the Appendix).
Introduction

The Chinese cities, and perhaps above all Beijing, have been built in a hierarchical feudal system of square blocks during a thousand year or more. In Beijing this form is dominated and generated by the Imperial residence and the Forbidden City. The smallest unit or cell in this system is the traditional courtyard house. This is still the most frequent residential house in Beijing, especially in the "Outer City", the area outside the Forbidden City but inside the outer wall of Beijing (see map Figure 1). Most of the courtyard houses in this area were built in the Qing Dynasty (1611–1911).

Traditional Courtyard Houses

The basic architectural element used in the traditional concept of city planning is this generic courtyard house, surrounded by a wall. All houses face inwards to the courtyard, and the outer wall encloses it from surrounding units and streets. The streets are like narrow channels, on both sides bordered by heavy walls without any windows and only interrupted by the portals framing the entrances to the courtyards.

The courtyard house is a type with many variations. It is mostly a one-storey house, called "ping-fang" in the Chinese language. The organization and the form of the courtyard house is the result of a long process in which the form of the house and the social, economic and cultural needs and habits of the Chinese family, all are developed in a process of interaction. A building regulation system was developed already 700 years ago and later modified from time to time. In the harmonic phases of this process, the house reflects the traditional culture and this culture is correspondingly materialized in the house.

However, today, the courtyard house reflects the feudal society, and it is still quite possible to see, what person a particular courtyard house was initially designed for. Not only the number of courtyards and houses but also the number of jian (the area between four pillars), the decorations and even the colours followed a strict code, corresponding to the rank of the
household. According to this system, the courtyard houses were specially designed for each category of princes, dukes, officials of different ranks, and common citizens (Figure 2).

The inner organization of the courtyard also reflected the traditional family system based on Confucian patriarchal principles. In one family there might be three, four or even five generations. The head of the family was the father of the oldest generation and the older generation always had precedence over the younger. All this was worked out in the design and in the use of the buildings and the courtyards between them.
Figure 2.
The main axis of a typical courtyard house is from south to north, which is also the length of the rectangle. On each side of the courtyard, buildings or suites of rooms are symmetrically placed. The entrance is at the corner, mostly on the south wall.

Traditionally, the head of the family and his wife lived in the northern house, facing the south. This house was the largest and it was situated on a platform often three steps above the level of the courtyard. Here were also the main living room and perhaps a bedroom for the younger children. Here the family ate, celebrated, and received their guests. Older children lived in one of the east or west buildings and perhaps a married son and his family in the other. The platform of those houses were lower than that of the main building. The south building was occupied by members of the family of the lowest rank, or by servants. This house was also situated on the lowest platform, only one step above the courtyard (Figure 3).

The kitchen, which often dominates the dwellings of many other traditional building cultures, has a less important influence on the organization and design of the traditional Chinese courtyard house. It does not take up any definite room or location and can be set up outdoors on a temporary basis, at the back of the house (when more than one courtyard) or in a side room (Zhao, 1985).

This house type (Figure 2-3) is known to have existed for at least two thousand years and is to be seen on pictures from the Han dynasty (206 BC – 220AD). They have changed very little since. Until 1949, the courtyard house, was the dominant dwelling in Beijing. There was only a small amount of western influence or colonial dwellings.

Transformations after 1949

The traditional courtyard houses are now being rapidly and extensively demolished and replaced by high-rise buildings. According to recent plans for Beijing only a few smaller areas are being preserved and restored (interview at Ministry of Construction). This rapid change will probably lead to a significant change of every day life of the citizens of Beijing, and deeply influence the Chinese culture and society. However, some changes in the domestic culture began immediately after the Liberation 1949.
Figure 3.
Housing and Health in Beijing

Housing was not given high priority in 1949. The authorities adopted the principle "production first, life second". During the next 30 years the average living space (i.e., the net habitable area such as bedrooms, living rooms, etc.) per inhabitants decreased from 4.5 square meters to 3.6 square meters in the urban areas, due to insufficient investment and construction (Zhang, unpublished).

The policy after 1949 of considering housing as a welfare service, aimed at lightening the family economic burden in view of the prevailing low wage system. The average family expenditure on rent has been 1-3% since then, (i.e., social welfare about the same as the cost of electricity!). In most of the cities of China, until late 1979, domestic space was distributed by local governments or leaders of working units, and family size was one of the major criteria for distribution. Since the onset of the national campaign of one-child families, which China was the first country to launch, in 1979, local government leaders in most cities usually have assigned living quarters of the same size to one-child and to two-child families.

In the 1950s and 1960s the investment in urban housing accounted for no more than 0.7% of GNP. In 1985 according to official statistics, the figure was 3%. The low cost system leads to a shortage of funds for maintenance and repair. Private investment and private ownership of the apartments is encouraged by the officials. According to official statistics the percentage of private urban housing has been increasing from 17% in 1982 to about 20% in 1987. Still there is no private home insurance, which complicates the situation whenever something is demolished in the house or apartment.

From 1949, there was, as mentioned above, an extreme shortage of housing and the traditional way of using the courtyard house, just for one family, was more or less abandoned. Several families were now forced to live around the same courtyard and even under the same roof. Single buildings, which were not originally built to live in, were now used as bedrooms and living-rooms. Extreme overcrowding became common and today the situation is still the same, and in some big cities, for example Shanghai, perhaps even worse. In these traditional residential areas in Shanghai there are still less than three square
meters living area per person. Also in Beijing, many courtyards are densely built-up with a lot of extra small houses, usually erected by grown-up sons of the families living around the courtyard. This in-fill activity was accentuated in Beijing after the big earthquake in 1976 (with its centre in Tangshan), when a lot of households received building materials from the state to repair the damages. This material was often used to erect new small houses in the courtyards.

What actually is happening is that the old traditional social pattern tries to take form, now in a more overcrowded situation, and we can see how the three generation family tries to stick together in the same household but now side by side with other three generation families inside the same courtyard.

The courtyard is still a central part of the traditional Chinese dwelling. It serves as a playground for the children as well as the place for a lot of domestic activities including cooking, repairing bicycles, storing of coal and cabbage, laundering and so on. It is also the place for social interaction between members of the household and people from different households. It is also an open space where the inhabitants meet strangers and other visitors, a private or semi-private zone between the house and the street. Most of these activities still take place in the courtyard, even if the social situation is changed when one family has to share the place with other families. However, this new situation also leads to quarrels with neighbours about the common use of the courtyard.

Today it is a fact that, for some people, the traditional house and the overcrowded courtyard, represent a bad dwelling and a nonattractive way of living. Yet, it is also a fact that many people, without hesitation, would prefer to live in a small courtyard house, surrounded by the network of their own family, than to live in a small apartment in a high-rise building without their family.

Mid-rise in the 1950s

During the first period after the Liberation, buildings and designs of residential areas were influenced by Russian architecture and planning. Types and forms were more or less copied from Russian projects. In some projects at the beginning of the
fifties, some efforts and experiments were made to adjust the
Russian types and style to Chinese traditional building culture.
These projects were criticized because they were said to cost too
much and further experiments became impossible for a long
period.

The Russian influence (or rather: Russian transformed West-
European influence) represents a break in the Chinese tradition
in many ways. Instead of the one storey courtyard houses, 3–6-
storey residential houses were erected, so called mid-rise build-
ings. In this new concept of residential planning the “private” or
“semi-private” courtyard disappeared and was replaced by
open “in-between” space, an open-ended courtyard, directly
connected to the street. The extremely diversified and intensive
use of the courtyard became reduced to “simple” passage. Con-
currently, the character of the streets changed from narrow
“channels between walls”, to wider streets with visual presence
of balconies, windows and views into the space between resi-
dential building blocks. People in the streets became more
involved in the privacy of the inhabitants, because the visitors
and passing pedestrians could now be watched from windows
and open courtyards. At the same time, the courtyard became
more public because of the open connection with the street and
the passing pedestrians.

The flats were designed to fulfill the needs generated by an
extreme shortage of dwellings. Corridor plans were preferred at
first because they allowed a temporary overcrowding of the
dwelling with one family per room and common use of facilities
such as toilet and kitchen (Figure 4).

Flats in High-rise Buildings

By the mid-1970s, the concept and mode of residential build-
ing had changed again. It became directly influenced by West-
erm industrial building systems and high-rise buildings. During
the Cultural Revolution, 1966–1976, the building activity was
very low.

This caused an increasing demand which brought about a
situation that led an insufficient number of city planners, archi-
tects and housing developers to solve a lot of problems caused
by an enormous population pressure. They have responded
with intensive construction activities often concentrated on high-rise residential buildings (Figure 5) with large numbers of relatively small flats. Concurrently, not much attention was given to the social and psychological consequences of these change to the physical environment. During 1974–75 some experimental systems were carried out for the construction of residential high-rise buildings. On the basis of this work, over 400 000 square meters of high-rise apartment buildings were erected along the Qiananmen Street in Beijing during 1976 (Hu, 1985).

From 1978, we can speak of a high-rise building boom in the great cities of China. In 1979–1983, 395 million square metres of urban housing were completed in China.

The proportion of high-rise units is at least 30–50% in the cities of China, and in Beijing nearly all in high-rise. Most of them are 18 stories or more. Each apartment in high-rise costs 70–80% more to construct than in mid-rise. For instance, to construct a high-rise apartment consumes three times as much electricity compared to the building of an apartment in mid-rise (Zhang unpublished).
In 1985, the first Chinese urban housing census was completed by the Ministry of Construction (former called Ministry of Urban and Rural Construction and Environmental Protection, MURCEP) and the State Statistics Bureau on a material involving about 150 million urban inhabitants from different parts of
the country. The results are summarized in Table 2. Only about one-third of the total housing units were equipped with private kitchens, lavatories and basic facilities. Qualitative as well as quantitative improvements are highly needed.

The annual volume of new housing in urban areas is now around 100 million square metres and Beijing 7–8 million square metres. In Beijing, they are mostly flats for low-income groups, usually 2-room units each with its own toilet and kitchen. According to the plans, the living area per urban resident will reach 8 square metres in the year 2000. So far it seems that the rate of living area is increasing even more than expected.

However, the housing shortage tends to dominate the thinking of government officials and architects in an immediate, shortsighted way and other problems seem unimportant. Nonetheless, Brogan and James have showed results from investigations indicating that characteristics of the physical environment are about as important as characteristics of the socio-cultural environment in explaining variations in psycho-social health (Brogan & James, 1980). What will happen in the long term? What other problems will arise? What will be the impact on socio-cultural development? Do the new urban areas and the new kind of dwellings have a negative impact on the well-being of the inhabitants? Do the changes lead to measurable changes in the health status of the respective resident populations?

Experiences of Living in High-rise Flats

Introductory Remarks

During recent decades some research has been done in the Western countries about living in flats in high-rise buildings. Some existing data suggest that explanations of area differences are more likely to come through a focus on the process, whereby populations with particular characteristics come to inhabit particular areas, rather than a focus on the physical environment. However, this is not to say that the built environment has no effect on the health and well-being of residents, including the lifestyle of the elderly, parenting and child development.
Vulnerable Groups

Children are probably the most vulnerable group (many without child care). The child’s perception and appropriation of the surrounding environment is of great importance for the development of the child’s identity and mind. Children’s lives in flats, especially in high-rise, contribute to the social isolation, which is common in modern cities and under the impact of which many families break down. There is general agreement that living in high-rise apartments has disadvantages, but there is less agreement about what the disadvantages are as well as their relative importance.

Stewart (1970) reviews the following findings in the literature on children living in flats:
(a) Health and illness: Higher incidence of respiratory infections in young children and of psycho-neurotic disorders in woman, postulated in previous research, was not confirmed in Stewart’s study.
(b) Space considerations: Spatial restrictions might have a double effect on a child. It is recognized that factors, like living in a high-rise apartment, which restricts the child’s environment and experience during the early years, might lessen that child’s potential for intellectual development. At the same time the effect of space restrictions on the parents might affect the relationships between them and their child(ren).
(c) Noise: The troublesome noise to the residents are internal noise within the flats and between them (i.e., intermittent and irregular noise like lifts, stairways, machinery and pumping apparatus). In this case, the effect on the child is twofold. The parents might restrict the child’s play because it makes a lot of noise. At the same time, the parents’ own irritation by noise combined with guilt-feeling about the regular restraint can result in a more severe attitude to noise than is justified.

In high-rise residential buildings, children have difficulties to meet each other at home in small apartments. In the traditional Chinese dwelling, the courtyard is the natural playground. In the new high-rise areas the children can seldom find a comparable substitute. Sometimes they solve this lacunae by seeking out other places (i.e., streets, tea-houses, railway stations, bus stations).
Smaller children also have difficulties to have contact with their parents outside the high-rise building and feel unsafe (Björklid 1982). The caretaker of the child does not see them and there are often no playgrounds around the high-rise. Another effect on children, in the new developed residential areas, concerns the lack of diversified activities in the environment, which reduce the possibilities for children to develop new capacities through watching or participating in the adults work. In the traditional courtyard housing areas the children encounter a lot of activities in the outdoor environment (i.e., handicrafts, workshops, adults outdoor work in the courtyards).

In high-rise housing, the elderly and the handicapped residents may easily become passive and isolated compared to those groups in courtyard housing. The design of dwelling units is not suitable for the needs of these groups. For instance, on the sixth floor and less there is no elevator. In high-rise buildings the elevator usually stops at alternative (even or uneven) floors and does not work during the night. The lack of daily service in high-rise areas is common.

Traditionally, care of aged parents in China is not an option but a moral responsibility of adult children. Chinese culture, strongly influenced by the Confucian ethic of "filial piety", emphasized that children care for their elders at home in accordance with filial devotion and obedience. Neglect of one's parents is considered unethical and immoral, a break of traditional values and customs.

In the traditional courtyard the elderly can do a lot to enrich their lives. They can care for grandchildren, call on friends and have a chat, do some work if they are still capable, grow flowers, keep pet birds or fishes, write, paint or calligraphy, pay cards or chess with friends and do physical exercises. These activities are difficult to perform in high-rise residential buildings. Their social environments may be expected to differ significantly from those who live in traditional courtyard houses.

Elderly citizens are most vulnerable to the feeling of loneliness and uselessness. Loneliness is specially found among elderly in high-rise. The fact that they hear noises from other flats while not seeing anyone, can influence the feeling of loneliness. Conversation is not easy to establish since in the Chinese
culture such contacts must be preceded of an introduction by a third person. For cognitive impairment, or dementia, environments lacking in stimulation are suggested to be one factor which may contribute to decline (Whitehead 1984). Furthermore, the absence of safety and security have added to the difficulties for the elderly in high-rise residential buildings and their surroundings.

**Debate Concerning High-rise**

In Chinese mass media articles about the consequences of building high-rise are quite common today. Are Western mistakes, for example, not to see the negative socio-cultural, psychological, economical, environmental, and other effects of building high-rise, to be repeated in China? The articles quote that high-rise housing units cause many problems and are not a symbol of modernization. They destroy the skyline and environment of the city, increase construction costs, and create difficulties for children and the elderly because of the poor conditions of elevators and other facilities. The main reason for building high-rise is said to be the need to save ground area. On the contrary, it is argued that some developed areas in Beijing with fewer high-rise buildings, house more people per hectare than others with more high-rise (Li, 1987). This finding is already substantiated with respect to the post-war housing in Britain (Dunleavy, 1981).

The debate is still ongoing, as well as the construction of high-rise buildings. Yet, as far as we know, there are no systematic studies in China of the impact of the process of environmental changes on family functioning or on health and well-being. However, studies in industrialized as well as in developing countries suggest that both positive as well as negative effects may arise (Levi and Andersson, 1974). Positive effects may be expected due to greater accessibility to facilities for basic hygiene. Negative effects may be caused by the dissolution of formal and informal social networks (the large family, neighbourhood communities), plus changes in functions and lifestyles, owing to the rapid environmental changes and the divergence between the old traditional dwelling culture and the new spatial organization of daily life.
Discussion

Surveys in many developed countries have revealed a higher incidence of psychic disorder in the slum districts of city centres and also in newly constructed suburbs, (i.e., in dwelling environments where a number of the above needs have not been met and led to social disintegration) (Rahim and Cederblad, 1982, 1984). Contrary to this, a study concerning health and well-being from a human ecology perspective, among urban Chinese in Hong Kong, from 1974, indicates that there was evidence of high family bonds and networks even though there was indications of lack of social cohesion. The degree of disorder and its prevalence among the inhabitants did not appear to be excessive. There are characteristic cultural factors (e.g., regulations and social networks) in the Chinese culture which might to some extent counteract the detrimental effects of stress (Boyden, Millar et al., 1981). The philosophical concept of “optimum health” in Chinese is a state of balance between man and environment, between man and other people, as well as between all parts of man’s internal organs (Cheng and Williams, 1986).

Whatever the outcome of the urbanization process in China, there is no doubt that it can influence family functions as well as socio-psychological development and the mental health of young and old people. However, the highly effective social networks in Chinese society seem to have protective properties, or “buffering effects”. The question is how far these “buffering effects” can be strained and if the rapid change and the new environment are inhibiting these networks. Yet, this seems to be the case when comparing lifestyles in traditional courtyard houses with those in modern flats. The second phase of our project will perhaps give us some more substantial cues on this question.

Review of Literature Survey

Very little epidemiological data exist on mental health and urbanization among mainland Chinese children and the elderly. The data in Beijing show no indication, so far, that mental disorders have been caused by urbanization and changes in lifestyles. Some recent observations support this view.

Child mental health. Mental health studies on relatively small samples of selected populations of children have been
carried out in different, large Chinese cites. In a recent study (Ekblad, 1985) it was found that Chinese children learn to control their emotions more than Swedish children, and that Chinese children learn to orient themselves towards collective norms more than Swedish children, who are more individualistic.

The findings gave a valid picture of the behaviour and attitudes of the Chinese children: by and large they were nonaggressive, well-behaved, ambitious, friendly and pro-social and exerted strong control over aggressive feeling and behaviour tendencies. In possible conflicts with adults, they were likely to take a humble and submissive attitude. Shen, Wong and Yang (1985) have reported results on hyperactivity among children in different parts of Beijing. Here the findings are contrary to expectations, with the lowest rates in the urban areas, higher rates in the suburbs, and the highest rates in impoverished mountain communities.

Divorce rate. An effect of the strict regulations and the mediation groups at the grassroots level, is the low divorce rate, being 0.67 per cent in age group of 30–54 years old in 1981, according to official statistics (Ekblad, 1985). The divorce rate is now increasing but is still low in comparison to rates in Western countries.

Juvenile delinquency. In 1983, the number of reported crimes in China was 1.3% of those reported in the United States. Another difference from many Western countries was that more than 80% of China's crimes were cases of theft, while violent crimes that endanger people's lives and security such as homicide, robbery and rape, accounted for only eight% (Beijing Review, 1983). Poor education during the Cultural Revolution (1966–1976) is officially stated to be the main reason for the increase of youth problems.

Elderly mental health. According to prevailing Chinese culture, as mentioned above, children shall take care of their parents. Both the absolute and relative figures of the elderly are expected to increase continuously in the next 30 years. It is

2 Most people belong to an extended family. Each family belongs to a group of families. In the city, these groups becomes residences, neighbourhoods, districts and municipalities. Each level provides a means of dealing with problems of a certain degree of complexity and a means of passing the remaining problems on to the next higher level (Kraft and Swift, 1979).
estimated that one in ten will be retired (55 years of age for labour women and 60 for male labour) next year in Beijing. At the same time, the size of the family will decrease. At present, the adult children living separately with their parents are 70% of all families in the capital. Nearly four of ten elderly are single or living without relatives in the city. These trends may engender a series of social problems. The authorities assume that improving the dwelling and physical environment (security and convenience) is one of the methods of decreasing the problems of the elderly.

It may well be that the incidence and prevalence of family dysfunction and mental illness in children and the elderly is indeed low and not just an expression of an unwillingness or inability to record, report and label such phenomena, nor a repression of their manifestation. This may be so partly because of protective properties of China's highly effective social network. The role of external coping resources, or social support systems, in buffering the effects of stressors plus internal resources also buffer the effects of stress, as well as impact directly on mental health status.

An optimum integration of the processes producing the combinations of poor environments, low resources and personal vulnerabilities that generate pathogenic family environments will be of paramount importance in understanding the Chinese urban population's physical, mental and social well-being. However, such data are very rare even outside China, because these processes cross all disciplinary boundaries, involving macro-social processes, local political organization, medicine, architecture and psychology. According to Quinton (1988) two approaches hold the possibility of opening up this subject further: life history and life events research.

Authorities and city planners all over the world must not only realize that city planning is a crossectorial and very complex matter which influences all parts of the daily life of the citizens, but they should also develop methods and tools to manage it as such. The powerful technological and economical approach that dominates today, always seems to be rational, in the short term. In the long term, however, we must realize that without involvement of specialists from different fields, we can not satisfy basic
human cultural, societal, psychological and physiological needs. Both qualitative and quantitative parameters should be examined from an integrative perspective.

References


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Appendix

List of illustrations.

Figure 1: A Short History of Chinese ancient architecture, Vol 1, Compiled by Committee of the compiling of the history of Chinese architecture, Beijing 1962, p. 183.

Figure 2: After: Annotation to Chinese Wooden Structure Regulations, Guo Qinghua, unpublished, CTH 1987.

Figure 3: After: Chinese Architecture and Town Planning 1500 B.C.—A.D. 1911, Andrew Boyd, London 1962, p. 80–81.

Figure 4: After: Architectural Journal, 1956:1.

Figure 5: After: A Collection of Urban Housing Illustrations, Zhang Shou Yi, Li Dao, Tsinghua Univ. 1982, p. 19.

Table 1


| Population: 9.83 million, plus 10% temporary residents, floating population. |
| Significant ethnic minorities: 5.1% of the population consists of different minorities; 94.9% is Han. |
| Rate of growth per year: 5.45/1000. |
| Family size: One child per each family policy. 3.67 members per family compared with 9.41 (1949). 30% of the total of all households consists of three generation families. 38% elderly in Beijing live alone without relatives. |
| Pre-school activities: 47.8% of pre-school children go to nursery and/or kindergarten. |
| Illiterate: 11.2% |
| Unemployment: 2% (5.9% in 70s). The youth unemployment is estimated to be 3.7%. |
| Accommodation: More than 2 million people are estimated to have no place to live or are living in run-down homes. |
| Population density: In agrarian area of Beijing: 0.1 ha per person. |
In housing from the 1950s (3–4 stories): 400 persons per ha.
In housing from 1970s (5–6 stories): 600–800 persons per ha.
In high-rise from the 1980s (18–24 stories): The figure is not yet available.

