

Surveillance of Community Acquired Pneumonia: Potential for wearable devices and Remote monitoring system in Nepal

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Background and objective

- CAP is one of the major cause of severe infection and deaths across LMICs
- Rigorous monitoring, early detection and prompt intervention are key for severe cases
- Overburdened healthcare providers and resource constraints are key challenges in LMICs

Background and objective

The objective of this analysis is to:

- To demonstrate the demographic profiles of selected in-patient pneumonia cases, their hospital trajectories, the data collection metrics, and the risk for patient deterioration, and mortality using National Early Warning Score (NEWS) and Sequential Organ Failure Assessment (SOFA) respectively.
- To emphasize the feasibility and potential benefit of using wearable devices and continuous remote monitoring of critically ill patients.

Methodology

- Part of a prospective observational mixed method study being conducted in a government hospital in Nepal
- The study collected photoplethysmography (PPG) waveforms and electrocardiogram (ECG) waveform data using low-cost pulse oximeter and ECG recording patch
- 100 patients enrolled between September 2025 until February 2026

Methodology

Data collected and analyzed:

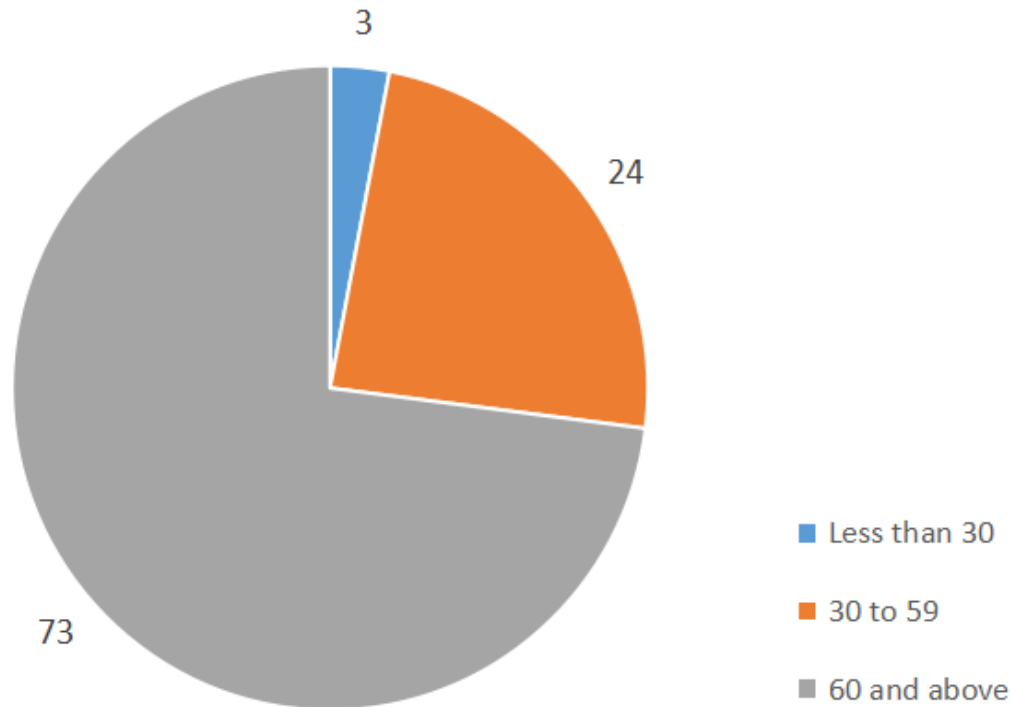
- Age
- Sex
- Comorbidities
- NEWS variables
- SOFA variables
- Duration of hospital stay
- Events during the hospital stay
- Average hours of PPG and ECG collected per day per patient
- Average days of data collection per patient
- Average hours of data collected in the first 24 hours per patient
- Average days of data collected per patient

