

# Spatial Planning, Land Development and Land Use Management in a Context of HIV and AIDS

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1.	Introduction .....	4
1.1.	Why HIV, Spatial planning and land use management.....	4
1.2.	Scope and methodology for the study .....	5
1.3.	Structure of the report .....	5
2.	Considering the lifecycle of HIV and AIDS .....	6
3.	Impacts of spatial and structural factors on HIV and AIDS and implications of HIV and AIDS for land use and land development.....	8
3.1.	Impacts of spatial and structural factors on HIV and AIDS .....	9
3.2.	Impacts of HIV and AIDS on land and spatial development.....	14
4.	The burden of extra AIDS mortality on land .....	17
4.1.	Contextualising the challenge of extra AIDS mortality .....	17
4.2.	Quantifying and specifying the challenge .....	18
	Monitoring trends in disposal of human remains.....	20
	Challenges associated with interment.....	20
4.3.	Alternative methods to single grave interment.....	21
	Legal and policy parameters .....	26
	Social, cultural and religious parameters .....	26
	Incentives to promote alternative methods .....	29
5.	HIV, AIDS and institutional capacity of local governance .....	32
5.1.	Demographic impacts of HIV and AIDS on occupational categories active in the land administration and delivery sector .....	32
6.	Recommendations.....	34
6.1.	Consolidated problem statement and approaches .....	34
6.2.	Recommendations .....	35

Figure 1: Projected number of AIDS deaths with and without (Source: Dorrington, et al; 2004)....	7
Figure 2: HIV prevalence by province among antenatal clinic attendees (Source: Department of Health, 2004) .....	8
Figure 3: Additional land required in the cities according to different methods of disposal of human remains .....	24
Table 1: HIV prevalence per geotype (Source: HSRC, 2002).....	8
Table 2: Percentage of households sharing a single room and in informal dwellings in the cities (Source: Statistics South Africa, in Cities Network, 2003) .....	9
Table 3: Inadequate access to services in the Cities (Source: Statistics South Africa, in Cities Network, 2003) .....	10
Table 4: Management of home-based care medical waste in the cities (Source: municipal officials).....	11
Table 5: Incidence of crime (Source: Cities Network 2003) .....	13
Table 6: Impact of HIV and AIDS on mortality (Source: Dorrington et al, 2004).....	18
Table 7: Shortage of cemetery space in the cities .....	19
Table 8: Monitoring mortality trends in the cities .....	19
Table 9: Trends pertaining to the method of disposal of human remains .....	20
Table 10: Measures taken to minimise the problem.....	21
Table 11: Alternative methods of disposal of human remains .....	22
Table 12: Demand for land according to different methods of disposal of human remains.....	23
Table 13: Extra AIDS deaths nationally and in the nine cities (Adapted from Dorrington et al, 2004).....	23
Table 14: Detailed assumptions for the apportionment of extra AIDS death to different methods per scenario .....	25
Table 15: Additional land required to accommodate extra AIDS deaths per scenario.....	25
Table 16: Cultural and religious outlooks on death and alternative methods of disposal of human remains.....	27
Table 17: Pricing for interments and cremations.....	29
Table 18: Informal and illegal burials in the cities.....	30

# 1. Introduction

## 1.1. Why HIV, Spatial planning and land use management

The spread of HIV and the impact of AIDS are affected by the manner in which land and space, as platforms for human activity, are structured and developed. Conversely, the wide ranging social, economic and demographic transformation that arises from HIV and AIDS affects the use and development of land. Responding to this inter-relationship between HIV and AIDS on one hand; and spatial planning and land use management on the other, is imperative for all municipalities. The situation is particularly challenging in cities as they are places where land is not only scarce and subject to the demands of urbanisation but also where HIV and AIDS are concentrated.

Responding to this imperative requires a sound understanding of the various facets of this relationship. The relationship is particularly complex. This complexity arises because its different facets are primarily indirect. Increases in the number of deaths, whether brought about because of AIDS and/or urbanisation, within the area of jurisdiction of municipalities, speak directly to the cemeteries and crematoria planning and management competence of municipalities. Similarly, HIV morbidity and mortality in the municipal workplace affect directly the institutional capacities and budgetary resources, available to the municipality to perform its spatial planning, land development and land use management roles. However, suggesting that settlement planning and land development processes, norms and standards have a bearing on the spread and impacts of HIV and AIDS require a little mental gymnastics.

HIV and AIDS impact on the sustainability of communities and their development conditions (Ambert, forthcoming). Conversely development conditions affect HIV prevalence and the impact of AIDS on individuals, households and communities. Poor housing and settlement conditions have been correlated with high HIV prevalence. Inadequate access to services, to secure tenure and to housing makes HIV positive individuals and HIV negative individuals alike particularly vulnerable to opportunistic infections (ibid). Such conditions do not provide an appropriate platform for care and support of the sick and frail (Tomlinson, 2003). HIV and AIDS fuel fluidity in household formation patterns, household size, mobility and profile. These trends find expression in increased informality and therefore the perpetuation of informal settlements (Ambert, forthcoming).

Spatial and settlement planning form the basis on which service delivery investment decisions are made and services delivered. Spatial planning at the city-scale helps determine the location of new settlements and the identification of informal settlements for regularisation and upgrading and hence accessibility to some of the services and opportunities HIV positive and negative persons alike have at their disposal to fend-off the spread and impacts of HIV and AIDS. Similarly, failing to plan for and implement the release of sufficient land to accommodate household growth in the cities means that households and individuals have little option but to turn to informality as a settlement and shelter strategy. Planning and managing land use, whether formal or informal, similarly falls within the ambit of municipal functions.

On the basis of this understanding, this study proposes approaches and strategies for land planning, development and management practices in cities, that:

- Contribute to decreasing the rate of HIV infection;
- Contribute to mitigating opportunistic infections and AIDS defining conditions;
- Respond to shifts in demographic and socio-economic dynamics arising from the impacts of HIV and AIDS in society, and in turn demand and use of land;
- Respond to the increase in the rate of morbidity resulting from AIDS; and
- Respond to the impacts of HIV and AIDS on the supply-side of land development and management.

## **1.2. Scope and methodology for the study**

The terms spatial planning, land use management and land development have been specified in the Spatial Planning and Land Use Management (Department of Land Affairs, 2001). This specification has been used to guide the scope of the study, as follows:

- Spatial planning: planning of the way in which different activities, land uses and buildings are located in relation to each other, in terms of distance between them, proximity to each other and the way in which spatial considerations influence and are influenced by economic, social, political, infrastructural and environmental considerations;
- Land-use planning: planning of human activity to ensure that land is put to the optimal use, taking into account the different effects that land-uses can have in relation to social, political, economic and environmental concerns; and
- Land development: the process of building and landscaping land in order to enhance its commercial or social value.

As can be seen in the body of this report, the study has sought to engage with all three dimensions of planning, in general, but also to focus on specific dimensions that are of particular relevance in a context of HIV and AIDS, as follows:

- Spatial planning and land development for informal settlement upgrading;
- Spatial planning and land development for new settlement development;
- Land use planning and management for informality; and
- Spatial and land use planning for the living and the dead.

The process followed in the course of this study has included:

- An extensive review of literature;
- Primary research with environmental health as well as parks and cemeteries officials in the cities;
- Primary research with anthropology and sociology researchers, religious leaders and traditional healers;
- Engagement with the teams responsible for two complementary studies (i.e. HIV and migration, and HIV and poverty); and
- Worksessions to analyse the research findings and develop strategies and responses.

## **1.3. Structure of the report**

This report is structured as follows:

- Section two describes some of the underlying bio-medical assumptions of the study in respect of HIV and AIDS;
- Section three explores the range of impacts of spatial and structural factors on HIV and AIDS as well as the demographic, social and economic impacts of HIV and AIDS on land and spatial development dynamics;
- Section four specifically explores the challenges associated with AIDS related mortality in terms of land use in the face of current and alternative methods of disposal of human remains;
- Section five briefly presents existing research findings in respect of the impacts of HIV and AIDS on the supply side of spatial planning, land development and land use management; and finally
- Section six proposes approaches and recommendations to respond, in an integrated manner, to the challenges associated with HIV and AIDS in respect of spatial planning, land development and land use management.

## 2. Considering the lifecycle of HIV and AIDS

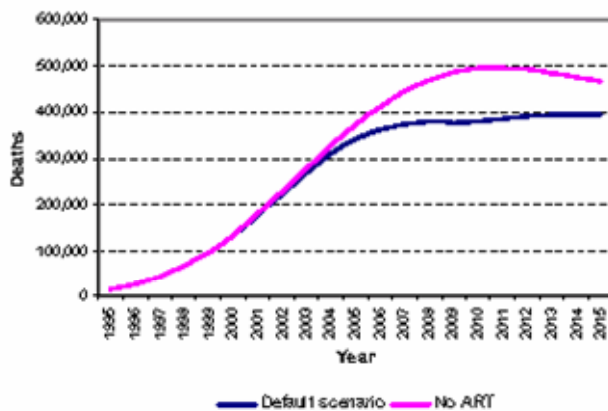
Whiteside and Sunter (2000) posit that AIDS will have a greater livelihood impact than death from other causes. The protracted nature of HIV illness and the lengthy depletion of household resources giving rise to greater and more enduring hardship than other causes of death so that AIDS increases poverty levels and socio-economic inequality in society as a whole (ibid.). Importantly, the link between HIV, AIDS and poverty does not only apply to those who have AIDS (Tomlinson, 2005).

HIV and AIDS are a long-wave process of gradual and systemic increases in vulnerability, because they are a chronic disease. Most infected people only show signs and symptoms of disease after many years. In developed settings, the average time from HIV infection to testing HIV positive is 2 months (the so-called "window period"). The average time from contracting the virus to the onset of AIDS is 10 years. Average survival following an AIDS defining condition is 2 to 3 years, without anti-retroviral treatment (ART) and adequate access to life-sustaining goods.

HIV infection results in a progressive weakening of the immune system. This makes a person susceptible to a wide variety of opportunistic infections and cancers. Secondary infections due to lower immunity occur at stages of disease before development of AIDS itself. Secondary diseases that are termed "AIDS defining conditions" occur in the end stage of the natural history. Diseases associated with HIV infection occur such as tuberculosis, diarrhoeal diseases and pneumonias. These physiological changes can ultimately result in death. Survival after an AIDS diagnosis appears to be substantially shorter in African countries and this may be partly because of later diagnosis of AIDS in Africa, but may also be because of environmental factors such as increased exposure to pathogens of high virulence and lack of access to care (Grand, et al., 1997). The limited data available suggests that death occurs at a higher range of CD4 counts in African countries, than in more economically developed countries, although still in the range consistent with advanced disease (ibid.).

Although the rolling out of ART represents an important turning point in South Africa, it is unlikely to resolve the situation entirely. Projections undertaken by the Actuarial Society of South Africa show that interventions have had and are having a significant impact on the course of the epidemic (Dorrington et al., 2004). The Prevention of Mother To Child Transmission (PMTCT) programme has reduced the number of babies infected and behaviour change, in particular, has seen an increase in condom use and has reduced the number of adults infected. The national ART programme can be expected to play a particularly important role in the future outcome of the epidemic. The model projects that by 2010, there are likely to be roughly 381 000 AIDS deaths per annum rather than the 495 000 that would have been expected if no ART programmes were introduced (ibid.). In the default scenario, it is assumed that ultimately only about half of South Africans who need ART will be able to access it. If we assume that only 20% manage to access ART then the estimated number of AIDS deaths in 2010 increases to 450 000, but if the proportion is as high as 90% the number of AIDS deaths would be reduced to 290 000 (ibid.).

**Figure 1: Projected number of AIDS deaths with and without (Source: Dorrington, et al; 2004)**



Already, in 2004, HIV and AIDS had decrease life expectancy by 13 years to 51.0 years, rather than the 63.9 years (Dorrington, et al. 2004). By 2015, the difference is expected to reduce to 15 years, giving a life expectancy of 50 years (Ibid.).

Bio-medical prevention, treatment and care efforts are an important part of the response to HIV and AIDS. Nevertheless the effectiveness and impact of these efforts are confronted by important challenges which include:

- Socio-cultural and cultural resistance to behaviour change (See, Preston-Whyte, E. 1999);
- To access ART, an HIV positive person has to know his or her status. This is a significant obstacle, as factors ranging from personal denial, stigma and uneven geographical accessibility of Voluntary Counselling and Testing (VCT) sites combine to make knowledge of one's status difficult to achieve;
- Positive living, the concept used to defined health enhancing behavioural changes suggest sustained condom use, to avoid re-infection with the same or different strains of the virus. In several settings, negotiating condom use may not be feasible;
- Access to life sustaining goods, such as adequate nutrition and safe water and sanitation services plays an important role in sustaining the wellbeing of HIV positive and negative persons alike. The South African context is one which access to such life sustaining goods is particularly uneven. For most, entrenched poverty means that that irrespective of HIV and AIDS, one's immune system is compromised.

Key issue: Although the roll out of prevention, care and treatment interventions will contribute to mitigating the spread and impact of HIV and AIDS, contextual challenges will continue to decrease life expectancy and generate additional mortality.