Table 2
The Results from the First Chinese Urban Housing Census 1985 (MURCEP, 1987)

Ownership
Enterprise or department owned properties constituted 75%, and 9% were owned by local housing administration departments. Private properties accounted for 16%.

Structure
45% of the housing stock was of masonry and concrete structure, while 38% was of brick-and-wood structure.

Storey height
Single-storied building and multiple storied buildings occupied 50% respectively.

Time of construction
36% of the buildings stock was built in the 80s, 32% in the 70s, while only 9% was built before 1949.

Usage of the total area surveyed
49% residential buildings
29% industrial, communication purposes and warehouse
9% commercial establishments
7% educational, medical or scientific institutions
1% cultural and sport purposes
4% office buildings
1% other use

Residential conditions
Living space per inhabitant has risen to 6.1 square meters. However there is still a housing shortage and uneven distribution in living areas with many families still living in poor standards. About one-fifth of families or one-fourth of all inhabitants still have less than four square metres per person. Moreover, the distribution is uneven between cities.

Facilities
a) electricity: provided for 96% of urban families
b) water supply: provided for 73% of families (57% independently and 10% share)
c) Kitchen: provided for 70% of families (63% independently and 10% share)
d) Flush toilet: provided for 34% of families (24% independently and 10% share)

According to the household structure and in view of future changes, the principles in deciding housing standards should be, according to Professor Zhang Shou Yi, Department of Architecture, Tsinghua University, Beijing, an average living area per inhabitant of approximately eight square meters (2-3 rooms, floor space 50 square meters) with:

1. One family per apartment
2. Separate bedrooms for boys and girls over 10 years of age
3. Built-in facilities, such as private kitchen and lavatory
Factors in Urban Stress

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This paper examines changing patterns of health, causes and effects of urban stress, and approaches to the management of stress.

Changing Patterns of Health

Dramatic advances in biomedical research and the great increases in national financial resources devoted to health care have enabled the richer countries of the European region to bring under control and virtually conquer the major killing infectious diseases such as tuberculosis, poliomyelitis and measles, which only thirty years ago still constituted an important hazard. Even earlier, the diseases of typhoid, cholera and malaria were brought under control, first in northern and then in southern Europe. Such diseases are still at a high level of incidence in countries on the borders of the European region and constant vigilance is therefore still required, especially in cities where immigrant populations are growing.

Almost the sole remaining infectious diseases of major proportions are bronchitis and similar chest-lung infections which persist especially in the poorer countries of the region.

Even in these poorer countries, there has been a major improvement in health standards—fewer mothers die in childbirth and more children survive to maturity. The expectation of life at birth has increased steadily in the region as a whole from 65.4 years in 1950-1955 to 72.7 in 1980-1985 (United Nations, 1981). Further modest increases of life expectancy are to be expected, but there are also signs that the figure could become stationary or even begin to decline if newly emerging health problems are not properly addressed.

The pattern of health and ill-health is constantly evolving and as one set of problems is brought under control, others emerge. In order to maintain the relatively high standards of health achieved in the European region, monitoring and
research continue at a high level. This work is bringing to
attention a newly emerging pattern of health hazards so serious
in its implications that there is widespread concern about a new
health crisis which could overtake the European countries, espe-
cially the cities, by the year 2000 (O'Neill, 1983).

The dominant "new diseases" of the late 20th century in
European cities are of course not new in any fundamental way,
but they have risen to the top of the list of causes of death as the
demographic pyramid has thickened out with an aging popula-
tion and as the "classical" infective diseases have been brought
under control. The leading causes of death in Europe today are
diseases of the circulatory system (cardiovascular diseases) and
cancer of all kinds (malignant neoplasms). Cardio-vascular dis-
eases account for more than 50% of deaths in ten countries in the
region and over 40% of deaths in thirteen others. About 20% of
all deaths are due to cancer, of which one third are in the
respiratory system. A further 10% of deaths are due to acute
respiratory infections, bronchitis, pneumonia and influenza.

Although accidents cause only 5% of all deaths, they are the
largest single cause of death in children and young adults. In
most countries of the region, the proportion of deaths primarily
due to other infections and parasitic diseases is less than 2%

While death rates and causes of death are an important
indicator of where health problems lie, in countries with high
standards of public health, other measures such as those of
absenteeism (caused by ill-health), disability, discomfort and
dissatisfaction must be added in order to obtain a more com-
plete picture of a society's level of health.

Such a complete picture must necessarily include mental
health as an important element. It is probably the leading cause
of disability (if not mortality) in most developed countries. In
the U.S.A., it has been claimed that over 80% of the population
experiences some measure of psychiatric impairment at one
time or another (Wolman, 1973). In England and Wales, nearly
half the hospital beds were occupied by the mentally ill or
mentally retarded (1962–63 estimates) and in the same period it
was reported that 32 million working days were lost due to
mental illnesses, with direct costs to National Insurance funds
alone amounting to 21 million (Office of Health Economics 1962).
Factors in Urban Stress

Stress: Causes and Effects

Precise definitions of "mental health" and "mental illness" continue to provoke debate among specialists, ranging from those who prefer to regard mental illness in the medical tradition as another variation of somatic illness, to those who regard mental health as essentially a social concept reflecting the values and norms of society (Griggs 1980).

By some definitions, some kinds of socially unacceptable behaviour, or social pathologies, are regarded as a symptom of mental illness, e.g., alcoholism, drug addiction, excessive use of medicines, rape, crimes of domestic violence (wife and child beating) and so forth. These are clearly associated with a set of environmental conditions, often including poor quality housing, high density living conditions, excessive noise, high levels of environmental pollution, and the general pattern of environmental and social conditions often found in the inner areas of large cities.

The concept of "stress" has been developed to describe the total sum of all such external and malign influences on health (Selye, 1974). Stress is thus seen as a function of environment (noise, overcrowding, toxic chemicals, air pollution, etc.) and social and behavioural factors (lifestyle), although what is cause and what is effect is not always clear (Evans, 1982). Are alcoholism and obesity causes or symptoms of stress?

The effects of stress are not necessarily limited to mental health and psycho-social pathologies, but are believed by some to be a factor in coronary heart disease, cerebrovascular disease and some forms of cancer (Howe 1980).

Of particular concern in some highly developed countries is the high cost of treatment of cardio-vascular diseases, of cancer and of mental illness. Even the richest countries are now finding the cost of hospital care and the elaborate treatment methods involved in the "new diseases" a growing burden on the national treasury. Thus it is not only the incidence of the "new diseases" that is cause for concern, but the costs that they impose. "Health Crisis 2000" is likely to be seen as much as a crisis of finance as it is of mortality and morbidity.

The emerging pattern is complex. The dominant causes of death and illness are underlain by many contributing factors.
Biomedical research has revealed not one cause of heart disease or cancer, but many causes. Unfortunately it is rarely possible to identify any one cause as "necessary". If necessary causes could be found, each one might be eliminated in turn, according to an order of priority and thus the diseases would be reduced. Alas, the causes identified do seem to be "sufficient", but what combination of causes, in what degree, is impossible to state. Whether one or a few fundamental and necessary causes of cancer and heart disease will ever be found is an open question. Certainly a massive allocation of research funds by developed country governments and private sources of funds have not been able to achieve it over three decades or more of concentrated effort.

The search for a single cause for cancer or heart disease is unlikely to be fruitful in the short run, but it is not entirely beyond the bounds of scientific possibility that fundamental biochemical research could produce a proper scientific explanation and hence a "cure". Such indeed is the rationale and justification for the expenditure of literally hundreds of millions of dollars on research annually.

On the other hand, it is quite certain that a single cause of the disabilities, discomforts and dissatisfaction will not be found. The root causes of the "health crisis 2000" that are manifested in social and behavioural symptoms are not at all susceptible to the kinds of proven cause-and-effect relationships that can be established in the natural sciences.

Civilization and its Discontents

Given that there are symptoms not only of disease, but also of discontent, and given that no single factor explanations are likely to suffice, what can be said by way of diagnosis of present and future ills in the European region?

First, that the causes of difficulty stem from the record of success. Industrialization, the growth of cities, and the modern lifestyle, based for the majority of the population on a level of "affluence" well beyond the anticipations and hopes of earlier generations. Second, despite four decades of economic growth and four decades of social egalitarian legislation and social philosophy, the "benefits" of economic success are still very unevenly distributed, and, in particular, leave out or neglect the
urban poor, including substantial numbers of immigrants from outside the European region, and the growing number of unemployed (both immigrant and nonimmigrant) especially among the young.

It has become a convention in international discussions of health to refer to the diseases prevalent in developing countries as constituting one problem area, and the diseases of "affluence" and "overdevelopment" as constituting another. Paradoxically, however, when we examine the health problems of the developed industrial societies more closely, we find that while some of them can clearly be attributed to "affluence"—(the wealthy business executive who rides everywhere in his car, lacks exercise, over-indulges in high cholesterol foods, is overweight, drinks and smokes too heavily, and is subject to heavy psychologically stressful business pressures, and who dies of a heart attack at the peak of his career), others are more associated with the conditions in which the poor or certainly the less affluent members of society live—(the industrial worker who is exposed to toxic substances in his work place, who lives in a more densely populated area of the central city, where pollution levels are high, living space is less, noise levels are higher, and who faces economic pressures of keeping up payments on loans—for house, car, appliances—in an environment where crimes of violence and drug abuse are common, and who dies from lung cancer).

These stereotypes no doubt are an overdrawn caricature, but they serve to illustrate the problem of the interlocking and interwoven causes of mortality and morbidity that afflict the most successful developed and urbanized societies in Europe today. The social, economic and behavioural "causes" are linked with the environmental "causes". Different patterns of "cause" are exhibited in different localities and at different socio-economic levels, but all form part of the same mosaic.

There is no satisfactory way to describe the whole picture—it is indeed a fragmentary mosaic—one for which the term "stress" has come to be widely applied. The currency and popularity of the concept of "stress" derives from the work of Selye who was among the first to draw attention to the fact that all manner of illnesses manifest themselves in somewhat similar
symptoms of ill-health or "distress". The concept has now evolved into a general term applied to all sorts of "stimuli" or "insults" or "impacts" on the human body and mind, so much so that it is in danger of losing its meaning.

One thing is clear about "stress" in the sense used and propounded by Selye (Selye, 1974). Stress is part of life. It is not conceivable to think of life without stress, and an absence of stress can be harmful as much as over-abundance. The relationship should theoretically follow the slope of the arc in Figure 1 where the highest level of health is attained at an intermediate or optimal level of stress.

Figure 1. The relationship of stress to health.

![Figure 1: The relationship of stress to health.](image)

Of course, this simple relationship is highly theoretical and cannot be measured or specified precisely. The reasons for this are that stress has so many different components—environmental, socio-economic, behavioural, etc., that there is and cannot be any satisfactory measure of "aggregate stress". Even if such a measure were available, it would have different values for each individual, and one would therefore have to measure both individual stress tolerance and average stress tolerance.

The management and policy questions thus are seen to be very complex. How do changing levels of stress in one area (e.g., higher levels of population) affect levels of stress in another (e.g., higher incomes, more employment, warmer and more comfortable living conditions, etc.)? Furthermore, how do "stresses" of various kinds augment and compound each other, or cancel each other out? What is "aggregate net stress" and how is it to be defined?

Before turning to the question of how "stress" is to be studied and policies adopted for the management of stress, it is
useful to list some of the "stressors" that have been identified. Partial lists are provided in Tables 1 and 2.

Approaches to the Management of Stress

A major objective of public health policy in European cities may therefore be described as the need to manage stress. Clearly some forms of stress are better eliminated entirely (or almost so) while others can be reduced to some acceptable or satisfactory level.

Simply to focus on the removal of stressors perceived as "bads" or "negatives" will not suffice however. From the point

Table 1

<table>
<thead>
<tr>
<th>Environmental Stressors</th>
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</thead>
<tbody>
<tr>
<td><strong>Exposure to Chemicals</strong></td>
</tr>
<tr>
<td>Indoors:</td>
</tr>
<tr>
<td>Formaldehyde</td>
</tr>
<tr>
<td>Radon daughters</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
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<tr>
<td>Outdoors:</td>
</tr>
<tr>
<td>SO₂</td>
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<tr>
<td>NO₂</td>
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<tr>
<td>General:</td>
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<tr>
<td>Toxic chemicals in the workplace</td>
</tr>
<tr>
<td>Food Additives and contaminants</td>
</tr>
<tr>
<td><strong>Exposure to Physical Factors</strong></td>
</tr>
<tr>
<td>Noise</td>
</tr>
<tr>
<td>Ionizing and nonionizing radiation</td>
</tr>
<tr>
<td>Particulates and smoke</td>
</tr>
<tr>
<td>Climatic and geophysical hazards</td>
</tr>
<tr>
<td>Architecture and urban lay-out and design</td>
</tr>
<tr>
<td>Housing conditions: temperature (insulation), ventilation</td>
</tr>
<tr>
<td>Accessibility to urban green space</td>
</tr>
<tr>
<td><strong>Exposure to Biological Factors</strong></td>
</tr>
<tr>
<td>Germs</td>
</tr>
<tr>
<td>Virus</td>
</tr>
<tr>
<td>Microbes</td>
</tr>
<tr>
<td>Bacteria</td>
</tr>
<tr>
<td>Diet</td>
</tr>
<tr>
<td><strong>Technological Hazards</strong></td>
</tr>
<tr>
<td>Accidents – automobile accidents, accidents in the home, public transport</td>
</tr>
<tr>
<td>Falls</td>
</tr>
</tbody>
</table>
Table 2
Socio-Economic, Behavioural Stressors

<table>
<thead>
<tr>
<th>Stressor</th>
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<tbody>
<tr>
<td>Lack of exercise</td>
</tr>
<tr>
<td>Obesity</td>
</tr>
<tr>
<td>Overuse of medicines</td>
</tr>
<tr>
<td>Alcoholism</td>
</tr>
<tr>
<td>Other drug addictions</td>
</tr>
<tr>
<td>Sexually transmitted disease</td>
</tr>
<tr>
<td>Smoking</td>
</tr>
<tr>
<td>Mental illness</td>
</tr>
<tr>
<td>Suicide</td>
</tr>
<tr>
<td>Sense of security</td>
</tr>
<tr>
<td>Crime-robbery</td>
</tr>
<tr>
<td>Rape</td>
</tr>
<tr>
<td>Inter-personal domestic violence – wife &amp; child beating</td>
</tr>
<tr>
<td>Unemployment</td>
</tr>
<tr>
<td>Divorce</td>
</tr>
<tr>
<td>Death of spouse or close relative</td>
</tr>
<tr>
<td>Lack of social support networks</td>
</tr>
</tbody>
</table>

of view of public policy, it is also important to improve conditions. Thus a response to high residential density (overcrowding) can involve the provision of improved, more spacious housing. It may be convenient to distinguish between actions to reduce stress and actions to improve conditions or meliors.

Development of a public health strategy in European countries to meet the emerging health problems of the cities depends upon an appreciation of the interrelationships of three sets of variables. These are: (a) the incidence of mortality, morbidity and psycho-social pathologies as identifiers and measures of ill-health; (b) the behavioural and lifestyle patterns related to these patterns of ill-health; and (c) the environmental factors related to the patterns of ill-health and to the behavioural and lifestyle patterns.

A simple conceptual framework is suggested by Figure 2. The framework suggests that health problems result from behavioural, lifestyle, socio-economic and environmental stress factors. The socio-economic and behavioural factors contribute directly to ill-health. The environmental factors contribute both directly to ill-health and indirectly through the socio-economic
and behavioural factors. There are feedback effects in all cases, but for present purposes those are considered of secondary importance.

The precise contributions to ill-health of many of the socioeconomic, behavioural and environmental variables is not known. Nor is there a good understanding of the possible synergistic effects of the variables upon each other. Faced with this complex and unyielding pattern of health problems and their causes, two broad and complementary approaches have been developed, the one focussing on treatment of ill-health, and the other on management of causes.

The treatment approach is essentially the classical medical approach of discovering illness by screening, testing and then applying medical prescriptions for treatment and perhaps cure. It is a characteristic of many of the "new diseases" that cure is more likely to be effected the earlier the illness is diagnosed. More emphasis is therefore being placed on the screening and monitoring of apparently healthy persons in order to achieve early detection of incipient disease. This holds true for cardiovascular diseases, cancer, and mental illness.

Success in early detection procedures is increasing in many instances. The mortality and morbidity statistics reflect to a degree the use of early detection. There is considerable discussion and concern in health policy circles about the high cost of expenditure on treatment and attempted cures for the "new diseases". Surgical and chemo-therapeutic treatments for example involve expensive "high technology" equipment and
sometimes long hospital stays. The high cost of treating the mentally ill and the high proportion of hospital beds occupied by the mentally ill have already been referred to.

Increasing realization of the "open-ended" costs of treating the main contemporary health problems in a highly urban society and in an aging population have led to serious questioning about health policy priorities, and more emphasis is now being given to the second approach, which might be called "the management of causes". This term is preferred to the more common "preventive approach" because it more accurately reflects what is possible. While heart disease, cancer and mental illness might, in certain individual cases, be "prevented", for society as a whole the most that can be hoped for is a reduction in the incidence of such diseases, and a postponement of their onset to a later age. This is simply because the causes cannot be eradicated.

Take, for example, the widespread presence of toxic, carcinogenic chemical substances in the environment. The extent to which many of these may be carcinogenic in human populations is not known (e.g., nitrates and nitrosomine compounds). Their alleged carcinogenicity rests on animal tests, usually based on high level exposures in short time periods. Extrapolation of such experimental results to human populations is highly uncertain. Human beings are biologically different from the test animals and may be less (or more) susceptible to the chemicals in question. Also human beings are exposed to low doses over long periods of time and the relationship of this to high short-term doses is not clear.

However, since such chemicals have been shown to be carcinogenic in animal testing, it cannot be assumed that they are not carcinogenic in man. Nor is it possible to set an absolutely safe exposure level. In many cases, permissible levels of chemical contamination are proposed (see W.H.O. environmental health criteria documents), on the grounds of available knowledge and expert judgment. To reduce the risk to zero, however, would involve the elimination of toxic chemicals from the human environment. In many instances, the benefits of such chemicals in manufacturing, in agricultural pest control, and in insect disease vector control, are such that it would be disadvantageous to stop
using them. Even if total prohibition were to be adopted, the risk would not be entirely removed because the chemicals are persistent, and are widely distributed through environmental media such that they cannot be recaptured.

In these circumstances, the approach adopted has been to carry out scientific research on exposure rates and dose levels in relation to effects, to construct dose-effect curves or dose/response curves, and to use these as a basis for setting standards or ambient standards). In this sense, then, the approach is one of "management of causes" rather than "prevention" strictly speaking.

The "management of causes" approach applies not only to toxic chemicals, but also to other environmental, socio-economic and behavioural sources of stress.

**Human Ecological Approaches**

The "management of causes" approach to health is essentially ecological in point of view. It seeks to explain the relationship of individual organisms, and communities of organisms (in this case, human beings, hence human ecology) to their environment. Within the broad framework labelled "human ecology", there are many levels at which studies can be organized and results assembled. These are schematically suggested in Table 3.

At the top left-hand corner of the table is a cell for studies of single environmental factors and their impact upon select (target) somatic functions or behaviours. In this category comes the impact of noise on hearing or blood pressure, or on sleep. Measures can be made in the field or in the laboratory of hearing impairment, blood pressure and loss of sleep, and these can in turn be linked to other health effects.

Such studies are usually very tightly circumscribed and rigorous scientific observations are made or attempted, holding, as far as possible, all other variables constant. While the evidently more precise results that can be obtained from such studies are useful as criteria in the setting of environmental (and other) standards, they are necessarily limited by the neglect (intentionally so) of other variables.

The scope of such studies can easily be broadened by movement in the two directions of the axes of the table. First, the
Table 3

Levels of Human Ecological Enquiry

<table>
<thead>
<tr>
<th>Impact on selected somatic functioning or behavioral, e.g., hearing, blood pressure or sleep</th>
<th>Single Environmental Factor: Noise impact on sleep or myocardial infarction risk</th>
<th>Multiple Environmental Factors: Interactional effects of noise and other environmental factors</th>
<th>Integrated Holistic Environment: Integrated effects of environmental and socio-economic stressors</th>
<th>Environment as Perceived: Modification of stress as subjectively perceived</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact upon &quot;whole man&quot;</td>
<td>Impact of noise on hearing, non-auditory effects, sleep disturbance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact upon communities</td>
<td>Impact of noise on individual in community functioning</td>
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</tr>
</tbody>
</table>

Single environmental factors (noise, carbon monoxide, cadmium, etc., see Table 1) can be examined in relation to their effects on the "whole man", including all physiological, psychological and behavioural responses. Still further, the effects on whole communities can be studied. The complex interactive and self-aware nature of human society is such that community effects may be much more than the sum of effects on individuals. For example, noise may lead to aggregate social responses (blighted neighbourhoods, economic decline, crime) which will exacerbate or even create other environmental stressors.

The second direction of broadening is to examine multiple environmental factors, e.g., noise plus crowding, plus toxic exposure, plus air pollution on selected somatic functioning or pathophysiological effects. Similarly, the environmental factors can be broadened from physical, chemical and biotic factors to psychosocial, cultural, economic and so forth. Finally, these factors can be measured by some presumably objective measures (noise in decibels) and also as perceived by the individuals affected or their community groups.
Scientific studies of the health aspects of the human environment (human ecological studies) have not surprisingly tended to concentrate towards the upper left-hand corner of the table. The reasons for this are evident. The further one moves away from the single environmental factor and the single somatic function or organism, the more the research results are confused with extraneous variable factors that cannot be held constant and which therefore bias or invalidate the results.

There is, however, a major difficulty with such narrowly focussed and defined enquiry. It gives little guidance to health policy makers except in terms of very specific causes. As we have seen, the nature of the health crisis facing European cities is not one in which specific causes can be neatly attached to specific diseases. What specific diseases there are seem to have multiple causes, and there are many other manifestations of ill-health in the socio-psychological realm that it is hard to define as diseases. They are frequently thought of simply as manifestations of stress.

