

# Saving Lives with the Implementation of a Rapid Response System

Empowering Healthcare Providers to Care for Clinically Declining Patients in West Africa

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## Background and Problem

- In many underdeveloped countries and resource-limited settings, there has been a greater loss of lives due to inadequate training and absence of systematic protocols utilized to intervene when a patient's condition is rapidly declining.
- Successful management of a patient who is deteriorating rapidly requires prompt recognition, timely response, and competent clinical reasoning skills for achievement of positive outcomes (Clayton, 2019).
- The hospital president at a private mission hospital in West Africa identified the need to further develop the clinical reasoning skills of the nursing staff and provide them with protocols for intervention (S. Ablrh, personal communication, March 23, 2023).
- Adverse events can occur on any hospital unit and signs of patient instability are often missed (Rashid, 2014). Up to 60% of in-hospital patients who experience a cardiopulmonary arrest have one or more abnormal vital sign prior to the arrest (Song & Lee, 2021).
- When these abnormal signs are overlooked, a preventable adverse event can occur, leading to substandard care and poor safety culture (Fischer et al., 2021).
- Establishment of a Rapid Response System (RRS) has been shown to reduce cardiopulmonary arrests & mortality rates (Al-Omari et al., 2019).
- Evidence-based research has shown that use of the NEWS tool enables early recognition with timely activation of a RRS for a rapidly declining patient (Tirkkonen et al., 2019).

## Purpose of the Project

To help improve the healthcare providers' ability to...

### Identify

- Identify the imminent signs of a clinically declining patient

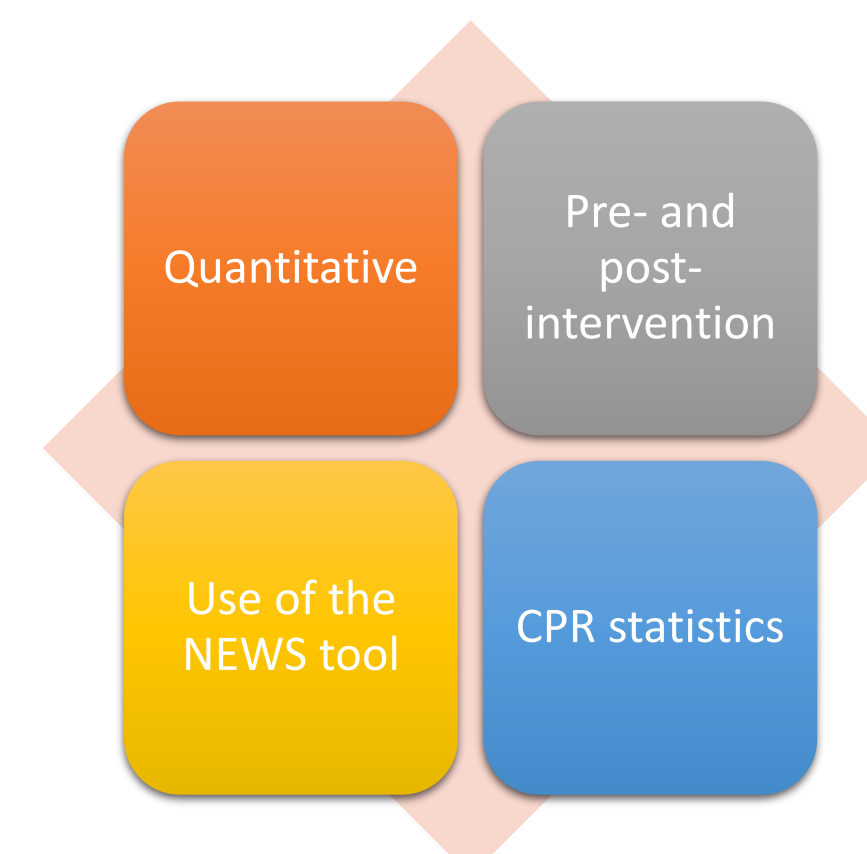
### Provide

- Provide prompt, appropriate interventions

## Clinical Question

Does implementation of a RRS with education on the use of an early warning score tool (NEWS) (I) for healthcare providers at a private mission hospital in West Africa (P) improve early detection and intervention of a patient's deteriorating condition (O) as compared to current practice (C) within the first month of initiation (T)?

