

BMJ Open Emergency healthcare needs in the Lavender Hill suburb of Cape Town, South Africa: a cross-sectional, community-based household survey

Peter W Hodkinson , Jennifer Lee Pigoga , Lee Wallis

To cite: Hodkinson PW, Pigoga JL, Wallis L. Emergency healthcare needs in the Lavender Hill suburb of Cape Town, South Africa: a cross-sectional, community-based household survey. *BMJ Open* 2020;**10**:e033643. doi:10.1136/bmjopen-2019-033643

► Prepublication history and additional material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2019-033643>).

Received 15 August 2019
Revised 05 December 2019
Accepted 11 December 2019



© Author(s) (or their employer(s)) 2020. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

Division of Emergency Medicine, University of Cape Town, Rondebosch, South Africa

Correspondence to

A/Prof Peter W Hodkinson;
peter.hodkinson@uct.ac.za

ABSTRACT

Objective Emergency care is a key component of healthcare systems, but little is known about its real impact on communities. This study evaluated access, utilisation and barriers to healthcare, and specifically emergency care, in the low socioeconomic Cape Town suburb of Lavender Hill.

Design A cross-sectional, community-based household survey.

Setting Lavender Hill suburb in the Cape Flats of Cape Town, South Africa.

Participants Two-stage cluster sampling was used to identify approximately 13 households in each of 46 clusters, for a total of 608 households. A senior householder responded on behalf of each household surveyed.

Primary outcome measures Access to, utilisation of and unmet needs related to healthcare at large and emergency care.

Results In August 2018, 608 households were surveyed, encompassing 2754 individuals, with a response rate of 96.4%. Almost a quarter of respondents (n=663, 24.1%) used the healthcare system within the last year. Female gender, advancing age, lower levels of education, recipients of disability grants, smaller household sizes and living in formal dwellings were factors associated with increased risk of unmet healthcare and emergency care needs. Only a small proportion of respondents (n=39, 1.4%) reported having unmet emergency healthcare needs, with wait times at facilities (n=9, 23.1%), emergency medical service delays (n=7, 17.9%) and personal safety (n=6, 15.4%) being prominent. There was a high prevalence of chronic medical conditions (hypertension, diabetes and dyslipidaemias) and recent deaths predominantly from trauma and malignancy.

Conclusion The emergency healthcare needs of the community appear to be well catered for, although community expectations may not be high and many barriers exist, particularly in accessing emergency care—be it via ambulance services or at healthcare facilities—and caring for chronic diseases in the ageing population. The Lavender Hill community could benefit from programmes addressing chronic disease management and emergency care delivery within the community.

Strengths and limitations of this study

- Using a household survey to evaluate the usage and needs for emergency care is an innovative approach to this problem and builds on a 2017 research conducted in Cameroon.
- Household surveys are a resource-intensive, yet well-evidenced method of evaluating first-line community issues and perceptions, and although many have been conducted in South Africa none has focused on emergency care needs.
- This study evaluates access to, utilisation of and unmet needs for emergency care in a large, representative sample of households in the Lavender Hill community of Cape Town, South Africa.
- The results of this study are limited by factors inherent to the survey protocol, such as surveyors asking only one adult householder about the entire household's healthcare needs.

INTRODUCTION

Emergency care uses a range of services to address the time-sensitive needs of acutely ill and injured patients.¹ It addresses the management of a wide variety of time-sensitive medical, surgical and obstetric health issues, many of which consistently pose as major burdens in low-income and middle-income countries (LMICs), including in sub-Saharan Africa.^{2–9} Unlike most medical fields, which centre around facility-based care, emergency care is unique in that it is provided in a broader range of settings, from scenes of emergencies through to hospitals. It can be seen as a continuum, with various levels of care being rendered under two main components: out-of-hospital emergency care and in-hospital emergency care. Coordinated emergency care, from the scene of an emergency to care in emergency units, is an effective means of combating the toll that injuries, illness and other emergencies take on LMIC populations.^{10–13}

One aspect of this care is emergency medical services (EMS), which have been shown to have a significant impact on public health and secondary disease prevention, and could lead to a 25% decrease in mortality.^{7 14} An EMS is an essential aspect of any emergency care system and represents the gateway to healthcare facilities for many patients.¹⁵ The goal of an EMS system is to stabilise any life-threatening problems, and reduce morbidity, mortality and disability by providing timely care with subsequent transport to appropriate health facilities.^{5 7 16} These systems can be formal, consisting of certified trained emergency medical technicians and paramedics with access to ambulances or patient transport vehicles, or an informal system, where taxi drivers or other laypeople are trained in basic first aid and provide transport to healthcare facilities. Both types of systems have been shown to be effective in LMICs.^{5 7 16 17}

While there is a push for development of EMS systems in Africa, little is known about the accessibility and reliability of those that have been established.^{9 18} Despite EMS and prehospital systems developed in LMICs having been shown to reduce mortality, patients' perspective of such systems has yet to be evaluated in most countries. By using a more consumer-based method of health system evaluation that includes the community, shortcomings and pitfalls can be better identified, leading to new interventions to strengthen the EMS systems in place.

