RAPiD: Reducing Antibiotic Prescribing in Dentistry

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Antibiotic Prescribing in Dentistry

- Antimicrobial resistance is recognised as a major threat to public health and patient safety[1]
- Antibiotic prescribing in dentistry now accounts for 9% (388 919 items in 2013-14) of total antibiotic prescribing in primary care in Scotland[2]
- Evidence suggests dentists often prescribe antibiotics inappropriately[3]
- The total number of antibiotics prescribed by dentists increased steadily up to 2012-13[2]

1. World Health Organisation. Antimicrobial Resistance Factsheet No. 194; April 2014.
2. Scottish Antimicrobial Prescribing Group. Primary Care Prescribing Indicators. Annual Report 2013-14.
3. Dar-Odeh NS *et al.* Antibiotic prescribing practices by dentists. *Ther Clin Risk Manag*; 2010.

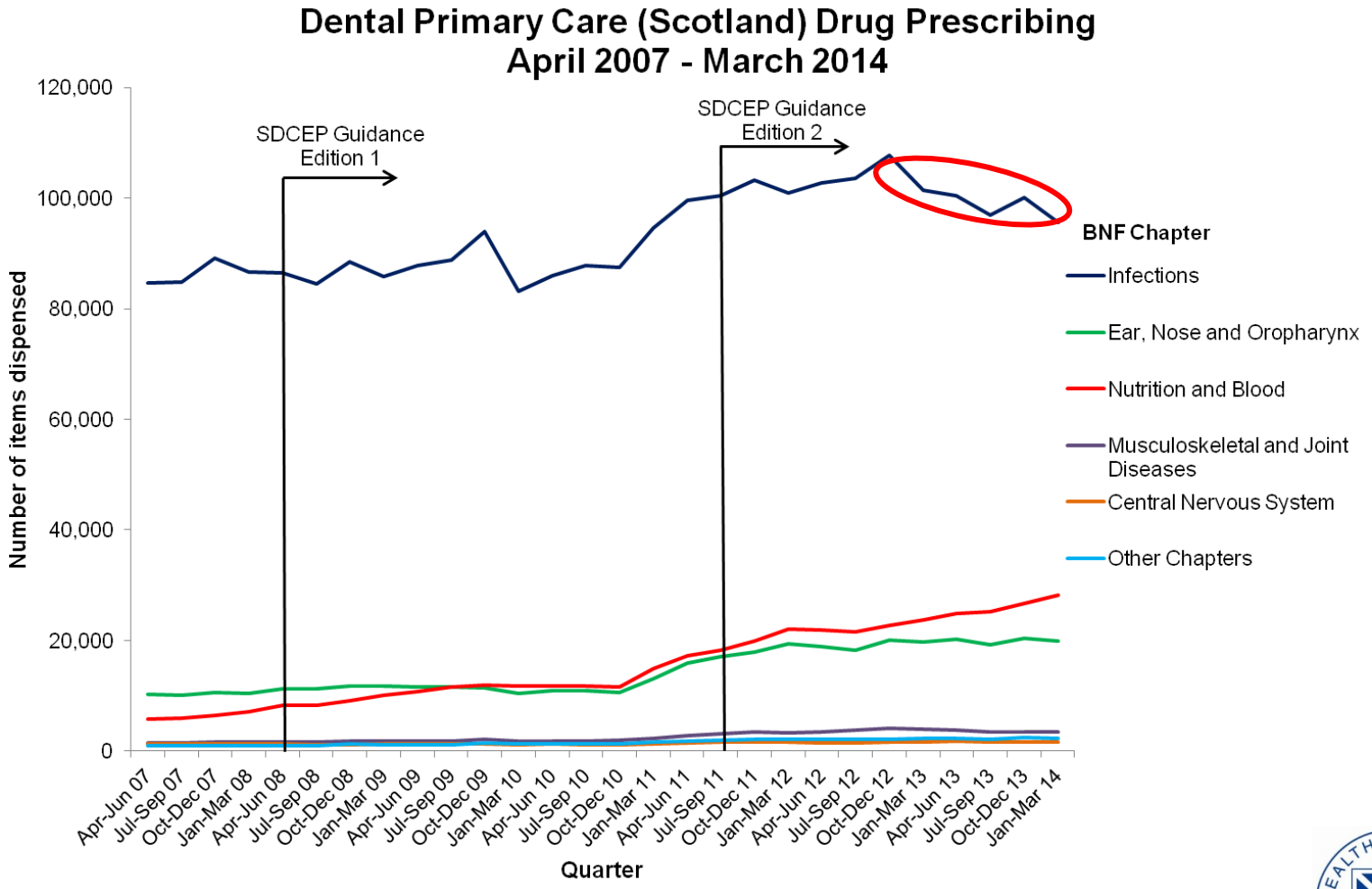
Drug Prescribing For Dentistry Guidance

- Drug Prescribing guidance published in April 2008
  - brings together advice and recommendations from the BNF and NICE
