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SOCIAL INNOVATION IN PREVENTATIVE HEALTH FOR HUMAN SETTLEMENTS IN SOUTH AFRICA

Annexure: Background for the challenge

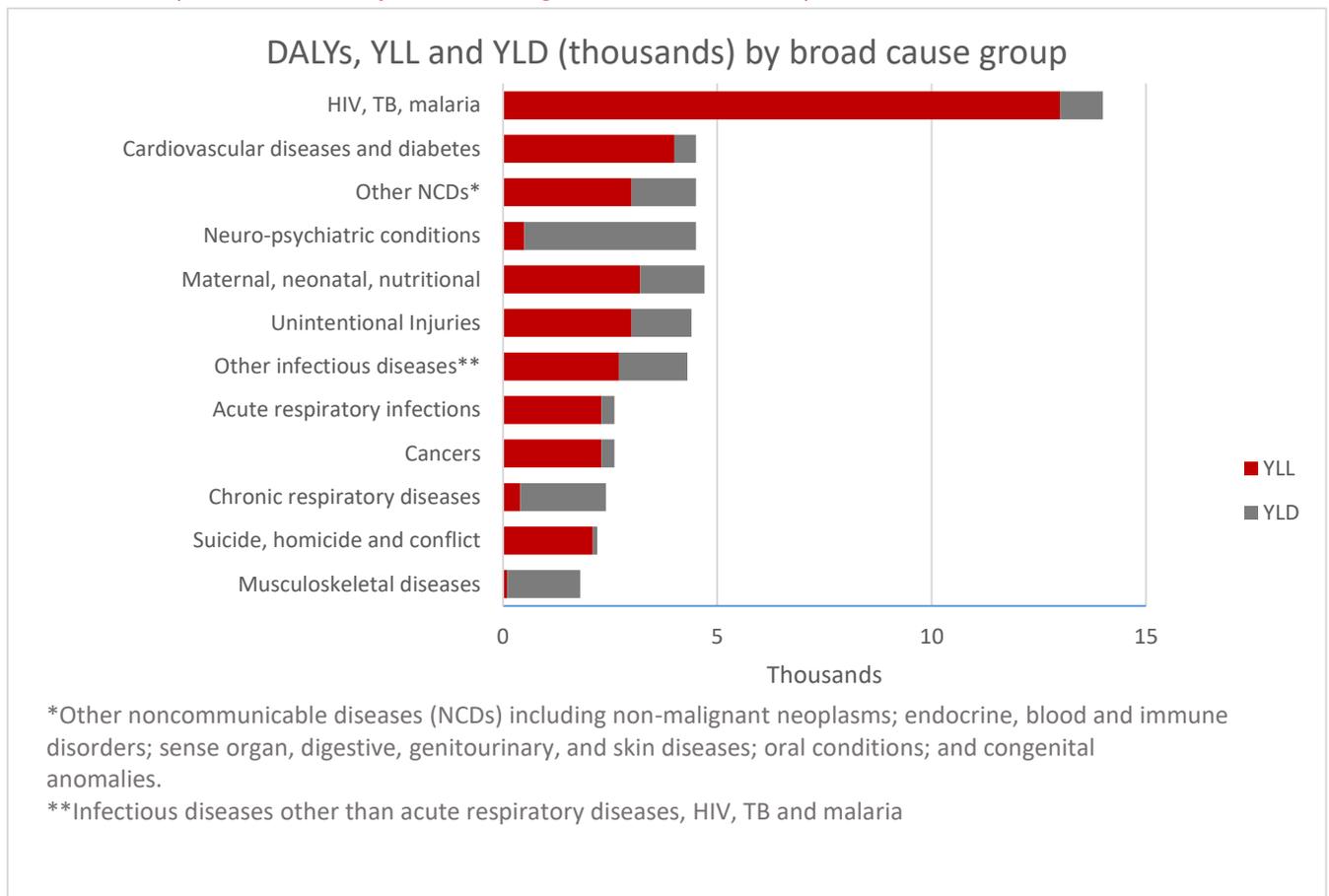
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THE BURDEN OF DISEASE IN SOUTH AFRICA

In South Africa, the healthy life expectancy at birth is 51 years, significantly lower than the average healthy life expectancy of upper middle income countries (WHO, 2015). This below-average expectancy is partly due to the burden of diseases such as HIV/AIDS, cardiovascular diseases, and other communicable and non-communicable diseases. As illustrated on Table 1 (WHO, 2015), the burden of disease can be measured by combining an estimate of the years of life lost¹ (YLL) due to premature death and years of healthy life lost due to disability (YLD). This measure - referred to as Disability Adjusted Life Years (DALYs) – provides a more comprehensive overview of the main health issues affecting a population.

