

Analysis of data on mortality prior to paediatric clinician training

Data were collected from 2 sources, the first was the admissions book where patients and their outcome are documented on admission to the ward. The second was the individual patient notes. There was a large discrepancy between the two sources when it comes to numbers of death – we have therefore used the higher number of deaths (that is from case notes) to ensure we capture all cases of paediatric mortality. All analysis on mortality rate/age/sex was performed using the case notes.

Total Admissions: 7217 from 3 hospitals: FJ Grante Hospital in Sinoe County, Fishtown Hospital in Rivergee County and Phebe Hospital in Bong County. Total deaths from the case notes = 542 but from Admissions book only 321.

FJ Grant – Data over 48 months January 2018-December 2021

Data from admission book:

Admissions: 1252

Deaths: 62 = 5% mortality

Data from case notes:

Deaths: 54 = 3.5% mortality

Phebe – Data over 42 months January 2018-June 2021

Data from admission book:

Admissions: 4901

Deaths: 232 = 4.7% mortality

Data from case notes:

Deaths: 468 = 9.5% mortality

Fishtown – Data over 48 months Jan 2018-Dec 2021

Data from admission book:

Admissions: 1064

Deaths: 27 = 2.5% mortality

Data from case notes:

Deaths: 20 = 1.9% mortality

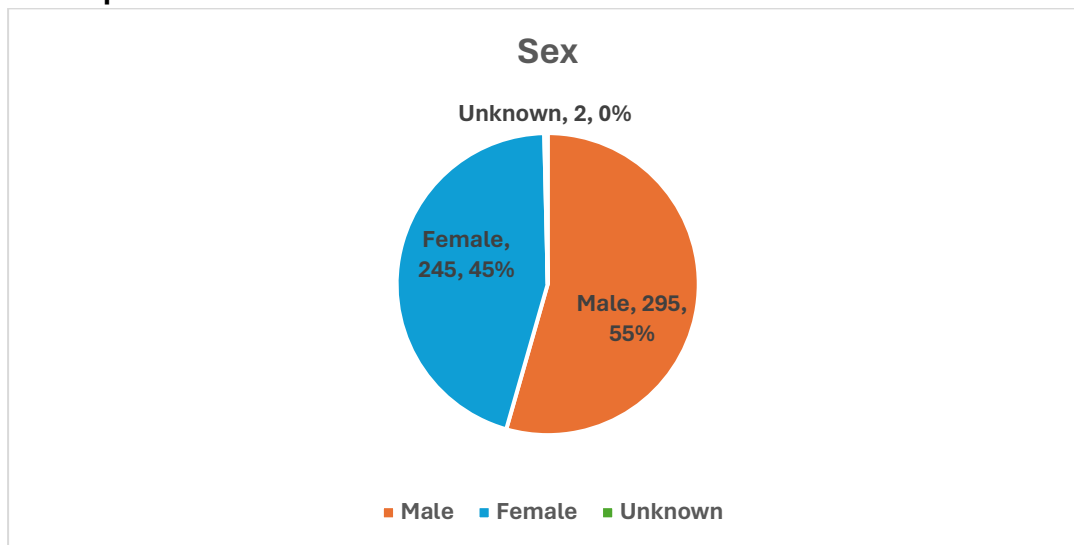
Total Admissions: 7217 (from admission book)

Total Deaths: 542 (from case notes)

Mortality rate: 7.5%

All of the data below relates only to the case notes regarding the patients who died (542)

Sex of patients at time of death

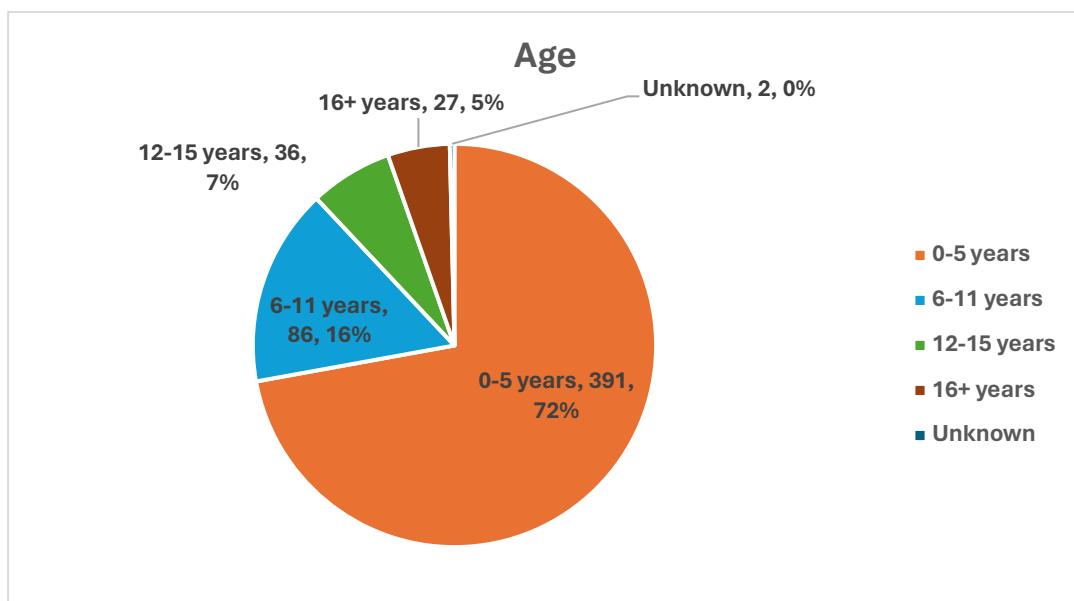


There was no significant difference between the sex of the patients. **Sex: Male 295, Female 245, Unknown**

