Survival analysis of cholera admitted at the Temporal Cholera Treatment Centre at the National Hero's Stadium in Lusaka, Zambia

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No Disclosures

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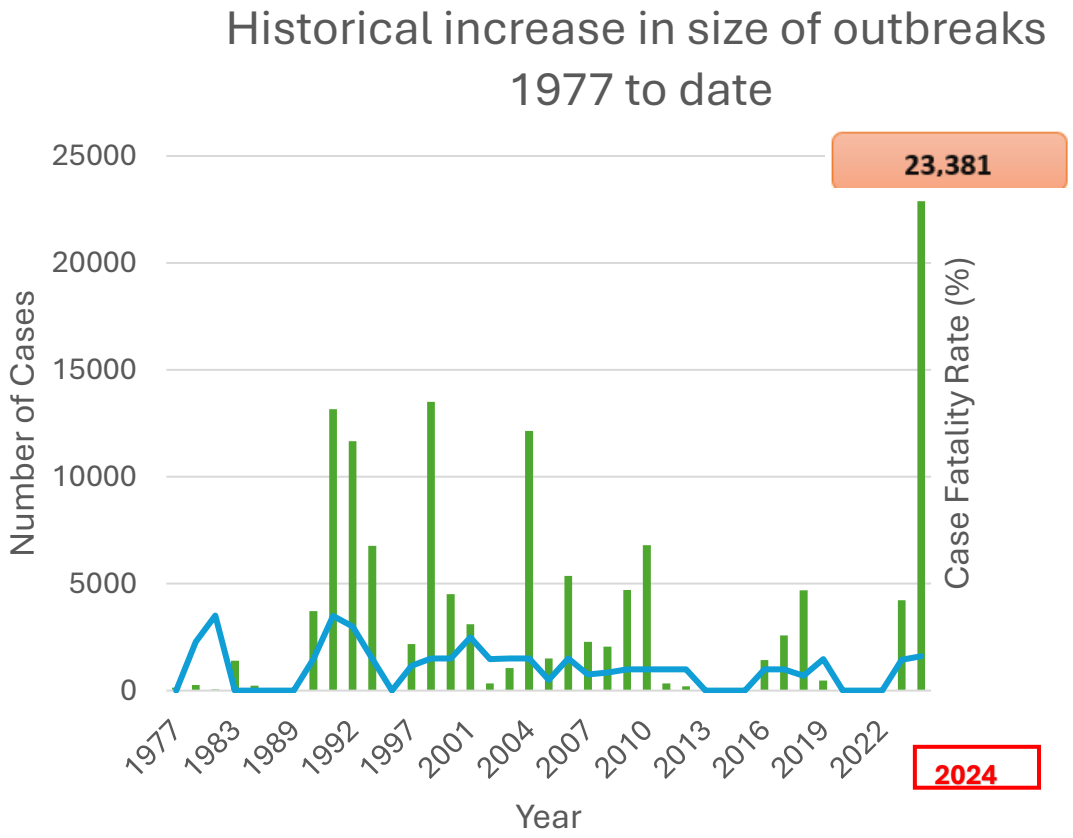
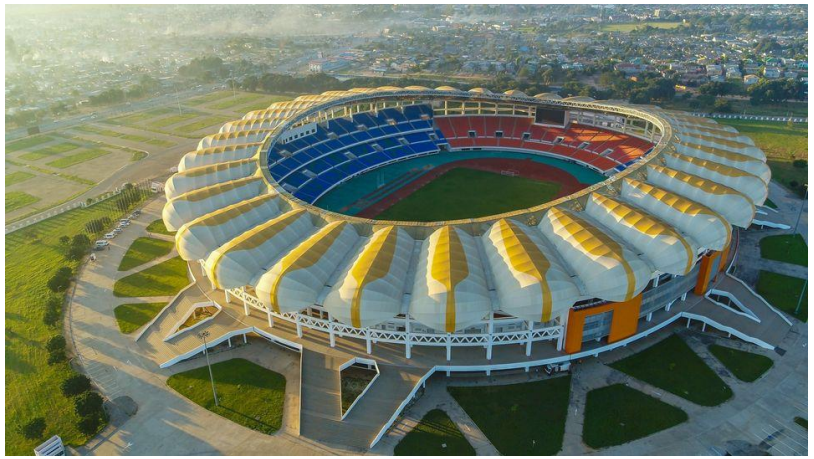
Introduction