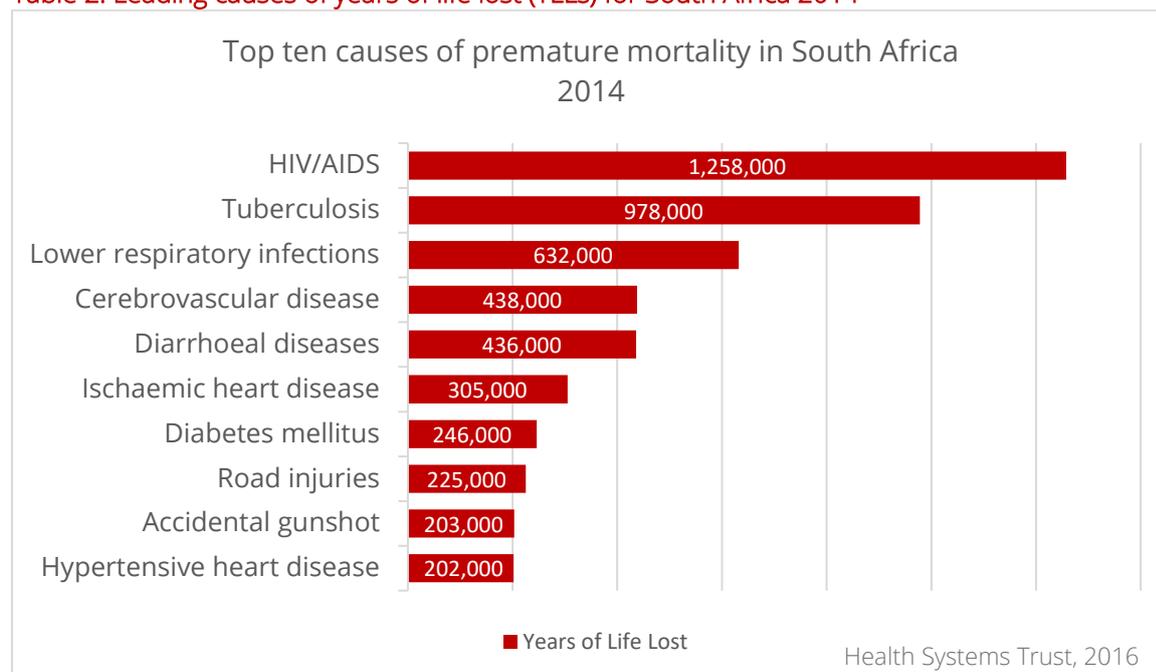
Table 1: Top diseases and injuries affecting the South African Population - 2012



¹ Years of life lost is a measure of premature mortality based on the age at death and thus highlights the causes of death that should be targeted for prevention. Years of healthy life lost (YLDs) is a measure to estimate how many years are lived with lower quality of life due to disability.

For a more detailed overview on the main causes of premature deaths in South Africa, the comparison table below of estimates from 2008 and 2014 is also a good reference (Health Systems Trust, 2016).

