

# Quantifying antibiotic use in Norwegian Cattle using the VetReg database

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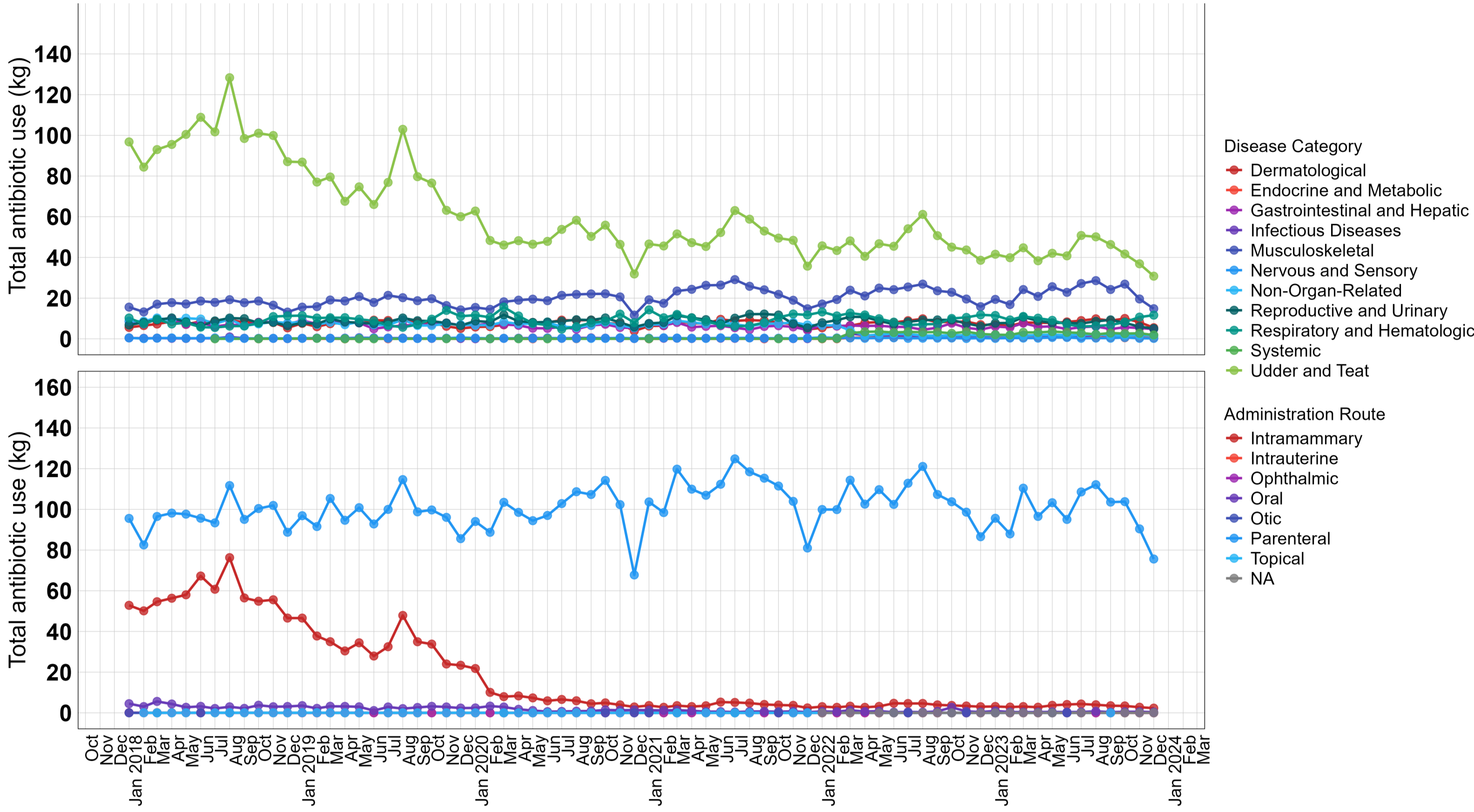
## Background

- Monitoring antimicrobial use (AMU) in livestock is crucial for antimicrobial stewardship.
- The Veterinary Prescription Register (VetReg), maintained by the Norwegian Food Safety Authority (NFSA), is a key data source for species-specific AMU monitoring.
- Due to data quality issues within VetReg and a lack of standardized usage metrics, precise AMU quantification has been difficult for cattle, which represent a large proportion of antibiotic use in food producing animals in Norway.

