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Catastrophic healthcare expenditure from cryptococcal meningitis in Eastern and Southern Africa

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BACKGROUND

- HIV-associated cryptococcal meningitis is the second leading cause of AIDS-related mortality.
- Cryptococcal meningitis is a poverty-related disease most cases occur in resource-limited settings where access to quality care is often linked to an individual's ability to pay for services.
- We demonstrated the efficacy[1], safety, and cost-effectiveness[2] of a single, high-dose liposomal amphotericin-based treatment regimen within the AMBITION-cm trial.
- Here we present a five-country, within-trial analysis exploring the individual economic impact of cryptococcal meningitis.

METHODS

- 810 participants were recruited into this sub-study in Botswana, Malawi, South Africa, Uganda and Zimbabwe.
- We collected data on annual household expenditure, direct costs and indirect costs incurred prior to enrolment and during the ten-week trial period.
- Costs were inflated and converted to 2022 USD.
- We calculated out-of-pocket expenditure, lost income, and catastrophic healthcare expenditure – defined as costs exceeding 20% of annual household expenditure.

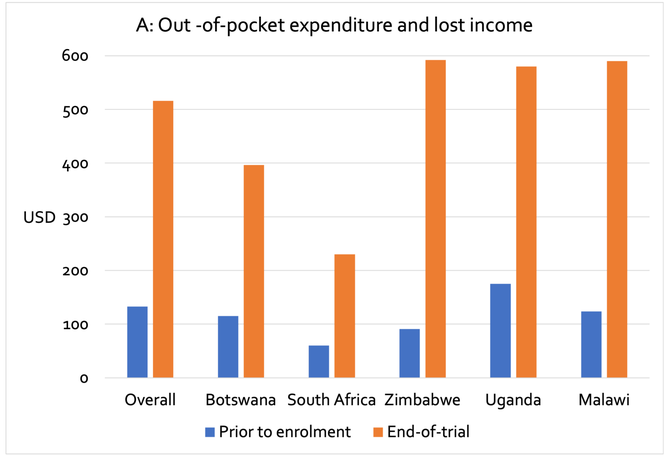
RESULTS

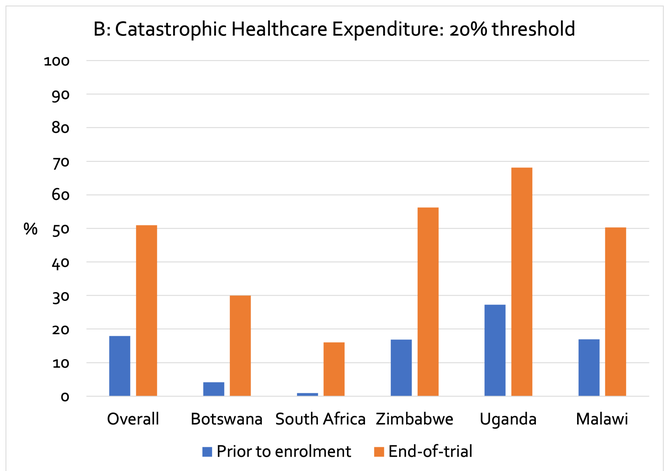
- The average total out-of-pocket expenditure plus lost income prior to enrolment was $132 (Table and Figure A).
- By the point of enrolment 18% (145/810) of participants had already experienced catastrophic healthcare expenditure (Figure B).
- Among the 592 participants who survived to ten-weeks, combining out-of-pocket expenditure and lost income, the average individual cost was $516, ranging from $230 in South Africa to $592 in Zimbabwe (Table and Figure A).
- More than half (51%, 296/581) experienced catastrophic healthcare expenditure by the end of the trial, ranging from 16% (13/81) in South Africa to 68% (156/229) in Uganda (Figure B).

