

Background

- Calcaneal fractures are relatively uncommon but can be complex injuries leading to serious disability [1]. The incidence of calcaneal fractures in England has not been recorded.
- The operative management of displaced intra-articular calcaneal fractures remains controversial. The UK Heel Fracture Trial (UK HeFT) is a high profile, pragmatic, randomised control trial (RCT) performed within the National Health Service (NHS) which compared the operative and non-operative treatment of patients with closed, displaced intra-articular calcaneal fractures [2]. This level 1 evidence generated significant controversy and conflicting opinions as to its veracity in clinical practice [3, 4].
- Previous studies have suggested that surgeons in England change their practice in response to large multi-centre trials. For example, following the Distal Radius Acute Fracture Fixation Trial (DRAFFT) the proportion of patients having K-wire fixation over plate fixation rose [5,6].

Research Aims

Primary

- Document the epidemiology of admitted calcaneal fractures in England since the year 2000 in adults (age >18 years) using the annual Hospital Episode Statistics (HES) data.

Secondary

- Determine whether UK HeFT has impacted on the proportion of admitted calcaneal fractures being surgically fixed;
- Determine if there has been any recent change in the surgical technique used.

Methods

- In England the Hospital Episode Statistics (HES) data is recorded annually.
- Between 2000/01 and 2016/17 the number of adults admitted to an English NHS hospital with a diagnosis of a calcaneal fracture and whether they were treated with surgical fixation was determined.

Analysis

- The majority of the results are descriptive analysis.
- The annual incidence of admitted calcaneal fractures per 100,000 persons were calculated using annual populations from the United Kingdom Office for National Statistics [7].
- A simple Student's-t test was used to determine any significant difference pre and post UK HeFT publication in the percentage of admitted calcaneal fractures internally fixed.
- Of those calcaneal fractures internally fixed a simple Student's-t test was also used to determine any significant difference pre and post UK HeFT publication in the percentage performed by closed reduction as opposed to open reduction.
- The percentage of calcaneal fractures fixed with closed reduction in each two year period from 2000 – 2014 was compared to 2015 – 2017, by calculating the standard error of the difference in percentages between the two biennial data sets, assuming a 2-tailed distribution and a 95% confidence interval (i.e. $p < 0.05$).

Acknowledgements

- This study was supported by a grant from the British Orthopaedic Foot and Ankle Society

