



Closing the treatment gap: Antiepileptic Drug Availability, Affordability and Quality in Urban and Rural Ghana

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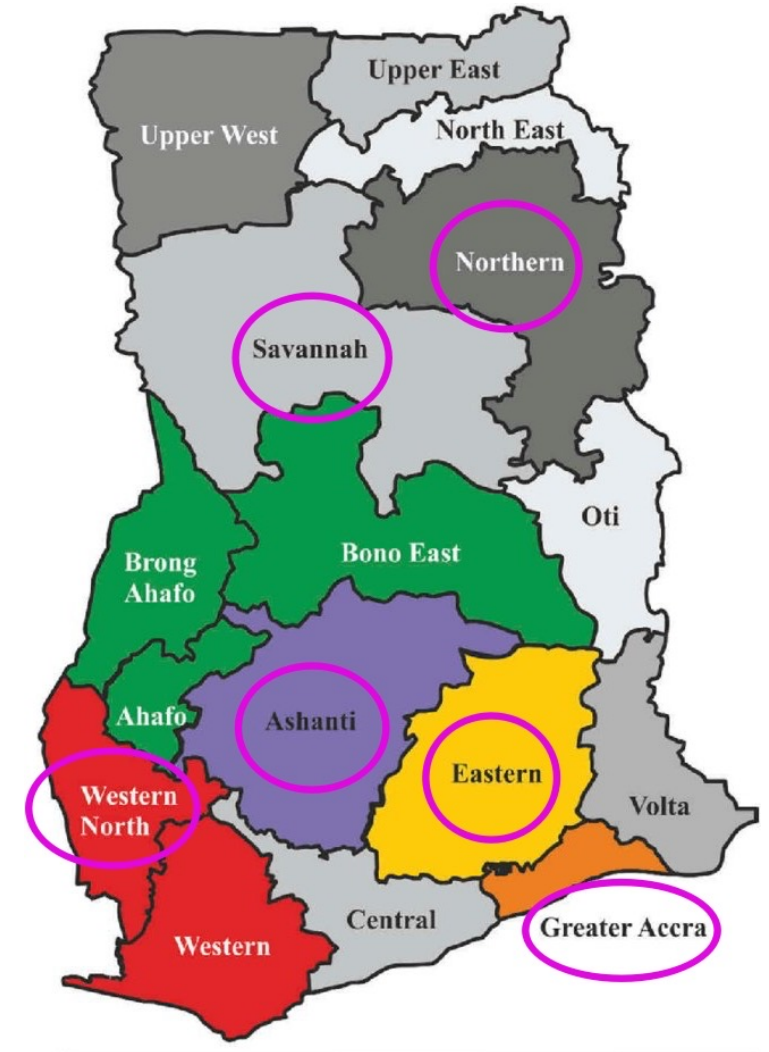
Introduction

- Epilepsy is a major neurological disorder that requires long-term medical treatment.
- About 80% of people with epilepsy (PWE) live in LMICs¹.
- The Epilepsy Treatment Gap (ETG) is the percentage of people with active epilepsy not being appropriately treated.
 - 70% - 85% in LMICs¹
- Accessibility and quality of treatment therefore remain important issues.
- This study assessed the availability, affordability and quality of antiepileptic drugs (AEDs) in rural and urban areas in Ghana.



Methods

- A cross-sectional study was carried out in both rural and urban dispensary structures in Accra, Kumasi, Tamale, Anum-Boso, Juabo, and Bole.
- Randomly selected formal facilities and facilities outside the approved distribution chain were included e.g. Over-The-Counter Medicine Sellers (OTCMS) and street sellers.



