



Determinants of the costs of Buruli ulcer (BU) to households and treatment facilities in rural Ghana, 2000-2004

Mumma GA, Whitney EAS, Dadzie F, Etuaful S,
Ampadu E, Klutse E, Ashford D, Asiedu K



Introduction

- Buruli Ulcer (BU) is a debilitating skin disease that typically requires prolonged and costly treatment, and often results in long-term disability.
- Identifying the factors that determine the BU-related costs to treatment facilities and households and (in rural Ghana) may assist BU program managers and care providers to plan to provide care for patients, and households in their planning to confront future episodes of BU.



Objectives



- To identify the factors that influence the costs of Buruli Ulcer care in health facilities in rural Ghana
- To identify the factors that determine BU-related costs to households in rural Ghana



Methods



- To assess the costs of BU care in a health facility, we
 - Reviewed medical records for 725 BU patients treated from 2000 to 2004 at the St. Martins Hospital, Agroyesum (Amansie West District) and Dunkwa District Hospital (Upper Denkyira District)
 - Used a cost-of illness approach to calculate the annual total costs per BU patient in the two health facilities from 2000 to 2004.
 - Used multiple regression analysis to examine how the total costs per BU patient for health facilities in rural Ghana were influenced by the patients' demographic characteristics, and disease stage.



Methods –cont'd.



- To assess the costs of BU care to BU-affected households in rural Ghana, we
 - Surveyed 390 BU-affected households in October 2003 on socioeconomic, disease stage, health care and management characteristics of BU patients for the years 1998-2003 in three endemic districts of rural Ghana: Amansie West, Upper Denkyira, and Atwima.
 - Used a cost-of illness approach to calculate the annual total costs of BU care per patient in BU-affected households for 2000-2003



Methods-cont'd



- Used multivariate regression analysis to examine how the total costs per BU patient for affected households (household model) were influenced by the BU patients and their households' socioeconomic, health care seeking behavior, and management characteristics.



Results



Treatment facility costs per BU patient by disease stage: Ghana, 2000-'04



Patient's characteristics	Costs per BU patient (2003 U.S. \$)	95% CI: (2003 U.S. \$)
Reference patient (Nodule; 21.07 years old; male; 2004; Dunkwa district hospital; Hospitalized for 76 days)		
Reference (Nodule, ...)	154.25	149.39 – 159.11
Edema	211.95	191.32-232.60
Plaque	208.39	197.70-219.08
Ulcer	182.43	174.79-190.07
Female (Male, reference)	163.78	25.85 - 305.27
Female	163.78	156.72 - 170.84
St. Martin's Hospital, Agroyesum	197.06	190.59-203.53
Year: 2000	195.00	188.46-203.46
Year: 2002	100.76	92.29-109.22
Year: 2003	102.87	94.32-111.41
Each additional day of hospitalization	2.01	1.99-2.02
For each additional year of age	0.07	0.03-0.11



Total household costs per BU patient by disease stage: Ghana, 2000-2003



Patient's disease stage characteristics	Costs per BU patient (in 2003 U.S. \$)	95% CI: (in 2003 U.S. \$)
Nodule (reference...)	53.20	-44.41 to 150.73
Ulcer, no joint involvement	-45.36	-174.16 to 83.44
Scar, no visible contracture	-12.97	-144.52 to 118.57
Ulcer, with joint involvement	93.78	-40.62 to 228.17
Scar, no visible joint involvement	165.56	25.85 to 305.27
Amputee	407.65	245.23 to 570.06

•Costs for a patient with plaque/edema were not statistically different from one with a nodule



Total household costs per BU patient by district and treatment seeking behavior: Ghana, 2000-2003



Patient's disease stage characteristics	Costs per BU patient (in 2003 U.S. \$)	95% CI: (in 2003 U.S. \$)
Upper Denkyira district (reference, ...)	53.20	-44.41 to 150.73
Amansie West district	84.34	-31.83 to 200.51
Atwima district	260.31	-124.64 to 395.97
Didn't seek self- tr'mnt or facility-based tr'mnt(Reference,...)	53.20	-44.41 to 150.73
Sought treatment at a health facility	143.82	22.85 to 264.78
Sought self-treatment and trtmt at a health facility	155.83	22.87 to 288.79
\$159.68 earnings per capita; Average age of 20.86 years; 3.33 years with BU	53.20	-44.41 to 150.73
1\$ additional HH annual earnings pcpta	0.07	0.025 to 0.12
1 additional year of age for BU patient	-0.87	-1.47 to -0.28
1 additional year with BU	19.28	14.59 to 23.99



Conclusions



- Patient and household characteristics influenced the costs of Buruli ulcer care in health facilities in rural Ghana
- Patient, household, health care seeking behavior characteristics influenced the costs of Buruli ulcer to households in rural Ghana
- Country or district-specific BU costs data can be used by BU program managers to develop BU patient cost profiles which can facilitate BU program planning and budgeting

Course for future action

- There is a need to
 - Standardize the data collected (methods, variables) among treatment facilities in rural Ghana.
 - Conduct follow-up research to study the wide variability in the estimates for the households costs data
 - Construct country or district BU costs decision aids to assist decision makers with assessing patient specific costs and for planning purposes



Limitations



- Data for the procedures for treating BU were not available for one treatment facility
- Information bias for the household model due to
 - Recall bias: cases more likely to remember exposures
 - Misclassification bias:
 - Interviewer error
- Reporting bias
 - Traditional and spiritual healers



Acknowledgements

- Ministry of Health, Ghana
 - In particular: Ms Theresa Asare, Mr. Joseph Forkuo, and Ms. Comfort Ntow of St. Martin's Hospital, Agroyesum
- World Health Organization
- Centers for Disease Control and Prevention, USA

Thank you