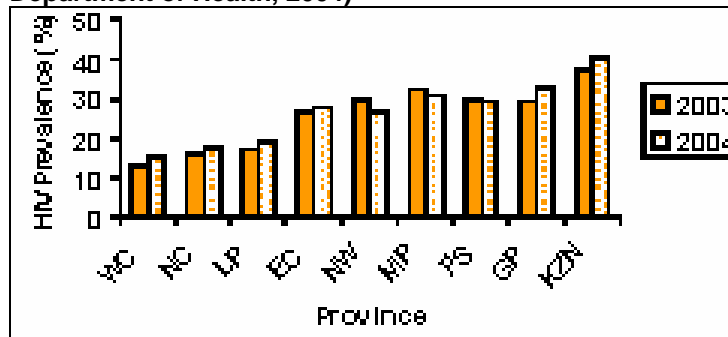
### 3. Impacts of spatial and structural factors on HIV and AIDS and implications of HIV and AIDS for land use and land development

The following turns to the manner in which spatial and structural factors shaping the geography of cities are affecting the spread of HIV and the impacts of AIDS and goes on to describe how, by deepening socio-economic vulnerability, HIV and AIDS affect land settlement and land use patterns.

In the ideal, HIV prevalence information would be available at least at the settlement-scale, as significant variations exist between and within settlements, located within the same municipality's area of jurisdiction. However, gathering and maintaining such information over time, would be an extremely resource-intensive process. City-scale prevalence information is mostly unavailable, although census demographic information, capturing information for the cities could be used to model the HIV epidemic using epidemiological projections software, such as, for example, the Doyle Metropolitan Model or the Actuarial Society of South Africa's model. In the absence of dedicated HIV prevalence information at the city scale, provincial and genotype information has been used as background data in this report.

The Nelson Mandela/Human Sciences Research Council's (HSRC's) Prevalence Study (HSRC, 2002) estimates that between 10% and 12.7% of the South African population was HIV positive in 2002. This amounts to 5,1 million persons. It found that close to 15.6% of adults, aged between 15 and 49 were HIV positive (ibid.). HIV prevalence is not consistent across all provinces in the country (See Figure 2 below).

**Figure 2: HIV prevalence by province among antenatal clinic attendees (Source: Department of Health, 2004)**



Provincial prevalence hides significant disparities. In the whole of South Africa, it is estimated that between 16.2% and 26.5% (average 21.3%) of all persons living in urban informal settlements of all age groups were HIV positive in 2002 (ibid.). In the age group 15 to 49, average prevalence was 28.4% and ranged between 22.8% and 36% across the country. In contrast, an average 15.8% of those in the same age cohort living in formal urban settlements were HIV positive. In tribal areas and farms prevalence was found to stand at 12.4% and 11.3% respectively.

The concentration of the pandemic in informal urban settlements is associated with a concentration of the predictors of HIV such as high levels of migration and prevalence of the sexually active age group among the residents of informal urban settlements (Tomlinson, 2005). Table 1, below, provides an overview of HIV prevalence by geotype in South Africa.

**Table 1: HIV prevalence per geotype (Source: HSRC, 2002)**

Locality type	HIV positive
Total	10% to 12.7%
Urban formal	10.3% to 14%



Urban informal	16.2% to 26.5%
Tribal	6.5% to 10.9%
Farms	4.8% to 11.1%

The extent to which the cities incorporate each of these types of localities varies. Nevertheless, all include at least urban formal and urban informal locality types. The latter are where the highest prevalence has been recorded. This is in line with the assertion that HIV, like other diseases, is a symptom of rapid urbanisation (Pimentel, et al. 1998).

Key issue: HIV and AIDS are a symptom of rapid urbanisation and concentrated in urban formal and informal settlements.

### 3.1. Impacts of spatial and structural factors on HIV and AIDS

Lessons from the past suggest that biomedical approaches to disease control in individuals, when acting in isolation, often fail to achieve sustainable health gains at the level of populations (Pronyk, P M, Et Al, 2001). In the treatment of diarrhoeal disease, antibiotics are helpful in certain cases, but improving sanitation and water supply systems will lead to a sustainable decrease in infections (Ibid.). Similarly, effective medications for the treatment of tuberculosis (TB) have been available for nearly five decades. Yet, in the context of the overcrowded living conditions which fuel its transmission, tuberculosis remains responsible for more deaths worldwide than any other infectious agents (Ibid.).

Clearly the factors driving the spread of HIV and AIDS, and potential responses thereto, are not solely limited to structural and spatial factors. Nevertheless, structural and spatial factors heighten opportunities for sexual networking and risk of HIV infection. It is those factors that spatial planning, land development and land use management practices can help shape and thus need to respond to.

Key issue: Although the factors driving the spread of HIV and AIDS are not solely limited to structural and spatial factors, they heighten the probability of sexual networking and risk of HIV infection.

#### 3.1.1. Urbanisation, overcrowding and inadequate access to services

Environmental factors are key in determining the course of epidemics (Smith et al. 1999). High densities facilitate the increase and spread of infectious organisms among people. Human plagues such as cholera, tuberculosis and HIV are essentially problems of dense urban population (Pimentel et al. 1998). High densities increase opportunities for sexual networking, and in turn, exposure to HIV is heightened.

Density levels also need to be considered at the household scale. Overcrowding is associated with a lack of sexual privacy. The HSRC study suggests that a lack of sexual privacy is associated with a lower age of sexual debut, which in turn heightens the risk of HIV infection. Overcrowding also heightens the risk of TB infection among those who are HIV positive as well as those who are HIV negative. It risks compromising the effectiveness of treatment. The following table presents an overview of the percentage of households sharing a single room and in informal dwellings in the cities, as a possible proxy for overcrowding.

**Table 2: Percentage of households sharing a single room and in informal dwellings in the cities (Source: Statistics South Africa, in Cities Network, 2003)**

City	Buffalo City	Cape Town	Ekurhuleni	Ethekwini	Johannesburg	Mangaung	Msunduzi	Nelson Mandela	Tshwane
% households sharing a single room	4,88%	8,85%	10,18%	7,67%	8,62%	8,38%	8,03%	7,03%	11,50%

% households in informal dwelling in backyard	5,66%	4,33%	6,73%	3,48%	7,84%	4,34%	2,16%	3,04%	4,26%
% households in informal dwelling not in backyard	31,12%	16,50%	23,05%	23,40%	14,48%	23,74%	28,52%	21,53%	20,32%

Key issue: Urbanisation and overcrowding fuel the spread of HIV and expose positive individuals to opportunistic infections.

Certain settlement and housing conditions, especially those where access to water and sanitation and environmental health are either lacking or compromised, increase the likelihood of contracting opportunistic infections such as TB. Table 3 below provides an overview of the percentage of households with inadequate access to services as a proxy for households whose environmental health conditions would be particularly inappropriate in a context of HIV and AIDS.

**Table 3: Inadequate access to services in the Cities (Source: Statistics South Africa, in Cities Network, 2003)**

City	Buffalo City	Cape Town	Ekhuruleni	Ethekwini	Johannesburg	Mangaung	Msunduzi	Nelson Mandela	Tshwane
% without on site water	41,11%	15,58%	18,10%	30,31%	15,52%	31,17%	29,97%	20,26%	20,33%
% with VIP toilets or less	32,47%	12,57%	16,95%	31,11%	13,44%	49,64%	41,48%	20,45%	28,00%
% households not using electricity	36,91%	11,15%	25,00%	20,10%	14,98%	14,90%	14,22%	24,92%	19,30%
% households without refuse collection	28,65%	5,62%	12,03%	14,58%	8,75%	40,19%	40,94%	13,91%	21,76%

Soil is easily contaminated by a wide array of chemicals and pathogens, which are acquired by humans directly from the soil as well as through food and water. Malnutrition complicated by parasitic infections is frequently found in poverty stricken areas with inadequate water, sanitation and solid waste management services. Their presence also increases the loss of nutrients by causing diarrhoea. Hookworms for instance can suck out as much as 30 ml of blood from an infected person each day, gradually weakening individuals and lowering their resistance to other diseases (Hotez and Pritchard, 1995; in Pimentel, et al. Ibid). Research undertaken by the Medical Research Council suggests that infection with hookworms may make one more susceptible to HIV infection and heighten the risk of transmitting HIV to babies may increase when mothers have worms (Medical Research Council, 2005). Moreover, when people are co-infected with helminths and HIV, their immune response is inappropriate for HIV infection (ibid.). Scientists of the Amoebiasis Research Unit have found that about 40% of adults in Khayelitsha have worm eggs in their faeces, which confirms infection (Ibid.). This has several important implications. Persons with co-infection will progress more rapidly to full-blown AIDS and may have higher morbidity and mortality.

Key issue: Inadequate access to water, sanitation, energy and solid waste management compromises the immune system of the HIV positive and negative alike.

Access to solid waste management services is also critical in a context of HIV and AIDS. If not disposed of properly, contaminated wastes may carry micro-organisms that can infect the people who come in contact with the waste as well as the community at large. Contaminated wastes include blood, pus, urine, stool and other body fluids, as well as items that come in contact with them, such as used dressings. Soiled medical devices that can inflict injury (e.g. used needles) are capable of spreading blood-borne diseases such as HIV (World Health Organisation, 1999).

During this study, environmental health officers of the cities were engaged to ascertain the extent to which the management of home based care solid waste had been taken into account in terms of planning for solid waste and environmental health management. Table 4 below provides an overview of results. It highlights that, where they are in place, medical waste policies target primarily institutionalised producers of medical waste (i.e. clinics and hospitals). In some cities, effective systems have been set up to link up home based care providers with institutionalised providers.

Of concern is the situation where individuals, sick with AIDS defining conditions and opportunistic infections, are receiving home based care without such linkages being made. This would be the case where home based care services are provided informally. In such situations, the handling of contaminated medical waste presents a particularly pronounced challenge.

**Table 4: Management of home-based care medical waste in the cities (Source: municipal officials)**

	Management of HBC medical waste
Buffalo City	Not clear how this happens
Cape Town	Unclear. For hospitals and clinics, Environmental Health By-law regulates the management of medical waste from the point of generation to final disposal
Ekhuruleni	HBC system monitored by council No problems noted
Ethekwini	Unclear
Johannesburg	Unclear
Mangaung	All waste collected from homes to clinics Medical waste policy in place
Msunduzi	Waste by-laws but only for management of medical waste from medical institutions- not HBC although HBC care-givers linked up with health services institutions
Nelson Mandela	Identified as an issue in the integrated waste management plan but no policy is in place yet to monitor this
Tshwane	Unclear

Settlement and housing types, where conditions of inadequate access to services and overcrowding persist include free-standing and infill informal settlements, backyards, overcrowded formal housing and hostel accommodation. In the above, it has been established that the living conditions found in such settlement and housing conditions can be particularly compromising in a context of HIV and AIDS. Most of these housing and settlement conditions have not developed as a result of present-day spatial planning and land use management interventions. Instead, they are “unplanned” and people-driven initiatives, where settlement processes and outcomes are informal in nature. In South African cities, they arise from the demand for land and shelter linked to urbanisation and immigration, alongside natural population growth and the unbundling of urban households. These processes are intrinsically relevant to strategic spatial planning. Yet, they have primarily been defined as housing-related issues, wherein planning only plays a reactive role (for instance through township establishment processes or, where enforcement capacity exists, the monitoring and enforcement of adherence to zoning and town planning scheme provisions).

Cities have tended to adopt a fairly strict and conservative stance in reaction to processes of informal settlement (whether through land invasions, backyard shacking or slumming). The eviction of illegal and informal residents is common-place and rationalised as acceptable in a context where the state’s responsibilities in respect of the right to housing is deemed to be upheld via the provincially administered housing subsidy programme. In spite of the near 1.7 million housing subsidies approved since the inception of the subsidy programme, this control-based approach to settlement development, in a context of limited supply capacity, has meant that supply remains outstripped by demand. In turn, this continues to perpetuate informal settlement processes.

Key issue: Informal settlements and housing conditions are places where HIV and AIDS are concentrated. As “unplanned” and people-driven responses to urbanisation, they are places which the planning system only engages with on a reactive basis. In many respect informal settlements point to the failure of the planning system and practices to proactively respond to the processes of urbanisation and migration, and resulting settlement, housing and economic informality.

### 3.1.2. City form

Fragmented, sprawling cities and the spatial legacy of apartheid aggravate the spread of HIV and the impact of AIDS. The types of settlement patterns that have been identified as heightening both HIV and AIDS are found in cities where residents have multiple household bases (often migrating on a weekly basis), which increases sexual networking opportunities. Such settlements include Apartheid settlements (for instance Mangaung, where residents spend the week in Mangaung and the weekend in Botshabelo) as well as new RDP housing settlements that are located on the periphery of municipalities are often places where the distance to work opportunities is such that the cost of commuting forces working residents to settle (even informally) closer to their place of work. Settlements created as part of the apartheid industrial decentralisation process, where economic activity has all but collapsed with the end of decentralisation incentives, and where employment opportunities have become quasi-inexistent (Mpumalanga Township study), are often places where women are forced into transactional sex arrangements.