Medicine selection and data collection

- Antiepileptic drugs studied were those listed in
 - 21st WHO Essential Medicines List 2020
 - Essential Medicines List, Ministry of Health, Ghana, Seventh Edition (7th), 2017
- Only solid oral pharmaceutical forms (tablet/capsule) were investigated.
- Data collected
 - AEDs availability, strength, cost, and country of manufacture
- Samples were collected by researchers posing as patients



Endpoints

- AED was considered available if at least one strength of this AED was available in the facilities
 - Availability was expressed as a percentage, by molecule
 - Very low: < 30%; low: 30%-49%; fairly high: 50%-80%; high: >80%
- Median price ratios were computed using WHO/HAI methods²
 - MPR calculated by local median unit prices, compared with International Reference Prices (IRPs)⁴
 - MPR of 1.0 means the local price is equivalent to the IRP.
- Affordability gauged with reference to the Ghana national daily minimum wage.



Quality of AEDs

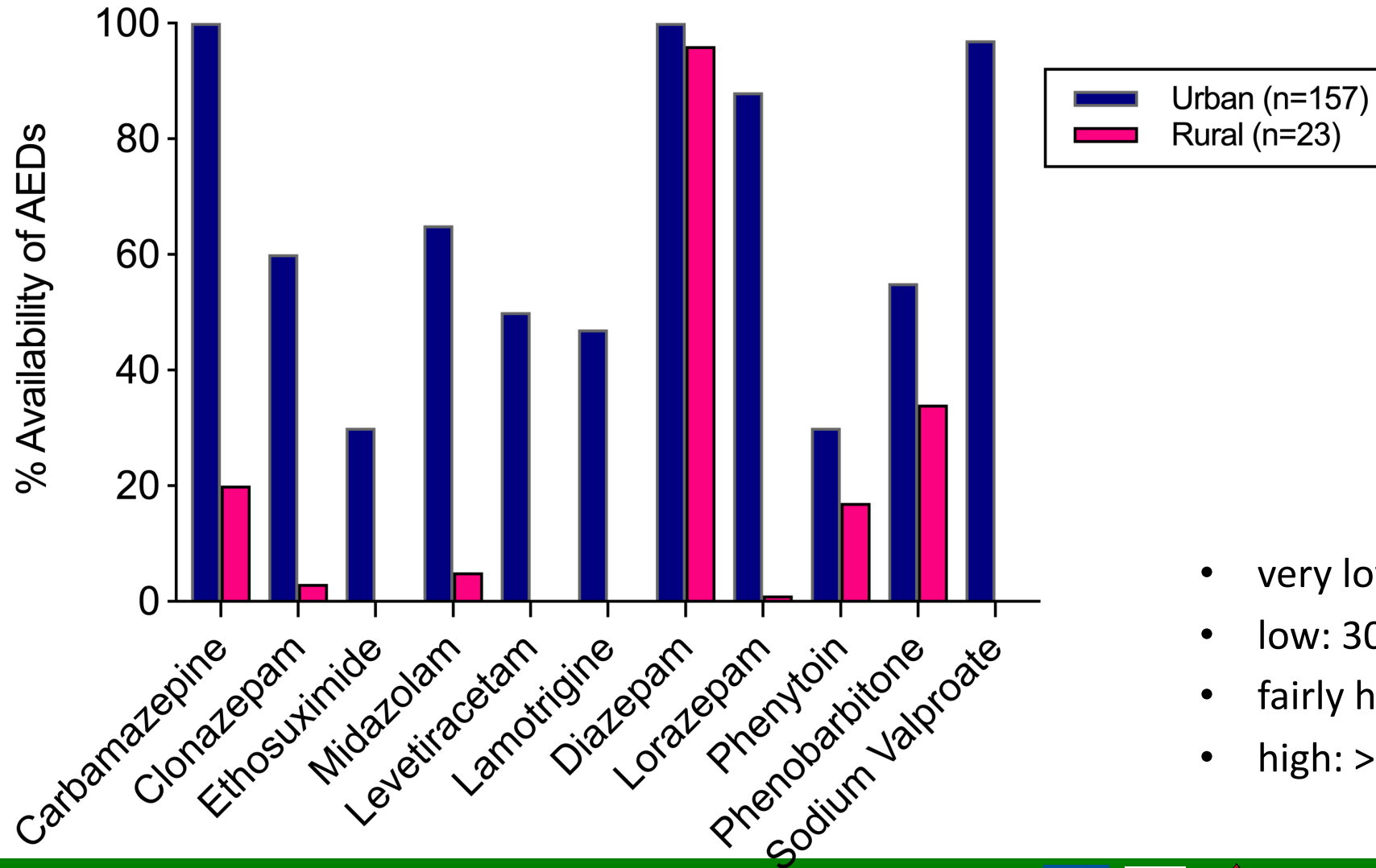
- All collected samples were considered for analysis .
- Assays were performed by high-performance liquid chromatography (HPLC).
- Pharmacopoeias (British, BP 2018; American USP41; International Pharmacopoeia 7th edition) were used as references for all samples.
- Manufacturer's analytical procedure was used for the sodium valproate film-coated scored.
- Samples were assessed for uniformity of weight, dissolution time and active ingredient content.