The aim of this study was to determine the emergency care needs of inhabitants of Lavender Hill, a township in the Cape Flats near the urban metropole of Cape Town, South Africa, via an evaluation of emergency care utilisation, and second a description of barriers to accessing emergency healthcare and clinical or demographic indicators associated with encountering these barriers.

METHODS

A community-based, cross-sectional survey of households in the Lavender Hill community was undertaken in August 2018.

Study setting

Lavender Hill is a township in the Cape Flats of South Africa that covers an area of 1.63 km². According to 2011 census data, it comprises a population of 25 897 people and 5113 households, likely to have increased substantially by this time with a growth of 18.4% reported in 2017 for Cape Town overall.¹⁹ The population has a slight female majority at 51.8%. Seventy-four per cent speak Afrikaans and 23.9% speak English, while the rest speak another language (eg, Xhosa, Zulu or Setswana).¹⁹ The community suffers from high rates of poverty, and is known for violent, gang-related crime, leading to Western Cape Government (WCG) EMS responding to many calls in Lavender Hill daily.²⁰ There are several nearby health facilities, but it is unknown if the EMS system adequately connects patients to these facilities or generally addresses the emergency care needs of the community.

Sampling methods

Cluster sampling was used to calculate the requisite sample size.²¹ A previous, similar study in Cameroon identified that 35% of the population had experienced at least one emergency condition in the last year and 69% had unmet needs for emergency care.²² Given a more developed urban health system, the more conservative 35% was used as the expected proportion; assuming that 35% of participants in the population had the factors of interest, along with an intraclass coefficient of 0.05 and cluster size of 12, a sample size of 542 was generated for expected proportion with 5% absolute precision and 95% confidence.²³ Given a hypothesised 10% non-response rate, we aimed to sample 600 households. The suburb's estimated 6000 households were divided into 46 representative clusters, each with approximately 140 households (estimated from local knowledge and satellite imagery).¹⁹ Systematic sampling methods were used to identify 13 households to survey within each cluster; every 13th household was to be surveyed within the cluster.

Survey protocol

The survey tool was modified to the South African context from a previous survey successfully conducted for the same purpose in Yaoundé, Cameroon.²² All major categories such as household information, individual health information and deaths were retained (online supplementary file). Items contextually appropriate to South Africa, such as social grants and medical aid, were added and presentations were aligned to the African Federation for Emergency Medicine's emergency chief complaint categories. The survey had two sections: one for households at large and another to be completed for each unique householder.

A paid survey team of four women from a non-governmental organisation (NGO) active in the suburb, fluent in the majority of the languages of the area (Afrikaans, English and Xhosa) and with previous experience conducting surveys, underwent a daylong protocol training workshop, after which they were evaluated for competency in administering the protocol. Surveyors then conducted an internal pilot of the survey to allow for refinement.

Patient and public involvement

Patient and public involvement representatives were incorporated into this study in the form of surveyors, who were known in the community; they were identifiable by the NGO logo and colours on their clothing and worked in pairs to approach a systematic sample of households across the suburb. Surveying occurred in specific demarcated blocks during working hours each day, starting at a convenient household, and then interviewing every 13th adjacent household until a sample of 13 households was reached. In each household they interviewed a senior householder 18 years of age or older. Where more than one adult householder was present, surveyors asked to interview the most senior member present. Written informed consent was

obtained from respondents in the language of their choice (Afrikaans, Xhosa or English) prior to beginning the survey. Surveyors were trained to ask a series of follow-up questions to the respondents to ensure adequate understanding of the informed consent process and to ensure that participation was entirely voluntary. Survey administration time was between 10 and 20 min, depending on the number of residents in the household. In the case of householders not being home, refusing to participate or language barriers, surveyors moved to the next household immediately adjacent until they were able to conduct an interview, later resuming the systematic allocation from the originally selected household.

Data collection and analysis

Data were collected in real time using paper forms as the surveyors interviewed the respondent following the study protocol. Participants were asked a variety of questions about their households, focusing largely on household demographics, healthcare utilisation throughout the past calendar year and any barriers to accessing healthcare. They were then asked for details about household members who had died in the last year. Finally, the participant was asked about each individual member of the household (age, gender, employment status, social grant status and details of any healthcare utilisation in the last year, as well as emergency health issues and unmet healthcare needs).

Forms were stored in a secure location and later entered digitally by a member of the research team. Data collection was overseen by a research coordinator in the community, who also performed quality checks at regular intervals. Survey data were entered into encrypted Microsoft Excel (Microsoft, Richmond, Washington) spreadsheets, after which basic and inferential statistics were generated using Stata V.15 software. Descriptive statistics were used to generate proportions of reasons for emergent healthcare utilisation and unmet needs, and to evaluate this utilisation among various demographic factors. An exploratory analysis with Fisher's exact testing was conducted to determine statistically significant differences (two-sided significance level of $p < 0.05$) across groups. Stepwise multivariable logistic regression with age, gender and cluster adjustments was conducted for variables significant at the univariate level to determine adjusted ORs (aORs) for factors influencing healthcare utilisation and unmet healthcare needs across different demographic and socioeconomic factors. Univariate adjustment to correct clustering using robust SEs (using household number as the cluster variable) was performed.

