

# Staying alert: a simple e-alert for acute kidney injury

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## Introduction

- An NHS Kidney Care survey identified IT issues and cost as barriers to using AKI e-alerts
- We describe an e-alert taking 10 minutes to set up that we believe could be implemented on all laboratory IT systems

## A simple AKI e-alert

- A real time automated delta check in CliniSys WinPath flagged a >50% increase in creatinine
- In addition, all creatinine results > 300 µmol/L were retrospectively reviewed and phoned if AKI was suspected

>50% increase in creatinine to >50 µmol/L from the most recent result within a 90 day period

Creatinine > 300 µmol/L

Automatic comment appended to creatinine result:

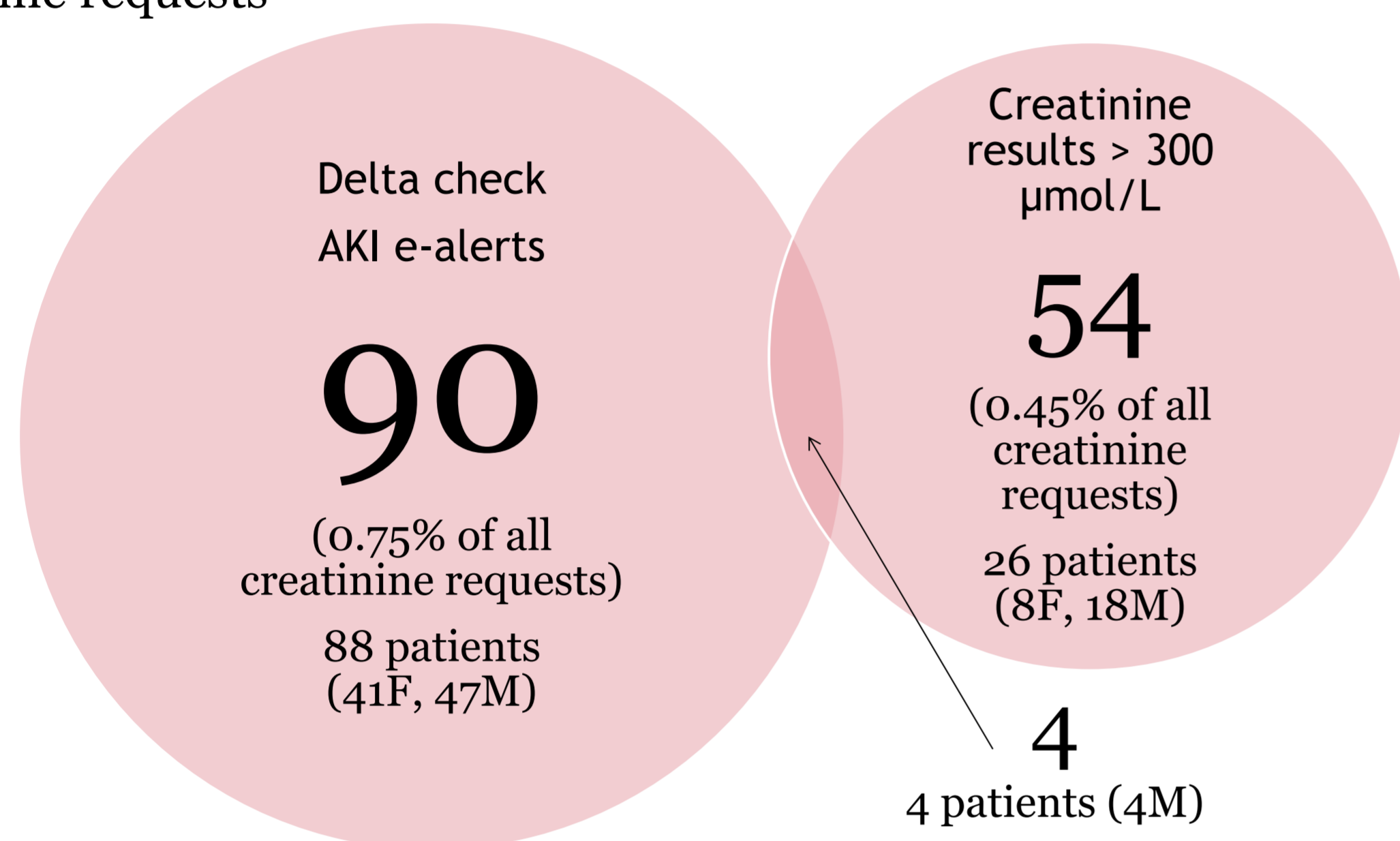
'?AKI - creatinine increase >50% from previous' with a link to the LAKIN website (londonaki.net)

