



Reducing Noise Levels in a Paediatric Surgical Ward using Real-Time Visual Feedback

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Introduction:

High noise levels are a well-recognized problem for patients and staff in hospital environments, with pediatric surgical patients being a specific risk group (Currie, 2013). Sound levels at hospital wards have been reported to be often higher than recommended (McClaren et al. 2008; Farrehi et al. 2015). Singapore's National Environment Agency (NEA) guidelines for maximum permissible noise levels in hospital wards are 60 dB(A) (day time, 7am-7pm) and 50 dB(A) (night time; 7pm-7am). Our study reports baseline noise levels at a single paediatric surgical ward and explores real-time visual feedback as potential strategy for noise reduction.

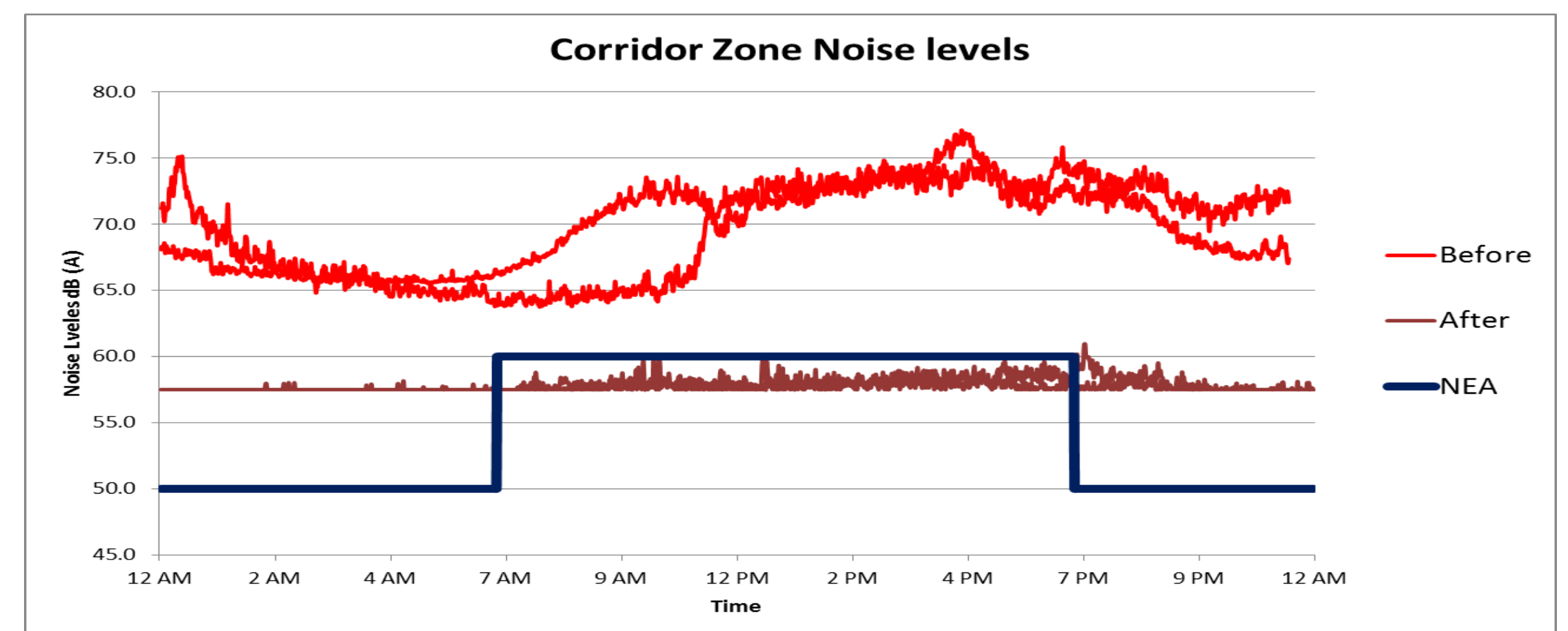
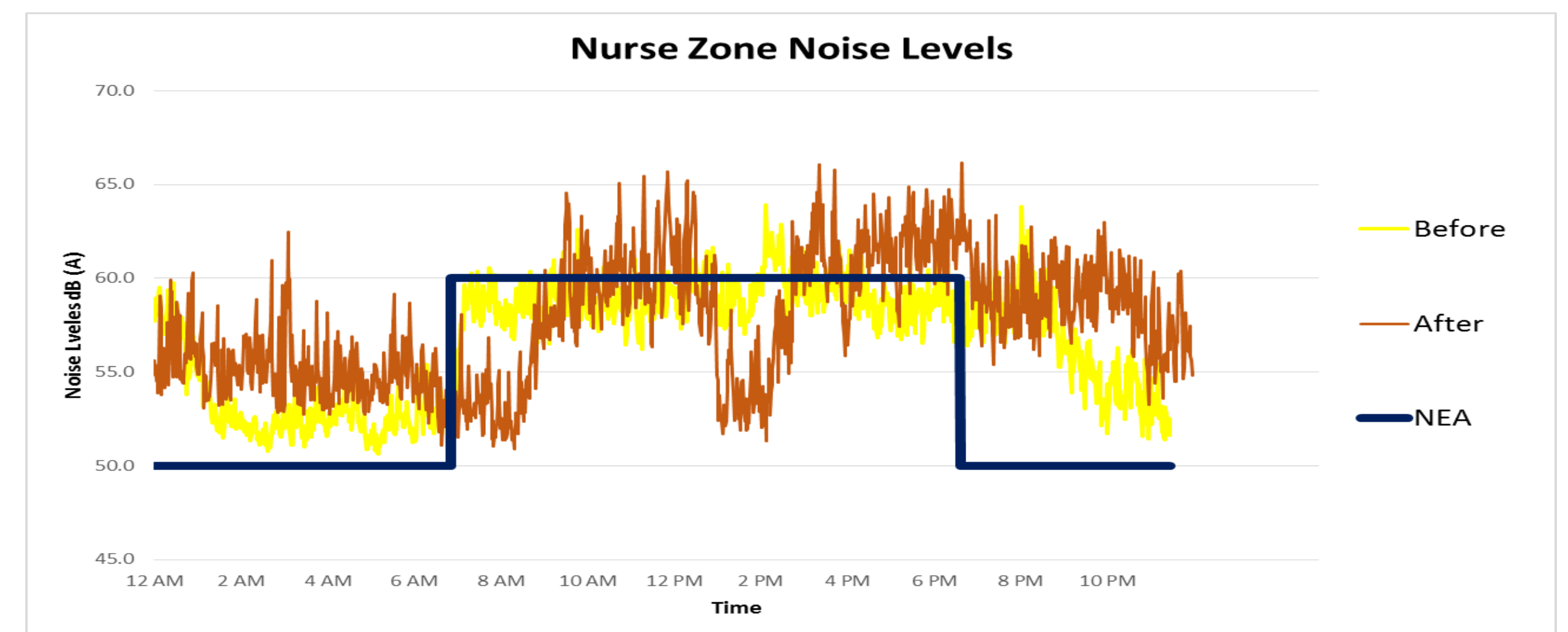
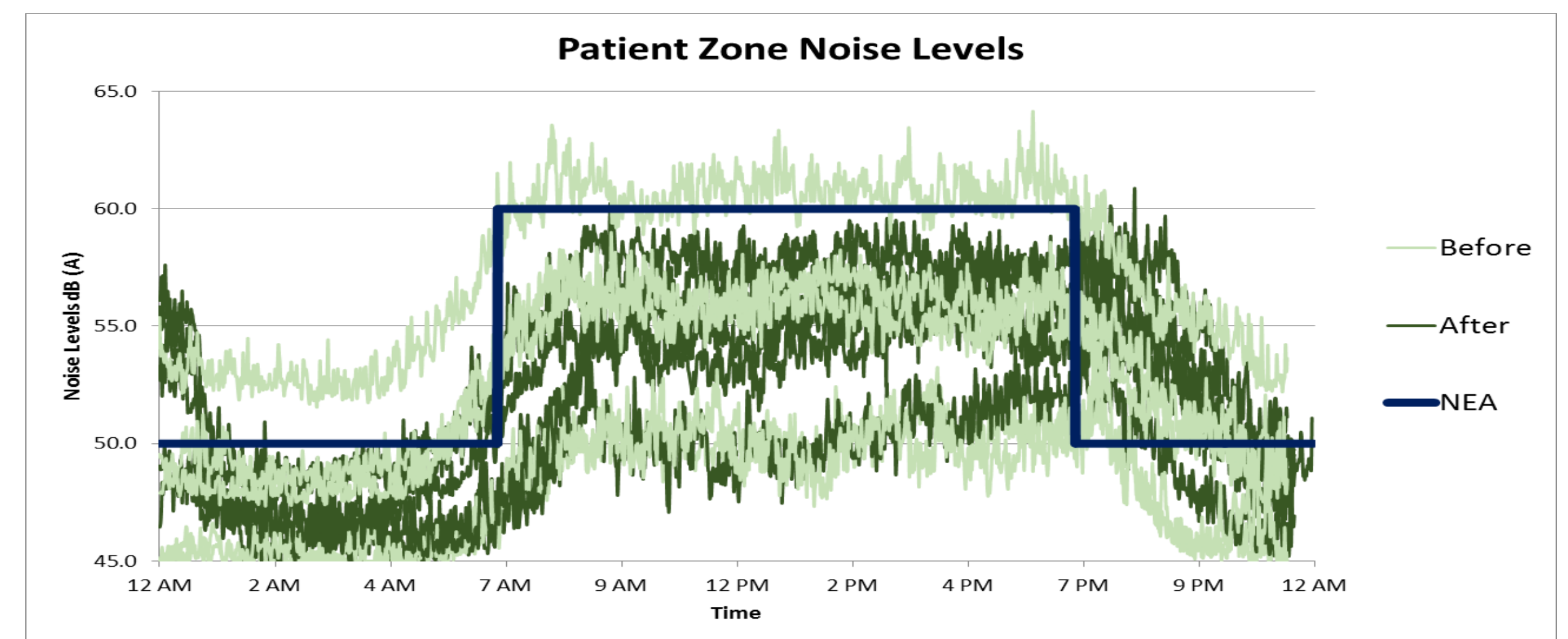
Methods:

