

# THE HEALTH, ENVIRONMENT DEVELOPMENT STUDY

PRELIMINARY RESULTS FROM PHASE ONE

*Research Report*



*Urban Health*

an initiative of the world health organization collaborating centre for





RESEARCH REPORT



THE HEALTH, ENVIRONMENT  
DEVELOPMENT STUDY  
PRELIMINARY RESULTS FROM PHASE ONE  
2006  
*Research Report*

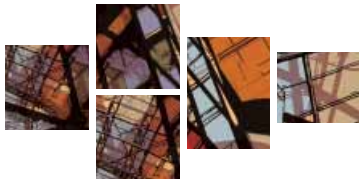
COMPRISING THE  
SOUTH AFRICAN MEDICAL  
RESEARCH COUNCIL

UNIVERSITY OF JOHANNESBURG

UNIVERSITY OF THE  
WITWATERSRAND

CITY OF JOHANNESBURG





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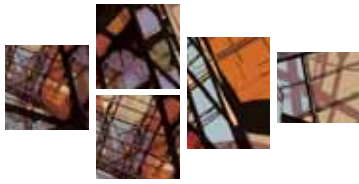
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## PREAMBLE



### PREAMBLE

The Health, Environment and Development (HEAD) study was designed as a vehicle for urban health research and research capacity development under the umbrella of the World Health Organization Collaborating Centre for Urban Health (WHOCCUH). The WHOCCUH is a partnership of:

- The Medical Research Council;
- The University of Johannesburg;
- The University of the Witwatersrand; and
- The City of Johannesburg.

The WHOCCUH partnership seeks to, through sharing of expertise and experiences, to improve urban health in the City of Johannesburg and urban centres elsewhere on the African continent.

Through the HEAD study, the WHOCCUH has afforded opportunities to gain experience in research and research management to undergraduate, masters and doctoral students from the University of Johannesburg and the University of the Witwatersrand.

Various mechanisms are now being developed to ensure that information from the HEAD study is shared with local and provincial government policy makers, community organizations and other interested parties. This process is being supported in part by a grant in terms of the Development Partnership for Higher Education (DeLPHE) programme, managed by the British Council.



## EXECUTIVE SUMMARY



## INTRODUCTION

The Health, Environment and Development (HEAD) study is a five-year panel study of living conditions and health status in five housing settlements in Johannesburg. The HEAD study was designed as a research and research capacity development vehicle by the World Health Organization Collaborating Centre for Urban Health (WHOCCUH). The WHOCCUH is an urban health research and policy partnership comprising:

- The Medical Research Council;
- The University of Johannesburg;
- The University of the Witwatersrand; and
- The City of Johannesburg.

Following the implementation of a pilot study in 2005 to test logistics and the data collection instrument, the first formal data collection wave was undertaken around September 2006. Household level data on a range of environment and health parameters were collected during interviews conducted in five different sites:

- Hospital Hill (an informal settlement on the city periphery);
- Riverlea (Extension 1) (an apartheid era low cost housing development);
- Braamfischerville (a democratic era low cost housing development);
- Bertrams (a mixed residential-commercial inner city suburb);
- Hillbrow (a high-rise inner city suburb).

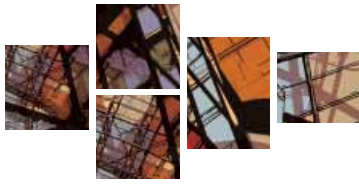
This report outlines the findings from preliminary frequency analyses of data collected during 2006.

Information is provided on the study methodology and preliminary results, including socio-demographic factors, migration patterns, housing conditions, perceptions of local neighbourhoods, exposure to violence and health status (acute, chronic and mental ill health). Future reports and research briefs will focus in greater depth on specific issues studied, and in years to come, the information on trends will become available.

At this stage, it is clear that the study findings point to a high degree of heterogeneity across the study sites, in terms of, for example, income, socio-cultural factors, neighbourhood conditions and health status. The local health profiles vary considerably, with the residents of the impoverished informal settlement of Hospital Hill having the poorest health status overall. Also apparent is that, as housing and basic environmental health services (water, sanitation and electricity) are supplied in association with the Reconstruction and Development Programme, there are now relatively low levels of acute ill health concerns such as diarrhoeal diseases and pneumonia. Instead the burden of chronic diseases such as diabetes, asthma and hypertension appears to be high, as does the burden of mental ill health indicators, such

as often feeling depressed or that life is not worth living. High levels of experience of violence is a further potential threat to health in most of the communities studied, and in some areas (such as the informal settlement of Hospital Hill) appears to be pervasive – in Hospital Hill 28% of households were reported to have a member who had experienced violence in the year before. In Riverlea, around 15% of households are reported to have experienced more than one form of violence (experience of more than one of rape, gunshot, stabbing or assault within one household) in the year preceding the study, indicating a concentration of violence in certain households.

While the results of the 2006 survey will serve as a valuable baseline against which future health trends, and the impacts of local government development efforts, may be measured, it is already clear from the data in hand that the health challenges faced by these urban communities are heterogeneous and complex. Efforts to improve and promote public health in Johannesburg (and similar settings in other South African cities) will need to take account of the diversity of factors that contribute to health, including the development, environment and psycho-social dimensions.



## EXECUTIVE SUMMARY



### INTRODUCTION

More than half of the world's population now live in cities, and by the year 2050, urban populations are expected to comprise more than 75% of all people (UNFPA, 2007). The health of the world's people is therefore increasingly a matter of urban health. However, urban growth, especially in sub-Saharan Africa has occurred mainly in informal settlements and other areas of "concentrated disadvantage" (Vlahov et al 2007) such as inner city areas and the city periphery, with the prospect of increasing burdens of ill health and rising inequities.

Environmental factors are associated with around 25% of the global burden of disease (WHO 2003). In developing countries, or settings of disadvantage, the environmental contribution to burden of disease may be considerably higher. Housing quality in particular has long been recognized to be amongst the most important determinants of health (WHO 2003) - those who live in poor quality housing are likely to have poor health (Lowry 1989).

