

# "Ur-ine Breach of Minimum Retesting Intervals!"

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## Introduction

- Urine testing (urinalysis) has a large CO<sub>2</sub> equivalent (CO<sub>2</sub>e) emissions per test<sup>[1]</sup>.
- The Royal College of Pathologists have suggested implementing Minimum Retesting Intervals (MRIs) to prevent urine samples being sent within 3 days of a previous sample to avoid unnecessary testing<sup>[2]</sup>.

## Aims

- Identify the scale and nature of sample rejections in two North-East NHS laboratories.
- Calculate the environmental and financial impact.
- Suggest interventions to reduce sample rejections.

## Results

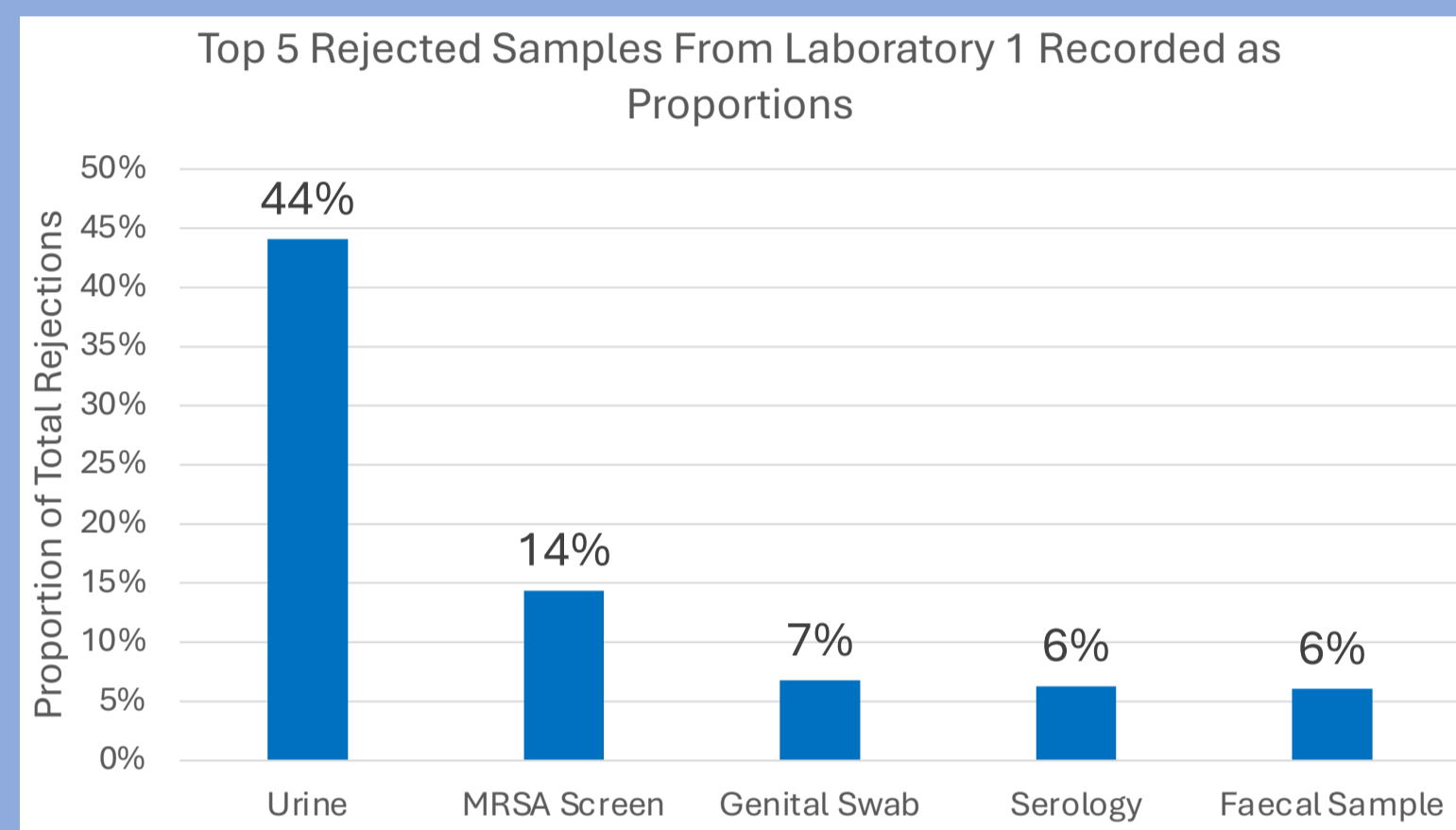


