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Cost-effectiveness of home-based vs. in-hospital treatment of paediatric tuberculous meningitis

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SUMMARY

SETTING: Cape Town, South Africa, 2014.

OBJECTIVE: To assess the societal costs and cost-effectiveness of home-based vs. in-hospital treatment of paediatric tuberculous meningitis.

DESIGN: This was an economic evaluation from a societal perspective using probabilistic analysis. Health care, informal care, lost productivity costs and costs in other sectors, health-related quality of life (HRQoL) and family impact were assessed during interviews with care givers, children, medical staff and management.

RESULTS: Societal costs for home-based treatment were USD3857, and USD28 043 for in-hospital treatment. Home-based vs. in-hospital treatment HRQoL scores were 90.9% vs. 84.5%, while family impact scores were 94.8% vs. 73.1%. The point estimate of the incremental cost-effectiveness ratio indicated that improving HRQoL and family impact by 1% was associated with a saving of respectively USD3726 and USD1140 for home-based vs. in-hospital treatment. The probability that home-based treatment was less expensive and more effective than in-hospital treatment was 96.3% for HRQoL and 100% for family impact.

CONCLUSION: Societal costs of home-based treatment were lower than for in-hospital treatment. Children treated at home had a better HRQoL and family impact scores. Home-based treatment was a cost-effective alternative to in-hospital treatment of drug-susceptible tuberculous meningitis.

KEY WORDS: TBM; cost-effectiveness; home-based treatment; paediatric

THE GLOBAL NUMBER of incident tuberculosis (TB) cases in 2016 was estimated at 10.4 million, 10% of whom were children aged 0–14 years; 1.7 million, of whom 14.7% were children, died due to TB.[1] With 438 000 TB cases, South Africa accounts for >4% of the global TB burden.[1]

Tuberculous meningitis (TBM), the most severe form of TB, frequently occurs in early childhood.[2] In the Western Cape Province of South Africa, 14.9% of all culture-confirmed TB cases in children (age <13 years) from two main referral hospitals were TBM.[3] In-hospital treatment is widely considered the gold standard for children with TBM due to the complexity of care and serious consequences of non-adherence to anti-tuberculosis treatment.[4] However, long-term hospitalisation can negatively affect the child and his/her family.[5] Under certain conditions, home-based treatment is a viable alternative to 6-month in-hospital treatment for TBM.[6] A prospective observational study at Tygerberg Hospital (TBH), Cape Town, South Africa, showed that short, intensified treatment, both in hospital and home-based, is safe and effective in children with drug-susceptible TBM.[7]

The cost-effectiveness of home-based treatment compared with in-patient treatment has not yet been determined. Research priorities in the South African context are health policy and systems research activities to generate new knowledge on improving the delivery of existing health care interventions that are cost-effective.[8] Long-term in-hospital TBM treatment is seldom feasible in resource-poor countries due to bed shortages and budgetary constraints.[4,7] Home-based treatment could therefore be a cost-effective alternative to ease the strain on the South African health system.

The aim of the present study was to assess the costs and cost-effectiveness of home-based paediatric TBM treatment as compared with in-hospital treatment in Cape Town. We included both health-related quality of life (HRQoL) and impact on the family as effect

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measures, and assessed costs from a societal perspective.

STUDY POPULATION AND METHODS

We performed a probabilistic analysis covering the entire duration of TBM treatment to assess the cost-effectiveness of home-based compared with in-hospital treatment from a societal perspective. Treatment comprised two phases. First, stabilisation in both groups was performed at an academic tertiary hospital. In the home-based group, this was followed by home-based care coordinated by TBH's specialised out-patient clinic. In the in-hospital group, this was followed by treatment at Brooklyn Chest Hospital (BCH), a specialised primary care TB hospital.