Data safety and monitoring

In order to coordinate data collection and prevent doubly surveying any one household, households were identified by location on initial paper-based survey forms. On electronic entry of data, no identifying information was captured, and only coded households and individual identifiers were used. Paper forms were stored in a secured location until entries were checked for accuracy,

after which they were destroyed. All researchers signed a confidentiality agreement, and individuals, households and locations are known only to the research team.

RESULTS

Respondent demographics

In August 2018, 608 households were surveyed, encompassing 2754 individuals, with a response rate of 96.4% (16 households were not available for surveying and 6 declined participation) (table 1). No survey responses were excluded.

A slight majority of participants were female (52.9%). Less than half had attained a grade 9 education, and only 17.6% had completed through grade 12. Despite this, almost 60% of adults of working age were unemployed. Three-quarters of respondents lived in formal dwellings, and there was a median of 5 household members in each household (range 1–21). Nearly all (99.7%) spoke both English and Afrikaans. Participants had a median monthly household income range of 1000–5000 South African rand (approximately US\$70–350).

Only 1.5% of respondents had health insurance (medical aid), and the remainder relied solely on public healthcare services provided by the government. One-third received at least one form of social support grants.

Using healthcare services

There were 663 (24.1%) individuals who reported using the healthcare system in the last year; these users were more likely to be women of older age (31 and above). They were also more likely to be unemployed or pensioners on fixed income and recipients of social grants (eg, disability). Respondents in larger households were much less likely to have used care, as were those in informal housing.

The majority of respondents who had visits within the last year did so between one and two times. Seventeen per cent ($n=113$) of healthcare utilisation instances were immediate, unscheduled presentations to facilities for emergencies. Utilisation was prescheduled by appointment in the remainder of cases. Most health complaints involved cardiac issues ($n=211$, 31.8%), followed by shortness of breath ($n=120$, 18.1%). Of the 663 individuals who had used healthcare services in the past year (mean age 47.2 years, SD 19.7), there were several prevalent chronic medical conditions termed hypertension in 222, 'heart disease' in 211, diabetes in 125, hypercholesterolaemia in 67, arthritis in 47, epilepsy in 22 and mental health issues in 25 (in many cases combinations of these in the same individual).

A majority of participants accessed care via public transport ($n=250$, 37.7%), walking ($n=202$, 30.5%) or a personal vehicle ($n=143$, 21.6%). Only 1.5% ($n=10$) used ambulance services for transport. Nearly all patients ($n=559$, 84.3%) went to community health centres (CHCs). Approximately 10.5% ($n=70$) went directly to a hospital. Of respondents who used healthcare services, 68.9% ($n=457$) stated that they were satisfied or very

Table 1 Demographics of survey respondents by healthcare utilisation over the past calendar year

	Healthcare utilisation over the past calendar year						P value
	Total		Yes		No		
	n	%	n	%	n	%	
Total	2754	100.0	663	24.1	2091	75.9	
Gender							
Female	1456	52.9	411	28.2	1045	71.8	<0.001
Male	1298	47.1	252	19.4	1046	80.6	
Age (years)							
Under 5	237	8.6	19	8.0	218	92.0	<0.001
6–10	365	13.3	26	7.1	339	92.9	
11–20	475	17.2	45	9.5	430	90.5	
21–30	474	17.2	46	9.7	428	90.3	
31–40	357	13	74	20.7	283	79.3	
41–50	274	10	97	35.4	177	64.6	
51–60	317	11.5	182	57.4	135	42.6	
61–70	167	6.1	114	68.3	53	31.7	
71+	84	3.1	59	70.2	25	29.8	
Median (IQR)	27 (12–47)		52 (35–61)		22 (10–36)		<0.001
Health insurance							
No	2712	98.5	650	24.0	2062	76.0	0.329
Yes	42	1.5	13	31.0	29	69.0	
Highest grade of education							
0–7	1160	43.6	290	25.0	870	75.0	<0.001
8–10	497	18.7	155	31.2	342	68.8	
11 or higher	1004	37.7	192	19.1	812	80.9	
Employment status							
Full-time	509	18.5	98	19.3	411	80.7	<0.001
Part-time	131	4.7	25	19.1	106	80.9	
Pensioner	253	9.2	175	69.2	78	30.8	
Preschool	311	11.3	28	9.0	283	91.0	
Scholar/student	658	23.9	52	7.9	606	92.2	
Unemployed	892	32.4	285	32.0	607	68.0	
Social grants received							
None	1841	66.8	382	20.7	1459	79.3	<0.001
Child support	581	21.1	46	7.9	535	92.1	
Disability	77	2.8	62	80.5	15	19.5	
Foster grant	5	0.2	0	0.0	5	100.0	
Old age pension	250	9.1	173	69.2	77	30.8	
Home language							
Afrikaans	155	5.6	41	26.5	114	73.5	0.52
English and Afrikaans	2591	94.1	622	24.0	1969	76.0	
English	8	0.3	0	0.0	8	100.0	
Number of household members							
1–2	199	7.2	101	50.8	98	49.2	<0.001
3–6	1600	58.1	379	23.7	1221	76.3	
7–10	811	29.4	161	19.9	650	80.1	
11–14	123	4.5	21	17.1	102	82.9	
15 or more	21	0.8	1	4.8	20	95.2	
Median (IQR)	5 (4–7)		5 (3–7)		5 (4–8)		<0.001