Results

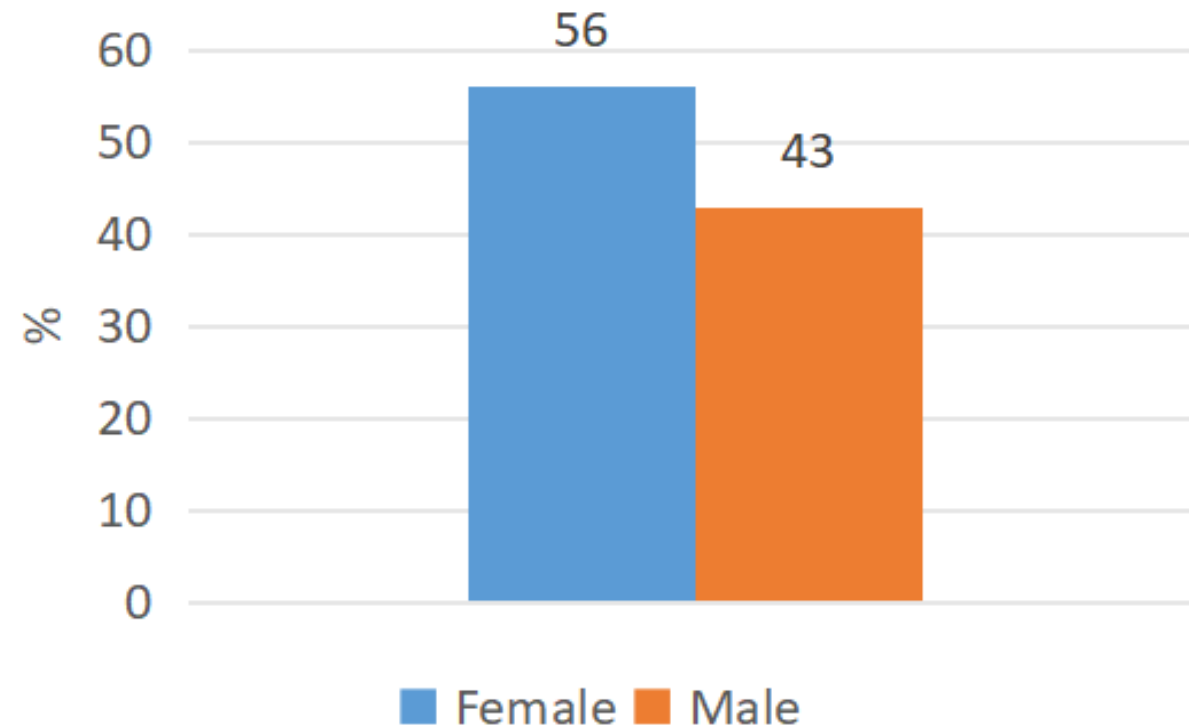
Results

- Demographic patient profile: Age and Gender (N=100)