Johannesburg is a city of more than 3.2 million people, but is part of a larger urban agglomeration (including Pretoria and Ekurhuleni) of around 10 million residents. Amongst the challenges facing

the city are high rates of poverty and inequity (South Africa currently has the highest GINI coefficient - a measure of inequality - in the world) (UNDP 2007), high rates of urbanization and a concomitant difficulty in meeting the ongoing demand for housing and environmental health infrastructure. The upshot of these challenges is that large numbers of relatively impoverished Johannesburg residents live in informal settlements, areas of inner city degradation and poor quality mass-based housing from both the apartheid and democratic eras. However, there is a dearth of household level information available on the socio-demographic and health profiles, and the needs and challenges faced by these communities in Johannesburg and cities elsewhere in South Africa (or Africa).

The Health, Environment and Development (HEAD) study was designed as a vehicle for research capacity development and a tool to provide a finer picture than is currently available, of the health and quality of life of Johannesburg residents living in settings of relative impoverishment. The HEAD study is a panel study, and will be conducted over an initial five-year period with a view to tracking changes in living conditions and health status in the selected sentinel sites.



## EXECUTIVE SUMMARY

**METHODS****2.1 Study Goal and Objectives**

The overall goal of the study is to monitor changes in living conditions and health status in the selected study sites over a 5-year period from 2006 to 2010. Specific objectives of the study are:

- To develop health profiles by site;
- To determine trends in health status over time;
- To compare health status across the five study sites;
- To identify risk factors for ill health in the five study sites;
- To inform urban environment, development and health policy.

**2.2 Study Design and Population**

A panel study is being conducted in five sentinel study sites in Johannesburg. In 2006, 150 dwellings were randomly selected for inclusion in the study. Each year, using a pre-structured questionnaire, data are collected in relation to the main or primary household living on each of the 150 dwelling sites.

Respondents are defined as a person of at least 18 years of age who is knowledgeable about the health of household members.

**2.3 Study Sites**

The study sites are:

- Hospital Hill – an informal settlement;

- Riverlea Extension 1 – an apartheid era low-cost housing development;
- Braamfischerville – a democratic era low-cost housing development;
- Bertrams – a mixed development (residential/commercial) inner city suburb. Bertrams is also the location of one of the main venues for the World Cup 2010 soccer tournament, and may undergo a process of gentrification during the study period;
- Hillbrow – a high-rise, densely populated, inner city area.

The study sites, selected in consultation with officials from the City of Johannesburg, represent the main housing types available to the poor in Johannesburg.

The study population comprises respondents and other members of the primary households in the selected study sites.

**2.4 Data Collection**

The questionnaires are administered to a suitable respondent (a person of at least 18 years of age, who knows the most about the health of the members of the household) by trained interviewers. The interviewers are second year environmental health students from the University of Johannesburg.

Data is collected on:

- socio-demographic status & expenditure patterns;

- migration patterns;
- perceptions of housing and neighbourhood conditions;
- hygiene behaviour;
- quality of life & social cohesion;
- food procurement and insecurity;
- exposure to violence;
- physical activity;
- health status (acute, chronic and mental).

**2.5 Data Processing and Analyses**

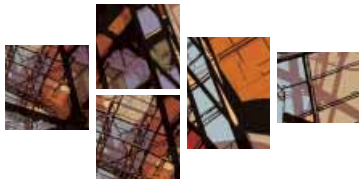
The data was processed and analyzed with support from the Biostatistics Unit of the Medical Research Council.

**2.6 Ethical Considerations**

Approval to conduct the study was obtained from the Committee for Ethical Research on Human Subjects of the University of the Witwatersrand.

Questionnaires were administered only after obtaining written, informed consent from respondents. The names of individuals were not recorded and information is identified only by a unique study identity code.

Data is recorded and reported only as a group, with the identity of individuals not being revealed.



## RESULTS



### RESULTS

#### 3.1 Response Rate

Interviews were successfully completed in 536 dwellings (an overall response rate of 71%) and provided information on 2 247 individuals. Table 1 gives the response rate in each of the study sites. The relatively low response rate in Bertrams may have been due to the accelerated pace of development in the area in anticipation of the 2010 World Cup soccer tournament; for example a considerable number of stands were vacant or under development during the period of data collection.

TABLE 1. RESPONSE RATE BY STUDY SITE

Study Sites	Hospital Hill	Riverlea	Braamfischerville	Bertrams	Hillbrow
Number Of Households	104	102	122	68	130
Response Rate	69%	68%	81%	45%	87%

#### 3.2 Income

Overall around 35% of households were highly impoverished, earning no income at all, or less than R1000.00 monthly. The proportion of highly impoverished households varied considerably across the five study sites, ranging from 7% in Hillbrow, up to 62% in Hospital Hill (see Table 2). Household income disparity between Hillbrow (site of the highest average income) and Hospital Hill (lowest average income) was substantial enough to produce a binodal distribution (see Figure 1), indicating considerable income heterogeneity across the sites.

#### 3.3 State Financial Support

More than one-quarter of households (26%) were sufficiently needy to be in receipt of child support grants from the state, while 6% and 13% respectively were receiving disability grants and old age pensions. There was a high degree of variation across the five study sites in terms of the proportions of households in receipt of state grants. In Braamfischerville for example, 44% of households were in receipt of child support grants, while in Hillbrow the figure was only 5% (see Table 2).

As expected, settlements with high proportions of households earning low or no income had low levels of households who were able to save money, or with access to medical aid. Settlements with high proportions of impoverished households also tended to have low proportions of households with increasingly important commodities such as computers (see Table 2).

## RESULTS



FIGURE 1. COMPARISON OF AVERAGE MONTHLY HOUSEHOLD INCOME IN HOSPITAL HILL AND HILLBROW

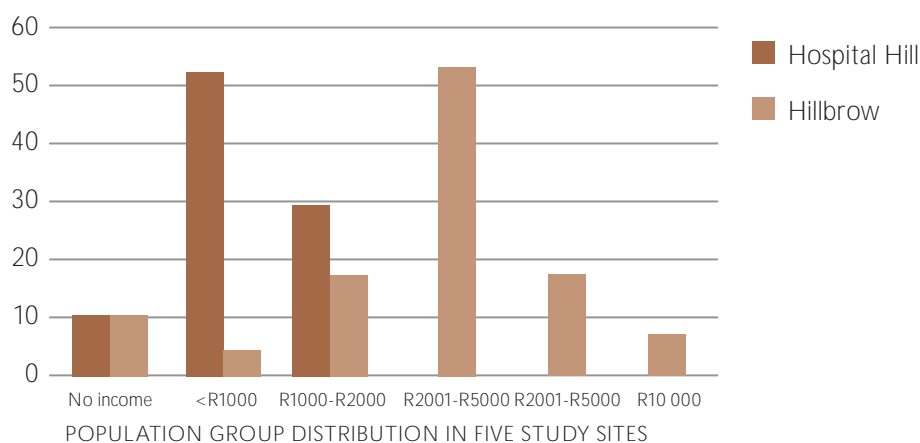
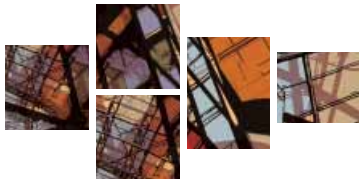