- Cholera outbreaks ↑ frequency & severity worldwide, especially Sub-Saharan Africa
- Govt endorsed the Multisectoral Cholera Elimination Plan (MCEP) in 2019 intending to eliminate cholera by 2025.
- 2023/2024, largest outbreak since 1977,
  - over 23, 000 cases & 750 deaths
  - 1.4% CFR in facilities, 436 community deaths
- Revised NMCEP, is a collaborative effort of government ministries and health partners
- Aims to reduce cholera ill-health and deaths, ultimately achieving a cholera-free Zambia by 2030



Hero’s Stadium CTC



Objective

The aim of this study was to investigate survival probability of cholera patients who were under follow-up and identify significant risk factors for mortality in the CTC

Methodology

Design – Retrospect cohort study

- The study examined 1,529 patients admitted to the CTCs in Lusaka.

Discharge

- All patients that are without loose stool or vomiting four over fours and able to walk unassisted and oriented.

Death

- A patient who died in the CTC after admission.

Statistical Analysis

Variable

- Age, Sex, HIV status, presence of comorbidities, Hydration status at admission, OCV, treatment plan, Time(days) and
- Outcome (died or discharged)

Nonparametric

- Kaplan-Meier (KM) was used to estimate the survival probabilities from death between groups.
- Wilcoxon rank-sum test was used to explore the relationships between continuous variables and the outcome

Semiparametric model-cox

- Before fitting the survival model, proportional hazard assumptions (PHA) were verified.

Selecting cases

Inclusion criteria

- Admitted to CTC for acute water diarrhoea.