"Management of causes" therefore, if it concentrates on single causes, may miss the important sources of ill-health. Or, the controlled reduction of one cause may not have the beneficial impact foreseen, because other factors continue to operate. Furthermore, disease factors that were previously missed may assume greater significance as other factors were removed.

As long as environmental health studies remain heavily concentrated in the top left-hand corner of Table 3, then it will remain extremely difficult to provide good overall policy guidance to the managers of human settlements and those who would improve health in cities by reducing stress. The important policy questions concern not only the amount by which each individually identified stressor or risk factor should be reduced to meet certain health goals, but the combination of factors that need to be addressed.

Further Progress in Health Promotion

This brief survey of the concept of environmental stress and its causes suggests several important conclusions. First, the further development of scientific understanding is inhibited by the methodological difficulties of complex systems. Limited results
will be gained by single-factor studies which retain scientific validity but cannot reach the heart of the matter—which is the complex interactions involved. Second, it is desirable therefore to develop more holistic approaches to individual, family and community health. A possible approach is the development of a more rigorous methodology of comparative study in which large samples of individuals and communities are examined to identify congeries of causes and effects, or syndromes of causes as well as symptoms. Such a method might be expected to provide guidance for policy prescriptions, but not for the setting of precise standards and criteria.

Third, the research and management approaches suggested here are best conducted in the context of health promotion activities aimed at lifestyle risks as well as direct environmental risks to health. In order to obtain necessary feedback for policy evaluation and modification a careful programme of longitudinal comparisons is also required.

The directions in which to proceed in alleviating the anticipated “Health Crisis 2000” are relatively clear. Changes in “lifestyle” and “human behaviour” can do much to reduce environment stress and help avoid or mitigate the impending crisis in the health of urbanized society.

References

Home accidents are now a leading cause of death and injury particularly in young children and the elderly. For example, 3.1 million accidents occur in the home every year in the United Kingdom with no signs of diminishment. More effective systems of accident recording, monitoring, investigation, intercollaboration and education are urgently needed to redress this epidemic. More attention needs to be given to preventive safety design in architect training and adoption of home safety design standards and legislation. The major threat to public health which home accidents represent must not go unchallenged.

Deaths and injuries caused by accidents in the home present us with one of the biggest public health challenges of this country. Quarterly statistics by WHO in 1984 stated that accident injuries of all kinds now rank fifth among the leading causes of death; in the case of young children and the elderly it is often higher than for infectious diseases (WHO, 1984).

Unfortunately, data on home accidents are less readily available on a national basis than data on road accidents. The American National Electronic Injury Surveillance System (NEISS) was the first to collect data on home accidents, followed by the United Kingdom (UK) Home Accident Surveillance Scheme, (HASS), now being developed on an European Economic Community and Nordic Country Basis. HASS has been monitoring the UK general pattern of accidents in the home from information recorded at 20 hospital Accident and Emergency (A&E) Departments since 1976. According to their estimate 3.1 million accidents occur in the home every year in the UK. Of these, 5,500 are fatal and represent about 40% of all fatal accidents and a third of all accidents treated in hospital (DTI, 1989). This costs the National Health Service approximately £300 million each year. Young children have the highest risk of incurring a home accident: Over 200,000 accidents occur each year to children aged 0–4 years. The HASS statistics show that 25% of all home
accidents are to children aged 1-14 years and 40.7% to children aged 0-14 years. The cost of childhood accidents alone in the United Kingdom is greater than the cost of treating cancer for all age groups. However, in terms of overall numbers, over half of all home accidents occur to elderly persons over the age of 75 years. These are mainly injuries arising from falls many of which are fatal. Indeed elderly people are at far more at risk of incurring a fatal home accident than any other group.

The long term trend for fatal home accidents in the United Kingdom shows a steady improvement from some 7,500 deaths p.a. in 1966 to less than 5000 p.a. by 1987. However, this has been levelling out over the last few years and the progress of improvement now appears to have bottomed out (Barrow, 1987).

The trend in nonfatal accidents is less satisfactory. Here the number has stayed constant at around 2 million per annum throughout the 10 years of HASS (i.e., according to HASS), there has, "been no improvement at all in non-fatal accident rates over this time" (Barrow, 1987).

Policy makers and practitioners in the UK are therefore faced with a major health hazard which unlike other twentieth century ailments has reached epidemic proportions and shows no signs of diminishing. The tragedy is that these human deaths and resultant misery are in the main, entirely preventable. We already have detailed knowledge of causation and safety design measures which can limit both the incidence and severity of home accidents. What is needed is the political will and the resources to act upon this knowledge.

The World Health Organisation (WHO) strategy document "Health for all by the year 2000" makes specific reference to a number of targets for safety in the home and environment (WHO, 1986). For example, target number 10 states that by the year 2000, deaths from accidents in the European region should be reduced by at least 25%; target number 24 requires that all people in the region should have a better opportunity of living in houses and settlements which provide a healthy and safe environment. These targets thus provide an opportunity to reexamine existing policies, standards, legislation and attitudes towards accident limitation. This is especially important in the United Kingdom which has dismally failed to reduce accidents
over the last ten years or given home safety the priority and attention it clearly deserves.

In fairness though the problem may be no better outside the United Kingdom. The problem is making any meaningful comparisons since the extent and methods of collating home accident statistics (where they are monitored at all) varies considerably throughout the world. For example, a review of the problems of accidents in Europe by Jackson (1983) concluded that "home accidents have been under-researched and underestimated in importance compared to vehicle accidents". Jackson somewhat cynically concludes that the relative lack of concern over falls (which is the predominant cause of fatal and severe accidents) "may be associated with the fact that they do not cause much damage to property in comparison to the distress caused to people".

Conception of the Problem

The sorts of factors which distort comparative statistical analysis include interpretation of the term "home", e.g., whether this should be restricted to the shelter on the immediate environs, whether suicides are included as accidents or not, and how severity of accidents is recorded. (Many countries only keep statistics on fatalities and not serious injuries resulting from accidents.) The WHO defines an "accident" as an "unpremeditated event resulting in recognisable damage" (Backett, 1965). For recording purposes HASS define an accident "as an unintentional injury or suspended injury no matter how caused, except deliberately self-inflicted injuries/suspected suicides or injuries resulting from physical attacks by other persons, animals or insects" (DTI, 1986). The important word in this definition is "injury" since physical injury, disability, or mental impairment brings accidents within the WHO, definition of Health.

In some countries where the home is also the basis for cottage industries, home accident statistics may include injuries caused by occupational accidents. There are similar recording difficulties in counting accidents to people who live in and work in hotels, shops and farms.

A critique of the various data collection systems at present in use has been published by the OECD, but in general, national
data have not been collected over a long enough period of time or in enough countries to warrant any overall comment other than a general statement about the significance of falls as a cause of death and of poisoning in children as a reason for admission to hospital.

With regard to falls, intercountry variations are considerable: Bulgaria and Spain have low rates, Austria and France high ones (about four times the rate of the lowest countries), while the rate in Hungary has almost doubled in the nine years 1969–1978. By contrast, fires produce comparatively few deaths, with no sign of any significant changes over the years. Poisoning likewise is low, apart from in Finland which has a rate of 8.9 per 100,000 population which is twice as high as the next country, Bulgaria (Jackson, 1983).

Vulnerable Groups

Examination of accident returns show a fairly standard morbidity pattern by age and gender (Backett, 1965). Children (particularly boys) have a relatively high injury rate but a fairly low risk of death. Home accidents gradually rise to a slight peak in the toddler and 15–24 age groups, steady in middle age, and finally rise sharply in the elderly. Interestingly enough, the elderly suffer fewer accidents than children but more of the accidents end in serious injury or death. Females have a higher number of fatal home accidents than males, probably because they spend more time in the home, are often distracted by young children and may be subject to the often destabilizing effects of premenstrual tension.

A review of home accidents in children shows that the pattern of accidents also changes with the hazards of the environment and the stage of children development. Young babies are totally unable to protect themselves and rely entirely on adult guardians for their safety. Toddlers aged 2–5 years (who have the largest number of home accidents of any age-group) also are incapable of recognising dangers, are physically immature and yet at the same time are actively exploring their environment: consequently, they are at greater risk of minor accidents. For babies, the greatest hazards are to be found in the bedroom, kitchen, bathroom or any room where he or she is
unattended. Suffocation and falls are the most common types of accident. However, for children aged 2–5 years the places where accidents most frequently occur are the living room, kitchen, nursery and bedroom: falls, scalds, poisoning and burns predominate. For somewhat older children, the pattern of accidents is more varied with danger in the immediate vicinity of the home becoming more commonplace.

Home accidents can have very serious consequences for the elderly, such as invalidity, extended periods of medical care and even death. In addition, pathological factors, such as acute and chronic illnesses, compound the effects of accidents. The tendency of the elderly to tire easily, to be forgetful, absent-minded and fearful of modern surroundings and equipment increases environmental hazards (WHO, 1968). The side effects of medication for geriatric ailments or mental illness also interfere with normal reasoning abilities, thus increasing accident risks. Depression, lack of self-confidence or boredom also may disincline the elderly to take safety precautions.

Socioeconomic classification of accident victims has not been sufficiently refined to enable any accurate opinions to be formed. However, many surveys have shown a relationship between poverty and a high number of domestic accidents. Socially neglected families generally live in substandard housing that is often overcrowded, unduly cluttered with equipment and household belongings (because of limited storage space), or has inadequate cooking facilities, all of which are likely to play some part in home accidents. For instance, an information paper by the Building Research Establishment in England noted that a number of housing and social indicators are statistically correlated with fire incidence in dwellings. Research showed a higher incidence of fires in areas of nonowner-occupied and thus poorer areas (Chandler, 1980). Clearly, in poor housing, accidents are related to the higher number of hazards present and also perhaps to less understanding of hazard risks.

Low income also may contribute to home accidents, by reducing the amount of finance available to remedy an unsafe physical environment, or to buy safe but more expensive equipment and goods. Children of one-parent families also seem to have a higher number of accidents. Single parents generally
have less income, tend to live in poorer, less safe housing, and may be forced occasionally to leave children unsupervised.

Another important epidemiological factor in the etiology of home accidents concerns the state of health of the occupants. Recent studies of fatal accidents carried out by the Consumer Safety Unit of the Department of Trade in the United Kingdom (Poyner, 1980) suggest that many accidents in the home occur because of the physical and mental condition of the casualty and the characteristics of the social setting. Relevant factors include alcohol, drugs, mental and physically disabling illness, tiredness, stress and inadequate supervision of children. Very low intelligence also is correlated with increased accident liability, but other handicaps in the form of decreased sight, hearing, sense of smell, skeletal deformity and spasticity also make people more vulnerable to accidents. For example, arthritis and osteoporosis (particularly of the neck of the femur) make a fall that might not seriously injure a healthy limb more likely to result in a fracture. Also, the relative immobility of the arthritic lower limb makes tripping and falling more probable.

Immigrants and ethnic minorities also may be a special risk of home accidents because of poor understanding of electrical and mechanical appliances together with a generally poorer educational background or difficulties in adjusting to a different environment.

However, at a more complex level "home safety" means more than just death and injury limitation. It also includes other consequences of living in unhealthy housing or using household products which are unsafe or in some way hazardous to health. Many authorities have taken a very narrow view of home safety and have arbitrarily tried to prioritise some home safety features whilst ignoring others of equal importance. In other cases, there is confusion as to what constitutes 'health' and 'safety'.

A 'Holistic' home safety policy would take a much a wider view. Safety would certainly include the "accidental" ingestion of asbestos fibres from asbestos building materials or "accidental" inhalation of indoor air pollutants emitted from building products. From this perspective any distinction between "safety" and "health" is arbitrary and meaningless, 'Safety' must be seen as one aspect of any public health policy and not disconnected, as it often is, into some separate, remote entity.
Home Safety Policy

Effective home safety policies have several key components: primary prevention which is concerned with safety design of the home environment and consumer products used in the home; and secondary prevention including elements such as health education and accident monitoring.

Primary Prevention

Compliance with the WHO ‘Health for All’ targets would mean reducing the number of accidents caused by unsafe architectural features in the United Kingdom by 250,000 each year. This is not an unreasonable objective. For example, in the UK during 1984 there were 33,000 accidents attributable to the use of nonsafety glass in doors and windows (Tomalin, 1985). According to Sinnot “the elimination of glass in doors and the relocation or modification of windows so that they are unlikely to be contacted accidentally should be considered in a home safety glazing material in all glazed panels in doors, side panels and low level windows” (Sinnot, 1987). However, Sinnot believes that existing British Standard requirements (BS6262) for glass are "inadequate". In any case compliance with British Standards is not statutorily required by current Building Regulations.

In theory, the United Kingdom Building Regulations of 1986 have a number of requirements that directly or indirectly affect health and safety in new housing or conversions. However, the 1986 Regulations have been considerably diluted as part of the governments strategy of “lifting the bureaucratic burden” to builders and designers to increase consumer choice and to expose building construction standards to market forces. This is a short-sighted policy since it leaves the door open for consumer exploitation particularly by “cowboy builders” taking advantage of the ignorant or gullable who are usually unaware of correct safety design when buying or rehabilitating housing. This could follow the pattern of injuries caused by cheap and unsafe consumer goods where safety standards either do not exist or have been compromised by unscrupulous product manufacturers. However, in the main, the safety of consumer goods used in the home is governed by a wealth of consumer legislation including a number of regulations made under the
Consumer Protection Act 1961 and the Consumer Safety Act 1978. Unfortunately the same legal protection is not granted to consumers in relation to unsafe housing design features. Ideally Building Regulations should include a specific section on home safety which incorporates all preventive design measures.

Apart from legal controls there is considerable information available on home safety design through product and design standards, Codes of Practice's and other guidelines. There are a number of ways such guidelines can be implemented. Some agencies have produced design check lists for architects and designers when originating plans and specifications. One example is presented in a document entitled “Healthy Housing Guidelines” which the author has written for WHO (Ranson, 1988). The following requirements relate directly to home safety and can be used as a basis for policy formulation and implementation: (a) protection of neighbourhood against the hazards of vehicular traffic; (b) avoidance of unsafe conditions in the housing environment, in outbuildings and surroundings of the home; (c) protection against the risks and effects of falls; (d) provision of adequate facilities for enabling means of escape in case of fire and control and removal of conditions likely to cause or promote fire; (e) protection against burns and scalds (f) protection against asphyxiation or gas poisoning from faulty heating and cooking appliances and services; (g) protection against electrical shocks from defective appliances and services; (h) protection against bodily injuries from lacerations and similar injuries; (i) protection against poisoning from dangerous drugs, medicines and household chemicals; and (j) protection against poisoning from plants.

The Department of the Environment booklet “Safety in the Home” (DOE, 1971) and the Child Accident Prevention Trust book “Child Safety and Housing” (CAPT, 1986) also give detailed information on safety design measures in Housing. The problem is that home safety is not specifically included in architecture and planning training programmes. Architects and planners are thus often ignorant about home safety criteria. Clearly, whatever the drawbacks of legislative constraints, it is paramount that architects, planners and designers are fully conversant and involved in home safety design. This is probably the
most effective preventive device available. Public authorities could greatly facilitate this through training courses, scheme design working parties and standard design briefs, particularly, in the publicly owned housing sector where local authorities (as landlords) have a moral if not a statutory duty to protect the health, safety and welfare of its tenants. In the private sector, architects, builders, building societies and housing agencies may also need to be targeted in collaborative measures to improve understanding of home safety design.

The above measures mainly apply to new housing. However, one would expect to find most unsafe conditions in existing housing particularly older housing of poor initial design and/or in a state of poor repair. The range of safety issues here may relate to the structural safety of the shelter itself, or to fixtures, fittings, services and goods used within. Since it is generally poor and uneducated people who live in the most worse housing its not surprising that its in existing housing where most home accidents generally arise.

However, this raises the question of what we mean by the term "housing" or the "home" in relation to safety. There is no satisfactory way of defining the boundaries of the home and environment in terms of home safety and accident prevention but it is important to recognise that a distinction often exists and that this can affect accident monitoring and policy implementation. At its most basic level the "home" is defined as the basic structure for providing shelter against the elements and to serve as the focus of household life. However, people do not spend all of their time indoors. Children, for example, spend a lot of time outside the shelter during play.

My own view is that Home Safety must include the "residential environment" which has been described by WHO as "the physical structure that mankind uses for shelter and the environs of that structure including all necessary services, facilities, equipment and devices needed or described for the physical and social well-being of the family" (WHO, 1972). Clearly consumer products used inside or outside the home come within this definition. It will certainly mean including leisure activities, safety of play areas and pedestrian and road safety at least in the immediate surrounds of the home. It may also include water
safety. It is encouraging to note that the Commission of the European Communities have decided to include leisure accidents in the European Home and Leisure Accident Surveillance System (EHLASS) which will strengthen the existing HASS system in the United Kingdom regards the home as being synonymous with the house or shelter.

In terms of intervention and secondary prevention, in the United Kingdom, specific powers are given to local authorities to deal with dangerous structures under Building Acts and Public Health legislation. Environmental Health Officers also commonly use Housing and Public Health Acts to deal with housing in a state of disrepair or lacking basic amenities. It is a major omission of current housing legislation that home safety is not one of the items which can be taken into account when assessing whether housing is fit for human habitation or not. Nevertheless many safety design measures could come within the specific criteria for determining whether a house is unfit for human habitation under current legislation, for example: repair, stability, internal arrangement, natural lighting, ventilation, and facilities for preparation and cooking of food and for disposal of waste water.

In addition the Defective Premises Act 1972 makes landlords (who are responsible for maintenance or repair) liable to all persons who might reasonably be expected to be affected by defects in the state of the premises a duty to take reasonable care to see that these persons are reasonably safe from "personal injury" caused by a relevant defect.

Special legal provisions apply to houses in multiple occupation (HMO's) and hostels. These premises (particularly those providing bed and breakfast accommodation for the homeless) are potentially the most dangerous type of housing from the point of view of home safety. Viz: Bed and breakfast accommodation typically accommodates low income, single parent families (where children might be left unsupervised for long periods); serious overcrowding and poor state of repair makes it impossible for children to be safeguarded against accidents; risks of fires and fire deaths are higher in multioccupied housing. According to a survey by the DOE, 38% of HMO's had inadequate fire escapes and 16% were grossly over crowded. It is
estimated that 15,000 children are living in hostels in London alone.

A recent survey by the Health Visitors Association and SHELTER (a campaign group for the homeless) of bed and breakfast accommodation showed that home accidents were commonplace particularly to young children (Drennan, 1988). There might be a number of explanations for this. Research by Constantinides showed that there was a close correlation between the number of home accidents and socio-economic factors such as income and class (Constantinides, 1986). However, other factors, such as disrepair, overcrowding, lack of play facilities, inadequate cooking facilities are other relevant considerations which ought to be considered.

**Home Safety Education**

The second ingredient of a home safety policy is safety education. Given the view that home safety is just another branch of preventive medicine, (i.e., that it has a public health foundation) then it follows that home safety education is a branch of health education, although it may be administered separately from other health education initiatives.

In order to be effective, health education must be developed along three main lines: (a) raising individual competence and knowledge about health and illness and about prevention and coping with a given situation; (b) raising competence and knowledge in using the health care system and to understand its functions; and, (c) raising awareness about social, political and environmental factors that influence safety as an aspect of health.

There are several elements to achieving these objectives. Most of these revolve around targetting the right information to the right people and optimising the right communication vehicles to ensure that this is achieved.

Regarding targets, home safety education normally follows other health education initiatives in institutionalising “individual responsibility in making safety choices”. This priority is totally misguided, because it tends to “preach to the converted” and can become a middle class institution. In any event, changes in lifestyles (rather than the environment in which these
lifestyles take place) are extremely difficult to achieve particularly in the very young and old. Nevertheless, in terms of risk behaviour there is no doubt that lifestyles can be hazardous to health. However, this is not because people choose to risk their health and safety by acting dangerously. In the main, safety costs money which many people simply do not have. Risk behaviour is sometimes the only way people can continue functioning or at least adapt to the unsatisfactory physical and social environment in which they live. Didactic styles of safety education only serve to enforce the powerlessness which poverty groups, ethnic minorities, single parent families, the chronically sick and the elderly already face. Unfortunately safety statistics show that it is precisely these groups which have the most accidents.

Safety education really needs to be applied to those in a position to change the physical environment in which hazardous lifestyles take place (e.g., the professions, the policy makers and the politicians). This really is the third aspect of health education: raising awareness about social, political and environmental factors which influence safety as an aspect of health. Some local authorities have taken up some of these issues through interprofessional health promotion teams and home safety committees.

Local authorities in the United Kingdom have generally failed to target Home Safety Education to those groups who would most benefit from it. Most have ignored social, cultural, economic and ethnic considerations in their safety campaigns. Education of professionals, such as Environmental Health Officers, GPs, Health Visitors, Midwives, District Nurses, Housing Officers etc., on home safety would probably be a much more effective approach than current initiatives. This could be supported by implementation of free home safety check schemes which some authorities have offered to home owners. In terms of vehicles of communication, local authorities have generally shown a lack of flair and imagination in getting their message across. Television, radio, video and press could be used far more effectively than they have so far and campaigns need to be constantly reinforced (i.e., publicity should empower change rather than order it in a prescriptive manner). Finally more
home safety education by inclusion of home safety in school curricula.

Accident Monitoring and Prevention

Home accidents are unique in that there is generally no legal requirement to announce them, or to monitor either their incidence, or the source of injury. According to Health and Safety Legislation in the United Kingdom accidents have to be recorded in an accident book and notified to the Enforcement Authority. Usually there is an investigation to establish causality following which secondary preventative action can be taken. However, this system does not apply to home accidents. The HASS system permits a certain amount of information of accidents to be collected at 20 chosen hospital A&E Departments. Most home accidents therefore simply go unrecorded. Effective collaboration between local authorities and health authorities and doctors would enable more systematic monitoring, investigation and in some cases intervention. In the USA (Haddon, 1973) has defined ten areas of intervention as follows: (a) prevent the creation of the hazard in the first place; (b) reduce the amount of hazard brought into being; (c) prevent the release of the hazard that already exists; (d) modify the rate of, or spatial distribution of, the hazard from its source; (e) separate in terms of time or space the hazard from the person or object to be protected; (f) separate the person from the hazard by a material barrier; (g) modify the relevant basic qualities of the hazard, and, (h) make the protectee more resistant to damage from the hazard, (i) to begin to counter damage done by hazards, (j) to stabilize, repair and rehabilitate the object of the damage.