TABLE 2. SOCIO-ECONOMIC STATUS

	Hospital Hill	Riverlea	Braamfischerville	Bertrams	Hillbrow
% households without income or earning <R1000.00 monthly	62	48	41	21	7
% households receiving 1 or more old age pensions	5	39	8	10	4
% households receiving 1 or more disability grants	5	13	7	9	2
% households receiving 1 or more child support grants	37	22	44	18	23
% households with money saved	32	30	44	52	62
% households with medical aid/ insurance	1	19	12	23	21
% households with a television	45	93	79	85	88
% households with a radio	64	68	78	79	77
% households with a refrigerator	6	81	83	79	72
% households with a washing machine	1	51	18	50	13
% households with a microwave oven	0	48	32	55	45
% households with a computer	0	5	6	25	22
% households with satellite television	0	4	1	6	9
% households with a car	4	11	8	40	21
*Respondents' Rating of Standard of Living (mean)	4.0	5.7	5.8	5.8	6.0

\*Rated from 0 (highly dissatisfied) to 10 (highly satisfied):



## RESULTS



Despite its relatively impoverished status (in terms of income), levels of ownership of commodities such as television sets, refrigerators and washing machines in Riverlea were equivalent or higher than in the relatively economically wealthy neighbourhoods of Hillbrow and Bertrams (see Table 2), This may have been due to the longer duration of residence in Riverlea households compared with their counterparts in Bertrams and Hillbrow.

### 3.4 Cottage Industries

Respondents were asked about their households' involvement in cottage industries related to motor vehicle repairs, spray painting, jewellery manufacture, electrical repairs, recycling of scrap metal and hairdressing (see Table 4). Fourteen percent of households were involved in income-generation activities (fixing of motor vehicles, spray painting, making of jewellery, repairs to electrical appliances or hairdressing) from their living premises, with a concomitant elevated risk of household exposure to the chemicals or substances used in these process. In 4% of households more than 1 such home-based "cottage industry" was being operated.

TABLE 3. PREVALENCE OF COTTAGE INDUSTRIES

	Hospital Hill	Riverlea	Braamfischerville	Bertrams	Hillbrow
% households involved with fixing cars at home	6	4	3	14	0
% households who conduct spray painting at home	1	2	3	6	0
% households who make jewellery at home	0	0	0	1	1
% households who undertake electrical repairs at home	4	10	8	13	6
% households who recycle scrap metal from home	3	3	0	5	1
% households who undertake hairdressing at home	4	2	4	2	6
% households where work is done from home#	16	16	12	22	10

### 3.5 Household Expenditure Patterns

Tables 3 gives the mean household expenditure by study site on a selection of categories. As can be seen, in most of the study sites, the main category of household expenditure was on food. The only exception was Hillbrow, where expenditure on housing exceeded that on food. There was considerable variation across the study sites in terms of the amount of money spent on particular items. For example, on average Hospital Hill households spent half the amount of money on food compared with households in Bertrams. Similarly, in Hillbrow, households were spending 95 times as much as Hospital Hill households on housing.

## RESULTS



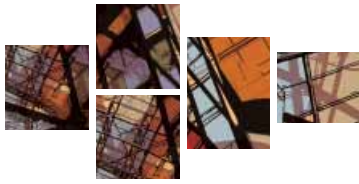
Table 4. HOUSEHOLDS EXPENDITURE PATTERNS

STUDY SITES	HOSPITAL HILL	RIVERLEA	BRAAMFISCHERVILLE	BERTRAMS	HILLBROW
Mean sum (Rands) spent on food monthly	378	699	504	872	729
Mean sum (Rands) spent on transport monthly	306	385	455	580	519
Mean sum (Rands) spent on rent monthly	15	228	132	752	1422
Mean sum (Rands) spent on fuel monthly	118	178	112	309	375
Mean sum (Rands) spent on alcohol monthly	196	157	146	294	366
Mean sum (Rands) spent on cigarettes monthly	121	133	133	162	136
Mean sum (Rands) spent on entertainment monthly	136	238	253	314	261
Mean sum (Rands) spent on telephone services monthly	81	123	75	206	220
Mean sum (Rands) spent on education (university & school fees, books etc) monthly	208	551	276	400	1031

Table 5 gives a ranking of the main categories of household expenditure. As can be seen, there is particular variation in expenditure on housing across the study sites, whereas expenditure on food, transport and education is similarly ranked at the upper end of the scale, and on cigarettes and telephones at the lower end of the scale..

Table 5. RANKING OF HOUSEHOLD EXPENDITURE BY STUDY SITE

HOSPITAL HILL	RIVERLEA	BRAAMFISCHERVILLE	BERTRAMS	HILLBROW
Food	Food	Food	Food	Housing
Transport	Education	Transport	Housing	Education
Education	Transport	Education	Transport	Food
Alcohol	Entertainment	Entertainment	Education	Transport
Entertainment	Housing	Alcohol	Entertainment	Fuel
Cigarettes	Fuel	Cigarettes	Fuel	Alcohol
Fuel	Alcohol	Housing	Alcohol	Entertainment
Telephones	Cigarettes	Fuel	Telephones	Telephone
Housing	Telephones	Telephone	Cigarettes	Cigarettes



## RESULTS



### 3.6 Socio-Demography

The overall majority of the study population was African Black. Looking at population group across study sites, the results showed that racial divisions associated with the Apartheid era continue to be strongly entrenched in the sites studied. As can be seen from Table 6, Hillbrow and Braamfischerville housed Black African households exclusively, and this group also constituted the majority of households in Bertrams and the informal settlement of Hospital Hill. By contrast, the majority of households in Riverlea was Coloured.

### 3.7 Languages Spoken

Overall, isiZulu and Afrikaans were the main languages spoken, with seSotho, seTswana, Venda and English also being spoken by sizeable proportions of the study population (see Table 6).