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Results

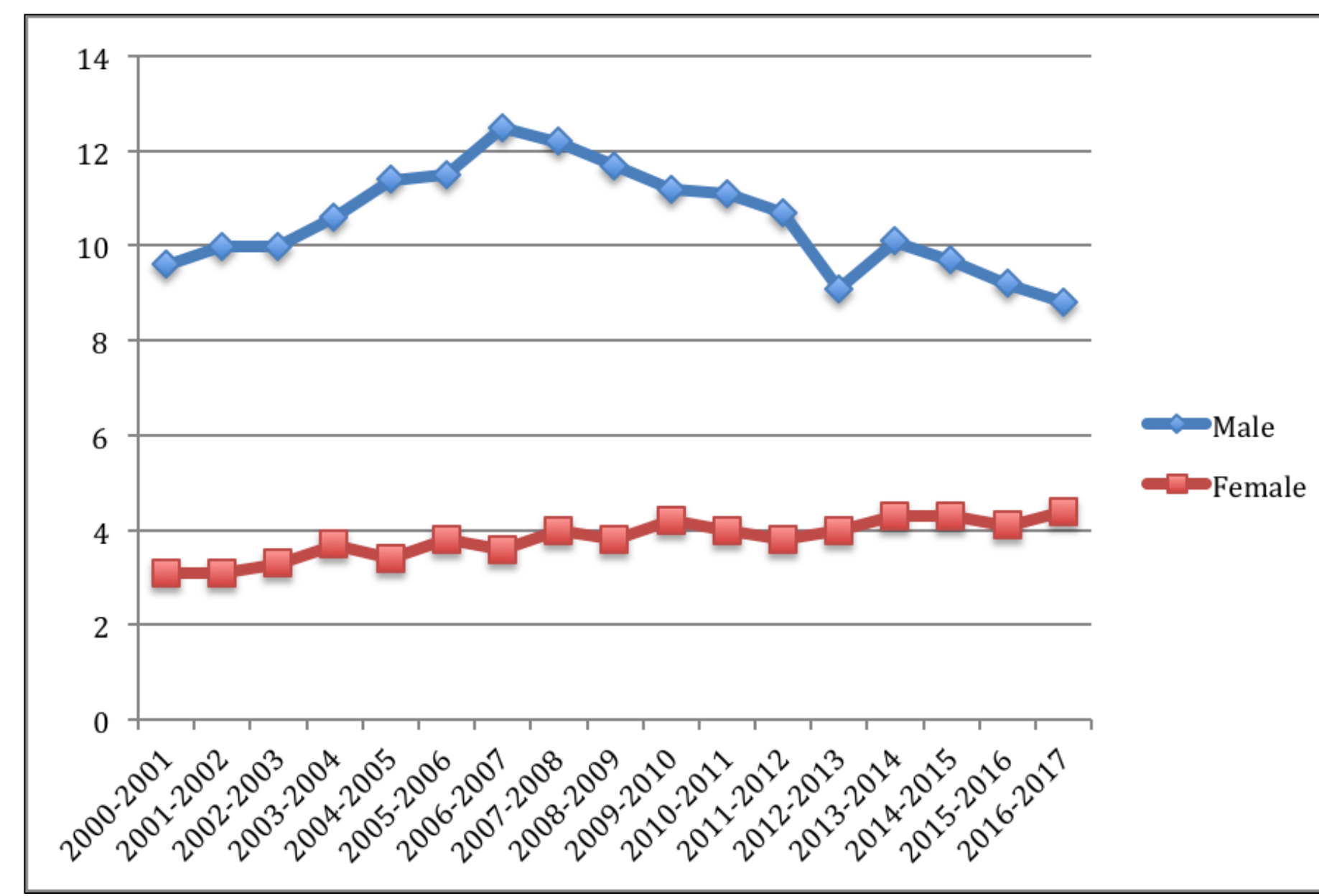


Figure 1 – The mean annual incidence of male and female calcaneal fractures admitted to hospital in England per 100,000 persons.

