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

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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 household 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 5,113 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 (e.g., 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.39 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

|                      | Total | Healthcare utilisation over the past calendar year | P value |
|----------------------|-------|----------------------------------------------------|---------|
|                      | n     | %        | Yes | n | %    | No | n | %    |
| Total                | 2754  | 100.0    |     | 663 | 24.1 | 2091 | 75.9 |
| Gender               |       |          |     |     |      |     |     |      |
| Female               | 1456  | 52.9     | 411 | 28.2 | 1045 | 71.8 |
| Male                 | 1298  | 47.1     | 252 | 19.4 | 1046 | 80.6 |
| Age (years)          |       |          |     |     |      |     |     |      |
| Under 5              | 237   | 8.6      | 19  | 8.0 | 218  | 92.0 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
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.

Five (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;

| Dwelling type | Total | Yes | No | P value |
|--------------|-------|-----|----|---------|
|             | n     | %   | n  | %      |<0.001 |
| Formal      | 2042  | 74.1| 550| 26.9   |        |
| Informal    | 712   | 25.9| 113| 15.9   |        |

Table 1 Continued
Table 2  Demographics of survey respondents by unmet healthcare needs over the past calendar year

|                             | Total       | Unmet healthcare need(s) over the past calendar year |  |  |  |
|-----------------------------|-------------|------------------------------------------------------|--|---|---|
|                             | n           | %          | n           | %          | n           | %          |
| Total                       | 2754        | 100.0      | 39          | 1.4        | 2715        | 98.6       |
| Gender                      |             |            |             |            |             |            |
| Female                      | 1456        | 52.9       | 25          | 1.7        | 1431        | 98.3       |
| Male                        | 1298        | 47.1       | 14          | 1.1        | 1284        | 98.9       |
| Age (years)                 |             |            |             |            |             |            |
| Under 5                     | 237         | 8.6        | 0           | 0.0        | 237         | 100.0      |
| 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)  | 0.004      |
| Health insurance            |             |            |             |            |             |            |
| No                          | 2712        | 98.5       | 39          | 1.4        | 2673        | 98.6       |
| Yes                         | 42          | 1.5        | 1           | 0.0        | 41          | 97.6       |
| Highest grade of education  |             |            |             |            |             |            |
| 0–7                         | 1160        | 43.6       | 16          | 1.4        | 1144        | 98.6       |
| 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       |
| Part-time                   | 131         | 4.7        | 3           | 0.3        | 128         | 97.7       |
| Pensioner                   | 253         | 9.2        | 8           | 0.3        | 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       |
| Child support               | 581         | 21.1       | 3           | 0.5        | 578         | 99.5       |
| Disability                  | 77          | 2.8        | 2           | 0.3        | 75          | 97.4       |
| Foster grant                | 5           | 0.2        | 0           | 0.0        | 5           | 100.0      |
| Old age pension             | 250         | 9.1        | 8           | 0.3        | 242         | 96.8       |
| Home language               |             |            |             |            |             |            |
| Afrikaans                   | 155         | 5.6        | 6           | 3.9        | 149         | 96.1       |
| 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       |
| 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)     | 0.001      |

Continued
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. 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.

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 and does suggest opportunities for simultaneous improvement efforts within hospitals. High costs were far less a barrier than 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, 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, 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, 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 household member 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. 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.

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

| Gender          | Unadjusted OR (95% CI) | Adjusted OR (95% CI) |
|-----------------|------------------------|----------------------|
| 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)    | 3.8 (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                 |
| 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 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.

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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’.
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