

# HEALTH AND WELLBEING CHARACTERISTICS AND IMPACTS IN INFORMAL SETTLEMENTS: THEMATIC AND PRIORITY RESEARCH AREAS

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## Abstract

Informal settlements are characterised by congested living conditions, environmental and inequality impacts, illegal or unplanned housing structures and lack of essential and basic services. The objective of the study was to identify priority areas in research on the characteristics and socio-economic impacts of informal settlement conditions on the health and wellbeing of the citizenry. A systematic review involving bibliometric and content analyses was conducted. The study revealed that most studies about health and wellbeing in informal settlements originate from the United Kingdom, Kenya, and United States. There are three priority knowledge areas: marginalisation experiences affecting livelihoods; neighbourhood and housing impacts; and community and social environment. Further findings include that provision of adequate infrastructure and services in an equitable manner, local level health initiatives, attention to neighbourhood characteristics, housing, community, and social environment/networks/relationships would alleviate some informal settlements' wellbeing impacts. In addition, community engagement and intersectoral collaborations will enhance conscientiousness regarding wellbeing and health in informal settlements. The research emphasises the economic and social impacts of informal settlements on the wellbeing of inhabitants. More discussions and streamlined interventions could be initiated to improve conditions and thus health, safety, and wellbeing in informal settlements. The findings are useful to support future research and decision-making on informal settlements.

Keywords: health, housing, H&S, infrastructure, informal settlements, safety, wellbeing.

## 1. INTRODUCTION

African cities are projected to be home to nearly 60% of the continent's population by 2050 [1], with the urban population in South Asia and Sub-Saharan Africa doubled [2]. In addition to the pressure on existing facilities and infrastructure, urbanisation has multifarious impacts (positive and negative) on the wellbeing of humans and the environment [2]. While urbanization is associated with increased opportunities for socio-economic economic progress, it generally leads to changes in demography, social patterns and support systems, economic status, and psychological attributes [3]. Hence, urbanization results in informal settlements sprouting in many urban areas in African cities and globally. Informal settlements are characterised by congested living conditions, environmental and inequality impacts, illegal or unplanned housing structures and lack of essential and basic services [4-6]. These conditions are further exacerbated by the social and spatial marginalisation experienced by inhabitants of informal settlements [7]. Therefore, attention is essential to reduce the impacts of urbanisation. Moreso, increased attention is critical as countries struggle to emerge or recover from the COVID-19 crisis. The crisis highlights the suffering among 1.2 billion living in informal settlements/slums [8]. International development agendas such as the Sustainable Development Goals (SDGs) and UN Habitat III New Urban Agenda emphasise the need to provide adequate dwellings and safe, liveable environments for all by supporting local and national level policies [9,10]. National and provincial strategic development plans such as the National Development Plan 2030 also highlight health and safety as top priorities for all peoples in South Africa. However, Weimann and Oni [7] argued that there is a lack of adequate monitoring efforts on the health impact of informal settlement upgrading.

A few studies have explored aspects of health and wellbeing in informal settlements. For example, Chumo et al. [11] investigated drivers of health, safety, and wellbeing challenges in informal settlements in Nairobi using interviews and focus group discussions. The study found that individual community, societal and structural level factors that drive concerns around health and wellbeing.

Similarly, Chumo et al. [12] examined drivers of vulnerability to health and wellbeing challenges across different groups in informal urban space using governance diaries with 24 participants in Nairobi. Visser and Law-van Wyk [13] investigated university students' mental health and emotional wellbeing during the COVID-19 pandemic and ensuing lockdown and found that students residing in informal settlements were most at risk of experiencing emotional difficulties. Amoah et al. [4] examined the impact of informal settlements on water quality assessment. Other studies indicated a lack of health impact evaluations and trend analysis of informal settlement in the Global South, including South Africa [7,14]. Using the four dimensions of housing described by the World Health Organisation (WHO), Weimann and Oni [7] investigated influences of informal settlement upgrading on the health and wellbeing of vulnerable groups of residents. Further, in their study that explored 24 local and provincial policymaker perceptions on barriers and facilitators for intersectoral action using interviews, Weimann et al. [15] opined that hard and soft characteristics of informal settlements directly or indirectly impact health and should be the focus of more studies.

Therefore, this desktop study adopts Weimann and Oni's [7] approach to explore the socio-economic impacts of informal settlements on wellbeing. Therefore, the objective of the study was to identify priority areas in research on the characteristics and impacts of informal settlements on the health and wellbeing of the inhabitants. Findings from this study are envisaged to garner more collaboration and discourse among relevant actors to develop strategies to improve informal settlements' conditions; thus, contributing to positive implications and reducing the impacts of negative externalities of urbanisation on the citizenry.