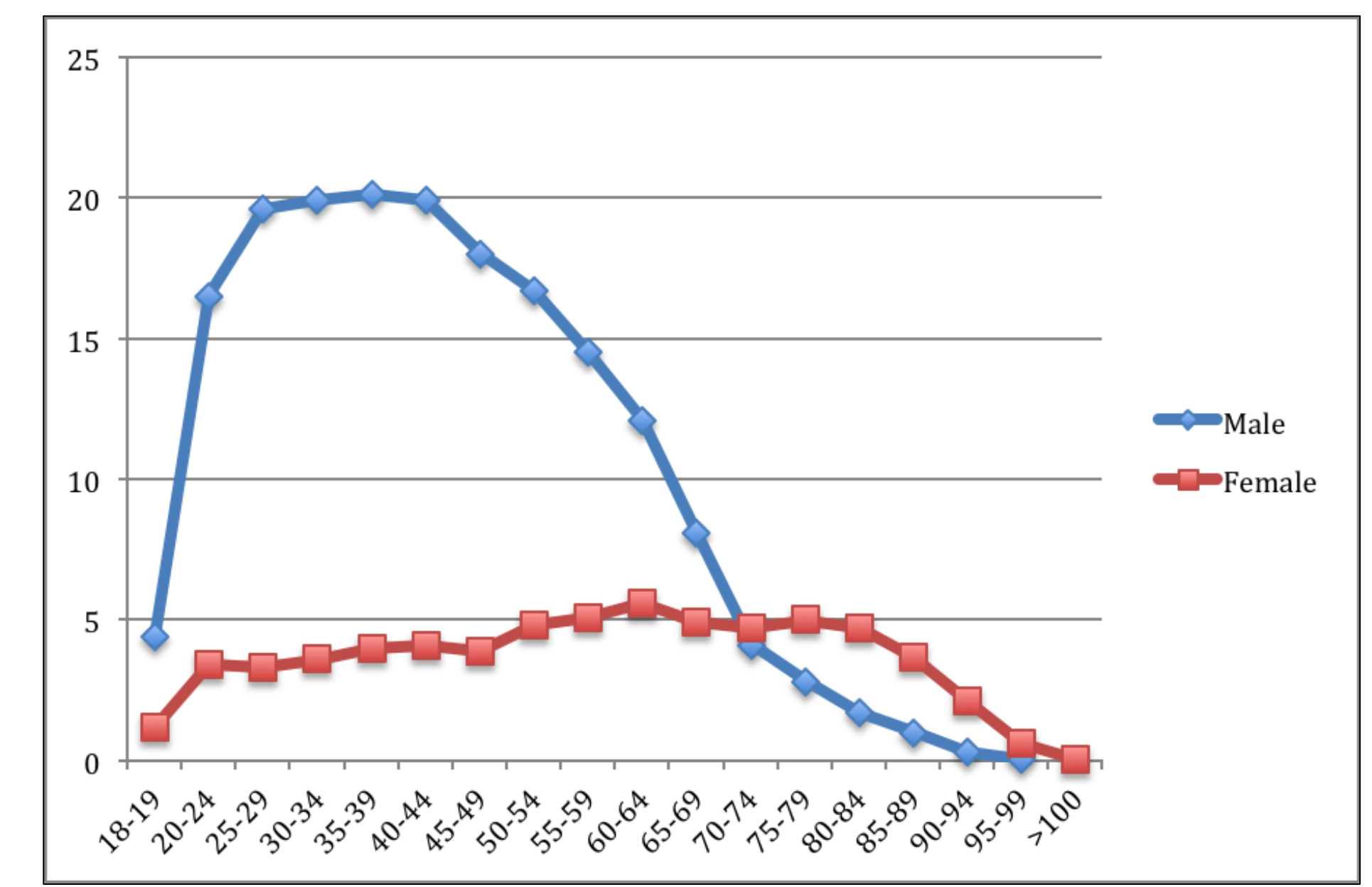


Figure 2 – The age specified mean annual incidence per 100,000 persons of male and female calcaneal fractures admitted to hospital in England

- Over the 17-year period 62,858 patients were admitted to hospital with a calcaneal fracture.
- The male to female ratio was 2.66:1.
- The mean annual incidence for males is 10.5 / 100,000 and for females 3.8 / 100,000.

Figure 3 – Annual percentage of internally fixed Calcaneal Fractures in England. The arrow highlights the publication of UK HeFT in 2014.