Table 6. LANGUAGES SPOKEN						
		Hospital Hill	Riverlea	Braamfischerville	Bertrams	Hillbrow
Main Home Languages Spoken	Primary	seSotho – 25%	Afrikaans – 80%	SeTswana – 36%	isiZulu – 34%	isiZulu – 45%
	Secondary	isiXhosa – 21%	English – 11%	isiZulu – 29%	Afrikaans – 24%	Venda – 12%
Population Group	Primary	Black African – 100%	Coloured – 91%	Black African – 100%	Black African – 71%	Black African – 77%
	Secondary	0%	Black African – 8%	0%	White – 18%	Coloured – 19%

### 3.8 Population Age Distribution

In Hillbrow only one fifth of households included a child under the age of five years. In Hospital Hill on the other hand, 37% of households included a young child (see Table 7).

Table 7. HOUSEHOLD AGE DISTRIBUTION					
	Hospital Hill	Riverlea	Braamfischerville	Bertrams	Hillbrow
% households with one or more children under the age of 5 years	37	27	35	29	20

### 3.9 Country of Origin

The proportion of non-South African households in the study sites varied from 0% in Riverlea, to 31% in Hillbrow (see Table 8). Amongst South African households, several of the study sites had attracted households from provinces other than Gauteng. In Hospital Hill for example, 19% and 14% respectively of households reported coming from the Eastern Cape and the Free State. Households from a particular province appeared to cluster in a particular site. Households originating from Limpopo for example, appeared to be concentrated in Hillbrow, while as many as 26% of Bertrams households were from KwaZulu Natal (see Table 7). In general, most of the non-Gauteng South African households appeared to originate from South Africa's poorest provinces – Eastern Cape, Limpopo, KwaZulu Natal and the North West.

## RESULTS



Hillbrow households had the highest levels of residential mobility, with 38% of respondents reporting that their households had lived in the current dwelling for less than one year. By contrast, all Riverlea households had lived in their current dwelling for more than one year, and 95% had lived there for more than five years.

Table 8. PLACE OF ORIGIN & RESIDENTIAL MOBILITY

		Hospital Hill	Riverlea	Braamfischerville	Bertrams	Hillbrow
% non-South African households		7	0	2	13	31
Province of Origin of South African households if not Gauteng (province in which Johannesburg is located)		Eastern Cape – 19% Free State – 14%	Eastern Cape – 6% North West – 3%	Eastern Cape – 12% North West – 7%	KwaZulu Natal – 26% Eastern Cape – 6%	Limpopo – 15% KwaZulu Natal – 14%
Period of Residence in current dwelling (years)	< 1	8	0	5	15	38
	2 to 5	30	5	20	34	34
	> 5	62	95	75	51	28

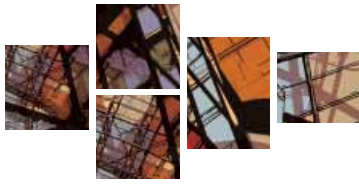
### 3.10 Ownership & Decision-making

Housing tenure in Hospital Hill, Riverlea and Braamfischerville took the form mainly of ownership. In Bertrams and Hillbrow on the other hand, housing was mainly being rented (see Table 9). In Hospital Hill, where expenditure on housing was lowest, more than one third of households reported that they were not paying for their housing.

In Hospital Hill and Hillbrow, dwellings were reported to be owned mainly by men, whereas in Riverlea and Braamfischerville the owners were mainly female. The distribution of decision makers in respect of sex, was similar to that of ownership (see Table 9).

TABLE 9. OWNERSHIP AND GENDER (SEX)

STUDY SITES		HOSPITAL HILL	RIVERLEA	BRAAMFISCH-ERVILLE	BERTRAMS	HILLBROW
Ownership	Owned	56	64	64	44	10
	Rented	8	16	25	47	90
	Do not pay	37	15	9	6	0
Sex of owner	Male	66	35	23	45	62
	Female	26	61	65	45	35
	Both	8	4	12	9	3
Sex of main decision-maker	Male	58	32	26	38	51
	Female	26	56	53	47	33
	Both	16	12	20	15	16



## RESULTS



### 3.11 Living Conditions & Access to Environmental Health Services

As can be seen from Table 10, dwellings in Hospital Hill were mainly of an informal nature, in Hillbrow mainly apartments, and in the remaining three sites, mainly free-standing dwellings.

The number of people living on dwelling sites ranged from 1 to 39. The average number of people on a dwelling site ranged from 4.0 in Hospital Hill to 7.7 in Bertrams. The number of households living on a single site ranged from 1 to 17. The average number of households per site ranged from 1.2 in Braamfischerville to 3.2 in Bertrams. The size of the primary household on the site ranged from 1 to 25 persons. The smallest primary households (an average of 3.6 people per household) were in Hillbrow, while the largest were in Braamfischerville (an average of 4.7 people per household) (see Table 10).

Table 10. LIVING CONDITIONS

STUDY SITES		HOSPITAL HILL	RIVERLEA	BRAAMFISCHERVILLE	BERTRAMS	HILLBROW
Type of Dwelling % of households	Formal) free-standing, semi-detached, townhouse, cluster	20	96	98	94	1
	Flat/Apartment	0	0	0	1	99
	Informal/backyard	79	3	2	1	0
	Other	1	1	0	3	0
Mean (median) number of people per site		4.0 (3) Range: 1-25	5.5 (5) range: 1-13	4.4 (4) Range: 1-13	7.7 (6) Range: 1-39	4.4 (4) range: 1-13
Mean (median) number of separate households per site		1.4 (1) Range: 1-11	1.6 (1) range: 1-6	1.2 (1) range: 1-6	3.2 (2) Range: 1-17	1.8 (1) range: 1-5
Mean (median) number of people in the primary household		4.4 (3) Range: 1-25	4.7 (4) range: 1-13	4.5 (4) Range: 1-12	4.4 (4) range: 1-10	3.6 (3) range: 1-8

### 3.12 Housing Conditions

Respondents were asked about the condition of the dwelling of current residence, and their responses are given in Table 11. There was evidence of degradation of dwelling units, with one quarter of respondents reporting having a major problem with leaking roofs, 15% with leaking water pipes, and 36% with cracks in walls. Around 14% reported damp problems at home, and 25% said they have a major problem with peeling interior paint. As expected, for several of the housing parameters measured, it was reported that residents in the informal settlement of Hospital Hill were worst off. Unanticipated however, was the reported extent of degradation of housing infrastructure in the relatively recently constructed housing development of Braamfischerville. For example, 45% of Braamfischerville respondents reported cracks in their walls and 18% reported leaking water pipes, which could be an indicator of poor quality housing construction. Braamfischerville also had amongst the highest proportions of respondents reporting dampness (16%)



## RESULTS



and fungal growth on walls (15%), which may increase the risk of respiratory ill health conditions such as asthma. The reported extent of housing degradation in Braamfischerville (constructed around 10 years ago) appeared to be similar to or worse than in the suburb of Riverlea, which was constructed more than 40 years ago.