## 2. INFORMAL SETTLEMENTS' CHARACTERISTICS AND IMPACTS

The proportion of urban dwellers (55%) in Sub-Saharan Africa that live in slums and informal settlements is larger than the global average (30%) [16]. With a rapidly urbanising population (66%), South Africa's urbanization process is often unplanned, and characterised by significant spatial inequalities and high levels of health disparities [17,18]. Data from Statistics South Africa (StatsSA)'s General Household Survey indicate that approximately 1 in 5 households in metropolitan areas lived in informal dwellings [19]. South African urban centres have become synonymous with rising housing backlog, strain on urban resources, large numbers of informal settlement dwellers that generally lack access to adequate basic services prior to government intervention [20]. Corruption and ineffective strategies combined with historical racial discrimination and segregation during apartheid regime through policies such as the Group Areas Act No. 41 of 1950 has also been cited as contributing factors to informal settlements development in SA [21].

Housing is a component of the urban system (built in line with political or civil society priorities, or in response to human need) and an underlying factor capable of shaping and determining human health – physical, mental, and social wellbeing [7,22]. Other social factors influencing health include quality of living environment, work stressors, behavioural and lifestyle choices when combined with underlying genetic conditions [23]. Mental and physical ill health are also common consequences of the compromised living and working conditions in slums [24]. Further, Cruz et al. [25] found that an increase in neighborhood violence and the fear of it is likely to result in a higher level of mental health and poor quality of life.

The WHO [26] considers four overlapping and interrelated dimensions of housing that contribute to health and wellbeing: the physical housing structure such as dilapidated shelters with inadequate ventilation and high levels of indoor pollution (house); the psychosocial and cultural home environment (home) such as high socio-economic stress experienced by families; the physical characteristics of the neighbourhood environment (neighbourhood) such as high-risk areas for natural disasters; accidents, injuries and the social environment and services within the community (community) such as high crime or gender discrimination.

### 2.1 Housing factor

Previous studies highlighted the prevalence and impacts of crowding in informal settlements increases dilapidation and the risk of exposure to, and transmission of infectious diseases such as tuberculosis (TB) as well as increased risk of mental illness [27,28]. Van Niekerk et al. [29] cited unsafe use of paraffin, coal and wood for cooking, heating, and lighting due to lack of access to electricity as contributing factors to injury and burn risk. Shortt and Hammett [30] further reported that injuries were more prone in shacks because of overcrowding and lack of designated cooking space. The cross-sectional study, which sought to investigate self-reported health changes in response to the upgrading

of Imizamo Yethu informal settlement in Cape Town, found the presence of damp and mould associated with respiratory infections, allergies, and asthma. Concurring with these views, De Klerk et al. [31], Archer et al. [32] and French et al. [33] reported that pest infestation, skin and infectious diseases are common in informal settlements.

## 2.2 Home factor

Psychological and cultural factors such as stress and depression have been associated with socioeconomic status and how residents perceive their home [34,35]. Gibbs et al. [35] found that 57.9% of young females and 49.5% of young males (18–30 years) living in two South African informal settlements were depressed. Weimann and Oni [7] argued that while relocation from rural areas to urban informal settlements improved mental health by providing a sense of hope for obtaining government subsidised housing as suggested by Marais et al. [36], other factors such as recent environmental, service delivery improvements or educational interventions need to be considered as possible contributing factors.

## 2.3 Neighbourhood factor

Risk of infectious diseases such as diarrhoea in informal settlements is exacerbated by unsanitary collection and storage of water in containers due to the lack of onsite water facilities [37,38]. Residents' sanitation practices include the use of plastic bags, buckets, porta-potties, or open defecation, which are because of factors including safety, poor conditions of the facilities, lack of privacy and choice [39]. Govender et al. [38] reported households with high levels of diarrhoea likely due to high levels of faecal bacteria and *Escherichia coli* in surface runoff water from four Cape Town urban poor communities with informal backyard dwellings and low-cost housing.

According to Weimann et al. [15], the immediate neighbourhood environment, which includes the state and perceptions of the surrounding built and natural environment, may face varying challenges and impacts. For example, inadequate water and sanitation could promptly increase the risk of physical illness and disease (hard-direct); while healthcare access may have a more delayed health impact. This emphasizes the need for local level attention and initiatives to provide needed facilities.