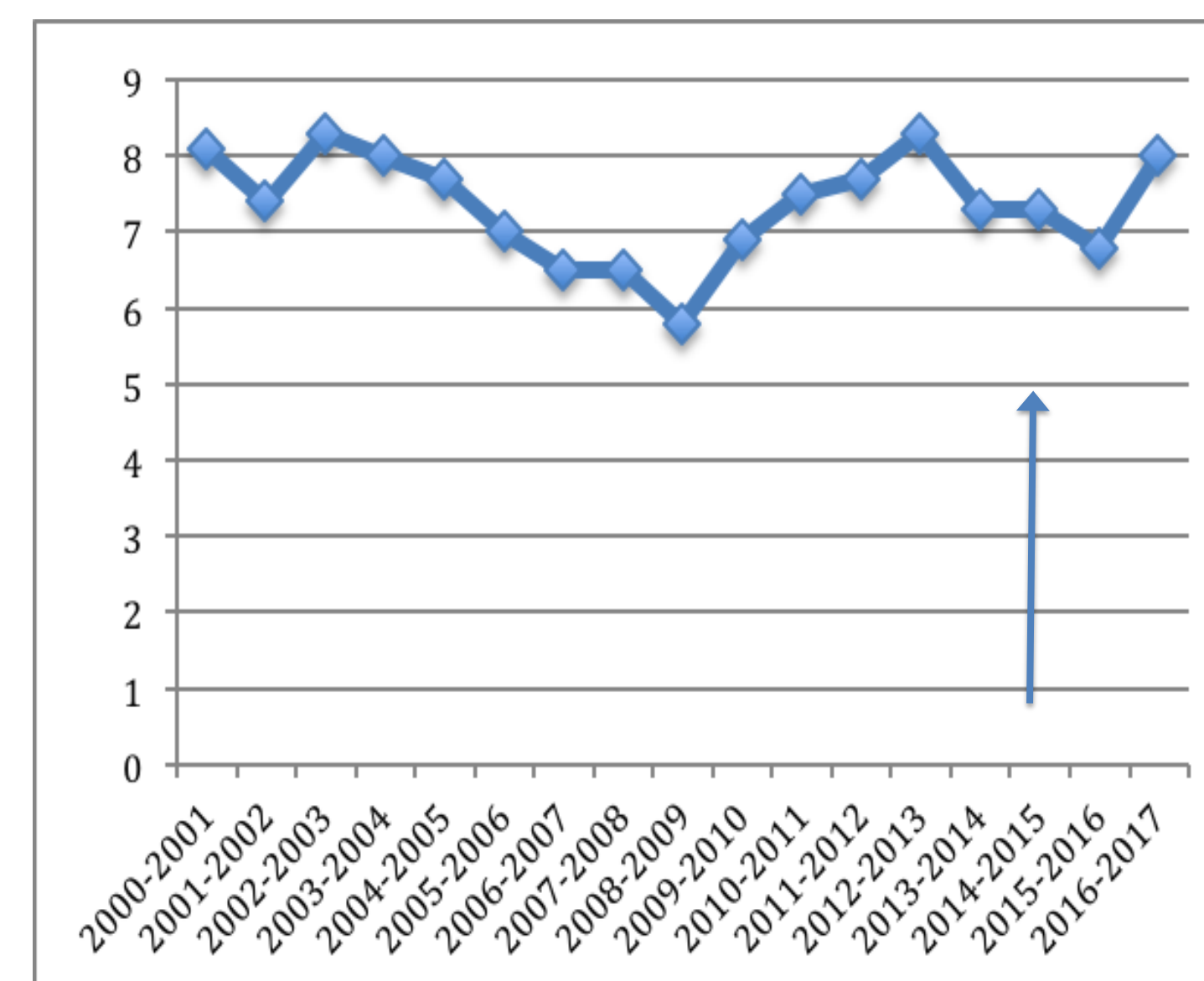


Figure 4 – Percentage of internally fixed calcaneal fractures, according to age and gender

