

Supplement Material: Record of Search Strategy

Question/Topic: A systematised literature review was conducted to explore existing evidence and knowledge gaps on the association between informal settlement characteristics and health and the impact of informal settlement upgrading on health, within South Africa, an upper-middle income African country.

Population/Problem: Informal settlements

Intervention/Issue: Upgrading interventions

Comparison: Health status before and after upgrading

Outcome/Evaluation: Improved health

Main concepts/keywords/synonyms/ MeSH terms: upgrading; informal; health; South Africa; informal settlement; informal settlements; slum; slums; wellbeing

Databases searched:

Searches were conducted in two databases to identify recent publications – **Web of Science, PubMed**

Limits: **Language English**

Time frame: **1998 - 2018**

Abstracts of identified documents were read and full text of relevant documents were retrieved for further examination to determine appropriateness for review. In-text searches for the terms “informal settlement”, “slum”, “health”, “infectious”, “chronic”, “non-communicable disease” were conducted to explore relevance of article.

Inclusion and exclusion criteria:

Inclusion criteria:

Studies were included if they met any of the following criteria:

- Study is specific to the context of South Africa
- Study has an explicit link to informal settlements, and to at least one of the four dimensions of housing within the context of informal settlements (i.e. the house, the home, the neighbourhood, the community)
- Study has an explicit link to health (physical, mental and social wellbeing, as per the WHO's 1946 definition)

Exclusion criteria:

Studies were excluded if they met any of the following criteria:

- Published earlier than 1998, as the South African National Housing Code, which incorporates an informal settlement upgrading plan, was implemented in 1997
- Study only linked to poverty or homelessness; no explicit informal settlement link
- Discussion papers; or studies that are still ongoing
- Methodological concerns and/or methodology that was not well described and/or full text was not available

Reference lists: were hand-searched in order to identify studies that were possibly relevant to the following concepts:

- South Africa
- Informal settlement(s) / slums
- Health / wellbeing / any specific health outcomes or diseases

The final studies included in the literature review comprised experiments, retrospective case note reviews, case studies, cross-sectional studies, randomised control trials, qualitative studies, and systematic reviews.

Summary of the database searches are provided in Table S1 and Table S2 below.

Table S1: Search strategy undertaken for initial 2017 search.

Database searched	Search terms	Results	Relevant sources	Relevant source refs	Unique sources used	Unique source refs
2017 SEARCH						
Limits: English; 1998 – 2017						
Exclusion criteria: In pre-1998; if not specific to context of South Africa; did not have explicit link to informal settlements' did not have an explicit link to health in context of informal settlements						
Pub Med	Initial Searches using the specified search:					
	"UPGRADING" AND "INFORMAL" AND "HEALTH" AND "SOUTH AFRICA"	0	0	-	-	-
	Broadened searches:					
	"UPGRADING" AND "INFORMAL" AND "HEALTH"	8	0	-	-	-
	"UPGRADING" AND "INFORMAL SETTLEMENT" AND "HEALTH"	1	0	-	-	-
	"UPGRADING" AND "INFORMAL SETTLEMENTS" AND "HEALTH"	2	0	-	-	-
	"UPGRADING" AND "SLUMS" AND "HEALTH"	10	0	-	-	-
	"UPGRADING" AND "SLUM" AND "HEALTH"	12	0	-	-	-
	"UPGRADING" AND "SLUM" AND "WELLBEING"	1	0	-	-	-
	"UPGRADING" AND "SLUM" AND "WELL BEING"	3	0	-	-	-
	"UPGRADING" AND "INFORMAL" AND "WELLBEING"	0	0	-	-	-
	"UPGRADING" AND "INFORMAL" AND "WELL-BEING"	2	0	-	-	-
	"UPGRADING" AND "INFORMAL" AND "WELL BEING"	2	0	-	-	-
	"UPGRADING" AND "INFORMAL" AND "WELLBEING"	0	0	-	-	-
	Additional searches using combinations of the following terms	57	12	[1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12]	12	[1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12]
	"INFORMAL SETTLEMENT", "INFORMAL SETTLEMENTS", "SLUM", "SLUMS", "SOUTH AFRICA", "HEALTH", "WELLBEING", "WELL BEING", "WELL-BEING"					
Web of Science	Initial Search					

