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Clinical Information Network

BLOOD TRANSFUSION PRACTICES AND OUTCOMES IN COUNTY HOSPITALS IN KENYA

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On behalf of
Clinical Information Network (CIN)

KENYA PAEDIATRIC ASSOCIATION

MINISTRY OF HEALTH

Background

- Severe malaria anaemia is a leading indication for hospitalization, blood transfusion and mortality in children <5years of age

- Reports indicate that most malarial anaemia deaths (sub Saharan Africa) occur within 2 days of admission due to blood transfusion delay

- Delay in blood transfusion may increase mortality within local health care settings and may be a useful marker of blood transfusion service performance

General Purpose of the Study

- Explore evidence of any delays in blood transfusion in Kenyan hospitals
- Determine possible outcomes of delays in blood transfusion
- Evaluate risk of death among children with blood transfusion ordered at admission

Methodology

Study Setting

- Nested within the Clinical Information Network (CIN) – 14 sites in Kenya

Study Population

Inclusion –Exclusion Criteria

- Of the CIN hospitals, 4 found in highland settings which had zero cases of blood transfusion (H4, H5, H9, H12) were excluded

- Overall study population ~ Admissions to the other 10 CIN hospitals + no surgical diagnosis, or aged at least 1 month of age

- Main sub group of focus ~ children with a blood transfusion ordered

- Period of study is from September 2013 to March 2016

Data Collection

- Basic demographic plus clinical data

Data Analysis

- Using R Statistical software, Version 3.1.3

- Logistic regression models were used to evaluate risk of death among children with blood transfusion ordered at admission.

Results

Baseline and Demographic characteristics of children in hospitals	N (%)
Blood Transfusion Practices	
Proportion of admissions with transfusion ordered	2875/53208 (5%)
Proportion of ordered transfusions that had a diagnosis of	
Anaemia	2240/2875 (78%)
Malaria	2094/2875 (73%)
SCD	293/2875 (10%)
Malnutrition	226/2875 (8%)
Both malaria and SCD	149/2875 (5%)
OTHER	157/2875 (5%)
Proportion of ordered transfusions for whom Hb known to be <5g/dl	1295/2875 (45%)
Proportion of Anaemia cases with Hb < 5g/dl	2232/6199 (36%)
Proportion of ordered transfusions given	2352/2875 (82%)
Proportion of transfusions given that were on the same day as the order	1760/2352 (75%)
Mortality	
Mortality among the study population	3486/53208 (7%)
Mortality among cases ordered for transfusion	381/2875 (13%)
Mortality among cases transfused	276/2352 (12%)
Mortality among cases Not transfused	105/523 (20%)

Table 1: Characteristics Of Children Admitted In The 10 CIN Hospitals From September 2013 Through March 2016