## 2.4 Community factor

From a social environment perspective, Weimann and Oni [7], posited that the lack of community cohesion that exist in informal settlements may be intensified by the feeling of exclusion experienced by households who did not receive government subsidised housing. Brown-Luthango et al. [40] reported that residents' perception of safety did not improve even after receiving a formal house in informal settlements with prevailing high level of crime and gang violence. However, informal settlement reblocking is noted to have made residents feel safer and increased sense community cohesion [40].

Further, according to Weimann and Oni [7], within the context of informal settlements, community factors that affect the health and wellbeing of residents include services provided within the community, which may depend on other interacting factors including infrastructural pipeline, environmental (availability of water reservoir, for example), local government priorities and mandate, as well as social stresses such as high crime or gender discrimination. Goebel et al. [37] highlighted the importance of adopting a gender lens to informal settlement improvement strategies due to gender-related inequalities that may influence health patterns of informal settlement dwellers. Poverty, gender inequality and weak social networks in urban settlements have also been linked to intimate partner violence and HIV-risk [35]. According to French et al. [33], some of these impacts are compounded by exposure to flooding, climate change risks and environmental contamination.

## 3. METHODS

The study adopted a systematic review approach using bibliometric and content analyses. Bibliometrics is a quantitative analysis method that uses the external characteristics of scientific literature as research objects [41]. The bibliometric phase provided insight into key components of the literature, aggregated, and analysed at the country, author, journal levels and the academic structure of individual disciplines and knowledge focus [42]. The Scopus database was used to identify materials for the study. Scopus database is the largest abstract and citation database of peer-reviewed literature in the world, covering 15 000 journals in different fields [41]; thus, ensuring the

integrity and authority of articles. Keywords including wellbeing, health and informal settlements were used in the search. Keywords give an idea of the issues relevant in the paper. A total of 63 documents emerged. However, 42 were included based on selected inclusion and exclusion criteria, as presented in Fig. 1.



Fig. 1: Inclusion and exclusion criteria

The full search string was: TITLE-ABS-KEY (wellbeing, AND health, AND informal AND settlements) AND (LIMIT-TO (OA,"all")) AND (LIMIT-TO (PUBYEAR, 2023) OR LIMIT-TO (PUBYEAR, 2022) OR LIMIT-TO (PUBYEAR, 2021) OR LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2018) OR LIMIT-TO (PUBYEAR, 2017) OR LIMIT-TO (PUBYEAR, 2016) OR LIMIT-TO (PUBYEAR, 2015) OR LIMIT-TO (PUBYEAR, 2014) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (PUBSTAGE, "final")) AND (LIMIT-TO (LANGUAGE, "English")).

The selected papers were analysed and visualised using the VOSviewer software version 1.6.18. The status and academic development of research were assessed broadly on wellbeing and health in informal settlements. Specific outputs included networks and relationships related to authors, sources, countries, and keywords using co-occurrence and citation analyses [43]. Co-occurrence analysis explores the frequency of nouns or phrases in literature to identify relationships between topics in the discipline that the literature represents [42]. By calculating the frequency of occurrence of two subject words in the same document, a co-word network of the association was formed. The strength of the relationships or collaborations with other countries was also highlighted as evinced by the total link strength (TLS). The first bibliometric analysis revealed the research hotspots or concentrated phenomenon in the informal settlement literature regarding health and wellbeing over time (in this case, a decade, to reveal the most current knowledge). The specific impacts were subsequently identified using content analysis of the most cited studies as evinced from the first bibliometric phase. A similar two-phase approach was adopted by Okoro [43]. A deductive approach was used to identify authors' views relevant and aligned to the themes established from the clusters. Findings from both phases were integrated in the discussion.

#### 4. FINDINGS

Results emanating from the study showed that the top five countries publishing on informal settlements' health and wellbeing are the United Kingdom (UK) (21 documents, 237 citations, TLS=21), Kenya (12 documents, 96 citations, TLS=13), the United States (10 documents, 84 citations, TLS=12), South Africa (9 documents, 103 citations, TLS=7) and Canada (6 documents, 16 citations, TLS=9). The total link strength or collaboration was strongest with the UK, Kenya, and US.