## Methods



### NEWS Scoring System

| Physiological parameter        | 3     | 2         | 1         | Score               | 1               | 2               | 3             |
|--------------------------------|-------|-----------|-----------|---------------------|-----------------|-----------------|---------------|
| Respiration rate (per minute)  | ≥8    | 9-11      | 12-20     |                     | 21-24           | ≥25             |               |
| SpO <sub>2</sub> Scale 1 (%)   | ≤91   | 92-93     | 94-95     | ≥96                 |                 |                 |               |
| SpO <sub>2</sub> Scale 2 (%)   | ≤83   | 84-85     | 86-87     | 88-92<br>≥93 on air | 93-94 on oxygen | 95-96 on oxygen | ≥97 on oxygen |
| Air or oxygen?                 |       | Oxygen    |           | Air                 |                 |                 |               |
| Systolic blood pressure (mmHg) | ≤90   | 91-100    | 101-110   | 111-219             |                 |                 | ≥220          |
| Pulse (per minute)             | ≤40   | 41-50     | 51-90     | 91-110              | 111-130         | ≥131            |               |
| Consciousness                  |       |           |           | Alert               |                 |                 | CVPU          |
| Temperature (°C)               | ≤35.0 | 35.1-36.0 | 36.1-38.0 | 38.1-39.0           | ≥39.1           |                 |               |

(Royal College of Physicians, 2017)

## Intervention Procedures: Two Phases of Education

### Phase I: Afferent Limb

#### Components of a RRS

Identification of the declining patient

Use of the NEWS tool

Mechanism of activation

Two-hour sessions offered 7 days over 2 weeks

### Phase II: Efferent Limb

High performance team strategies

SBAR & patient hand-off transitions

Interventional protocols

Four patient scenarios with hands-on practice

Two-hour sessions offered 4 days over 2 weeks

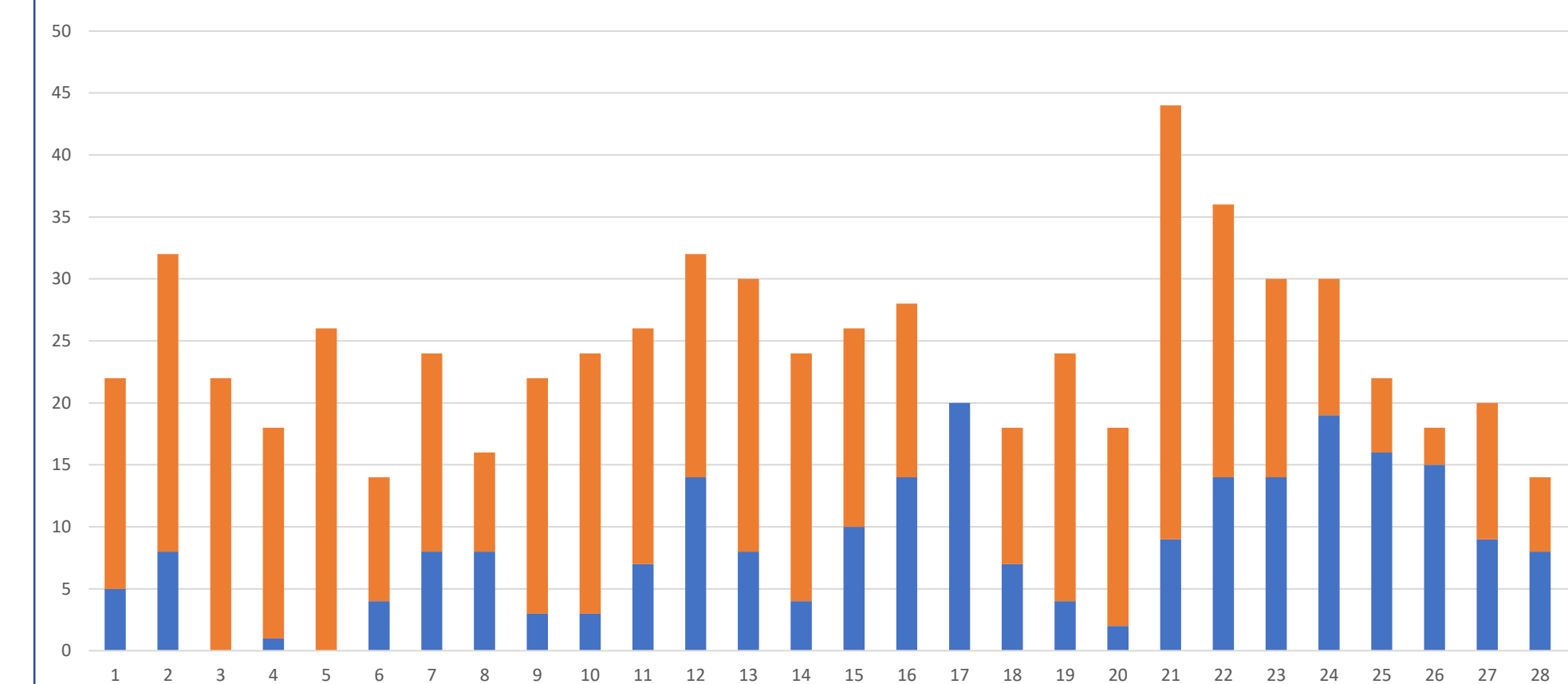
(AHRQ, 2006; Song & Lee, 2021)