Care givers were eligible for participation in the study when the child (age 0–14 years) had received at least 1 month of treatment after stabilisation and up to 6 months after completion of treatment. Children receiving in-hospital treatment at BCH were eligible for participation in the study if they were referred from hospitals other than TBH and fulfilled the TBH eligibility criteria for home-based treatment (exclusion criteria were an unreliable care giver, insufficient income or support network, regular TB clinic visits not possible, directly observed treatment supporter unavailable, multidrug-resistant TB or untreated household TB cases).[6,7]

The Health Research Ethics Committee of Stellenbosch University approved the study protocol. All care givers provided written informed consent for their and their child's participation. In addition, all children aged >7 years and with good cognitive functions provided written informed assent for their participation.

Cost measures

Interviews were held with 22 care givers to estimate societal costs between October 2014 and January 2015 (10 home-based, 2 of whom were still on treatment; 12 in the in-hospital group, 10 of whom were on treatment at the time of the interview). In addition to estimating costs, medical staff, hospital management and non-governmental organisation (NGO) management were consulted between October 2014 and January 2015. The proportion, frequency and duration estimates of health care services used were guided by expert opinion.

Societal costs included health care, informal care, lost productivity costs and costs in other sectors. In the home-based group, an estimated 5.6% of children were readmitted[7] for 2 months; the corresponding costs were included in the analyses. All cost indicators were converted from South African rand to US dollars using 2014 purchasing power parity rates.[9]

Health care costs

Health care costs during the stabilisation period (24 days) were fixed, and included costs of hospital admission per ward and consultations. Admission costs per ward were calculated as the aggregated costs per patient-day equivalent.[10] Costs were based on 2.5 days in either a paediatric emergency (95%) or paediatric intensive care unit (5%) setting, followed by 21 days in a general paediatric ward offering the following interventions: social work (all children, 4 visits), dietician (all children, 1.5 visits), physiotherapy (all children, 4 visits), occupational therapy (all children, 4 visits) and ophthalmology (55% of children, 4 visits).

Health care costs in the second phase of the treatment (177 days) were fixed. In the home-based group, health care costs included follow-up visits at TBH (all children, monthly), physiotherapy (20% of children, monthly), occupational therapy (all children, monthly), medication (all children, local short intensive regimen[6,7] at median age 58 months,[7] converted to weight using an advanced paediatric life support ratio suitable for Western Cape, South Africa[11]) and costs for readmission. In-hospital health care costs were based on aggregated costs per bed per day, which included medication, transportation and referrals to other services (excluding social work).

Informal care costs

Informal care costs were variable, and for both home-based and in-hospital groups these included general care-giving time (cleaning, washing, shopping, cooking, administration), condition-specific care-giving time (administering medication, personal care for child, moving child, playing, school support), travel time, travel costs and time spent at hospital (to attend follow-up for the home-based group, to visit the child for the in-hospital group). In the home-based group, additional costs of case notification at a local clinic (one-off visit, including travel time, costs and duration of visit), and costs associated with readmission were included. The time investment of care givers was converted to monetary units using the proxy good method[12] at the minimum hourly wage for domestic workers in 2014.[13]

Lost productivity costs

Lost productivity costs were variable and estimated based on unpaid leave taken by care givers (frequency and duration), their self-reported hourly wage and the duration of readmission in the home-based group. Costs were calculated using the human capital approach.[14]

Costs in other sectors

Costs in other sectors were fixed and included social work/counselling, day care, primary school costs and costs associated with readmission. In the home-based group, these costs were estimated based on salaries and educator-learner ratios for public day care (ratio 1/25)[15] and public primary school (ratio 1/28.9).[15] Costs of social work were provided through the TBH specialised out-patient clinic (all children, one visit). For the in-hospital group, day care, schooling and social work were provided by an NGO. Costs were estimated based on salaries and the teacher–student ratio (1/8 for both day care and primary school). Both groups were assumed to have 35.3% of children in day care and 64.7% of children in primary school.

Effect measures

Interviews were held with care givers and their child (age >5 years) to estimate effect measures. Between October 2011 and December 2014, we included 17 home-based and 10 in-hospital children who were on treatment at the time of the interview.

