

**SHORT COMMUNICATION****Paediatric in-patient care in a conflict-torn region of Somalia: are hospital outcomes of acceptable quality?**B. B. Ngoy,¹ R. Zachariah,² S. G. Hinderaker,³ M. Khogali,² M. Manzi,² J. van Griensven,⁴ L. Ayada,¹ J. P. Jemmy,⁵ A. Maalim,¹ H. Amin¹<http://dx.doi.org/10.5588/pha.12.0104>**Setting:** A district hospital in conflict-torn Somalia.**Objective:** To report on in-patient paediatric morbidity, case fatality and exit outcomes as indicators of quality of care.**Design:** Cross-sectional study.**Results:** Of 6211 children, lower respiratory tract infections (48%) and severe acute malnutrition (16%) were the leading reasons for admission. The highest case-fatality rate was for meningitis (20%). Adverse outcomes occurred in 378 (6%) children, including 205 (3.3%) deaths; 173 (2.8%) absconded.**Conclusion:** Hospital exit outcomes are good even in conflict-torn Somalia, and should boost efforts to ensure that such populations are not left out in the quest to achieve universal health coverage.

Somalia has been ravaged by conflict, drought and insecurity for over two decades. The health infrastructure is in disrepair and the health system is plagued by shortages of trained health staff and lack of drug supplies and equipment.

Children in such contexts are particularly vulnerable to severe morbidity and mortality,¹ and the under-five mortality rate is estimated to be 180 per 1000 live births.² Reducing childhood mortality in such settings is a humanitarian priority and is one of the United Nations Millennium Development Goals.²

Médecins Sans Frontières (MSF) runs a referral hospital in a remote region of Somalia with a strong focus on paediatrics. This is also the only health facility providing in-patient care in a 250 km radius.

Although care in all MSF hospitals is meant to be provided according to standard treatment guidelines, its implementation may be compromised in conflict settings. As one way of trying to ensure that high standards of care are maintained, MSF has set an in-house generated target for adverse hospital exit outcomes (death and absconded) to $\leq 15\%$. No formal evaluation has been made as to whether this target is being met in Somalia. There is also a paucity of published information on in-patient paediatric morbidity, case fatality and hospital exit outcomes for children aged ≤ 15 years in a conflict setting.³ Such information is needed to assess and improve the quality of paediatric care in such deprived areas.

Among children admitted to the paediatric ward of a remote hospital in Somalia, we report on 1) their

morbidity pattern and related case-fatality rates and 2) the hospital exit outcomes and how the latter compared to MSF standard thresholds.

METHODS

This was a cross-sectional descriptive study using routine programme data. The study was conducted over a 2-year period (2010–2011) in Istarlin hospital, in Guriel district, Somalia, which caters for a population of 327 000. The study population included all children aged < 15 years admitted to the paediatric ward.

Somalia is one of the most challenging contexts for health workers, due to the risks of kidnapping and life threats. No expatriates were present, and the hospital was exclusively reliant on Somali staff. As a way of supporting these clinicians, a real-time audio-video telemedicine support service from Kenya was introduced in 2010.¹

MSF started its support of the hospital in 2006; available services included paediatrics, internal medicine, maternity and emergency surgery. There were 90 beds, of which 36 were allocated to paediatrics, including neonatology. No intensive care unit was in place. There were four medical doctors and 80 nurses. There was no functional Ministry of Health, and all existing health services were provided by aid organisations and private for-profit actors. All services were provided free of charge.

Data were entered into an electronic data monitoring tool (In Patient Monitoring Tool, IPD Tool, Epicentre, Paris, France) by data entry clerks. Case definitions and outcomes were standardised. The database was regularly supervised and used for analysis. Data reported here included a period when telemedicine services were available (2011).

This study satisfied the ethics criteria of the MSF Ethics Review Board and the Ethics Advisory Group of the International Union Against Tuberculosis and Lung Disease for studies using routinely collected data.

RESULTS

A total of 6211 children, including 5099 (82%) children aged < 5 years, exited the paediatric ward. Table 1 shows morbidity type, deaths and case fatality. Lower respiratory tract infections (48%) and severe acute malnutrition (16%) were the leading reasons for admission. The largest absolute number of deaths was for

AFFILIATIONS

- 1 Médecins Sans Frontières, Belgium, Somalia Mission Coordination, Nairobi, Kenya
- 2 Médecins Sans Frontières, Brussels Operational Centre–Luxembourg, Luxembourg
- 3 Centre for Internal Health, University of Bergen, Bergen, Norway
- 4 Institute of Tropical Medicine, Antwerp, Belgium
- 5 Médecins Sans Frontières, Brussels Operational Centre, Brussels, Belgium