Continued

Table 1 Continued

	Total		Healthcare utilisation over the past calendar year				P value
			Yes		No		
	n	%	n	%	n	%	
Dwelling type							
Formal	2042	74.1	550	26.9	1492	73.1	<0.001
Informal	712	25.9	113	15.9	599	84.1	

satisfied with the services provided; 21.1% (n=140) were unsatisfied or very unsatisfied.

Knowledge of, and access to, emergency care varied. Some 41% knew the Cape Town emergency number to reach an ambulance, and another 12% were aware of other useful emergency numbers. Their experiences with ambulances were mixed: many (40%) said they were too slow or never arrived when called (22%), yet when they did arrive more than three-quarters found the quality of care to be fair or good. Respondents said that daytime emergencies would primarily be taken to a nearby CHC (67%) or hospital (32%), by ambulance (67%) or private care (22%); after-hours emergencies were similar, but more likely to go by ambulance (80%).

Unmet healthcare needs

Only 39 (1.4%) of all survey respondents reported having unmet emergency healthcare needs (table 2), nearly all of which (76.9%, n=30) were cited to be due to ongoing barriers. Advancing age as well as unemployment status and receipt of social grants were also linked to unmet needs.

Eighty-five per cent (n=33) of unmet healthcare needs were identified in cases where respondents were generally ill with medical issues (eg, infection). Three (7.6%) were due to psychiatric emergencies. Women represented 64.1% (n=25) of unmet needs.

Respondents identified self-limiting conditions (conditions resolving on their own) (25.6%, n=10), wait times at facilities (23.1%, n=9), EMS delays (17.9%, n=7) and concerns over personal safety (dangers and gang shootings) (15.4%, n=6) as reasons behind unmet healthcare needs. Financial barriers were only present for 5.1% (n=2) of these respondents.

Logistic regression identified multiple predictors for unmet healthcare needs in the Lavender Hill community (table 3). Women were more likely than men to have unmet healthcare needs (aOR 0.53, 95% CI 1.24 to 1.89). Advancing age was a substantial predictor: by the age of 31, respondents were 8.65 (95% CI 2.39 to 31.29) times more likely to have unmet needs; the risk increased with age.

Nine (23.1%) of those who identified as having unmet healthcare needs stated that these needs were not met due to facility wait times. Two (5.1%) noted that facilities were unhelpful and another two noted financial barriers. Sixty-nine per cent (n=418) of respondents who used healthcare services stated that they were satisfied or very satisfied with the services provided; 21.5% (n=131) were unsatisfied or very unsatisfied.

Thirty-five deaths were identified across responding households within the prior year; these deaths were largely male (n=19, 54.3%) with a mean age of 55.2 years (table 4). Some (n=12, 34.3%) deaths were sudden, of which eight were due to gunshot wounds. Those who died with gunshot wounds had a mean age of 32. Nearly all (n=7, 87.5%) were male and died on scene (n=6, 75.0%). Cancer claimed the lives of 31.6% (n=12), with a mean age of 60.5 years. Seventeen (n=48.6%) deaths occurred in a health facility, and only six (17.1%) were assisted by an ambulance in the final episode.

DISCUSSION

This study was able to describe healthcare utilisation, access and needs across a large, representative sample of the Lavender Hill community. We had an extremely low non-response rate of 3.6%, with instances of non-response due largely to unavailability of householders. This response rate is higher than that of a similar study in Cameroon, where 92.8% of participants encountered in the survey process responded.²² The high response rate by all available householders in our study may be due in part to surveyors being well known to the community. The make-up of the community as described by this survey was in line with a previous census¹⁹: gender, age structure and educational status were as expected. Due to the systematic clustering approach and large sample size, the results are likely representative of the community, and describe not only the demographics of the community in some detail but also their healthcare needs and utilisation.