## Educational Sessions

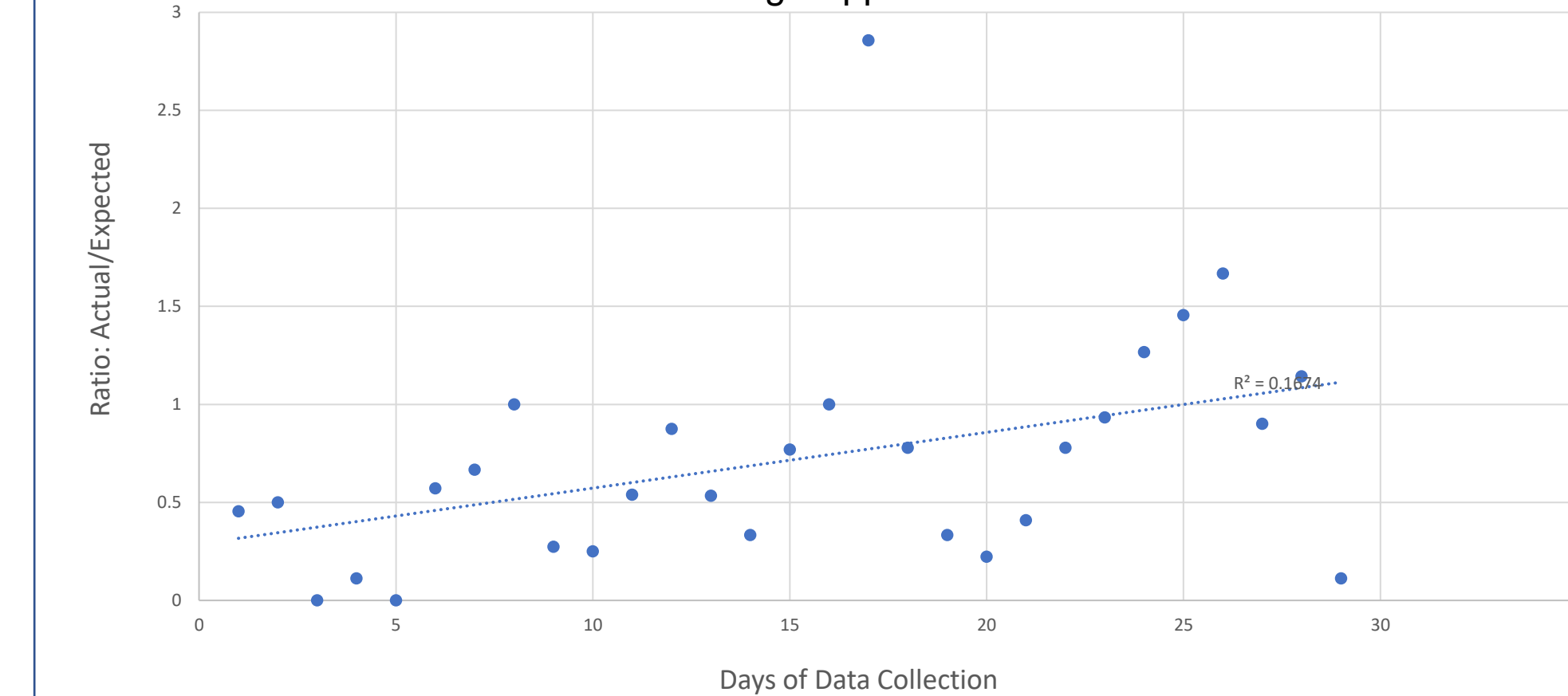


## Data Analysis

Number of NEWS Scores Compared to Daily Census



Knowledge Application Rate



Pearson's Correlation with Outlier Excluded

| Descriptive Statistics |         |                |    | Correlations |                     |      |        |
|------------------------|---------|----------------|----|--------------|---------------------|------|--------|
|                        | Mean    | Std. Deviation | N  | Days         | Pearson Correlation | Days | Ratio  |
| Days                   | 14.93   | 8.662          | 28 |              |                     | 1    | .527** |
| Ratio                  | .638257 | .43241065      | 28 |              |                     |      | .527** |
|                        |         |                |    | Days         | Pearson Correlation |      |        |
|                        |         |                |    |              | Sig. (2-tailed)     |      | .004   |
|                        |         |                |    |              | N                   |      | 28     |
|                        |         |                |    | Ratio        | Pearson Correlation |      | .527** |
|                        |         |                |    |              | Sig. (2-tailed)     |      | .004   |
|                        |         |                |    |              | N                   |      | 28     |

Pearson's Correlation of (.53) demonstrated higher significance of relationship between the variables with a two-tailed test of (.004) ( $p < 0.05$ )

\*\* Correlation is significant at the 0.01 level (2-tailed).

| CPR & RRT Rates              | Before Intervention | After Intervention |
|------------------------------|---------------------|--------------------|
| #Patients Needing CPR        | 2                   | 0                  |
| #Patients with RRT Activated | 0                   | 3                  |

## Results

- Rate of knowledge application increased significantly as days after training increased.
- Regression analysis revealed a positive correlation between ratio of NEWS scores in relation to daily patient census.
- Pearson's Correlation of (.53) demonstrated high relationship with the two-tailed test to be (.004) at the ( $p < 0.05$ ).
