

# PROPHYLACTIC GENTAMICIN AND FLUCLOXACILLIN IS ASSOCIATED WITH INCREASED RATES OF ACUTE KIDNEY INJURY IN ORTHOPAEDIC SURGERY

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## Introduction

Rising rates of *Clostridium difficile* infection (CDI), including fatal cases, prompted a number of measures to be implemented in 2008 in Scottish hospitals aimed at reducing CDI. These measures included restricting the use of broad spectrum antibiotics. Within the Tayside region of Scotland, the antibiotic policy was changed from cefuroxime to flucloxacillin and gentamicin as prophylaxis in patients undergoing orthopaedic surgery. A recent small observational study carried out in Dumfries and Galloway has raised concerns that this change has led to increased rates of acute kidney injury (AKI)<sup>1</sup>.

## Aims

The aim of this study was to examine the rates of AKI in adult patients undergoing orthopaedic implant surgery following the introduction of flucloxacillin plus gentamicin for surgical antibiotic prophylaxis in comparison with patients treated under the previous policy of cefuroxime.

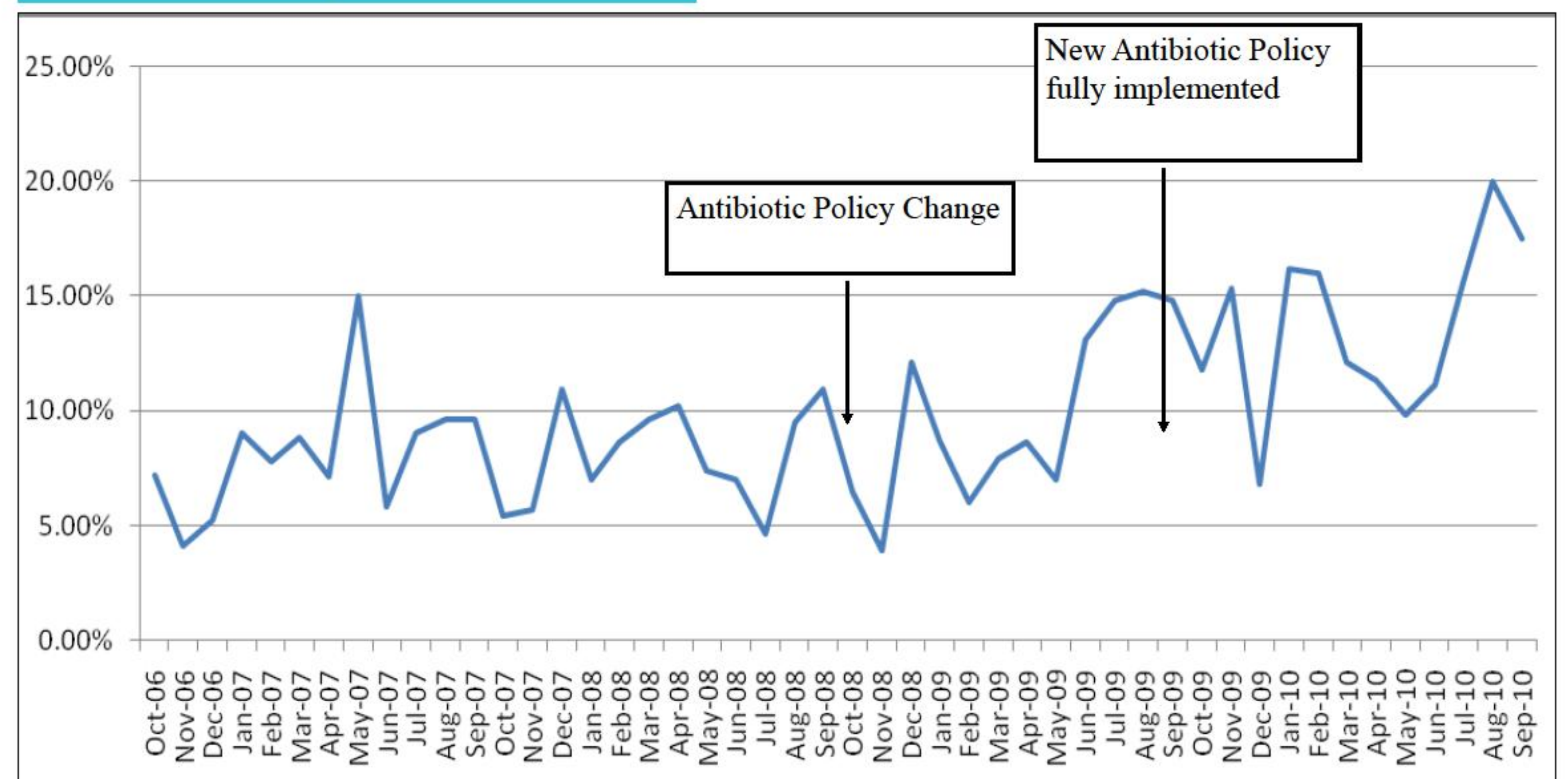
## Methods

Patients undergoing orthopaedic implant surgery between the 1st October 2006 and 30th September 2010 were studied. Data linkage was performed using anonymised record linkage via the Health Informatics Centre. Post-operative AKI was defined by AKIN criteria<sup>2</sup>. Interrupted time series (ITS)<sup>3</sup> with segmented regression analysis of intervention effect was carried out in the two years before and after the change in antibiotic policy in October 2008.