A quarter of respondents used healthcare services within the past year and only 1.5% of the population had medical aid; these rates of coverage and access are similar to other reports of healthcare utilisation in LMICs.²⁴ Similar to WHO study findings, women tended to use healthcare services more frequently than their male counterparts.²⁵ Results also aligned with wider literature in that older adults and those reliant on social grants used healthcare services more often in Lavender Hill,^{26 27} and also that traumatic injuries and chronic illness led to the majority of healthcare utilisation.²⁸

Patients accessed care mainly via public or private transport, or walking, with very few using ambulance services. Just over half of those surveyed had some awareness of how to call for an ambulance or other emergency assistance, congruent with other research in Cape Town²⁹;

Table 2 Demographics of survey respondents by unmet healthcare needs over the past calendar year

	Unmet healthcare need(s) over the past calendar year						P value
	Total		Yes		No		
	n	%	n	%	n	%	
Total	2754	100.0	39	1.4	2715	98.6	
Gender							
Female	1456	52.9	25	1.7	1431	98.3	<0.001
Male	1298	47.1	14	1.1	1284	98.9	
Age (years)							
Under 5	237	8.6	0	0.0	237	100.0	0.099
6–10	365	13.3	3	0.8	362	99.2	
11–20	475	17.2	3	0.6	472	99.4	
21–30	474	17.2	8	1.7	466	98.3	
31–40	357	13.0	9	2.5	348	97.5	
41–50	274	10.0	4	1.5	270	98.5	
51–60	317	11.5	5	1.6	312	98.4	
61–70	167	6.1	5	3.0	162	97.0	
71+	84	3.1	2	2.4	82	97.6	
Median (IQR)	27 (12–47)		36 (26–55)		26 (12–46)		
Health insurance							
No	2712	98.5	39	1.4	2673	98.6	0.257
Yes	42	1.5	1	2.4	41	97.6	
Highest grade of education							
0–7	1160	43.6	16	1.4	1144	98.6	0.913
8–10	497	18.7	7	1.4	490	98.6	
11 or higher	1004	37.7	12	1.2	992	98.8	
Employment status							
Full-time	509	18.5	3	0.6	506	99.4	<0.001
Part-time	131	4.7	3	2.3	128	97.7	
Pensioner	253	9.2	8	3.2	245	96.8	
Preschool	311	11.3	1	0.3	310	99.7	
Scholar currently	656	23.8	4	0.6	652	99.4	
Student	2	0.1	0	0.0	2	100.0	
Unemployed	892	32.4	20	2.2	872	97.8	
Social grants received							
None	1841	66.8	26	1.4	1815	98.6	<0.001
Child support	581	21.1	3	0.5	578	99.5	
Disability	77	2.8	2	2.6	75	97.4	
Foster grant	5	0.2	0	0.0	5	100.0	
Old age pension	250	9.1	8	3.2	242	96.8	
Home language							
Afrikaans	155	5.6	6	3.9	149	96.1	0.002
English and Afrikaans	2591	94.1	33	1.3	2558	98.7	
English	8	0.3	0	0.0	8	100.0	
Number of household members							
1–2	199	7.2	8	4.0	191	96.0	0.018
3–6	1600	58.1	21	1.3	1579	98.7	
7–10	811	29.4	9	1.1	802	98.9	
11–14	123	4.5	1	0.8	122	99.2	
15 or more	21	0.8	0	0.0	21	100.0	
Median (IQR)	5 (4–7)		4 (3–7)		5 (4–7)		

Continued

Table 2 Continued

	Total		Unmet healthcare need(s) over the past calendar year				P value
			Yes		No		
	n	%	n	%	n	%	
Dwelling type							
Formal	2042	74.1	28	37.8	2014	98.6	0.114
Informal	712	25.9	11	6472.7	701	98.5	

however, experiences with ambulances were largely negative. Most said that they were slow to arrive or never did. Despite this and other anecdotal issues with emergency care mentioned by respondents, the majority found the quality of emergency care provisions in the community to be fair or good. It is unknown how accessible the community is for EMS and ambulance systems, as there is often substantial violence against EMS providers^{20 30}; this might affect EMS access and aligns with participant opinions on reliability and speed. While working towards violence reduction, effective interventions might include deploying a system of first responders embedded in the community to attend to injuries rapidly prior to ambulance arrival. This could be achieved using a community first responder programme such as the Emergency First Aid Responder system successfully implemented by WCG EMS in other areas of the metropole.^{31 32}

Once at facilities, participants perceived healthcare provisions to be poor, with excessive waiting and inefficient, patient-unfriendly systems; this is in line with similar studies conducted in South Africa^{33 34} and does suggest opportunities for simultaneous improvement efforts within hospitals. High costs were far less a barrier than originally anticipated based on the Cameroon study,²² and reflect the urban context of this community, with an array of public health services nearby.

Reports of unmet needs were very few at 1.4% of respondents, and even fewer for emergency care-specific needs. This is substantially smaller than the 68.8% of emergency care needs being unmet in Cameroon,²² and is surprising because general healthcare needs encompass emergency care needs and thus one would expect these broader healthcare needs to be even larger in number. This could be attributed to particularly low expectations of the healthcare system within the community, the numerous logistical barriers to accessing care, and perhaps cultural views on the necessity or utility of formal healthcare.