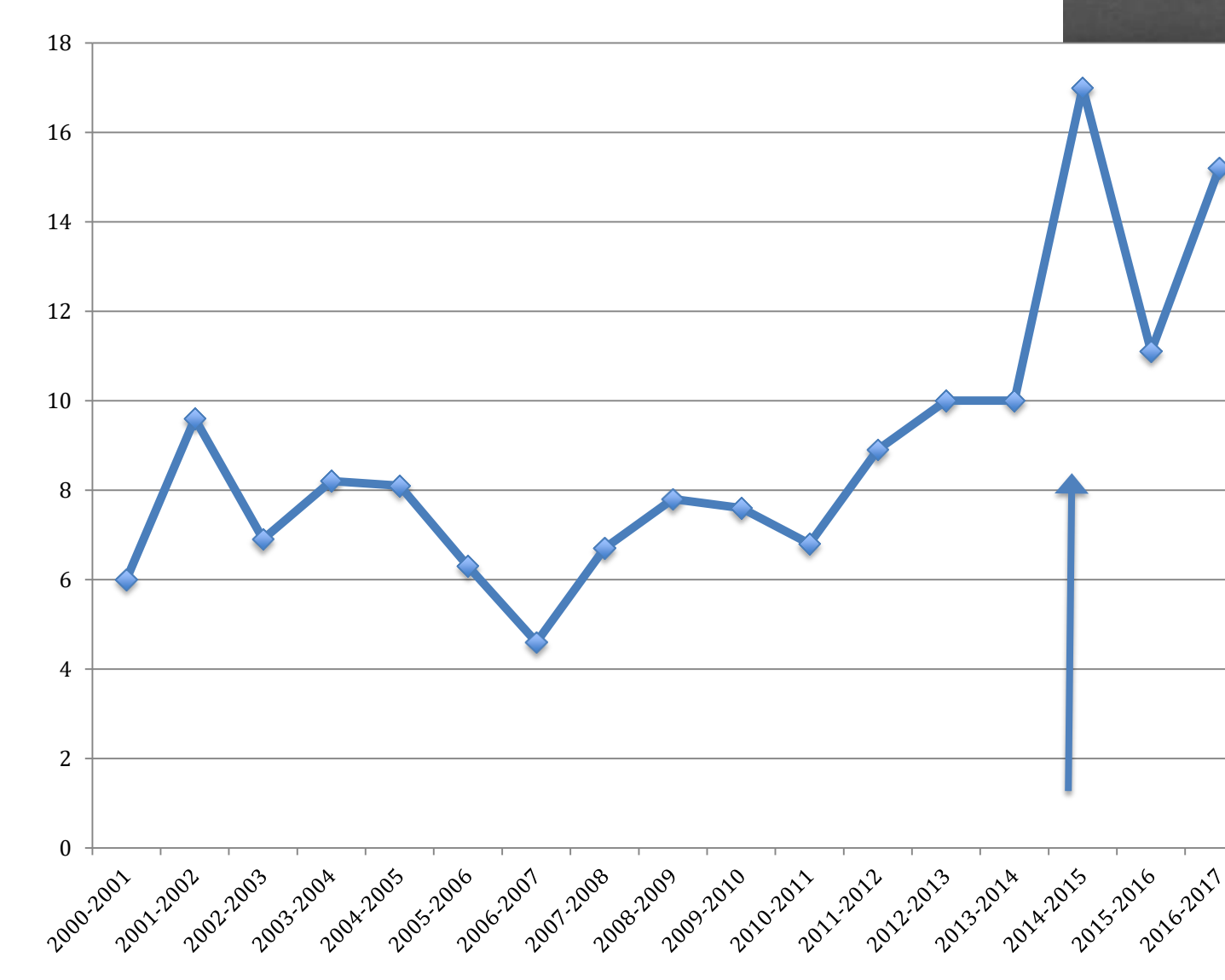