Effect measures were HRQoL and family impact. HRQoL was measured using the Paediatric Quality of Life Inventory™ (PedsQL™) 4.0 generic core scale (Mapi Research Trust, Lyons, France). This scale consists of three age-dependent questionnaires: 36-item (1–12 months), 45-item (13–24 months) and 21-item (2–18 years). The parent-proxy report (all ages) is combined with the child's self-report (>5 years) and measures physical, emotional, social and school functioning. The infant scales (1–24 months) also included physical symptoms and cognitive functioning.[16–18]

Family impact was defined as the impact of paediatric chronic health conditions on care giver and family and measured using the PedsQL™ 2.0 family impact module. This 36-item module includes parent functioning (physical, emotional, social cognitive, communication and worry) and family functioning (daily activities and family relationships).[19] A higher score (%) indicated better HRQoL and better overall family functioning.[20]

Clinical background was described based on medical records. TBM stage was classified as Stage I (Glasgow Coma Scale [GCS] 15/15, with no focal neurological signs), Stage II (GCS 11–14 with focal neurology) and Stage III (GCS < 11).[7]

Statistical analyses

Descriptive characteristics of the home-based and in-hospital groups were analysed using SPSS statistics v25 (IBM, Armonk, NY, USA). Because costs and effects were not assessed in the same cohort of children with TBM and their care givers, we developed a probabilistic analytical model assuming gamma distributions for both costs and effect outcomes. The gamma distributions were defined by the alpha ((mean/standard error [SE])^2) and beta (SE^2/mean) of the outcome distributions. Uncertainty surrounding the costs and effects was estimated using the Monte Carlo simulation with 1000 simulations based on random draws from the gamma distributions. The 95% credibility intervals (CrIs) were estimated using 2.5 and 97.5 centiles from the empirical sampling distribution of these 1000 simulations. The incremental cost-effectiveness ratio (ICER) was calculated for both effect measures (HRQoL and family impact) comparing home-based with in-hospital treatment.

$$\text{ICER} = \text{mean}\,\Delta C/\text{mean}\,\Delta E = \frac{\text{Costs}^{\text{home-based}} - \text{costs}^{\text{in-hospital}}}{\text{Effect}^{\text{home-based}} - \text{effect}^{\text{in-hospital}}}$$

The simulated cost-effect pairs reflected the joint uncertainty in incremental costs and effects around the point estimate of the ICER. This uncertainty, together with the ICER point estimate, was plotted on the cost-effectiveness plane. In a cost-effectiveness plane, differences in effects are plotted on the x-axis and differences in costs on the y-axis.

Cost-effectiveness acceptability (CEA) curves were estimated to show the probability of home-based treatment being more cost-effective than in-hospital treatment, given different ceiling ratios. Ceiling ratios (λ) are defined as the amount of money a decision-maker is willing to pay to gain one unit effect. Incremental net monetary benefits (INMBs) were calculated for each simulation using ceiling ratios ranging from zero to positive infinity (INMB = Δeffect*λ – Δcosts). For each λ, the proportion of INMBs > 0 was estimated to indicate the probability that home-based treatment was more cost-effective than in-hospital treatment at that λ. These analyses and figures were created using Microsoft Excel® v15.32 (Microsoft, Redmond, WA, USA).

Sensitivity analyses

The main societal cost-effectiveness analyses from a societal perspective (including health care, informal care, lost productivity costs and costs in other sectors) were supplemented with two sensitivity analyses using different assumptions. The first sensitivity analysis adjusted societal costs under the assumption that costs for time taken off work to care for the child were included in costs for time spent in informal care (including hospital visits). Costs of absenteeism time were subtracted from informal care costs (which were set to 0 if negative). The second sensitivity analysis adjusted societal costs by excluding schooling costs (day care/pre-primary and primary school).

Ethics committee approval

Ethical approval was obtained from the Health Research Ethics Committee of Stellenbosch University, Cape Town (N11/03/061). Permission was ob-

Table 1 Child, care giver, clinical and socio-economic characteristics of for home-based and in-hospital groups for both cost and effect data populations