Fragmented and sprawling cities also mean that infected and affected persons face uneven access to the health care system. Distance to prevention, care and treatment of sexually transmitted infections and PMTCT play a determining role. Public clinics and hospitals dispensing free condoms are the most common source of condoms for both males (35.2%) and females (45.3%) (HSRC). In settlements where such services are not available, access might be compromised. PMTCT efforts are also undermined because of economic reasons including the costs of formula feeding and distance to the ANC site. An HIV positive person has to be physically and physiologically able to access AIDS-specific care. In rural areas, in particular former homeland and former homelands areas, access to such care is particularly difficult. Within the area of jurisdiction of cities, residents of spatially alienated settlements on the periphery may not have the resources required to afford transport costs and in turn access treatment.

Boysen et al (2001) found that government health services were the most common source of health care. Ill members of affected households in most cases attended a government clinic and in some cases attended a government hospital. In contrast, ill members of non-affected households were most likely to have attended a government clinic. Khayamandi (2001) showed that government hospitals are a preferred source of care over other options. It is worth noting that the current health care dispensation in respect of the treatment of HIV and AIDS is promoting home-based care as a substantial source of care. The spatial accessibility of the preferred source of service (government hospitals), will be challenging for a substantial majority, in the context of urban South Africa marked by spatial fragmentation and dislocation. This suggests that the continued peripheralisation of access to urban land (through both formal and informal delivery channels) appear particularly at odds with the health-care requirements and preferences of People Living With HIV and AIDS (PLWHA) (Development Works, 2003).

Key issue: Fragmented cities and the apartheid settlement legacy are obstacles in the response to HIV and AIDS as they hinder and dilute the even and efficient coverage of prevention, care and treatment services.

### 3.1.3. Settlement environments and processes that are not conducive to strong social asset formation fuel the spread of HIV

Social networks play a key role in determining risk behaviour. Certain settlement environments and processes are not conducive to social asset formation. These include new low-income

housing developments, established through individually-framed housing subsidies, where “communities” are pulled together from beneficiary lists. The residents of settlements that act as reception areas for in-migrants are also places where social assets are limited. The social disruption, which characterises certain types of migration, determines vulnerability to HIV (Decosas and Kane, in Singh, 2005). Similarly, the economy of mobility creates complex and interconnected circumstances, which may lead to migrants’ heightened vulnerability to HIV infection (White 2003, in Singh, Ibid.).

Social assets such as strong community networks have been identified as acting as a “soft” buffer limiting the spread of HIV. Cohesive communities also provide a platform around which to successfully consider and respond to the socio-economic impacts of AIDS at the household and community level’ (Krishna A, Shrader E. in Washington DC: World Bank; 1999). This soft buffer also acts to mitigate the social and economic impacts of AIDS at the community level. Group mobilisation and development processes, such as those associated with certain forms of people’s housing processes can help communities intervene to protect vulnerable households from the usurpation of land rights by relatives after the death of the household head (Development Works, 2003).

Key issue: Settlement environments with newly-formed “communities, such as migration reception areas and RDP settlements have weak social networks which heightens residents’ vulnerability to HIV infection. However, settlement development processes that develop communities contribute to the response to HIV and AIDS.

Finally, certain settlement environments are particularly affected by violence and gender-based abuse. Although the concentration of perpetrators in such settlements may play a role, certain structural factors make such acts of violence more likely. Design and layout issues may make policing particularly Uncontrolled and un-developed spaces in new and existing settlements (for instance a stretch of veld in the middle of a settlement or between two settlements) are particularly concerning. On a cadastral map or layout plan such land might be marked as “open space” or earmarked for facilities development (for instance schools, churches or commercial developments). The setting aside of land for non-residential uses in new settlement developments is generally prescribed in terms of planning regulations and standards (such as those contained in the Red Book). In many respects, however, the extent to which land parcels set aside for non residential use are developed remains extremely limited.

**Table 5: Incidence of crime (Source: Cities Network 2003)**

Crime	East Rand	JHB	Soweto	Pretoria	Durban North	Durban South	Cape West Metro	Cape East Metro	East London	PE
Crime (Rape)	1 978	1 612	1 779	2 427	1 946	1 919	1 760	2 049	1 212	1 463
Crime (Child abuse)	194	205	248	156	149	117	321	420	73	131
Crime (Indecent assault)	312	316	157	451	378	388	743	917	149	301

Key issue: Uncontrolled spaces, design and layout affect violence levels and gender based abuse, thereby increasing residents’ vulnerability to HIV infection.

#### 3.1.4. Land uses and structural factors

Additional structural factors that have been identified as predictors of HIV prevalence within settlement are related to land uses. These include:

- The number of formal and informal establishments where alcohol is sold (from tavern, to liquor store, bar lounge, etc...) affects the likelihood of persons being under the influence of alcohol and hence engaging in risk behaviour (Pronick, Undated; Weir, S.S. et al, 2002);
- Proximity to mine and hostels as a proxy for single and wage earning populations (Campbell, in Singh 2005) as these populations tend to have more opportunities for purchasing sex or procuring transactional sex;
- Proximity to trading centres and break of bulk points in the goods, services and transport industries, which are places where mobile persons operate in relative anonymity and hence are less restricted by social norms and expectations to engage in multiple-sexual relationships;
- Proximity to primary and secondary roads in settlements where alternative income opportunities for women are limited especially in the periphery (Grosskurth, Colvin in HSRC, 2002).

The land uses and spatial structuring elements, listed above, are predictors of high prevalence because they are a platform for heightened opportunities for sexual networking. This does not mean that they should automatically be seen as undesirable uses. For instance, single sex hostels are indeed responding to a housing need. However, the forced migration context in which they have been developed and implemented has led their residents to establish multiple-partner sexual relations (Brummer, D. 2002).

**Key issue: Specific land uses and structural factors act as high transmission points.**

### **3.2. Impacts of HIV and AIDS on land and spatial development**

The previous sub-section explored the manner in which spatial and structural factors affect the spread and impacts of HIV and AIDS. The following turns to a description and analysis of how, by deepening socio-economic vulnerability, HIV and AIDS affect land settlement and land use patterns. It also highlights how the epidemic amplifies current household and community-based practices for coping with vulnerability (i.e. shacking, informal economic activities, etc...) that have implications for settlement and land use planning and land rights management.

#### **3.2.1. Demand for residential land use at a macro-demographic level**

Research has been undertaken to consider how macro-level demographic impacts will impact on housing demand for households earning less than R 6000 and R 3500 per month (Khayamandi, 2002). Although no such research has been undertaken in respect of land, housing demand can be used as a proxy for land demand. The prevalence of HIV is expected to result in a drop in housing demand in general (Ibid.). The demand would still increase until 2006/2007, but at a slightly lower rate than without HIV and AIDS. Nevertheless, the discrepancy between demand and supply remains so substantial, it suggests that the macro-demographic impact of HIV will not result in a substantial decrease in the existing gap between demand and supply (Ibid.).

**Key issue: HIV does not mean that demand for residential land use will be alleviated.**

#### **3.2.2. Impact of HIV and AIDS on demographic dynamics**

Not only do HIV and AIDS not alleviate the demand for land in cities at a macro-level, but at a micro-level the epidemic also introduces greater diversity and fluidity of the demand. HIV and AIDS mean that household composition and size are increasingly varied and dynamic, as affected households reconfigure themselves. Some settlement development practitioners may assume that households will grow, primarily to accommodate orphans after the death of one or both parents, and remain large households over time. There are, in fact, many different manners in which households reconfigure themselves.

Household reconfiguration may begin before death, when children who are too young to provide care are sent to live with grandparents (Tomlinson et. al, 2005). Migration of children is employed as a coping strategy for the household and the child is sent away to live with and help out a relative as this decreases the burden of the household that no longer has to spend its dwindling resources on one more child (Singh, 2005). As a consequence of a lack of supportive familial ties,



difficulties in living with the adoptive family, or economic difficulties experienced by the adoptive family, orphans may move to another family or, in some cases, move to the streets and engage in various forms of child labour as coping mechanisms (ibid.) Such coping mechanisms could in fact include transactional sex and/or sex work.

Children are not the only mobile population. Reasons for and patterns of PLWHA migration has been characterised as atypical to the migration patterns of non-affected households and individuals (Khayamandi, 2001; Boysen et al, 2001). The main reasons for individual as opposed to household mobility are linked to the desire to leave the family, for privacy and independence and to get care and support, as well as fleeing stigma and discrimination.

Both vulnerable children and adults tend to move to or group around someone with an income. This may be an employee's income or someone receiving a grant. Grandmothers are a popular choice because, unlike other relatives, e.g. siblings they tend not to have other dependants and are often willing to look after their children and grandchildren (C A S E, in Tomlinson, 2005). Mobility may take on different forms. Household members can also decide on location in order to minimise household expenses. The cost of living in smaller towns or peri-urban areas is lower than that of living in the cities. Living in those settlements also offers the possibility of utilising natural resources, such as medicinal plants, water from natural springs and firewood (however meagre or unsanitary they may be), for reducing the cost of living (Singh, 2005).

Cross (2003) has identified new household profiles emerging in a context of HIV and AIDS. These come together as a means to weather the impacts of HIV, AIDS and poverty. The emergence of households of orphaned young adults aged between 18 and 25 with or without children who temporarily come together is particularly emphasised alongside the fact that some young adults return to live with their parents and/or grand parents once a partner has died or once they themselves become ill.

Key issue: By changing household profiles and fuelling mobility HIV and AIDS introduce greater diversity and fluidity in the demand side for land. The current instruments used to support access to land, primarily the housing subsidy, implicitly attempt to tie people to places (for instance through individual based title deed). In a context where mobility and fluidity is a survival strategy that is decided upon by the extended family collectively, this might run against people-driven processes. In turn, this emphasises the urgency of considering alternatives to the current mechanisms which assume an urban household will remain settled in a specific space once having accessed housing benefits.

### 3.2.3. Household economic impact of HIV and AIDS

HIV and AIDS deepen the vulnerability of urban households. The impact of HIV and AIDS on a household's income and expenditure arises because of the duration and chronicity of the illness. Using Malaria as a foil, Tomlinson (2005) identifies that, whereas the period from the onset of malarial illness to death or cure can be several days, period for HIV and AIDS health care needs can be a number of years, thereby prolonging considerably the years during which a family experiences increasing expenditures, asset reduction and declining incomes.

Increase in the extent and changes in the patterns of household expenditure are driven by morbidity and mortality. HIV positive persons increase their expenditure to cover treatments and increased food and medication required (Boysen, et al, 2001). Substantially larger proportion of household resources are allocated to expenses on food and health care, while a smaller share goes to expenditure on education, clothing, personal items, transport and durables.

Death puts a much greater financial burden on a household than does illness. In a worst case scenario, the burden on affected households amounts to 3.4 to 4.3 times average monthly household income and 5.7 to 7.2 times average monthly household expenditure (Boysen, 2001). Funeral costs represent the largest share of the cost of mortality. The average direct cost of mortality to affected households respectively amounted to R 3928 and R5018 per death. The

Health Systems Trust (2001) corroborates the scale of the impact of AIDS deaths on household expenditure patterns and noted that rural households spent 350% of total monthly household income on funerals, compared to 500% in urban areas. What is significant about the nature of this expenditure is the sudden drain it places on household resources which have to be mobilised at once, presumably by borrowing.

Households affected by death spend relatively more of their available resources on food, health care, clothing and rent, and a less on education, household maintenance, transport, personal items and durables compared to households where no death has occurred in the six months before (Boysen, 2001). Multiple deaths mean that changes in expenditure patterns are particularly dramatic, with rent, durables and transport almost falling out of the picture in favour of expenditure on health care, food and other basic necessities (ibid.).

In order to cope with decreasing income and increasing expenditure, households can draw on four types of coping strategies: i.e. to borrow, to utilize savings, to sell assets, or to seek to increase income (Development Works, 2003). The most frequent responses of households to financial crises seem to be borrowing, followed by the utilisation of savings and the sale of assets, with a considerably larger proportion of affected households that had utilized these strategies also being affected by illness and/or death (Boysen, 2003). The magnitude of dissaving is considerable as affected households gradually deplete their savings as the costs of morbidity and mortality increase and at the time of the latest wave of interviews in the longitudinal study had utilised up to four years of current savings, whereas non-affected household only utilized 5 months of current savings (ibid.).

In an urban context, household financial viability is often a pre-condition for maintaining access to land and housing. Strategies to sustain financial viability in the face of a loss of income and increased expenditure find expression in increased informality, which include the transfers and resale of RDP houses, informal rental and sub-letting, backyard shacking, taking up productive and retail economic informality (from taverns, fruit and vegetable vending, cooked foods, etc..) (Development Works, 2003).

Key issue: The household economic impacts of HIV and AIDS increase informality as a survival strategy.



## 4. The burden of extra AIDS mortality on land

The most significant challenges which AIDS mortality brings about in terms of spatial planning and land use management are indirect challenges which arise from its socio-economic implications. Because they are indirect, systemic and gradual these challenges are not seamlessly identified as relevant to spatial planning and land use management by development practitioners. A much more visible challenge of AIDS mortality has been defined as a shortage of grave sites to accommodate mounting numbers of burial. This section seeks to unpack the nature of the problem by fleshing it out (i.e. consider additional elements, such as informal and illegal burials) and investigate how different ways of dealing with additional mortality affect the problem. It begins by specifying the nature of the challenges associated with AIDS mortality. Then, by exploring the bio-medical, environmental, economic and socio-cultural dimensions of different methods of disposing of human remains, it presents their implication for spatial planning and land use.