  - App for iPhone®, iPad® and iPod touch® launched in April 2012 (recently been optimised for Apple's latest operating system)
- Guidance recommendations
  - Focus on the use of local measures
  - Antibiotics only recommended for spreading, systemic infection

Monitoring of Prescribing

- TRiaDS – multidisciplinary international research collaboration embedded within the guidance development process
  - Focus on the implementation of the guidance into practice
  - Determine the need for, design and evaluation of knowledge translation strategies
- Drug Prescribing - monitoring the routine data
- TRiaDS has access to prescribing data for all individual dentists in Scotland (PRISMS – **Pr**escribing **I**nformation **S**yste**m** for **S**cotland)
- Routine prescribing data was monitored pre- and post-publication, analysed and trends identified

Total prescribing by dentists



The RAPiD Trial

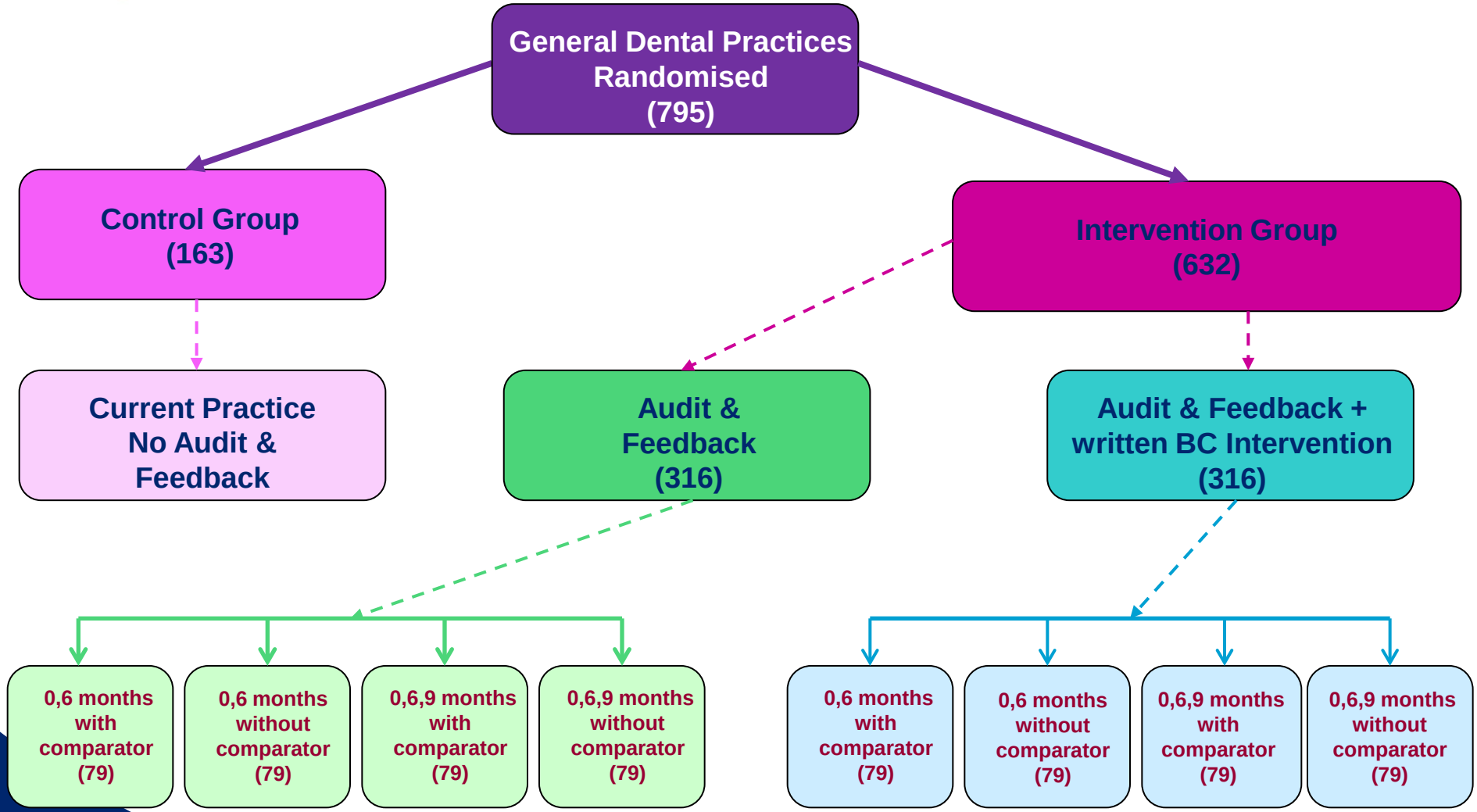
Reducing **A**ntibiotic **P**rescribing **i**n **D**entistry