	Cost data (n = 22)		Effect data (n = 27)	
	Home-based (n = 10) *n* (%)	In-hospital (n = 12) *n* (%)	Home-based (n = 17) *n* (%)	In-hospital (n = 10) *n* (%)
Child characteristics				
Age, years, median [IQR]	6.5 [1.5–10.4]	5.3 [1.9–8.1]	3.4 [2.3–9.6]	4.8 [1.3–9.4]
Sex				
Female	2 (20)	6 (50)	9 (53)	4 (40)
Male	8 (80)	6 (50)	8 (47)	6 (60)
Care giver characteristics				
Age, years, median [IQR]	35.4 [30.0–39.7]	32.7 [30.4–39.5]	33.6 [24.0–35.6]	35.2 [29.4–40.9]
Sex				
Female	9 (90)	11 (92)	16 (94)	9 (90)
Male	1 (10)	1 (8)	1 (6)	1 (10)
Relationship				
Parent	8 (80)	10 (83)	14 (82)	8 (80)
Grandparent	2 (20)	1 (8)	1 (6)	1 (10)
Uncle/aunt	0 (0)	1 (8)	2 (12)	1 (10)
Marital status				
Not married	6 (60)	10 (83)	12 (71)	8 (80)
Married	4 (40)	2 (17)	5 (29)	2 (20)
High school completed				
No	7 (70)	9 (75)	12 (71)	8 (80)
Yes	3 (30)	3 (25)	5 (29)	2 (20)
Clinical characteristics				
TBM Stage				
1	3 (30)	2 (17)	2 (13)	1 (10)
2	5 (50)	9 (75)	6 (40)	8 (80)
3	2 (20)	1 (8)	7 (47)	1 (10)
HIV				
Negative	9 (90)	11 (92)	15 (88)	9 (90)
Positive	1 (10)	1 (8)	2 (12)	1 (10)
Socio-economic characteristics				
Household members, *n*, median [IQR]	5.0 [3.8–8.0]	7.0 [5.0–8.0]	5 [5.0–7.0]	7.0 [5.0–8.0]
Care giver employed				
No paid job	7 (70)	10 (83)	—	—
Yes, paid job	3 (30)	2 (17)	—	—
Lost productivity				
No	7 (70)	10 (83)	—	—
Yes	3 (30)	2 (17)	—	—
Government grant				
No	1 (10)	1 (8)	—	—
Yes	9 (90)	11 (92)	—	—
Community support				
No	6 (60)	7 (58)	—	—
Yes	4 (40)	5 (42)	—	—
Medical insurance				
No	9 (90)	12 (100)	—	—
Yes	1 (10)	0	—	—
Household income, USD, mean ± SD*	99.11 ± 123.37	143.17 ± 248.18	—	—
Grant income, USD, mean ± SD*	38.46 ± 43.02)	26.67 ± 19.00	—	—
Support income, USD, mean ± SD*	45.85 ± 95.42	0.19 ± 0.41	—	—
Total household income, USD, mean ± SD*	178.84 ± 152.74	170.01 ± 253.21	—	—

* Per member living in household per month.
IQR = interquartile range; TBM = tuberculous meningitis; HIV = human immunodeficiency virus; USD = United States dollar (2014); SD = standard deviation.

tained in accordance with the Provincial Research Policy and Tygerberg Hospital (40/2009).

RESULTS

General, clinical and socio-economic characteristics of the children and their care givers were similar in the home-based treatment groups and in-hospital treatment groups (Table 1). The median age of the children in the two groups ranged between 3.4 and 6.5 years. Of 22 care givers, 5 (23%) were employed; 5 (23%) experienced loss of work productivity (time taken from work due to the child's condition), but only 3 (14%) lost income. The total household income per month (combined household members' earnings, grants and community support) during the treatment period was USD179 in the home-based group and USD170 in the in-hospital group.