Results

- 180 facilities - Accra (75), Kumasi (65), Tamale (17), Anum-Boso (11) , Juabo (6), and Bole (6).
- 12 (52.2%) of facilities in the rural areas were OTCMS.
- 11 AEDs were studied: Carbamazepine, Clonazepam, Diazepam, Ethosuximide, Lamotrigine, Levetiracetam, Lorazepam, Midazolam, Phenobarbitone, Phenytoin, Sodium Valproate
- Diazepam was the only AED obtained from 73 (71.6%) of 102 street sellers.



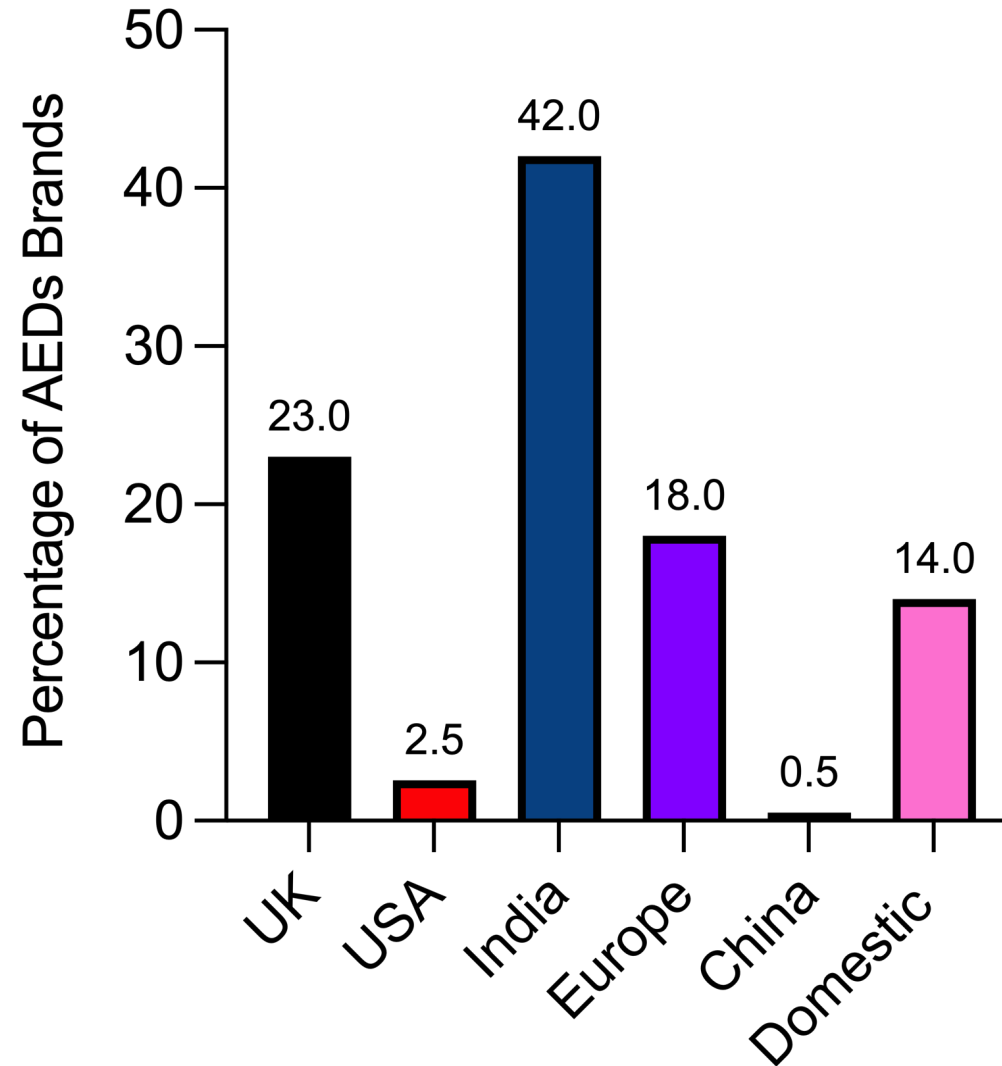
Availability of Recommended AEDs in Urban and Rural Ghana