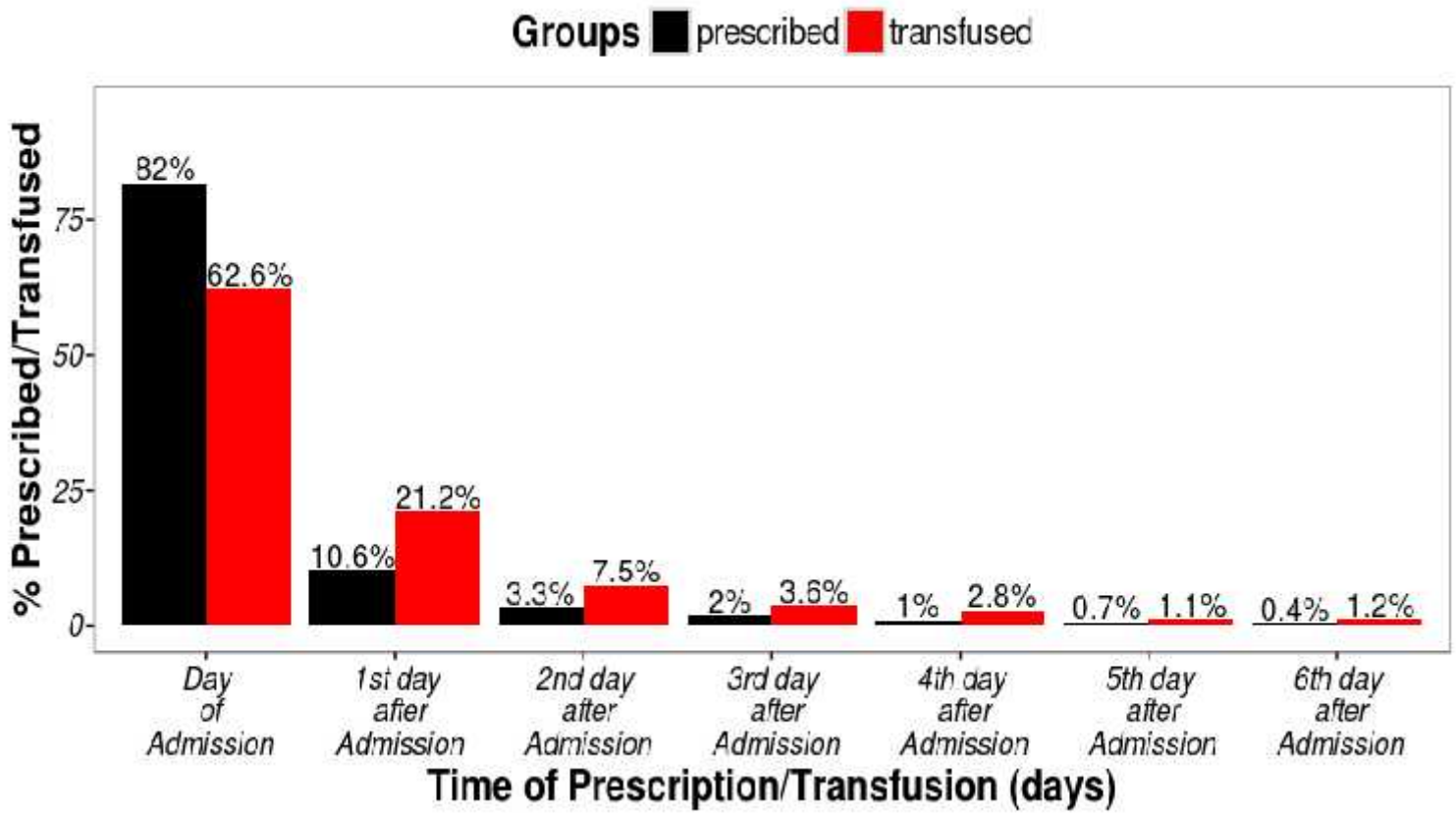