Age categories

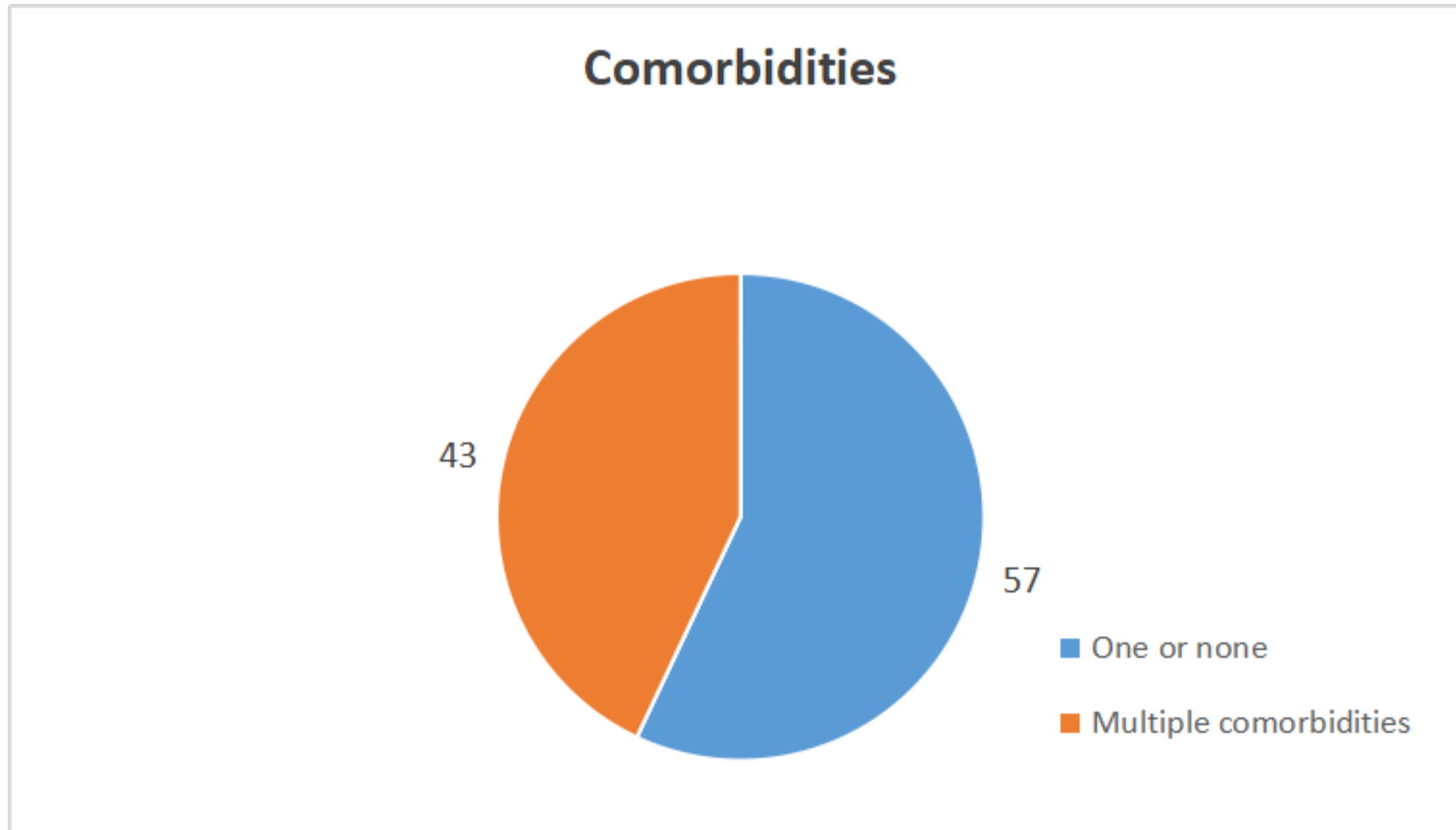


Distribution by Gender