CORRESPONDENCE

Bienvenu Baruani Ngoy
Medical Coordinator
Somalia Programs
Brussels Operational Centre
Nairobi, Kenya
Tel: (+254) 739 409 135
e-mail: bienvenu.baruani@gmail.com

ACKNOWLEDGEMENT

This research was supported through an operational research course that was jointly developed and run by the Centre for Operational Research, International Union Against Tuberculosis and Lung Disease, and the Operational Research Unit, Médecins Sans Frontières, Brussels–Luxembourg. Additional support for running the course was provided by the Institute of Tropical Medicine, Antwerp, Belgium; the Center for International Health, University of Bergen; and the University of Nairobi, Kenya. The authors thank health workers, support staff in the Guriel Hospital and the Nairobi coordination for their precious support. Funding for the course was from an anonymous donor, the Department for International Development, United Kingdom, and Médecins Sans Frontières, Brussels Operational Center, MSF–Luxembourg. Conflict of interest: none declared.

KEY WORDS

Somalia; conflict; hospital outcomes; paediatrics; operational research

Received 29 December 2012
Accepted 11 March 2013

TABLE 1 Type of morbidity and case fatality in the paediatric ward of Guriel Hospital, Somalia (2010–2011)

Morbidity	Cases <i>n</i> (%)	Case fatality <i>n</i> (%)
Lower respiratory tract infection	2957 (48)	62 (2)
Severe acute malnutrition	994 (16)	68 (7)
Others*	753 (12)	35 (5)
Non-bloody diarrhoea	619 (10)	21 (3)
Measles	500 (8)	6 (1)
Trauma, wounds, burns, accident	275 (4)	3 (1)
Pertussis	50 (0.8)	1 (2)
Meningitis	40 (0.7)	8 (20)
Bloody diarrhoea	23 (0.5)	1 (4)
Total	6211 (100)	205 (3)

*The top six causes in the 'others' category were violence (0.4%), malaria (0.3%), kala-azar (visceral leishmaniasis; 0.3%), surgical cases (0.2%), fever of unknown origin (0.1%) and tetanus (0.1%).

TABLE 2 Exit outcomes in the paediatric ward of Guriel Hospital, Somalia (2010–2011)

Variable	≤5 years <i>n</i> (%)	>5 years <i>n</i> (%)	Total <i>n</i> (%)
Total admission	5022	1144	6166
Total exit	5099*	1112	6211
Cured†	4742 (93)	1076 (96.8)	5818 (93.7)
Transferred out‡	6 (0.1)	9 (0.8)	15 (0.2)
Adverse outcomes§			
Death	188 (3.7)	17 (1.5)	205 (3.3)
Absconded	163 (3.2)	10 (0.9)	173 (2.8)

*More exits than admissions are shown in group '≤5 years' because some patients were admitted to the paediatric ward in late 2009 but were discharged (exited) in 2010. The same occurred in 2011.

†Patients who recovered from illness and were discharged.

‡Patients referred to a higher level facility.

§Combination of deaths and absconded; death = died for any reason while in the paediatric ward, absconded = left the ward against medical advice.

severe acute malnutrition ($n = 68$) followed by lower respiratory tract infection ($n = 62$), while the highest case-fatality rate was for meningitis (20%).

Table 2 shows exit outcomes for the 6211 children. Adverse outcomes were seen in 378 (6%) children: 205 (3.3%) died and 173 (2.8%) absconded. These outcomes lie within the 15% maximum threshold set by MSF.

DISCUSSION

This is one of the first studies to assess the quality of paediatric in-patient care in a region of conflict in the Horn of Africa, showing that adverse ward outcomes (deaths and absconded) were within set threshold limits.

The strengths of the study are that a standardised monitoring tool with case definitions was used throughout the study period and clinicians were well trained on its use. This should have minimised methodological bias. A limitation is that despite using standardised guidelines, independent on-site validation of diagnosis

and cause(s) of death were not feasible due to poor security precluding access to the site.

It is very encouraging that despite a high caseload of children and a limited number of clinical staff, under-five case fatality was only 3.7%. This is even lower than the 8% case fatality reported from a rural district hospital in a non-conflict region of Kenya.⁴ Our results also compare well with data involving 13 first-line referral district hospitals in Kenya that showed under-five in-patient case-fatality rates of 4–15%.⁵

Possible reasons for the positive results from Somalia include standardisation of treatment by MSF, the fact that the organisation mobilised resources (human, equipment and supplies) and all services were offered free of charge, all of which permit an adequate standard of care. This thinking is supported by a study from Guinea-Bissau, where the introduction of standardised guidelines and financial incentives reduced mortality rates.⁶ In addition, clinical staff were well trained and a telemedicine service was in place for continuing medical support from Kenya.¹ This significantly improved adverse outcomes by 30% between 2010 and 2011.¹ Finally, bi-monthly supervision was organised by flash on-site visits by a separate team from Kenya.