Table 2 Overview of mean health care, informal care, lost productivity and costs in other sectors for home-based and in-hospital groups

	Home-based (*n* = 10) USD	In-hospital (*n* = 12) USD	Difference mean (95%CI)
Health care costs: stabilisation (24 days)			
Paediatric emergency ward	886.69	886.69	0
Paediatric intensive care unit	249.67	249.67	0
General paediatrics ward	8 310.62	8 310.62	0
Social work	93.34	93.34	0
Dietician	35.00	35.00	0
Physiotherapy	70.00	70.00	0
Occupational therapy	70.00	70.00	0
Ophthalmology	38.50	38.50	0
Total	9753.82	9753.82	0
Health care costs: second phase (177 days)			
In-patient (including consults and medication)	—	23 406.49	—
Out-patient clinic visit	291.16	—	—
Physiotherapy	27.16	—	—
Occupational therapy	135.80	—	—
Medication	200.17	—	—
Readmission	437.88	0	437.88
Total	1 092.17	23 406.49	–22 314.32
Informal care costs: second phase (177 days)			
Informal care: general	1 089.78	1 088.07	1.70 (–507.76 to 511.17)
Informal care: condition-specific	622.81	495.68	127.13 (–264.88 to 519.13)
Travel time to hospital/clinic	28.60	111.59	–82.99 (–129.15 to –36.83)
Travel cost to hospital/clinic	73.88	238.18	–164.31 (–299.17 to –29.44)
Duration follow-up/visit at hospital/clinic	43.42	159.54	–116.12 (–177.47 to –54.77)
Case notification at local clinic	4.84	0	4.84
Readmission	4.42	0	4.42
Total	1 867.75	2 093.06	–225.32 (–866.46 to 415.82)
Informal care sensitivity analysis 1*	1 564.45	1 881.22	–316.77 (–1084.16 to 450.63)
Lost productivity costs: second phase (177 days)			
Lost productivity costs	341.10	515.14	–174.04 (-1236.44 to 888.37)
Readmission	3.35	0	3.35
Total	344.45	515.14	–170.68 (–1233.09 to 891.72)
Other sector costs: second phase (177 days)			
Social work/counselling	23.33	257.61	–1 234.28
Day care/pre-school	74.59	233.11	–158.52
Primary school	425.58	1 537.41	–1 111.83
Readmission	28.96	0	28.96
Total	552.47	2028.13	–1 475.66
Other sector sensitivity analysis 2†	27.85	257.61	–229.76

* Societal costs adjusted by informal care costs corrected for absenteeism.
† Societal costs adjusted by other sector costs, excluding day care/pre-school and primary school costs.
CI = credibility interval; USD = United States dollar (2014).

Costs and effect measures

Health care costs during the initial in-hospital stabilisation period (24 days) were USD9754 in both groups (Table 2). Health care costs in the second phase (177 days) were USD1092 for home-based treatment and USD23 407 for in-hospital treatment. Health care costs in the home-based treatment group were 95% lower than in the in-hospital group. Informal care costs of the second phase of treatment (177 days) were USD1868 for home-based and USD2093 for in-hospital treatment. Informal care costs in the home-based treatment group were 11% lower than in the in-hospital group. Costs for lost productivity were USD345 in the home-based group and USD515 in the in-hospital group. Lost productivity costs in the home-based treatment group were 33% lower than in the in-hospital group. Costs in other sectors were USD553 in the home-based group and USD2028 in the in-hospital group. Costs in other sectors in the home-based treatment group were 73% lower than in the in-hospital group (Table 2).

Total societal costs (health care, informal care, lost productivity and costs in other sectors) were USD3857 for home-based and USD28 043 for in-hospital treatment. Home-based treatment was thus less expensive than in-hospital care. Both sensitivity analyses showed similar results: in the first sensitivity analysis, adjusted total societal costs were USD3554 for home-based and USD27 831 for in-hospital treatment; in the second sensitivity analysis, adjusted total societal costs were USD3332 for home-based treatment and USD26 272 for in-hospital treatment. Children treated at home had higher HRQoL and family impact scores than children treated in-hospital (respectively 90.9 vs. 84.5%; and 94.8 vs. 73.1%; Table 3).