However, these areas of intervention do not refer to the importance of finding out the facts before deciding on priorities and setting a policy, nor in measuring the results. According to Jackson, accident prevention can take place by (a) altering the human being by education and training; (b) by altering the agent so as to reduce its potential for harm, and (c) by environmental changes (Jackson, 1983). These three principles are common to most public health policies. The process, therefore, involves the following:

1. The collection of satisfactory data on the accident, the injury, the person(s) concerned, the agent and the environmental
and psychological circumstances. (This must include assessment of the severity of injury before priorities can be set by medical services).

2. An analysis of data to decide what factors are most readily modifiable. The role of health services here lies partly in the area of psychology and behavioural sciences, but also in the interrelationships with ergonomics and biomechanics.

3. The identification of those persons or bodies who should be responsible for modifying the person, the agent or the environment. These may be individuals, local authorities with responsibility for the environment, a national trade association, a national standards institution, an educational or voluntary organisation, or a government department - or a combination of any of these. The role of health services lies in co-operation and support rather than in initiation.

4. The implementation of appropriate policies by the appropriate authorities.

5. The assessment of the effectiveness, including cost-effectiveness and cost-benefit, of the measures taken. Here the wheel has come full circle as we are back to the question of measurement again and thus to the importance of the role of health services.

Intercollaboration and Intervention

It is appropriate to underline the importance of intercollaboration between agencies which have a direct or indirect interest in Home Safety and the need to adopt a corporate approach to Home Safety Policies. However, it is also important to involve non-Governmental Agencies and professionals in these discussions and of course the community itself. Effective community participation is an essential element to inter-collaboration in any home safety policy. For example, Tenants Associations and Advice agencies can be extremely useful sources of information on potential home safety hazards and effective liaison arrangements should be made between all those who routinely visit housing for home visits. Local Community Groups such as play school organisations, Help the Aged Organisations and Safety Groups can be particularly useful in getting the message across. The higher degree of consultation and co-operation achieved the
higher is the likely preventive action which is likely to be attained. Certain areas of France have established local groups and in the United Kingdom, local multi-disciplinary groups were established in connection with the "Play if Safe" campaign on children's accidents of all sorts. There have been several examples of successful programmes of home accidents on a local scale. For example, the "Children can't fly" programme in New York has succeeded in reducing the numbers of deaths from children falling out of apartment windows from 150 a year to 1 death only in 1981. This was done by the identification of the social background of the children involved and by the provision of free window bars. Two features are worthy of mention: firstly, that these measures were instituted only after purely educational methods had failed, and secondly, that the cost of the provision of the window bars was less than the cost would be for medical care of the children who would otherwise have fallen out of the windows.

National programmes and policies are mainly directed at the prevention of specific types of accidents or in special age groups such as children, or by the use of special methods such as education. In the United Kingdom the Royal Society for the Prevention of Accidents (RoSPA) has separate groups dealing with special spheres of interest such as road safety and home safety and uses the educational approach in the main. The Child Accident Prevention Trust (CAPT) is a very much younger and smaller body. It aims to be a scientific advisory body in all aspects of accident prevention in childhood, which often need different approaches from the prevention of accidents in adults by reason of the close interrelationship of children's accidents with child development.

It is impossible to mention all of the wide variety of national institutions that are involved in accident prevention, but would stress the importance of national bodies such as AFNOR in France, the British Standards Institution (BSI), the DIN in the Federal Republic of Germany, and the Danish Standards Institution in setting standards. It is important to note that there has not been the same interest in providing standards relating to safety design and architectural features within the home and home environment. To be successful, home safety cannot and should not operate in total isolation from other service delivery agencies and the
community it is supposed to serve. Effective collaboration is the only practical way forward, particularly between the legislature and the various branches of the executive side of the government and voluntary bodies or organisations. One possible way of improving inter-sectoral collaboration is through a national accident prevention committee or council imposed on the appropriate government departments and the various voluntary bodies. This would be responsible for policy decisions in this field and it could conceivably be given some executive powers in order to initiate the action. In this way a national policy and plan can be developed and action taken.

Conclusion

The high number of deaths and injuries caused by accidents in the home presents us with one of the biggest public health challenges this century. However, the response of Government, Health Services and the professionals to Home Safety has been sporadic, low key and preoccupied with largely facile safety education initiatives. Design prevention, accident monitoring and investigation has usually been underrepresented in Home Safety policies. Local authorities, as democratically accountable institutions close to the community they serve, are in a unique position to promote health and safety in the home - not just as major public landlords but also as guardians of the public health.

It is argued that existing housing and building legislation needs to be strengthened to give local authorities executive powers to deal specifically with unsafe housing, despite cutbacks in health and local authorities, which are undoubtedly causing severe difficulties in extending preventive medicine. Nevertheless, the extant legislation could be used more effectively so that the abysmal progress made so far in reducing home accidents can be rectified.

Without a strong commitment to making home safety a reality the WHO "Health for all targets" aimed at reducing the number of home accidents by 25% by the year 2000 will not be achieved. The alternative is to subject this and future generations to a legacy of avoidable deaths, pain, injuries and disabilities. A major threat to public health such as this must not go unchallenged.
References


Health Implications of Homelessness: Reports from Three Countries

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This paper discusses the health implications of homelessness in the context of problems discovered and remedies proposed in three countries: Britain, Canada, and the United States. The findings, particularly with respect to programmatic responses, are selective. Based upon personal observation over the past four years, they are intended, however, to offer a glimpse at the range of projects which have evolved in the three countries during the eighties.

In 1851 Lord Shaftesbury noted that "as the homes, so the people." Today these relationships, though more complex, are still evident. Among the poorer segments of the population there are direct links among housing, homelessness and health.

The intent of this exercise is to demonstrate that housing, health and homelessness are inextricably related, that a broad range of comprehensive programs are required to deal with the diverse problems of heterogeneous populations, and that locally-devised solutions are most appropriate and likely to succeed.

For purposes of this discussion the most useful definition of homelessness is offered by the United Nations. Included are those without shelter (street people and those who find themselves without a roof as a result of fire or some other emergency), and those whose dwellings are inadequate because they lack protection from the elements, access to safe water and sanitation, secure tenure and personal safety, affordability, and accessibility to employment, education and health care.

Causes and Underlying Trends

In Britain, Canada, and the United States the causes of homelessness are remarkably similar. In all three countries social
changes have been important precipitants of homelessness; much of the problem, however, is at least partially attributable to government policy and to underlying economic conditions. Among the principal causes and underlying trends are: dramatic cuts in public spending on housing and public assistance programs; private sector focus on housing and health programs for middle and upper-income households; decline in the private rental sector and in housing conditions; loss of single room occupancy units and low cost housing as a result of gentrification and demolition; basic economic shifts, accompanied by increasing unemployment and a growing proportion of low paid jobs in the service sector; declining average wage levels relative to housing costs; a widening rift between haves and have-nots; racial discrimination in employment and housing; demographic changes, leading to smaller households, an increase in the number of households, and greater demands on the existing housing stock; the inflexibility of occupancy policies in government-subsidized housing, which can exacerbate domestic difficulties and homelessness; and, a continuing movement toward deinstitutionalization without a corresponding increase in community care facilities to attend to both physical and mental health needs.

The Dimensions of Homelessness in Three Countries

The homeless represent an elusive population. Counts are difficult and suspect. Estimates offered by government are low and self-serving, while figures submitted by voluntary agencies and advocacy groups may be inflated because of a need to secure public funding and private contributions. Population figures may also include double-counting of individuals who frequent several shelters, food banks, medical clinics and drop-in centers. It is important, however, to attempt to quantify the extent of homelessness, at least in order-of-magnitude terms. This is essential so that public policy and programmatic responses may be designed to fit the needs of the variety of individuals who are homeless.

Estimates of the size of homeless need groups in Britain are about 1% of the population (600,000 people), about 0.5-1.0% in
Canada (125,000-250,000 individuals), (Canadian Council on Social Development, 1987), and about 1% of the population in the United States (2.5 million). These figures represent extremely rough estimates which might be found too high by public agencies and too low by advocates for the homeless.

Britain

In 1948, as decreed in the National Assistance Act, local authorities took on the legal responsibility to provide temporary accommodation for "persons who are in urgent need thereof." This law proved inadequate, however, in dealing with the growing numbers of homeless people who were displaced by slum clearance and highway building projects during the fifties and sixties. Many resorted to squatting. Advocacy groups, like Shelter and CHAR, responded to the growing crisis and lobbied relentlessly at Westminster to bring this problem to public attention.

The extent of homelessness and the responsiveness of local authorities varied widely. The system was whimsical. One's right to housing often seemed to hinge on the political will of the local authority as well as one's relationship with the social worker assigned to the case. Welfare and housing departments continually passed the buck back and forth because no definitive policy had been developed. As early as 1971 certain boroughs used travel vouchers to induce people to leave their jurisdictions. Other authorities started to use bed-and-breakfast hotels for temporary accommodation of homeless families. By 1976 this practice was costing one million pounds annually for a total of 1500 households.

Advocacy groups began pressuring government to take action in the face of a rapidly growing problem. In 1977 legislation was passed. The Housing (Homeless Persons) Act defined people in need as "those without accommodation they were entitled to occupy." Specifically included were those, like battered women, who were threatened with homelessness. Priority groups included families with dependant children, pregnant women, those made homeless by fire or other emergencies, and those who were vulnerable as a result of old age or mental or physical disabilities. Local authorities were obliged, under the
Act, to provide temporary housing to priority households while their cases were examined. If found to be homeless they were entitled to permanent council housing.

Following passage of the 1977 Act the number of households certified as being homeless rose from 33,000 (in 1976) to over 53,000 (in 1978). By the late 1980s the total had doubled again, to more than 130,000 (Department of the Environment).

While local authorities now accept their obligation to deal with homelessness, central government has made little progress since the late 1970s. Public interest groups are again mobilizing to exert pressure on government because council housing stocks have been reduced, the private rental market has dwindled to less than ten percent of total stock, and local officials have resorted to shabby bed and breakfast accommodations to house those waiting for permanent housing.

Reformers have been frustrated because of hostile or apathetic responses from government. Buck-passing has occurred at both the national and local levels. The Department of Environment attributes the rise in homelessness to "profound changes in the nature of our society," including dramatic increases in divorces and illegitimate births, as well as youth mobility:

Young people are leaving home earlier and with higher, if not always more realistic, expectations about what they might expect by way of housing...Because of these long term social problems and the fact that homelessness is to a very large extent a symptom rather than a cause, the scope for Government action is limited. (Department of Environment, 1987)

Despite this laissez-faire attitude, a variety of innovative programs and projects have evolved in Britain. While many are publicly-funded most have been developed by voluntary organizations. A host of agencies have emerged to deal with a number of different aspects of homelessness. Their responses are based upon an understanding of the need for a diversity of housing, health, education and employment programs and support services to deal with a heterogeneous array of homeless people.
The United States

American cities in the 1980s have been characterized by public squalor in the midst of private affluence. Homeless street people huddle on heating grates outside luxury condominiums and sparkling office towers. In New York the municipal government now has to place over 30,000 people (including more than 12,500 children) in shelters. Many more remain on the street, preferring to avoid the squalid, violent emergency shelters. About 90% of the homeless families in New York City are black or Hispanic. The city has been described as “like the wedding cake in a bakery window: an exquisite excess of spun sugar covering a cardboard core...where the megarich in stretch limousines look away from the 1.8 million living in poverty” (Time, November 30, 1987).

The local government now spends over $250 million annually on shelters like the 1200-bed armory which is used by an assortment of drug addicts, mentally ill adults, runaway youths, and families with young children. Each year, despite dramatic increases in expenditures on emergency shelter and on obscenely expensive welfare hotels, the queue becomes longer. The supply of affordable housing has virtually disappeared. With government acquiescence, 90% of the single room occupancy units have been lost to conversion or the wrecker’s ball. Meanwhile, the waiting time for public housing units in 17 years.

Many in government have been paralyzed by entrenched opinions of the homeless as drug addicts and freeloaders. The position of the Reagan administration was set out by David Stockman who asserted that “I don’t think people are entitled to services...I don’t accept that equality is a moral principle” (New York Times, March 24, 1981. A second federal official, Philip Abrams of the Department of Housing and Urban Development, explained away the problem of severe overcrowding by glibly noting that doubling up “is characteristic of Hispanic communities, irrelevant to their social and economic conditions ...It is a cultural preference, I am told.” Others in the administration, notably Attorney General Edwin Meese, accused homeless people of cadging free meals at missions and food banks. The federal response was to pass the buck to state and local governments.
Rather than produce housing, the Reagan administration argued that free market mechanisms would ensure that all boats rose with the incoming tide. Meanwhile, the share of federal dollars allocated to education, training, employment, social services, health, income security, and housing fell from 25.5% in 1980 to 18.3% in 1987. During the same period the federal budget for defense increased from 22.7% to 28.4%. It was not until mid-1987 that substantial authorizations were made in Congress for programs dealing with homelessness. It is still uncertain how long this aid will be available and how effectively it will be applied.

At the local level responses have varied from innovative programs to blatant attempts to run the homeless out of town. A gradual awareness of the scope of homelessness has been evolving. It is now recognized by many as a nationwide concern in rural as well as urban areas. For several years the U.S. Conference of Mayors’ Task Force on Hunger and Homelessness has surveyed major cities. In December 1986 they reported:

By far, the most significant change in the cities’ homeless population has been in the number of families with children...In 72 per cent of the cities, families comprise the largest group for whom emergency shelter and other needed services are particularly lacking...Well over two-thirds of the homeless families are headed by a single parent. (U.S. Conference of Mayors, December 1986)

The most promising trend in the United States has been the ability of local agencies, both public and private, to obtain funding from foundations and private sources for the development of creative local programs. In the health field, for instance, a number of cities have devised innovative outreach projects which have been successful in assisting street people who were ignored by conventional welfare programs.

Canada

Because of its climate and the existence of a reasonably effective safety net of health and welfare services, Canada has relatively few people who are forced to exist on the streets. The Canadian Council on Social Development estimates, based upon
a snapshot survey of shelter users, that the extent of homelessness is only about half, in percentage terms, of Britain and the United States. Toronto’s shelter population, the highest in Canada, is only one-fourth of the rate in New York City.

When problems are not visible, however, government often does not feel compelled to react. The national housing agency (Canada Mortgage and Housing Corporation) has attempted to devolve responsibility for homelessness to the local level. Provincial and city authorities, however, are just now beginning to realize the serious implications of homelessness for public policy in terms of housing, health, employment training, and community services.

Perhaps the most salient characteristic of homelessness in Canada is the significant variation among cities. Both depressed and booming areas of the country have a high incidence of homelessness. Economically dormant regions like Newfoundland have very high rates of unemployment and have witnessed significant out-migration to areas like southern Ontario. In the Toronto region, which receives many of these newcomers, the economy is vibrant but few can afford the excessively high cost of housing. Average home prices now exceed $250,000. As a result, overcrowding and homelessness are on the increase. Toronto’s vacancy rate is nil and most single room occupancy units have already been lost to gentrification. Meanwhile, the city’s 2400 hostel beds were occupied last year by more than 25,000 different individuals. On any given night throughout the year virtually all of these beds — some of which consist only of a mat on the floor — are occupied.

**The Health Implications of Homelessness**

It is often difficult to ascertain which came first, homelessness or poor health. Homelessness frequently is the result, as well as the cause, of poor health. An obvious characteristic of homeless people is the fact that many suffer from ill health and from injuries. Life on the street is violent for some, and unhealthy for all. Homelessness contributes to poor health through such factors as hypothermia, physical and psychological stress, exposure to viruses, and lack of access to proper
health care. When one lives on the street, or is forced to move frequently from one insecure environment to another, the inevitable result is stress and poor health. Among the health problems encountered are the following.

**Sleep Deprivation**

Life in shelters and many insecure accommodations is noisy, chaotic, anxiety-producing, and often violent. It is still common for residents to be required to leave the premises each morning so that facilities can be cleaned. As a result, most simply roam the streets or find temporary shelter in alleyways and bus stations or under bridges. Many suffer from sleep disorders which result in apathy or behavioral impairment. Children, in particular, are likely to experience emotional difficulty and an inability to function effectively in school.

**Nutritional Problems**

A study of homeless men at a Birmingham, Alabama soup kitchen found that 94% suffered from lack of nutrients, resulting in weakness, fatigue, depression and other emotional problems. Facilities of this sort usually lack proper refrigeration, are unable to supply fresh fruits and vegetables, and thus cannot provide the nutrients which are most important for a transient population. Malnourishment is a fact of life for these people, which places them at risk of intestinal disorders and infectious diseases.

**Skin Diseases**

Most homeless people have great difficulty washing their bodies and their clothes. Shelters and other temporary accommodations generally lack showers. These individuals are prone to skin diseases, not only from the habitual use of dirty clothing, but also from ill-fitting shoes, from cuts and abrasions, from malnourishment and bacterial infections.

**Respiratory Ailments**

Respiratory illnesses are now commonly referred to as the shelter syndrome. In such close quarters adults and children are
susceptible to these ailments. Recent studies in both Canada and the United States have found a high incidence of tuberculosis among homeless people (City of Toronto, 1987; Brickner et al., 1985).

Physical Illnesses

As many as 40% of the homeless suffer from such chronic physical problems as heart disease, emphysema, diabetes and high blood pressure. A substantial proportion have multiple problems, which are compounded by lack of proper medical attention on a regular basis.

Mental Illnesses

The links between homelessness and mental illness have been the subject of numerous research studies, but the results are not clear (Arce & Vergare, 1984; Bassuk, 1984; Lamb, 1984; New York Office of Mental Health, 1982). Part of the problem is differentiating among substance abusers, those who are mentally ill, those who have been deinstitutionalized, and those who exaggerate their aberrant behavior in order to secure a place in a treatment center. (City of Toronto, 1987)

Bean, StefI, & Howe (1987) concluded that the overlap between homelessness and mental illness remains a tangled web of confusion, mental disorders and social conditions. Mental illness may either cause or result from homelessness. Many of the characteristics of the mentally ill are also common in homeless people — namely, they are poor, often members of minority groups, disenfranchised and without social support. The picture, then, is unclear; but it appears that about one third of the homeless require psychiatric help.

AIDS

The litany of ills besetting the homeless now includes the dreaded acquired immune deficiency syndrome. Many street people are drug users and a large proportion engage in homosexual sex to earn money for survival. Not surprisingly, they are a high risk group for AIDS. The spread of this disease among homeless people has some health professionals concerned about
the possibility of an epidemic. As with many diseases, public education is a major problem. In the case of AIDS, however, hysteria frequently replaces reason. "With almost every individual who has AIDS," a specialist in Toronto noted recently, "there is a horror story about being shunned by friends, families and lovers, about losing jobs, about being evicted from an apartment." With the caseload doubling every four months, there are now more than 40,000 known AIDS patients in North America; virtually all will die within two years.

Innovative Programs in the Three Countries

Creative programs and projects have been developed to address some of the concerns noted above. A few exemplary projects are described below.

Information and Advocacy Centers

The notions of information, access to social benefits and health care, and power are interrelated. It is essential that homeless people know whom to deal with and how to gain entrance to the complex maze of service agencies in order to secure their entitlements. In Britain, most cities now have a citizen's advice bureau and housing aid centers which provide essential information on the availability of health, welfare and housing benefits. Among a host of small group Shelter is probably the best known. It has been operating effectively as a lobbying and public information body since the mid-1960s.

An exemplary advocacy group is SHAC (The London Housing Aid Centre), which takes on cases of people who have been refused help by local authorities. It has been notably successful in fighting for the rights of elderly persons, about half of whom are ultimately accepted by the boroughs following SHAC appeals (Conway and Kemp, 1985).

Some groups act as advocates for those homeless people who are mentally ill. This assistance is especially important for the large numbers about to be deinstitutionalized. MIND, the National Institute of Mental Health Housing Unit based in London, provides assistance and training programs to agencies managing or developing accommodation for this population.
MIND's training package covers finance, legislation, support services, resident selection, space layout, and residents' rights. MIND has also lobbied extensively for improved community services to assist those who have been released from institutions. Its aims include fostering public awareness that mental illness should not be a barrier to the enjoyment of the full rights and responsibilities of citizenship (MIND, 1987).

**Outreach Projects**

The discouragement effect is prevalent among homeless people who must contend with endless delays and a bewildering array of forms to be completed at housing, employment, health, and welfare agencies. Many become frustrated after several encounters with hostile receptionists and apathetic bureaucrats. Because of their appearance some are turned away from health care facilities. Others are rejected because they lack a fixed address.

Outreach programs are essential to deal with such people who are unable to gain access to the system. One effective model is mobile health teams, funded by foundation grants, which operate in 20 American cities. Teams consisting of a physician, a clinical nurse, a social worker and an outreach worker, along with psychiatrists in some cases, operate vans in the evening to provide first aid and referrals for street people (Levine & Stockdill, 1986).

In Britain several efforts, like the East London Homeless Health Project, have begun to develop links between medical practitioners and homeless families placed in temporary lodgings by local councils (Daly, 1988).

Toronto's Street Health organization is an interesting example of a grass roots effort to provide front-line aid to homeless individuals. A group of nurses volunteer their time during off-duty hours to operate an informal clinic at several locations in the downtown core where there are substantial numbers of shelters, missions, food banks, and community service facilities serving the homeless. Started on a shoestring, the group's existence has been tenuous because they refused public funding which required that the board relinquish control. Finally, public support has been secured with few strings attached and the
services of Street Health (which looks after homeless men) have been expanded to include the Street Haven clinic for women (Daly, 1989).

**Education Programs**

For some homeless people, permanent housing will solve their problems. For others, like those who are leaving prisons or mental hospitals, housing alone will be insufficient. Organizations in Britain offer a combination of housing and education and training schemes for these people. One, the North London Education Project, has formal links to permanent housing (through the Hackney council) and well as with local colleges (through the Inner London Education Authority). Participants, who are selected after interviews, are provided with private rooms in a hostel and are enrolled in job training schemes or in college degree courses. Organizers believe that, for the particularly vulnerable young people who have recently been deinstitutionalized, a combination of training, housing, and support are essential to restore the individual’s mental health and sense of self worth (NACRO, 1987).

