

# Regeneration of Zeolite for Medical Oxygen Generation in LMIC-Settings

GP Douglas, C Tiyesi, EN Solomon, B Luhanga, M Lungu

[Preprints with THE LANCET](#)

## Background:

- Low- and middle-income countries (LMICs) rely on oxygen concentrators for a significant proportion of their oxygen needs.
- Concentrators use a chemical called zeolite to remove nitrogen from room air, producing almost pure oxygen.
- Zeolite performance deteriorates over time due to moisture contamination, rendering the device ineffective.
- Replacement zeolite cost more than \$100 for one oxygen concentrator and has to be procured in large batches, making it prohibitive for LMICs.
- This has resulted in “graveyards” of dead concentrators, and significant gaps in the provision of oxygen for patients.



## Impactful Innovation:

- Working with a team of Malawian biomedical engineers we have developed a [process](#) and a prototype device to regenerate used zeolite.
- The cost of regeneration is less than \$10 per concentrator and can be done on-site in an LMIC biomedical engineering workshop.