- Clinical significance achieved with decreased CPR rates and increased RRT rates after intervention.
- The decreased CPR rates, elevated RRT rates, and increased rate of knowledge application over time has helped meet the outcome of improving early detection and intervention of declining patients.

## Conclusions & Implications for Practice

- By implementing a RRS with education on the use of an early warning score tool (NEWS) at the clinical site, the healthcare providers were able to develop their expertise on how to rapidly assess and intervene on behalf of a deteriorating patient.
- Use of NEWS was a very cost-effective protocol for implementation in a low-resource country, providing monitoring support that can help to achieve a reduction in morbidity and mortality rates.
- Healthcare providers at the clinical site enhanced their clinical reasoning skills for rapid identification and rescue of deteriorating patients.
- Nursing staff were empowered to intervene and implement lifesaving protocols.
- The educational intervention provided a safe, effective, and interactive learning environment that included didactic instruction and simulation scenarios.
- With expansion of this project to healthcare facilities in surrounding villages and communities in West Africa, healthcare providers will become empowered to rapidly identify and intervene for patients who are clinically deteriorating.
- With early recognition and prompt intervention, there can be a reduction in morbidity and mortality rates in low-resource countries throughout West Africa.

## Plans for Sustainability

- Plans for sustainability began at onset of project conception by performing SWOT analysis and identifying the need to ensure buy-in by the administration.
- Nursing Inservice Training educators trained to teach refresher courses, orient new staff, provide on-going support, and maintain red supply bags.
- Integrate NEWS documentation into electronic health record and utilize check box format for ease and continuity.
- Make laminated NEWS tool badge buddy for all staff.
- Family medicine staff physician actively initiating changes to improve process.

## Contact Information

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References furnished upon request.