



Socio economic study of meningitis epidemic impact in Burkina Faso

Agence de Médecine Préventive
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Colombini A (1), Dr Badolo O (2), Jaillard P (1), Dr Seini E (3), Porgo S (2), Nassa R (4), Dr Tiendrébeogo S (2), Dr Gessner BD (5), Dr Da Silva A (5)

(1) Agence de Médecine Préventive, Ouagadougou, Burkina Faso ; (2) Direction de la Lutte contre les Maladies, Ministère de la Santé, Ouagadougou, Burkina Faso ; (3) Direction régionale de la Santé de la Boucle du Mouhoun, Dédougou, Burkina Faso ; (4) Direction régionale de la Santé du Nord, Ouahigouya, Burkina Faso ; (5) Agence de Médecine Préventive, Paris, France

Background

- The perception of meningitis and its cost for households in the African meningitis belt are not well known, though these factors should be taken into account by decision makers concerning meningitis epidemic response strategies.

Objective

- To evaluate the socio-economic impact of acute bacterial meningitis epidemics in Burkina Faso.

Methods

Study design

- Design: Micro-economic
- Perspective: Societal
- Period: 2006-2007 meningitis epidemic season
- Study site:
 - Two districts in Burkina Faso (*Réo* and *Kombissiri*).
 - Health care centres, district hospitals, laboratories, health districts, health regions and central level included,
 - 116 individuals with meningitis plus their family members (+116).
- Quantitative (costs and financing) and qualitative (impact on public health system) evaluations were performed using data collected through questionnaires and analysis of local data (budgetary, stock reports, and epidemiological).

Costing

- Type of costs
 - For the health sector and household we calculated direct medical costs (case management, sequelae rehabilitation, reactive immunization campaign).
 - For the household we also calculated direct non medical costs (food, transportation, others) and indirect costs (lost income and assets linked to the illness episode).
- Cost calculation
 - Two methods: Ingredient approach and spending made
 - Calculation of total costs in surveyed sites, per administrative level / structure, per activity, per type of costs.
 - Calculation of average costs in surveyed sites, per case notified and per person vaccinated (per administrative level / structure, per activity, per type of costs)
 - Extrapolation of total costs for Burkina Faso

Results

I. Economic impact on health sector and households

- Total costs**
 - Surveillance and response for the evaluated meningitis epidemic cost US\$ 9.428 million with an average cost of US\$ 0.69 per inhabitant.
 - One fourth of costs were borne by the household of persons with meningitis for case management (Table 1).
 - Meningitis epidemic cost for health sector: 2% of National Health expenditure
 - Reactive immunization campaigns with anti-meningococcal bivalent vaccine (A, C) were the most costly activity (65% of total costs; 85% of costs for the health sector).
 - The average cost per person vaccinated against meningitis was US\$ 1.45.
 - The average direct medical cost for meningitis case management was US\$ 46.7, of which US\$ 20.4 was paid by the household -excluding self medication and traditional health care.

Table 1. : Total cost of meningitis in Burkina Faso, 2006-2007 epidemic season

	Costs (US\$)
Total Cost	9 428 330
Reactive immunization campaigns	6 077 473
Case management (excluding sequelae)	3 007 802
- Public health sector	682 480
- Households	2 325 322
Other surveillance and response activities	343 055
Average cost per capita	0,69
Reactive immunization campaigns	0,44
Case management	0,22
- Public health sector	0,05
- Households	0,17
Other surveillance and response activities	0,02
Other average costs	
Reactive immunization campaigns, per person vaccinated	1.45
Average cost of case management, per case notified	116,3
- Public health sector	26,4
- Households	90,0
Average cost of other surveillance and response activities, per case notified	13,3

Costs for households

- Total average cost per household (Table 2):** US\$ 90 per meningitis case.
 - A catastrophic expense - which can contribute to a cycle of poverty.
 - Costs 2.3 times higher for urban vs. rural households
- Direct medical costs:** US\$ 25.3 per case (28.2% of total costs)
 - Despite national guidelines that care should be free, 95.7% of persons with meningitis paid for all or a part of their meningitis medical care
 - 93% paid for medicines prescribed by public health services, and 67% for consultation.
 - 34% of households paid for self medication, and 23% traditional care.
 - US\$ 20.4 of direct medical costs are linked to care delivered by the public health sector, US\$ 4.5 to traditional therapy and US\$ 0.4 to self medication
- Direct non-medical costs:** US\$ 15.5 per meningitis case (17.2% of total costs)
 - 100% of households paid these costs
 - Food (US\$ 9.6), transport (US\$ 2.6) and phone (US\$ 1.3) contributed the most
- Indirect cost:** US\$ 49.2 per case (54.6% of total costs)
 - Among meningitis cases, 22.4% have lost incomes during their illness; the latter have stop working an average of 20.6 days.
 - Regarding their family careers, 88.8% have lost incomes and have stop working an average of 9 days.
 - In addition, 6% of households have lost assets -excluding assets sell to pay direct meningitis costs.

Table 2. : Average household costs for bacterial meningitis, by case, excluding sequelae

All households	Costs (US\$)	95% CI (US\$)
Average Total Cost	90,0	[84.4 ; 95.4]
Average Direct Medical Cost	25,3	[17.4 ; 33.2]
Average Direct Non Medical Cost	15,5	[8.9 ; 22.0]
Average Indirect Cost	49,2	[42.7 ; 55.6]
Rural households		
Average Total Cost	57,7	[48.7 ; 66.7]
Average Direct Medical Cost	18,8	[11.7 ; 25.9]
Average Direct Non Medical Cost	13,4	[7.2 ; 19.6]
Average Indirect Cost	25,5	[19.9 ; 31.1]
Urban households		
Average Total Cost	132,0	[120.2 ; 143.8]
Average Direct Medical Cost	33,8	[25.2 ; 42.4]
Average Direct Non Medical Cost	18,0	[11.0 ; 25.0]
Average Indirect Cost	80,2	[75.0 ; 85.3]

- Households where individuals with meningitis had sequelae had to bear an additional US\$ 25.4 to US\$ 154.4 for rehabilitation.

II. Meningitis epidemic impact on health sector

- According to health system actors:
 - Meningitis epidemics lead to a disorganization of all structures at all levels of the sanitary pyramid.
 - Meningitis case management is the main contributor to this disorganization, due to work overload.
 - The main consequences described included delay or cancellation of routine activities.

Conclusions

- Meningitis epidemics have high economic costs for Burkinabe society, for both the health care system and individual households.
- In addition to enhanced health outcomes, preventive immunization against acute bacterial meningitis likely would reduce poverty.
- Response to meningitis epidemic should also be considered as part of poverty reduction strategies.

References

- Colombini A, et al. Costs and impact of meningitis epidemics for the public health system in Burkina Faso Vaccine 29 (2011) 5474– 5480
- Colombini A, et al. Costs for households and community perception of meningitis epidemics in Burkina Faso. Clin Infect Dis 2009;49:1520-5.

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