## Objectives

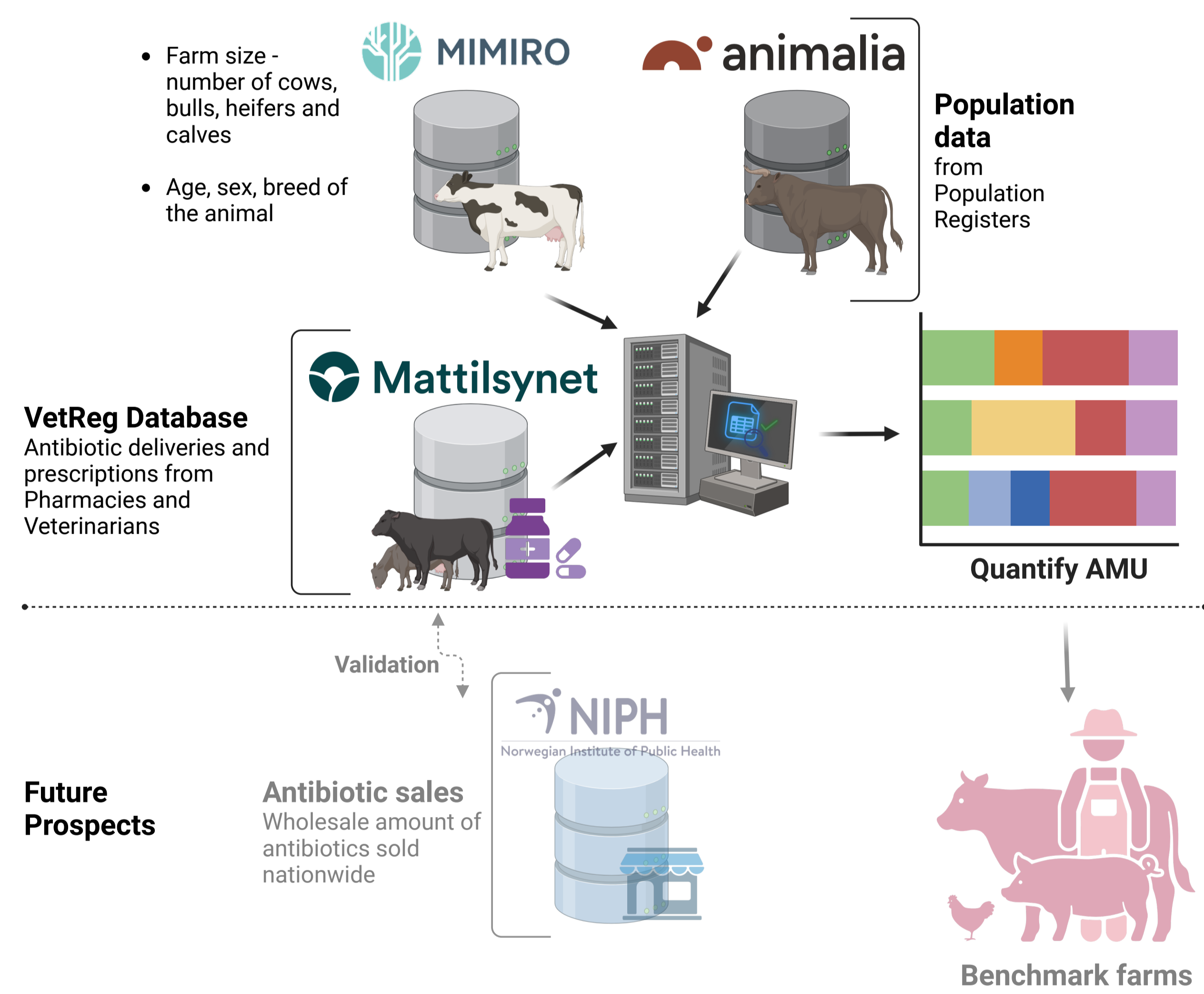
- Assess the quality of antimicrobial prescription data for cattle in VetReg (2018-2023), and develop and implement a systematic data cleaning and correction protocol.
- Quantify AMU (using mass-based and dose-based metrics) for Norwegian cattle.

## Results



- From 2018 to 2023, antibiotic use in Norwegian cattle showed a steady decline (1893kg in 2018 to 1235kg in 2023), with udder and teat disorders receiving the majority of treatments, administered primarily via parenteral and intramammary routes.