Table 11. PROPORTION OF DWELLINGS WITH STRUCTURAL AND OTHER DEFECTS

	STUDY SITES	HOSPITAL HILL	RIVERLEA	BRAAMFISCHERVILLE	BERTRAMS	HILLBROW
% of respondents who thought ... was a major problem	Peeling paint indoors	30	28	25	25	19
	Cracks in walls	62	41	45	25	12
	Ventilation	38	23	23	7	9
	Broken windows	31	15	4	12	12
	Noise in the area	45	31	26	36	45
	Leaking indoor water pipes	10	19	16	18	12
	Dampness	24	11	16	16	8
	Fungus or mould on walls	4	13	12	15	5

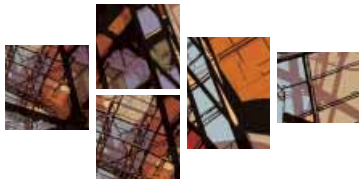
### 3.13 Access to Environmental Health Services

Apart from the informal settlement of Hospital Hill, most areas were well provided with indoor water supplies and indoor sanitation, and electricity was the main fuel used for cooking. The Hospital Hill community used mainly outdoor or communal water supplies and sanitation services, and paraffin for cooking (see Table 12).

While expected in Hospital Hill, there was a surprisingly low level of access to indoor hot water supplies in the established, formal settlements of Braamfischerville (6%) and Riverlea (18%), and to some extent in Bertrams (27% of households had no access to indoor hot water).

Table 12. ACCESS TO BASIC ENVIRONMENTAL HEALTH SERVICES

STUDY SITES	HOSPITAL HILL	RIVERLEA	BRAAMFISCH-ERVILLE	BERTRAMS	HILLBROW
% without access to running hot water (geyser)	99	82	94	27	7
% using mainly electricity for cooking	2	97	98	90	98



## RESULTS



### 3.14 Pests and Pesticide Use

Rats and cockroaches were reported to be most prevalent in all the study sites (see Table 13). Problems with rats were particularly prevalent in Hospital Hill, Braamfischerville and Bertrams, whereas cockroach infestations were reported most frequently in Riverlea, Bertrams and Hillbrow.

To address pest infestations, up to 46% of households (in Bertrams) were applying pesticides on a weekly or daily basis. Mean monthly expenditure on pesticides ranged from R21.00 in Hospital Hill to R43.00 in both Bertrams and Hillbrow.

STUDY SITES		HOSPITAL HILL	RIVERLEA	BRAAMFISCHERVILLE	BERTRAMS	HILLBROW
% with rat problem		69	42	66	59	26
% with cockroach problem		28	71	46	72	76
Frequency of pesticide use	Daily	6	11	5	11	6
	Weekly	22	20	28	35	17
	Monthly	41	51	49	39	47
	Intermittently	3	10	8	8	8
	Never	27	9	10	6	11
Mean monthly expenditure on pesticides (Rands)	21	31	26	43	43	

### 3.15 Perceptions of Neighbourhood Conditions

Perceptions of noise as a major neighbourhood problem were widespread, ranging from 26% in Braamfischerville to 45% in both Hillbrow and Hospital Hill (see Table 14), especially with respect to sources such as music being played loudly and parties late at night. In both Hospital Hill and Hillbrow as many as 45% of respondents described noise as a major neighbourhood problem. Even in the least affected area, Braamfischerville, more than one-quarter of respondents thought noise was a major neighbourhood problem.

	Hospital Hill	Riverlea	Braamfischerville	Bertrams	Hillbrow
% respondents who regard noise as a major neighbourhood problem	45	31	26	36	45

Most households (88% overall) used mainly public transport to get around – from 75% in Bertrams to 96% in both Hospital Hill and Braamfischerville (see Table 15). Levels of private vehicle ownership were low, with most people making use of public transport, mainly mini-bus taxis,

## RESULTS

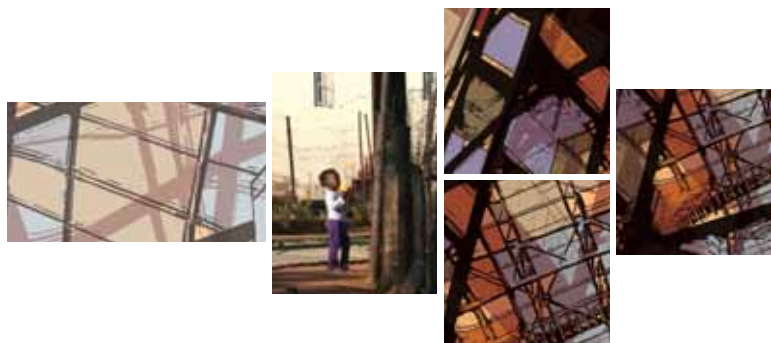


Table 15. USE OF PUBLIC TRANSPORT

	Hospital Hill	Riverlea	Braamfischerville	Bertrams	Hillbrow
% households mainly walking or using public transport to get around	96	90	96	75	80

### 3.16 Health Status – acute

As expected, the highest levels of acute ill health, as measured by levels of vomiting and diarrhoea using a two-week recall period, was found in Hospital Hill, where only communal environmental health services were available (see Table 16). In the remaining sites, levels of vomiting and diarrhoea appeared to be low. In Bertrams however, levels of vomiting and diarrhoeal appeared to be slightly elevated; investigations as to the cause of this should include the prevalence of HIV/AIDS.