Table 2: Leading causes of years of life lost (YLLs) for South Africa 2014



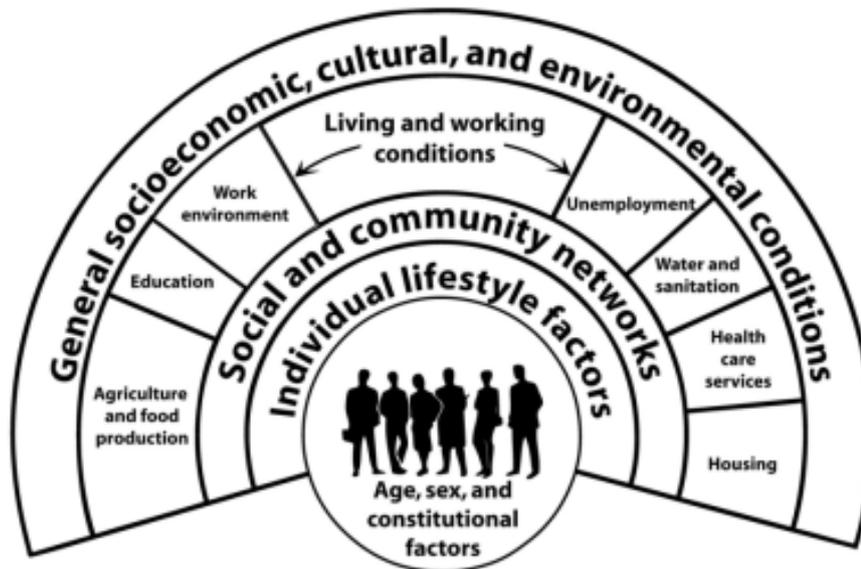
HEALTH AND OUR SURROUNDINGS: HOW OUR PHYSICAL & SOCIAL ENVIRONMENT AFFECTS OUR WELL-BEING

As early as 1974, a connection was made between the health of an individual and the environment in which the individual exists, going beyond health as a mere bio-medical concept (Lalonde, 1974). From there onwards, the field of health promotion has continued to evolve in order for public health to address social, environmental and structural factors which affect the health of the population (WHO, 1986). Researchers Dahlgren and Whitehead developed a ground-breaking model of the different health determinants and how they interact, which has set precedent for approaches to public health globally since the early 90s the inter-linkages of all the social, environmental and structural factors with health

Figure 1: A Model of Health Determinants

Source: Dahlgren, G. and Whitehead, M. (1993)

(Dahlgren & Whitehead, 1991).



THE ENVIRONMENT: A MAJOR HEALTH DETERMINANT

As evidenced by Dahlgreen and Whitehead's Model on Determinants of Health, the environment in which an individual or a community exists is a major influencing factor in health and well-being. The discipline on environmental health is dedicated in part to measuring the environmental burden of disease (i.e. how much are health issues attributable to environmental risks such as air pollution, climate change, among others). A comprehensive table of the different environmental risk factors and how they affect health negatively is presented on table 3.

Table 3: Indicative linkages between environmental risk factor and disease or injury (Pruss-Ustun, et al., 2016)

Environmental Risk Factor

Population attributable fractions for the environment (of DALYs)²:

● <5%, ● 25%, ● 5%

Disease or Injury	Water, sanitation and hygiene	Indoor fuel combustion	Second-hand tobacco smoke	Ambient air pollution	Noise	Chemicals ^a	Other housing risks	Recreational environment	Water resources management	Land use and built environment	Other community risks	Radiation	Occupation	Climate change
Infectious and parasitic diseases														
Respiratory infections		●	●	●			●							
Diarrhoeal diseases	●							●						●
Intestinal nematode infections	●												●	
Malaria									●		●		●	●
Trachoma	●													
Schistosomiasis	●							●						
Chagas disease							●							
Lymphatic filariasis	●								●					

² The contribution of a risk factor to a disease or a death is quantified using the **population attributable fraction** (PAF). PAF is the proportional reduction in **population** disease or mortality that would occur if exposure to a risk factor were reduced to an alternative ideal exposure scenario (WHO).

Disease or injury	Water, sanitation and hygiene	Indoor fuel combustion	Second-hand tobacco smoke	Ambient air pollution	Noise	Chemicals ^a	Other housing risks	Recreational environment	Water resources management	Land use and built environment	Other community risks	Radiation	Occupation	Climate change
Onchocerciasis									●				●	
Leishmaniasis							●						●	
Dengue							●						●	●
Japanese encephalitis									●				●	
HIV/AIDS													●	
STDs													●	
Hepatitis B and C													●	
Tuberculosis		●					●						●	
Other infectious diseases	●						●		●				●	
Neonatal and nutritional diseases														
Neonatal conditions	●	●	●	●		●							●	
Protein-energy malnutrition	●											●		●
Noncommunicable diseases														
Cancers		●	●	●		●					●	●	●	
Neuropsychiatric disorders					●	●	●						●	●
Cataracts		●										●	●	
Hearing loss						●							●	
Cardiovascular diseases		●	●	●	●	●			●				●	●
Chronic obstructive pulmonary disease (COPD)		●		●									●	
Asthma		●	●	●			●						●	
Other respiratory diseases													●	
Chronic kidney diseases						●							●	
Skin diseases						●							●	
Musculoskeletal diseases													●	
Congenital anomalies				●		●						●	●	
Injuries														
Road traffic accidents										●			●	
Falls							●		●	●			●	
Drownings								●			●		●	●
Fires			●				●						●	