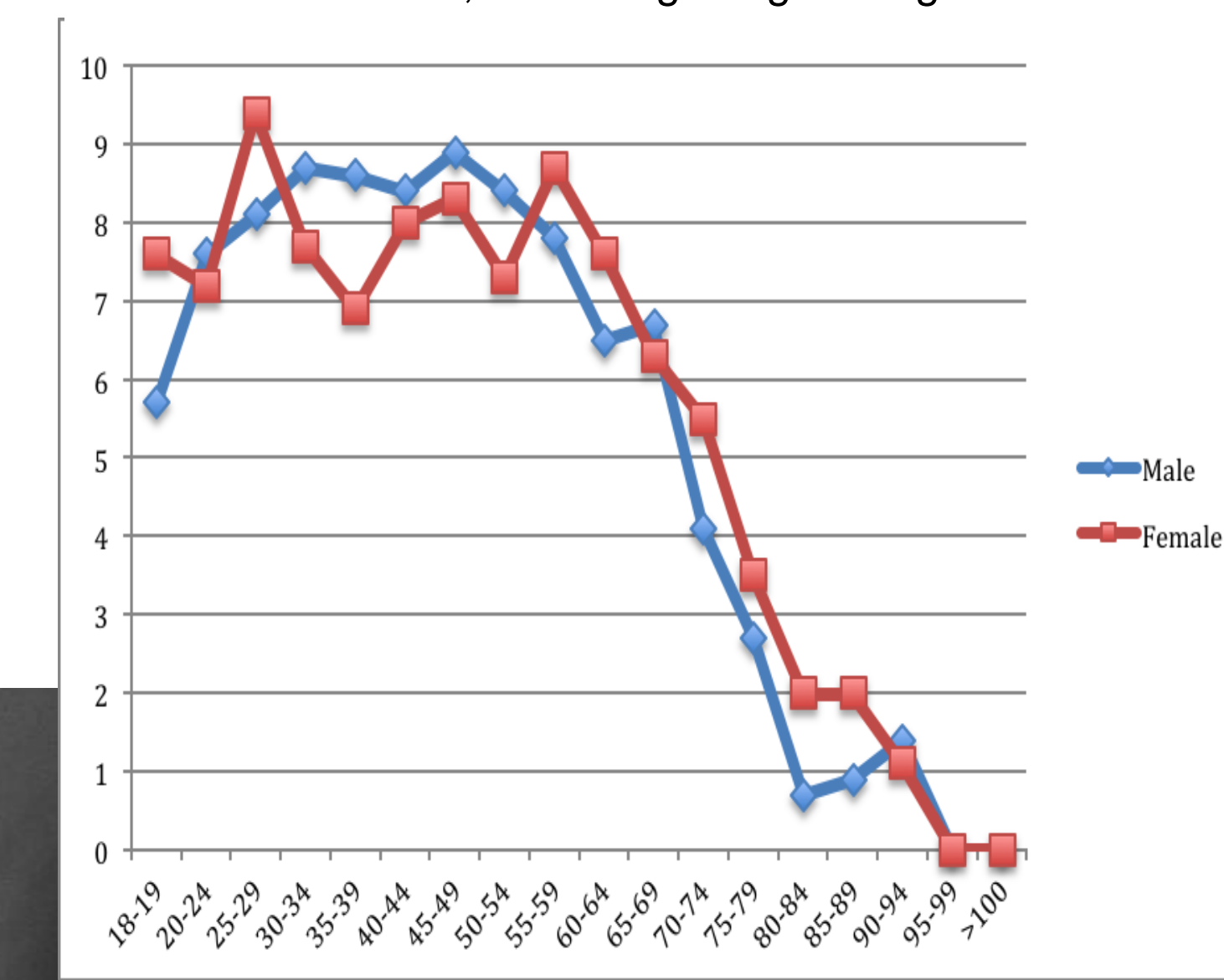