Other models, like that used by the Housing Support Team in south London, offer short courses for homeless people who are waiting to be rehoused. About 300 people are trained annually in three-day courses which cover social security procedures and benefits, budgeting and banking, housekeeping and establishing links with a new community (Housing Support Team, 1987).

Several different approaches have been attempted in American cities. Most, like the Employment and Training program in Massachusetts, emphasize job training, while providing participants child care, transportation and other benefits aimed at enabling them to break out of the cycle of welfare dependency (Kaufman, 1987).

**Programs for Youth**

A variety of programs, including Covenant House — which operates in New York, Fort Lauderdale, Toronto, and Houston — provide shelter, food and counselling for people under the age of 21 who are on the streets. Services include mobile teams in
vans operating nightly to help youngsters gain access to health and community service networks (Ritter, 1987). Most of these young people are on the street because they have no alternative. Virtually all suffer from some health problem. They are subjected to constant stress and are frequently exposed to life-threatening situations. A substantial percentage are the victims of sexual abuse and many are involved with drugs.

Several innovative projects in England have been developed by the voluntary sector to deal with homeless young people. These include the Hungerford Drug Project, a street-based agency conducting outreach work and counselling with young drug users. A similar undertaking in Kaleidoscope, the drug dependency unit for southwest London; it operates an all-night youth club, a hostel, and medical and educational facilities (Saunders, 1986).

Programs for Women

Many women are homeless or, if in abusive domestic situations, are potentially homeless. Often referred to as the hidden homeless, they suffer from stress and other health problems as a result of being forced to live in violent homes or from having to move frequently from one tenuous arrangement to another. Given low incomes and child care responsibilities, their housing choices are severely limited. Many in England, for example, even though they represent a priority need, have been temporarily accommodated for several years in unhealthy, chaotic, even dangerous bed-and-breakfast establishments. In the United States the principal users of welfare hotels are single mothers with very young children.

A number of women’s groups have developed alternatives to these shabby hotels which induce anxiety and a host of associated health problems. Among the solutions are refuges for battered women, transitional housing, and a few cooperatives and other forms of permanent housing specifically designed for women and their children. Some women’s organizations also offer counselling and referrals for physical and mental health problems.
Programs for AIDS Patients

Despite the antipathy of residents' groups and the apathy of bureaucrats, a few groups have managed to create innovative programs for people with AIDS. In Toronto, for instance, one of the most interesting projects is Casey House, a hospice for AIDS sufferers. Other programs include an AIDS drop-in center and outreach programs in the schools to acquaint youngsters with the reality of AIDS and related health problems.

Conclusions

In order to address the problems noted in this paper, a comprehensive range of programs, including permanent housing and long-term commitments to health care, is required to adequately deal with an array of ills encountered by increasingly heterogeneous populations. It is especially important that these programs be locally devised and operated on-site where homeless people congregate and where they can obtain related community services (Dear & Wolch, 1987). While small private or voluntary agencies may be the most appropriate providers of these services, government must be involved as both a funding source and a provider of certain medical, social and community services. While the problems of homeless people should not be pigeon-holed as those peculiar to "special need groups," it will be necessary to focus on certain populations which have been hidden or neglected — these include battered women and runaway youths. Moreover, it is essential that funds be directed to such outreach programs as mobile health services in order to provide front-line assistance for the hard-to-reach homeless. Finally, the programs and projects developed should emphasize information, advocacy and access in order to ensure that homeless people are informed, empowered, and visible.

References

Health Implications of Homelessness

The Role of Regulation in the Control of Housing Conditions

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Historically the control of housing conditions was based upon a concern for the health of the community and was safeguarded by the enforced repair and improvement of substandard property. In the United Kingdom the high cost of repair eventually induced a policy based upon subsidy to both home owners and private landlords as the price of healthier housing. This paper outlines the process by which the legislative standards invoked to protect health were modified to distribute subsidy. In 1989 the standards are poised to become criteria for the measurement of poverty rather than the identification of unhealthy housing conditions. In this process the protection of public health is being overlooked. There is strong evidence to suggest that the health of occupiers is at risk from modern and traditional housing hazards. Unless health is readopted as a concern of housing policy, the regulatory response needs radical rethinking.

Regulation in the sense of prescribed standards, the observance of which are coerced by penal sanction, is a form of control which has been the butt of critique for politicians and academics in both the United Kingdom and the United States in recent years. The experience of the regulation of housing conditions in England and Wales indicates that the coercive model of regulation, even as a background to negotiated compliance, had fallen into disuse as a mechanism for intervention in the housing market many years before the recent dissent. The regulatory framework of control fashioned in the nineteenth century had been transformed into an apparatus for the distribution of subsidy. The English and Welsh history is of more than parochial concern. It contains features reminiscent of developments in the United States and elsewhere. It is significant for the light that it sheds on the relationship between law and housing policy. It has
ramifications for the wider role of regulation in the pursuit of administrative objectives.

Housing law in England and Wales (legislation in Scotland as will be made clear is significantly separate) is undergoing extensive reform at present. The reforms are not based upon a policy which is derived from an analysis of housing need or the espousal of goals. In common with other wide ranging social reform, the restructuring of the housing market is being achieved by a relaxation of control on private investment, and tight regulation of the public sector. Thus there is deregulation of rent control, some relaxation of the regulation of building construction, and the unfettering of Building Societies, which have historically been the major provider of mortgage finance (Stewart and Burridge, 1989). These proposals and others reflect the policies of an administration concerned to dismantle what it regards as the suffocating regulatory restrictions on commercial behaviour. The arguments will be entirely familiar in the United States.

Housing provision has also been significantly affected by an increase in regulation of local government. The public sector in Britain, unlike the United States, has been a major provider of housing (nearly 30% in 1980). Public housing provided by local authorities has become a target for central government intervention. Initially the disposal of council housing was prompted by Conservative convictions that it was both an expensive object of public expenditure and a site of sympathetic Labour voters. Complex legislation was introduced forcing local councils to sell their housing to tenants, and almost accidentally the sale of council housing became one of the government’s most lucrative privatisation schemes (Forrest and Murie 1987).

This brief review of recent interventions in the housing market as a background to the regulation of housing conditions is directed to two separate issues. Firstly, the mechanisms for controlling the housing market continue to be the allocation (or withdrawal) of central government subsidy rather than the implementation of penal regulation. Secondly, whilst state intervention in the housing market is achieved primarily through subsidy, regulatory controls still exist. The regulatory framework is sustained but it has been separated from the foundations on which it was constructed.
The Role of Regulation

The Roots of Regulation

One of the earliest instances of the failure of market forces to protect the interests of the community arose from the threat posed to collective health emanating from individual houses. In England, a reform movement enthused by pity for the poor, frightened by contagion from their crowded courtyards and eager for their healthy labours (Finer, 1952), won for local Boards of health the power to close houses where insufficient “privy accommodation, means of drainage or ventilation” or other nuisances were “such as to render the house or building unfit for human habitation” (Nuisances Removal and Diseases Prevention Act 1855). The impetus for change was a concern for ill health, whether it was the poor who suffered it, the middle classes who feared it or the employers who lost labour from it.

By 1868 the power to intervene in the housing market locally had been extended to “taking down or improving dwellings occupied by working men and their families which are unfit for human habitation” (Artizans and Labourers Dwellings Act 1868; and Moore, 1987).

The identification of poor housing and sanitation as a source of epidemics was sufficiently powerful to subjugate to the control of local sanitary officers a slum owner’s right to let unfit property. Although in England the reform movement met opposition, the thrust of its legal intervention was the adoption of the penal sanction: owners of unfit property faced the prospect of compulsory demolition and harbourers of nuisances faced prosecution if they did not abate them. The free housing market encountered state control.

The American Codes evince a similar collective disapproval of antisocial landlords. At much the same period as the reform movement in England, similar sentiments were reflected in the Report of the Sanitary Commission of Massachusetts 1850 (Shattuck, 1948) and later in initiatives such as the Tenement House Act in New York and elsewhere. The American experience reveals a pattern of local regulation based upon the adoption of detailed housing codes, both to control the standard of new homes, and the conditions within existing ones. Intervention was prompted by the notion that national health was too important to be left to the vagaries of market forces.
Regulatory Responses

In English housing regulation, two separate concepts emerged as triggers for intervention. Both had health as their objective, but they focused upon different community situations. The 'statutory nuisance' was directed towards hazards in the local environment, whereas 'unfitness for human habitation' concentrated upon unhealthy conditions within the home. Initially both interventions were reactive and directed towards dealing with the unhealthy conditions that the market had unleashed in the tenements and rookeries of the industrial revolution.

A third parallel regulatory mechanism had emerged, directed at the control of the building process. Bye laws developed, until recently within the framework of the Public Health Acts, into Building Regulations. These dictated the size of components of new buildings, specified basic quality standards for materials, and laid down criteria for layout and design.

The principles underlying all three mechanisms were the Victorian conviction in the wholesomeness of space, light and fresh air. Traces of these concerns are evident in the modern formulations of all three regulatory approaches.

Fitness for Human Habitation

The Common Law concept was first reduced to ministerial guidance in a Ministry of Health Manual issued to local authorities in 1919 (Moore, 1987). The approach then, as now, was to identify a list of attributes to be expected of fit houses. These included freedom from damp, satisfactory lighting and ventilation, proper drainage, satisfactory water supply, adequate washing and food preparation facilities, and good general repair. The present procedure is to require action by local authorities to deal with houses in their area which are 'unfit' because they are so far defective in one or more of the items from a slightly more modernised list of attributes. The mechanism of enforcement is that Local Authority Environmental Health Officer's either serve a Repair Notice specifying the work to be done to make the property fit or require its closure. Local civil courts, the County Courts, hear challenges to the procedure.
Statutory Nuisance

The procedure for the abatement of statutory nuisances is that local government environmental health officers can serve upon any person who "suffers permits or allows" a statutory nuisance, a Notice requiring her to abate it and specifying how it should be done. If the person fails to abate the nuisance, the officer can apply to the Magistrates' Court for an order to enforce the Notice. The concept of nuisance is wide, and is accompanied by an extensive and historic body of judicial elaboration. The proceedings are criminal and a fine can be imposed.

Building Regulations

The regulatory approach of the Building Regulations has recently undergone significant changes. The rationale for the changes was the regulatory reaction — the system was felt to be "more cumbersome and bureaucratic than it need be; and that the present form of Regulations is inflexible; inhibits innovation and imposes unnecessary costs" (HMSO, 1981). The Building Act 1984 made two important changes to the procedures for building control. Firstly, it created a statutory framework of broadly defined Regulations and relegated the detailed requirements to practical guidance which has no statutory authority. Secondly, it created a band of "approved inspectors" with powers to certify compliance with the Regulations alongside the existing system of local authority Building Inspectors.

These three English models of housing control, illustrate the variety of regulatory techniques. Most studies of regulations concentrate upon an assessment of the effectiveness of regulatory agencies in the attainment of their espoused or supposed objectives. Such studies rightly emphasise the resource implications and institutional behaviour of the agencies, but ignore the regulatory alternatives. At most comparison is made with the regulation of 'real' crime by 'police forces' (Carson 1970, Hawkins 1984, Hutter 1988,). Current models of control are studied; there is little venture into the design of prototypes.

As the explanation of the control of English housing conditions illustrates, regulation is not a series of distinct legislative models. It is one manifestation of administrative power. Thus the penal component of fine for infringement can be redesigned
as subsidy to afford compliance; the criminal conviction for violation can be alternatively coerced by civil injunction; the pecuniary levelling of a fine against offenders can become the award of damages to the victim; documents from state officials range from letters of advice and information through official circulars, Codes of Guidance, enforceable Notices prescribing action to broad statutory norm and strict regulatory rule. The range of administrative mechanisms for the achievement of policy objectives and the combination of each of them is extensive. Models of regulation are misleading descriptions of state control; components of administration may provide a more accurate explanation.

Whatever components are assembled to create a legislative and administrative vehicle for the delivery of government policy should be determined by the objectives to be attained. Discussion may take place over which component is most appropriate to reach a given objective, but in the absence of such a policy objective, any initiative is likely to be misguided. By the same argument, a regulatory framework designed and built to achieve one set of objectives may be quite inappropriate as a vehicle for a different policy. It has been contended that the control of English housing conditions lacks such objectives; the mechanisms for control are available but there is confusion as to the purpose (Ormandy 1987). Should regulation maintain the housing stock or protect the community? Does the state invest in the fabric of the house or subsidise the income to the home? Are the standards minimum health requirements to be achieved by coercion or optimum targets to be obtained by subsidy or loan? What is the relationship between controlling the external as contrasted with the internal environment? Are controls directed towards the productions of housing or its consumption?

From Health to Comfort to Cost

The early concept of 'fitness for human habitation' was clearly built upon a concern for public health. The criteria first set out in the 1919 Manual from the Minister of Health and largely replicated in the unfitness standard today, echo the anxieties of the midnineteenth century sanitary movement. The legislative intervention was appropriately robust to counter the
threat to health. One of the luminaries of twentieth century housing policy, Professor J.B. Cullingworth summarised the response thus,

During the late nineteenth and early twentieth centuries a formidable-looking body of powers was built up to secure the adequate upkeep of private property. These not only made it the clear duty of owners to maintain their houses in a 'fit' condition, but also armed the local authorities with default powers. The principle was also established that an owner of an 'unfit' house could be compelled to demolish it or be bought out at site value only. (Cullingworth, 1966, p. 204)

The midcentury, however, witnessed changes in housing policy that are well documented (Cullingworth, 1966; Merret, 1979; Burnett, 1982). Firstly, there was growing recognition that the 1939–1945 war, and the clearance programmes before and after it, had eradicated the worst of the Victorian slums. Attention was turning towards properties that were not unfit, but which were substandard and rapidly deteriorating (Cullingworth, 1966). By the 1950s, the wholesale clearance of large areas of slums required a standard that could be used to justify the demolition of buildings which, whilst not immediately a danger to health, nevertheless fell below the rising perceptions of adequate housing for the day. Stability was included as a criterion for unfitness in 1954 and by 1969 poor internal arrangement was added as a ground of unfitness. Environmental health officers today recognise that the heydays of mass clearance were largely achieved by a generous interpretation of the unfitness standard (Burridge, 1987).

Many of the dilapidated properties were owned by the growing number of owner occupiers for whom the coercive powers of the Housing Acts were inappropriate. The easier economic climate of the 1950s allowed an expansion into a programme for the rehabilitation of private houses by the award of housing subsidy. Improvement grants, which had long been available but little used, increased dramatically in number as eligibility restrictions were lifted. Cullingworth (1966, p. 1207ff) records that only 6,000 grants were given between 1949 and 1953. By 1960 this had risen to over 130,000.
The impetus in favour of rehabilitation and subsidy to owners was fuelled in the seventies by a growing disillusionment with high-rise development as a solution to mass housing provision. The rising cost of new building coupled with increasing pressure to spend less indicated that rehabilitation was a cheaper economic goal.

This process had affected the implementation of the standard of fitness. The enthusiastic pursuit of wholesale clearance which had resulted in the adoption of a generous standard of unfitness by environmental health officers was contributing to the demolition of buildings that would otherwise have been capable of conservation. (Burridge, 1968; Moore, 1987).

The standard of fitness, first conceived as a penal standard to protect popular health was increasingly perceived as being based upon an outdated and narrow concentration upon health. In Scotland, for example, the Scottish Housing Advisory Committee, under the chairmanship of Cullingworth, recommended the adoption of a ‘tolerable’ standard to replace the unfitness standard, marking the acceptance of the view that “standards based on narrow public health concepts are now out of date, minimum standards should be based on considerations of convenience, amenity and socially acceptable living conditions” (Moore, 1987 p.10). The tolerable standard differed from the English unfitness standard in that it was both more objective — it required the evaluation of a building on a checklist of criteria rather than an overall subjective judgement — and was more in keeping with the needs of a postwar society in that it required a house to have hot and cold water as well as satisfactory provision for heating.

In England and Wales the broad subjective unfitness standard was retained, but the progress towards comfort and convenience as a goal of housing policy was marked by empowering environmental health officers in 1980 to intervene and enforce repair where “its condition is such as to materially interfere with the personal comfort of the tenant”.

Many of these influences seem to have been present in the shifts in U.S. Housing policy (Hays, 1985). The Housing Act 1949 was acclaimed as the “most important piece of health legislation ever enacted” by the Congress of the United States by the then
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Surgeon General, Dr. Scheele (Mood, 1987a, p.2). Intervention seems to have had a chequered past in the United States (Mood, 1987a, p.4) as in England, Wales and Scotland. Whilst estimation of the pursuit of the National Housing Goal ranges from the supremely confident (Weicher, 1977) to the cautious and critical (Mood, 1987a), the picture is one of a progression from the health concerns of individuals, through clearance of areas to rehabilitation of individual dilapidated houses. Furthermore, the change in emphasis was apparently accompanied by strong convictions amongst some housing administrators that the problems that had existed in 1949 had been largely eradicated and that minimum standards were already moving beyond the narrow health concerns of earlier administrations:

The fact that we have nearly eliminated the major housing inadequacies that existed in 1949 does not imply that we need no further improvement in housing quality, or that there are no remaining inadequacies to be eliminated. As our housing quality improves, we are able to raise our standards, to reach for levels or amenities unrealizable or unrealistic in earlier years. To some extent this has already been occurring. (Weicher, 1977).

In the process from clearance to rehabilitation, in the shift from public health under the banner of better standards that seems to have occurred on both sides of the Atlantic, common themes suggest themselves.

In the United States the plaintive call from Carlton, Lanfield and Loken in 1965 for a comprehensive campaign to enhance the public's image of municipal code enforcement was met over a decade later by the critique of regulatory unreasonableness (e.g., Bardach and Kagan, 1982) and the debureaucratisation of the Reagan administrations. The economics of regulation became a major concern. In housing, the implicit acknowledgement that health hazards had been eradicated deprived proponents of regulation of the powerful moral arguments that had sustained the early reformers. Attention moved away from the victims of bad housing conditions to the victims of the regulatory ratchet.

Whilst the Conservative administration in England espoused similar economic goals and political philosophies the flight from enforcement of the Public Health Acts had already
occurred and the penal approach of the Housing Acts had developed into the palliative of awarding housing subsidy. The grant system had already transformed the work of environmental health officers. Since the service of a Notice requiring repair entitles the recipient to grant aid, such officials have become less concerned with wielding the stick of coercion that is implicit in enforced rehabilitation; not surprisingly, the carrot of housing subsidy has proved a more amenable and effective repair mechanism than the threat of prosecution. Public Health Act procedures for most housing matters have fallen into disuse (Burridge, 1987). They are perceived as being unwieldy by those who would otherwise enforce them, and unpopular amongst the enforced. The beneficial effect of implementation to the dilatory landlord is that enforcement will either bring vacant possession and windfall profits via sale on the open market, or entitlement to grant to assist in the very repair which the landlord has in the past failed to carry out.

The involvement of environmental health officers in the apportionment of central government housing subsidy to the private sector resulted in a fundamental shift in emphasis in their role. They ceased to have a primary concern for the condition of houses or the health of the occupiers and became outlets for public expenditure. In many local authorities their housing activities were reorganised within the overall control of housing management. Public expenditure rather than public health became their overriding concern. In this process much of the debate about housing conditions became centred upon the relative importance of subsidy to the private or public sector housing programmes. In the early 1980s public housing was severely underfunded, deprived of finances by a government committed to reductions in public expenditure. Public sector housing, however, continues to provide some of the best housing and is in the least disrepair. The most recent house condition survey (Department of Environment, 1988) identifies the small private rented sector (less than 7% of all dwellings) as being in the worst conditions (ibid., p.31), whilst owner occupiers, the largest tenure group, suffer the next worst conditions.

The utilization of the legislative norms of the Housing Acts as the criteria for eligibility for housing subsidy reinforced a
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Treasury lead desire for centralised control. This in turn coincided with a political battle for the control of local government budgets that became a major objective of the Parliamentary power of the Conservatives in the 1980s.

Two potentially conflicting influences were affecting the implementation of the unfitness standard. The broadly defined and subjectively implemented standards suited the distribution of national housing subsidy between localities with widely differing housing stock. For these purposes a nationally applied norm might result in the politically unpalatable concentration of subsidy in more deprived regions to the almost total exclusion of some areas, particularly in the prosperous South East (Burridge 1987). On the other hand control of public expenditure necessitated uniformly implemented norms, preferable susceptible to accurate estimates of potential cost. This could be achieved by the introduction of a more objective standard of fitness, such as the 'tolerable' standard already employed in Scotland. The Building Research Establishment, the government agency entrusted with structural advice to the government recognised the benefits of objective evacuation (O'Dell 1985).

The checklist approach offered a number of advantages for a Treasury concerned with public expenditure control. It facilitated the evaluation of the national housing stock in House Condition Surveys which had been carried out since 1961 using the unfitness standard in the Housing Act as a yardstick; it was amenable to such empirical enquiry and suited the technology of the computer; and a standard of fitness could be set and altered according to calculations of the cost of repair or improvement that the government would sanction. The revised fitness standard currently progressing through Parliament includes adequate provision for heating facilities in the attributes to be contained within a fit house. Whether or not this improvement in the legislative standard has a marked effect on the condition of housing in England and Wales, however, will not depend upon the zeal of environmental health officers in its enforcement. It will be determined by the level at which the new means-tested eligibility for grant aid is set and the public expenditure dedicated for the employment of those officers who can identify the substandard properties. Thus the current housing standards
in England and Wales emerge as ciphers of economic expediency rather than symbols of a healthy housing policy.

The most recent proposals emanating from the Department of the Environment will complete a transformation from curative to palliative (Local Government and Housing Bill 1989). The identification of the owner occupied and private rented sector as being the sites of the worst housing is being used to intensify a policy of grant aid to the private sector. It also has been used as a justification for the targeting of subsidy to those most in need. The proposed targeting requires an evaluation of both the building and the owner, since as well as the adoption of a revised standard of unfitness it is proposed that all grant aid will now be means tested. The administration of housing subsidy has thus moved away from investment in the housing stock towards support for the poor.

This analysis of the regulation of English housing conditions amounts to more than a critique of current housing policy; in effect the recent proposals are symptoms of its demise. Ironically the official disinterest in housing and health is occurring at a time when elsewhere attention is turning towards the regulation of housing conditions. The efforts of the World Health Organisation (Mood, 1987b), and such campaigns as Healthy Cities 2000 are striving to reassert the consequences upon health resulting from the lack of adequate housing provision. The attempts of epidemiologists and clinical researchers to isolate and evaluate the relationship between potential housing hazards and ill health are meeting new success.