The most cited author was Ayeb-Karlsson S. with 105 citations across three documents, while the strongest co-authorship links were between El Asmar K. and Habib R.R cited 36 times across three co-authored documents. The top seven sources with at least two documents per source were International Journal of Environmental Research and Public Health (3 documents, 43 citations, TLS=6), Frontiers in Public Health (2 documents, 0 citations, TLS=5), Social Science and Medicine (2 documents, 17 citations, TLS=4), Social Sciences (2 documents, 1 citations, TLS=3), and Plos One (2 documents, 9 citations, TLS=0), Sustainability (2 documents, 15 citations, TLS=0), and Trials (2 documents, 34 citations, TLS=0).

Analysis of author keywords using co-occurrence analysis revealed the top 25 keywords out of a total of 137. The co-word association is represented by clusters as shown in Fig. 2. Three groups/clusters emerged from the analysis. These included the following items:

- Cluster 1 (purple coloured) – Ten items including cash transfer, India, intimate partner violence, Kenya, marginalised and vulnerable, Nairobi, public health, urban informal settlements, and urban slums.

- Cluster 2 (green coloured) – Ten items including covid 19, green space, housing, impact evaluation, mental health, slums, social capital, south Africa, sub-Saharan Africa, and urban.
- Cluster 3 (blue coloured) – Five items including Conflict, displacement, gender, social networks, and urban health.

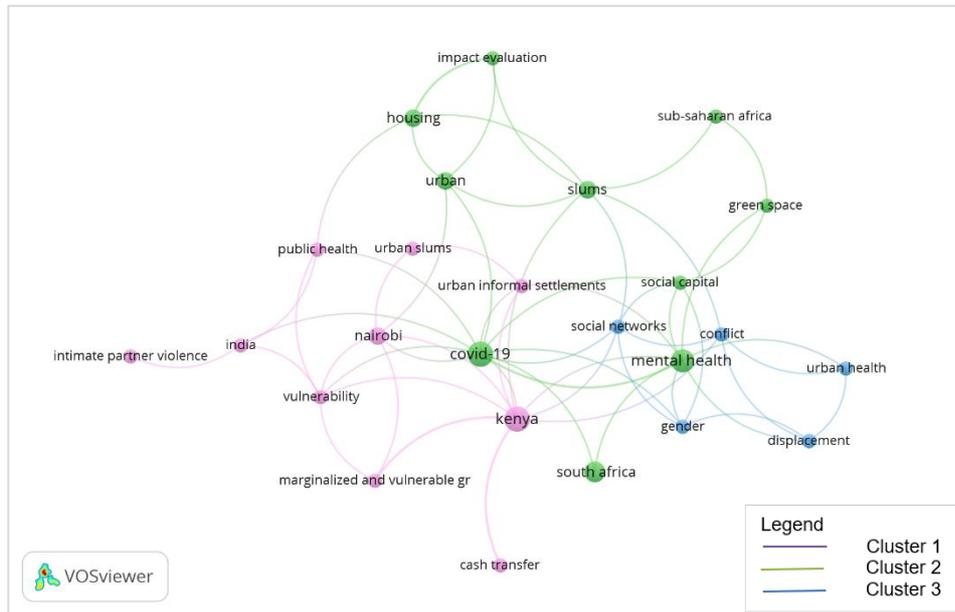


Fig. 2: Keyword analysis

The content analysis revealed views from the top ten cited studies (with at least 17 citations) centered around the established themes. The most cited document is an important metric because it highlights the most impactful and intensively researched topics [42]. Therefore, the top ten studies gave in-depth perceptions and reflected the most intensively researched areas on wellbeing and health characteristics and impacts in informal settlements. These are presented in Fig. 3 with their citation count indicated. The views from these studies are highlighted and integrated in the discussion section, in line with the deductively assigned themes/clusters.