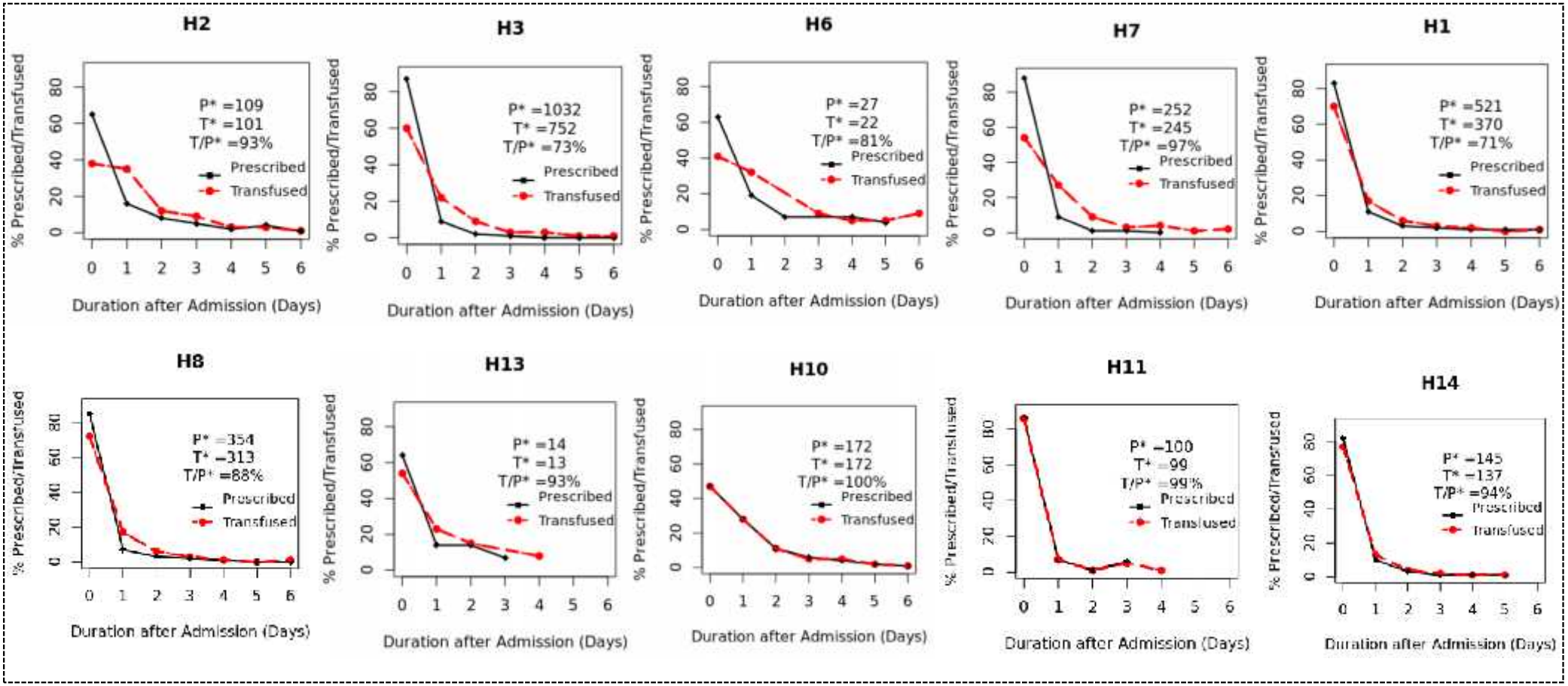


