Introduction
Axillary node dissection (AND) in breast cancer patients is known to cause significant morbidity. Several recent papers have challenged the previous notion that a positive sentinel node biopsy (SNB) is an absolute indication for surgical clearance of axillary nodes in all patients. The 2001 trial by The American College of Surgeons Oncology Group (ACOSOG) in 2011 randomized clinically T1/T2, N0, M0 invasive breast cancer patients with 1-2 positive sentinel nodes to axillary node dissection or no further axillary treatment1. All patients had lumpectomy and tangential breast irradiation. In 891 patients randomised, the authors found no significant difference in 5-year overall survival or 5-year disease-free survival.

Similar results have been reported elsewhere for patients with low risk cancer and a positive sentinel node2,3. Specifically, trials comparing AND vs. no AND when micrometastatic disease only is detected on SNB, continue to show non-inferiority in survival and disease free survival when AND is omitted4. The significance of staging continues to be largely found to be inversely proportional to morbidity associated with AND, such as lymphedema, restricted motion and parenthesis4.

This change in dogma should be reflected in treatments and outcomes for individual patients. The current study aims to quantify any changing trends in management for patients with invasive breast cancer in Auckland, New Zealand. It compares treatment for 2001-eligible patients before and after February 2011, which was the date of publication of the trial.

Methodology
The Auckland Breast Cancer Registry, covering public and private surgery across the Auckland region recorded from 2000-2012 invasive breast cancer who underwent sentinel node biopsy between January 2009 and June 2012. Patients who fulfilled eligibility to the 2001 trial were identified and divided into patients with a histological diagnosis prior to February 2011 and those after. The two groups were compared to ensure adequate similarity between the groups.

The proportion of eligible patients who proceeded to AND, as well as the proportion with micrometastatic disease only, was compared between the two groups. Lastly the number of positive nodes was compared between groups. Analysis was performed using Fisher’s exact test for P-values and binomial (Clopper-Pearson) ‘exact’ method for proportion confidence intervals.

Results
A total of 1,999 patients who underwent lumpectomy or mastectomy and SNB between January 2009 and June 2012 were identified from the registry database (Fig. 1). Using the 2001 selection criteria, 151 (7.6%) patients were deemed eligible and were used for further analysis, 96 were diagnosed prior to February 2011 and 55 after. A comparison of patient and tumour characteristics between the groups showed no significant difference except a small difference in mean age (Table 1).

There was a decrease in the proportion of patients who underwent completion axillary node clearance from 86.9% (CI 81.7 – 94.9) prior to February 2011 to 65.5% (CI 51.4 – 77.8) post (P=0.0005) (Fig. 1). No significant trend was found when comparing rate of progression to AND per year (Fig. 2). There was a significant decrease in the proportion of patients with micrometastatic disease only who underwent AND from 68.2% (CI 45.1 – 86.1) prior to February 2011 to 28.6% (CI 11.3 – 52.2) (P=0.0148).

Of the patients who had an AND (122 patients), 49 (40.2%) had further metastatic nodes detected. Of these, an average of 2.88 (range 1-17) nodes contained metastatic deposits. There was a non-significant increase in the proportion of patients with AND who had further metastatic nodes detected from February 2011, 30 of 86 patients (34.8%) had further positive nodes, and 19 of 36 patients (52.8%) after February 2011 (P=0.0724).

Discussion
The results show a significant drop between the two time periods in rate of progression to AND among women in Auckland who fulfilled the 2001 inclusion criteria. This drop was detected for both micro and micrometastatic disease. Of all women with T1-T2 invasive breast cancer in Auckland, only 7.6% would fulfil the criteria for the 2001 study. However, given the large number of patients over 3.5 years (1,999 patients), the drop in rate of AND is a significant decrease, and would avoid the morbidity associated with AND for many women. The most likely cause for this trend, although this would need a growing body of evidence against completion AND in all patients with a positive SNB. The fact there were no significant differences between the two groups at baseline, except a small difference in age, reinforces this. The date that separates the two groups in the study is the publication date of the 2001 trial; February 2011. It is unclear from the study if it is a meaningful date to separate the groups as there is no trend continuing downwards from 2011 to 2012 (Fig. 2). However, the results of the study were well known post February 2011 and highly likely to be contributing to surgeon decision making.

Similar results to 2001 have been replicated elsewhere, including a large meta-analysis by Glechner et al4. However many argue against generalising the results of 2001 to every patient that would fulfil the criteria. Gatzemeier & Mann list the main objections and criticisms against the trial3. These include early closure of the study, missing data and a high proportion lost to follow up. Interestingly there was a statistically significant difference in proportion of micrometastatic disease in the sentinel node between the two groups with the SNB only group potentially having less tumour burden. There was also double the rate of axillary recurrence (although low, 0.9% vs. 0.5%) in the SNB group only. Concerns regarding generalizability arise from the actual population of the 2001 trial which mainly included patients over 50, with small (T1) ER positive invasive ductal carcinomas. Notably this patient group is also over-represented in the present study, indicating natural variation in prevalence of breast cancer subgroups. Despite these reservations, the American Society of Clinical Oncology and National Comprehensive Cancer Network recommend no further surgery for patients who meet the eligibility criteria6.