## Results

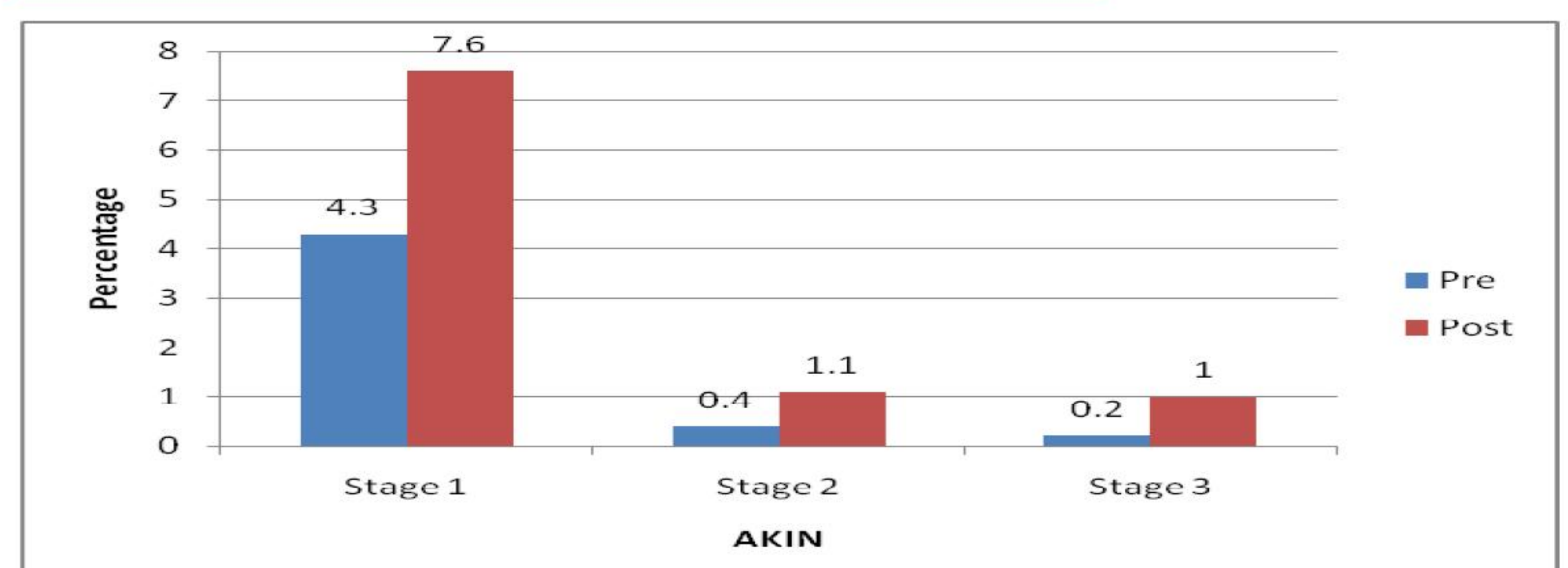
- 7698 patients were included in the analysis with 767 cases of AKI.
- Stage 1 AKI increased from 4.3% to 7.6%, stage 2 increased from 0.4% to 1.1% and stage 3 increased from 0.2% to 1%.
- Analyses using ITS showed that a significant increase in slope after introduction of the policy ( $p=0.035$ ), adjusted for gender, age and use of nephrotoxic drugs with a significant change in all levels of severity of AKI after the policy change (Chi squared = 57.584 ( $p<0.001$ )).
- 15 patients had persisting stage 2 and 15 patients had persisting stage 3 AKI 7 days post-operatively. 5/30 died post-operatively. 6/30 patients required renal replacement therapy (RRT). 5/30 were chronic dialysis patients. Length of hospital admission ranged from 3 to 41 days. All surviving patients recovered their renal function back to baseline.
- There was no change in AKI among patients with fractured neck of femur group who received co-amoxiclav as prophylaxis throughout the study period.