### 4.1. Contextualising the challenge of extra AIDS mortality

Irrespective of HIV and AIDS the availability of land for burials requires attention, in South Africa and abroad. In fact, most large cities have in the past and are currently facing this challenge. A Google search of the expression "shortage of cemetery space" yields more than 63 700 results. This shortage of land for burials has led cities, around the world, to investigate and implement alternative methods of disposal of human remains (See boxes below).

Article written by Teresa O'Connor (New Zealand Herald) Kiwis may have to change "six feet under" to "12 feet under", as cemeteries around the country gradually run out of room. The shortage of land is particularly acute in Auckland, prompting some cemeteries to consider the possibility of allowing older graves to be lowered to allow more people to be buried on top. Clifton Thomson, general manager of the private Purewa Cemetery, predicted New Zealand will introduce a "dig and deepen" policy in the future where older graves are dug up and lowered. Some Australian cemeteries were already doing this to cope with similar land shortages, he said. Mr Thomson said Purewa, the largest cemetery in Auckland City, had just six years of traditional burial space left on its Meadowbank land. The only other cemetery at Hillsborough has already run out of room for traditional burials because people have booked what little space remains. This means some existing graves are being reopened so family members can be buried with loved ones. Waitakere City Council says its Waikumete Cemetery is also under pressure and it is surveying residents on how to tackle the problem. To read more of this article, go to: [http://www.nzherald.co.nz/index.cfm?c\\_id=1&ObjectID=10331497](http://www.nzherald.co.nz/index.cfm?c_id=1&ObjectID=10331497)

Malaysia Considers Vertical Graves to Save Space  
Dead bodies could be buried vertically in part of Malaysia where cemeteries are running out of space. The radical idea is being considered by the state assembly in central Selangor, where cemeteries are full or approaching capacity, reports The New Straits Times. Housing and local government committee chairman Datuk Dahlan said the assembly was open to all suggestions and would consider the proposal. He also said housing developers would be required to set aside one hectare of burial land for every 5,000 residents in their projects. Burial plots are in high demand in Malaysia because the Muslim majority does not accept cremation.  
Source: [www.ananova.com](http://www.ananova.com) Wednesday 19 November 2003

Standing Room Only at New Cemetery  
It will be standing room only for those being buried at a new Australian cemetery that aims to provide cheap, environmentally friendly burials. Australia's Victoria state government has approved plans for the cemetery at Darlington, 200 km (125 miles) southwest of the Victorian capital Melbourne, where corpses will be buried vertically in body bags - instead of caskets - on grazing land. "When you die, you are returned to the earth with a minimum of fuss and with no paraphernalia that would affect the environment," a spokesman for Palacom, which will establish the cemetery, told Australian Associated Press on Thursday. "You're not burning 90 kg of gas in a crematorium and there's no ongoing maintenance costs." He said burials would cost about A \$1,000 (US\$781), with bodies held in a morgue in Melbourne and transported to the cemetery in batches of up to 15 in a bid to reduce costs. Animals would be allowed to graze on the land again once it was stable.  
Source: [news.yahoo.com](http://news.yahoo.com)

Key issue: Shortages of land for cemetery space are a challenge affecting most cities in the developed and the developing world. This has led to the exploration of alternative methods of disposal of human remains.

Secondly, it is inaccurate to state that HIV increases the demand for cemetery space. Strictly speaking, it is the rate of demand, rather than the demand itself that is increasing. HIV and AIDS

mean that current mortality include persons earlier than would have otherwise been the case. These deaths would occur eventually irrespective of HIV and AIDS and would accordingly result in demand for cemetery space (or alternative methods of disposal of human remains). In absolute terms, HIV reduces the demand, because it reduces fertility levels (Dorrington, et al., 2005).

Furthermore, the spatial location of where this demand is expressed would not only be in the cities. The phenomenon of people “returning home to die” persists. In the context of South Africa, where circular migration is prevalent, where links to rural homes are maintained by households who make permanent moves, and where the tradition of being buried in one’s ancestral home is strong, this phenomenon is likely to be rife (Singh, 2005). This practice, although not researched at scale, could attenuate the expression of demand in cities.

Nevertheless, HIV and AIDS are increasing the rate of mortality, to the extent that in 2005, AIDS is causing twice as many deaths that would otherwise be the case. By 2010, it is estimated that AIDS deaths will account for an extra 1.6 percentage points to the crude mortality rate (Dorrington et al, 2005). It is this premature mortality which poses a particular difficult challenge to municipalities in general and the cities in particular.

**Table 6: Impact of HIV and AIDS on mortality (Source: Dorrington et al, 2004)**

	2000	2005	2010	2015	2020	2025
Non-AIDS deaths	387,667	404,749	406,095	404,846	410,653	419,763
AIDS deaths	139,009	510,079	779,098	695,041	597,070	563,669
Total deaths	526,676	914,828	1,185,193	1,099,887	1,007,723	983,433
Aids deaths as a prop of total deaths	36	126	192	172	145	134
Crude extra mortality rate	0.3%	1.1%	1.6%	1.5%	1.3%	1.2%

Key issue: Extra AIDS death currently account for an additional 1.1 percentage points to the crude mortality rate. This will increase to 1.6 extra percentage points by 2010.

Thirdly, irrespective of HIV and AIDS, shortages of burial sites would be faced in most of the cities, whether in the urban core or in the other parts of the municipal's area of jurisdiction. In the past, planning for cemeteries was a regional planning function often undertaken by planning administrations on behalf of local authorities. With the creation of democratic wall-to-wall municipalities, spatial and regional planning have been sidelined in favour of Integrated Development Planning and the institutions responsible for undertaking regional planning such as the Transvaal Planning Administration have been dismantled. The newly established municipalities have been tasked with the responsibility for planning for cemeteries. In the pre-1994 period, the legal framework providing for the planning, implementation and management of cemeteries were very much aligned to the fragmented, inequitable and spatially distorted rationale of apartheid spatial planning and development. In many respects, this meant that most cemeteries located within the urban core of the cities were built to accommodate a stable and contained projected demand, to reflect the implementation of legislation aimed at containing and reversing urbanisation. Since the late 1980s, rapid urbanisation has, however, been a characteristic of most small and big cities. In the 9 largest cities, population growth has averaged 2,80% per year between 1996 and 2001, thus clearly outstripping projected demand.

Key issue: In the long-term, irrespective of HIV and AIDS, most cities would be confronted by shortages of cemetery space.

#### 4.2. Quantifying and specifying the challenge

Table 7, below, provides an overview of the number of cemeteries in the area of jurisdiction of the cities, as reported by officials interviewed in the course of this study or sourced from available secondary information. What is clear from this table is that the number, thus presumably average size and spatial spread, of cemeteries varies greatly across the cities. The table also highlights which cities have reported shortages of sites. Of note, in this respect, is the fact that only four (out

of eight available city interviewees) reported shortages. However, most acknowledged that the expected life-span of existing cemeteries is rapidly decreasing.

**Table 7: Shortage of cemetery space in the cities**

	# of cemeteries	Shortage of sites reported
Buffalo City	119 cemeteries and 2 cremators Approximately 90 cemeteries are informal, while 29 are formal	Yes, but depends on sites in the municipal area of jurisdiction.
Cape Town	18 formal cemeteries	Yes, Guguletu, Goedeheop and Gordon's Bay (in the Helderberg) and Mfuleni. Khayelitsha will also start experiencing problems within 12 months.
Ekhuruleni	63 formal cemeteries (29 are currently active)	Unclear
Ethekwini	56 (in central Durban only two have fresh grave sites), 1 planned and 1 new crematorium planned	Yes, only two sites have fresh graves, major townships have very high pressure
Johannesburg	35 in total , 6 very active and the remainder are only used for second burials	No, estimating that the lifespan of existing cemeteries is 40 years
Mangaung	48 cemeteries of various size (some no longer operational)	No, enough capacity and land available in municipal area of jurisdiction
Msunduzi	4 formal cemeteries	Yes, limited lifespan of existing cemeteries is of concern
Nelson Mandela	14 formal cemeteries	No, expected lifespan of current cemeteries is 32 years
Tshwane	41 formal cemeteries	No, but decrease in life span on cemeteries from 70 years to 35 years

To further specify the challenge being faced by municipalities, interviewees were also probed about the trends related to mortality and the management of cemeteries and crematoria in the cities. The ability of municipalities, including the cities, to monitor mortality trends for the purpose of informing cemetery and crematoria planning is limited. Information pertaining to trends prior to the latest municipal re-demarcation in 2001 is fragmented and seldom representative of the whole of the present-day municipal areas of jurisdiction. Currently, monitoring activities are also challenged given the increasing involvement of private sector operators in the disposal of human remains, whether in the form of privately established and managed cemeteries and crematoria or the delegated management of public facilities, as well as the “regionalisation” of city administration and delivery services. Finally, although all deaths are supposed to be registered at home affairs, it is unclear that this is systematically undertaken.

**Table 8: Monitoring mortality trends in the cities**

	Monitoring mortality trends
Buffalo City	The business unit is developing an electronic cemetery register
Cape Town	Monitoring system is in place
Ekhuruleni	Unclear
Ethekwini	Information not systematically documented at the scale of the city
Johannesburg	Electronic system which develops monthly reports enabling statistics to be used effectively as a management tool Private cemeteries also report on their operations
Mangaung	Recording system registers the number of deaths
Msunduzi	Unclear
Nelson Mandela	Monitoring trends in cemeteries only. Cremation has been privatised so the municipality is not able to monitor cremations
Tshwane	Monthly statements are compiled that provide information on the number of deaths

Irrespective of this situation most interviewees noted that the key shift in mortality pertains to the increase in the proportion of persons in the younger age cohorts (from 25 to 40) who are dying,

relative to historic patterns of mortality which had historically been concentrated among older age cohorts. When asked about what factors interviewees thought had given rise to this situation, most reported HIV and AIDS as well as urbanisation. A couple of interviewees noted, however, that given the sensitivity of HIV and AIDS in their municipal institution, they were not in a position to comment on the potential factors giving rise to the shift in patterns of mortality.

### Monitoring trends in disposal of human remains

Most cities do not systematically monitor trends pertaining to the method of disposal of human remains. Nevertheless, on the basis of the anecdotal observations made by interviewees, the following trends were noted:

- Secondary interments and grave sharing among spouses and family members are increasing. At present they are estimated to amount to approximately 15% of all interments;
- Cremation is becoming more popular among all race groups (although the race of cremated persons is not systematically recorded);
- Both indigent and paupers burials are increasing disproportionately to the overall increase in the number of interments (although this information is not systematically recorded and analysed).

Suggesting that there is some room for changing the demand for services, interviewees ascribed these trends to two factors:

- Economic pressures and increases in the cost of interment; and
- Social marketing undertaken by municipalities to popularise both cremation and grave sharing.

**Table 9: Trends pertaining to the method of disposal of human remains**

	Trends in respect of interment and cremation	Indigent and Pauper burials
Buffalo City	Unclear	Unclear
Cape Town	Increase in cremation	Increasing
Ekhuruleni	Unclear	Unclear
Ethekwini	Cremation increasing across all race groups	Increasing
Johannesburg	Steady increase in burials from 15000 in 1996 to 22000 in September 2005. Cremations have remained constant throughout. Increases in recycling of graves through family grave.	Increased from 500 to 1100 over the last 5 years whilst indigent burials remained reasonably constant, 82 for the previous year.
Mangaung	Cremation increasing across all race groups Increase in double burials (husband + wife)	Increasing
Msunduzi	Unclear	Unclear
Nelson Mandela	Increase in double burials	Unclear
Tshwane	Static	Increasing

Key issue: By insufficiently monitoring trends in respect of mortality and methods of disposal of human remains cities risk missing opportunities for consolidating information and knowledge to inform future planning and implementation.

### Challenges associated with interment

Land is not a renewable resource. Interment is a land-extensive and financial resource intensive method, in context where land availability is scarce and land uses compete with one another. Prioritising municipal investment in water and sanitation services would promote the well being of those who are HIV positive and negative alike. The location of cemetery space is also an important consideration. Compared to cemeteries, other land uses can change seamlessly. Restructuring the city to release well located land for settlement purposes will facilitate access to social and economic services that can assist HIV infected and affected individuals to mitigate the impacts of HIV and AIDS.

Not all land can be used for the burial of human remains. Environmental health concerns are particularly important. Decomposing corpses release a leachate containing a variety of organisms (Council for Geoscience, undated). For an average adult this can be as much as 45 litres. Where disease, such as cholera for example, has been the cause of death, the probability of viruses and bacteria transmission to ground water supplies increases. Buoyancy can expose shallowly buried coffins and corpses, releasing pollutants directly into the water stream. Viruses have the longest residence time (2-3 months) and highest degree of inter particle water borne mobility (Ibid.).

A scientific site evaluation system has been developed by the Council for Geoscience in order to consider the location of cemetery sites, with due regard to environmental health concerns. Various criteria as well as community level discussions, are evaluated and weighted. Manual or GIS based integration follows. Geophysical factors are particularly important in order to avoid underground and surface water pollution as well as erosion, to ensure that graves can be dug easily, that decomposition takes place and that graves do not collapse. The criteria include:

- Soil excavatability and permeability;
- Stability of grave sidewalls and workability of soil;
- Proximity to domestic water supplies and receiving water quality, as well as drainage features and site surface drainage;
- Site topography/slope;
- Nature of basal buffer zone;
- Size and lifespan of the intended cemetery; and
- Social and cultural factors (Ibid.).

