

Nitrous oxide and the environment: the time to change is now

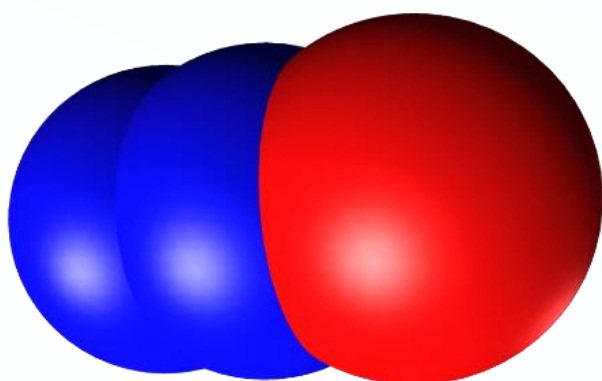
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Introduction

- Climate change is no longer a construct for the future but a devastating issue we are facing in the present.
- Anaesthetic gases represent 5% of the carbon footprint for acute NHS trusts.
- In 2019/2020, nitrous oxide accounted for 80% of the gas footprint in anaesthetics and a bigger contributor to carbon dioxide emissions than desflurane.
- The NHS has committed to achieving net zero omissions by 2040.
- We investigated the use of nitrous oxide at a district general hospital and whether the clinical benefits outweigh the benefits of decommissioning the central manifolds to reduce our carbon footprint.

Methods

- We collected data from logbook records of nitrous oxide usage at the central manifolds over a three-year period.
- These results were compared with anaesthetic machine usage in main theatres over a seven-day period.
- Results from anaesthetic machine data were extrapolated to attain an annual figure.



Results

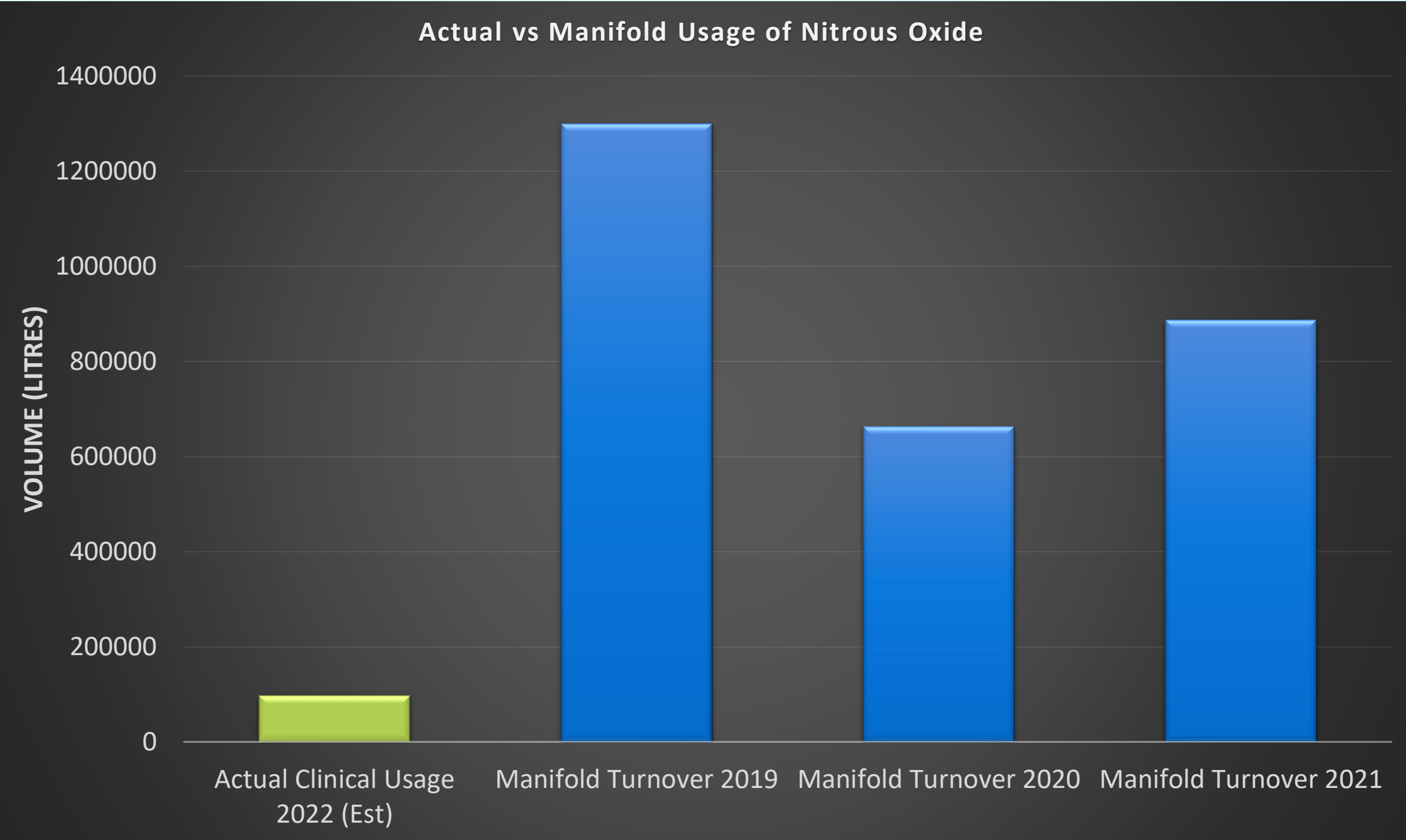


Figure 1: Annual nitrous oxide central manifold turnover between 2019-2021 versus estimated nitrous oxide usage in 2022.

