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Do deferred emergency payment programmes increase use of injury care services in Cameroon? A trauma registry analysis

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ABSTRACT

Background Injured patients in Cameroon face high out-of-pocket costs and care discrepancies based on ability to pay. Per government declaration, all Cameroonian hospitals instituted emergency payment deferral (EPD) programmes to mitigate financial barriers to emergency care. Doctors or nurses decide on patients' eligibility for the EPD programme. However, the impact of EPD on care patterns is unclear.

Methods The Cameroon Trauma Registry (CTR) is a prospective, multisite trauma registry collecting injured patient data from four hospitals in Cameroon. Using CTR data from March 2020 to February 2022, we analysed associations between patient participation in EPD programmes and healthcare interventions using univariate analysis and multivariate logistic regression.

Results Of 5287 CTR patients, 58% (n=3081) were emergency payment deferral recipients (EPDR). A greater proportion of EPDR lived in urban residences (89% EPDR vs 87% non-EPDR, p=0.003). EPDR more often presented with a 'serious' or more severe estimated injury severity (70% EPDR vs 59% non-EPDR, p<0.001). Compared with non-recipients, a smaller proportion of EPD recipients, a smaller proportion of EPDR underwent recommended X-rays (48% EPDR vs 51% non-EPDR, p<0.001). However, greater percentages of EPDR received a recommended ultrasound (3% vs 1%, p<0.001) or CT scan (14% EDPR vs 10% non-EDPR, p<0.001). EPDR more often did not receive radiological tests due to inability to pay (12% vs 4%, p<0.001). Moreover, 10% of EPDR did not undergo recommended surgery due to cost while 6% of non-EPDR did not undergo recommended surgery due to cost (p<0.001). Multivariate logistic regression controlling for injury severity and other demographics indicates that EPDR were less likely to undergo surgery (adjusted OR=0.63, p=0.001).

Conclusion Payment deferral programmes were associated with increased use of some imaging tests, but did not fully address the downstream financial barriers that impede health equity in Cameroon.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Cameroon lacks universal health coverage (UHC), and health financing in its fee-for-service system most commonly occurs as out-of-pocket payments before the rendering of medical care.
⇒ Though the current payment system limits access to adequate healthcare, this barrier is exacerbated in the setting of trauma, as the poorest patients likely suffer the most severe outcomes.
⇒ To reduce the financial causes of delayed care for patients in emergency situations, the Cameroon Ministry of Public Health instructed all health facilities to provide emergency care first and defer solicitation of payment for 24 hours after arrival.
⇒ However, the impact of this payment deferral policy on care patterns has not been studied.
⇒ Analysing the impact of payment deferral on trauma care will help inform policy on the usefulness of the strategy.

WHAT THIS STUDY ADDS

⇒ Our study revealed that patients with markers of lower socioeconomic status and more severe injuries were more likely to be emergency payment deferral recipients (EPDR).
⇒ EPDR patients received more ultrasound and CT diagnostic studies while also being less likely to leave the hospital against medical advice.
⇒ However, EPDR patients more often refused to undergo recommended radiological tests and surgery due to inability to pay.
⇒ Overall, multivariate logistic regression controlling for injury severity and other demographics indicates that EPDR patients were less likely to undergo surgery.
⇒ While emergency payment deferral may assist in the process of early diagnosis in the setting of trauma, it falls short of providing a comprehensive solution to the complex financial barriers present in Cameroonian healthcare.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Despite the significant burden of injury in Cameroon, emergency and trauma care are not included among the interventions targeted in the first phase of Cameroonian UHC implementation that was launched in 2024.

⇒ By demonstrating the limitations of emergency payment deferrals, this study provides an evidence basis to inform Cameroonian policy makers as they seek to implement the next phase of UHC interventions.

⇒ Nevertheless, in the current fee-for-service system, the existence of an emergency payment deferral mechanism in addition to other UHC measures could greatly impact injured patients seeking emergency care.

⇒ Increased governmental financial support in emergency care settings can result in rapid diagnosis and treatment of injuries to ultimately decrease the burden of trauma in Cameroonian society.