Swept aside in the fifties by the enthusiasm for high rise and the eagerness for new housing, further eroded in the seventies for their preoccupation with outdated concerns, then undermined for their unreliability, housing researchers are methodically establishing their credibility. Dampness and mould growth in housing has been identified as a factor affecting respiration (Hunt and Martin, 1986; Strachan, 1986, 1988); protection from cold in the home has been cautioned (Collins, 1983); relationships between building design, behaviour and mental stress are being clarified (Freeman 1984; Ineichen 1986; Gabe 1986) and correlations between ill health, housing, and poverty continue to be reinforced (Byrne, Keithly, Harrison, & McCarthy, 1986), To
these can be added current concerns over chemicals used in construction or naturally occurring (asbestos, radon); fire hazards and other features of design and construction conducive to accidents (Ranson 1987); or modern sanitary threats such as legionella (McEwen 1986).

This paper has argued that the opportunity for reassessing the administrative and legislative response to bad housing conditions should be taken. More is known about the human requirements to be provided by shelter (Lawrence 1986, 1987). The hazards of bad housing and the damage that it does to the national health are better understood. Methods for the evaluation of housing structures can provide detailed comparative assessment, which are capable of quantification and costing. If such objectives can be identified, appropriate regulatory responses can be implemented.

From Health Policy to Poverty Policy

The experience of housing regulation in Britain and the United States emphasises the breadth of legal mechanisms for control that is available, although the maintenance of largely unaltered Victorian standards as the guidons for a succession of diverse housing policies, indicates how ephemeral such legal regulation can become in the service of administration. The history of English housing standards is a tale of new Emperors and old clothes. Successive policies have been fitted in the norms of the past. The idea that regulation can be transformed from an instrument of policy to a product of it, is a reminder of the chimerical image of law.

That such a transformation has been possible is a reminder of the ease with which regulation can become the object rather than the instrument of policy. The policy currently influencing English housing arises from social security principles and emphasises means-tested benefits. It is based upon two fallacies. Firstly, that better housing on its own will improve the health of the poor. Secondly, that only the poor are unable to cope with the unhealthy housing conditions that they suffer. Both misapprehensions follow from policy that focusses upon the incomes of individuals, rather than the evaluation of structures which may give rise to health hazards.
Alternative strategies could reflect a reemphasis of health as a major concern of housing policy. Regulation and subsidy are not mutually exclusive as the review of English housing controls has demonstrated, but the decline of one will require an emphasis upon the other. In view of the sophisticated analyses and calculations contained in the English House Condition Survey (Department of Environment 1988), a comparable detailed programme of repair related to the severity of the structural conditions is possible. If subsidy rather than penalty is accepted in principle as the preferred mechanism for intervention (which would appear to be the case still), then such a programme could be expected to relate the level of subsidy to the estimated £12.6 billion cost of repair (Department of Environment 1988, p.97), rather than the poverty level of individual occupiers or landlords. Alternatively, if subsidy is not to be related to the worst housing, but only to the poorest people who seek assistance in the worst housing, then a return to the regulatory ratchet will be necessary. Since public health and not private comfort is still an issue, the regulatory response is ripe for rethinking for the private and public rented sectors.

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An Ecological Perspective on Housing, Health and Well-being

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Human ecology is a term that has been used frequently since the beginning of this century to examine some of the relationships between people and their surroundings. This article presents a different interpretation to that commonly used by academics and professionals in the medical and social sciences. The ecological perspective developed and illustrated here stems from an appraisal of many contemporary contributions, and an examination of Hippocrates’s treatise "On Airs, Waters, And Places". The perspective presented herein accounts for the impacts of human products and processes on the biotic and abiotic constituents of the environment, as well as the human organism. Feedback from the state of the environment on human activities, and on the health and well-being of the human organism, is explicitly accounted for. It is suggested and shown how this ecological perspective is appropriate for studies of the interrelations between housing conditions, and human health and well-being.

Human ecology is a term that has been used increasingly since the beginning of this century, yet it has been and still is characterized by some confusion, and a lack of consensus about what it means (Catalano, 1979; Young, 1983). For example, human ecology has commonly been equated with studies of the relations between people and their immediate surroundings. Such studies have commonly been completed by academics or professionals with training within established social science disciplines. In sociology, for example, an ecological approach has commonly been attributed to Robert Park, Roderick McKenzie, Ernest Burgess and Louis Wirth. This group of sociologists examined the spatial, social, and economic patterns and processes with respect to the human behaviour of individuals and groups in specific localities (cf. Park, Burgess and McKenzie, 1925). Likewise, ecological psychology (e.g., Wicker, 1979) and ecological geography (e.g., MacArthur, 1972) have examined the
relations between human activities and specific localities or environments using approaches and methods specific to each of the parent disciplines of psychology and geography. Consequently, the term environment has been interpreted and studied according to academic traditions that often emphasize the spatial and social constituents in which human activities occur, whereas both the inorganic and biological constituents of the environment have been overlooked. Furthermore, many of these studies do not identify the impacts or consequences of human activities on these constituents. Therefore, it is not unfair to claim that, in general, these contributions are not ecological but environmental sociology, psychology or geography, because they do not account for the ecosystem in which human beings are but one component. Fortunately, the biological sciences do provide cues for the application of corrective measures to overcome these kinds of shortcomings. These cues now warrant our attention.

Principles for an Ecological Perspective

The term ecology was used by biological scientists during the nineteenth century to refer to studies of the relationships between organisms — animals and plants — and their immediate environment. An ecosystem refers to a circumscribed environment, all of the organisms and inorganic constituents contained therein and the interrelations between them. From this perspective, it is noteworthy that the environment of any living species (such as communities of insects, or plants) is multi-dimensional, and complex, quite the opposite connotation to that used by many social scientists who refer to "human environments" as if they were a neutral background. In order to comprehend this complexity, it is instructive to recall a distinction frequently made in the biological sciences, between autecology and synecology. Whereas autecology examines one biological species, synecology analyzes communities of biological species — animals and plants — in terms of their interrelations with the biotic and abiotic constituents of their environment. The relationships between organisms and their environment are examined with respect to at least three subsystems: (a) the organism or community of organisms; (b) the abiotic and biotic environment; and,
(c) the sets of relationships between the organism(s) and the constituents of the environment, including the impact of the organism on these constituents. Although we refute biological analogies of the kind frequently used to interpret the individual or group behaviour and activities of humans (cf. Catalano, 1979), we admit that ecological studies in the biological sciences do provide important cues for social scientists who wish to formulate an integrative perspective for human ecology. This perspective will now be elaborated and illustrated.

What is human ecology?

Human ecology is an holistic, integrative interpretation of those processes, products, orders and mediating factors that regulate natural and human ecosystems at all scales of the earth's surface and atmosphere. It implies a systemic framework for the analysis and comprehension of three logics and the interrelations between their constituents using a temporal perspective. These three logics are: (a) A bio-logic, or the orders of biological organisms; (b) An eco-logic, or the orders of inorganic constituents (e.g. water, air, soil and sun); and, (c) A human-logic, or the ordering of cultural, societal and individual human factors.

It is suggested that this macro-system of three logics regulates the World. Consequently, it is inappropriate to emphasize one set of constituents to the detriment of others. Moreover, it is erroneous to distinguish between the "physical" and the "social" constituents of environments. This definition implies that a contextual approach is pertinent. This kind of integrative approach would examine specific situations in terms of the reciprocal relations between the three logics, both at one point in time, and over an extended period of time.

The interpretation challenges the "Man-environment paradigm", which has consistently been used since Antiquity to distinguish human beings from their "natural habitat", and to claim that the transformation of the material constituents of that habitat by people is an "underlying force" that has guided human history. This point of view creates a dualism between people and their habitat. Such chasms are bridged if it is accepted that it is misleading to study the inorganic, biological
or human constituents of the environment, because they are mutually defined by, and defining components of, one ecosystem in which people are but one constituent. Human attitudes, motives and values influence what people perceive and construe, how they use precise settings, and how they modify them over time. Moreover, the location, composition and organization of a setting has some bearing on how it is perceived and used. In sum, it is not "the people" or "the environment" which should be given priority, or become the methodological unit of study. Rather, the interrelations between the three logics presented above should be examined over an extended period of time in the context in which they occur.

The preceding definition of human ecology can be applied to examine precise subjects, such as housing, health and well-being, bearing in mind the following principles.

First, the interrelations between humans and the constituents of their surroundings are manifested through a wide range of physiological and psychological processes. These processes include sensations and perceptions (which animals also share) but also beliefs, doctrines, ideas and representations, which are uniquely human and now-observable. The interrelations between people and their environment are not just spatial, nor observable, but also (and indeed significantly) cultural and metaphysical. Moreover, these interrelations are not absolute, nor static, but dialectical, and subject to change during the lapse of relatively short and longer periods of time.

Second, unlike other biological organisms, the sets of interrelations between human beings are characterized by both discursive and reflexive knowledge, including a recourse to symbols, particularly (but not exclusively) linguistic symbols (Leach, 1976). This characteristic is a distinguishing feature between anthropoid behaviour and human behaviour: it has important implications with respect to the human interpretation of landscapes and the biosphere.

Third, the "human environment" can be distinguished from the "environment" of other biological organisms by its instrumental nature. Human products and processes transform the constituents of the environment in order to respond to prescribed aspirations, needs and goals, that are defined both by
individuals and human groups. Nearly all geographical regions of the world today have been used, constructed, or modified by humans for a wide range of purposes. An historical perspective can illustrate these human processes.

Ecological and Historical Explanations

According to some human ecologists, including Boyden (1987), a bio-historical analysis of human civilizations identifies four ecological phases which are defined with respect to the interrelations between the biosphere and human societies, as well as the interrelations between the health and well-being of people and their immediate surroundings. The four phases are: (a) The hunter-gatherer phase, by far the longest of the four; (b) The early agricultural, farming phase, with sedentary settlements, beginning about 400 generations ago; (c) The early urban settlements phase, beginning in some regions of the world about 200 generations ago; and, (d) The high-energy phase, beginning in a few regions, initially on a small scale, about 8 generations ago.

The distinguishing features of these four phases include the cultivation, production and consumption of food, the accumulation of waste products, the construction of human settlements, and the production and use of energy with respect to all the characteristics of daily life. We cannot elaborate on all these characteristics in this short article. However, in the context of this paper, it is important to indicate the interrelations between the distinguishing features of these four phases of human civilization and the health and well-being of people.

Although it is generally recognized that housing conditions have an effect on the health of residents, it is also apparent that it is not pertinent to extract material housing conditions and study them in isolation from other factors which form an integral part of the lifestyle of the inhabitants, and influence their health and well-being. Inadequate nutrition, for example, has an important role to play. Yet, can nutrition only be considered in terms of socio-economic factors, or should seasonal variations in the supply of food, and the lack of facilities for the storage and preparation of food also be examined? Clearly, there are many questions
that medical and housing practitioners, environmental health officers and human ecologists can (and should) ask. Any reply to these questions will ultimately depend on the conceptual framework or the theoretical stance adopted by the respondent.

An historical overview by Catalano (1979) of some of the varied explanations recurrently used to account for human illness, abnormal behaviour, and the health and well-being of communities indicates that some explanations, including those founded on "the germ paradigm" were usually partial and causal interpretations. In contrast, however, some contemporary studies, which Catalano labels "ecological explanations" uphold that the presence of a germ is a necessary but not a sufficient condition for all people to become ill. This kind of interpretation is not novel, but has some antecedents, grounded at least partially, in the works of Hippocrates (460-377, B.C. (?)), a Greek physician who taught at a medical school on the island of Cos. Many accounts of the Hippocratic treatise — some of which are quite misleading — have already been published. Those readers who require more details than those included here can refer to Glacken (1976, pp. 80-115) for an interesting overview. A summary of the Hippocratic treatise "On Airs, Waters, And Places" is presented here with the aim of showing the pertinence of an ecological perspective in order to examine housing, health and well-being in a more comprehensive way than other recurrent approaches such as "the germ paradigm".

The Contribution of Hippocrates

The Hippocratic treatise "On Airs, Waters, And Places", published initially about 2600 years ago, is founded on ethnographical, geographical and medical observations that are worthy of recalling today. Hippocrates maintained that human health and well-being are associated with a desirable state of balance or imbalance between the human organism — the humors — and its environmental conditions. He illustrated this viewpoint by describing the contextual conditions in which some specific populations of Asia and Europe lived. In order to understand the health environmental conditions and lifestyles of specific populations Hippocrates refuted commonly shared
beliefs in divine infliction and providence, and replaced such interpretations by an ecological perspective

...when one comes into a city to which he is a stranger, he ought to consider its situation, how it lies as to the winds and the rising of the sun; for its influence is not the same whether it lies to the north or the south, to the rising or to the setting sun. These things one ought to consider most attentively, ... (p. 190)

There is not doubt that Hippocrates underlines the importance of meteorological and astrological factors in this and other passages of his treatise. Yet, he is also equally concerned with comprehending the impact of micro-climatic factors, biological organisms (both animals and plants), and inorganic entities (namely air, soil, sun, and water) on human health and well-being in precise contexts. Hippocrates, and other medical teachers during the Middle Ages, maintained that the world contained four primary elements: air, fire, water, and earth, which had characteristic qualities. For example:

...and concerning the waters which the inhabitants use, whether they be marshy and soft, or hard, and running from elevated and rocky situations, and then if saltish and unfit for cooking; and the ground, whether it be naked and deficient in water, or wooded and well-watered, and whether it lies in a hollow, confined situation, or is elevated and cold, ... (p. 190)

It could be claimed that Hippocrates, like some epidemiologists, ethnologists and human geographers, presents a case for strict climatic/environmental determinism. Such a claim, however, can be refuted, as Glacken (1976) notes, because Hippocrates not only examines biological and inorganic factors, but also cultural and societal parameters, especially in relation to the work, leisure, and nourishment of specific populations in order to comprehend why the inhabitants of diverse regions of the globe are different:

...and the mode in which the inhabitants live, and what are their pursuits, whether they are fond of drinking and eating to excess, and given to indolence, or are fond of exercise and labour, and not give to excess in eating and drinking. (p. 190)
From these things he must proceed to investigate everything else. For if one knows all these things well, or at least the greater part of them, he cannot miss knowing, when he comes into a strange city, either the diseases peculiar to the place, or the particular nature of common diseases, so that he will not be in doubt as to the treatment of the diseases, or commit mistakes, as is likely to be the case provided one had not previously considered these matters. (p. 191)

Hippocrates noted that the patterns of lifestyle, health and disease in human societies are variable. His interpretation has subsequently been supported by palaeobiological studies of human remains, and anthropological and medical studies in contemporary hunter-gatherer societies (Boyden, 1987).

Hippocrates maintained that it was not the health of the individual, or his immediate surroundings that needed to be considered, but a thorough understanding of the contextual conditions in which people live. This interpretation is far removed from those stemming from “the germ paradigm”. It upholds that human health and well-being are grounded in the interrelations between the human organism and its milieu. Moreover, milieu is not equivalent to “personal space” or “residential environment” but explicitly accounts for biological organisms and inorganic entities. In this respect, Hippocrates proposed a perspective and advocated an approach to medical practice which is far removed from much contemporary academic research and professional practice adopted by people who isolate variables from each other and from the contextual conditions in which they occur. Consequently, it has been common practice to study the relations between one indicator of environmental conditions (e.g., noise or air pollution in residential quarters), or one indicator of housing quality (e.g., dampness in the building structure, or the quality of indoor air) and “its effect” on the health and well-being of the inhabitants (Kasl and Harburg, 1975; Jacobs and Stevenson, 1981). Alternatively, measures of the morbidity of resident populations (e.g., psychological strain are related to one dimension of the domestic setting (e.g., floor level above the ground in high-rise housing), as Mitchell (1971) has shown.

Irrespective of the simplifications inherent in research using these approaches, the findings of many studies of this kind have
An Ecological Perspective on Housing

rarely been replicated in the same or different residential settings, as Churchman and Ginsberg (1984), and Gabe and Williams (1986) have noted. Moreover, much contemporary research usually examines the relations between isolated variables at only one point in time. Yet, there is sufficient information that shows that the aspirations, preferences and lifestyle of people change during the life-cycle (e.g., Stokols, 1982); that the health and well-being of people are neither constant nor mono-dimensional; and that environmental conditions and housing quality vary during the course of time (e.g., Lawrence, 1987). Therefore, one should not only be critical of the limited perspective of many contemporary studies, but also formulate alternative theoretical and methodological principles for future research. We suggest that a human ecology perspective is a pertinent response to this requirement.

Applied Human Ecology to Housing and Health

A human ecology perspective acknowledges three main levels of interrelated sets of variables that account for:

1) *The physiological state of individuals*, in relation to human activities; the impacts of these activities on the health and well-being on individuals, and on the condition or state of their immediate surroundings. For example, those human activities which create air and noise pollution, may produce negative effects, such as respiratory illness, deafness, or stress, in the human organism, as well as reducing the quality of air or other constituent of the eco-logic, or the bio-logic.

2) *The immediate surroundings of individuals and small groups*; the interrelations between this small scale of the global environment, and the impacts of human processes and products on environmental conditions at this scale; the cumulative effect or impact of human activities and environmental conditions at this scale on the condition or state of the biosphere. For example, air quality and noise levels at home and in work places are influenced by the design of residential and work places as well as the activities that occur in them; the accumulation of air and noise pollution may induce negative effects on human groups and societies, and also lead to the
degradation of the biological and inorganic constituents of human ecosystems.

3) The total environment of the biosphere; the development of modifications to it owing to human processes and products that utilize nonorganic and biological constituents according to cultural and societal values, norms and traditions. For example, the accumulation of air pollution in precise contexts can often be related to the design and use of the built environment, particularly when natural resources, such as forestry timbers, are used and not replenished; consequently, human activities can lead to an imbalance in the ecosystem. Similarly, human activities can produce toxic wastes, that are harmful for human health and well-being; and if they are not treated prior to disposal they will engender negative effects on the biosphere.

It is important to underline here that the impact of human processes and products is quite different at each of these three levels. Nonetheless, such distinctions at these different levels are not common in many lists of health indicators. The need for such distinctions can be illustrated by a brief overview of some seminal interpretations of human health in relation to the built environment, in general, and residential quarters, in particular.

**Health and Housing: a complex subject**

Since the early nineteenth century, there has been a growing concern about the quality of the "environment" at various levels or scales, ranging from the quality of building interiors (e.g., indoor air pollution) to the quality of regional and global atmospheric conditions (e.g., the amount of carbon dioxide, nitrogen dioxide, and sulphur dioxide in the atmosphere). It has been shown that the health and well-being of people is not only influenced by the quality of air at these extreme levels or scales, but that atmospheric conditions are simultaneously influenced by human products and processes at these levels or scales. Although we shall not elaborate on the bacteriological, chemical and epidemiological characteristics of diseases due to atmospheric or other conditions in this article, it is noteworthy that the Public Health Movement in England, which began in the early nineteenth century, established correlations between the health and housing conditions of people at that time.
The Contribution of Edwin Chadwick

As Secretary to the Poor Law Commission, Edwin Chadwick (1842) wrote an influential report, which established that those people who lived in sanitary dwelling units generally lived longer than those who lived in slums; and, those persons from the same socio-economic class who lived in the country generally lived longer than those who lived in urban areas. Hence, in general, Chadwick underlined the need to examine the contextual conditions in which people lived: their domestic accommodation, its location and its immediate surroundings, and their work conditions. At another level, he noted that the provision and quality of air, sunlight, water and waste disposal was as equally important as the state of housing construction. Finally, he underlined the importance of the life-style of the inhabitants by noting the ill-effects of overcrowding, inadequate cleansing and ventilation, and the presence of noxious substances.

Chadwick suggested how housing conditions could be improved by sound public administration, and the enforcement of parliamentary laws. The removal of all refuse from dwelling units, streets and roads; and the improvement of drainage, lighting ventilation and water supply we recommended. These recommendations became the foundations of the sanitary and housing reform movement in the United Kingdom during the nineteenth century. From the groundwork accomplished by Chadwick, the condition of dwelling units and their immediate surroundings, became explicitly associated with the Public Health Campaign. In other words, the design and management of housing was related to the broader geographical context in which it was constructed. Concurrently, the provision and condition of the housing stock was considered in terms of economic and political parameters, including property rights, tenure and cost of rent. Consequently, it became the subject of a prolonged, ideological debate, grounded in the notions of laissez-faire and self-help.

During the course of the nineteenth century there was a slowly increasing involvement by government in the enactment of public health legislation. The Public Health Act of 1875 was a milestone. However, it is also noteworthy that all progress during this period was grounded on the misfounded yet common
interpretation of the transmission of infections disease by unpleasant odours (e.g., miasmatic vapours). The so-called miasmatic theory of disease, upheld by Chadwick and many reformers, proved to be misfounded and was rejected only after Louis Pasteur and other bacteriologists had made their discovery. This brief overview illustrates that although there was considerable progress in the health and housing conditions of people in England by the end of the last century, e.g., the last outbreak of cholera occurred in 1861 and cases of tuberculosis decreased — all reforms and progress in that field were based on an erroneous theory of the transmission of communicable diseases. (It is important to note, however, that if the role of micro-organisms in the transmission of such diseases had been established earlier, then the reforms outlined above may have been implemented sooner, because such new knowledge would have confirmed Chadwick’s recommendations for improvement). Yet, it is also pertinent to note here that any improvements in the health and well-being of the population cannot be limited to the vast range of variables that were examined, because improvements in the clothing and diet of people were but a few indicators of a general improvement in the livelihood of the population during the Victorian era.