Table 16. ACUTE ILL HEALTH CONDITIONS: TWO-WEEK RECALL PERIOD

	Hospital Hill	Riverlea	Braamfischerville	Bertrams	Hillbrow
% adults with vomiting (two week recall)	14	4	5	7	3
% adults with diarrhea (two week recall)	19	6	3	9	6

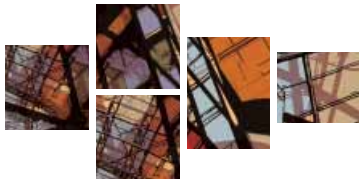
### 3.17 Chronic Ill Health Problems

In terms of chronic ill health, the prevalence of hypertension was reported to be particularly widespread, with asthma and diabetes also being major concerns for households. The prevalence of particular chronic ill health conditions varied from site to site (see Table 17), with Riverlea and Bertrams being worst affected in respect of asthma, diabetes, hypertension and stroke. Bertrams also had the highest reported level of obesity. The lowest levels of asthma, hypertension, stroke and obesity were found in the poorest and the wealthiest sites – Hospital Hill and Hillbrow respectively.

In Hillbrow 2% of households had suffered the death of one of its members during the past year. In the remaining sites, between 11 and 13% of households had been affected by death in the past year (see Table 17).

Table 17. PREVALENCE OF CHRONIC ILL HEALTH CONDITIONS

	Hospital Hill	Riverlea	Braamfischerville	Bertrams	Hillbrow
Asthma	3	19	7	20	2
Diabetes	8	16	4	15	2
Hypertension	11	31	16	23	5
Stroke	2	5	3	6	0
Obesity	0	4	6	10	2
% households in which a death occurred during the past year	12	13	13	11	2



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### 3.18 Mental Ill Health

Apart from Hillbrow, between 13% (Bertrams) and 24% (Hospital Hill) of respondents reported feeling nervous or anxious most or all of the time (see Table 18). Between 16% (Riverlea) and 23% (Braamfischerville) of respondents reported frequent problems with depression. Hospital Hill had the highest proportion (14%) of respondents who always or often felt life was not worth living and respondents from Riverlea reported the highest proportion of households (6%) in which a member had committed suicide over the past year.

Table 18. PREVALENCE OF INDICATORS OF MENTAL ILL HEALTH

		Hospital Hill	Riverlea	Braamfischerville	Bertrams	Hillbrow
% respondents who experienced the following most/all of the time	Nervousness/anxiety	24	16	18	13	9
	Depression	21	16	23	20	6
% respondents who often/always did not feel life was worth living	14	10	10	7	0	
% households in which a member has committed suicide	2	6	5	1	0	

### 3.19 Experience of Violence

Violence was a major public health concern in all the study sites, but was most pressing in Hospital Hill, where, using a 1-year recall period, respondents from 28% of households reported that one or more members had been a victim of a rape, deliberate gunshot, stabbing or assault incident (see Table 19). Hillbrow households had the lowest levels of experience of violence; nevertheless 14% of households had a member who had been afflicted by violence in the past year. In Hospital Hill concern was also most widespread over increased crime during the previous year.

Notable in Riverlea was the high proportion (15%) of households that had been affected by more than one form of violence (rape, gunshot, assault or stabbing) in the past year, indicating a concentration of violence in certain households in that suburb.

Table 19. PREVALENCE OF EXPERIENCE OF VIOLENCE

	Hospital Hill	Riverlea	Braamfischerville	Bertrams	Hillbrow
% households affected by violence (intentional gunshot, stabbing, rape or beating) - 12-month recall period	28	19	17	18	14
% households affected by multiple forms of violence – 12 month recall period	9	15	8	2	1
% of respondents who think crime worsened in past year	54	33	25	57	50

## RESULTS



The pattern of violence varied from site to site. For example, the highest levels of rape were reported in Riverlea and Braamfischerville (8% of households in each of these sites had a member who had been raped), as was the highest levels of injury from intentional gunshot wounds. The study did not distinguish between domestic and neighbourhood violence.

Half or more than half of respondents in Hillbrow, Hospital Hill and Bertrams thought that crime in the neighbourhood had worsened over the past year.

### 3.20 Perceptions of the Significance of Social Concerns in the Neighbourhood

Concern over neighbourhood social issues was widespread, but particularly elevated in Hillbrow, Riverlea and Bertrams as far as drug abuse was concerned (see Table 20). Large proportions (70% to 88%) of respondents in Hillbrow, Bertrams, Riverlea and Hospital Hill thought that alcohol abuse was a major neighbourhood problem, while in Braamfischerville a relatively lower but still high proportion (51%) of respondents thought so.

Table 20. CONCERN OVER NEIGHBOURHOOD SOCIAL ISSUES

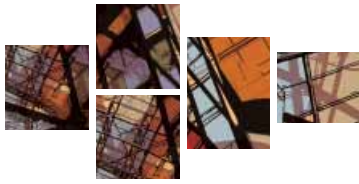
	Hospital Hill	Riverlea	Braamfischerville	Bertrams	Hillbrow
% respondents who believe that alcohol abuse is a major neighbourhood problem	70	75	51	76	88
% respondents who believe that drug abuse is a major neighbourhood problem	44	83	38	76	85

### 3.21 Patterns of Activity

When asked about exercise during the past three months, information from respondents showed that in all sites a lower proportion of women than men were taking exercise (Table 21). More members of households in Bertrams and Hillbrow than elsewhere were exercising, possibly because of a higher level of exercise, recreation and sporting infrastructure available in those areas.

Table 21. PARTICIPATION IN EXERCISE: MEN AND WOMEN

	Hospital Hill	Riverlea	Braamfischerville	Bertrams	Hillbrow
% households in which women have exercised during past month	8	18	13	30	27
% households in which men have exercised in past month	28	26	24	44	43
% households in which adults are participating in sport	52	49	57	40	43



## RESULTS



### 3.22 Social Cohesion

In recent decades the importance of social capital and social cohesion in health has been increasingly recognized. As can be seen in Table 22, membership of religious or faith-based groups are the dominant vehicle for social cohesion in all of the study sites. In the relatively impoverished and under-served site of Hospital Hill, a higher level of membership of political parties was observed, while more in Hillbrow than elsewhere were members of unions.