INTRODUCTION

According to the United Nations (UN) Sustainable Development Goal (SDG) target 3.8, populations should have access to quality healthcare services without exorbitant costs that push people into poverty. Ideally, the implementation of universal health coverage (UHC) recommended by UN SDG 3.8 can provide healthcare without prohibitively expensive costs for citizens.[1] However, many countries in sub-Saharan Africa still primarily operate with fee-for-service healthcare systems that force patients to finance their care with out-of-pocket payments.[2] Consequently, patients facing high out-of-pocket costs may minimise care-seeking behaviour and delay treatment, leading to worsening outcomes.[3 4] People with lower socioeconomic status (SES) often disproportionately suffer the greatest burden of poor health outcomes due to inability to pay.[2 4] In 2021, the Central African lower-middle-income country of Cameroon allocated US$64 per capita for healthcare expenditure, which comprises less than 4% of gross domestic product.[5] This amount per capita is among the lowest on the continent, but similar to bordering nations. Under the current fee-for-service system, Cameroonian healthcare operates with out-of-pocket costs paid by patients in 67% of cases while private health insurance covers only 3% of cases.[5] Moreover, Cameroon lacks formal UHC and does not have a national-scaled risk-pooling payment system.[6] In a country where a quarter of the population lives on less than US$2.15 per day, healthcare financing from out-of-pocket payments reduces access to healthcare services among the impoverished and vulnerable.[7–9]

Cameroon has worked to increase access to affordable healthcare services by initiating the first phase of UHC.[6 10 11] The interventions covered by this strategy include preventive services, such as vaccination, and specialised programmes including care for individuals living with HIV. However, this first phase does not fund medical treatment for emergency medicine or trauma care services.[11] Multiple hospital-based studies show evidence of high rates of trauma-related mortality and morbidity in Cameroon, with higher impact among people of lowest SES.[3 4 9 12 13] As a result, the disease burden of injury in Cameroon remains unsurprisingly high.[13 14] Approximately 96% of injured patients in Cameroon finance care at the emergency department (ED) with out-of-pocket payments, less than 1.5% of injured patients have access to private insurance and more than 50% of injured patients report cost as a barrier to care.[3] The anticipation of such prohibitive costs of radiological tests and surgical intervention, if indicated, may lead to delay or avoidance of formal care seeking.[4 15] Rapid diagnosis and early intervention in the form of radiological tests and surgery are critical to improving outcomes among trauma patients.[15–17] Additionally, increased access to some imaging modalities allows patients to have a more informed risk-benefit assessment about moving forward with therapeutic interventions such as surgical care. While a decrease in injury-related mortality reduces the overall disease burden of injury in Cameroon, morbidity after injury remains a significant issue.[4 13] In particular, Cameroonians of lower SES suffer disproportionately from long-term disability and other poor outcomes following injury.[4 15]

To reduce the barrier of emergency healthcare costs, in 2016 the Cameroon Ministry of Public Health (MOPH) instructed hospitals to implement an emergency payment deferral (EPD) system.[18] Under the typical Cameroonian fee-for-service model, patients pay for emergency care such as medications and specialist consultations before the services are rendered. Most healthcare materials like bandages and intravenous line tubing are purchased at the hospital pharmacy and delivered to the ED for the rendering of treatment. According to the MOPH policy, patients acutely presenting to the ED with a 'vital emergency' should first receive care without payment and receive a bill for services rendered 24 hours later.[18] The aim of this EPD system is to allow primary trauma care providers to focus on the treatment of critically injured patients regardless of ability to pay. While the EPD system should be offered to all acutely ill patients presenting to the ED, patients have the option to refuse the deferred payment and pre-pay for each service individually.

The association between the EPD system and care patterns, including access to diagnostic and surgical treatment, remains unclear. To determine if the deferred payment system is associated with the increased use of emergency injury services, we compared patterns of care provided among recipients of emergency financial assistance to non-recipients, who either refused or were not offered emergency deferral services. Provided that the programme is functioning as designed, we hypothesised that patients using EPD should have increased access to diagnostic tests and therapeutic interventions in the emergency setting.

METHODS

Study design

We conducted a retrospective cohort study of data collected in the Cameroon Trauma Registry (CTR) between March 2020 and February 2022. The CTR is a prospective, observational study using hospital-based data sources.

