# The RAPID trial
# Reducing antibiotic use in Scottish community dentists

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# Current state of audit and feedback

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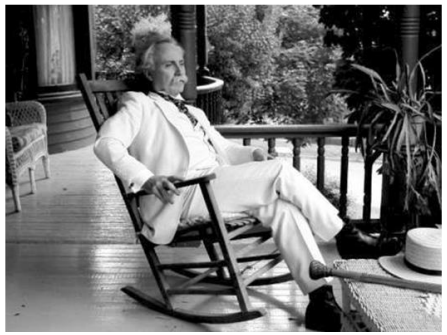
*"...there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns – the ones we don't know we don't know."*

*"The researches of many commentators have already thrown much darkness on this subject, and it is probable that if they continue, we shall soon know nothing at all about it."*



# Primary dental care services in Scotland




- Dental healthcare mostly provided via public insurance (National Health Service, NHS) – C$750 million/year
- 1,000 NHS primary care dental practices
- 3,200 dentists,
- 10,500 dental care professionals
- Complex remuneration system

# Scottish Dental Clinical Effectiveness Programme (SDCEP)

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*'supporting the dental team to provide quality patient care'*


- **Provides user-friendly, evidence-based guidance**
- **Priority topics for oral health**
- **Relevant to other healthcare disciplines**
- **Published guidance distributed to all dental practitioners in Scotland**
- **Used within Scotland and beyond**
- **Underpins education and informs policy**


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# TRiaDS
# Translation Research in a Dental Setting



- Established by NHS Education Scotland in November 2007
- A programme of KT research embedded within SDCEP guidance development
- A multi-disciplinary research collaboration with public, academic, policy, service and professional members
- Developed a standardised process to inform
  - development of guidance
  - need for, and design of, KT strategies
  - evaluation of KT strategies

# Example - Antibiotic Prescribing

- Antimicrobial resistance is a major threat to public health and patient safety
- Primary care dentistry accounts for 9% of total antibiotic prescribing in primary care in Scotland
- Dentists often prescribe inappropriately when there is no clinical indication
- The total number of antibiotics prescribed by dentists increased steadily up to 2012-13

# The RAPiD Trial

**R**educing **A**ntibiotic **P**rescribing **i**n **D**entistry

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PLOS | MEDICINE

RESEARCH ARTICLE

## An Audit and Feedback Intervention for Reducing Antibiotic Prescribing in General Dental Practice: The RAPiD Cluster Randomised Controlled Trial

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# The RAPiD Trial

## **R**educing **A**ntibiotic **P**rescribing **i**n **D**entistry

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- **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**
  - **Qualitative process evaluation conducted to explore the acceptability of the A&F strategies and to identify barriers and facilitators to evidence based antibiotic prescribing practice**
- **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**

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# RAPiD – Trial Design

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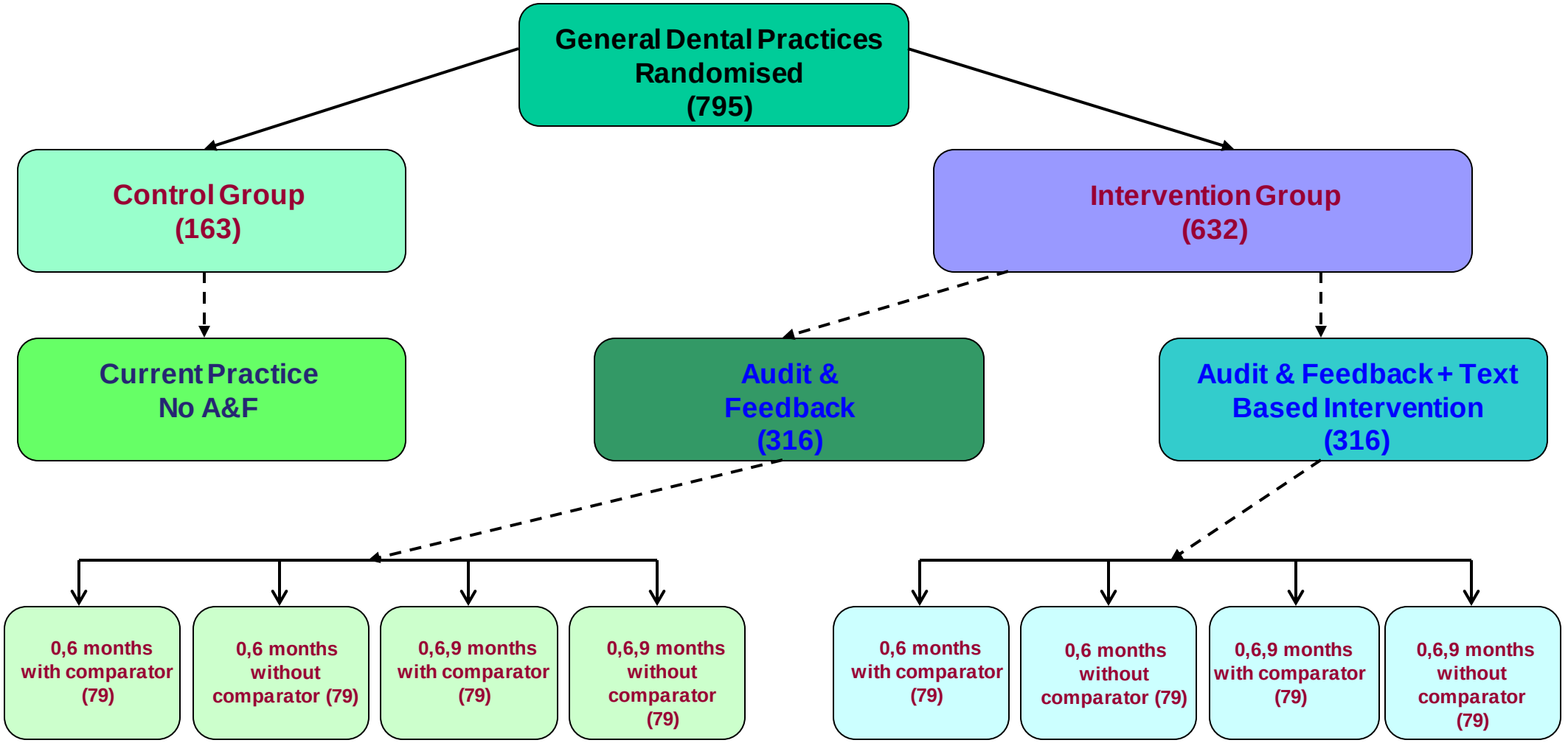