Local versus regional or sub-regional considerations, dictated by cultural and socio-economic considerations, community identity and ownership, optimum travelling distance ( $\pm 12\text{km}$ ), and an optimum cemetery size of 20-30 hectares given operational considerations.

**Key issue:** Not all types of land and spatial locations can be used for cemetery space.

#### 4.3. Alternative methods to single grave interment

In response to pressures on available cemetery space, municipalities have sought to decrease the proportion of human remains disposed of through single grave interment. These measures include:

- Intensifying land use by promoting grave recycling and grave sharing;
- Promoting cremation;
- Integrating cemeteries into the open space system;
- Investigating as well as offering alternative methods (in particular mausoleums); and
- Increasing the cost of single grave interment.

**Key issue:** Cities are already considering and experimenting with alternative methods to single grave interment.

**Table 10: Measures taken to minimise the problem**

	Same family grave sharing	Recycling of graves	Inclusion of cemeteries into the open space system
Buffalo City	Unclear	Unclear	Unclear
Cape Town	Unclear	Unclear	Currently under investigation
Ekhuruleni	Encouraged	Unclear	Unclear
Ethekwini	Strongly encouraged	Yes	Cemeteries currently part of open space, maintained to be places for the living and the dead
Johannesburg	Strongly encouraged	Yes	All cemeteries are designed today as a memorial park which contributes to the green environment

Mangaung	Encouraged	No	Cemeteries already classified as open space
Msunduzi	Unclear	Unclear	Unavailable
Nelson Mandela	Available	Yes	Possibility, not currently applied
Tshwane	Available	No	Not possible in terms of the by-laws

Technical alternatives to single grave, horizontal interment exist, they include:

- Alternative interment methods;
- Cremation;
- Mausoleums;
- Promotion; and
- Catacombs.

These are discussed further below.

**Table 11: Alternative methods of disposal of human remains**

Method	Description
Cremation	<p>Cremation involves burning the body at high temperature to reduce it into ashes. Ashes can be interred, disposed of in the wild or kept by the family of the deceased.</p> <p>At present approximately 6% of deaths result in cremation in South Africa. An increasing number of private crematoria suggest that this method is gaining popularity.</p> <p>Although several cultures and religions have, historically, treated cremation as unacceptable, this perspective is changing over time, as a result of the high costs of interment. The cremation of the dead constitutes a major component of white and Indian mortuary practices. Until the 1930s however, the practice was virtually unknown among white South Africans, whereas by the 1940s it had become firmly rooted among a small but growing number as a result of effective social marketing (Garrey, 2003). Similarly, most western religions initially did not accommodate cremation but over time this has changed</p>
Alternative interment methods: Grave recycling	<p>The recycling of graves involves the recurring use of the same gravesite for more than one body. In several countries around the world this occurs through grave-sharing among spouses and family members.</p> <p>When grave recycling involves the reuse of a grave site for unrelated persons, this can include the exhuming of human remains for subsequent re-interment of the original occupant at an alternative (less land-extensive) site. Depending on municipal bylaws, exhuming human remains often involves a bureaucratic approval process.</p> <p>Soil quality and geological conditions affect the frequency of reuse of grave sites. This can range from one to ten years between interments. Some municipalities also place limits on the number of times a gravesite can be recycled.</p> <p>Some cities are prioritising sections of cemeteries previously used for paupers burials for recycling purposes as opportunity cemeteries.</p> <p>Only about 15% of all interments are secondary interments in South Africa.</p>
Alternative interment methods: Vertical and crouching interment	<p>Vertical and crouching interments are not fundamentally different from other forms of interment, although they do result in a measure of space saving over horizontal single grave interment.</p> <p>It involves the excavation of a deep hole where the body is placed vertically either in a casket or body bag. This method is currently not practiced in South Africa but is under investigation elsewhere.</p> <p>Crouching interment is a method that is indigenous to some Southern African ethnic groups which appears to have fallen out of favour. It can only be practiced if a casket is not used.</p>
Alternative interment methods: Seeking opportunity cemeteries	<p>This method is about maximising available land to create new interment opportunities. This includes making use of land previously used for landscaping and draining land to overcome high water tables. In some countries opportunity cemeteries are being developed in church yards.</p>
Alternative interment methods: Eco-interment	<p>Eco-interments can include single grave interment. This practice aims to speed up the decomposition process by avoiding technical treatment of human remains (such as embalming), the use of caskets and the concrete lining of gravesites. Land used through eco-interment can then be used for alternative purposes, such as grazing, vegetable planting and open-space landscaping. Although eco-interment</p>

	cannot strictly be seen as an alternative “technology” it is gaining popularity in several countries around the world in both urban and peri-urban settings.
Mausoleums	Mausoleums have long-been in existence. Mausoleums are best described as vertical, above-ground, housing for the dead. Alternative technologies have been developed, which make more or less intensive use of land (depending on the height of the mausoleum). Some technologies are more affordable to the user as they do not require caskets. The standard mausoleum offers interment facilities for 1008 bodies on the space normally reserved for 80 standard graves.
Promation	Promation is a new technology, which is yet to be implemented at scale, It involves the dry-freezing and shattering of the body into a fine dust. The remains can be interred.  This technology is being marketed as both environmentally and culturally sensitive, on the basis that unlike other forms of disposal it does not create harmful by-products and that it recalls the Christian adage of “from dust to dust”.
Catacombs	Catacombs have long been in existence. They are a form of underground cemetery where galleries are used to store exhumed bones or to act as a crypt for the interment of recently deceased persons. In South Africa, the use of disused mine-shafts has been envisaged as a possibility for establishing catacombs.

The different methods described above have different implications in terms of their use of land. To begin generating an understanding of the implications of HIV and AIDS in terms of land use a simple modelling exercise was undertaken. This exercise sought to estimate additional land required to accommodate extra mortality arising from AIDS according to different methods. This exercise is purely illustrative and would need to be further refined. It is based on the following assumptions in terms of square meter of land required according to different methods (Table 12) and extra AIDS mortality (Table 13).

**Table 12: Demand for land according to different methods of disposal of human remains**

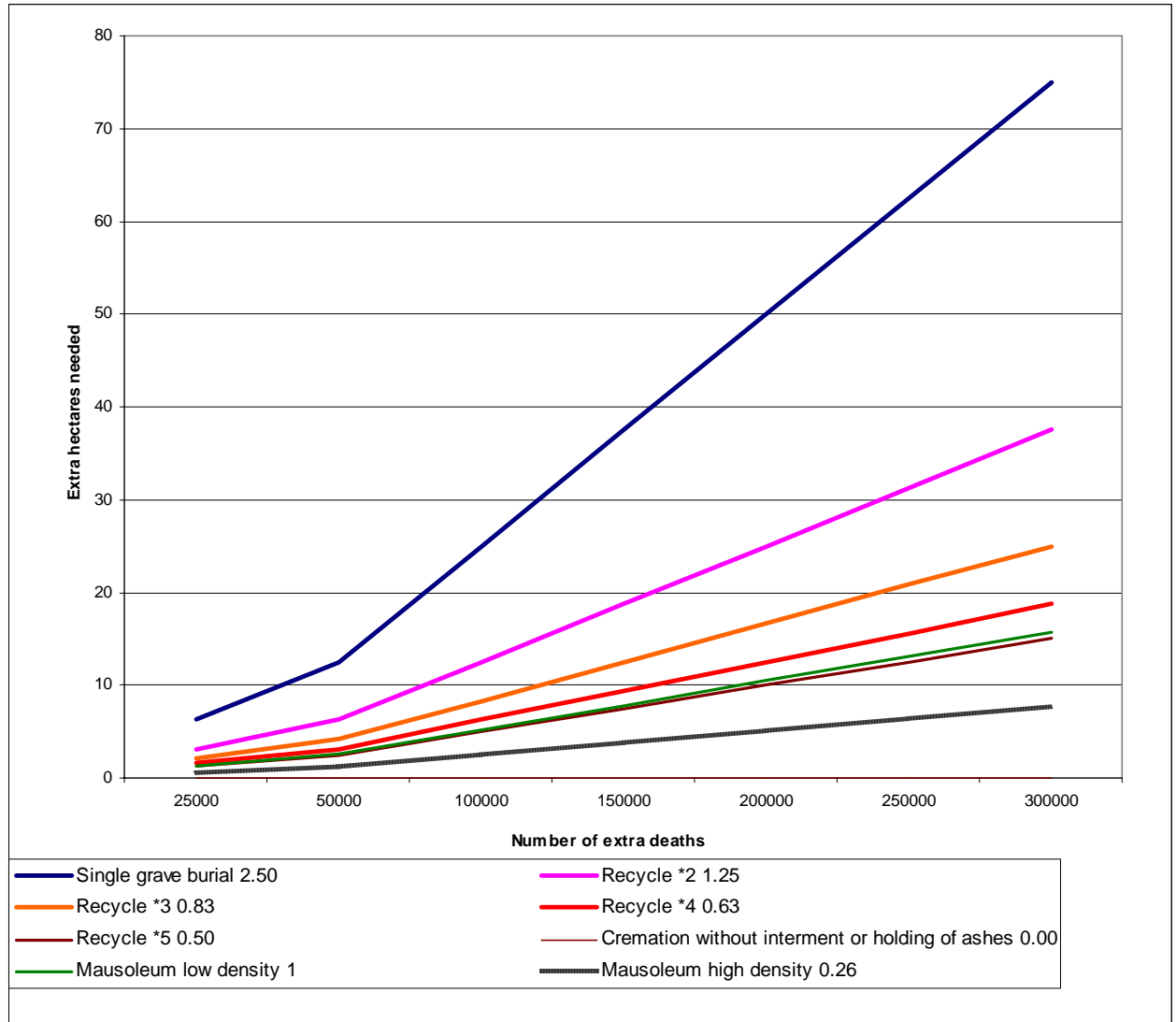
	Single grave burial	Recycle *2	Recycle *3	Recycle *4	Recycle *5	Cremation or promation without interment or holding of ashes	Mausoleum low density	Mausoleum high density
Square meter per person required	2.5	1.25	0.833333	0.625	0.5	0	0.252	0.263

**Table 13: Extra AIDS deaths nationally and in the nine cities (Adapted from Dorrington et al, 2004)**

	National	Cities
Percentage of national population *	100%	36%
Additional deaths due to AIDS 2000 in	139,009	50,043
Additional deaths due to AIDS 2005	510,079	183628
Additional deaths due to AIDS 2010	779,098	280475

Figure 3 below provides a graphic representation of how different methods of disposal of human remains would affect additional land demands to accommodate extra AIDS deaths.

**Figure 3: Additional land required in the cities according to different methods of disposal of human remains**



Although this Figure illustrates convincingly the comparative advantage of certain methods over others in terms of land use alone, shifting from one method to the next will not occur overnight. A range of factors, ranging from the policy and legal framework to social, cultural and religious prescripts will have substantial bearing on the implementability of various methods (both are further explored in subsequent subsections). Accordingly, six scenarios were developed as follows:

- Scenario 1 estimates additional land required if current practices are maintained;
- Scenario 2 estimates additional land required if practices are changed to promote greater levels of 2<sup>nd</sup> and 3<sup>rd</sup> recycling of graves;
- Scenario 3 estimates additional land required if practices are changed to promote greater levels of cremation;
- Scenario 4 estimates additional land required if practices are changed to promote both greater levels of 2<sup>nd</sup> and 3<sup>rd</sup> recycling of graves and cremation;
- Scenario 5 estimates additional land required if practices are changed through the introduction of mausoleums;



Scenario 6 estimates additional land required if practices are changed to promote greater levels of 2<sup>nd</sup> and 3<sup>rd</sup> recycling of graves, cremations and mausoleums.

The table below presents the detailed assumptions for each scenario in terms of the proportion of deaths distributed according to the respective methods.

**Table 14: Detailed assumptions for the apportionment of extra AIDS death to different methods per scenario**

Scenario	Apportionment of extra AIDS deaths to different methods					
	Single grave	Recycle *2	Recycle *3	Cremation	Low density mausoleums	High density mausoleums
<b>Scenario 1: Current practices</b>	79.9%	14.1%	0.0%	6.0%	-	-
<b>Scenario 2: Change to pursue 2nd and 3rd recycling and sharing</b>	55.0%	24.0%	15.0%	6.0%	-	-
<b>Scenario 3: pursue greater levels of cremation</b>	65.0%	10.0%	0.0%	25.0%	-	-
<b>Scenario 4: pursue combined approach of diversification</b>	45.0%	19.0%	11.0%	25.0%	-	-
<b>Scenario 5: Introduce mausoleums</b>	65%	14%	0	6%	8%	8%
<b>Scenario 6: tri-combination approach including mausoleums</b>	38.0%	14.00%	7.00%	25.00%	8.00%	8.00%

The table below presents the details of the modelling exercise, for 2005 and 2010, in terms of additional land in meters and hectares in the cities. It highlights that an approach which combines increased levels of grave recycling, cremation and the introduction of mausoleums enables economies of close to half the amount of additional land required to accommodate extra AIDS death compared to current practices. However, it also identifies that encouraging greater levels of second and third recycling (scenario 2) or greater levels of cremation (scenario 1) can achieve savings in land that exceed those achieved by pursuing an approach where the introduction of mausoleums is the only alternative sought.