STUDY SETTING AND DATA SOURCE

The CTR is a previously described multisite registry that prospectively gathered data on injured patients presenting to four CTR-affiliated hospitals in the Littoral and Southwest regions of Cameroon between 2015 and 2022.[15 19 20] The four CTR-affiliated hospitals included a public tertiary referral hospital with a catchment area of 3 million people (Laquintinie Hospital of Douala), two public secondary referral hospitals with catchment areas of 100 000–300 000 people, respectively, (Regional Hospital of Limbe and Regional Hospital Annex of Edéa), and finally a private Catholic hospital with a catchment area of less than 100 000 people (Catholic Hospital of Pouma).

STUDY PARTICIPANTS

Patients enrolled in the CTR were followed from admission until exit from the hospital. Inclusion criteria for enrolment included all consenting patients who experienced an injury within the last 2 weeks and presented to the ED of a CTR-affiliated hospital with one of the following characteristics: (1) formal admission to the ward for at least 24 hours; (2) transferred patients and leaving against medical advice; (3) deceased patients, including death on arrival. Patient disposition from the ED was categorised as at least one of the following: discharged home, admitted to the ward, admitted to the intensive care unit, admitted directly to the operating room (OR), left against medical advice or transferred to another hospital. Patient age and injury severity thresholds were not exclusion criteria.

PATIENT AND PUBLIC INVOLVEMENT

No trauma patients nor public were involved in the design, implementation and dissemination plan of the CTR-related findings.

VARIABLES, DATA ANALYSIS AND STATISTICAL METHODS

We analysed patient demographic and clinical variables from the CTR data set in this study. Demographic variables included age, sex, urban or rural residence status, cell phone ownership, education attainment and cooking fuel use. High education attainment, cellphone ownership, urban residence status and use of liquid petroleum gas cooking fuel were regarded as proxies for increased SES. Additionally, we classified patients in six SES clusters from rural poor to urban wealthy based on an EconomicCluster algorithm generated and validated using the CTR data sets.[21 22] The variables used to build the EconomicCluster algorithm were urban/rural residence, agricultural land ownership, residence ownership, cellphone ownership and cooking fuel.[21 22] Clinical variables included recommendation of imaging and surgical services and subsequent utilisation of such services. Research assistants also documented reasoning for refusing recommended interventions, if applicable. The Highest Estimated Abbreviated Injury Severity score (HEAIS) was calculated using clinical factors and used as an estimate of injury severity.[23]

We defined emergency payment deferral recipients (EPDR) as the cohort of patients who accepted the EPD service. The cohort of patients who were not offered payment deferrals or refused to use deferrals were not differentiable in our data sets and were all considered as non-EPDR. Continuous variables were described as medians and IQRs. X^2 analysis was used for comparison of categorical variables and Kruskal-Wallis analysis for continuous variables, respectively. For all analyses, an alpha level of less than 0.05 was considered significant. Statistical analysis was conducted in Stata V.16.[24]

ETHICS

The study obtained Institutional Review Board (IRB) approval from the University of California, Los Angeles, and approvals from the Cameroon National Ethics Committee for Human Research. Patients or patient surrogates provided verbal consent for enrolment in the CTR after research assistants conducted the informed consent process using an IRB approved script. Parents and/or guardians provided verbal consent for minor patients under the age of 18. The research assistants encouraged patients and surrogates to ask questions during the informed consent process. Patients were reassured that CTR enrolment was voluntary, and their enrolment decision had no effect on their medical care. The use of verbal consent in lieu of written consent was granted by the IRB given variable literacy rates and emergency setting of the CTR. Patients or surrogates who did not consent to participate were not enrolled in the CTR.

RESULTS

There were 5287 total patients enrolled in the CTR between March 2020 and February 2022. Of all enrolled CTR patients during this period, 58% (n=3081) of patients were EPDR (table 1).