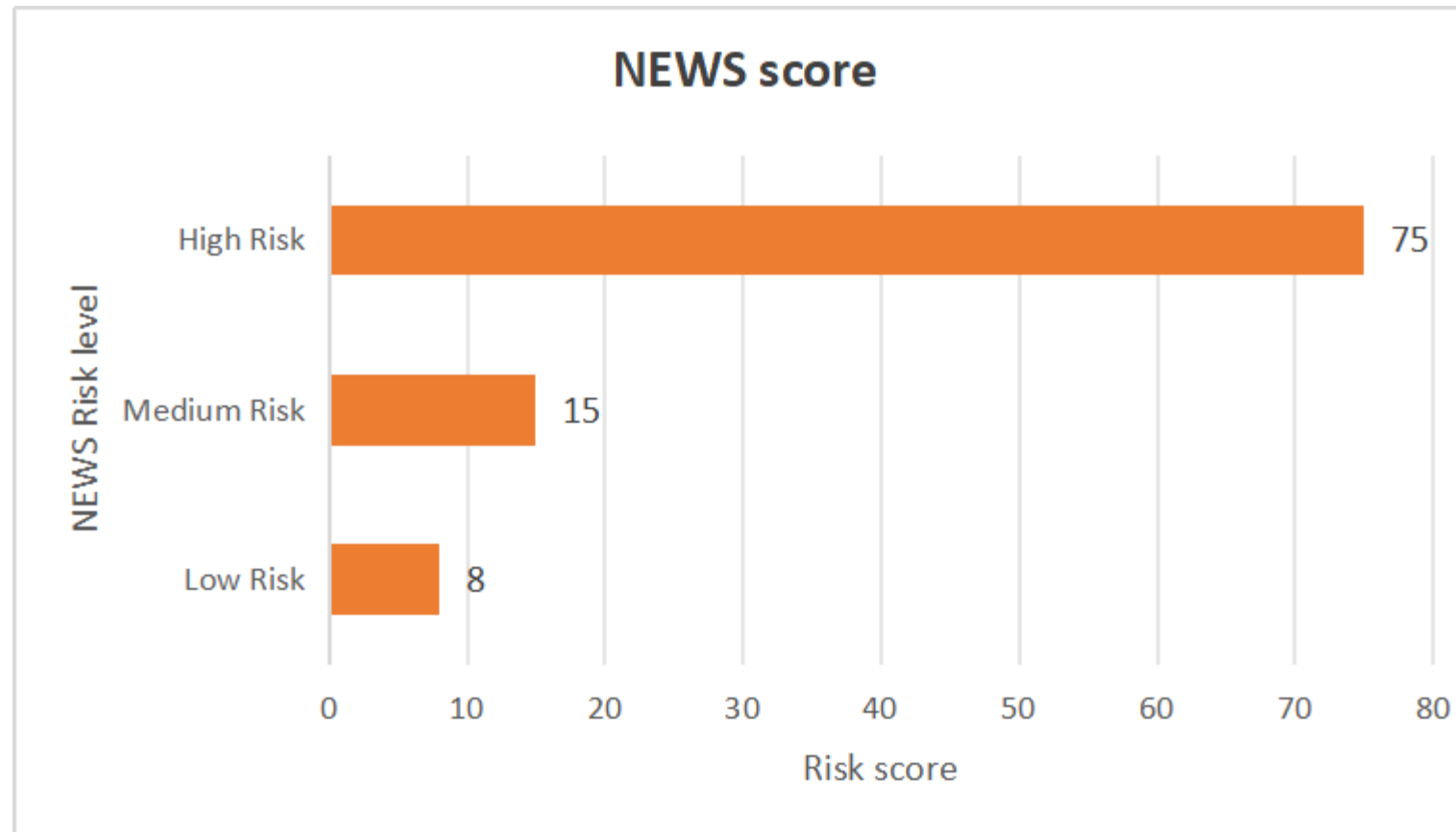
Results

- Demographic patient profile: Comorbidities (N=100)