**Key issue: Diversifying the types of funerary services is an imperative. Economies of land can be achieved through encouraging cremation, grave sharing and using high density mausoleums.**

**Table 15: Additional land required to accommodate extra AIDS deaths per scenario**

Scenario		Total additional land in meters	Total additional hectares in cities
<b>Scenario 1: Current practices</b>	Additional land required 2005	399162.3	<b>40</b>
	Additional land required 2010	609683.1	<b>61</b>
<b>Scenario 2: Change to pursue 2<sup>nd</sup> and 3rd recycling and sharing</b>	Additional land required 2005	330531.2	<b>33</b>
	Additional land required 2010	504855.5	<b>50</b>
<b>Scenario 3: pursue greater levels of cremation</b>	Additional land required 2005	321349.8	<b>32</b>
	Additional land required 2010	490831.7	<b>49</b>
<b>Scenario 4: pursue combined approach of diversification</b>	Additional land required 2005	267026.4	<b>27</b>
	Additional land required 2010	407857.8	<b>41</b>
<b>Scenario 5: Introduce mausoleums</b>	Additional land required 2005	337740.0	<b>34</b>

	<b>Additional land required 2010</b>	515866.3	<b>52</b>
<b>Scenario 6: tri-combination approach including mausoleums</b>	Additional land required 2005	224502.5	<b>22</b>
	Additional land required 2005	342906.6	<b>34</b>

This exercise and the assumptions on which it is based have been developed to illustrate the need to compare and contrast land uses according to different methods and would need to be substantially refined to align with the particular local context in each municipality. This adjustment would also need to consider the legal as well as social, cultural and religious parameters that would affect its applicability in each of the cities.

**Key issue: Cities need to systematically compare and contrast the implications of different methods of disposal of human remains on the basis of their respective local context.**

### **Legal and policy parameters**

The legal framework pertaining to the disposal of human remains is governed by the Death Registration Act and municipal bylaws. Although the latter are fragmented and different across and within municipalities, they primarily provide for burials in cemeteries or cremation only. Secondly, most also specify adherence to an onerous approval process for exhumation of human remains. Furthermore, in several cities municipal bylaws also discourage the integration of cemeteries into the open space system. This suggests that any effort to introduce a new method, encourage recycling or intensify use may require adjustments to this legal framework. A process is currently underway to develop a draft nation-wide unified bylaw for cemeteries and crematoria.

**Key issue: The legal framework affects the feasibility of different land use optimisation strategies.**

### **Social, cultural and religious parameters**

Ultimately, developing and availing alternative methods of disposal of human remains cannot disregard social, cultural and religious concerns. Around the world, the meaning of death, as a social construct, is intrinsically related to the meaning of life. It is therefore akin to the sacred. In several religions and cultures, oral and written prescripts codify funerary rites and establish what are acceptable and unacceptable practices. Variegated and complex, cultural and religious perspectives on death and funerary rites are often fairly prescriptive. On the surface these prescripts, especially where they only accommodate single interment, might be argued to be at odds with a context of land scarcity. However, ignoring or dismissing these prescripts is clearly not an appropriate response for municipalities in a context of developmental local governance and Batho Pele.

**Key issue: Ignoring or dismissing social, cultural and religion prescripts in respect of funerary rites is not an appropriate response for municipalities.**

Table 16, overleaf, provides an overview of cultural and religious perspectives on death and funerary rites, summarising the findings of interviews conducted with religious and other leaders as well as academics.

**Table 16: Cultural and religious outlooks on death and alternative methods of disposal of human remains**

Ethnic group/ religion	Meaning of death	Methods of disposal of body remains	Cultural and social taboos in different cultures associated with this process	Preconditions of taking the remains out/ exhuming	Views on cremation	Grave sharing with family members
Sotho Ntoane Mophiring	Transformation of an individual from physical state to spiritual form. D "sleeping", "shutting the eyes", "being called away" and "departing"	Seeds of indigenous plants accompany the remains of the dead and to show the bereaved that the deceased will plant the seeds wherever they go.	Not washing hands after visiting the cemeteries is regarded as a taboo by the Sotho culture.	Unclear.	Cremation is unacceptable. Burial is the only method adopted.	This method is unacceptable.
Xhosa Prof. Peter Mtuzze	Terminating an old life to join the ancestral lineage in the afterlife.	Historically, the remains of the dead were wrapped by cattle's skin slaughtered on the funeral day.	Night vigil if person dies in accident. Women and children forbidden from viewing the remains and going to the grave.	It is suitable for those who died away from home to be exhumed and re-buried at home.	Generally seen as unacceptable although some people practice it.	Circumstances in the urban areas force people to bury in the same grave.
Islam Zahraa Mc Donald	Proceeding to another phase of existence. The grave is seen as a place where the soul and the body rest. The grave is also important for religious holidays where people read specific chapters from the Koran.	Same day burials. Men perform funerary rites and conduct funerals. Muslims do not use coffins only cloths to wrap the body before the burial.	Women do not attend funerals.	Unacceptable.	Muslims argue that the Prophet has given certain method that has to be followed. Cremation is a taboo.	Possible.
Zulu Thandanani Masikane	Death is seen as the beginning of a new life. Graves are sacred. The grave should be identified and accessible whenever needed. It is important for the descendents of the dead to trace their heritage by identifying the graves of their forefathers.	Depends on the cause of death. If death is violent or accidental, a goat is slaughtered for cleansing the wounds. Before lowering a coffin, an Ucantsi (traditional mat) is laid first to show that the remains are laid to rest.	It is a taboo for people who died in an accident to be brought in the house because they might bring misfortune home.	Acceptable provided the proper rituals are followed by the family.	Unacceptable.	Unacceptable.
Pedi Dr. Mogomme Masoga	When a person dies, s/he has to be buried at 'home'. Death is seen as a process of moving to the next phase. Descendants maintain a strong relationship with the deceased.	People believe in interacting with the dead by visiting the graves.	It is unacceptable for the living not to maintain relationship with the departed family members.	Acceptable provided certain persons preside over the ritual should be carried out.	Slaughtering cattle and or a sheep/ goat. The physical body is important for mourners to see because it is regarded as evidence that death has occurred. Death can only be mentioned in the	Considered to be insensitive to each person who has died.

Ethnic group/ religion	Meaning of death	Methods of disposal of body remains	Cultural and social taboos in different cultures associated with this process	Preconditions of taking the remains out/ exhuming	Views on cremation	Grave sharing with family members
					presence of the remains of the dead.	
Traditional Healers Org. (THO) Dr Maseko	Traditionally a person never dies but moves to a new life. As a living descendant, "you speak to him, he hears, he mediates/ a messenger to God".	If the deceased died of an accident, the body would be kept outside the premises to avoid bringing more death in the family. If the accident happened in the house, a goat should be slaughtered to push the misfortune away.	After tears party, bands, singing and eating in the funeral are unacceptable.	Acceptable but needs to be managed sensitively.	Prevents interaction with the dead and visiting of graves.	Burying in the same grave was done for chiefs. This was unacceptable for ordinary people.
Hindu Raymond	Death is interpreted as departure of an old body to form a new body in the spirit (often referred to as soul) form. Strong belief in the after death life. It is maintained that the body covers the soul, just as the clothes cover the body.	Rituals are performed by relatives and friends at home and at the chapel before cremation or interment including a mass prayer.	Unclear.	Unclear.	Cremation is the main method of disposing the remains of the dead. Cremation should be followed because the creation is seen as happening through fire. Ashes are spread into the ocean or river.	Unclear.
Judaism Daron Wolderg	Orthodox Jews believe in the afterlife. They believe that when people die, their spirit continues in the afterlife.	The body is washed and has to be interred timeously.	Unclear.	Unclear.	Orthodox Jews perceive cremation as a taboo although Reform Jews do practice cremation.	Unacceptable.
Christian	People who die believing in God are promised an eternal life after death.	Christian funerals generally involve prayers and mass.	Unclear.	Unclear.	Most Christian denominations widely accept cremation.	Acceptable.
Bahai	Sees the spirit as not having any connection with the body after death.	The body should be wrapped in a shroud of silk or cotton and a ring worn.	The body should not be buried further than a day's travel from the place of death.	Unclear.	Unacceptable.	Acceptable for married people.

There is currently no city-scale information pertaining to religious affiliation in the cities. These variations do need to be borne in mind as they would affect the potential acceptability of different methods depending on the prevailing cultural and religious context. Drawing from the 2001 Census, 80% of the SA population classified themselves as Christian and 15% with no beliefs. The other groupings are: Hindu (1.2%), Muslim (1.5%), Undetermined (1.4%), Other (0.6%). Within the broad Christians grouping, 1.5% classified themselves as a member of the African Independent. Key variations between provinces show Hinduism in KZN (4.8%) and a concentration of people observing Islam in the Western Cape (6.5%).

Although respecting religious and cultural prescripts is imperative, it is also important to note that social, cultural and religious norms can and do change over time. For instance, the 1917 Code of Canon Law, regulating several branches of Christianity, strictly forbade cremation except when grave public necessity required rapid disposal of human remains, as in times of plague or natural disaster. The Church went so far as to deny Christian burial rites to anyone choosing cremation. In time, this position was modified through the Revised Code of Canon Law. Similarly, although Orthodox Judaism prescribes that interment is the only acceptable method, Reform Judaism accommodates cremation.

**Key issue: Social, cultural and religious prescripts in respect of the acceptability of various methods of disposal of human remains are not immutable.**

**Incentives to promote alternative methods**

In the South African context, the social marketing efforts of municipalities in respect of both double interment and cremation appear to be making inroads. These efforts include:

- Holding open days in crematoria;
- Engaging with ward councillors, traditional leaders and religious about alternative methods;
- Setting up city-wide forums as platforms for discussing cemetery sites shortages and the desirability and acceptability of alternative methods; and
- Direct engagement with users to encourage the sharing of graves between spouses and family members.

These interventions are a long-term investment to change attitudes and behaviours. Targeting the recipients of social marketing in respect of alternative methods is particularly important. A study undertaken in Ekurhuleni showed that whereas young people across cultural and ethnic grounds found cremation to be acceptable, decision-making in respect of funerary rights was the preserve of older generations (Ekurhuleni Metropolitan Municipality, in Field M, 2004).

**Key issue: Social marketing to encourage alternative methods are a long-term investment.**

Accompanying the social marketing approach is the use of differential pricing to discourage single grave interment. Pricing for interments and cremations vary extensively between and within the cities, not only to reflect different land costs and services level but also to encourage cremation and grave recycling.

**Table 17: Pricing for interments and cremations**

	Cost per interment	Cost per cremation
Buffalo City	Unclear	Unclear
Cape Town	Category B cemeteries : Private R 450; Public R 420 per grave] Category A cemeteries: Private R 1250; Public R 515 per grave	Increasing
Ekurhuleni	Unclear	Unclear
Ethekwini	R 1500 (but for 10 year period only)	R 400
Johannesburg	R 1280 reducing to R 580 depending upon cemetery of choice	Increased from R 500 to R 1100 over the last 5 years
Mangaung	Flexible depending on site and affordability	Increasing
Msunduzi	Family Grave R 75 to R 330 Single Grave from R 55 to R 224 Planning to roll out higher tariff once cheaper cemetery closes down	Person over 12 years of age R 555 Child 12 years of age and under R 210

Nelson Mandela	Unclear	Unclear
Tshwane	Flexible depending on quality from R 0 to R 1075	Increasing

In practice, the setting of cemeteries tariffs appears to consider primarily once-off costs and maintenance cost. In many respects, it is unclear whether pricing effectively reflects the range of costs associated with providing and maintaining services. In respect of cemeteries, these might include:

- Land purchase costs;
- Environmental impact assessment and cemetery establishment costs;
- Capital costs of equipping and landscaping the cemetery;
- Capital costs of each interment;
- Maintenance costs of cleaning and maintenance of individual graves and public areas;
- Municipal rates; and
- The opportunity cost of not being able to change the use of land seamlessly and/or to dispose and redevelop the land over an extended period of time (perhaps even in perpetuity).

**Key issue:** The comprehensiveness of factors taken into account to determine tariffs for interments and cremation appears limited and not transparent.

Manipulating pricing as a strategy to promote alternatives to single grave interment is an effective strategy, although economically inequitable. Further, this strategy might generate unforeseen challenges in respect of indigence burial policies and budgets as well as informal and illegal burials.

Most cities have indigence policies in respect of interment costs. Whereas the socio-economic impact of HIV and AIDS is likely to result in increased demand for indigent interments, it is unclear that the budgetary implications of increasing numbers of indigent burials have been taken into account over the long-term.

Informal and illegal burials are emerging as a result of the high user costs of interment (including but not limited to burial fees) and distance to existing cemeteries (especially around newly established RDP settlements). Although cemeteries and parks officials interviewed during this study were unevenly aware of this phenomenon, environmental health officials reported informal and illegal burials as increasing. These practices pose high environmental health challenges and take the following forms:

- Informal burials in vacant tracts of land next to existing or new RDP settlements on the urban periphery;
- Informal cemeteries set in rural settlements falling under the jurisdiction of traditional leaders; and
- Illegal burials in formal cemeteries, outside opening hours.