Based on economic status indicators such as place of residence, education, cell phone ownership and cooking fuel, we found that the EPDR group had a greater proportion of individuals who were likely to be of lower SES than the non-EPDR group (table 1). While a slightly larger portion of EPDR resided in urban residences, a smaller percentage of EPDR (94%, n=2893) owned cellphones compared with non-EPDR (98%, n=2150) (p<0.001). A greater percentage of EPDR lacked any formal education (EPDR 2.8% n=85 vs non-EPDR 1.5% n=34, p<0.001).

Table 1 Patient demographic data (n=5287)

	EPDR* (n=3081)	Non-EPDR* (n=2206)	
	Percentage (n)	Percentage (n)	P value
Age (median, IQR)	32 (24–42)	32 (25–42)	0.54
Male sex	78.7 (2426)	76.7 (1691)	0.119
Urban residence	88.9 (2738)	86.9 (1916)	0.004
Own cellphone	93.9 (2893)	97.5 (2150)	<0.001
Education			
None	2.8 (85)	1.5 (34)	<0.001
Primary	23.6 (728)	17.3 (383)	<0.001
Secondary	58.1 (1789)	54.4 (1199)	<0.001
University	10.3 (318)	12.9 (285)	<0.001
Cooking fuel			
Wood	19.2 (590)	6.0 (132)	<0.001
Charcoal	6.8 (208)	2.0 (45)	<0.001
Kerosene	8.6 (264)	8.3 (182)	<0.001
Liquid petroleum gas	34.5 (1063)	47.0 (1036)	<0.001
Economic cluster			<0.001
Rural poor	94 (31)	6 (2)	
Rural wealthy	50.9 (260)	49.1 (251)	
Urban poor	80 (40)	20 (10)	
Urban middle class - home owner	55.2 (1790)	44.6 (1443)	
Urban middle class - tenant	71.2 (725)	28.9 (294)	
Urban wealthy	40.6 (116)	59.4 (170)	
Hospital type			<0.001
Primary referral HCP	0 (0)	100 (323)	
Secondary referral HRL HRE	58.8 (646) 93.1 (703)	41.2 (453) 6.9 (52)	
Tertiary referral HLD	55.9 (1704)	44.1 (1346)	
Hospital presentation			
Primary presentation	56.1 (2234)	43.9 (1749)	
Transferred from another facility	65.2 (837)	34.8 (447)	
Unknown transfer status	50 (10)	50 (10)	

*Missing values were excluded from analysis.
AMA, against medical advice; EPDR, emergency payment deferral recipient; HCP, Catholic Hospital of Pouma; HLD, Laquintinie Hospital of Douala; HRE, Regional Hospital of Edéa annex; HRL, Regional Hospital of Limbe; ICU, intensive care unit; OR, operating room.

Furthermore, a greater percentage of EPDR used wood for cooking fuel and a smaller proportion of EPDR used liquid petroleum gas (table 1). The EconomicCluster distribution of EPD recipients confirmed these results, with greater proportions of EPDR among the poorer classes, except for the urban wealthy class. The largest representation gaps were observed among the poorest and the middle-class cluster groups (table 1).

The most common mechanism of injury was road traffic injuries for both EPD recipients (or EPDR) and those who did not benefit from the EPD programme (non-EPDR) (table 2). While both cohorts demonstrated similar systolic blood pressure on presentation (EPDR 128 (IQR 115–140) mm Hg vs non-EPDR 127 (IQR 116–139); p=0.30), EPDR exhibited a slightly lower median heart rate on admission (EPDR: 87 (IQR 76–99)

Table 2 Patient clinical data (n=5287)