Unlike in the Cameroon study, where most unmet needs were in patients presenting with psychiatric emergencies, allergic reactions and haemorrhage,²² most Lavender Hill respondents with unmet needs had general (and largely more chronic healthcare-related) medical issues.

It was expected that increased age was associated with increased dependency on social services, as well as increased healthcare utilisation and unmet needs. Interestingly, smaller households and those who lived in formal dwellings were more likely to have unmet health needs, despite having used care more frequently. We suspect that

smaller households may represent the elderly, who are more likely to use healthcare services.

While our data do not allow for evaluation of mortality rates that robust death audits do,^{35 36} patterns and avoidable deaths can be identified, which may in turn point to gaps in the local healthcare system. The majority of deaths were either rapid on-scene trauma deaths or chronic conditions (eg, hypertension and diabetes) already being attended to by the healthcare system. From the limited information in this study, there is little evidence to suggest that deaths collected on were avoidable; it was unlikely that emergency care or healthcare at large could have reversed these poor outcomes, other than long-term screening and earlier intervention for oncological and chronic diseases. However, very few deaths received EMS assistance, suggesting that there are barriers to receiving any on-scene care in fatal situations.

Limitations

The results of this study are limited by factors inherent to the survey protocol, as well as social and cultural influences. This survey only asked one adult householder about the entire household's healthcare needs. It is unlikely that every respondent knew the exact needs of every person living in their household; other members might have reported otherwise. Given the large sizes of many households in Lavender Hill, this likely influenced survey results.

In both training surveyors and interviewing participants, it was identified that there was difficulty in understanding the concept of an emergency as distinct from chronic healthcare episode. This is a common phenomenon in regions where emergency care remains in its infancy that likely led to under-reporting of some unmet needs and emergencies.³⁷ Surveyors also noted in the debriefing process that the findings may reflect some inaccuracies, for example, people avoided discussing drug and gang-related healthcare issues, although they are known to be prevalent in many households.³⁸

Unlike the Cameroon survey, which assessed unmet needs specific to emergency care, this study evaluated unmet healthcare needs at large. While many survey items were specific to emergency care, there were also questions regarding access and barriers to care for chronic, non-emergent conditions. This means the results are reflective of the entire healthcare system; however, it limits generalisability and strength of findings related to emergency care. We are unable to extrapolate the findings of this

Table 3 Multivariable logistic analysis for unmet healthcare needs among survey respondents

	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Gender		
Female	1.63 (1.38 to 1.92)	1.53 (1.24 to 1.89)
Male	1.00	1.00
Age (years)		
Under 5	1.00	1.00
6–10	0.88 (0.47 to 1.65)	1.74 (0.70 to 4.34)
11–20	1.2 (0.67 to 2.15)	3.15 (1.00 to 9.90)
21–30	1.23 (0.71 to 2.14)	3.6 (1.00 to 12.95)
31–40	3 (1.74 to 5.16)	8.65 (2.39 to 31.29)
41–50	6.29 (3.72 to 10.63)	16.77 (4.71 to 59.78)
51–60	15.47 (9.22 to 25.94)	33.81 (9.53 to 119.99)
61–70	24.68 (13.99 to 43.51)	39.8 (9.34 to 169.68)
71+	27.08 (13.40 to 54.73)	45.02 (9.9 to 204.29)
Grade		
0–7	1.92 (1.52 to 2.42)	1.38 (1.04 to 1.82)
8–10	1.41 (1.14 to 1.74)	1.49 (1.12 to 1.99)
11 or higher	1.00	1.00
Employment status		
Full-time	1.00	1.00
Part-time	0.99 (0.91 to 1.62)	0.87 (0.51 to 1.51)
Pensioner	9.41 (6.63 to 13.36)	1.94 (0.81 to 4.66)
Preschool	0.41 (0.26 to 0.66)	3.23 (1.00 to 10.41)
Scholar currently	0.36 (0.25 to 0.52)	1.38 (0.67 to 2.84)
Student	0.97 (1.50 to 2.59)	1.53 (1.12 to 2.11)
Unemployed	1.00	1.00
Grant		
None	1.00	1.00
Disability	15.79 (8.92 to 27.95)	10.09 (5.10 to 19.95)
All other grants	1.36 (1.11 to 1.66)	0.98 (0.60 to 1.59)
Number of household members		
1–2	20.62 (15.52 to 27.37)	6.76 (4.38 to 10.45)
3–6	6.21 (5.42 to 7.16)	4.41 (3.38 to 5.73)
7–10	4.95 (4.03 to 6.09)	4.66 (3.47 to 6.25)
11–14	4.11 (2.96 to 5.74)	3.44 (2.15 to 5.49)
15 or more	1.00	1.00
Dwelling type		
Formal	1.95 (1.51 to 2.53)	1.54 (1.15 to 2.09)
Informal	1.00	1.00

study beyond this suburb and its own unique healthcare context, but it seems likely that the findings reflecting the burden of non-communicable disease are common to other urban LMICs.