More than half of individuals who survive after cryptococcal meningitis experience catastrophic healthcare expenditure

Table: Participant demographics, out-of-pocket expenditure and lost income

Participants	Overall	Botswana	Malawi	South Africa	Uganda	Zimbabwe
	n=810	n=73	n=230	n=106	n=330	n=71
Gender (n(%))						
Female	319 (39·4)	19 (26·0)	86 (37·4)	59 (55·7)	130 (39·4)	25 (35·2)
Male	491 (60·6)	54 (74·0)	144 (62·6)	47 (44·3)	200 (60·6)	46 (64·8)
Age, Years						
Median (IQR)	37 (32-43)	39 (34-44)	38 (32-44)	37 (32-44)	35 (30-40)	39 (33-45)
Participant main earner (n(%))	n=808	n=72		n=105		
Yes	562 (69·6)	57 (79·2)	147 (63·9)	60 (57·1)	248 (75·2)	50 (70·4)
No	246 (30·4)	15 (20·8)	83 (36·1)	45 (42·9)	82 (24·8)	21 (29·6)
Estimated annual expenditure (Mean (SD)) USD	1716·93 (1939·14)	2713·10 (2072·41)	1561·05 (1918·62)	2863·13 (2744·96)	1414·08 (1516·95)	894·04 (810·42)
Among all participants - in the four weeks prior to enrolment:						
Duration of illness in days						
Median (IQR)	14 (7-24)	7 (4-14)	14 (7-21)	14 (7-21)	14 (10-30)	14 (9-21)
Mean (SD)	19·5 (19·5)	10·9 (10·5)	19·0 (17·3)	17·4 (16·1)	23·1 (23·7)	16·8 (10·9)
Primary activity missed (n(%))						
Working	634 (78·3%)	59 (80·8%)	177 (77·0%)	54 (50·9%)	288 (87·3%)	56 (78·9%)
Studying	17 (2·1%)	0	11 (4·8%)	1 (0·9%)	4 (1·2%)	1 (1·4%)
Maintaining the House	28 (3·5%)	2 (2·7%)	4 (1·7%)	9 (8·5%)	9 (2·7%)	4 (5·6%)
Caring for Children	35 (4·3%)	1 (1·4%)	20 (8·7%)	5 (4·7%)	2 (0·6%)	7 (9·9%)
Nothing	96 (11·9%)	11 (15·1%)	18 (7·8%)	37 (34·9%)	27 (8·2%)	3 (4·2%)
If working, income lost before trial (Mean (SD)) USD	**n=338** 162·31 (299·83)	**n=20** 306·77 (351·71)	**n=74** 166·43 (291·57)	**n=19** 211·71 (244·75)	**n=191** 158·82 (321·63)	**n=34** 60·35 (75·34)
Overall out of pocket expenditure (Mean (SD)) USD	64·71 (103·78)	30·83 (100·92)	69·97 (109·43)	21·86 (32·93)	82·92 (103·90)	61·84 (129·67)
Overall out of pocket expenditure plus lost income (Mean (SD)) USD	132·44 (250·02)	114·87 (280·04)	123·53 (231·25)	59·81 (134·97)	174·84 (291·38)	90·74 (147·07)
Among survivors - in the four weeks before and ten weeks of the trial						
Overall duration of illness	**n=581**	**n=60**	**n=163**	**n=81**	**n=229**	**n=48**
Median (IQR)	77 (60-90)	73 (47-82)	77 (44-84)	84 (77-91)	82 (65-100)	67 (40-79)
Mean (SD)	75·2 (28·9)	65·7 (25·6)	70·7 (28·2)	82·3 (16·3)	81·5 (31·9)	60·2 (25·5)
If working and lost income, total lost income (Mean (SD)) USD	**n=455** 558·97 (2064·25)	**n=49** 720·01 (715·72)	**n=125** 967·25 (4639·61)	**n=34** 580·65 (516·78)	**n=206** 383·36 (505·25)	**n=41** 737·56 (1600·71)
Overall out of pocket expenditure before and during trial (Mean (SD)) USD	132·23 (173·34)	47·31 (97·58)	190·58 (178·49)	26·74 (38·33)	155·90 (199·15)	105·38 (102·42)
Overall out of pocket expenditure plus lost income (Mean (SD)) USD	516·08 (1633·16)	396·58 (646·44)	589·97 (2834·74)	230·15 (488·37)	579·99 (682·53)	592·12 (1349·98)





CONCLUSIONS

- This is the first study exploring the individual economic impact experienced by individuals with cryptococcal meningitis.
- The personal economic impact of cryptococcal meningitis is high and more than half of individuals who survive experience catastrophic healthcare expenditure.
- This highlights the profound financial impact of this devastating infection and provides a rationale to offer financial and social protection to those affected.

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