## Initial unadjusted results



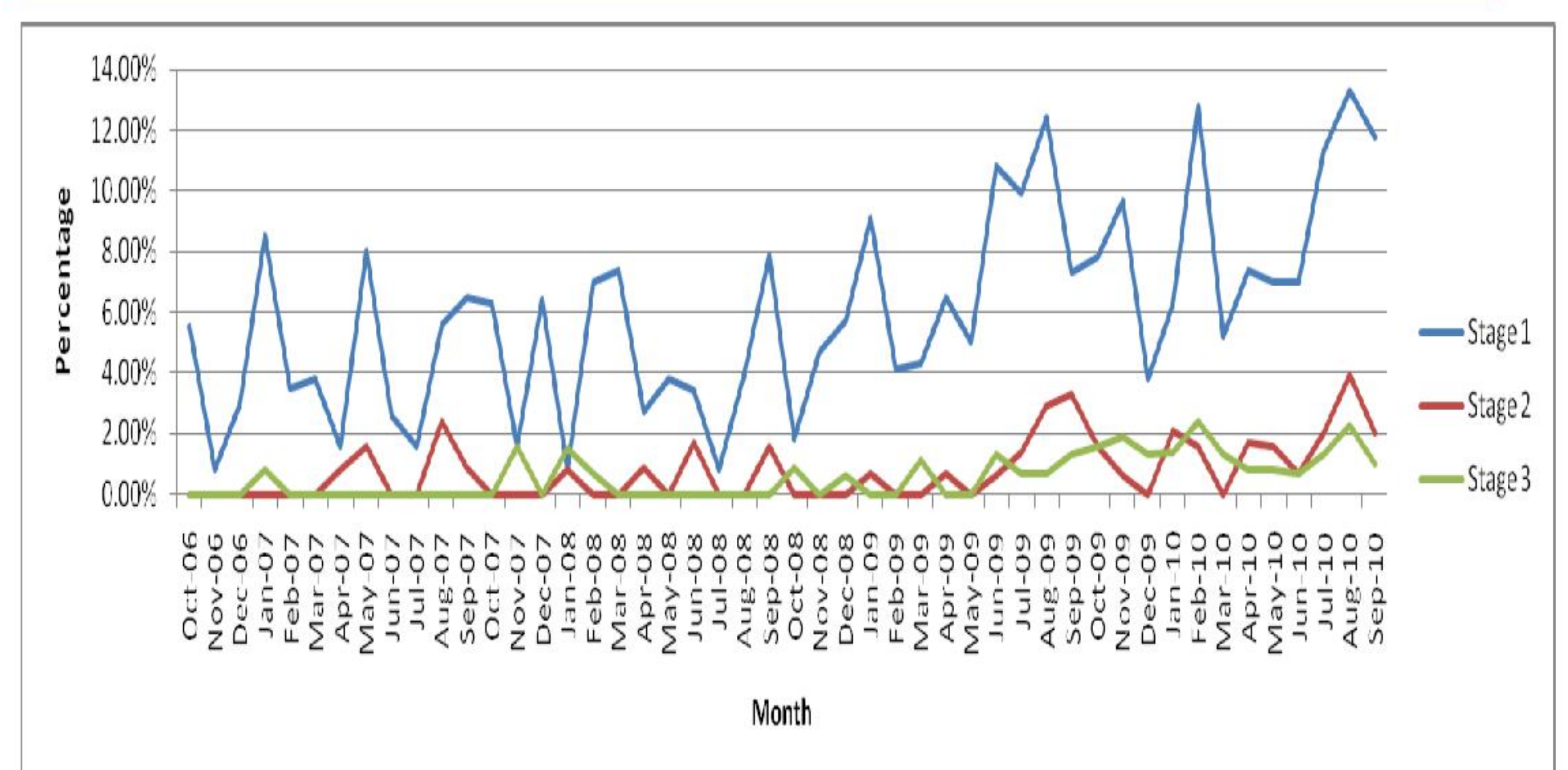
AKI defined as increase in serum creatinine by at least 1.5-fold in any 48h period during the first seven post-operative days

## Highest post-operative serum Creatinine



Percentage of AKI – Stage 1, 2 and 3 pre and post policy change. There were about 200 operations per month so a 1% difference indicates about 2 extra cases of AKI

## Percentage of AKI – Stage 1, 2 and 3 for each month



## Conclusion

The change in antibiotic policy from cefuroxime to flucloxacillin and gentamicin was associated with increased rates of AKI in patients undergoing orthopaedic implant surgery within Tayside. This has led to a change in policy with co-amoxiclav now being given as prophylaxis to all patients undergoing orthopaedic surgery.

### References

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3. Wagner AK, Soumerai SB, Zhang F, Ross-Degnan D. Segmented regression analysis of interrupted time series studies in medication use research. J Clin Pharm Ther 2002;27(4):299-309.