Calculating and Monitoring Costs and Benefits

The preceding sections of this article illustrate that it is too restrictive to examine the interrelations between housing and health only in terms of bio-medical and environmental factors. Studies of the housing conditions of the majority of urban populations in England, during the nineteenth century, and in many countries today, confirm that it is also necessary to consider a range of political and economic parameters that structure and function in human societies. The design, management and use of the housing stock is but one set of products and processes of human ecosystems. During the last century, as for today, those people who did not have regular employment, who could not afford to pay prearranged housing rents or fixed mortgage payments, who needed to live in inner urban quarters to be readily accessible to the job market, had (and still often have) the
most unfavourable housing conditions. Then (as now) the advent of "slum clearance" which was explained by the construction of railroads, factories, and road widening projects, meant that vast numbers of these unfavourable housing units were demolished. Consequently, overcrowding increased — not by choice as the advocates of *laissez-faire* pretended — but by economic necessity. These processes, and their consequences were (and still are) the crux of health and housing problems in many cities around the world. Hence, if we adopt an approach like that advocated by Chadwick, we will tackle an important part of the problem, but not its core unless political and economic parameters related to the ownership of land and the housing stock, as well as the domestic economy of households are also considered.

From this perspective, it is noteworthy that although epidemiological studies in London from 1951 presented a cause-effect relationship between air pollution and the high number of deaths, in more recent years, some epidemiologists have shown that a wide range of other factors were involved in the high mortality rates; by addition, the London smog became a catalytic factor that surpassed the threshold of tolerance. This enlarged interpretation related the degree of atmospheric pollution to climatic and microclimatic conditions (e.g., inversion of temperature, wind velocity and atmospheric precipitations); to the use of fossil fuels for heating and energy in the work place, at home, and for transportation between these localities and other services and facilities; and to personal habits related to life-style (such as cigarette smoking, private motor-car transport, daily exercise). The impacts of these human practices and products are numerous and varied: some will be positive, others negative, depending on what criteria are used to assess them.

Many land uses, including housing construction, generate benefits and costs of diverse kinds. The decision to construct a new factory — for a pharmaceutical company, for example — is usually related to the purchase price of alternative sites, the costs of transportation, site services and infrastructure, the cost and availability of energy supplies, and other parameters which are readily quantifiable. Those persons employed in the factory will usually try to choose the location of their residence by
trading off the cost, the distance and travelling time from home to work with access to community services and facilities, the attractiveness of the neighbourhood, and a range of other social and economic parameters. Neither the factory owner, nor each of the workers, is responsible for (or fully aware of) the external costs generated by their respective decisions. Nonetheless, although the factory benefits the local community by providing employment, the production processes it shelters may release nontoxic and toxic wastes that cannot be eliminated, pollute the air and/or subterranean soil, thus creating direct, harmful effects on some inorganic and biological constituents of the local ecosystem. There may also be harmful effects on the health and well-being of the workers and the local population. Likewise each of the workers (like all motorized commuters) will pollute the atmosphere, use nonrenewable fossil fuels, and contribute to noise while travelling between home and work. In essence, what may seem rational for the factory owner or worker (at least in economic terms) may not serve the best interests of the local human ecosystem, at any point in time.

This example shows that the calculation and monitoring of costs and benefits is a fundamental, controversial, and complex function that should be assumed by government, owing to the need to examine all the constituents of bio-logic, the eco-logic and the human-logic in a precise context, at the three levels of interrelations presented earlier in this paper. Environmental health officers, medical practitioners, architects, social scientists, and planners can make an important contribution to the accounting and monitoring of the constituents of human ecosystems. Subsequently, alternative proposals for land uses and housing, for example, can be formulated, tradeoffs can be examined, and compromises can be negotiated. Nonetheless, today so few public or private institutions are examining the benefits and costs of developments and changes for specific communities, or populations, or ecosystems, so that informed decisions are made, costs and benefits are correctly assigned, and negative impacts are reduced. Unfortunately, this kind of approach was not implemented prior to the construction of vast numbers of rental housing units in numerous countries around the world during this century, and especially since the Second
World War as Dunleavy (1981), and Prak and Priemus (1985) have shown. The legacy for current and future generations is a grim one: although many dwelling units were constructed in response to a housing shortage, which many countries faced in the 1920s and 1950s, it has only been in recent decades that the ecological and economic costs of such housing have been studied in detail (e.g., Prak and Priemus, 1985). The condition of these housing units has been related to the nature of their immediate surroundings, and also to conditions in other areas of the city or region in which they are located. For example, some attention has focused on the quality of atmospheric conditions, the micro-climates of housing estates, and indoor air quality. Concurrently, it has been found that respiratory illnesses and diseases are the primary cause of death in European countries today. Moreover, new (or formerly unidentified) diseases have been tabled. One example is *legionellosis*, which comprises two distinct but related illnesses: an infection of the lower lung, known as legionnaires’ disease, and Pontiac fever, a non-pulmonary disease like influenza. According to a recent report published by the World Health Organization (1986, p. 1):

Legionnaires’ disease accounts for only a small proportion of all reported cases of pneumonia, though the rate of infection is higher in men over 50 years of age. Numerous outbreaks have appeared in recent years all over Europe, North America and North Africa, mainly in hospitals and hotels but also less often in other buildings.

The disease has been associated with conditions in residential buildings. Numerous studies have established that room humidifiers, air conditioning systems and cooling towers, and hot and cold water supplies nurture *legionella* bacteria and transmit them through the indoor building environment, or discharge them into the atmosphere outside the building. Although chlorination and temperature control are crucial for both hot water supply (not below 60c) and cold water supply (not above 20c), the ecological perspective presented in this article also raises many other issues. One could begin by asking why the water supply has become prone to bacteria, much in the same vein that Edwin Chadwick approached the question of water supply. One could examine the amount of energy
required to pump, filter and heat hot and cold water supplies in relation to the increase in comfort and convenience provided. One could also examine "the need" to install air humidifying, air conditioning and ventilation systems in an increasing number of buildings that have internal rooms or spaces devoid of natural light and ventilation. Apart from the installation, the maintenance and running costs of these services, are there not alternative practices for building and housing design even at relatively high densities? We suggest that the ecological perspective presented in this paper not only raises fundamental questions of this kind, but also enables us to respond to them in a more comprehensive way than has commonly been done in the recent past.

Conclusion

When the health and well-being of individuals and human communities are examined by environmental and public health officials some of their attention ought to focus on architectural, economic and socio-psychological indicators, e.g., the design, the meaning and use of the built environment — which are associated with human health and well-being. Furthermore, when architects, planners and housing administrators examine the built environment, then a range of environmental health indicators, e.g., safety hazards, stressors, nonbiological toxins and other pollutants — need to be considered. This paper requests and suggests that much more attention is devoted to the interrelations between those indicators of health and well-being, as well as those environmental and housing indicators, that reflect the demographic, economic, political and life-style characteristics of local populations. Moreover, the monitoring and the regulation of the condition or state of the biological, inorganic and human constituents of specific human ecosystems has not been widely achieved in a comprehensive manner. This paper indicates that much more methodological research and applications are required before remedial and preventive strategies can be formulated and implemented. The ecological perspective presented and illustrated in this paper can enable professionals, practitioners and laypeople to achieve this goal.

If human ecology is to become an integrative perspective (rather than a multi-disciplinary field), for the study of housing,
health and well-being, then there ought to be an integrative conceptual framework. This paper has briefly presented and illustrated a tripartite framework. In sum, according to this interpretation, human ecology is simultaneously concerned with the impact of human processes and products on the inorganic and biological constituents of the environment, and the reciprocal relations of these impacts on human processes and products. This ecological perspective can generate a coherent body of knowledge by identifying those operant principles that ought to be accounted for in a precise context, at a specific point in time, as well as at larger geographical scales, over a relatively long period of time. These principles define the orders, the conditions, the benefits and the costs that enable human populations, their immediate surroundings, and the ecosystem which supports them to remain sustainable. Using such a coherent body of knowledge, public administrators, politicians, and other professionals in tandem with local populations, could formulate and implement policies that encourage sustainable conditions not just inside dwelling units, but at other geographical scales, from the house, the neighbourhood, the city and region to the world ecosystem.

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Housing, Health and Well-Being: An International Perspective

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At present around 1,000 million people live in grossly inadequate housing, and 100 million have no shelter whatsoever. Adverse trends in housing status and environmental conditions threaten the health and well-being of additional millions of people world-wide. The relationships between housing and health are reviewed, with an emphasis on the house structure, sanitation, pollution, and overcrowding. Possible approaches to improved housing and municipal planning are examined, and the key requirements include new policies of municipal and national governments, intersectoral coordination, the mobilization and "enabling" of communities, and strengthened environmental health services.

Housing is not only a major defence against ill health, but also it should support the state of "positive health" implied by the WHO definition: a state of "optimal physical, mental and social well-being".

More than half of the world's people do not enjoy a level of health that allows them to lead a productive and satisfying life, or that comes anywhere near a state of health as defined above. Statistics on the world health situation describe the frequency and burden of premature death, chronic sickness and disability, but sometimes the sheer volume of numbers diverts our attention from the fact we are talking about infant deaths, children
who do not grow because of recurrent infections, mothers who are so malnourished that they cannot care for their children, and a cycle of ill-health leading to unemployment, which leads to greater poverty and more ill-health (Eckholm, 1977).

In contrast to a worsening situation in developing countries, diseases related to basic deficiencies in infrastructure, such as a lack of clean water and basic housing, or to malnutrition, are much less common, and life-expectancy is much improved in the developed countries. However there are a host of diseases and disorders, of infectious, allergic, genetic, or psycho-social aetiology, in which environmental conditions and especially housing, play an important role.

What can national and international health agencies do about this? Is the answer to be found within the health services, to provide more and better doctors and health workers, more hospitals, cheaper and better medicines and laboratory tests? Is it to be found in education, to teach people how to change their behaviors to avoid contracting illnesses? With WHO support, many countries are making major efforts to provide better health services and better education for health.

But the impact of health services is limited, as is the impact of health education when people lack the facilities to enable salutary behavior. In the developed world, the major improvements in the standard of health over the last century, when decades were added to the human life-span, when infant mortality was reduced 10-fold, and many forms of chronic debilitating illness such as tuberculosis were controlled, came with improved housing and a healthier environment. Most public health workers accept the proposition that unless dwelling conditions and the housing environment are improved, then the proclaimed goal of "Health for All" cannot be reached. The paradox for Ministries of Health in all countries is that one of the most effective approaches to improving health, which is to improve housing and living conditions, is not under their administration or within their mandate. The drift of this argument is plain: they must raise the health awareness of housing authorities and planners, of builders, of those enmeshed in economic development and of those responsible for the physical and social environment (Hardoy and Satterthwaite, 1987).
The health and social welfare aspects of housing involve far more than the dwelling structure and its immediate surroundings. Shelter is a critical factor in the ecology of human health and must be considered in relation to that ecology. The roads that run through settlements, existing and new industries in relation to residences, access to educational and health facilities, markets, employment and income opportunities, space for recreation and privacy, gardens, transport — apart from topography, climate and geology — all bear on health protection and promotion. In that shelter is a basic human need that must figure in any adequate development policy, health is one function to be maximized by the larger social system.

The problem of shelter in urban areas dramatizes the need for housing authorities and planners to adopt a comprehensive approach to their work. Although most of the housing factors that influence health that are discussed below are equally important in rural settlements, urban examples are emphasized due not only to the greater availability of data on urban housing, but to the increasing urgency of urban needs.

Rapid population growth in urban centres throughout the world is creating an urban revolution. The urban population of the industrialized countries doubled between 1950 and 1985, and it quadrupled in the developing countries. Cities in developing countries, which already have enormous squatter settlement populations, will have to accommodate a further 750 million people by the year 2000 (UNCHS, 1988a).

Their urban growth has preceded the establishment of a solid, diversified economic base to support the provision of housing, infrastructure and employment. Major deficiencies exist in housing quantity and quality, the security of the occupants' tenure, the infrastructure (including roads, piped water, sanitation, site drainage, and electricity), and basic services (including collection of household wastes, primary health care, education and emergency services). Several case-studies vividly illustrate these points (Adegbola, 1987; Oya-Sawyer et al. 1987).

Environmental problems pose health hazards to both wealthy and low-income settlements in urban areas in most countries. They include air pollution from motor vehicles and industrial
emissions, water pollution, insufficient water supplies, inadequate solid waste management leading to the proliferation of disease vectors (particularly insects and rodents), contaminated food, and noise. However in any country the health impacts are felt most severely in low income settlements, where capacities to deal with the problems are the most deficient. In the following sections this paper discusses housing and health relationships, trends in housing and the housing environment, and finally it considers approaches and requirements for improved housing and health.

The Low-Income Housing Settlement:
Elements of the Living Environment
Which Impact on Health

Many WHO documents have established the relationships between various aspects of housing and the health status of the inhabitants (Martin, 1977; WHO, 1987). Some key relationships are summarized briefly here.

The House as a Structure and Shelter

Makeshift dwellings do not guard against extremes of heat and cold; they lack insulation against noise and intrusion of dust, rain, insects and rodents. Risks of accidental fires, burns and scalds are high with small, cramped dwellings made of temporary materials with open fires or unprotected stoves. Cracks in the walls of mud or wooden houses provide breeding sites for bedbugs, and for triatomine bugs which are responsible for transmission of Chagas' disease. Shrinkage cracks in earthen floors provide breeding grounds for argasid tick vectors of rickettsial relapsing fevers. Mosquito vectors of malaria, filariasis and encephalitis rest on the cool mud surfaces inside earthen constructed dwellings, and cockroaches and flea larvae flourish in the shaded crevices of earthen floors and walls. Good ventilation and indoor lighting (natural and artificial) is not only important to maintain health and safety, but also for efficient productive activity and for human social and intellectual development.
Drinking Water Supply and Quality

Unsafe water is a primary medium for the transmission of diseases, the most important being typhoid, cholera, hepatitis, polio, dysentery, amoebiasis and intestinal protozoa.

Excreta and Sewage Disposal

Human excreta is a dangerous substance for people to touch, for diseases transmitted by contact with human faeces are major causes of death in developing countries. Lack of provision for safe disposal of excreta and solid wastes leads to intestinal tract diseases, when faecal matter containing pathogenic organisms contaminates food, water or the fingers and is subsequently ingested by people. Hazards are intensified when poor drainage leaves stagnant water near the dwelling. Pathogens include various bacteria and viruses, and intestinal parasites such as hookworm, ascaris, whipworm, pinworm, and strongyloides.

Solid Waste Disposal

Ideally, solid wastes should not contain any faecal matter, but in practice this has been found difficult to prevent, and leads to additional hazards in the handling and disposal of wastes. Health hazards of solid wastes include air pollution from burning; clogging of drainage channels leading to the breeding of culex mosquitoes, the vector of filariasis; and as a medium for breeding flies and rats. Rats may be a reservoir of pathogenic organisms for plague, typhus and leptospirosis. Waste dumps near dwellings (usually squatter settlements) place these occupants at special risk.

Land

Housing sites and adjacent open space that are contaminated with faecal matter, chemicals and other wastes pose major health threats, especially to children using the land for play and recreation. Many squatter settlements have developed on land subject to flooding or landslides. Poor site drainage results in waterlogged soil which is the ideal medium for the transmission of parasitic diseases such as hookworm. Pools of standing water may become contaminated and convey enteric disease or serve
as ideal breeding loci for mosquitoes, pests and vectors, contributing to the spread of filariasis, malaria, encephalitis and other diseases. Location of settlements near industries may expose residents to high levels of pollutants and make them vulnerable to industrial disasters.

**Vectors and Hosts of Disease**

Insect and animal carriers of diseases are serious health hazards, where climate and inadequate provision for the disposal of solid wastes and waste water ensure the propagation of vectors. Dengue hemorrhagic fever and filariasis spread by mosquitoes are increasing in many urban areas, and onchocerciasis, schistosomiasis and malaria which are normally associated with rural areas are increasingly problems in urban centers.

**Overcrowding**

Small, poorly ventilated dwellings increase exposures to communicable diseases spread by aerosol droplets — for instance influenza, tuberculosis, meningitis and upper respiratory infections, all of which are associated with overcrowded housing. In addition, the frequency of all diseases transmitted through direct inter-human contact increases dramatically with population density.

**Air**

Air pollution from fires and stoves in the house has a serious impact on the health of hundreds of millions of people in developing countries. Women and children are most affected, and it is likely that high indoor air pollution levels in homes exacerbate respiratory illness in children — one of the chief causes of child mortality in developing countries. Biomass materials are often the only source of fuel for half the world’s population, and their use is responsible for a large proportion of chronic respiratory disorders. Insufficient indoor space and poor smoke exhausting, coupled with inefficient burning practices, exacerbate the situation.

**Food Safety and Nutrition**

Apart from nutritional considerations, food can serve as the medium for the intake of toxic chemicals and micro-biological
agents; infections resulting from the latter agents are the most common food-borne diseases. Low income groups' housing often has inadequate or no provision for food storage to protect against spoilage and contamination. Inadequate water supplies and washing facilities make the hygienic cleaning and storing of utensils for cooking and food preparation very difficult. Urban migration may contribute to an increased incidence of child malnutrition, through a decline in breast-feeding, reduced child-care associated with the loss of the extended family, and high environmental contamination by infectious organisms.

*The Home as a Workplace*

Needs for family income leads to increasing the amount of indoor space dedicated to revenue-generating activities such as shops, workshops and rooms for rent. Using the home as a workplace can mean increased health risk from chemicals or accidents including fires and poisonings.

*Mental Illness and Social Deviance*

Higher rates of mental problems and social deviance occur in adults and children living in urban areas. The causes are complex, but recognized adverse factors and psychological stressors in low-income settlements include overcrowding, lack of privacy, lack of space and facilities for recreation and children's play, large family size, poverty, unemployment and lack of secure residential tenure. In many countries people are experiencing rapid changes in the type of housing, e.g., from rural village to urban squatter settlement, or from traditional housing to an apartment in a high-rise building — changes from the accustomed spatial layout of villages and communities, and such public areas as courtyards, play areas, and markets. It is clear that a proportion of people experiencing migration adapt poorly, i.e., they experience difficulties in *acculturation*, the process of adapting to the economic, cultural, social, political, economic and psychological changes the migrant experiences. Acculturation experience is associated with virtually the whole range of mental health problems, including depression, anxiety, confusion, paranoid states, addictions and a variety of behavioral dysfunctions (Berry and Kim, 1988). It will be critical —
assuming the socio-economic and other causal forces of urbanization continue — to identify the factors that influence acculturation, and particularly, the types of support that can help people to adapt successfully.

Transportation

Most low-income settlements are located at some distance from the central district, without adequate public transport. Access to employment, markets and services may be restricted, leading to a reduction in income and depressed nutritional status. Health problems may be exacerbated by poor physical access to health services.

Industrialization

Health problems of toxic substances and hazardous wastes. The wastes of industries of developing countries often contaminate lakes or streams that serve as supplies of washing, drinking and cooking water. Periods of heavy effluent discharge from agricultural processing industries are likely to be seasonal, and especially hazardous when they correspond to low water level periods. The most common problems associated with industrial facilities are air and water pollution, the creation of solid wastes, noise, modification of traditional land use, and problems associated with the settlement of workers and their families.

Security against Theft and Assault

This is a major concern worldwide, particularly in urban areas, in both developing and developed countries. Metal bars and grilles installed on windows and doorways may be hazardous, by preventing a quick exit in the event of fire. Improved security measures are needed, both in the physical design of houses and buildings, and in community programmes (such as “neighborhood watch” programmes) to alleviate this problem.

Noise

Noise in residential areas is difficult to link to readily measured health deficits (such as the nerve deafness caused by prolonged exposures to high noise levels in industrial settings).
However, surveys of inhabitants of apartment blocks reveal that noise from neighbors is a major cause of annoyance and reduction in the quality of life.

Trends in Housing and the Housing Environment: Increasing Threats to Health

A review of trends in various indicators of environmental conditions with adverse health impacts shows an alarming deterioration in living conditions especially in urban areas and developing countries:

Housing Quantity and Quality

Information generated during the International Year of Shelter for the Homeless (IYSH — 1987) indicated that more than 1,000 million people live in grossly inadequate shelter and that 100 million have no shelter whatsoever. Further, it was concluded that the housing situation in the developing countries is worse now than it was ten years ago (UNCHS, 1987).

The majority of the urban populations in developing countries are poor and their needs for services and facilities exceed the capacity of governments to provide them (Hardoy and Satterthwaite, 1986). This has given rise to an expanding informal sector of housing, income generation and community services, provided by the people themselves. The informal sector of urban areas in developing countries is growing at a much faster rate than is the formal sector of government (UNCHS, 1988b).

The Housing Environment

Pollution. The Global Environmental Monitoring System (GEMS) implemented by WHO and the UN Environment Programme (UNEP) has collected data on environmental quality in urban areas during the past ten years. The results indicate the relative severity and trends in environmental pollution affecting human health (WHO/UNEP, 1987).

Urban air quality is far from satisfactory. Almost half the cities included in GEMS sampling exceed the short-term guide-
line established by WHO for health protection, and about another 20% fall in the range termed "marginal air quality". In two categories together, some 60–70% of the cities need increased air pollution control. More than 1,000 million people are estimated to be living in urban areas where the particulate pollution exceeds the WHO recommended limits, and over 600 million people live where the average sulphur dioxide pollution exceeds WHO recommended guidelines. Air quality is improving in some industrial countries, but in other regions the trends are worsening. For example, in Asian cities with moderate climates, sulphur dioxide concentrations are increasing in the order of 10% annually.

Pollution of water by sewage and chemicals, according to GEMS data, show adverse trends similar to those for air quality. It is known from national statistics that much of the municipal sewage in the developing countries receives little or no treatment. Undoubtedly, contaminated waters are a contributing factor to the high morbidity and mortality rates of infants, due to diarrheas and other diseases resulting from gastrointestinal infections. The quantity of water available per capita in urban areas is decreasing rapidly on a global basis because of population increases. For example, in Asia the per capita availability of water will be almost halved by the year 2000. Water quality is deteriorating due to the reduction in the per capita availability of water during the dry seasons in many African countries. Clearly, sewage, industrial waste water and drinking water supplies will have to be extensively treated and disinfected in order to avoid major adverse health consequences.

Drinking water supply and sanitation. Through the efforts of member states and involved international agencies cooperating in the International Drinking Water and Sanitation Decade (IDWSSD, 1980–1989), more that 225 million urban residents (excluding figures from China) were provided with drinking water supply and 250 million with sanitation facilities since 1980. Regrettably, this impressive and substantial accomplishment has been offset by the growth of urban populations during the decade. The percentages of urban populations covered by water supply has changed very little over the period from the beginning of the decade in 1980 up until the most current assessment
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in 1988. This lack of progress in extending the percentage of coverage has ominous implications for health improvements. While there has been an encouraging 10% rise in the proportion of the urban population with access to sanitary excreta disposal, the 1988 assessment indicates that 215 million people remain without access.