Figure 1: Top rejected samples from a North East laboratory

**Urine is the most rejected specimen type.**

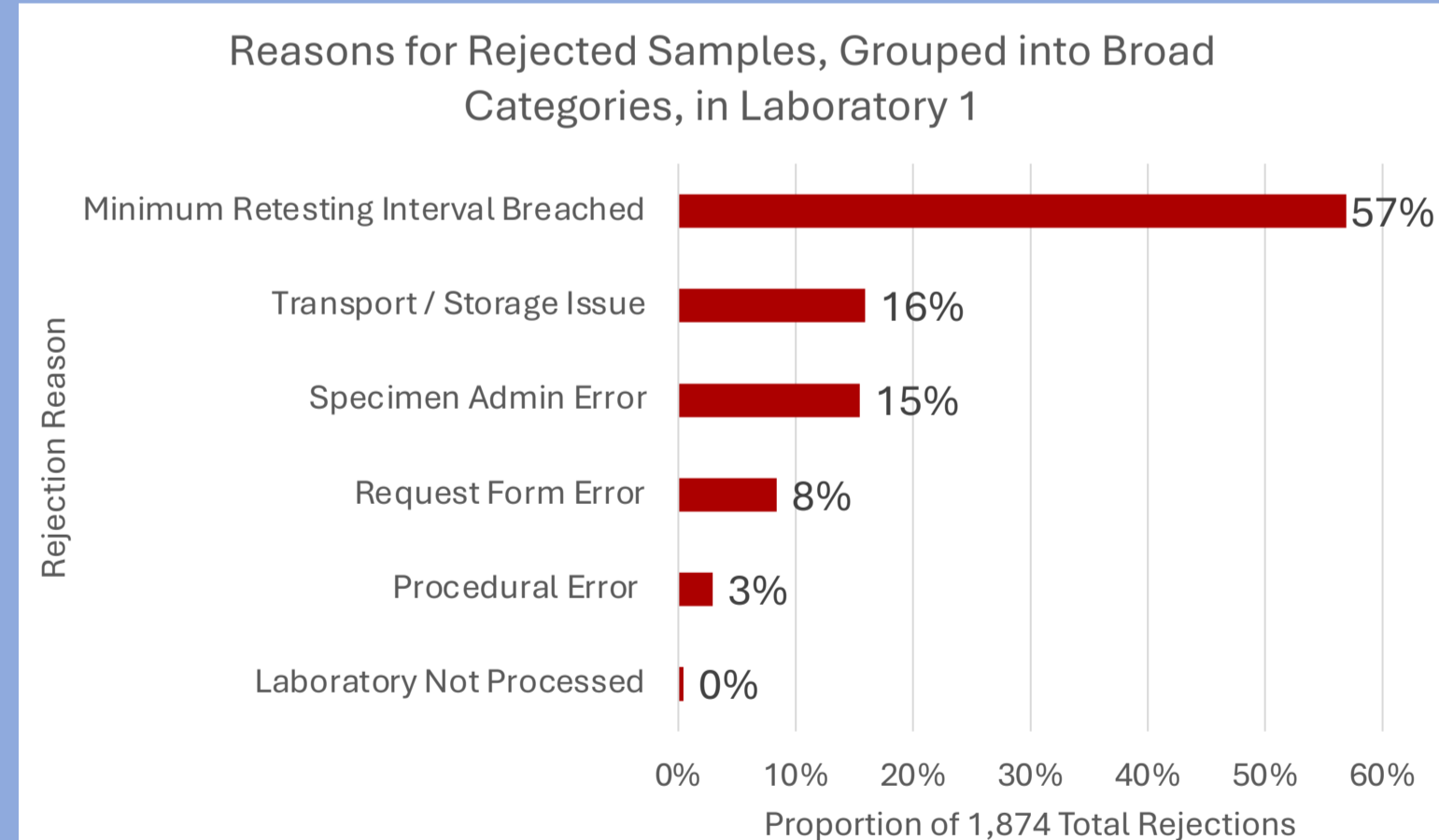


Figure 2: Reasons for urine rejection from a North East laboratory

**Sending repeat samples within 3 days was the most frequent reason for rejection.**

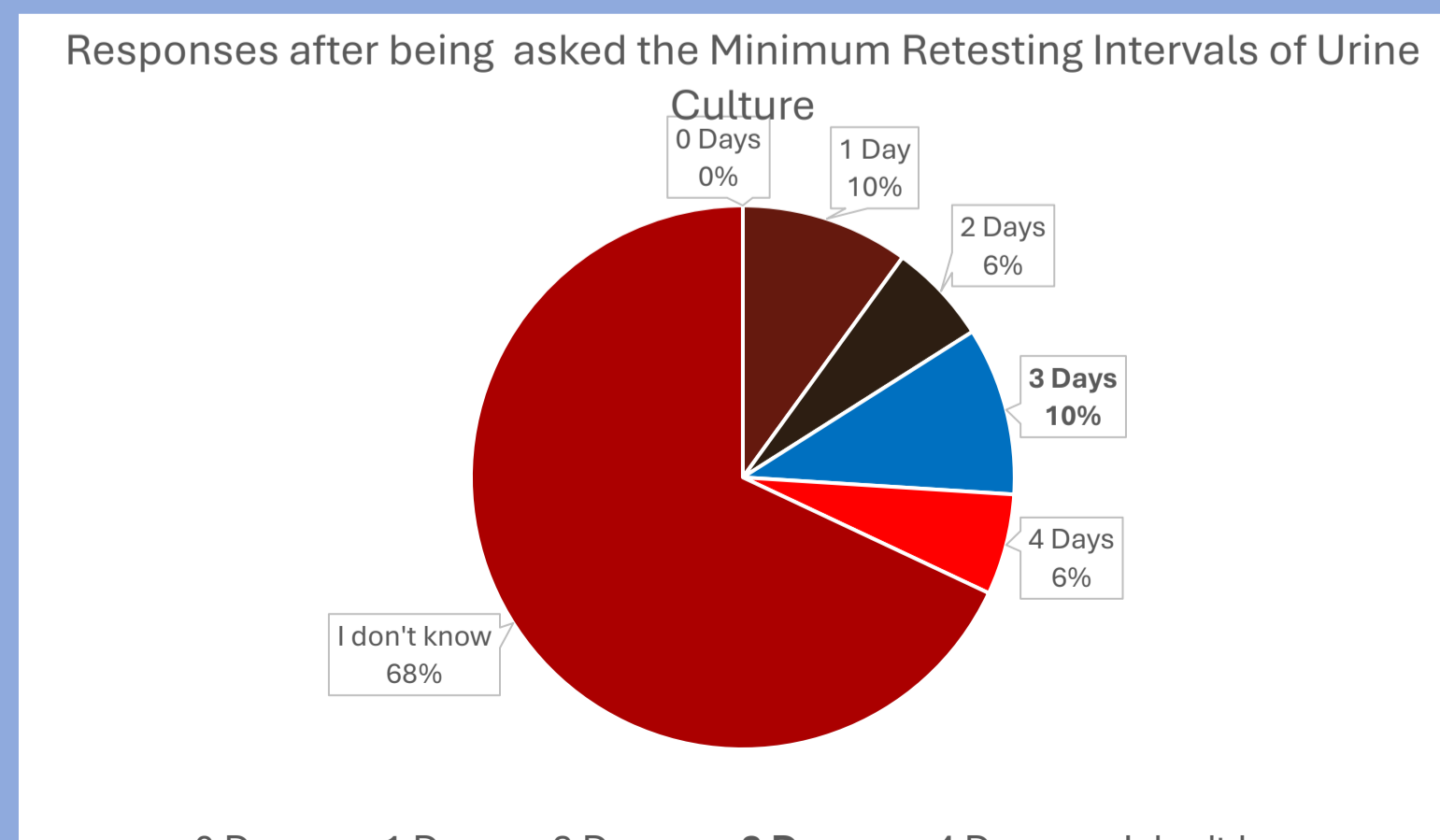


Figure 3: 31 healthcare workers surveyed on minimum retesting intervals of urine testing

**<10% clinicians' correctly identified the MRI as 3 days for urine culture.**

## Results

Per Autoclave Cycle	Environmental Costs (CO <sub>2</sub> e, kg)	Financial Costs (£)
	Computer	9.51
Autoclave	3.15	3.43
Water	0.08	0.59
Electric	-	10.36
Staff Wages	-	13.99
	<b>12.74</b>	<b>28.37</b>

Rejections from Lab 1	Environmental Costs (CO <sub>2</sub> e, kg)	Financial Costs (£)
	Sample Tube	83.71
Manufacture	0.34	-
Incineration	-	955.74
	<b>84.05</b>	<b>955.74</b>

Figure 4: Contributions to financial and environmental costs of 1,874 rejected urine samples

**The value of wasted sample collection materials was:**

- £984 = 12 CT scans without contrast<sup>[4]</sup>.
- 84kg CO<sub>2</sub>e = driving 235 miles<sup>[5]</sup>.

## Suggested Implementations

- A flowchart was developed to inform clinicians of correct sampling procedure
- To be used both electronically and in poster form in high traffic areas.