Retrospective review twice daily by duty biochemist  
Result phoned if AKI suspected

## Audit of AKI e-alerts

### Number of e-alerts

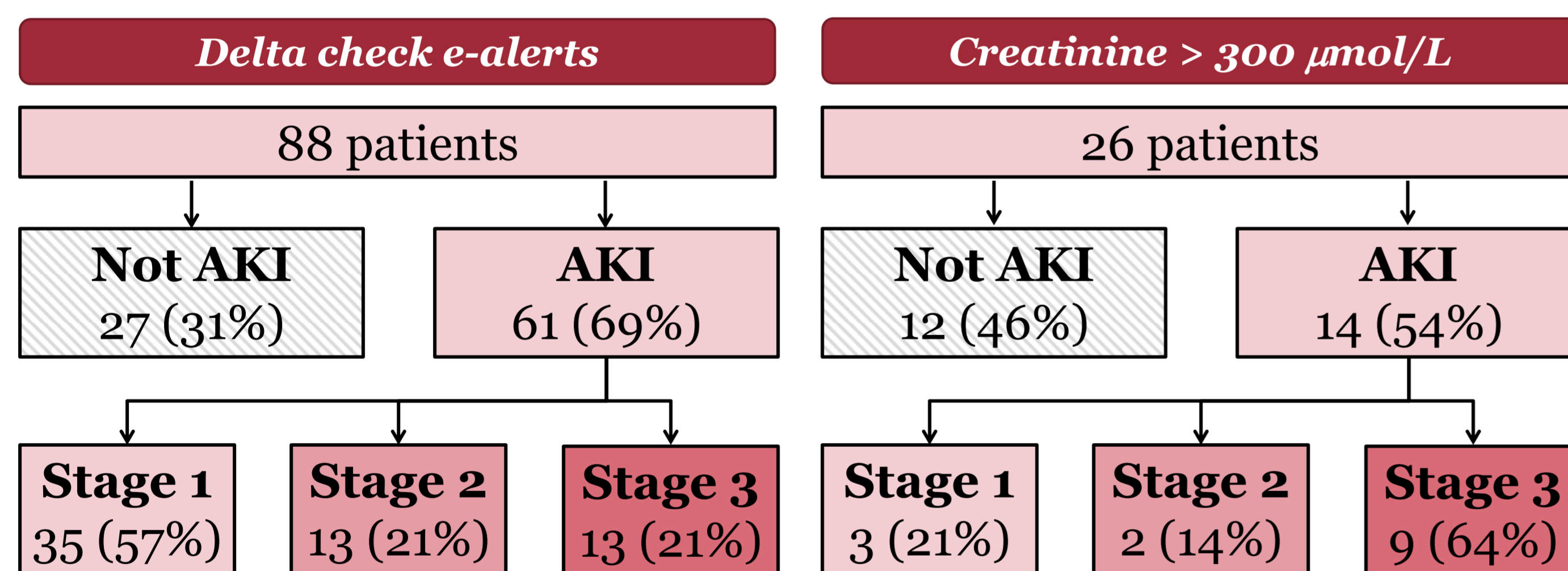
- During the 12 day audit period, the laboratory at UCLH received 11930 creatinine requests