We conducted an observational study, measuring noise levels at 10 locations of a 32-bed surgical ward in a paediatric hospital in Singapore. Continuous noise levels were measured for one month with SoundLog/SoundEarII® noise meters, which also contain visual feedback capabilities. Noise levels were measured every second and 5 min Leq (equivalent steady sound). Two noise meters were placed in the main hallway (Corridor), two at nurse desks (Nurse Zone) and six above patient beds (Patient Zone). At noise levels above the threshold of 60 dB (A), the tool would turn red. Subsequently we conducted an intermediary study after realizing the corridor tool constantly portrays a red visual. In the second phase of the study, the threshold of the corridor zone noise level was increased to 75 dB(A) to re-sensitize the users.

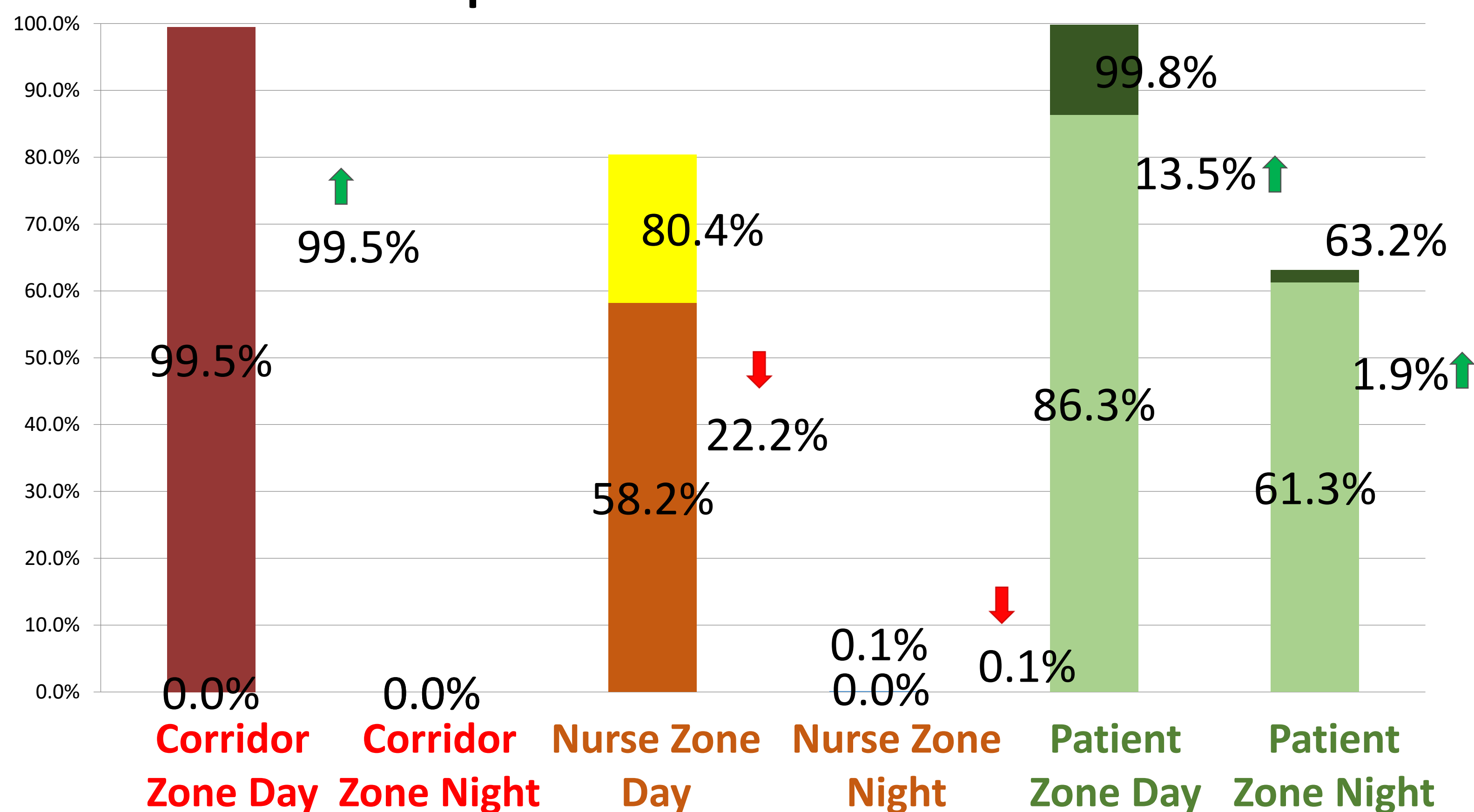


Results:

Noise levels in the patient zone were compliant to NEA guidelines 86.3% of day time respectively 61.3% of night time. Nurse zone noise levels were compliant 80.4% of day time respectively 0.14% of night time. Corridor noise levels were non-compliant during both day and night time. After the threshold intervention is made, noise level compliance in the patient zone increased to 99.8% of day time respectively 63.2% of night time with a reduced variation. Nurse zone noise levels had a decreased compliance of 58.2% during day time and were non-compliant during night time. Corridor noise levels increased its compliance to 99.5% during day time and remain non-compliant during night time.



Compliance of Zones to NEA Guidelines



Conclusion/Recommendations:

Our results show that there is a need for noise level reduction, with a particular focus on the nurse zone during night time, as well as corridor zones. Use of zone specific guidelines and real-time visual feedback on noise levels might be a appropriate tool to reduce noise levels.

References:

Currie K, Ruddy A, Mohammed T. Improving the Patient Experience: Reducing Avoidable Noise at Night Service Development Project Final Report, NHS Greater Glasgow and Clyde and Glasgow Caledonian University. 2013.
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 Farrehi, Peter M., Brahmajee K. Nallamothu, and Mojtaba Navvab. "Reducing hospital noise with sound acoustic panels and diffusion: a controlled study." *BMJ Quality & Safety* 25.8 (2016): 644-646.