	EPDR* (n=3081)	Non-EPDR* (n=2206)	
	Percentage (n)	Percentage (n)	P value
Mechanism			
RTI	72.9 (2246)	73.1 (1612)	<0.001
Assault	6.0 (186)	4.2 (93)	<0.001
Fall	7.4 (229)	9.5 (209)	<0.001
Stab wound	7.2 (221)	9.4 (207)	<0.001
Unknown/missing/other	6.5 (199)	3.9 (85)	<0.001
Arrival HR (bpm) (median, IQR)	87 (76–99)	89 (79–98)	0.03
Arrival SBP (mm Hg) (median, IQR)	128 (115–140)	127 (116–139)	0.30
HEAIS			
Mild	0.7 (21)	1.7 (38)	<0.001
Moderate	28.1 (866)	36.3 (800)	<0.001
Serious	56.0 (1724)	48.2 (1063)	<0.001
Severe	10.7 (329)	8.9 (196)	<0.001
Critical	1.9 (58)	1.1 (25)	<0.001
Unsurvivable	1.6 (48)	0.4 (9)	<0.001
Disposition			
Discharged home	6.6 (203)	10.7 (236)	<0.001
Admit ward	56.8 (1750)	53.5 (1179)	<0.001
Admit ICU	1.0 (32)	0.4 (8)	<0.001
Direct to OR	4.5 (139)	0.8 (18)	<0.001
Died	6.3 (195)	1.5 (32)	<0.001
Left AMA	16.4 (506)	20.9 (461)	<0.001
Transferred	6.4 (196)	8.5 (187)	<0.001

*Missing values were excluded from analysis.
AMA, against medical advice; bpm, beats per minute; EPDR, emergency payment deferral recipient; HEAIS, Highest Estimated Abbreviated Injury Severity Score; HR, heart rate; ICU, intensive care unit; mm Hg, millimetres of mercury; OR, operating room; RTI, road traffic injury; SBP, systolic blood pressure.

beats per minute (bpm) vs non-EPDR: 89 (IQR 79–98) bpm; p value=0.03). EPDR demonstrated greater estimated injury severity, with a larger proportion of EPDR presenting with HEAIS of 'serious' or greater (EPDR 70%, n=2159 vs non-EPDR 59%, n=1293; p<0.001). A greater proportion of EPDR were admitted to the ward (EPDR 57%, n=1750 vs non-EPDR 53%, n=1179; p<0.001) and were taken directly to the OR (EPDR 5%, n=139 vs non-EPDR 1%, n=18; p<0.001) compared with the non-EPDR cohort. A smaller proportion of EPDR patients left the hospital against medical advice (EPDR 16%, n=506 vs non-EPDR 21%, n=461; p<0.001).

Patterns of care differed between patients in EPDR and non-EPDR cohorts (table 3). For indicated radiological tests, EPDR underwent X-rays at a lower frequency than non-EPDR (EPDR 47%, n=1460 vs non-EPDR 51%, n=1125; p<0.001), but more commonly received ultrasound (3%, n=83 vs non-EPDR 1%, n=23; p<0.001) and CT imaging (EPDR 14%, n=443 vs non-EPDR 10%, n=211; p<0.001). Overall, the proportion of patients receiving radiological tests was higher among the EPDR patients, irrespective of their SES cluster (figure 1). Despite this, a much higher percentage of EPDR patients refused a radiological study because of inability to pay (EPDR 12%, n=379 vs 4%, n=85; p<0.001) (table 3).

Similarly, though the EPDR cohort had a higher percentage of patients undergoing surgery (details on the different types of surgeries provided in online supplemental table 1) consistently inside each SES cluster (figure 2), cost impeded surgical treatment in 10% (n=293) of EPDR patients but only 6% (n=131) of the non-EPDR cohort (p<0.001) (table 3).

Despite these differences in care patterns between the two groups, there was no significant difference in ED cost of care (EPDR US$68 vs non-EPDR US$64; p=0.14) (table 3). Multivariate regression controlling for age, sex, injury severity, urban residence, cellphone ownership and education level indicated that EPDR patients were

Table 3 Cost of care, utilisation of diagnostics and surgical intervention (n=5287)

	EPDR (n=3081)	Non-EPDR (n=2206)	
	Percentage (n)	Percentage (n)	P value
Underwent X-ray	47.4 (1460)	51.0 (1125)	<0.001
Underwent US	2.7 (83)	1.0 (23)	<0.001
Underwent CT	14.4 (443)	9.6 (211)	<0.001
Underwent MRI	0.2 (5)	0.2 (4)	0.78
Diagnostic study not performed due to cost	12.3 (379)	3.9 (85)	<0.001
Underwent surgery	22.8 (702)	19.9 (439)	<0.001
Did not undergo surgery due to cost	9.5 (293)	5.9 (131)	<0.001
ED disposition cost in CFA (median, IQR)	40 955 (28 000–54 850) CFA	38 650 (28 450–60 000) CFA	0.14
ED disposition cost in US$ (median, IQR)*	US$68.26 (US$46.67–US$91.42)	US$64.41 (US$47.41–US$100.00)	0.14

*Note: an exchange rate of US$1=600 CFA was used when calculating disposition costs in US$.
CFA, Central African franc; ED, emergency department; EPDR, emergency payment deferral payment recipient; US, ultrasound.