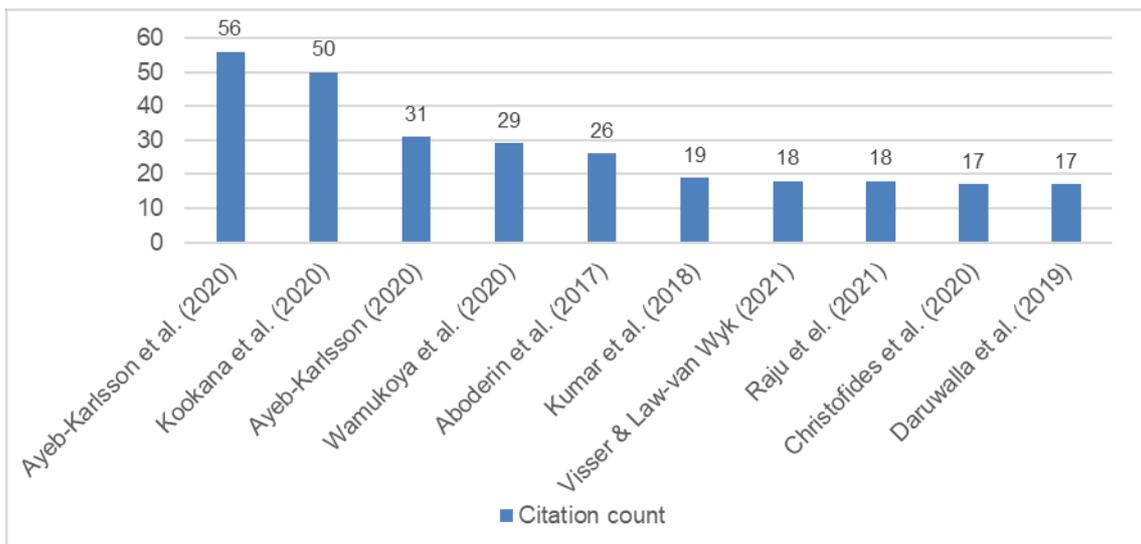


Fig. 3: Citation count of the most cited documents

## 5. DISCUSSION AND INTEGRATION OF BIBLIOMETRIC AND CONTENT ANALYSES FINDINGS

The above classification is slightly different from the WHO's [26] categorization of informal settlements' characteristics presented in Section 2. This is probably because of the overlap between impacts, which are highlighted in the discussed hereunder.

### *Cluster 1 - Marginalisation experiences affecting livelihoods*

The first cluster included items relating to experiences that affect the livelihoods of the most vulnerable groups in communities. According to Karuga et al. [44], informal settlements inhabitants face specific vulnerabilities shaped by limitations on their opportunities and capabilities within the context of urban inequities, which affect their wellbeing. In addition, the multiple intersectionality of inequity (age, gender, identity, and disability) and positionalities within the urban informal systems of power create vulnerabilities for households/individuals, which in turn exacerbate their discrimination and exclusion. Such positionalities of intersecting vulnerabilities can lead to marginalisation and exclusion from mainstream social, educational, and cultural life; thus, affecting their cash transfer, gender-based relationships and dependencies, and public health.

The above views were shared by six of the most cited studies, which focused on marginalised and vulnerable groups in India and Kenya. Ayeb-Karlsson et al. [45], the most cited study, which used Q methodology and discourse analysis to explore psychosocial constraints in informal settlements that paralyse inhabitants mentally and geographically. Aboderin et al. [46], the fifth most cited study, analysed the health and social circumstances of two slum communities in Nairobi and advocated age-friendly initiatives to tackle challenges and impacts in informal settlements, especially for older dwellers considered as vulnerable groups. Similar views were expressed by Kumar et al. [47] (the sixth most cited) and Raju et al. [48] (the eight most cited), in their studies of adverse childhood experiences in Kenya's informal settlements, and public health challenges of migrants and urban slum dwellers during the COVID-19 pandemic in India, respectively. The authors concurred that vulnerable populations require strategically targeted welfare policies and intervention planning to support informal settlement, a view shared by Daruwalla et al. [49] and Christofides et al. [50] in their studies on violence against women.

### *Cluster 2 – Neighbourhood and housing impacts*

The items here relate to neighbourhood and housing impacts. This is consistent with the WHO's [26] views on the impacts from the condition of housing and provision of basic infrastructure services. In agreement, the second most cited study, Kookana et al. [2], posited that limited resources in informal settlements worsen urbanization impacts. The study, which reviewed the urbanization-related challenges in developing countries in relation to globally Sustainable Development Goal 6 revealed that several cities are on the verge of water crisis and water distribution to informal settlements or slums in megacities is the most challenging. This is consistent with views expressed by the WHO [26] that informal cities' needs grow on an ad-hoc basis without adequate infrastructure provision, and this is challenging for urban leaders in addressing environmental and health challenges. Similar views were shared in the fourth most cited study, Wamukoya et al. [3], which used a descriptive-analytical approach to assess the historical dimensions, values, processes, challenges, and lessons learned from implementing a health surveillance system in two urban slums in Nairobi. The study sought an understanding of changes in the health and socio-economic status of urban slum dwellers, and the intra-urban and intra-slum differences. It also assessed household characteristics and availability of supporting amenities and services including energy, water, transport, gifts, toilet and garbage, personal hygiene, entertainment, rotating credit and saving associations, communication, salaries, electricity, healthcare, traditional or religious contributions, rent, school fees and other expenses.