Poisonings						●	●						●	
Other unintentional injuries							●	●		●	●	●	●	●
Violence						●	●			●				
Self-harm						●	●			●			●	

Notes: ^aLimited to industrial and agricultural chemicals and chemicals involved in acute poisonings

HOUSING AS A HEALTH DETERMINANT

Another health determinant identified by Dahlgreen and Whitehead is housing, and more broadly, living and working conditions. Precarious housing is linked to lack of access to safe drinking water, lack of adequate waste disposal, worse quality of ambient air, and exposure to harmful building materials and/or chemicals, among others (Pruss-Ustun, et al., 2016). According to WHO, “urbanisation itself is a determinant of health” and “poverty leads to slum formation and ill-health” (KNUS, 2008, pp. 25, 67).

Table 4: Major risk factors of unhealthy living conditions (adapted from WHO, 1997)

RISK FACTOR	COMMUNICABLE DISEASES	NCDs AND INJURIES (incl. Mental health issues)
<i>DEFECTS IN BUILDINGS</i>	Insect-vector diseases Rodent-vector diseases Diseases due to animal faeces Diseases due to animal bites Overcrowding related diseases	Dust, damp and mould-induced diseases Injuries Burns Neuroses Violence and delinquency Drug and alcohol abuse
<i>DEFECTIVE WATER SUPPLIES</i>	Faecal-oral (waterborne and water-washed), non-faecal-oral water-washed and water-related insect-vector diseases	Heart disease Cancer
<i>DEFECTIVE SANITATION</i>	Faecal-oral diseases Taeniasis and helminthiasis Insect and rodent-vector diseases	Stomach cancer
<i>POOR FUEL AND VENTILATION (INDOOR FUEL COMBUSTION)</i>	Acute respiratory infection	Perinatal defects Heart disease

		Chronic lung disease and cancer
		Burns
		Poisoning
<i>POOR REFUSE STORAGE AND COLLECTION</i>	Insect-vector diseases Rodent-vector diseases	Injuries Burns
<i>DEFECTIVE FOOD STORAGE AND PREPARATION</i>	Excreta-related diseases Zoonoses Diseases due to microbial toxins	Cancer
<i>POOR LOCATION (NEAR TRAFFIC, WASTE SITES, INDUSTRIES...)</i>	Airborne excreta-related diseases Enhanced infectious respiratory disease risk	Chronic lung disease Heart disease, cancer Neurological/reproductive diseases Injuries Psychiatric organic disorders due to industrial chemicals Neuroses

It is important to note that in the Model of Health Determinants, not only is each factor directly linked to the individual's health and well-being, but they are inter-linked. Housing, health care services, water and sanitation, and environmental conditions among others are closely linked, and inter-dependent.

HOUSING CHALLENGES IN SOUTH AFRICA

Since the dawn of democracy, the South African Government has made progress in addressing the housing challenge on many levels, with projects including but not limited to the Reconstruction and Development (RDP) programme. However, despite more than 4.3 million houses and subsidies provided to citizens since 1994 (GCIS, 2016), there is still a housing crisis, with over 7.5 million people living in informal settlements with little to no access to basic services such as water and sanitation (Tissington, 2011); (Urban Think Tank, 2017). Further evidence suggests the clear consequence of inadequate living conditions on South Africans' health (Marais & Cloete, 2014).

Given the growth of informal settlements, initiatives to upgrade living conditions and housing within these unplanned settlements have developed, both from government and NGOs (Tissington, 2011). Addressing this challenge is the notion of 'gap housing'.