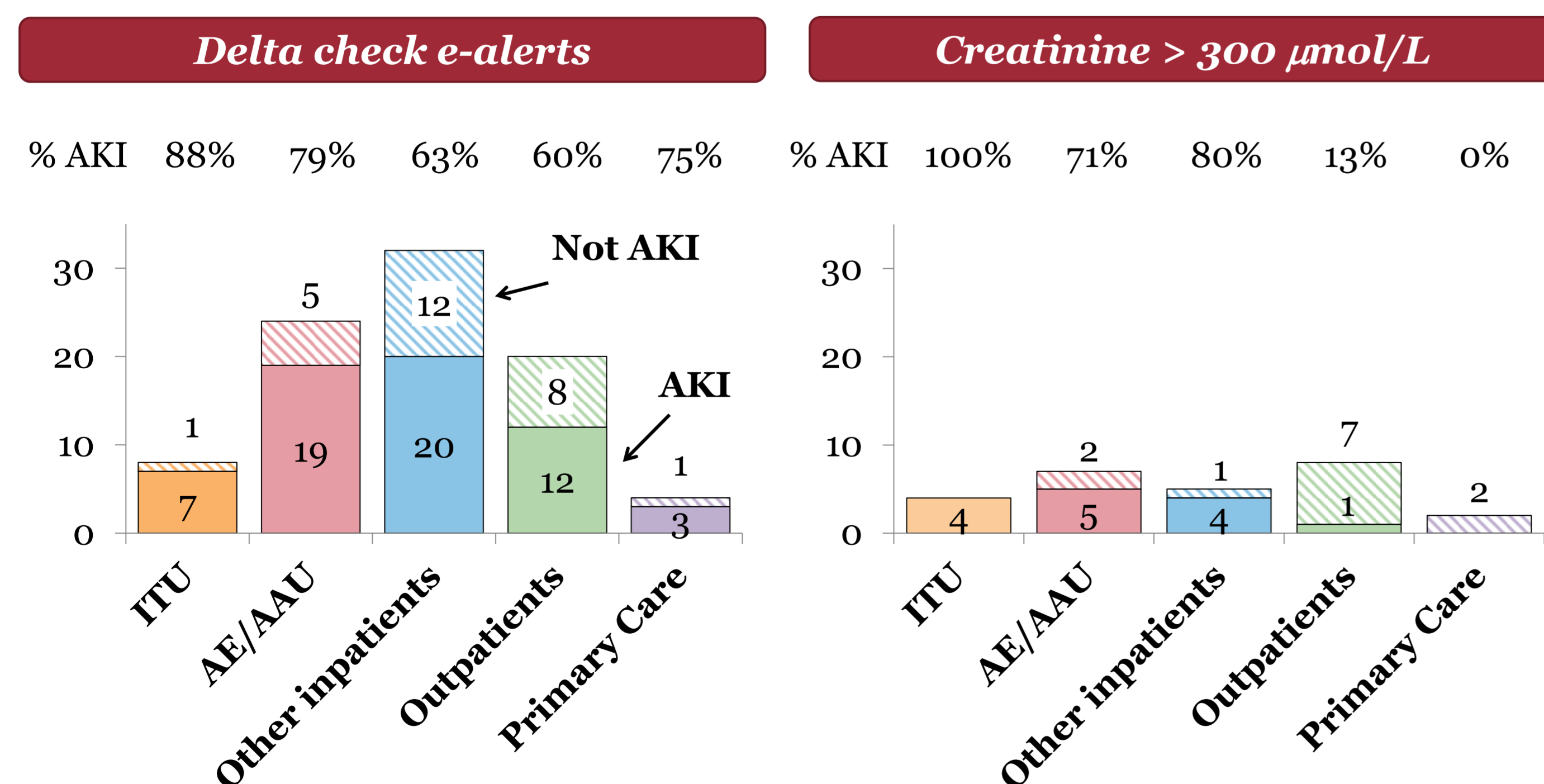
- On average, there were 7.5 (range 4-14) delta check e-alerts and 4.5 (range 2-7) creatinine results > 300 µmol/L per day

### AKIN staging

- Previous and subsequent creatinine results were reviewed to classify AKI
- 63 of 90 (70%) delta check e-alerts and 34 of 54 (63%) creatinine results > 300 µmol/L were due to AKI, identifying 61 and 14 AKI episodes respectively