### *Cluster 3 – Community and social environment*

Items here were related to the social environment in informal communities. According to Ayeb-Karlsson [24], the third most cited in this study, these are non-economic concerns and damages in urban environments. The study noted that belongingness, identity, quality of life and social value draw people to settle. The study investigated the connections between urban climate-induced loss of wellbeing and mobility in an informal settlement in Bangladesh using storytelling methodology. As

agreed by the WHO [26], better urban planning for green spaces fosters physical activity and positive social interactions. Poverty, gender inequality and weak social networks in urban settlements have also been linked to informal settlement characteristics and impacts like intimate partner violence [35], thus indicating a link with marginalisation experiences (cluster 1). Other studies concurred that the lack of community cohesion, belongingness, identity, quality of life and social value influence wellbeing in informal settlements [7,24]. Local health education and awareness campaigns, community engagement programs and social support structures could be emphasised to improve community cohesion and reduce disenfranchisement. The importance of social networks was also emphasised by Kabir et al. [6]. According to the study, social networks, which could be formal or informal, strategic, or reciprocated, are coping mechanisms in times of crisis or scarcity. Many residents foster close and trusting relationships, and a strong sense of community and integration in urban slums.

Further, more actors should engage in more expansive and collaborative thinking about strategies to improve informal settlements conditions in general, a view shared by Chumo et al. [11]. Increased collaboration between national and local governments, and momentum should be built to speed implementation of the UN Habitat III New Urban Agenda, which will help to provide basic services in a more equitable manner [8].

## 6. FUTURE RESEARCH

Although intersectoral collaboration was cited, for example, Weimann et al. [15], how the frameworks could work in reducing negative impacts and experiences in informal settlements was not explored. Also, according to Weimann et al. [15], there is dissonance between existing reactive, siloed approaches and the understood (and in policy documents, expressed) need for proactive, intersectoral interventions to be imagined and implemented for improving urban health and wellbeing sustainably. Future studies could focus on the nature and dynamics of such collaborations and engagements.

Further, only one study, the seventh most cited, was found that focused on university students [13]. More attention should be given to this important population group whose success at education and the future of an economy depends on their mental health and wellbeing. In addition, two useful tools for building resilience in social ecosystems are structured scenarios and proactive adaptive management, as expressed by Karuga et al. [44]. Resilience and adaptive management is necessary to monitor the progress of regulatory and managerial policies. Future research could focus on developing adaptive management and resilience frameworks targeted at vulnerable groups and incorporating economic and non-economic (social) welfare gains. The dearth of research into the subject in developing countries demonstrate the need for further research in this area, especially as informal settlements issues are greater there when compared to the developed ones. Additionally, there was no study found that measured the impact of informal settlements' characteristics on the health and wellbeing of the citizenry. Although Weimann et al. [15] acknowledged impacts, which may vary depending on geography scales (neighbourhood or community), gravity (hard or soft) and nature (direct or indirect), the extent of the impacts was not demonstrated or measured. This could be the focus of future quantitative studies.

## 7. CONCLUSION

The study explored priority areas in research on the characteristics of informal settlements that have implications for health and wellbeing of the settlers. Through bibliometric and content analyses, the study revealed that these can be categorised into marginalisation experiences that affect livelihoods, neighbourhood and housing, and community and social attributes of the settlements and residents. There is evidence that social networks are a coping mechanism for informal settlement challenges such as crisis or scarcity. Further, it was found that gender inequality, poverty and weak social networks are linked with partner violence which have implications for the health and wellbeing of the settlers. The study also found that these contributed to the status quo in informal settlements. Therefore, attention to neighbourhood characteristics and social networks/relationships to foster community engagement and enhance conscientiousness regarding health and safety standards in housing would go a long way in improving the status quo in informal settlements. Further, there is also an underrepresentation of studies in developing countries on the subject.

Informal settlement improvement efforts should focus on reducing crowding, providing access to basic services, and intervention/support systems within the community and governance. Vulnerable groups

assistance programs and community engagement should be implemented to improve social inclusion/cohesion, which will in turn improve mindfulness, strength, and capacity to support individual and households' livelihoods. There is no shortage of studies exploring the concepts of health in informal settlements, including the current desktop study which is limited in the absence of primary data. However, there is a need for more empirical studies on health and safety in informal settlements, specifically on the impact of the characteristics. More research into the subject that focuses on developing countries is also recommended.

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