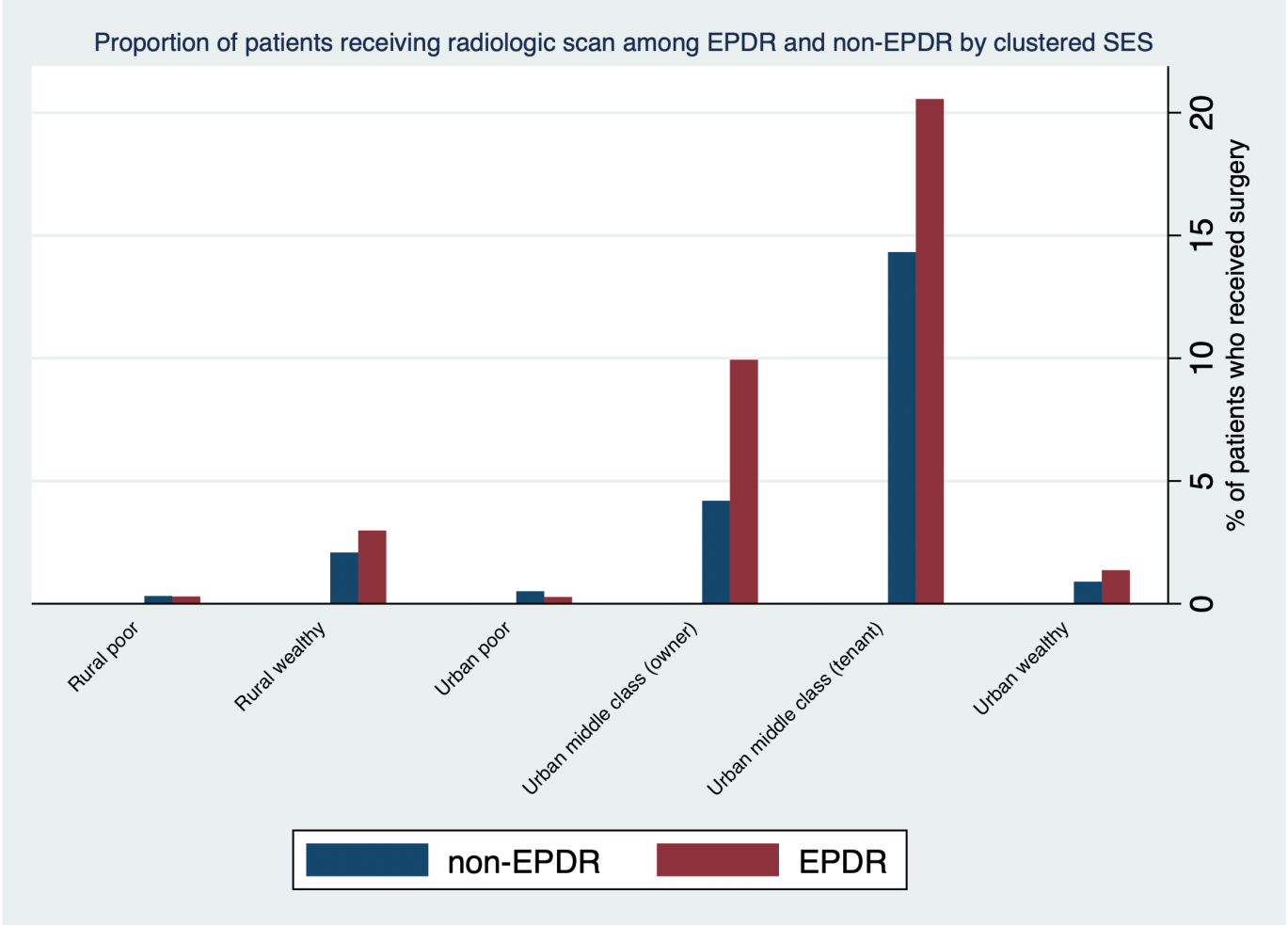

Figure 1 Proportion of patients receiving radiological tests by clustered socioeconomic status. EPDR, emergency payment deferral recipients; SES, socioeconomic status.