	"UPGRADING" AND "INFORMAL" AND "HEALTH" AND "SOUTH AFRICA"	3	2	[13, 14]	2	[13, 14]
	Broadened searches:					
	"UPGRADING" AND "INFORMAL" AND "HEALTH"	23	3	[13, 14, 15]	1	[15]
	"UPGRADING" AND "INFORMAL SETTLEMENT" AND "HEALTH"	5	2	[13, 15]	-	
	"UPGRADING" AND "INFORMAL SETTLEMENTS" AND "HEALTH"	2	0	-	-	-
	"UPGRADING" AND "SLUMS" AND "HEALTH"	17	1	[15]	-	-
	"UPGRADING" AND "SLUM" AND "HEALTH"	17	0	-	-	-
	"UPGRADING" AND "SLUM" AND "WELLBEING"	1	0	-	-	-
	"UPGRADING" AND "SLUM" AND "WELL BEING"	5	0	-	-	-
	"UPGRADING" AND "INFORMAL" AND "WELLBEING"	0	0	-	-	-
	"UPGRADING" AND "INFORMAL" AND "WELL-BEING"	2	0	-	-	-
	"UPGRADING" AND "INFORMAL" AND "WELL BEING"	2	0	-	-	-
	"UPGRADING" AND "INFORMAL" AND "WELLBEING"	0	0	-	-	-
	Additional searches using combinations of the following terms: "INFORMAL SETTLEMENT", "INFORMAL SETTLEMENTS", "SLUM", "SLUMS", "SOUTH AFRICA", "HEALTH", "WELLBEING", "WELL BEING", "WELL-BEING"	30	13	[13, 16, 17, 18, 2, 19, 5, 20, 7, 21, 9, 11, 12]	6	[16, 17, 18, 19, 20, 21]
REFERENCE LIST	Reference lists of selected articles were searched: South Africa; informal settlement(s); slums; any health outcome				7	[22, 23, 24, 25, 26, 27, 28]
					28	

Table S2: Search strategy undertaken for additional search conducted in 2018

2018 SEARCH					
Limits: English; 1998 - 2018					
Excluded Review Round 1: not specific to South African context (n=83); did not have explicit link to informal settlements (n=157); did not have explicit health link (n=39); discussion papers/studies still ongoing (n=10); methodology not disclosed/full text non available (n=2); duplicated articles (n=23);					
Excluded Review Round 2: if previously included in 2017 search (n=19); not clearly linked to at least 1 of the 4 interrelated dimensions of housing (n=22)					
Database searched	Search terms	Results	Studies retained from round 1 review	Studies retained from round 2 review	Final source refs
Pub Med	("UPGRADING" AND "INFORMAL" AND "HEALTH" AND "SOUTH AFRICA"); (UPGRADING AND INFORMAL AND HEALTH AND "SOUTH AFRICA"); ("INFORMAL	152	21		

	SETTLEMENTS" AND "SOUTH AFRICA" AND HEALTH); ("INFORMAL SETTLEMENT" AND "SOUTH AFRICA" AND "HEALTH"); ("SLUM" AND "SOUTH AFRICA" AND "HEALTH"); (SLUM AND "SOUTH AFRICA" AND "HEALTH"); ("INFORMAL SETTLEMENT" AND "SOUTH AFRICA" AND "WELLBEING"); ("INFORMAL SETTLEMENTS" AND "SOUTH AFRICA" AND "WELLBEING")				
Web of Science (including MEDLINE and SciELO Citation Index)	("UPGRADING" AND "INFORMAL" AND "HEALTH" AND "SOUTH AFRICA"); (UPGRADING AND INFORMAL AND HEALTH AND "SOUTH AFRICA"); ("INFORMAL SETTLEMENTS" AND "SOUTH AFRICA" AND HEALTH); ("INFORMAL SETTLEMENT" AND "SOUTH AFRICA" AND "HEALTH"); ("SLUM" AND "SOUTH AFRICA" AND "HEALTH"); (SLUM AND "SOUTH AFRICA" AND "HEALTH"); ("INFORMAL SETTLEMENT" AND "SOUTH AFRICA" AND "WELLBEING"); ("INFORMAL SETTLEMENTS" AND "SOUTH AFRICA" AND "WELLBEING")	221	38		
	<i>Round 2 review process</i>			18	[29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46]

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