- A 12-month partial factorial cluster RCT conducted in NHS General Dental Practices across Scotland
- Aim
  - To compare the effectiveness of individualised Audit & Feedback (A&F) strategies for the translation into practice of SDCEP recommendations on antibiotic prescribing
- 795 practices were randomised to control or one of eight A&F intervention groups:
  - A&F ± written TRiaDS behaviour change (BC) intervention
    - ± health board comparator and ± A&F at 9 months

RAPiD – Trial Design

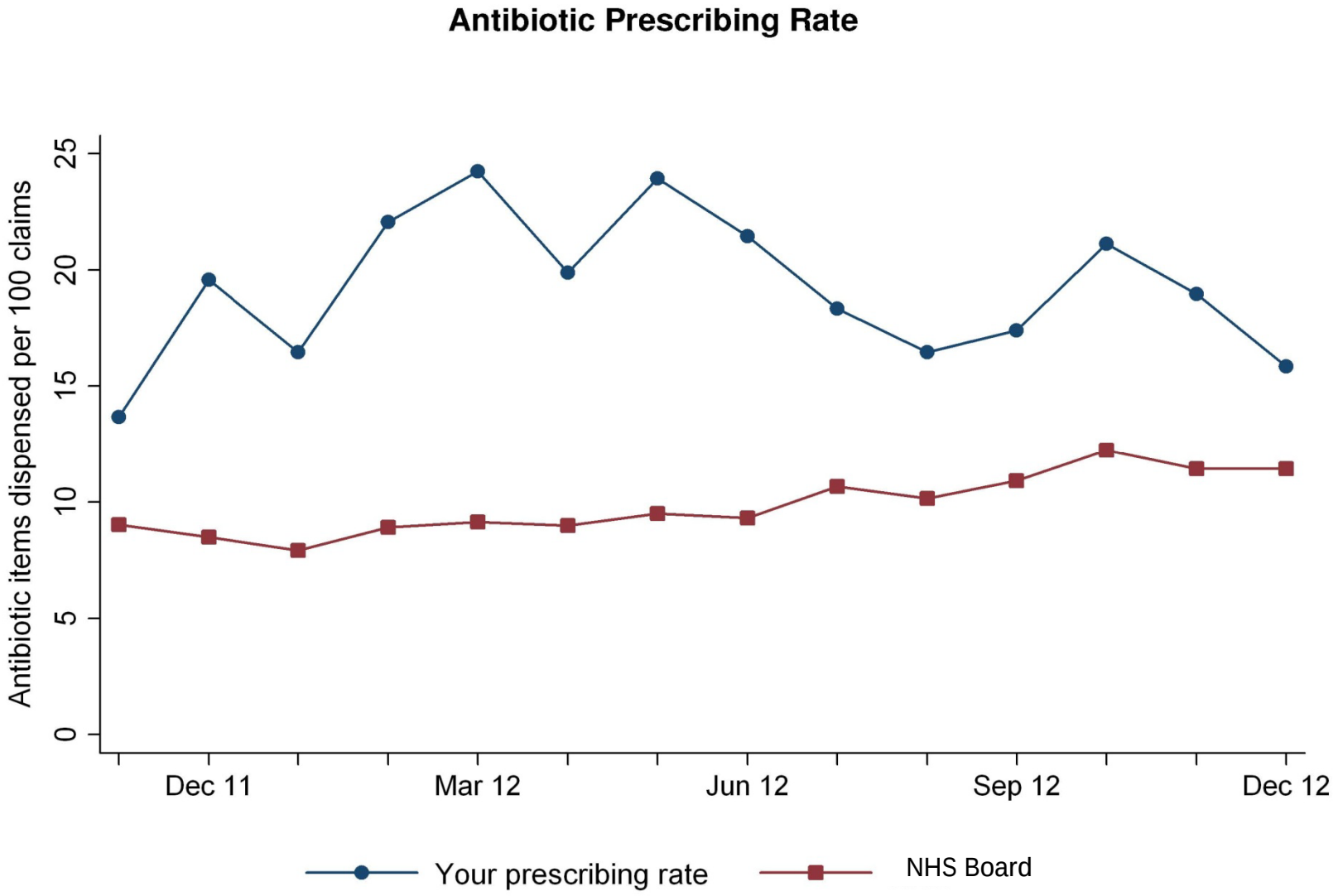
- Relies heavily on routinely collected electronic healthcare data
  - Data linkage
- Data from PRISMS and MIDAS (Management Information and Dental Accounting System)
- Routine data is used in 5 aspects of the trial design
  - MIDAS
    - To identify the study population
    - Apply eligibility criteria
    - Conduct stratified randomisation
  - Linked MIDAS & PRISMS *(dentist list number used as common identifier)*
    - Generate the intervention
    - Analyse outcomes