- very low: < 30%;
- low: 30%-49%;
- fairly high: 50%-80%;
- high: >80%



Origin of AEDs Available on the market



Affordability of AEDs on the market

Drug	*Median Price Ratio
Carbamazepine	3.070
Clonazepam	26.344
Diazepam	5.039
Ethosuximide	2.105
Lamotrigine	5.957
Levetiracetam	7.719
Lorazepam	11.174
Midazolam	3.511
Phenobarbitone	4.557
Phenytoin	1.954
Sodium Valproate	3.155

* MPR calculated with WHO/HAI methods in comparison with IRP



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Treatment Costs for Epilepsy

Drug	Median Cost Per Tab, GHC	Treatment cost (Per Month, GHC)	NHIS Reimbursement Per tab, GHC	Treatment cost Covered by NHIS, GHC
Carbamazepine	2.45	183.75	2.40	180
Clonazepam	4.73	1135.20	NR	0
Diazepam	0.27	8.10	0.10	3
Ethosuximide	6.00	540.00	4.55	*409.5
Lamotrigine	4.00	360.00	NR	0
Levetiracetam	4.40	396.00	NR	0
Lorazepam	3.00	225.00	0.63	*47.25
Midazolam	5.07	151.95	4.90	147
Phenobarbitone	0.20	12.00	0.10	6
Phenytoin	0.50	45.00	0.45	40.5
Sodium Valproate	1.25	375.00	1.20	360

Monthly costs based on WHO ATC/DDD Index . 67 (39.8%) of Pharmacies accepted NHIS for cost of medicines.



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Quality of AEDs

Total Samples
= 4687 units
(150 batches)

Good Quality
62.09%

100% - Clonazepam,
Diazepam, Ethosuximide,
Lamotrigine, Levetiracetam,
Lorazepam, Midazolam,
Phenytoin, Sodium Valproate
Carbamazepine (80%),
Phenobarbitone (67%),

**Good Quality
with caution**
0.0%

Substandard
37.91%

*Failed one test

Carbamazepine (20%)
Phenobarbitone (33%)

Bad Quality
0.0%

*Failed two tests

Fake AED
0.0%

*Failed all tests



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Conclusions

- Availability of recommended AEDs is low in rural areas in Ghana.
- Affordability of epilepsy treatment in Ghana is low.
- Majority of sampled AEDs on the market are of good quality.
- Increasing domestic production of AEDs is an integral part of the strategy to lower drug prices and increase availability.



Thank you



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References

1. World Health Organization, 2017. Tracking universal health coverage: 2017 global monitoring report.