High case fatality was linked to meningitis and severe acute malnutrition, and may reflect late presentation, delayed lumbar puncture and lack of sufficient laboratory tests such as electrolyte measurements and supportive care facilities for unconscious children. Even in high-resource settings, such cases are difficult to manage. A study of paediatric case fatality in eight MSF-supported hospitals in Africa showed a similar case-fatality rate (24%) for meningitis.³

CONCLUSION

At a time when there is global momentum towards achieving universal health coverage (UHC) and health for all, this study shows that access to both good quality care and coverage (a pillar of UHC) can be achieved even in remote, conflict-torn settings. These encouraging findings should boost efforts to ensure that such deprived populations are not left out in the quest to achieve UHC.

References

- Zachariah R, Bienvenue B, Ayada L, et al. Practicing medicine without borders: tele-consultations and tele-mentoring for improving paediatric care in a conflict setting in Somalia? *Trop Med Int Health* 2012; 17: 1156–1162.
- United Nations. The Millennium Development Goals report 2011. Addendum, Goal 4, Reduce child mortality. New York, NY, USA: UN, 2011. [http://mdgs.un.org/unsd/mdg/Resources/Static/Products/Progress2011/11-31339%20\(E\)%20MDG%20Report%202011_HR_4%20Addendum%20NEW.pdf](http://mdgs.un.org/unsd/mdg/Resources/Static/Products/Progress2011/11-31339%20(E)%20MDG%20Report%202011_HR_4%20Addendum%20NEW.pdf) Accessed April 2013.
- van den Boogaard W, Manzi M, Harries A D, Reid A J. Causes of pediatric mortality and case-fatality rates in eight Médecins Sans Frontières-supported hospitals in Africa. *Public Health Action* 2012; 4: 117–121.
- Mwaniki M K, Gatakaa H W, Mturi F N, et al. An increase in the burden of neonatal admissions to a rural district hospital in Kenya over 19 years. *BMC Public Health* 2010; 10: 591.
- English M, Esamai F, Wasunna A, et al. Assessment of inpatient paediatric care in first referral level hospitals in 13 districts in Kenya. *Lancet* 2004; 363: 1948–1953.
- Biai S, Rodrigues A, Gomes M, et al. Reduced in-hospital mortality after improved management of children under 5 years admitted to hospital with malaria: randomised trial. *BMJ* 2007; 335: 862.

Contexte : Un hôpital de district dans la Somalie en conflit.

Objectif : Rapport sur la morbidité, la létalité et les résultats à la sortie de l'hôpital comme indicateurs de la qualité des soins chez des patients admis en pédiatrie.

Schéma : Etude transversale.

Résultats : Chez 6211 enfants, les infections du tractus respiratoire inférieur (48%) et une malnutrition aiguë grave (16%) ont été les causes principales d'admission. Le taux de létalité le plus élevé sur-

vient dans les cas de méningite (20%). Des effets indésirables sont survenus chez 378 enfants (6%), notamment 205 décès (3,3%) et 173 évactions (2,8%).

Conclusion : Les résultats à la sortie de l'hôpital sont bons même dans une Somalie en conflit, ce qui devrait stimuler les efforts pour garantir que de telles populations ne soient pas abandonnées dans la recherche d'une couverture universelle de la santé.

Marco de referencia: Un hospital distrital en Somalia, un país fracturado por el conflicto armado.

Objetivo: Comunicar los datos sobre la morbilidad y la letalidad de los niños hospitalizados y el desenlace de alta hospitalaria como indicadores de la calidad de la atención de salud.

Método: Fue este un estudio transversal.

Resultados: Las principales causas de hospitalización de los 6211 niños fueron la infección de las vías respiratorias inferiores (48%) y la desnu-

trición grave aguda (16%). El índice más alto de letalidad fue por meningitis (20%). Ocurrieron desenlaces desfavorables en 378 casos (6%), de los cuales 205 muertes (3,3%) y 173 altas voluntarias (2,8%).

Conclusión: Los desenlaces de la hospitalización de los niños en Somalia son buenos, pese a las divisiones que causa el conflicto armado, lo cual debe estimular las iniciativas encaminadas a evitar que estas poblaciones queden aisladas de la búsqueda de una cobertura universal de salud.