**Table 18: Informal and illegal burials in the cities**

	Informal/illegal practices noted	Location
Buffalo City	Yes extensively	Rural areas. Areas under traditional authorities and farms
Cape Town	Unclear	Unclear
Ekhuruleni	Yes	Informal settlement
Ethekwini	Yes	Informal settlements in the periphery, new settlements- low cost housing especially in areas of traditional lead
Johannesburg	Yes	Informal settlement and proximity to new settlements Decreasing with effective monitoring by Environmental health
Mangaung	Yes (informal and illegal burials)	Rural areas (Especially in areas where there are traditional leaders)
Msunduzi	Yes	Areas under traditional authority Also disposal of ashes in streams and rivers
Nelson Mandela	Yes	Peri-urban areas
Tshwane	Yes	Illegal burials controlling burials with the help of Security Guards

Key issue: Indiscriminate manipulation of interment tariffs to encourage alternative methods can have negative unforeseen circumstances, such as increases in indigent burials and informal burials.

## 5. HIV, AIDS and institutional capacity of local governance

This section draws on research undertaken by Development Works (2001) on the impact of HIV and AIDS on the construction sector and in turn on the implementation of the Housing Policy, between 2001 and 2002. The scope of this research was much broader than urban land. Nevertheless, it generated important findings in respect of the housing supply systems which typically involve the delivery of land as well as the specific delivery agents and occupational categories involved in the planning, delivery and management of land.

### 5.1. Demographic impacts of HIV and AIDS on occupational categories active in the land administration and delivery sector

A range of delivery agents operate the supply systems through which land is made available, in particular where land is made available as part of a subsidised housing delivery systems. These include institutional role-players who are delivery agents active within the national, provincial and municipal spheres of government as well as technical and professional role-players in the surveying, engineering, planning and conveyancing professions in the public, private and not for profit sectors.

Public sector institutional role-players are involved in the screening and approval of project proposals and subsidy applications as well as the processing of subsidy draw downs (claims). The land assembly and planning component requires the involvement of municipal authorities, provincial authorities or other land development authorities. It includes the property registration system governed nationally by the Deeds Office and the Surveyor General's Office. It is, however, in the private and NGO environment that most of the site specific professional activities are performed (such as surveying land portions, developing layouts, engineering designs, compiling title deed information, and project management). The roles of private and non-profit delivery agents are often distinct from those performed by public sector delivery agents; however, they are ultimately complementary. If one set of role-players is unable to perform their roles, the other role-players will also be hindered. Hence, if one set of delivery agents is vulnerable to the demographic and economic impacts of HIV and AIDS, this means that other delivery agents will likewise be vulnerable.

Key issue: The supply system for land planning, delivery and management involves a set of inter-dependent delivery agents.

Development Works (2001) found that institutional role-players in the public and non-profit environments are generally operating off a shallow base of organisational capacity, in terms of the level of skill held, the number of staff and the paucity of administrative and decision making systems. The private sector is generally able to attract and retain skilled personnel, in respect of land related delivery agents. However, these are not only increasingly shying away from low-income land and housing delivery processes in favour of high income residential, commercial and industrial developments, but also favouring more upwardly mobile sectors such as the financial and information technology sectors. Overall, this means that the availability of required technical and professional capacity to the land and housing delivery systems is becoming narrower, irrespective of the impacts of HIV and AIDS.

Key issue: Irrespective of HIV and AIDS, supply-side delivery agents are particularly vulnerable to disruption and institutional weakness.

The occupational categories representing this broad type of delivery agents include professional support as well as on site professionals and technicians categories. Projections were undertaken in respect of both occupational categories on the basis of the 1996 Census data to estimate current and future prevalence, morbidity and mortality for the range of occupational categories found in the delivery of land and housing. This includes the occupational categories representing the delivery agents described above. The research found that HIV infection levels among professionals and technicians on site are set to rise from below 9% in 2002 to 12% in 2006 and just under 15% in 2010. While the current infection levels are already fairly high for this occupational category, the visibility of the impact



of the epidemic is much lower. Indeed, the AIDS epidemic lags behind its HIV predecessor, so that at present both the number of people ill with AIDS and the number of AIDS deaths are less than 1 per hundred persons. These figures are however set to increase to over 1 per fifty and 1,5 per cent respectively in 2010. A further factor masking levels of AIDS is likely to be greater access to antiretroviral drugs in this group, which tends to have higher access to medical aid cover. This suggests that a demographic impact on this group of delivery agents—even limited to the projections could leave a vacuum. Among the professional support occupational category HIV infection levels in this occupational category are set to rise from 9% in 2002 (1 in 11) to 12% in 2006 (1 in 8) and just under 14% in 2010 (1 in +- 7). While the current infection levels are already fairly high, much of the demographic impacts in this occupational category are not significantly visible as the projections estimate that currently less than 1 per cent of this occupational category is either ill with AIDS or will die in the year from AIDS. This is set to rise to increase to over 2 per cent and 1,5% respectively in 2010, according to the projections. Within this occupational category the Development Works research team noted not only existing high staff turnover within given organisations, especially in the NGO and public sectors, but also large provincial disparities in the extent to which specific provinces currently have such resources within their geographic jurisdictions. The Development Works research concludes that in respect of these types of delivery agents, from a demographic perspective only, the impact of HIV and AIDS is likely to aggravate a situation where skills and capacities are already weak.

Key issue: The demographic impact of HIV and AIDS is likely to aggravate a situation where skills and capacities are already limited.

## 6. Recommendations

Having explored comprehensively the range of relationships between HIV, AIDS, spatial planning, land use planning and management, and finally land development, the study team turned to developing recommendations. Whereas in the previous section the various facets of these relationships were discussed through a distinct set of lenses, attention was given to formulating integrated recommendations on the basis of a consolidated problem statement, that serves as the basis for specifying approaches for spatial planning and land use management responses to HIV and AIDS.

### 6.1. Consolidated problem statement and approaches

HIV and AIDS are a symptom of rapid urbanisation. Overcrowding fuels the spread of HIV and expose positive individuals to opportunistic infections. Inadequate access to services compromises the immune system of the HIV positive and negative alike. Informal settlements and housing conditions are places where HIV and AIDS are concentrated. As “unplanned” and people-driven responses to urbanisation, they are places which the planning system only engages with on a reactive basis. In many respect informal settlements point to the failure of the planning system and practices to proactively respond to the processes of urbanisation and migration, and resulting settlement, housing and economic informality. HIV does not mean that the demand for residential land use will be alleviated. By changing household profiles and fuelling mobility HIV and AIDS introduce greater diversity and fluidity in the demand side of urban land. By increasing opportunities for sexual networking and limiting access to prevention, care and treatment, fragmented cities and the apartheid settlement legacy are obstacles in the response to HIV and AIDS. In turn, this highlights the urgency for spatial planning to take a proactive stance in respect of the identification, release and development of land for settlement. It also emphasises the importance of achieving city compaction and spatially integrated planning and development.

Approach: Spatial planning must effectively and proactively support the identification, release and development of land for settlement, and enable city compaction and spatially integrated planning and development.

Settlement environments with newly-formed “communities”, such as migration reception areas and RDP settlements have weak social networks. This heightens residents’ vulnerability to HIV infection. Settlement development processes that develop communities contribute to the response to HIV and AIDS. This means that the processes and outcomes of settlement planning and land development need to encourage community building and development. Further, HIV increase and diversify existing patterns of migration and mobility. This suggests that mechanisms for accessing land that are individually-based and indiscriminately result in the upfront granting of ownership rights may be at odds with population movement dynamics in a context of HIV and AIDS. An alternative, for proactive land release as well as informal settlement upgrading interventions, would be to consider mechanisms and instruments that are based on group-access to land and services.

Approach: The processes and outcomes of settlement planning and land development need to encourage community building and development. This includes considering mechanisms and instruments for land release that are based on group-access to land and services.

Settlement planning also pertains to the designation of land use and the design of urban space. Uncontrolled spaces, design and layout affect violence levels and increase the risk of gender-based abuse, thereby increasing residents’ vulnerability to HIV infection. Specific land uses and structural factors act as high transmission points. Alongside increases in household fluidity, the economic impacts of HIV and AIDS increase informality as a survival strategy. In many respects, this informality (whether in the form of economic activity or shelter) is likely to be the primary survival strategy in response to the extreme economic shocks associated with AIDS illness and deaths. These factors need to be proactively considered and accommodated in all settlement and land use planning activities, as well as land use management activities.

Approach: Settlement and land use planning as well as land use management activities must consider how space and structural factors affect residents’ vulnerability to HIV infection and

accommodate informality as a critical survival strategy for people and communities affected by HIV and AIDS.

Shortages of land for cemetery space are a challenge affecting most cities in the developed and the developing world. Extra AIDS death currently account for 136% of total deaths and will amount to 192% in 2010 in South Africa. In the long-term, irrespective of HIV and AIDS, most cities would be confronted by shortages of cemetery space. This challenge is all the more critical that not all types of land and spatial locations can be used for cemeteries. Cities are already considering and experimenting with alternative methods to single grave interment. Diversifying the types of funerary services is an imperative. This process is affected by the legal framework as well as social, cultural and religion prescripts in respect of funerary rites. Ignoring these prescripts is not an appropriate response for municipalities, although they are not immutable. Social marketing to encourage alternative methods is a long-term strategy and alternative practice is the manipulation of interment tariffs to encourage alternative methods. This strategy can have negative unforeseen circumstances, such as increases in indigent burials and informal burials. Land use optimisation can be achieved by encouraging cremation, grave recycling, using high density mausoleums, and seeking out "opportunity cemeteries". Nevertheless, cities need to systematically compare and contrast the implications of different methods of disposal of human remains on the basis of their respective local context.

Approach: Diversifying the types of services offered by the cities is an imperative. Land use optimisation can be achieved through encouraging cremation, grave-recycling, using high density mausoleums and seeking out "opportunity cemeteries". Deciding on which services to offer requires a systematic comparison of the feasibility and implications of different methods of disposal of human remains on the basis of each city's local context through a transparent and open process.

The supply system for land planning, delivery and management involves a set of inter-dependent delivery agents. Irrespective of HIV and AIDS, the supply-side of spatial planning, land use management and development is particularly vulnerable to disruption and institutional weakness. The demographic impact of HIV and AIDS is likely to aggravate a situation where skills and capacities are already limited. Aside from workplace management interventions which the cities are already pursuing, this highlights the importance of ensuring that the processes and mechanisms supporting spatial planning, land use management and land development need to be made more robust in the face of disruption and decreasing capacity. The South African Cities Network is currently engaged in a process to develop guidelines to assist municipalities integrate HIV and AIDS in their workplaces.

Approach: The processes and mechanisms supporting spatial planning, land use management and land development need to be made more robust in the face of disruption and decreasing capacity, including by simplifying them. Accordingly, dedicated recommendations have not been developed in respect of this approach; nevertheless, its implications have been duly integrated in the recommendations.

## 6.2. Recommendations

### 6.2.1. Rapid release and development of well located land and spatially integration

#### ***Enabling rapid land release on a proactive basis***

Land and spatial planning practices must enable the release of land, on a proactive basis, that supports and includes a basic level of services to match the scale of the demand. Enabling rapid land release is not a new concept in the South African context and has generated a number of legal, regulatory and financial instruments, such as Gauteng's Rapid Land Release and Mayibuye Programmes. The tenure and financial arrangements developed in Ethekwini's Cato Manor provide were developed to support informal settlement upgrading, but provide an example of how existing instruments can be shaped to release and develop land on a flexible basis. These experiences, including their principles and operational limitations, must be considered to develop at the city-level, in collaboration with provincial and

national departments of housing and land affairs, mechanisms that achieve rapid land release.

### ***Co-opting and accommodating informal settlement processes***

Given current institutional and financial constraints, enabling rapid housing and land release will need to co-opt the range of delivery processes for land and settlement planning and development, including informal processes. This implies that informal processes (for instance, backyard shacks) need to be pre-empted and supported in terms of the spatial planning and land use management instruments used by the cities.

### ***Achieving city compaction***

Economies of scale suggest that the agglomeration of services, including healthcare services needs to be proportionate to the concentration of service users in a given settlements. Arguments supporting city compaction and integrated development are commonplace. They are even entrenched in legislation and policy promulgated since 1994, such as the Development Facilitation Act. Yet, their practice has encountered challenges, not least of which are market competition and exclusion. In turn, this has meant that by and large most new settlement development has occurred on the outskirts of the cities thereby perpetuating the apartheid legacy of fragmented cities and displaced urbanisation. In a context of HIV and AIDS, further impetus needs to be given to infill development and the release of centrally located land to afford more equitable access to life sustaining goods and services.

This approach also has implications for the identification of informal settlements to be prioritised in terms of in-situ regularisation and upgrading. Where such settlements are located in the periphery of the cities' urban core, regularising them and supporting infrastructure development would result in the confirmation and entrenchment of displaced urbanisation. Where a housing intervention entails household relocation (from a housing structure, site or settlement) attention should be given to ensuring that the person(s) being relocated are not negatively affected in terms of:

- The level, cost, ease of access and reliability of water and sanitation services;
- The level, cost and ease of access of social services (such as schools or health care services);
- Cost and ease of access to HIV and AIDS specific care (such as ART coverage, ANC services, monthly check up).