## Methods



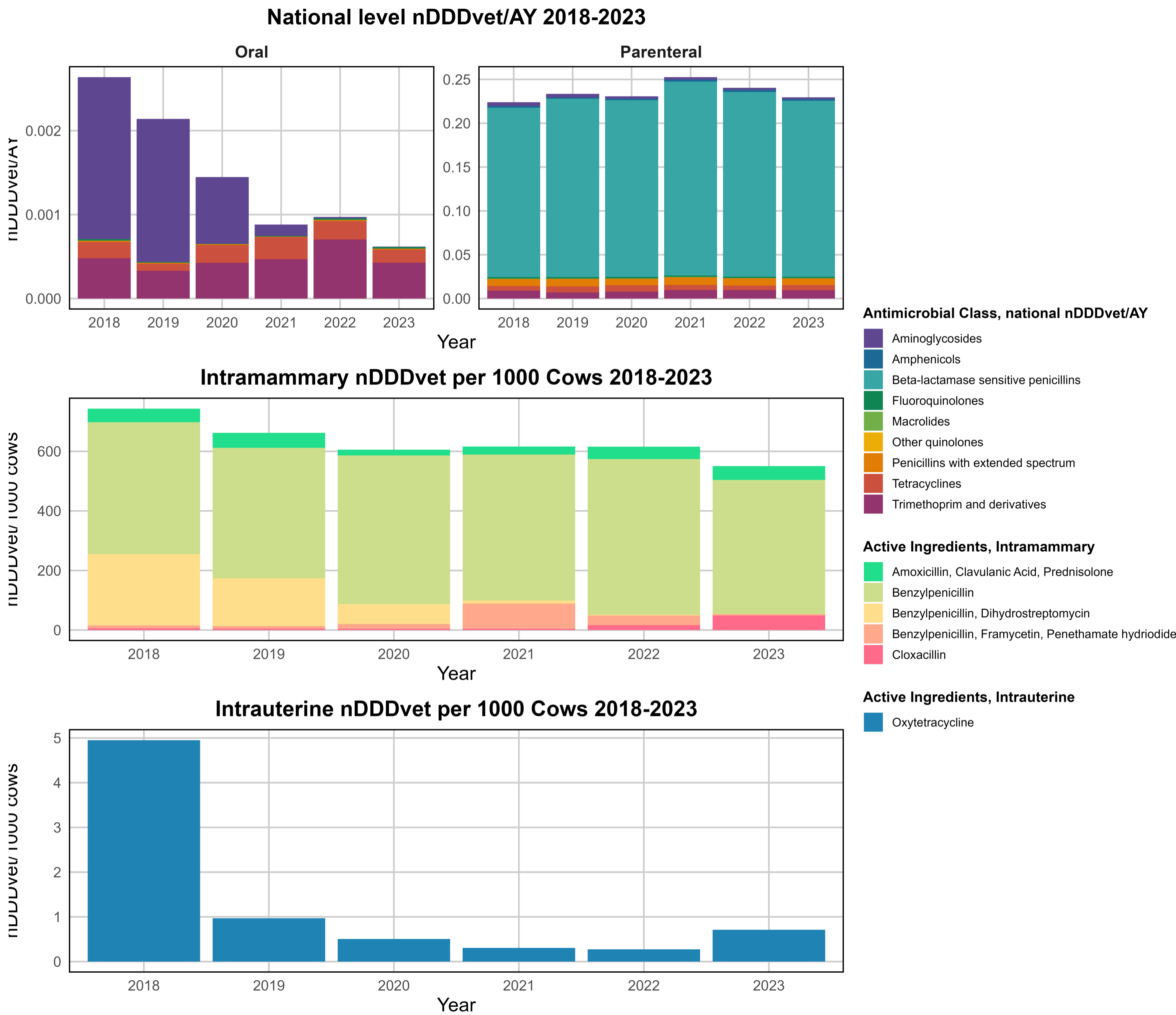
- Data:** VetReg (2018-2023), cattle, antimicrobial ATC codes.
- Data cleaning and correction:**
  - Standardization (units).
  - Error detection (based on IQR and dosage limits).
  - Imputation (missing data or errors in reporting).

### AMU Quantification:

**Mass-based:**  $\Sigma$  kg active substance

**Dose-based:**

- Numerator:  $TK_{DDVet} = (\Sigma \text{ mg active substance}) / DDD_{vet}$
- Denominator: National Average Yearly Biomass using EMA standard weights for cattle
- $AMU = TK_{DDVet} / AY$
- Intramammary/Intrauterine: nDDDVet/1000 cows
- Exclusions: Topical, otic, ophthalmic medications



- Dose-based metric showed similar patterns to weight-based metric; stable parenteral penicillin use (0.22-0.25 nDDDVet/AY), declining oral use (0.0025→0.0006 nDDDVet/AY), decreasing intramammary treatments (700→ 560 nDDDVet/1000 cows), and dramatically reduced intrauterine oxytetracycline (4.9→0.1→0.8 nDDDVet/1000 cows) during 2018-2023.

## Conclusion

- Both mass-based (kg active substance) and dose-based (nDDDVet/AY) AMU metrics were calculated for Norwegian cattle, which enable robust benchmarking.
- There was a steady decline in AMU in Norwegian cattle from 2018 to 2023.

## Acknowledgements & References

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