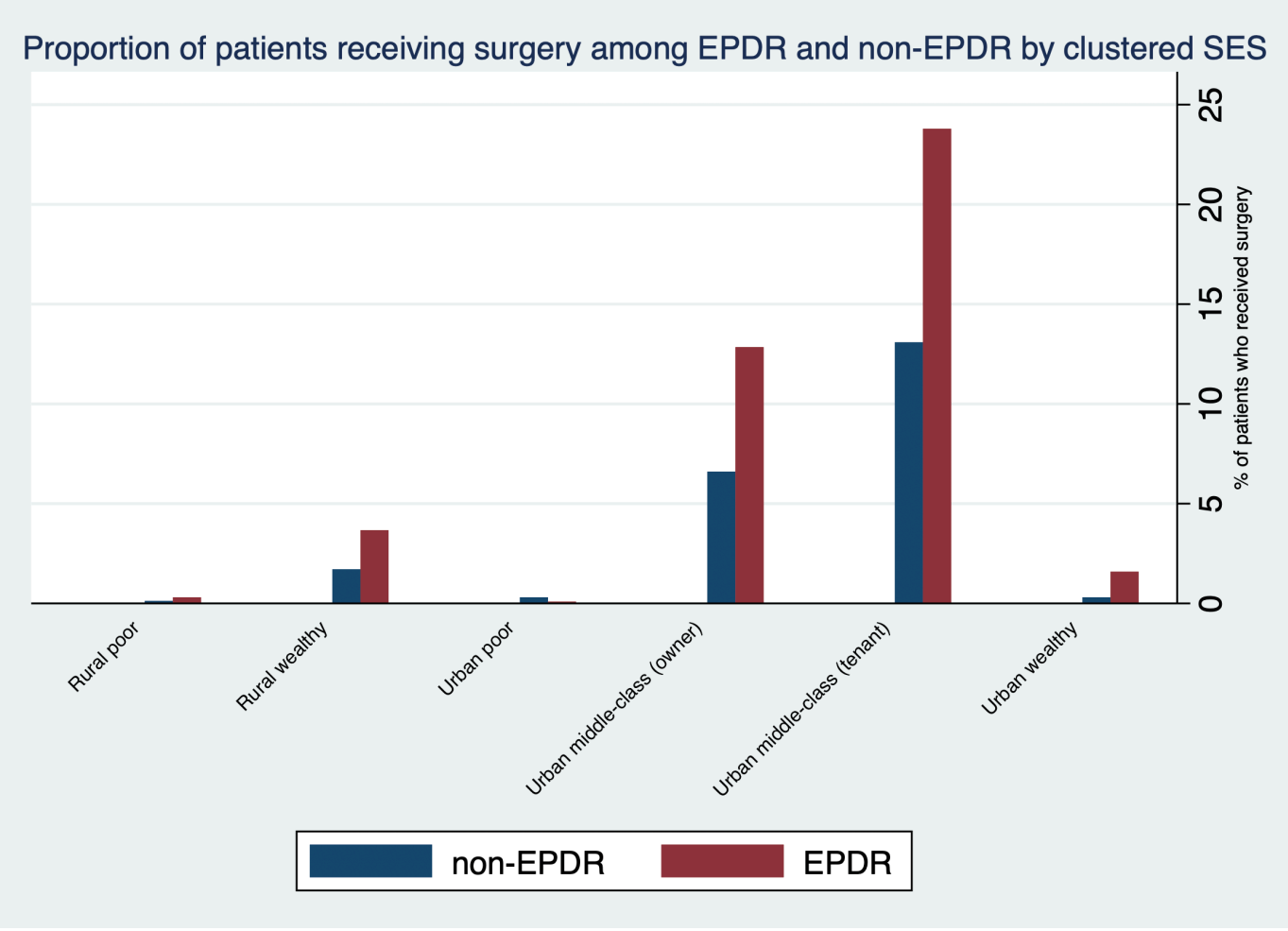

Figure 2 Proportion of patients receiving surgery by clustered socioeconomic status. EPDR, EPDR, emergency payment deferral recipients.

less likely to undergo surgery (adjusted OR=0.63, 95% CI 0.50 to 0.80, p<0.001).