Figure 5 – Shows the annual percentage of internally fixed calcaneal fractures managed with closed reduction. The arrow highlights the publication of UK HeFT in 2014.

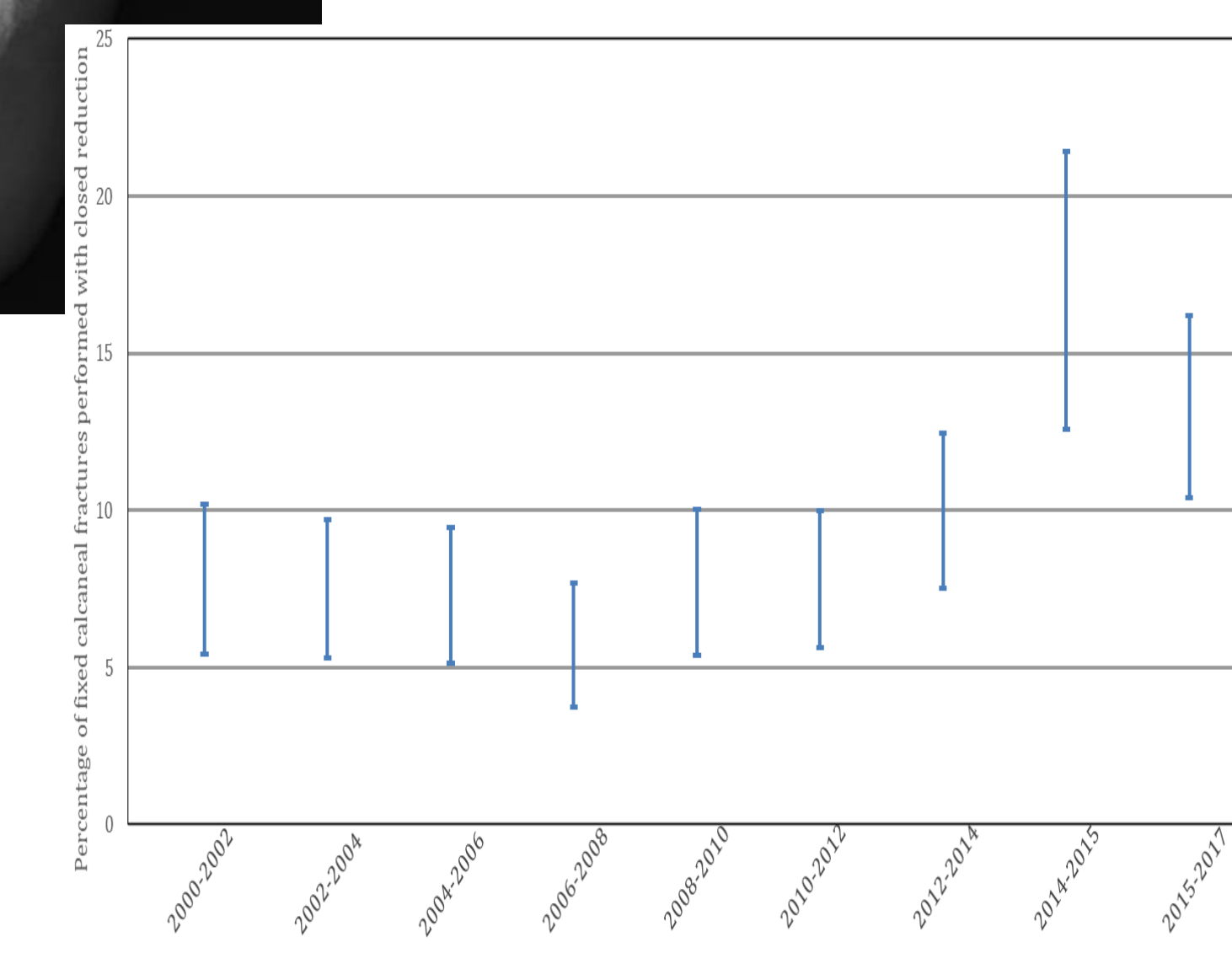


Figure 6 – Biennial trends of fixed calcaneal fractures performed with closed reduction between 2000-2017..

- The percentage of patients with an admitted calcaneal fracture undergoing internal fixation pre-2015 was 7.31% (3,792/51,859). Post-2015 the internal fixation rate was 7.38% (534/7,229), which was not significantly different ($p=0.94$).
- Since 2015 there has been a significant increase in the percentage of calcaneal fractures treated by closed reduction and internal fixation, as opposed to open reduction and internal fixation, from 7.7% (292/3792) to 13.29% (71/534) ($p < 0.05$).
- There was also a significant difference between the percentage of calcaneal fractures fixed with closed reduction for each individual two year period from 2000 – 2014 compared to 2015 – 2017 ($p < 0.05$).

Conclusions

- This study documents the epidemiology and fixation trends of calcaneal fractures in England.
- The incidence of admitted calcaneal fractures for males has reduced over the last 11 years, whilst that for females has increased.
- We have established that surgeons did not change their clinical practice in terms of offering surgery for calcaneal fractures in response to UK HeFT.
- Surgeons are now innovating to find better surgical methods to treat calcaneal fractures with a recent increase in less invasive procedures.