The Lavender Hill community is well known for its sporadic gang-related violence, as portrayed by the deaths and injuries from gunshots. This is likely primarily a social entity related

Table 4 Causes of deaths within households across survey respondents (n=35)

Cause of death	n	%
Cancer	12	34.3
Chest pain/heart attack	3	8.6
Gunshot wound	8	22.9
Respiratory	4	11.4
Stroke	3	8.6
Other*	5	14.3

*Other includes HIV, tuberculosis, liver failure, dementia and unspecified 'old age'.

to poverty, unemployment and drugs. It is important to highlight the difficulties that this caused in conducting this survey; surveyors were at constant risk, having been caught in gunfights and held at gunpoint several times during the survey. These imminent safety risks should be planned for ahead of implementing any future survey.

CONCLUSIONS

Although the emergency needs of the community seem to be well catered for, there is no doubt that there is room for improvement, particularly in accessing emergency services—be it via community-based responders, ambulance services or at healthcare facilities.

Healthcare needs are predominantly due to chronic diseases of lifestyle, which are surely amenable to preventative lifestyle approaches, as well as aggressive and early healthcare screening and interventions. Programmes must also be targeted for the ageing population. This survey was not designed to explore these avenues, but further research and interventions are indicated.

Lavender Hill, like many other parts of Cape Flats, is economically disadvantaged. Through this survey, we were able to gain an understanding of the healthcare needs of the people living in Lavender Hill. With this information, future EMS and facility-based emergency care interventions can be better targeted at improving patient outcomes and satisfaction. In turn, this could help improve the large inequities and inequalities that exist in Cape Town and in other similar settings across the continent.

Acknowledgements We would like to acknowledge the New World Foundation and their staff for assisting us in conducting this survey.

Contributors PH and LW were involved in the design of this study. PH and JLP were involved in the acquisition, analysis or interpretation of data. PH and JLP were involved in drafting the manuscript, and all authors were involved in its revision and approval.

Funding This study was funded by the Cape Higher Education Consortium.

Competing interests None declared.

Patient consent for publication Not required.

Ethics approval Ethical approval was obtained from the Human Research Ethics Committee of the University of Cape Town (HREC 375/2018).

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement No data are available.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iDs