**Vector borne disease.** Over the past several years vector-borne diseases in urban areas in developing regions are not only showing increased incidence, but have become endemic (Bang adn Shah, 1988). They include malaria, dengue fever/dengue hemorrhagic fever (DF/DHF), Japanese encephalitis, bancroftian filariasis, leishmaniasis and Chagas' disease. This increase in vector borne diseases is related to ecological changes occurring in the biological, physical, social and economic environment in urban areas. Several examples of the urban vector borne disease situation are listed below:

In the South East Asia Region 400 million urban dwellers are estimated to be at risk of bancroftian filariasis and over 46 million to be infected with parasites; and in three countries of the region endemic urban DF can be estimated at 20 million cases, in addition to 100,000 DHF cases that occur annually.

In Latin America, 100 million people live in endemic Chagas' disease areas, and 18 million people are infected. Chagas' disease was previously considered to be a disease exclusively found in rural areas, but is now being found more and more in urban areas. The principal causes are the migration of infected individuals from rural to urban areas, and the transmission which occurs as the result of vector adaption to poor quality housing in slums. In addition, some transmission occurs as the result of transfusion of infected blood.

Leishmaniasis is of growing concern in urban areas in the countries of Central and South America, North and Eastern Africa, South West Asia and Southern Europe. Over 200 million people are at risk in endemic areas, and 18 million are estimated to be infected (from all forms of the disease). In the course of urban land development projects, man has entered into the transmission cycle, whereas formerly transmission was the result of a zoonotic cycle.
Monitoring of Impacts on Health

There is a dearth of systematic epidemiologic studies, information collection and assessment, and monitoring of environmental conditions and related health indices pertinent to the living environment of human settlements. National health statistics are spotty, and those available to WHO are not specific to various types of urban settlements and/or housing, and provide very little useful material for epidemiologic analysis in respect of specific communities with various housing characteristics and living conditions.

There is an urgent need to develop systems to generate and distribute valid epidemiological information about the health effects of housing and environmental conditions on a global basis. The results of specific studies indicate that conditions of slums and squatter settlements (i.e., poverty, malnutrition, gross insanitation and overcrowding) have a severe impact on health.

Availability of Health Services

Towns and cities generally have more trained personnel and better communications than do rural areas. However widespread deficiencies exist in the availability of urban primary health care services, and in many parts of the world the slum and squatter areas have been left more or less completely to the nongovernmental health providers (Tabibzadeh, Rossi-Espagnet, & Maxwell, 1988). These transient population groups often have had negative experiences with government agencies, and there are often difficulties in mobilizing collaborative efforts with community organizations and local government agencies.

Approaches to Improved Housing and Health

Improved Public Policy and Planning

In the 1960s and 70s, public low-cost housing programmes with government involvement in construction were popular. The concept involved the demolition of existing slums and squatter settlements, and relocation of the dwellers into government-built housing. However, the unit costs of the houses were
too high for the populations they were intended to serve. Such subsidies had the effect of limiting the numbers who could be helped. From the mid-1970s, the dual approach of squatter settlement upgrading and sites-and-services programmes became more frequent. These approaches were based on more positive attitudes towards the poor (UNCHS, 1988b). Squatters demonstrated that they possessed the skills, motivation, and sometimes the resources to provide basic shelter for themselves. They were able to provide themselves with building materials, and use self-help and mutual aid in building houses and community facilities.

The upgrading projects commonly involved provision for water supply, sanitation, electricity, surface drainage, and streets and footpaths, and sometimes tenure was granted to households. Sites-and-services efforts consisted of the opening up of new land and its subdivision into serviced residential plots. Provisions for legal tenure proved very important to persuading dwellers to invest their savings, time and labor in house and community improvements.

Both the upgrading and sites-and-services approaches have proved more successful than the earlier government provision of housing, although the success of the sites-and-services approach has been limited to some extent by the difficulties of obtaining sufficient cheap land located near to employment opportunities. Difficulties associated with cost-recovery (for materials and services provided) has limited the ability to "scale up" slum upgrading projects.

Both the upgrading and sites-and-services approaches depend on "informal sector" activity for actual house construction. The small-scale undertakings that fall under this definition are not registered by the authorities, do not keep accounts, and employ mostly casual labor. New enterprises enjoy easy entry into the market, without formal qualifications or permits, and without formal training or substantial capital. In the case of housing, the informal sector includes not only those who build the houses and provide the services, but also illegal subdividers, small cooperatives, and community associations.

Statistics provided by the United Nations Centre for Human Settlements (UNCHS) show that the contribution to housing
stock by the informal sector is significant: for example, in the Philippines 86% of the housing stock increase was produced by the informal sector, in Brazil 82%, in Venezuela 77%, in Colombia 64%, and in Chile 44% (UNCHS, 1988b).

It is now generally accepted that large public housing schemes that involve the public authorities in direct construction cannot provide a significant impact in reducing housing deficits. Government policies intended to promote healthy housing may have the opposite effect, through adverse impacts on the operation of the private and informal sectors, for example:

(a) unrealistic standards for construction; building acts and regulations must take account of social and economic realities, and must allow for gradual improvements.

(b) The codes, standards and regulations of the infrastructure may also be unduly restrictive, and hinder the use of healthful, lowcost technology, e.g., they may prohibit ventilated pit or pour flush latrines.

(c) Land-use controls and regulations have proved of little benefit when they are used to justify clearing of houses built in contravention to the regulations. The provision of land tenure or long-term leaseholds has proved to be a viable economic alternative and provides an effective incentive for communities to invest their limited resources in improving their housing so it promotes safety, health and well-being.

(d) Controls on rents, land and building material prices, while well-intentioned, have the long-term effect of maintaining distortions in the markets that tend to increase the present housing shortages, and discourage the maintenance of current housing stock. Thus landlords respond to controls by reducing the quantity and quality of houses and land available for rent by reducing the construction of new houses, withholding existing houses from the market, and providing less maintenance on rented houses. Less direct effects on housing and health come from public policies on property rights, economic enterprise, industrialization, taxation, migration, environmental management, and family
planning/population. The priorities established for socio-economic development, and the pattern of incentives for investment, likewise affect housing outcomes and their health impacts.

How can government housing policies and planning be improved? Despite the efforts of governments, the poor have often done more for themselves than governments have been able to do for them. However the government role is important, and includes: (a) making public and private investments in basic infrastructure and services; (b) insisting that health objectives become an intrinsic component of national housing policies; (c) setting ground rules through policies that enable people to undertake locally determined, self-organized and self-managed settlement programmes, based on individual and collective private initiatives; enabling policies are a basic theme of the UN Global Strategy for Shelter to the Year 2000 (UNCHS, 1988a), and of WHO's "Health Principles of Housing" (see Appendix I); (d) providing for housing programmes to be integrated into rural and urban development programmes.

At the level of the city or district, policies must support a healthy spatial layout of housing areas in relation to industrial plants, commercial districts and waste disposal areas. Traditional master plans with their zoning regulations, have sometimes not been able to prevent the siting of new settlements near hazardous industries. Instead, planning must provide for acquiring alternative land in more suitable areas and for encouraging people to use it, through governmental provision of basic infrastructure and the adoption of enabling policies.

Limited public and private resources dictate that mounting needs be met by more comprehensive and rational development planning action. Consensus among affected parties on goals, priorities, and approaching is a perquisite for coherent development that can mobilize the diverse elements of a city, to provide direction for problem analysis, policy and strategy formulation, planning, development actions, and management. Ecologically-based concepts are needed to undergird methodologies for solving the complexities of man's environmental relationships, and to frame guiding ideas that address a city's political, social and
economic realities, so that sectoral leaders and planners can "speak the same language" and exchange information that has the same meaning to all.

The vision of comprehensive and integrated approaches to housing and urban development has often been expressed, but the message has been poorly spread or understood, since the ideas are seldom applied in practice. Governmental sponsors and donor agencies are often required to show quantifiable results in the short term, and tend to favor projects that can be carried out by specialized units within sectoral organizations. Coherent action requires not only the linking of many sectors and autonomous organizations, but also a means to overcome jurisdictional fragmentation. Often the government of the central city has no authority over other towns in the conurbation, and rival local governments may pursue uncoordinated and contradictory policies. Major responsibilities may be assigned to different levels of government (e.g. national economic development and local land use planning), and local planning is rarely coordinated with regional and national planning (Schaefer, 1981). The result is inequities, wasted resources, and poor control of development actions, the situation compounded by poor staffing, information, and technology. In many cities, the only operational tool to address overall needs is an annual budget process, which is often inefficient, limited to the governmental sector, and more often aimed at keeping the leaking ship afloat than at encouraging imagination and innovation; sometimes, even this tool is not used.

Thus the planning process is fragmented, and in the same country or city, one can find separate applications of urban planning, land use planning, development planning, economic planning, and a galaxy of sectoral planning activities: for transportation and traffic, for housing, for industry, for commerce, for capital improvements, for water and sewerage, for wastes management, for education, for social services, for recreation and culture, for health, etc. Development planning often disregards health aspects and fails to consider information that could help avoid preventable health risks and promote healthy living. Drawing master plans, land use plans, and the grand programmes of sectors is but one planning function. Planning
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should also be a managerial tool, applied to programme implementation and the determination of needs and actions for the short- and medium-term. This requires that planning be demystified, necessary protocols be provided, and training to plan be extended and strengthened.

Overcoming the technical, structural, and political shortcomings in urban planning requires specified urban policies, clearly stated expectations of political leaders, improved information, appropriate methods, and strong coordination of planning done in many organizations and agencies. In many cities, the implementation of plans requires more adequate human resources and improved processes of managing development, as well as the means to coordinate predominantly fragmented structures for economic and social action.

Development of Intersectoral Mechanisms and Action

Suitable intersectoral structures and processes are required for coherence in the planning and implementation of urban development processes, but designs and specifications must also be developed. Setting up high-level consultative bodies makes a beginning on the task; to complete it, structural arrangements that reach down to the front-line units of each sector (and the community) must be defined and put in place. Feasible processes — for information exchange, information management, planning, decision-making, programming, and logistical support — must likewise be specified, not through a one-time, all-out effort but through a continuing process that leaves room for trial and error, and learning from experience.

Two provisions are essential to developing intersectoral capacity. One is setting up sanctions — preferably positive — to foster cooperation. Intangible rewards, such as enhanced prospects for an agency or voluntary organization to fulfill its mission, can be powerful. The second provision is to actively promote and coordinate cooperative action. This function may be undertaken by a staff or body equipped with skilled and politically powerful resources, attached or close to the “head of government’s” office, and with the capacity for more than nominal oversight.
Mobilizing and Enabling Communities

Enabling policies at local level include changes in the way funds are allocated and used, the ways in which credit is generated and disbursed, and ways in which decisions are made and responsibility is exercised.

The concept of community participation — that people must be involved in bettering their condition through development — has become a truism of socioeconomic development. While participative strategies are sometimes favored as a means of transferring costs, the more compelling argument is the benefit of mobilizing the energies and talents of individuals and groups — doing with, rather than doing for. Government's role is to "enable" communities to pursue their goals, making strategic inputs — economic, legal, educational, organizational — to motivate and support popular action.

In the urban context, "community" has multiple meanings, referring not only to the city as a whole, but also to neighborhoods, internal settlements, affinity and age groups, and trades and professions. Thus, shelter policy may involve communities of builders, architects, materials fabricators, social action agencies, and financial institutions, as well as groups of residents themselves.

All such communities require a greater awareness that environmental conditions are important determinants of health, and that there are many steps that can be taken at the community level to reduce health risks. The creativity and resources of people must be mobilized, guided and aided in improving the shelter and environmental situation of local neighborhoods.

Successes in mobilizing both urban and rural communities have been described, including local and national organizing efforts. Most community participation schemes, regardless of sponsorship, tend to be based in single sectors and to have limited aims; they may work at cross purposes to other efforts. Schemes sometimes break down at the place where official agency staffs interface with community groups; interactions between the bureaucracy and indigenous groups have to be carefully worked out, to ensure that needed supports are delivered and performance is audited fairly.

Community enablement has been most productive when explicit goals have been jointly specified, clear action lines have
been defined, and popular involvement has been respected. Linking with existing social structures has been a useful tactic, but is often more feasible in cohesive rural settlements, than amidst the more diffuse social structures of cities. The full potential of this approach has yet to be tapped in many countries, and research is needed into such issues as sustaining volunteer efforts and finding suitable means to provide tutelage and subsidies.

WHO and other agencies are supporting workshops which bring together local government officials, and community leaders, and health and community workers to disseminate information about housing and environmental improvements that can be undertaken at the community level, with or without government support. Approaches are outlined in a number of WHO/RUD publications, prepared in collaboration with the UN Environment Programme (UNEP), which deal with environmental health issues, such as surface water drainage and insect and rodent control (FIGURE 1). The approach is a "self-help" one, in which members of a group within a district may decide to assist each other reciprocally, in order to (a) reduce the need for technical and financial assistance from the government, (b) put the latent capacity of people to work, and promote initiative and collective action, and (c) to strengthen the participants' confidence in themselves.

Demonstration projects and case studies are useful in promoting community participation, especially if the information gained from such projects is disseminated through publications, media announcements, conferences etc.

Finally, primary and occupational educational institutions must be encouraged to include health education principles in the curriculum, and to ensure that this content appropriately covers environmental factors in the maintenance of good health. Similarly, community education via mass media is required to provide information and encouragement for people to improve sanitation, waste disposal and drinking water quality in their communities.

**Strengthening environmental health services**

Protecting and promoting health is increasingly a major objective of the work of many agencies involved in managing
housing and the urban environment. Public health leadership can help to optimize the contributions of these agencies, by increasing awareness of health implications, providing technical guidance, and advocating health-promoting choices in policies and programmes. To do so, sound "health intelligence" must be generated and communicated. The role of health authorities includes (a) defining health problems and the environmental determinants that contribute to or cause them, (b) identifying policies (or changes in existing policies), and actions by municipal and national authorities that can ameliorate the health problems; this includes an assessment of current policies and whether they may cause possible adverse health impacts; (c) communication of this health intelligence to decision makers in the appropriate sectors; and (d) technical assistance in the programming and implementation of policies.

References


Appendix I

Rural and Urban Development and Housing Guidance Materials*

1. UPGRADING ENVIRONMENTAL HEALTH CONDITIONS IN LOW-INCOME SETTLEMENTS; A COMMUNITY-BASED METHOD FOR IDENTIFYING NEEDS AND PRIORITIES
2. URBAN SURFACE WATER DRAINAGE IN DEVELOPING COUNTRIES
3. COMMUNITY PROGRAMME FOR INSECT AND RODENT CONTROL THROUGH ENVIRONMENTAL MANAGEMENT CAP — KIT
4. URBANIZATION AND ITS IMPLICATIONS FOR CHILD HEALTH: POTENTIAL FOR ACTION
5. INDOOR ENVIRONMENT: A GUIDEBOOK ON THE HEALTH ASPECTS OF AIR QUALITY, THERMAL ENVIRONMENT, LIGHT AND NOISE
6. ACCESS TO LIFE-SAVING SERVICES IN URBAN AREAS
7. CHILD SURVIVAL IN OR NEAR CITIES: INTERVENTIONS FOR A HEALTHIER ENVIRONMENT
8. ENVIRONMENTAL HEALTH ASPECTS OF PLANNING URBAN AREAS
9. HEALTH PRINCIPLES OF HOUSING
10. HOUSING AND HEALTH: AN AGENDA FOR ACTION
11. SHELTER AND HEALTH, CONTRIBUTION OF THE WORLD HEALTH ORGANIZATION TO THE INTERNATIONAL YEAR OF SHELTER FOR THE HOMELESS
12. CURRICULA FOR TRAINING ARCHITECTS AND URBAN PLANNERS
13. RECOMMENDATIONS OF THE WHO EXPERT COMMITTEE ON “ENVIRONMENTAL HEALTH IN URBAN DEVELOPMENT”

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CALL FOR PAPERS

This is a call for papers for a special issue of the Journal of Sociology and Social Welfare to be focused on theoretical and practice issues related to ethnicity and minority group status.

Renewed attention to the subject is warranted in light of a number of national and international developments, including a substantial increase in immigration to the United States. Problems of racism, and poverty remain and indeed are on the increase. In this special issue we hope to publish papers that bring new insights to bear on the theories, policies and practice related to ethnic and minority concerns. Special interest is focused on the following:

1. Conceptual and empirical work that analyzes the experience of new immigrants and refugees and suggests refinements or new insights into the processes of acculturation and assimilation. Are new concepts needed to capture the experience of these groups?
2. What are the nature of relationships between the newer immigrant groups? What is the nature of their relationship with other ethnic groups in the United States?
3. What does current research and theory suggest about the relative power of ethnic group membership and social class in explaining the experiences of significant segments of the ethnic community; is the question as posed relevant? Or are newer, more complex clusters of concepts required?
4. What has been the experience in efforts to test the concepts of ethnic sensitive practice? What practice principles seem most congruent with the tenets of ethnic sensitive practice?
5. What has been the experience in efforts to engage multiple ethnic groups in community development and other grassroots activities? Have there been efforts to engage groups with possible competing interests in joint endeavors? For example, what do Soviet Jewish refugees and American orthodox Jews share in common? Do Caribbean "Blacks" and American Blacks share common concerns?

Clearly, the list of questions is suggestive, and by no means intended to be an exhaustive listing of the issues to be covered in this special issue. Please direct questions and submit manuscripts to:

Elfriede G. Schlesinger
Editor, Special Issue
Professor, Associate Dean
Rutgers University School of Social Work
536 George Street
New Brunswick, NJ 08903

Submission deadline, October 1, 1990

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(Revised December, 1987)

JSSW welcomes a broad range of articles which analyze social welfare institutions, policies, or problems from a social scientific perspective or otherwise attempt to bridge the gap between social science theory and social work practice.

Submission Process. Submit manuscripts to Robert D. Leininger, Jr., School of Social Work, Western Michigan University, Kalamazoo, Michigan, 49008. Send three copies together with an abstract of approximately 100 words. Include a stamped, self-addressed postcard if you wish acknowledgement of receipt. Since manuscripts are not returned by reviewers to the editorial office, the editorial office cannot return them to authors. Submission certifies that it is an original article and that it has not been published nor is being considered for publication elsewhere.

Reviewing normally takes 60 days but can take longer in the event of split recommendations. Things move more slowly at the end of semesters and during the summer. Authors should feel free to write or call the editor if they feel an undue amount of time has elapsed.

Preparation. Articles should be typed, doublespaced (including the abstract, indented material, footnotes, references, and tables) on 8 1/2 x 11 inch white bond paper with one inch margins on all sides.

Anonymous Review. To facilitate anonymous review, please keep identifying information out of the manuscript. Only the title should appear on the first page. Attach one cover page that contains the title, authors, affiliations, date of submission, mailing address, telephone number, and any statements of credit or research support.

Style. Overall style should conform to that found in the Publication Manual of the American Psychological Association, Third Edition, 1983. Use in-text citations (Reich, 1983), (Reich, 1983, p.5). The use of footnotes in the text is discouraged. If footnotes are essential, include them on a separate sheet after the last page of the text. The use of italics or quotation marks for emphasis is discouraged. Words should be underlined only when it is intended that they be typeset in italics.

Gender and Disability Stereotypes. We encourage authors to avoid gender-restricting phrasing and unnecessary masculine pronouns. Use of plural pronouns and truly generic nouns ("labor force" instead of "manpower") will usually solve the problem without extra space or awkwardness. When dealing with disabilities, avoid making people synonymous with the disability they have ("employees with visual impairments" rather than "the blind"). Don't magnify the disabling condition ("wheelchair user" rather than "confined to a wheelchair"). For further suggestions see the Publication Manual of the American Psychological Association or Guide to Non-Sexist Language and Visuals, University of Wisconsin-Extension.

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BOOK REVIEWS

Books for review should be sent to Shimon Gottschalk, School of Social Work, Florida State University, Tallahassee, Florida 32306.
CALL FOR PAPERS

This is a call for papers for a special issue of the Journal of Sociology and Social Welfare to be focused on theoretical and practice issues related to ethnicity and minority group status.

Renewed attention to the subject is warranted in light of a number of national and international developments, including a substantial increase in immigration to the United States. Problems of racism, and poverty remain and indeed are on the increase. In this special issue we hope to publish papers that bring new insights to bear on the theories, policies and practice related to ethnic and minority concerns. Special interest is focused on the following:

1. Conceptual and empirical work that analyzes the experience of new immigrants and refugees and suggests refinements or new insights into the processes of acculturation and assimilation. Are new concepts needed to capture the experience of these groups?
2. What are the nature of relationships between the newer immigrant groups? What is the nature of their relationship with other ethnic groups in the United States?
3. Does current research and theory suggest about the relative power of ethnic group membership and social class in explaining the experiences of significant segments of the ethnic community; is the question as posed relevant? Or are newer, more complex clusters of concepts required?
4. What has been the experience in efforts to test the concepts of ethnic sensitive practice? What practice principles seem most congruent with the tenets of ethnic sensitive practice?
5. What has been the experience in efforts to engage multiple ethnic groups in community development and other grassroots activities? Have there been efforts to engage groups with possible competing interests in joint endeavors? For example, what do Soviet Jewish refugees and American orthodox Jews share in common? Do Caribbean "Blacks" and American Blacks share common concerns?

Clearly, the list of questions is suggestive, and by no means intended to be an exhaustive listing of the issues to be covered in this special issue. Please direct questions and submit manuscripts to:

Elfriede G. Schlesinger
Editor, Special Issue
Professor, Associate Dean
Rutgers University School of Social Work
536 George Street
New Brunswick, NJ 08903

INSTRUCTIONS FOR AUTHORS

JSSW welcomes a broad range of articles which analyze social welfare institutions, policies, or problems from a social scientific perspective or otherwise attempt to bridge the gap between social science theory and social work practice.

Submission Process. Submit manuscripts to Robert D. Leighninger, Jr., School of Social Work, Western Michigan University, Kalamazoo, Michigan, 49008. Send three copies together with an abstract of approximately 100 words. Include a stamped, self-addressed postcard if you wish acknowledgement of receipt. Since manuscripts are not returned by reviewers to the editorial office, the editorial office cannot return them to authors. Submission certifies that it is an original article and that it has not been published nor is being considered for publication elsewhere.

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