

YES, CHILDREN DO DIE IN SINGAPORE: A SEVEN-YEAR ANALYSIS OF PAEDIATRIC MORTALITY

We read with interest the review of deaths in a children's hospital by Chong et al.⁽¹⁾ Given the paucity of studies on paediatric mortality in hospitals overseas as well as locally, we proceeded to review paediatric mortality at the National University Hospital (NUH) to determine if the data from KK Women's and Children's Hospital (KKH) were generalisable to other Singapore public hospital settings.

We performed a retrospective audit of all paediatric deaths in NUH from 2005 to 2011. The mortality data were downloaded from the hospital admission and discharge records as part of routine post-SARS surveillance mandated by the World Health Organization for countries affected by SARS.⁽²⁾ Clinical history and demographic profiles of cases were collected from electronic case records. The cause of death was ascertained from coroners' reports, as well as from the results of any samples sent for laboratory testing. Inclusion criteria were all deaths in the paediatric medical wards and the intensive care unit in 2005–2011 from four weeks to 19 years of age. Exclusion criteria were deaths from accidents, poisoning and post surgery/procedures. Deaths in the surgical theatre, accident and emergency department (A & E) or outside the hospital, e.g. the patient's home or other pre-hospital sites, were also excluded.

A total of 261 paediatric deaths were reported over the seven years. This gave an average of 37 paediatric deaths a year, with a minimum of 28 in 2008 and a maximum of 52 in 2009 (Fig. 1). A total of 79 (30.3%) deaths occurred at the A & E or pre-hospital sites, and were thus excluded from this study. A total of 171 children met the inclusion criteria and their records were analysed. The top three causes of paediatric deaths in NUH were also cancers, congenital anomalies and infections. There was no statistically significant difference between the causes of paediatric mortality in NUH between 2005 and 2011 and KKH between 2008 and 2009 (Table I), suggesting that the data presented by Chong et al are indeed generalisable to the wider Singapore population.

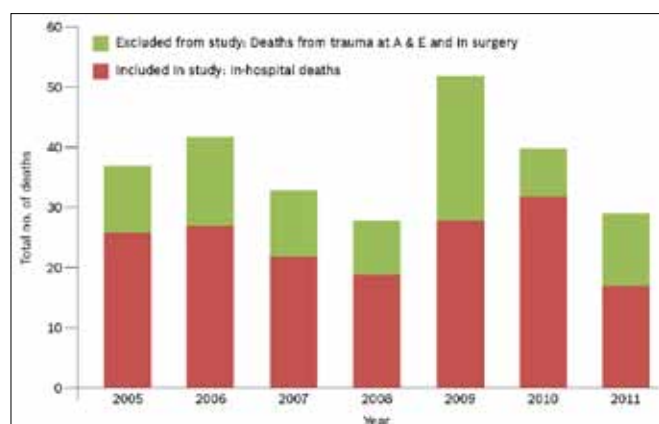


Fig. 1 Total number of paediatric deaths in NUH from 2005 to 2011.

Table I. Incidence of paediatric deaths classified by diagnosis in the two hospitals.

Diagnosis	No. of deaths (%)	
	NUHS 2005–2011 (n = 171)	KKH 2008–2009 (n = 68)
Cancers	54 (31.6)	20 (29.4)
Congenital anomalies	54 (31.6)	14 (20.6)
Infections	27 (15.8)	12 (17.7)
Cardiovascular diseases	8 (4.68)	7 (10.3)
Perinatal conditions	7 (4.08)	6 (8.82)
Cerebrovascular diseases	6 (3.51)	2 (2.94)
Others	14 (8.19)	7 (10.3)
Unascertained	1 (0.58)	NA

Chong et al reported that 'others', Indians and Malays appeared to be over-represented in KKH. In the KKH study, 28 (41%) children were Chinese, and 40 (59%) were listed as 'others' and these included Indians and Malays. Our analysis revealed similar findings. 87 (51%) children were Chinese, 48 (28%) were Malay, 10 (6%) were Indian and 26 (15%) were classified under 'others'. The last category was largely made up of local Eurasians and foreigners. The reasons for this ethnic difference are not clear and bear further investigation in prospective analyses.

Our study covering a longer period shows that the incidence of the various causes of paediatric mortality in NUH is similar to that of KKH. The incidence of deaths from congenital anomalies was comparable to that from cancers. This indicates that more may need to be done to address the palliative care needs of children with congenital anomalies. The parents of these children often face tremendous challenges in taking care of these children without access to Medishield or most insurance schemes. Additional support in the form of well-funded palliative care during terminal illnesses would be a great help.

After cancers and congenital anomalies, infections were the next most common cause of paediatric mortality. Advances in vaccinations and antimicrobial therapy over the years have made infections a less likely cause of death compared to cancers and congenital anomalies in most middle and high-income countries worldwide.⁽³⁾ However, we noted that among patients who died from cancers and congenital anomalies, the terminal event leading to their demise was often infection. This was also observed in a study on changes in infectious disease mortality among children in the Netherlands⁽⁴⁾ and several other studies,^(5,6) where at least 50% of the children who died from infections had underlying conditions such as malignancies and congenital anomalies. Some of these events followed surgery. Hence, surgical events would also be times at which ancillary support for children with severe congenital illnesses

would be necessary and helpful. While both our study and the KKH study are retrospective analyses of mortality data, we feel that they both highlight a major issue – children in Singapore do die. While we recognise that many of these deaths – from cancers and severe congenital illnesses – are often difficult to prevent, it is critical for us as a society and a medical community to see how we can work with these children and their families to ensure the best quality of life possible for the ‘least of these’.

Yours sincerely,

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