DISCUSSION

The present study aimed to determine the association between the Cameroonian EPD system and patients' access to emergency and surgical care. Our main findings suggested that the EPD programme was associated with increased use of some diagnostics, but did not address the downstream financial barriers that impede health equity in Cameroon.

A greater proportion of individuals who likely belong to a lower SES in the EPDR cohort indicates that the EPD programme was successful in serving a more financially vulnerable population. We also found the use of ultrasound and CT scans in a greater proportion of EPDR patients, indicating increased access to some radiological tests. This also suggests another success of this programme, especially in the Cameroonian context where increased access to imaging has been shown to be positively associated with survival among injury victims.[15] However, inability to pay was cited as a prohibitive factor for receipt of many radiological tests in the EPDR cohort.

In contrast to its success in increasing access to some radiological tests, the EPD programme was seemingly less effective in reducing barriers to surgical care, as the EPDR cohort had decreased access to surgical care on regression analysis in our study. Once again, cost appeared to be a major barrier to surgical care, as a greater proportion of patients in the EPDR cohort declined surgical care due to perceived cost concerns.

Overall, our findings suggest that the EPD programme in its current state ultimately appears to be limited: people from the poorest SES have greater programme use and better access to urgent radiology tests, but they still do not end up with better access to surgical care. Despite not needing to provide up-front payment prior to receiving services, patients know that hospitals will expect payment 24 hours after arrival to the hospital, as stated in the MOPH official note.[18] This could explain the persistence of costs as a barrier for care access, especially for surgical services (more expensive than radiological tests), that we observed in our study: most of the patients who refused to undergo the prescribed radiology and/or surgery gave the 'inability to pay [later]' as the main reason for their refusal. Therefore, continued reform

of the Cameroonian fee-for-service system might be indicated.

This study has several notable limitations. Patient demographics are self-reported on arrival by patients or patient surrogates to research assistants, which may lead to inaccurate or missing data. Another limitation is linked with the possible selection bias related to the patients considered as 'EPD recipients'. Although all patients are eligible for payment deferral, it appears that not all patients were offered it by personnel in the ED and not all patients to whom it was offered accepted the voucher. This discrepancy may be explained by non-standardised nursing practices or limited documentation by research assistants.

Given the complex decision-making associated with healthcare financing, especially among patients for whom cost is a major barrier, future research using qualitative interviews with hospital stakeholders and injured patients can provide more in-depth analysis of payment deferral impact and its impact on care provision. Though all patients are eligible for payment deferral but just over half of patients accept the programme, understanding patient perceptions of payment deferral and their motivations for accepting or declining the services is critical to programme development. Likewise, analysing the perspectives of healthcare providers in a qualitative study may help determine why payment deferral appears to be inconsistently offered to patients. Other future studies may evaluate long-term clinical outcomes of EPDR patients and catalogue of individual healthcare financing solutions once billing begins. As the Cameroonian government progresses in the development of its healthcare financing systems, there is a need for continued evaluation of care patterns and resource provisions.

CONCLUSION

The EPD programme was associated with increased access to some early care (radiological diagnostics), but not to the ultimate surgical care needed by injured patients, thus failing in its final goal of alleviating the prevailing financial barriers to care. EPDR patients indicated that cost persisted as a significant barrier for the receipt of diagnostic imaging and therapeutic intervention. Achieving greater healthcare equity in Cameroon requires interventions that address the high burden of out-of-pocket costs through additional financing solutions.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by (1) Cameroon National Ethics Committee for Human Research (No2018/09/1034/CE/CNERSH/SP and No2022/03/1444/CE/CNERSH/SP) and (2) University of California, Los Angeles (IRB#19-000086). Participants gave informed consent to participate in the study before taking part.

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