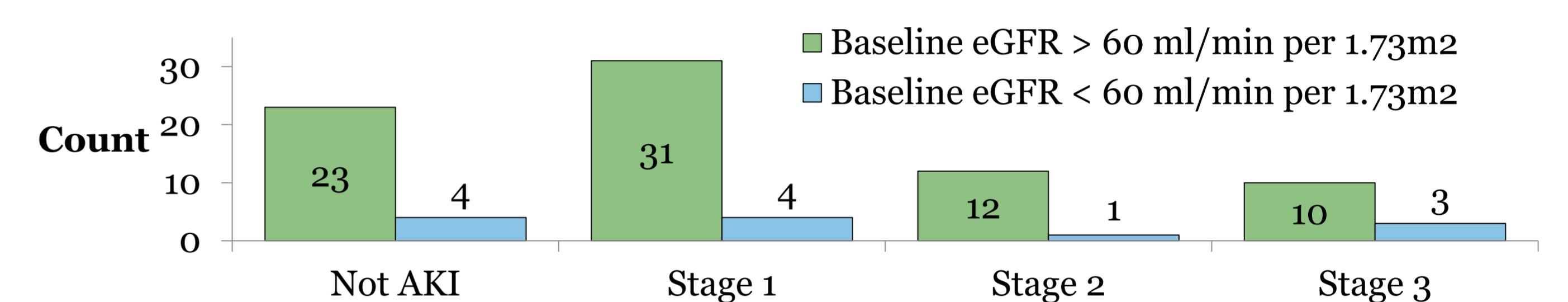


### Patient location

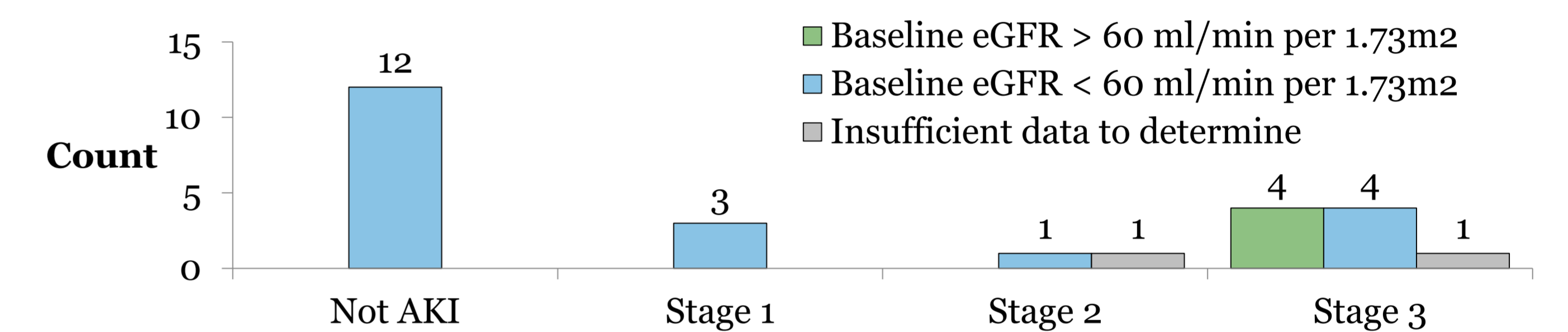


### Baseline renal function

#### Delta checks detect AKI in patients with baseline eGFR > 60 ml/min/1.73m<sup>2</sup>



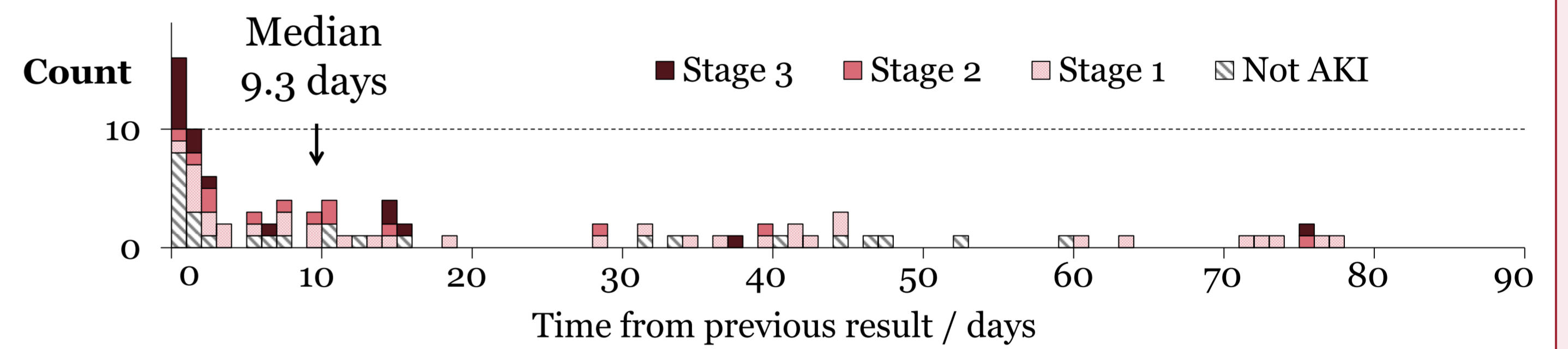
#### Creatinine results > 300 µmol/L detect acute on chronic kidney injury