Ages of patients at time of death

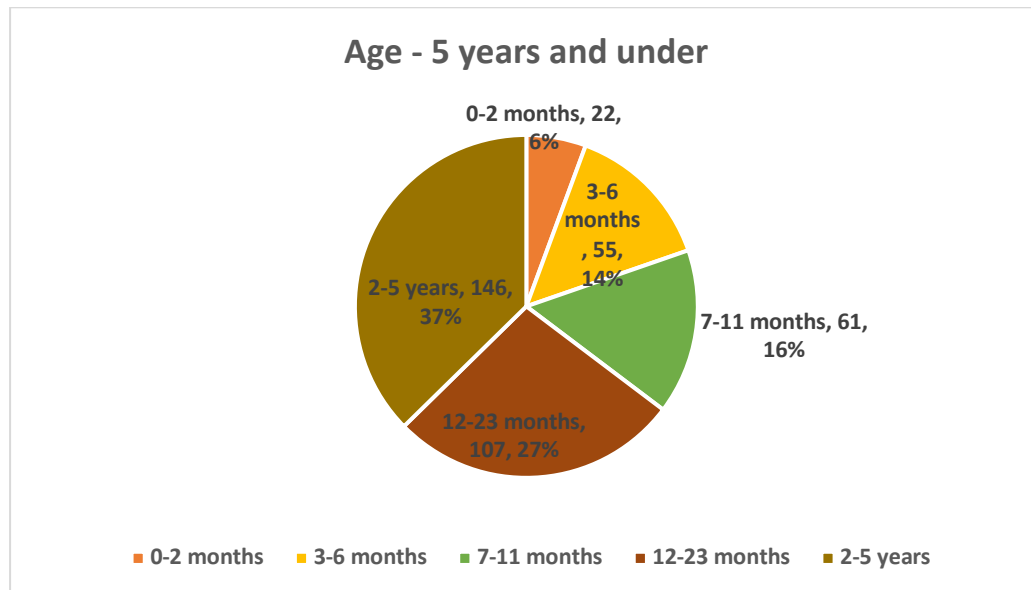
Age: 0-5y 391, 6-11y 86, 12-15y 36, 16+ 27, unknown 2

72% (391/542) of deaths occurred in patients aged ≤ 5 years confirming that we need to focus on reducing the under-5 mortality rate.



Breakdown of deaths occurring 0 to 5yrs of age

0-2months 22, 3-6months 55, 7-11months 61, 12-23months 107, 2-5years 146



53% of patients who died were in hospital between 0-1 day, suggesting that a focus on emergency paediatric assessment and treatment is important. In addition, 8% of patients died on or before arrival.

Analysis of case notes identified the following conditions associated with death.

- Malaria (alone or in combination with other conditions/co-morbidities, for example anaemia which was a very common pathology)
- Pneumonia
- Gastroenteritis, dehydration, and shock
- Sepsis and infections (alone or in combination with malaria)
- Nephrotic syndrome and acute glomerulonephritis
- Severe acute malnutrition (presenting alone or in combination with infection)
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Examination of themes regarding the management of patients included:

1. Inappropriate use of certain drugs:

- Diclofenac/NSAIDs – non-steroidal anti-inflammatory drugs, often used in infants and cases of dehydration where caution is advised due to increased risk of nephrotoxicity. [Diclofenac is not advised in patients less than 9 years of age.](#)
- Diazepam & Phenobarbitone – very frequent use of these anticonvulsants. We are unable to comment on seizure activity from the available data, however, it is very important to use these drugs only in prolonged seizures and to have a bag-valve-mask system immediately available and staff trained to use this device effectively.
- Steroids were often used in pneumonia and occasionally malaria. The main indications for steroids in paediatric medicine are the treatment of wheeze/asthma exacerbations and nephrotic syndrome.
- Diuretics – often used with blood transfusions as a routine, even in cases who presented with shock or dehydration. Diuretics should be reserved for patients

who are at risk of fluid overload, and the child must be assessed prior to dose. If given in circulatory compromise it could lead to worsening hypotension.

2. Lack of antibiotic stewardship – In some cases of infection a patient's antimicrobials were not escalated from oral to intravenous antibiotics despite deterioration. We need to develop robust guidelines to lead antimicrobial use in view of developing antibiotic resistance worldwide and resource availability.
3. Fluid management in SAM – patients with severe acute malnutrition require caution with regards to their fluid management or complications can arise, particularly if presenting with shock or dehydration.
4. Variable fluid resuscitation in dehydration and shock – we need to provide training and review current guidelines for the management of these conditions in paediatric patients.
5. Priority of treatments – many patients received vitamin supplementation and de-worming in the acute phase of illness including those in hospital < 24hours. We need to look at the priority of treatment, ensuring emergency care is the priority with the provision of routine treatments for health promotion prior to discharge.

Paediatric mortality across rural Liberia requires priority attention. There are many possible strategies, especially management of the key conditions and themes above. The data also supports the training of paediatric clinicians who will work in rural hospitals helping to provide and sustain paediatric services around the highest risk areas of the country.