Table 3 Mean societal costs and effect measures for home-based and in-hospital groups, including sensitivity analyses

	Home-based (n = 10) mean ± SD (SE)	In-hospital (n = 12) mean ± SD (SE)	Difference mean (95%CI)
Cost measures, USD			
Main societal costs	3 856.84 ± 780.57 (246.84)	28 042.82 ± 2267.95 (654.70)	–24 185.98 (–25 557.37 to –22 814.60)
Costs, Sensitivity 1*	3 553.54 ± 775.87 (245.35)	27 830.97 ± 1572.22 (453.86)	–24 277.43 (–25 288.66 to –23 266.20)
Costs, Sensitivity 2†	3 332.22 ± 780.57 (246.84)	26 272.30 ± 2267.95 (654.70)	–22 940.08 (–24 311.47 to –21 568.70)
Effect measures, %	(n = 17)	(n = 10)	
Health-related quality of life	90.94 ± 9.74 (2.36)	84.45 ± 9.68 (3.06)	6.49 (–1.09 to 14.07)
Family impact	94.78 ± 4.91 (1.19)	73.08 ± 9.98 (3.16)	21.22 (14.60 to 27.84)

* Societal costs adjusted by informal care costs corrected for absenteeism.
† Societal costs adjusted by other sector costs, excluding day care/pre-school and primary school costs.
SD = standard deviation; SE = standard error; CI = credibility interval; USD = United States dollar (2014).

Cost-effectiveness analyses

Improving the HRQoL of a child in home-based treatment by 1% was associated with a saving of USD3726 compared with in-hospital treatment (respectively USD3740 and USD3536, for sensitivity analyses one and two) (Table 4). Home-based treatment was thus dominant compared with in-hospital treatment. There was a probability of 96.3% that home-based treatment was less expensive and more effective than in-hospital treatment (SE quadrant), and of 3.7% that home-based treatment was less expensive and less effective than in-hospital treatment (SW quadrant) (Figure). Sensitivity analyses 1 and 2 showed similar results (Table 4). CEA curves showed that the probability that home-based treatment was more cost-effective than in-hospital treatment was 100% at a willingness-to-pay of USD0/additional percentage point improvement in HRQoL. This probability slowly decreased only with higher ceiling ratios, confirming the dominance of home-based treatment over in-hospital treatment (data not shown).

Improving family impact for a child in home-based treatment by 1% was associated with a saving of USD1140 as compared with in-hospital treatment, indicating the dominance of home-based treatment (USD1144 and USD1081 for sensitivity analyses 1 and 2, respectively) (Table 4). There was a probability of 100% that home-based treatment was dominant over in-hospital treatment (SE quadrant) (Figure). Findings for sensitivity analyses 1 and 2 were similar (Table 4). CEA curves indicated that the probability that home-based treatment was dominant over in-hospital treatment for family impact was 100% for all willingness-to-pay values (data not shown).

DISCUSSION

Home-based treatment of paediatric, drug-susceptible TBM was dominant compared with in-hospital treatment of patients who qualified for home-based treatment with regard to both HRQoL and family impact. The difference in costs between the two types of treatments could mainly be attributed to the high health care costs of in-hospital treatment. Sensitivity analyses excluding costs of schooling/day care, or accounting for possible double counting of lost productivity costs, confirmed these findings.

The cost-effectiveness of home-based vs. in-hospital treatment in paediatric TBM for QoL effect measures has not been assessed previously. Reports have described the cost-effectiveness of community-based treatment vs. in-hospital treatment for (pulmonary) TB in adult populations.[21–26] Similar to our research, these studies adopted a societal costs perspective in African populations. Despite methodological differences, our findings are similar: community-based approaches dominate the conventional

Table 4 Probabilistic cost-effectiveness results for the main analysis and sensitivity analyses

Simulation	Mean cost difference USD	Mean effect difference %	ICER USD	Distribution CE plane, % NE	SE	SW	NW
HRQoL							
Main societal	–24 185.98	6.49	–3 725.76	0.0	96.3	3.7	0.0
Sensitivity 1*	–24 277.43	6.49	–3 739.85	0.0	95.6	4.4	0.0
Sensitivity 2†	–22 940.08	6.49	–3 535.46	0.0	95.8	4.2	0.0
Family impact							
Main societal	–24 185.98	21.22	–1 139.69	0.0	100.0	0.0	0.0
Sensitivity 1*	–24 277.43	21.22	–1 144.08	0.0	100.0	0.0	0.0
Sensitivity 2†	–22 940.08	21.22	–1 081.06	0.0	100.0	0.0	0.0

* Societal costs adjusted by informal care costs corrected for absenteeism.
† Societal costs adjusted for other sectors, excluding day care/pre-school and primary school costs.
USD = United States dollar (2014); ICER = incremental cost-effectiveness ratio; CE = cost-effectiveness; NE = North-East; SE = South-East; SW = South-West; NW = North-West; HRQoL = health-related quality of life.