Peter W Hodkinson <https://orcid.org/0000-0002-0376-7982>

Jennifer Lee Pigoga <http://orcid.org/0000-0002-5587-590X>

REFERENCES

- Mould-Millman NK, Naidoo R, de Vries S, *et al*. AFEM consensus Conference, 2013. AFEM out-of-hospital emergency care Workgroup consensus paper: advancing out-of-hospital emergency care in Africa-Advocacy and development. *Afr J Emerg Med* 2014;4:90–5.
- Desta T. Diabetic ketoacidosis in an Addis Abeba children's Hospital. *Ethiop Med J* 1992;30:7–11.
- Mbugua PK, Otieno CF, Kayima JK, *et al*. Diabetic ketoacidosis: clinical presentation and precipitating factors at Kenyatta national Hospital, Nairobi. *East Afr Med J* 2005;82:S191–6.
- Lawless J. Paediatric emergency care in less-developed countries. *Lancet* 2001;357:1205.
- Razzak JA, Kellermann AL. Emergency medical care in developing countries: is it worthwhile? *Bull World Health Organ* 2002;80:900–5.
- Levine AC, Presser DZ, Rosborough S, *et al*. Understanding barriers to emergency care in low-income countries: view from the front line. *Prehosp Disaster Med* 2007;22:467–70.
- Anderson PD, Suter RE, Mulligan T, *et al*. World health assembly resolution 60.22 and its importance as a health care policy tool for improving emergency care access and availability globally. *Ann Emerg Med* 2012;60:35–44.
- Hofman K, Primack A, Keusch G, *et al*. Addressing the growing burden of trauma and injury in low- and middle-income countries. *Am J Public Health* 2005;95:13–17.
- Dalal S, Beunza JJ, Volmink J, *et al*. Non-communicable diseases in sub-Saharan Africa: what we know now. *Int J Epidemiol* 2011;40:885–901.
- Peden MMK, Sharma G. *The injury chart book: a graphical overview of the global burden of injuries*. Geneva: World Health Organization, 2002.
- World Health Organization. *The global burden of disease: 2004 update*. Geneva, Switzerland: World Health Organization, 2004: 40–5.
- Mock CN, Donkor P, Gawande A, *et al*. Essential surgery: key messages from disease control priorities, 3rd edition. *Lancet* 2015;385:2209–19.
- Kobusingye OC, Hyder AA, Bishai D. Emergency Medical Services. In: Jamison DT, Breman JG, Measham AR, eds. *Disease control priorities in developing countries*. 2nd edn. Washington, DC, 2006.
- Henry JA, Reingold AL. Prehospital trauma systems reduce mortality in developing countries: a systematic review and meta-analysis. *J Trauma Acute Care Surg* 2012;73:261–8.
- Sawe HR, Mfinanga JA, Lidenge SJ, *et al*. Disease patterns and clinical outcomes of patients admitted in intensive care units of tertiary referral hospitals of Tanzania. *BMC Int Health Hum Rights* 2014;14:26.
- Kobusingye OC, Hyder AA, Bishai D, *et al*. Emergency medical systems in low- and middle-income countries: recommendations for action. *Bull World Health Organ* 2005;83:626–31.
- Hobgood C, Mulligan T, Bodiwala G, *et al*. International Federation for emergency medicine model curriculum for continuing professional development. *CJEM* 2015;17:295–309.
- Hsia RY, Mbembati NA, Macfarlane S, *et al*. Access to emergency and surgical care in sub-Saharan Africa: the infrastructure gap. *Health Policy Plan* 2012;27:234–44.
- Frith A. Lavender Hill 2011 census data, 2011. Available: <https://census2011.adrianfrith.com/place/199041118>
- Times Live. Police sergeant shot dead while chasing suspects in Cape town gang stronghold, 2019. Available: <https://www.timeslive.co.za/news/south-africa/2019-06-25-police-sergeant-shot-dead-while-chasing-suspects-in-cape-town-gang-stronghold/> [Accessed 29 Jul 2019].
- Elfil M, Negida A. Sampling methods in clinical research; an educational review. *Emerg* 2017;5:e52.
- Ro YS, Shin SD, Jeong J, *et al*. Evaluation of demands, usage and unmet needs for emergency care in Yaoundé, Cameroon: a cross-sectional study. *BMJ Open* 2017;7:e014573.
- Statulator: An online statistical calculator. Sample size calculator for estimating a single proportion: Statulator beta, 2019. Available: <http://statulator.com/SampleSize/ss1P.html>
- Leslie HH, Malata A, Ndiaye Y, *et al*. Effective coverage of primary care services in eight high-mortality countries. *BMJ Glob Health* 2017;2:e000424.
- Global Health Observatory (GHO) data. *World health statistics 2019: monitoring health for the SDGs*. Geneva, Switzerland: World Health Organization, 2019.
- World Health Organization. Ageing and health. Geneva, Switzerland, 2019. Available: <https://www.who.int/news-room/fact-sheets/detail/ageing-and-health> [Accessed 01 Jul 2019].
- Zuurmond M, Mactaggart I, Kannuri N, *et al*. Barriers and facilitators to accessing health services: a qualitative study amongst people with disabilities in Cameroon and India. *Int J Environ Res Public Health* 2019;16:1126.
- Debas HT, Donkor P, Gawande A, *et al*, eds. *Essential Surgery: Disease Control Priorities*. Vol. 1. 3rd edn. Washington (DC), 2015.
- Anest T, Stewart de Ramirez S, Balhara KS, *et al*. Defining and improving the role of emergency medical services in Cape town, South Africa. *Emerg Med J* 2016;33:557–61.
- Ground Up. We're afraid to leave our homes, Lavender Hill residents tell police minister, 2019. Available: <https://www.groundup.org.za/article/afraid-leave-their-homes-lavender-hill-residents-tell-police-minister/> [Accessed 29 Jul 2019].
- Sun JH, Shing R, Twomey M, *et al*. A strategy to implement and support pre-hospital emergency medical systems in developing, resource-constrained areas of South Africa. *Injury* 2014;45:31–8.
- Sun JH, Wallis LA. The emergency first aid Responder system model: using community members to assist life-threatening emergencies in violent, developing areas of need. *Emerg Med J* 2012;29:673–8.
- Murphy K, Chuma T, Mathews C, *et al*. A qualitative study of the experiences of care and motivation for effective self-management among diabetic and hypertensive patients attending public sector primary health care services in South Africa. *BMC Health Serv Res* 2015;15:303.
- Jones CHD, Ward A, Hodkinson PW, *et al*. Caregivers' experiences of pathways to care for seriously ill children in Cape town, South Africa: a qualitative investigation. *PLoS One* 2016;11:e0151606.
- Willcox ML NB, Price J, Stuart B, *et al*. Death audits and reviews for reducing maternal, perinatal and child mortality. *Cochrane Database Syst Rev* 2018;7:CD012982.
- Willcox ML, Kumbakumba E, Diallo D, *et al*. Circumstances of child deaths in Mali and Uganda: a community-based confidential enquiry. *Lancet Glob Health* 2018;6:e691–702.
- Broccoli MC, Cunningham C, Twomey M, *et al*. Community-Based perceptions of emergency care in Zambian communities lacking formalised emergency medicine systems. *Emerg Med J* 2016;33:870–5.
- Asante KO, Lento AG. Use of crystal methamphetamine among male adolescents in Cape town, South Africa: caregivers' experiences. *Subst Abuse Treat Prev Policy* 2017;12:18.