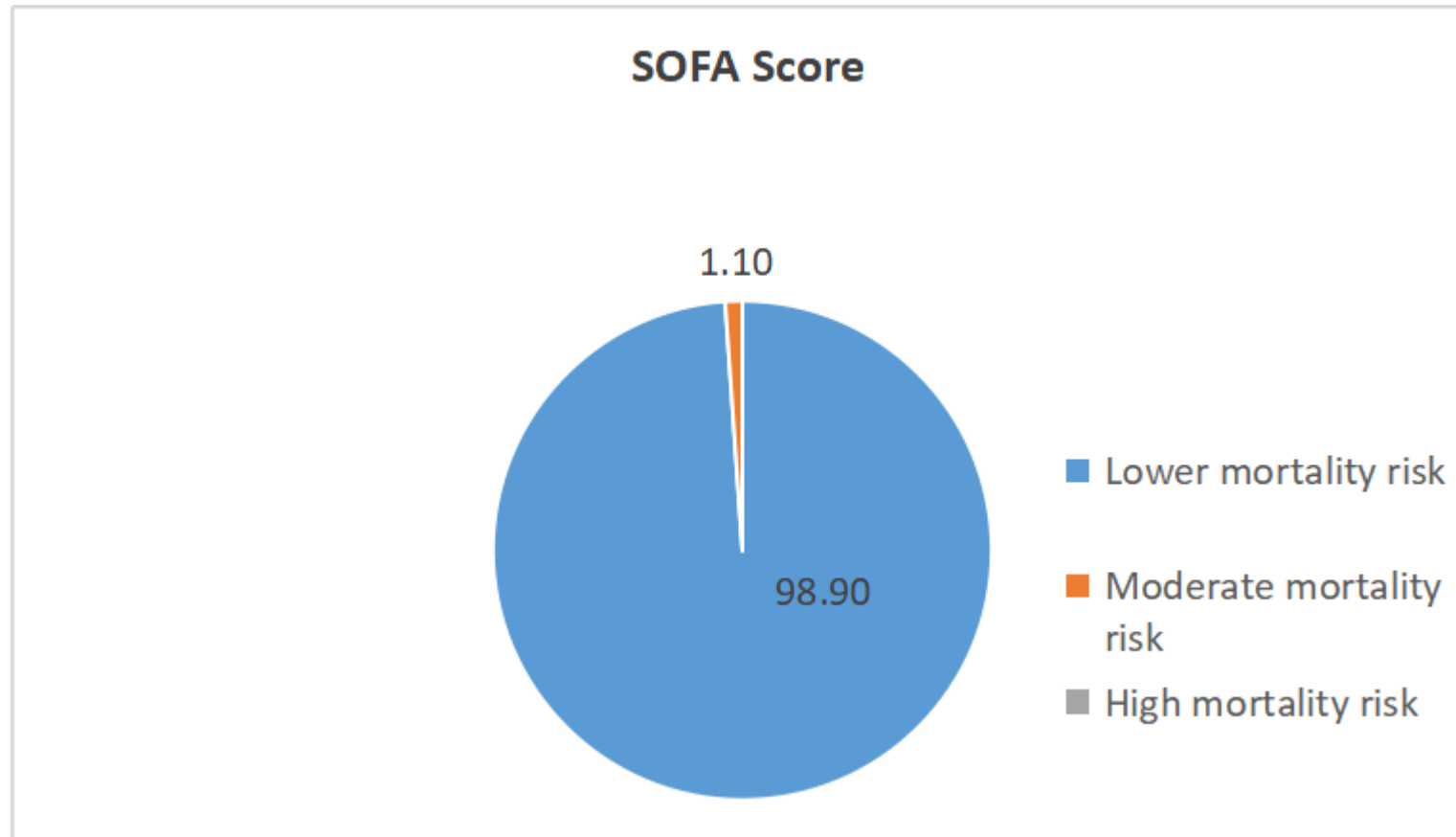
Results

- Clinical profile: NEWS score at enrollment (N=98)