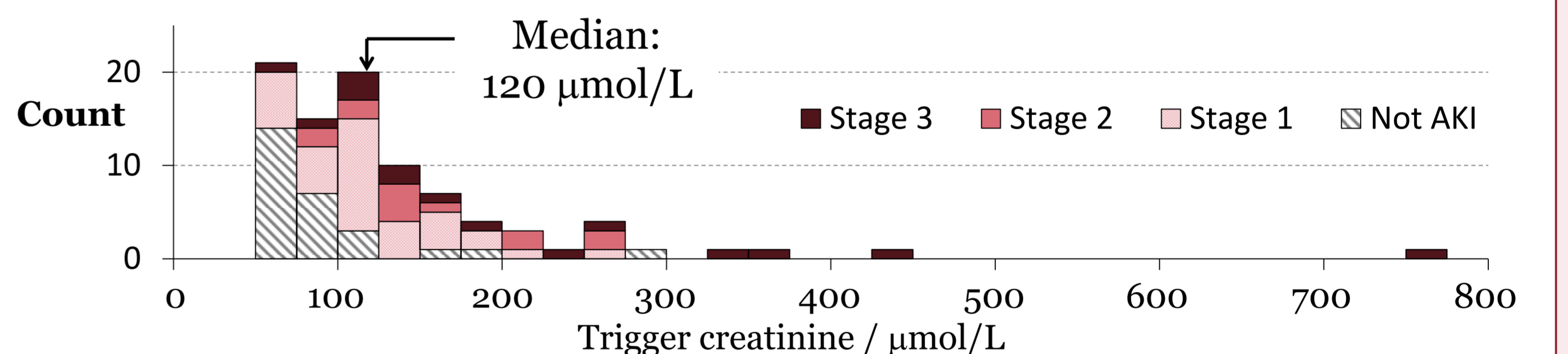
### Delta check characteristics

- Median creatinine increase: 47 µmol/L (IQR: 36-71; range 18-666)

#### Median time from previous result: 9.3 days (IQR 1.2-37 days)

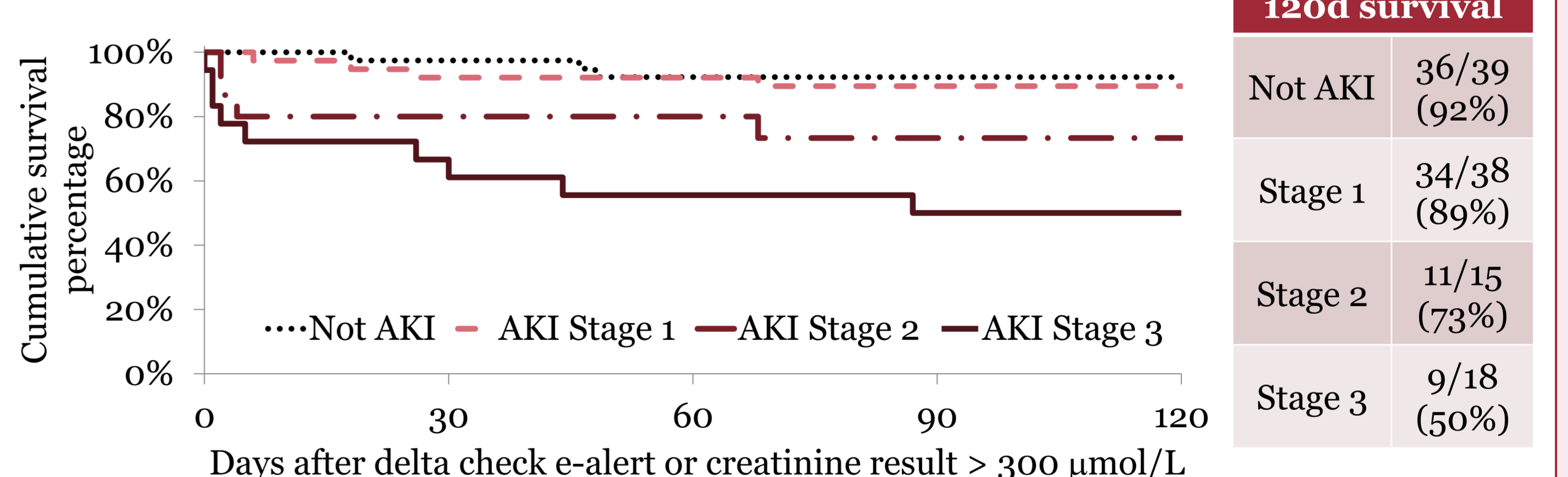


#### False positive e-alerts more frequent at trigger creatinine < 100 µmol/L



- During a separate 12 day period, there were no convincing cases of AKI among 20 alerts with trigger creatinine < 50 µmol/L

### Follow up



#### 54 of 71 (76%) patients with AKI survived to 120 days

- 43 (80%) recovered their renal function within 120 days (creatinine +/- 20% baseline)
- 4 (7%) had persisting renal impairment at 120 days
- 7 (13%) had insufficient data to assess recovery of renal function

## Conclusion & e-alert development

- A simple automated delta check e-alert can detect and flag AKI in real time, 24 hours a day, 365 days a year, at little extra cost and without human input
- Further developments of the AKI e-alert system at UCLH include :
  - o 24/7 phoning of delta check e-alerts to requesting clinician (if trigger creatinine > 100 µmol/L or patient < 18 years)
  - o Automatic email of delta check e-alerts sent twice daily to ITU outreach, containing patient details and previous creatinine results