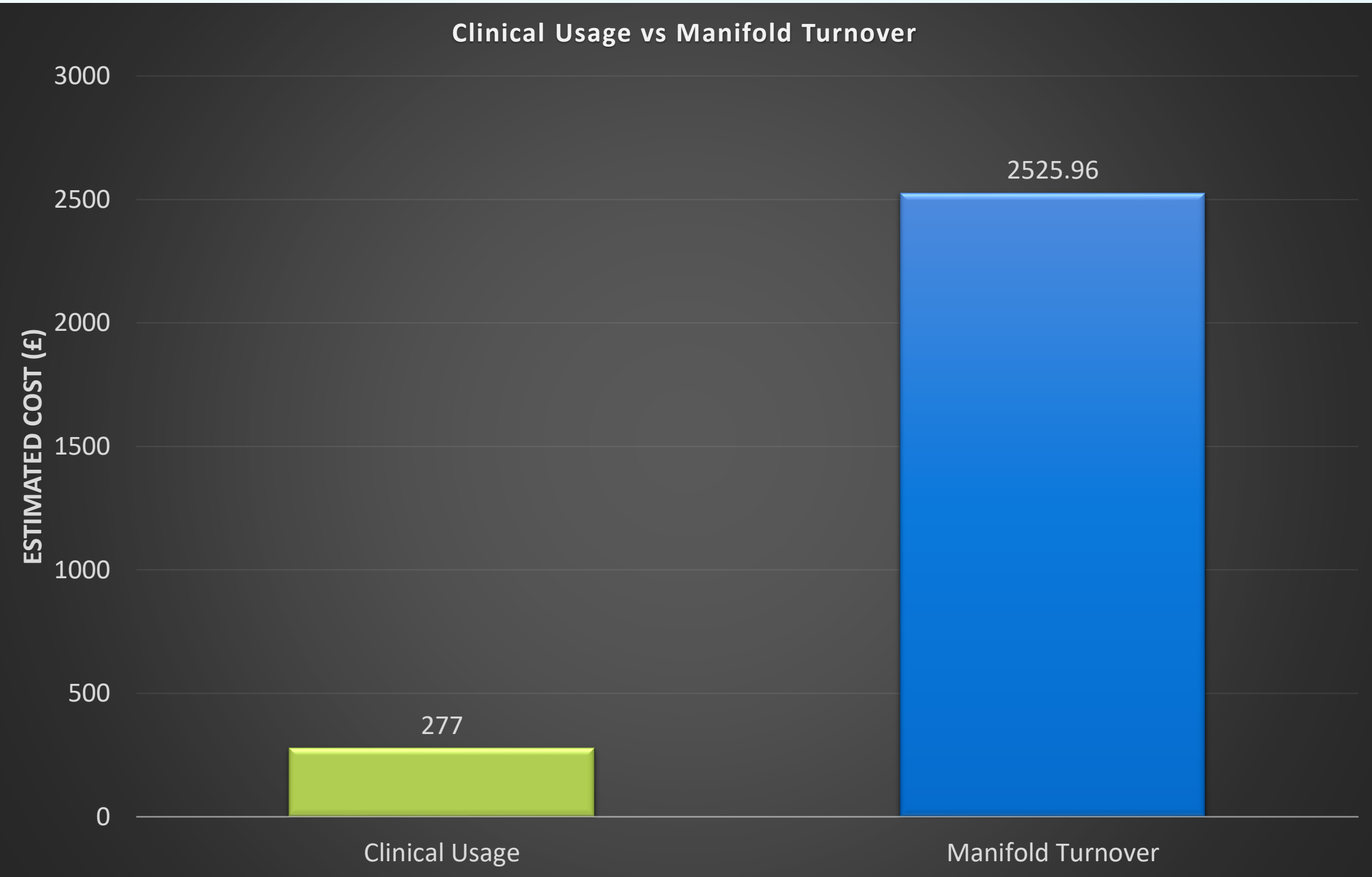


Figure 2: Estimated cost attributed to clinical usage of nitrous oxide versus manifold turnover.

Discussion

- An estimated 100,000 litres of nitrous oxide used in clinical practice at Blackpool Victoria Hospital in 2022.
- Large disparity between manifold turnover and clinical usage.
- In 2021, clinical usage only made up 10% of manifold turnover.
- It is postulated that most of the nitrous oxide was going to waste through leakage.
- This finding is consistent with *The Nitrous Oxide Project* conducted by NHS Lothian.
- Using this data, the manifolds at the trust have been decommissioned.
- Anaesthetic machines have been fitted with nitrous oxide cylinders.

Conclusion

- Nitrous oxide is a contributor to climate change.
- Majority of nitrous oxide was deemed to be wasted through manifold leaks.
- Plans to decommission the central manifold bank based on the results of this audit have been implemented successfully.

References

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- Chakera A. (2021). *Piped Nitrous Oxide Waste Reduction Strategy*. [online] Available at: <https://anaesthetists.org/Portals/0/PDFs/Environment/Nitrous%20waste%20methodology.pdf?ver=2021-04-26-115439-240>.