Table 22. MEMBERSHIP OF SELECTED COMMUNITY OR SOCIAL GROUPS

Does anyone in this household belong to a (% of households):	Hospital Hill	Riverlea	Braamfischerville	Bertrams	Hillbrow
Union	19	18	18	18	30
Religious group	68	84	69	79	70
Political group	25	7	14	11	8
Cultural group	16	6	14	9	12
Education group	4	5	8	8	13
Sports group	15	18	21	24	24
Non-governmental organization	4	11	9	8	4
Youth group	4	14	8	12	10
Women's group	6	11	16	14	6

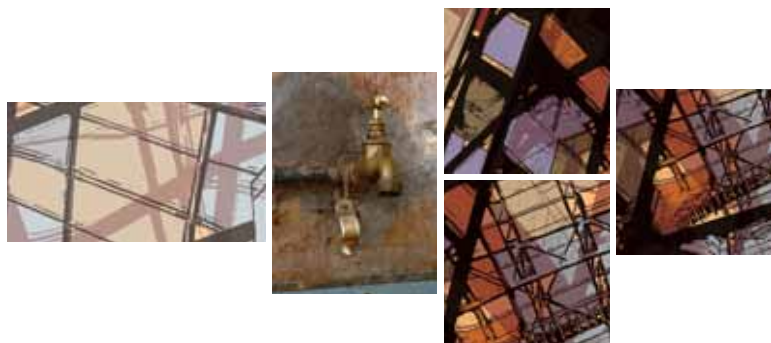
### 3.23 Quality of Life

Table 23 gives the results when respondents were asked to rate their quality of life. For the most part respondents in Hillbrow rated the various aspects of their quality of life highly, relative to their counterparts in Hospital Hill. An exception was in relation to their sense of community connectedness. In this regard Hillbrow respondents gave a poor overall rating, possibly associated with the relatively high proportion of households reporting that they are not South Africa in origin.

Table 23. PERCEPTIONS OF QUALITY OF LIFE (on a scale of 0 to 10, with 0 = poorest and 10 = excellent)

How satisfied are you with your:	Hospital Hill	Riverlea	Braamfischerville	Bertrams	Hillbrow
Standard of living	4.0	5.7	5.8	5.8	6.0
Health	5.3	6.7	6.5	7.1	7.5
Achievements in life	4.4	5.6	5.2	6.3	6.3
Relationships	7.9	7.6	7.8	7.5	7.6
Safety	4.9	6.8	6.7	6.1	6.4
Community connectedness	5.7	6.3	6.6	5.2	4.8
Future security	4.7	6.0	6.0	5.4	6.0
Life as a whole	6.2	6.9	6.9	6.8	7.3

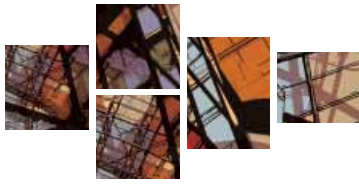
## RESULTS



### 3.24 Perceptions of Dwellings, Neighbourhood Conditions and Services

Table 24 gives a breakdown of the responses when respondents were asked to rate, on a scale of 0 to 10, their dwellings, neighbourhood and various aspects of local infrastructure and services. The information provides insight into local perceptions and a guide for local interventions.

Table 24. PERCEPTIONS OF DWELLINGS, NEIGHBOURHOOD CONDITIONS AND LOCAL SERVICES					
How would you rate your: (on a scale of 0 to 10, with 0 = poorest and 10 = excellent)	Hospital Hill	Riverlea	Braamfischerville	Bertrams	Hospital Hill
Dwelling	3.3	5.3	4.8	5.7	5.6
Neighbourhood	3.6	4.6	5.5	3.9	3.9
Schools in the neighbourhood	3.7	5.6	4.0	4.7	5.2
Local Roads	1.4	5.6	3.1	5.9	5.7
Traffic	5.2	5.5	5.3	5.8	4.3
Litter in the area	1.6	3.8	4.9	3.6	2.9
Dumping in the area	1.6	3.5	1.6	3.9	3.1
Street lighting	3.1	5.5	6.1	6.6	6.6
Open space	2.1	5.1	3.9	4.7	3.5
Play areas for children	1.1	5.5	1.2	5.9	4.6
Air quality in the area	3.3	4.0	4.5	5.9	4.1
Local police services	3.6	3.9	3.8	3.9	4.4
Health services	5.0	5.1	2.9	4.0	5.5
Refuse removal	1.6	7.7	8.2	7.3	6.9
Parks	1.8	5.7	1.8	4.9	4.7
Trees	3.9	5.9	3.9	6.2	4.0
Shopping facilities	3.1	3.0	4.9	5.2	6.1
Cinemas	0.6	0.8	0.7	2.2	5.5
Public transport	4.5	4.7	6.4	6.9	7.7



## DISCUSSION



### 4. DISCUSSION

While the study sites described here were selected because of their perceived status as impoverished, the data presented nevertheless show high levels of income inequality across the five areas. The study has also demonstrated a high degree of heterogeneity across the study sites, in terms of language, place of origin, living conditions, health profiles and activity patterns, implying the need for tailor made health optimization and promotion strategies.

In Hospital Hill, which is provided only with communal services, a heavy burden from acute ill health problems, such as diarrhoeal diseases, remains an important health concern. Overall however, it appears that, especially in the case of the Riverlea, Braamfischerville and Bertrams study sites, the predominant health concern is from a variety of chronic ill health conditions such as diabetes, hypertension and asthma. In this regard, alongside the implementation of various reconstruction and development programmes, a health transition may be underway – with disease profiles shifting from a heavy burden from acute ill health concerns, to an increasing burden of chronic diseases. In addition, indicators of mental ill health, a neglected public health problem, is widely prevalent. The high levels of household experience of violence reported in this study is a further important public health concern. As far back as 1996 the World Health Organization declared violence a major and growing public health problem, saying that health cannot flourish in conditions of violence. (WHO 2002) With as many as 28% of households having experienced rape, gunshots, stabbing or assault in a single year prior to the day of the interview in Hospital Hill and 19% in Riverlea, community violence in these areas can only be described as pervasive, and most likely a major obstacle to good health.

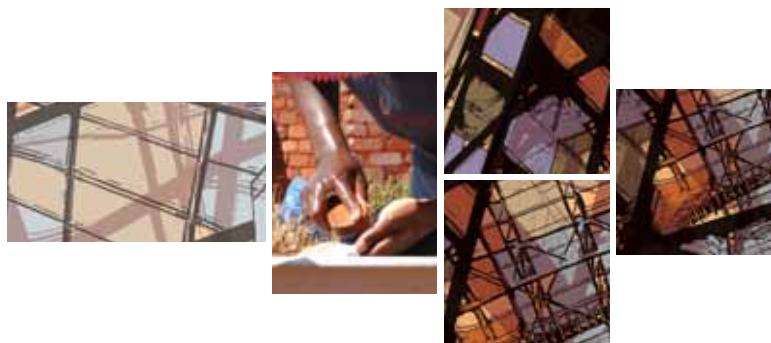
The data indicate that the highly impoverished Hospital Hill community is bearing multiple burdens of disease, associated with inadequate housing and services, as well as the growing epidemic of chronic diseases predicted for developing countries, accompanied also by violence and mental ill health.