RAPiD – Trial Design



Example Baseline intervention

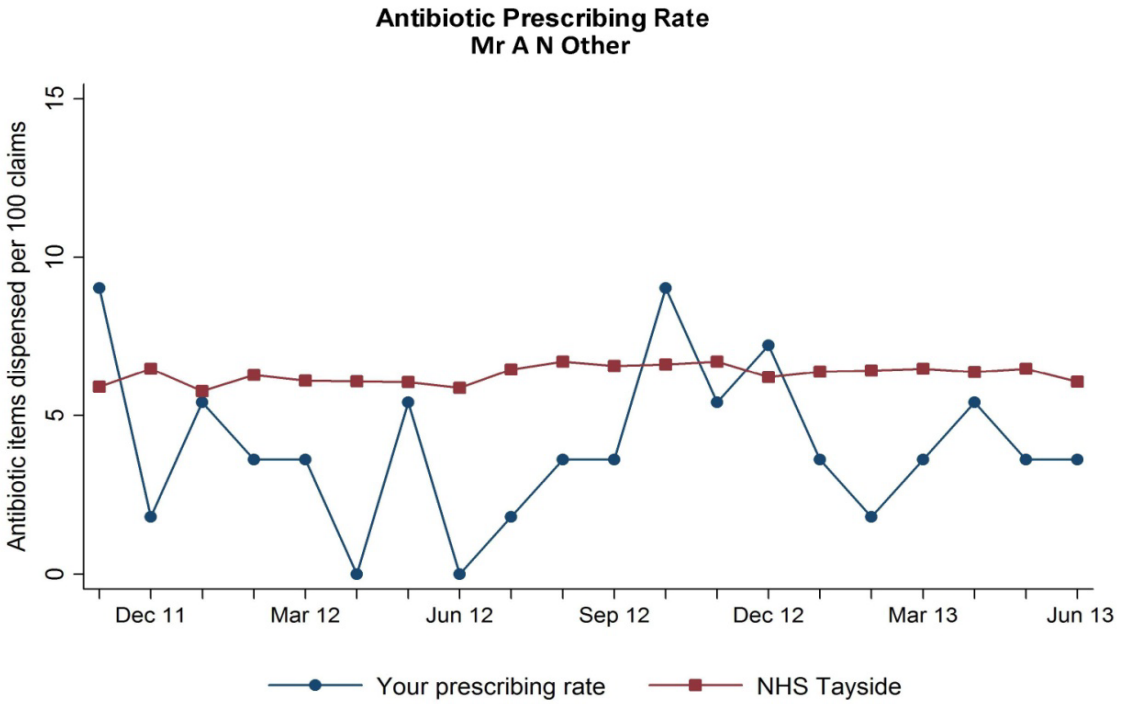
14 months data



TRiaDS
Translation Research in a Dental Setting

NHS Education for Scotland

Example Feedback
(A&F + comparator + BC intervention)