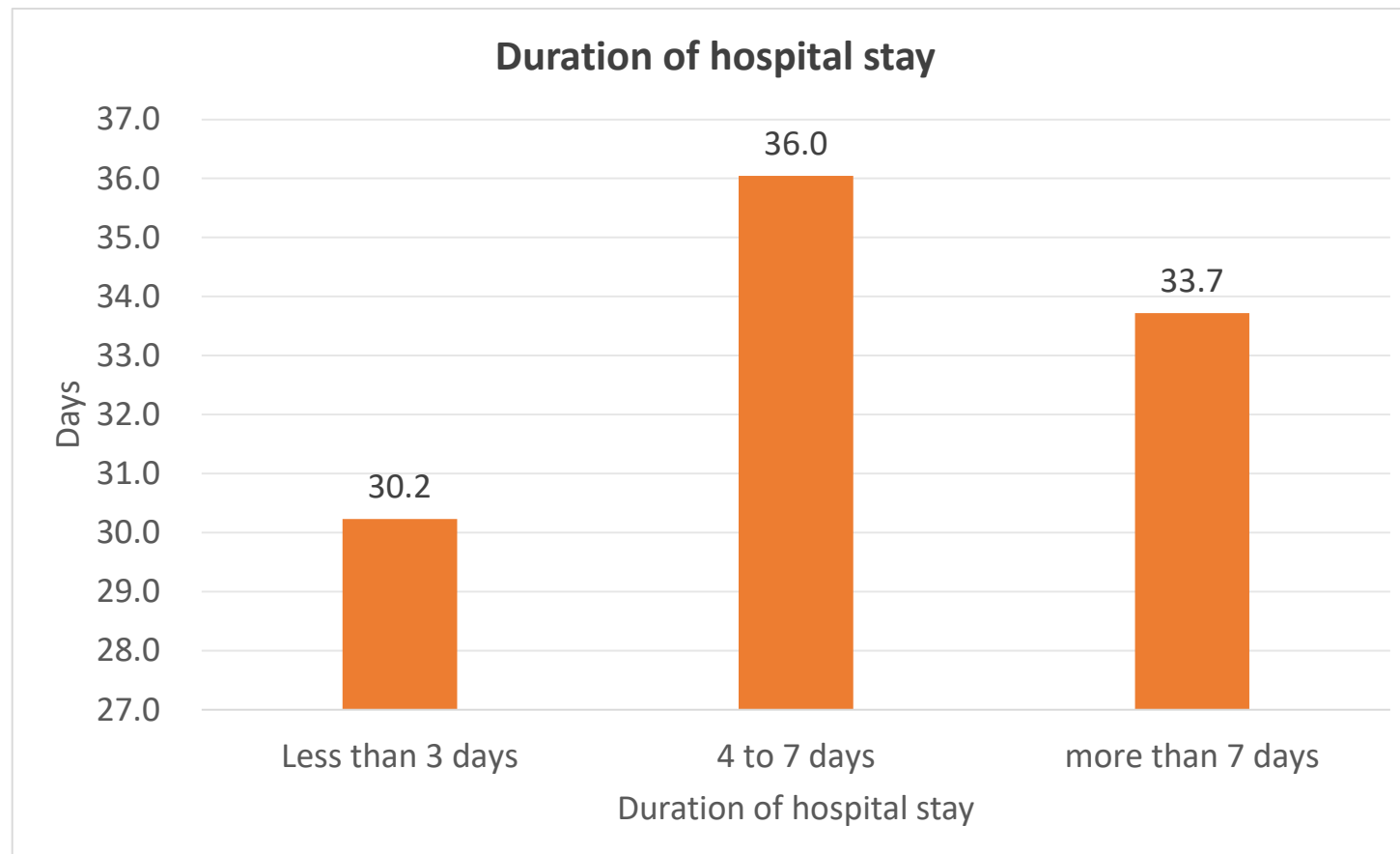
Results

- Clinical profile: SOFA score at enrollment (N=91)