### Flowchart for Criteria to be Fulfilled Before Requesting and Collecting a Urine Culture Sample of Patients

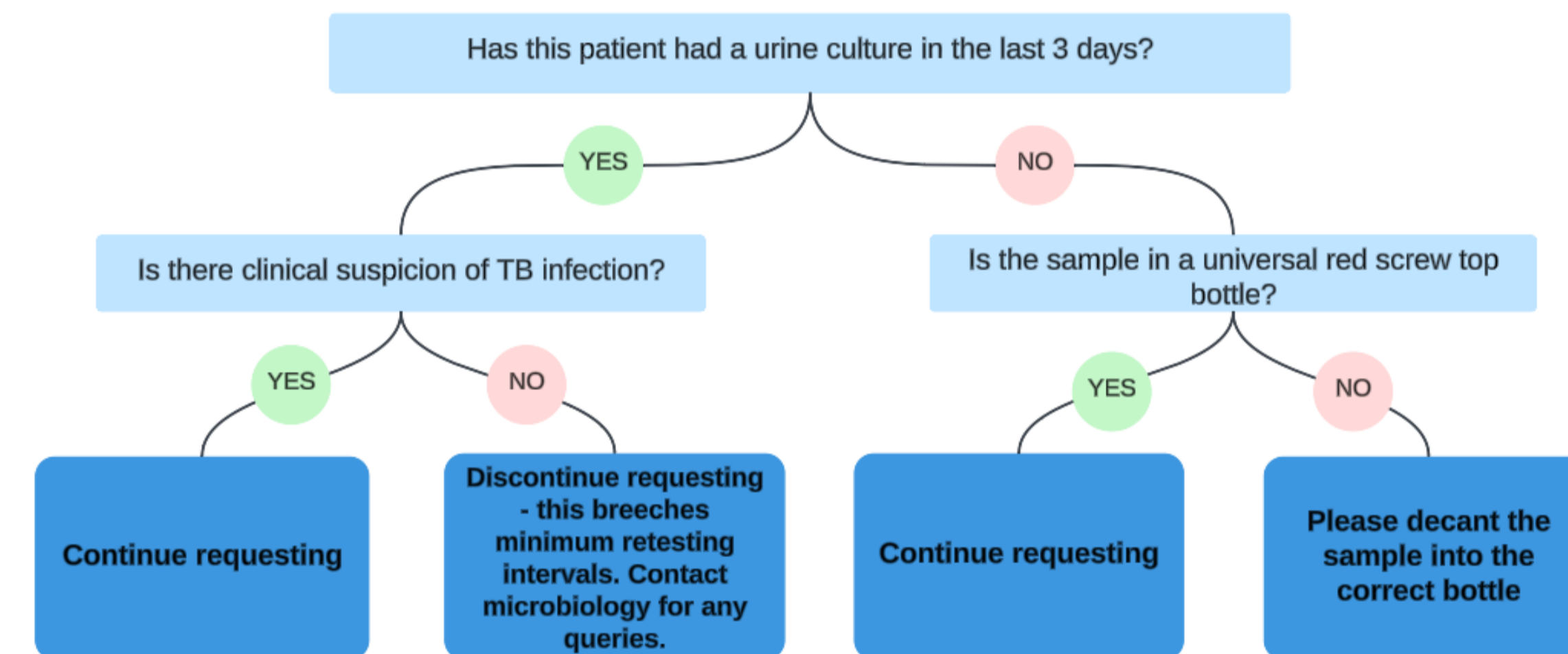


Figure 5: Suggested flowchart to be implemented into both the digital ICE requests and physical poster format

## Conclusions

- Rejected samples have **significant environmental impacts.**
- Clinicians could be **made better aware** of pre-analytical testing requirements.
- Simple interventions** could **reduce collection** of such samples.

## References

[1] McAlister, S., Grant, T., & McGain, F. (2021). An LCA of hospital pathology testing. *International Journal of Life Cycle Assessment*, 26(9), 1753-1763. <https://doi.org/10.1007/s11367-021-01959-1>  
 [2] Lang, T., & Croal, B. (2021). National minimum retesting intervals in pathology.  
 [3] 2023-25 NHS Payment Scheme (amended). Retrieved October 20, 2024, from <https://www.england.nhs.uk/publication/2023-25-nhs-payment-scheme/>  
 [4] United States Environmental Protection Agency. (2011). Greenhouse Gas Emissions from a Typical Passenger Vehicle. P2. <https://nepis.epa.gov/Exec/DisplayPage.cfm?Dockey=P100C2FN.txt>