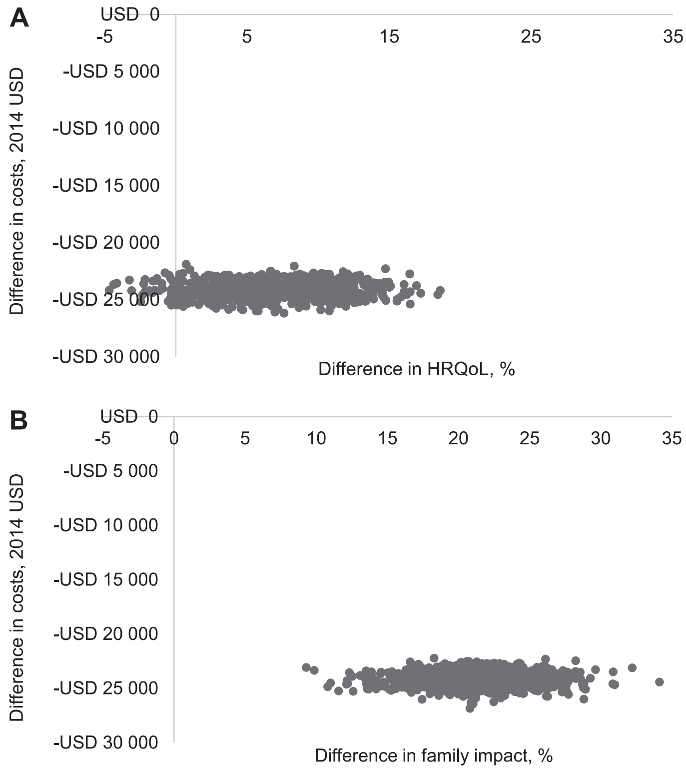

Figure Cost-effectiveness planes of home-based treatment vs. in-hospital treatment for **A)** HRQoL and **B)** family impact scores. HRQoL = health-related quality of life; USD = United States dollar (2014).

hospital-based approach, with the main cost-saving component being health care costs.

A small sample size was a limitation of our study, although all eligible patients at the time were included. In addition, costs and effects were assessed in two different cohorts of patients. Probabilistic analysis was therefore performed to compare the groups. Whereas informal care and lost productivity costs were based on individual patient data, health care costs and costs in other sectors were based on average patient data, ignoring variations between individual patients. Most variations in resource utilisation and related costs occur during in-hospital stabilisation, which was not included in the simulation and cost-effectiveness analyses. Strict selection criteria, including eligibility requirements for home treatment in the in-hospital group, further diminished variability within the study cohorts and increased generalisability to other settings.

Some consideration is required regarding the use of both PedsQL questionnaires, which are non-preference-based HRQoL measures (societal health state utilities cannot be derived and results cannot be expressed in quality-adjusted life years). Conversely, interpretation of the 0–100 scale is straightforward; the instrument is designed specifically for children with chronic disease, and both scales have good measurement properties (validity and reliability).[16–19] The societal design was a strength because it addressed health care, patient, care giver, education and NGO perspectives.

Potential treatment interruption (loss to follow-up during home-based treatment) and corresponding societal costs were not addressed in this evaluation. TBM is the most lethal form of TB,[27] and uninterrupted treatment is essential to improve clinical symptoms, limit disease progression, terminate transmission and prevent the emergence of drug resistance.[28] Successful implementation of home-based treatment for paediatric TBM requires structured follow-up systems to ensure children remain on treatment until completion.

CONCLUSION

This economic evaluation from a societal perspective showed that home-based treatment was dominant over in-hospital treatment in selected cases. This finding adds evidence to other studies showing that treatment of drug-susceptible paediatric TBM can be provided at home if adequate screening, counselling and support are in place.[6,7] Both in-hospital (specialised primary level hospital) and home-based treatment (out-patient clinic at a tertiary hospital) are provided at the provincial level. We recommend that policy makers invest in home-based treatment infrastructure (e.g., dedicated programme nurse) to facilitate costs savings and increase QoL and family impact in children with TBM.