For this purpose, it would be advisable for cities to engage with the provincial departments of health, social services and education to ensure that those departments are able to seamlessly extend their services to people affected by relocations (temporary or permanent), where such relocation would otherwise hinder or interrupt access.

### ***Enabling multi-sector interventions and integration by using space as a platform for co-ordination***

This approach emphasises the urgency of achieving multi-sector co-ordinated development, to overcome current practices where human settlement development processes are primarily driven through the development of "hard" infrastructure such as water and sanitation services and housing.

Existing planning instruments are intended to support the rapid release of centrally located land co-ordinated with the extension of critical social services. In principle, the Integrated Development Planning (IDP) process, which all municipalities are required to undertake in terms of the Municipal Systems Act, provides a suitable platform for this. Experiences, to date, suggest that most municipalities, including the nine cities, are yet to co-opt both the IDP and its spatial development planning elements, in the form of the Spatial Development Framework, to its full potential. Nevertheless, the existence of these instruments is an opportunity which must be harnessed effectively.

6.2.2. processes and outcomes of settlement planning and land development need to encourage community building and development

### ***Supporting the development of communities through appropriate participation processes***

To contribute meaningfully to the response to HIV and AIDS, settlement planning and development practices need to support community development. This requires a shift away from settlement development practices that are strictly technocratic, towards community-based planning approaches to spatial development. From a process perspective, this means enabling and supporting group-based interventions, where facilitation procedures are not reduced to a once-off "community" mass meeting, for the purpose of allocating sites or identifying community members who will be employed in the construction of infrastructure. This approach also requires affording women and children, who are seldom given meaningful opportunities to influence the outcomes of land planning and development, a voice in the process.

However, the concentration of vulnerable households at the settlement and city scale and the increasing mobility of may make the adoption of participatory practices in support of community development particularly challenging. Indeed, there may be vulnerability thresholds for socio-economic networks beyond which HIV and AIDS impacts precipitate communities and settlements. In such an ultra-vulnerable context the ability of communities to articulate a demand, to access and maintain access over land may become even more precarious than is currently the case.

At a project level, this would be easier to achieve in settlement regularisation and upgrading than in the development of new settlements. At a settlement or ward level, approaches such as Community Based Planning and the tools developed for community-based information and knowledge development, planning and action enable meaningful community participation and empowerment in ways that are supportive of vulnerable groups. At a city scale, opportunities also exist for broader consultation and engagement with women and children to elicit their experiences and needs in respect of spatial and land development, as a means to influence the development of HIV and AIDS competent as well as gender-conscious practices.

***Moving away from individualised tenure, services and housing benefits towards group-based benefits to accommodate household fluidity and diversity and support to development of communities***

There is currently no clear typology of household types. Historically, the majority of household types have not aligned with the nuclear model of two parents with children on which much policy is premised. A wide array of household types with multiple generations and transient members has been established, in parts due to the distorting impacts of Apartheid urbanisation policies. HIV and AIDS are a new factor of household profile transformation.

Actual household profiles are increasingly becoming fluid and diversified. This makes settlement planning and design particularly uncertain in as much as existing assumptions used to determine individual site sizes and densities may be completely at odds with reality. From a product perspective, group-based interventions suggest a move away from purely individualised systems (i.e. where the number of households is equated to the number of sites to be delivered) towards systems of land planning and delivery that accommodate groups of individuals and households. This would cater for the fluidity associated with informal settlement processes. It would alleviate the upfront planning costs of releasing land on an individual ownership basis. It could also assist the setting up of geographically bound platforms for the provision of a range of services that are particularly important in a context of HIV and AIDS, including municipal infrastructure to home-based care and social services.

6.2.3. Considering space and structural factors' impact on vulnerability and accommodate informality as a critical survival strategy

***Accommodate and manage informality as an expression of vulnerable households' survival strategies***

Informality, whether settlement and housing or economic informality, is a survival strategy for all poor and vulnerable households. In a context of HIV and AIDS it will become an increasingly significant strategy. Most spatial planning and land use management practices are not particularly supportive of informality. In fact, informal activity is often seen as environmentally harmful and compromising and dealt with accordingly. Informal activity should not be indiscriminately glamourised as a panacea for overcoming all situations of vulnerability. In a context of HIV and AIDS, the environmental health implications of

informality cannot be dismissed or ignored. These need to be monitored and managed within the ambit of a supportive approach which assists informal operators to adhere to minimum environmental health standards rather than prohibit their activities.

Accommodating informality means, for instance, reviewing land use management instruments such as zoning regulations and town planning schemes to ensure that they do not impose overly restrictive conditions. This may require moving away from standardised arrangements that impose strict conditions across the whole area of jurisdiction of the municipality.

Excessively onerous standards and restrictions in respect of top-structure development are inappropriate in a context of HIV and AIDS. Indeed, such improvements are a manifestation of people's own initiatives to mitigate socio-economic duress. For instance, an additional shack could be used to shelter HIV and AIDS affected individuals including fostering orphans or temporarily isolating sick household members to avoid the spread of certain infectious diseases within the household. Informal additions may also ensure that household members have a level of privacy, including sexual privacy.

#### ***Avoiding and managing uncontrolled space***

Dealing with uncontrolled spaces should become a priority. In terms of new settlement layout planning, this requires carefully selecting the amount of space to be set aside for non residential purposes and its location. If in practice a land parcel, that has been earmarked as open space on a cadastral map, is no more than veld or an informal refuse dump opportunities must be made to consider alternative uses, such as communal vegetable gardens or even community-based cemeteries.

#### ***Making spatial planning and land use management tools available to support HIV and AIDS interventions***

Gaining a spatial appreciation of HIV and AIDS is critical not only for spatial and land use planning and land development role-players, but also for those involved in the response to HIV and AIDS. Ideally, both sets of role-players would collaborate to ensure that the interventions which they plan and implement in their respective professional roles complement and support each other. For instance, municipal Geographic Information Systems could be co-opted to map out home based care service providers throughout the municipal area of jurisdiction. This would enhance co-ordination. Similarly, GIS mapping can be used to identify high transmission areas to support prevention efforts in those areas.

#### 6.2.4. Addressing the implications of AIDS mortality

##### ***Prioritising municipal investment that improves the wellbeing of the living***

Although recommending the prioritisation of municipal investment that improves the wellbeing of the living might seem out of place in a sub-section dealing with the implications of AIDS mortality, it is premised on the notion that such interventions can contribute to mitigating the pressure of AIDS mortality. Indeed, ensuring a better quality of life for the living means mitigating the risk of HIV infection, opportunistic infections and AIDS defining conditions. In turn, this means less immediate pressure on land for cemeteries. This type of investment includes supporting the release of well located land and enabling all persons throughout the municipal area of jurisdiction to access water, sanitation, energy and solid waste services.

##### ***Consider the range of costs of various methods of disposal of human remains***

Costing and tariff-setting for the various methods of disposal of human remains must become more transparent and comprehensive. Costing and budgeting cannot be limited to considering once-off capital costs and maintenance costs. For instance, it needs to consider the environmental costs of cremation in terms of the release of carbon dioxide and the opportunity costs of setting aside well located land for cemeteries over the long-term, instead of reserving it for settlement development. The site evaluation system developed by the Council for Geoscience focuses on the identification of sites within the targeted areas, informed by a matrix of location factors, including:

- Geo-hydrological conditions;
- Cultural and socio-economic considerations;
- Conservation importance of ecological systems and habitats;
- Growth corridors and reconstruction and development focus areas;

- Metropolitan accessibility, especially public transport; and
- Land availability, including competing uses, opportunity cost and acquisition feasibility in terms of ownership and cost.

In the medium-term, budgeting and tariff-setting for funerary services will need to consider these costs appropriately. This needs to be particularly sensitively as excessively onerous end-user costs might actually increase the number of paupers and indigent or informal and illegal burials.

### ***Diversifying the types of funerary services and optimising current services***

Scenario planning and modelling the land use impacts of demand for funerary services must form part of strategic spatial planning activities, within as well as possibly at the regional/cross-municipality scale. The modelling exercise presented in this document was developed for illustrative purposes. This exercise would need to be substantially refined to align with the particular local context in each municipality. This adjustment would need to consider the legal as well as social, cultural and religious parameters that would affect its applicability in each of the cities. Nevertheless, it highlights that an approach which combines increased levels of grave recycling (through setting up family graves in particular and encouraging exhumation and relocation), cremation and the introduction of mausoleums enables economies of close to half the amount of additional land required to accommodate extra AIDS death compared to current practices.

Diversifying the types of funerary services on offer will not occur overnight; neither will the demand for such services. In the interim, opportunities will need to be pursued to optimised current services. In this respect, engagement with the current process of developing a nation-wide cemeteries by-law must be engaged with proactively. The concept of “opportunity cemeteries” is particularly valuable. The current approach to defining opportunity cemeteries includes using landscaped areas, lowering the water table through drainage and recycling parts of the cemetery previously used for pauper’s burials. This approach could be broadened to include:

- Developing uncontrolled spaces in settlements as “community based cemeteries”;
- Using land that is currently underused and “sterilized” (i.e. under power line or next to railway line servitudes);
- Orientating the demand to cemeteries in parts of the city that are undergoing processes of de-urbanisation (e.g. Botshabelo in Mangaung municipality);
- Developing eco-cemeteries and including cemeteries as part of the open space system of municipalities (i.e. by making them places for the living as well as the dead).

In order to identify which methods to pursue, identify opportunity cemeteries and ensure that the spatial planning implications of AIDS mortality are adequately catered for as part of the cities’ planning and budgeting process, introducing the issue systematically in the IDP review process (and in turn SDF preparation process) is a necessity.

### ***Systematising practices of social marketing in respect of alternative methods***

Social marketing practices in respect of various methods should become more systematic and comprehensive. It could include the following elements:

- Engagement with leadership figures and opinion-makers in society, such as, for example councillors, traditional leaders and healers, religious and union leaders, but also artists, journalists and business leaders. The purpose of engagement should be to raise the awareness of the pressures facing municipality as well as alternative methods.
- Ensuring that social marketing activities with community members prepare people to select alternative methods and to make their funerary preferences known to their family members.
- Where possible information about the costs and benefits of alternative methods should be distributed through channels where people assemble, for instance at break of commuter bulk points, religious services, municipal service centres, health services centres, funerals and IDP participatory activities.

### ***Generating knowledge on mortality and funerary preferences and trends***

In the absence of systematic information collection and management practices, in respect of mortality and funerary trends, several cities miss out on the opportunity to generate

knowledge to inform the development and refinement of strategies on an ongoing basis. The type of information to be collected, for the purpose of establishing trends, should include as a minimum:

- The age gender and settlement of the diseased person;
- The method of disposal;
- Whether alternative methods were proposed to the family of the deceased;
- The nature of the response in respect of alternative methods;
- The price paid.

This information should be systematically monitored in both municipal and private facilities. In addition, surveys could be undertaken in the general public, on a regular basis, to ascertain what factors would lead people to shift their funerary preferences and what their knowledge of different methods is. This would generate information on the effectiveness of social marketing activities.

Finally, environmental health officials and cemeteries and parks officials should collaborate to monitor on a systematic basis the incidence of informal and illegal burials.

***Locating AIDS mortality on the agenda of international processes and organisations pertaining to urban development***

Because shortages of cemetery space is a challenge facing cities in many parts of the world, even in places where HIV and AIDS are relatively minor factors, opportunities exist for locating this challenge on the agenda of international processes and organisations dealing with urban development. This would provide platforms for information exchanges about innovative practices and support horizontal learning on an ongoing basis.



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#### Interviewees

Name	Name of Municipality/ Organisation
Mr K.E.Tapile	Buffalo City
Mr Jerry Chaka	Ekurhuleni Metro
Mr. Gama Ngqulunga	Ethekwini Metro
Mr Jabulani Mdiniso	Ethekwini Metro
Mr Billy Barnes	Mangaung Municipality
Mr Jimmy Pather	Msunduzi Municipality
Dr Paul Martin	Nelson Mandela Metro
Mr Nicky Oliphant	Nelson Mandela Metro
Mr John Jarvis	City of Cape Town
Mr Jabulani Mdiniso	Ethekwini Metro
Mr Alan Buff	City of Johannesburg
Mr Brian Mthembu	Mangaung Municipality
Mr Steven Naick	Msunduzi Municipality
Mr Jerry Motsamai	Tshwane Metro
Mr Andre Denyschen	Tshwane Metro
Mr Ntoane Mophiring	Sotho Interview

Prof. Peter Mtuze	Rhodes University (Xhosa interview)
Ms Zahraa McDonald	University of Johannesburg (Islam interview)
Mr Thandanani Masikane	Zulu interview
Dr. Mogomme Masoga	Pedi interview
Dr D. N. Maseko	Traditional Healers Organisation
Raymond	Johannesburg Hindu Crematorium
Daron Wolderg	Johannesburg Jewish Helping Hand and Burial Society
Rabbi G. Finkelstein	Johannesburg Jewish Helping Hand and Burial Society
Ms Kelly Luck	University of Johannesburg- Anthropology Department
Ms Phelekwa Mbejeni	Nelson Mandela Metro