Chronic disease, obesity, inactivity, mental ill health and violence have been shown to be inter-related, and also have a strong environmental or developmental dimension. For example, high levels of neighbourhood violence is likely to result in a decline in the use of outdoor spaces and lower levels of outdoor or physical activity, leading to sedentary lifestyles and high levels of obesity, and in turn, high levels of cardiovascular diseases, diabetes and certain forms of cancer. Similarly, high levels of neighbourhood or domestic violence has been associated with poor mental health status. Poor or limited neighbourhood infrastructure, such as inadequate open space, children's play parks and sporting facilities, can have a deterrent effect on inclination to exercise, leading in turn to obesity and an escalation of downstream ill health conditions.

With the establishment of the WHO Commission on the Social Determinants of Health (CSDH), impetus has been given to the position that action to address the underlying causes of ill health is as important as the provision of health services. The chairperson of the CSDH, Professor Sir Michael Marmot, has asked “why do we keep on treating people, only to send them back to the conditions which caused their ill health in the first place.” Some in the communities described here may well fall into this category of people whose prospects for good health are threatened by inappropriate development and social conditions, that lie outside of the ambit of health departments.



## DISCUSSION



Effective responses to this changing health profile, require a re-engineering of urban health departments to ensure that the services provided correspond with local health needs, for example an increased emphasis on mental health and chronic disease services, that include community outreach initiatives. A significant need for health departments to drive a broader process to put in place measures that will prevent the predicted epidemics of chronic disease and mental ill health in the African Region, as well as measures to reduce levels of violence that are already pervasive in some areas. Since the cause (and solutions) to these public health problems lie outside the ambit of the health sector, it is increasingly important that the political and developmental dimensions of public health be understood and addressed at the highest level in local and other spheres of government, and that closer relationships are forged between health departments and non-health sectors in the interests of improved public health.

In many ways the ground is fertile for action around the social dimensions of health in South Africa, where concerns around crime and violence are already a political and public priority. There is also support at the highest level for a focus on inequity and social

factors: in 2006 the President, Thabo Mbeki, acknowledged that in recent years development efforts in the country had focused on “changing the material conditions [water, sanitation, housing, electricity, telecommunications and so forth] of the lives of [South African] people”, but were lacking in terms of the social dimensions. He went on to say that “human fulfilment consists of more than access to modern services,” and appealed to South Africans to “place at the centre of our daily lives the pursuit of the goals of social cohesion and human solidarity” ([http:// www.nelsonmandela.org/](http://www.nelsonmandela.org/)). This study has shown that membership of cultural, education and youth groups, for example, is low relatively to membership of faith-based agencies.

Any efforts to address the health concerns facing communities such as Hillbrow and Bertrams will be challenged by factors highlighted in the report, such as the high levels of residential mobility, as well as the challenges inherent in working with foreign communities, whose languages and cultural practices may be different to what local service providers are accustomed to.

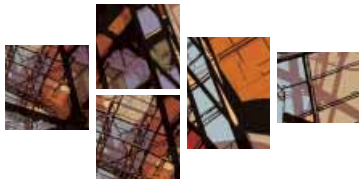
Over the past century, understanding of the determinants and promotion of health has changed dramatically, moving from a simplistic medical model, to a greater recognition of the complex nature of

the biological, environmental and social forces that impact on health. These are reflected in the key public health milestones of the last half-century:

- The Alma Ata Declaration on Primary Health Care;
- The Ottawa Charter for Health Promotion
- The Helsinki Statement on Supportive Environments for Health;
- The Healthy Cities Project;
- The Commission on the Social Determinants of Health

Given the ill health profiles determined, it is apparent that in the communities studied (and possibly similar settings elsewhere in South Africa and beyond) there is a need for a developmental or cross-sectoral approach to address the health problems revealed. It is also clear that tailor-made plans of action are needed if the complex and multiple burdens of ill health being experienced by these communities are to be addressed effectively.

The most important lesson from this study, as well as from international experience, is the need for a holistic and integrated approach to the design and development of human settlements. In particular, to ensure that disease is prevented and that health is promoted, a closer relationship needs to be forged between planning and health



## REFERENCES



departments. To engage most effectively in such partnerships, health departments need to ensure access to appropriate skills and expertise, for example in terms of health impact assessments and the management of inter-sectoral relationships.

In order to respond effectively to the particular health challenges of various urban communities, it is important to develop a sound information base. The Health, Environment and Development (HEAD) study seeks to describe prevailing health status in selected sentinel sites of relative impoverishment in Johannesburg.

### REFERENCES

1. Lowry S. *An introduction to housing and health*. BMJ. 1989 18; 299(6710):1261-2.
2. UNFPA (United Nations Population Fund). *State of World Population 2007: Unleashing the Potential of Urban Growth*. UNFPA, New York. Available at <http://www.unfpa.org/pds/urbanization.htm>.
3. UNDP (United Nations Development Programme). *Human Development Report 2007*. Available at <http://hdr.undp.org/hdr2007.cfm>.
4. Vlahov D, Freudenberg N, Proietti F, Ompad D, Quinn A, Nandi V, Galea S. *Urban as a Determinant of Health*. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, 2007, 84(1): 16-26.
5. WHO - World Health Organization. *World Report on Violence and Health*, Geneva 2002.
6. WHO - World Health Organisation. (2003) *Quantifying selected major risks to health*. (Newsletter 2003), World Health Organization, Geneva.





**RESEARCH REPORT: THE HEALTH, ENVIRONMENT & DEVELOPMENT (HEAD) STUDY**  
COMPRISING THE: SOUTH AFRICAN MEDICAL RESEARCH COUNCIL, UNIVERSITY OF JOHANNESBURG  
UNIVERSITY OF THE WITWATERSRAND AND THE CITY OF JOHANNESBURG  
AN INITIATIVE OF THE WORLD HEALTH ORGANIZATION COLLABORATING CENTRE FOR URBAN HEALTH