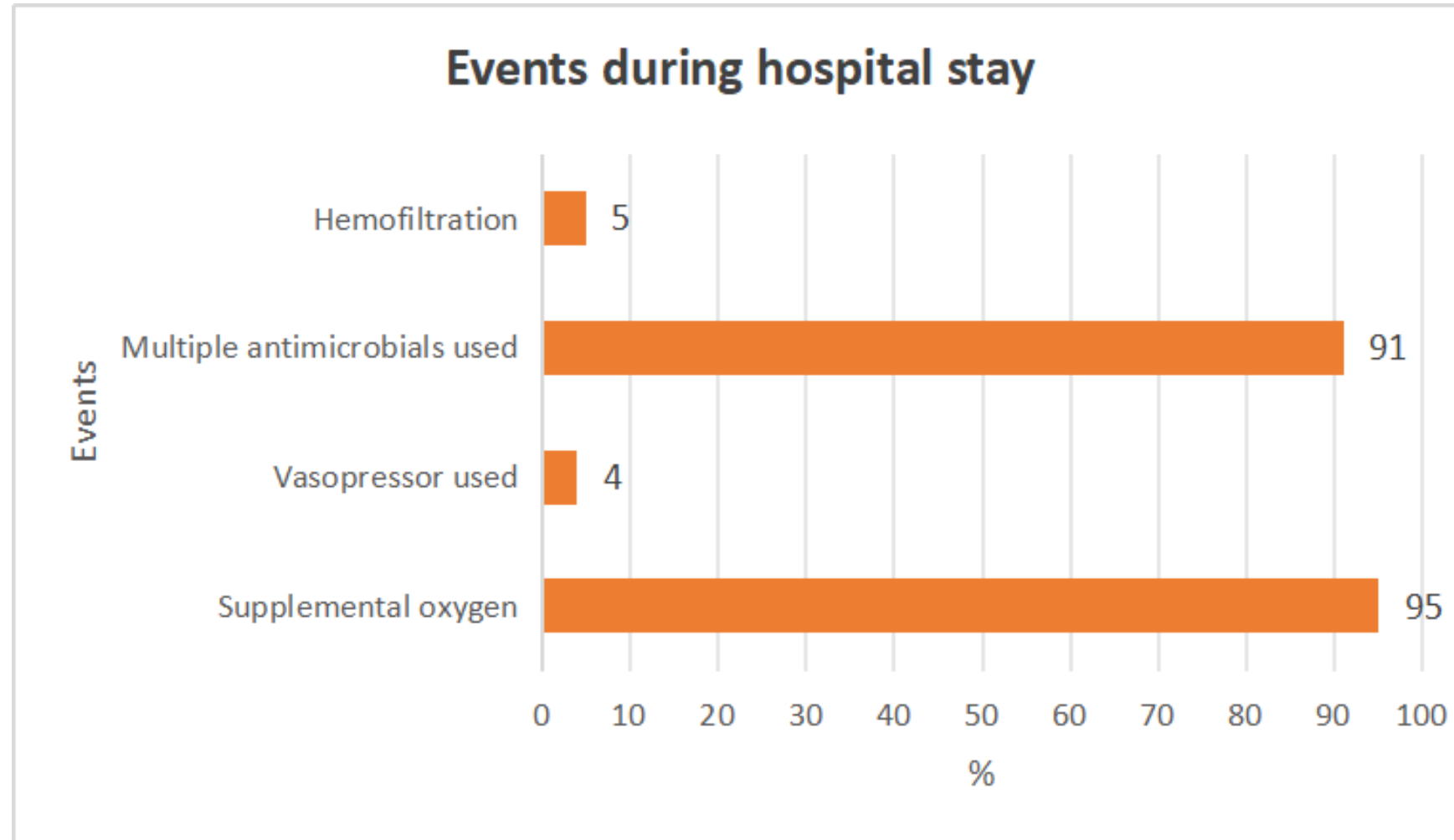
Results

- Clinical profile: Duration of hospital stay (N=86)



Results

- Clinical profile: Events during hospital stay (N=100)



Results

- Clinical profile: Data captured during hospital stay

Average data captured per patient	PPG	ECG
Average days of follow-up	6.5	5.7
Average hours/day	4.8	19.9
Average hours (First 24h)	20.8	21.4

Conclusion

- Considerable risk of deterioration in severe CAP cases
- Need for intensive management
- Potential to use wearable devices; enable timely intervention, and effective patient

Dr. Shristi Singh

Dr. Shristi Singh is a medical doctor with a Master of Public Health (MPH) and over five years of professional experience in clinical research and project management. She is currently working as a Project Manager at Oxford University Clinical Research Unit Nepal. Her professional experience covers both non-communicable and infectious diseases, and includes managing national-level research projects as well as coordinating clinical trials and research studies across Nepal.





THANK YOU FOR THE ATTENTION