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RÉSUMÉ

CONTEXTE : Le Cap, Afrique du Sud, 2014.

OBJECTIF : Évaluer les coûts sociétaux et le rapport coût-efficacité du traitement à domicile par rapport au traitement hospitalier de la méningite tuberculeuse pédiatrique.

MÉTHODE : Une évaluation économique d'un point de vue sociétal utilisant une analyse probabiliste. Les soins de santé, les soins informels, les coûts de perte de productivité et les coûts concernant d'autres secteurs, la qualité de vie liée à la santé (HRQoL) et l'impact sur la famille ont été évalués au cours d'entretiens avec les soignants, les enfants, le personnel médical et la direction.

RÉSULTATS : Les coûts sociétaux pour les traitements à domicile étaient de USD3857 et de USD28 043 pour les traitements en hospitalisation. Les scores de HRQoL étaient de 90,9% par rapport à 84,5% et les scores de l'impact sur la famille étaient de 94,8% par rapport à 73,1%. L'estimation ponctuelle du rapport coût-efficacité différentiel a indiqué que l'amélioration de la HRQoL et de l'impact sur la famille avec 1% était associée à des économies de USD3726 et USD1140, respectivement, pour le traitement à domicile par rapport au traitement hospitalier. Les analyses probabilistes démontrent que la probabilité que le traitement à domicile soit moins coûteux et plus efficace que le traitement à l'hôpital était de 96,3% pour la HRQoL, et de 100% pour l'impact sur la famille.

CONCLUSION : Les coûts sociétaux des traitements à domicile sont inférieurs à ceux des traitements effectués à l'hôpital. Les enfants traités à la maison ont une meilleure HRQoL et un meilleur impact sur la famille. Le traitement à domicile est une alternative rentable pour le traitement en milieu hospitalier de la méningite tuberculeuse sensible aux médicaments.

RESUMEN

MARCO DE REFERENCIA: La Ciudad del Cabo en Suráfrica en el 2014.

OBJETIVO: Evaluar los costos a escala de la sociedad y la costo-efectividad de un tratamiento domiciliario, en comparación con el tratamiento hospitalario de la meningitis tuberculosa en los niños.

MÉTODO: Se llevó a cabo un análisis económico probabilístico desde una perspectiva de la sociedad. Durante las entrevistas a los cuidadores, los niños y el personal médico y administrativo se evaluaron los costos de la atención de salud, la atención informal, los costos por pérdida de productividad y los costos en otros sectores, la calidad de vida relacionada con la salud (HRQoL) y la repercusión en las familias.

RESULTADOS: Los costos para la sociedad del tratamiento domiciliario fueron USD3857 y los costos del tratamiento hospitalario fueron USD28 043. La puntuación de la escala de HRQoL al recibir el tratamiento en el hogar fue 90,9% contra 84,5% con el tratamiento en el hospital; las puntuaciones de la repercusión familiar fueron 94,8% contra 73,1%. La estimación puntual del cociente de costo-efectividad diferencial reveló que el hecho de mejorar un 1% la HRQoL y la repercusión familiar se asociaba con un ahorro de USD3726 en el tratamiento domiciliario y de USD1140 con el tratamiento hospitalario. Los análisis probabilísticos revelaron que la probabilidad de que el tratamiento domiciliario sea menos costoso y más eficaz que el tratamiento hospitalario era de 96,3% en materia de HRQoL y de 100% con respecto a la repercusión familiar.

CONCLUSIÓN: Los costos para la sociedad del tratamiento domiciliario son más bajos que los costos del tratamiento hospitalario. Los niños que reciben tratamiento en el hogar presentan una mejor HRQoL y puntuaciones más favorables en materia de repercusión familiar. El tratamiento en los hogares representa una opción eficaz al tratamiento intrahospitalario de la meningitis tuberculosa sensible a los medicamentos.