Exclusion criteria

- Self discharged patients
- Patient who date of discharge was not known

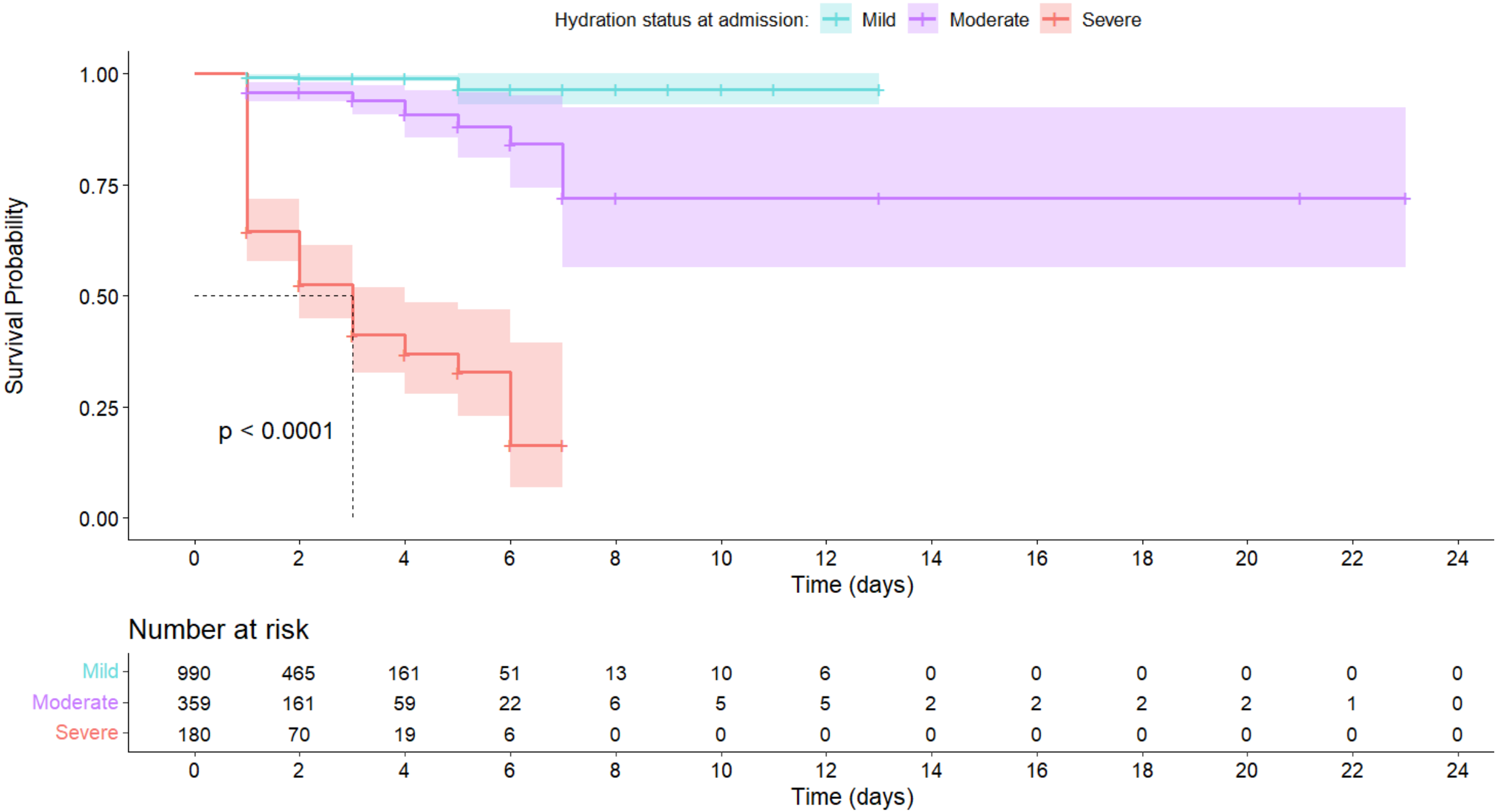
Results

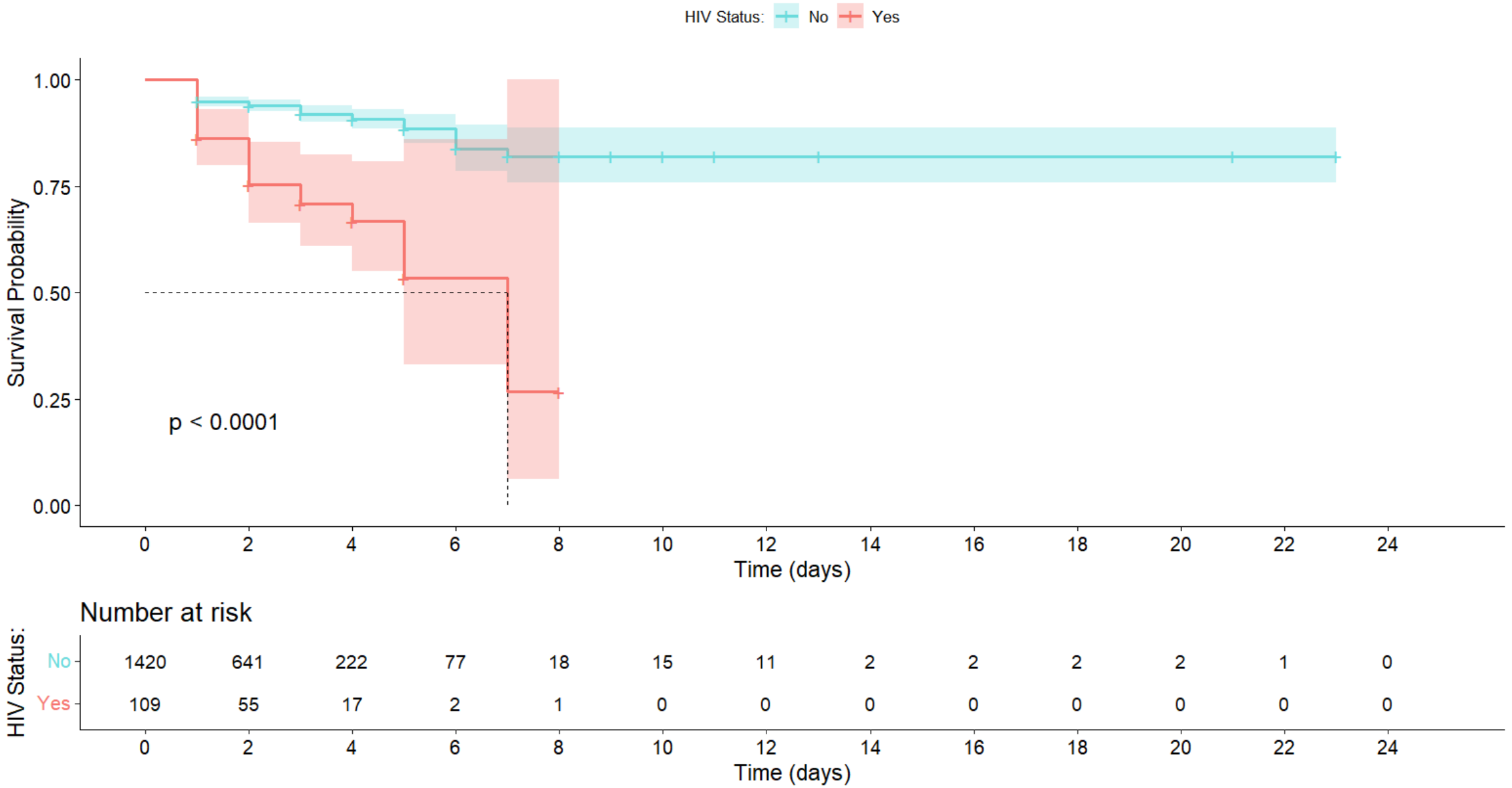
Descriptive

- At the end of the follow-up (2024, 16 March), 1,404 of the patients recovered from Cholera, and 125 died.
- The median age was 24(IQR, 8-34). The median age recovered from Cholera was 23 years (IQR = 8, 33) and who died 31 years (IQR = 10, 44).

incidence

- The median survival from death was 2 days (IQR, 1-3) and the total person time at risk was 3246 days.
- Incidence was estimated at 51.0 per 100 persons per day.


Hydration status at admission: Mild Moderate Severe
Survival Probability
1.00
0.75
0.50
0.25
0.00
p < 0.0001
0 2 4 6 8 10 12 14 16 18 20 22 24
Time (days)
Number at risk
Mild 990 465 161 51 13 10 6 0 0 0 0 0 0
Moderate 359 161 59 22 6 5 5 2 2 2 2 1 0
Severe 180 70 19 6 0 0 0 0 0 0 0 0 0
0 2 4 6 8 10 12 14 16 18 20 22 24
Time (days)


HIV Status: No Yes
1.00
0.75
0.50
0.25
0.00
Survival Probability
p < 0.0001
0 2 4 6 8 10 12 14 16 18 20 22 24
Time (days)
Number at risk
HIV Status:
No 1420 641 222 77 18 15 11 2 2 2 2 1 0
Yes 109 55 17 2 1 0 0 0 0 0 0 0 0
0 2 4 6 8 10 12 14 16 18 20 22 24
Time (days)

Bivariate analysis of background and clinical characteristics of hospitalised cholera patients

		Survival Status		
Variable	**Total (N = 1,529)[1]**	**Discharged**, N = 1,404[1]	**Died**, N = 125[1]	**p-value[2]**
Hospital length of stay (days)	1.00 (1.00, 3.00)	1.00 (1.00, 3.00)	1.00 (1.00, 2.00)	**0.001**
Age				**0.001**
≤4	249 (16%)	236 (17%)	13 (10%)	
5-19	370 (24%)	347 (25%)	23 (18%)	
20-40	667 (44%)	614 (44%)	53 (42%)	