According to the Department of Human Settlements,

Gap housing is a term that describes the shortfall or gap in the market between residential units supplied by the State and houses delivered by the private sector. The gap housing market comprises people who typically earn between R3 500 and R15 000 per month, which is too little to enable them to participate in the private property market, yet too much to qualify for state assistance (GCIS, 2016, p. 120).

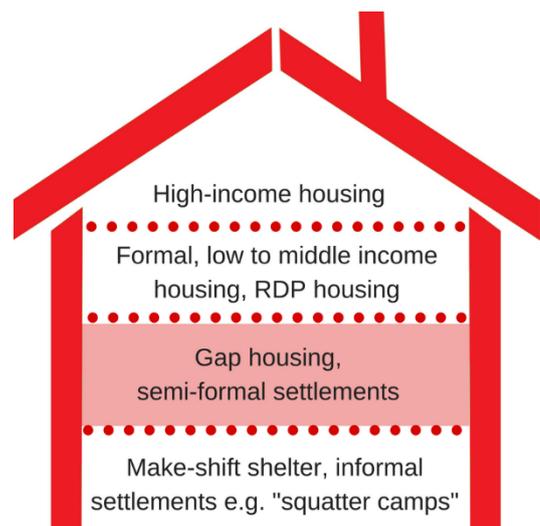


Figure 2:
Housing quality "hierarchy"

An example of informal settlement upgrade, or gap housing improvement, is the initiative by the Swiss ETHZ - Urban Think Tank and the Cape Town based NGO Ikhalyami, in Khayelitsha. The project replaces the existing shacks which consist of an upgraded structure comprised of wooden foundations, two stories, and insulated walls made from corrugated sheets and brick walls. The project goes further by providing each unit, with water and sanitation facilities and a kitchenette that is pre-designed, easy to set and flexible units, (Urban Think Tank, 2017).



Empower Shack progress (photos by Urban Think Tank)

ADDRESSING THE UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS (SDGs)

The issues in housing and health in the South African context, as presented above, show the challenges which remain ahead in order to attain the SDGs set by the UN in 2015, to be reached by 2030 (United Nations, 2015). Of particular relevance to the issues above are the following goals, on Figure 5 (United Nations, 2015).

Figure 3: Relevant SDGs to the Housing and Health challenge



Ensure healthy lives and promote well-being for all at all ages

Significant strides have been made in increasing life expectancy and reducing some of the common killers associated with child and maternal mortality. Major progress has been made on increasing access to clean water and sanitation, reducing malaria, tuberculosis, polio and the spread of HIV/AIDS. However, many more efforts are needed to fully eradicate a wide range of diseases and address many different persistent and emerging health issues.



Ensure access to water and sanitation for all

Water scarcity, poor water quality and inadequate sanitation negatively impact food security, livelihood choices and educational opportunities for poor families across the world. Drought afflicts some of the world's poorest countries, worsening hunger and malnutrition.



Ensure access to affordable, reliable, sustainable and modern energy for all

Energy is central to nearly every major challenge and opportunity the world faces today. Be it for jobs, security, climate change, food production or increasing incomes, access to energy for all is essential.



Make cities inclusive, safe, resilient and sustainable

Cities are hubs for ideas, commerce, culture, science, productivity, social development and much more. At their best, cities have enabled people to advance socially and economically. However, many challenges exist to maintaining cities in a way that continues to create jobs and prosperity while not straining land and resources. Common urban challenges include congestion, lack of funds to provide basic services, a shortage of adequate housing and declining infrastructure.



Take urgent action to combat climate change and its impacts

Climate change is now affecting every country on every continent. It is disrupting national economies and affecting lives, costing people, communities and countries dearly today and even more tomorrow. It is an issue that requires solutions that need to be coordinated at the international level and it requires international cooperation to help developing countries move toward a low-carbon economy.

BRINGING IT ALL TOGETHER: IMPROVED HOUSING, A CLEANER ENVIRONMENT, AND IMPROVED HEALTH AND WELL-BEING

The hope of this challenge is to find innovations which will address housing conditions, whether it be through cleaner and cheaper energy technology, building environment innovations, innovative and affordable WASH solutions, or others, to ultimately take a step closer towards a greener and healthier future.

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