Fig 1: Charts of time to prescription and transfusion from the day of admission for all children who had blood prescribed for the 10 CIN hospitals



P* = represents total cases prescribed for the specific hospital during the period. **T*** = represents total cases transfused for the specific hospital during the period.
T/P* = represents percentage of the prescribed cases that were transfused for the specific hospital during the period

Figure 2: Hospital Specific charts of blood prescriptions and actual transfusions indicating delays in receiving blood in all the CIN hospitals

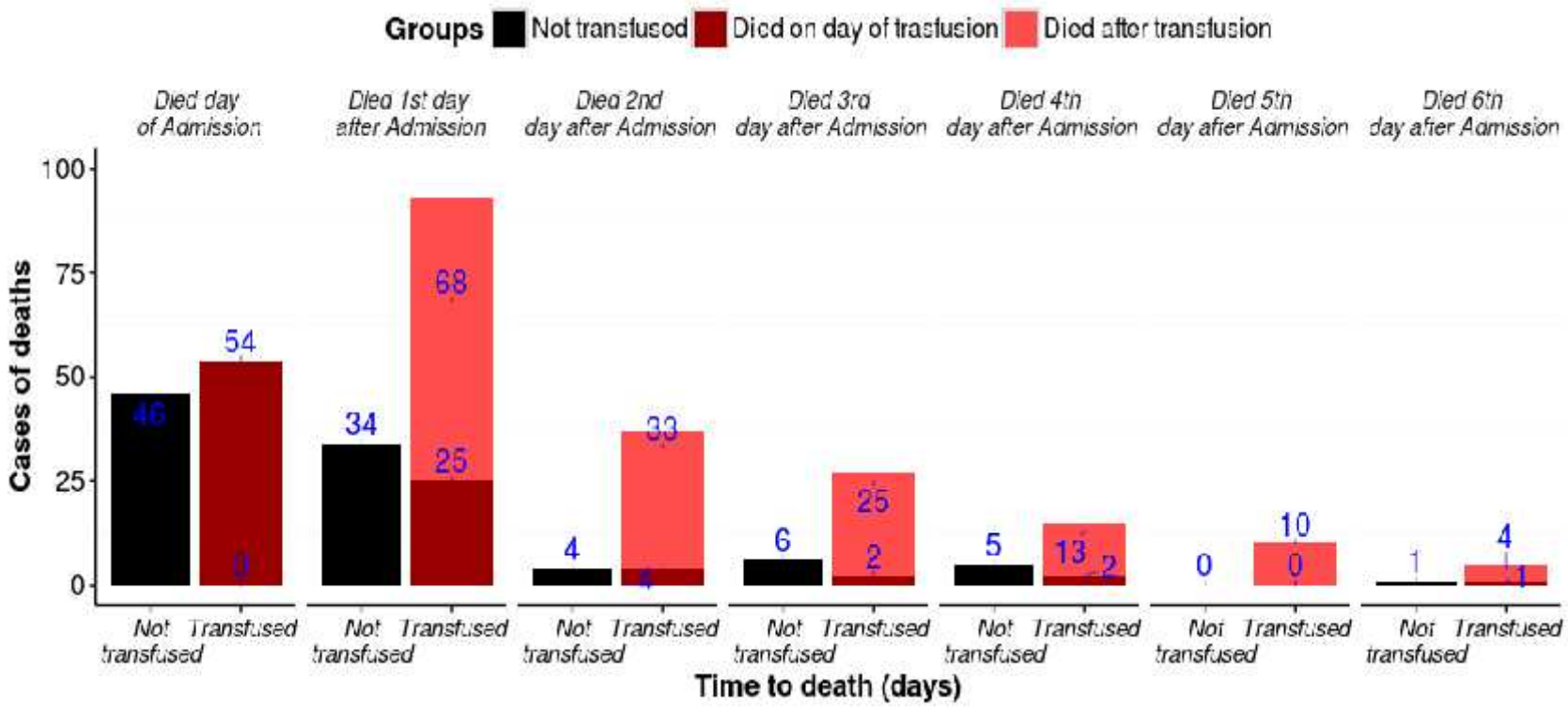


Figure 3: Pattern Of Mortality Amongst All Deaths For Those Not Transfused And Those Transfused

Indicator	Univariable Analysis			Multivariable Analysis		
		Unadjusted Odds Ratio (95% CI)			Adjusted Odds Ratio (95% CI)	
	N	OR	p value	N	OR	p value
Transfusion Ordered	2875					
Anaemia	2040	0.41(0.33-0.52)	<0.001		0.63(0.47-0.86)	0.0037
Malaria	2094	0.4(0.33-0.50)	<0.001		0.51(0.37-0.71)	<0.001
Malnutrition	226	3.59(2.65-4.82)	<0.001		2.56(1.74-3.75)	<0.001
Sickle Cell Disease	293	0.54(0.35-0.81)	0.00466		0.66(0.38-1.1)	0.1269
Severe Pallor	1831	0.65(0.53-0.81)	<0.001		0.66(0.49-0.89)	0.0066
Indrawing	427	5.65(4.46-7.16)	<0.001		2.81(1.99-3.93)	<0.001
Grunting	200	6.01(4.43-8.13)	<0.001		2.05(1.35-3.1)	0.0007
AVPU level	2726			2578		
Alert		1 (ref)				
Verbal response		2.81(1.72-4.46)	<0.001		2.64(1.43-4.7)	0.0013
Pain response & Unresponsive		4.73(3.54-6.3)	<0.001		3.81(2.66-5.43)	<0.001
Jaundice level	2783			2691		
none		1 (ref)				
+ (mild/moderate)		0.6(0.39-0.88)	0.0113		1.01(0.62-1.61)	0.9639
+ + + (severe)		1.57(0.92-2.55)	0.0811		3.12(1.66-5.61)	0.0003
Transfusion given level						
Given same day		1 (ref)				
Given different day		0.46(0.32-0.64)	<0.001		0.58(0.38-0.87)	0.0106
Not transfused		1.52(1.18-1.94)	0.000878		1.8(1.3-2.49)	0.0004

Table 2: Risk Of Death Predictors Among Children With Blood Transfusion Ordered At Admission

Summary

- Anaemia and malaria are the leading cause of blood transfusion in acute childhood illnesses
- Generally, a large percentage of all the orders for transfusion at admission result in blood administration
- Hospitals located in highland areas experience no blood transfusion cases and frequency of transfusion varies widely
- Most of the deaths among those ordered for transfusion occurs within 2 days of admission
- A significant increase in the risk of mortality among children not transfused with (OR 1.8) compared to those transfused on the same day
- Delays in transfusion varies across hospitals and may indicate the performance of blood transfusion service

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