41-60	202 (13%)	171 (12%)	31 (25%)	
61+	41 (3%)	36 (3%)	5 (4%)	
Sex				**0.035**
Male	767 (50%)	693 (49%)	74 (59%)	
Female	762 (50%)	711 (51%)	51 (41%)	
OCV Status				**0.002**
No	1,411 (92%)	1,287 (92%)	124 (99%)	
Yes	118 (8%)	117 (8%)	1 (1%)	
Hydration status at admission				**<0.001**
Mild	990 (65%)	979 (70%)	11 (9%)	
Moderate	359 (23%)	336 (24%)	23 (18%)	
Severe	180 (12%)	89 (6%)	91 (73%)	
HIV Status				**<0.001**
No	1,420 (93%)	1,322 (94%)	98 (78%)	
Yes	109 (7%)	82 (6%)	27 (22%)	
Presence of comorbidities				**<0.001**
No	1,357 (89%)	1,277 (91%)	80 (64%)	
Yes	172 (11%)	127 (9%)	45 (36%)	

Discussion

- The patients with severe dehydration have increased risk of dying compared to patients with moderate or mild.
- Being Female, vaccinated before the infection and patients with mild degree of dehydration have reduced risk of dying from Cholera.
- Alternative remedies-worrying thing during and after the outbreak

- **Limitations**
  - Comorbidities eg HIV status were self reported
  - Lab testing such as CD4, VL, electrolytes were not routine

Conclusions and Recommendations

The vaccination, sex, HIV, presence of comorbidities and degree of dehydration of a cholera patient affects its survival at the CTCs

Recommendations

1. Multiyear Plan of Action for Pre-emptive Oral Cholera Vaccinations
2. Access to Safe Water – Water quality monitoring in hotspots
3. Integrated Community Strategy
   - Case Management + WASH = CATI
   - Community ambulances
4. Point of care testing for complications

Acknowledgments

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- UNICEF Zambia

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