Your prescribing rate is your monthly number of antibiotic items dispensed multiplied by 100 and divided by the average monthly number of claims made on your ordinary lists at this practice between November 2011 and June 2013. The health board rate is the overall ordinary list prescribing rate for current dentists in non-salaried practices in NHS Tayside. (Source: ISD Scotland. Data as at October 2013)

Prescribing courses of antibiotic treatment can encourage the development of antimicrobial resistance and therefore must be kept to a minimum.

As a first step in the treatment of bacterial infections, use local measures. For example, drain pus if present in dental abscesses by extraction of the tooth or through root canals, and attempt to drain any soft-tissue pus by incision.

This should be the first step even if patients request antibiotics and even when time is short.

Antibiotics are appropriate for oral infections where there is evidence of spreading infection, systemic involvement or persistent swelling despite local treatment.

Use antibiotics in conjunction with, and not as an alternative to, local measures.

If you would like to discuss any part of this feedback please contact: Dr Paula Elouafkaoui, Tel: 01382 740913, e-mail: TRiaDS@nes.scot.nhs.uk.

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Outcomes and Analysis

- Primary outcome
  - total number of antibiotic items dispensed per 100 claims over the 12 months from May 2013 to April 2014
- Secondary outcomes
  - amoxicillin 3g
  - second line antibiotic items
  - defined daily doses
- Single principal analysis conducted using data at 12 months post baseline intervention
  - Estimated the effect of the overall A&F intervention compared with current practice
  - Estimated the differential effect of separate elements of the intervention (inclusion of written BC intervention, frequency of feedback, inclusion of a comparator) within the intervention group

Results

- Intervention Delivered
  - Baseline (May 2013) - 1999 dentists
  - 6 month intervention (Nov 2013) - 2055 dentists
  - Final 9 month intervention (Feb 2014) - 50% of practices allocated to an intervention arm – 996 dentists

- Primary Analysis
  - At 12 months, the antibiotic prescribing rate in the intervention group was **6% lower** than the rate in the control group (p=0.014)
  - Extrapolated to all dentists in Scotland this represents a reduction of approximately **20 000 antibiotic items**

Results

- Intervention Components
  - Prescribing rate was significantly lower (6%; P=0.005) for groups receiving the BC intervention compared to the groups with no written BC intervention
  - Lower prescribing rate for groups provided with a health board comparator (4%; P=0.057) compared to no comparator
  - No difference between groups receiving the intervention at 0 and 6 months and those receiving feedback at 0, 6 and 9 months (p=0.989)
- Subgroup analyses
  - 12% reduction in prescribing from baseline by high prescribers who received A&F compared to high prescribers in the control group; 3% reduction in low prescribers in the intervention compared to control

Results

- Secondary Outcomes
  - Significant reduction in the defined daily doses rate (6%; p=0.0280) in the intervention group compared to control
  - No other statistically significant differences observed for remaining outcomes though the general trend was a reduction in prescribing across all outcomes
- Process Evaluation
  - in general the findings were positive
  - support the results from the statistical analysis
  - highlighted areas where change has already been made
  - suggestions on how to modify and/or improve the feedback

Conclusions

- Rigorous trial design providing a robust evaluation of the impact of A&F on antibiotic prescribing in real world dental practice

- Demonstrates that individualised A&F can significantly reduce the rate of antibiotic prescribing by dentists – important in the context of increasing prescribing and antimicrobial resistance

- Contributed to the observed reduction in total items prescribed by dentists in 2013-14 (5.5% reduction reported in latest SAPG report)

- Adopts *best-practice* for A&F components (Ivers *et al;* 2014)
    - Data are individualised, based on recent performance and new data presented over time

- Provides a mechanism to test and evaluate further interventions to improve prescribing – other target behaviours, context, recipients?

- Relatively straightforward public health and patient safety intervention that can be delivered quickly, at low cost and at scale

Acknowledgements

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Trial Team: Paula Elouafkaoui, Jan Clarkson, Linda Young, Eilidh Duncan, Rumana Newlands, Andrew Elders and Craig Ramsay

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