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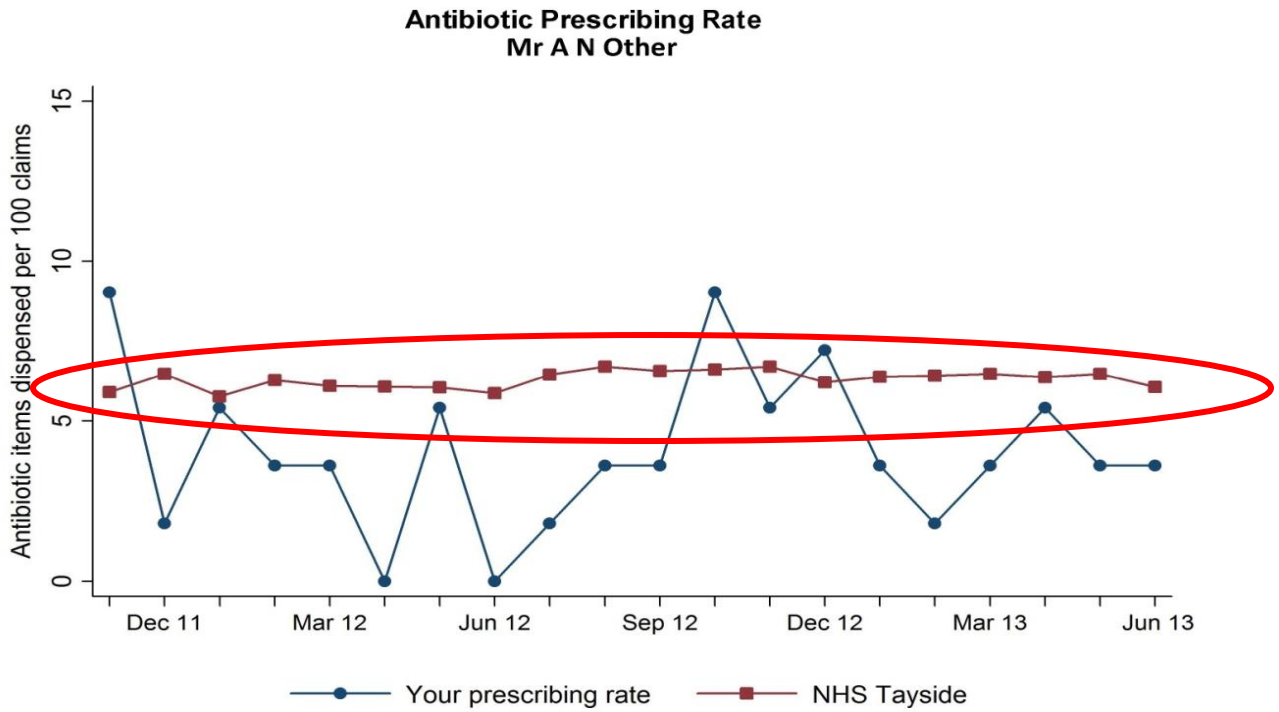
# Example Feedback
## (A&F + comparator + behaviour change message)




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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# RAPiD – Efficient Trial Design

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- Relies heavily on routinely collected electronic healthcare data
- Routine data is used in 5 aspects of the trial design
    - To identify the study population
    - Apply eligibility criteria
    - Conduct stratified randomisation
    - Generate the intervention
    - Analyse outcomes

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| Primary outcome | Baseline Mean | | Follow-up mean | | Difference in rate (95% CI) | p value | % reduction from baseline[a] (95% CI) |
|---|---|---|---|---|---|---|---|
| | Control | Intervention | Control | Intervention | | | |
| **All antibiotic items/100 claims** | 8.3 | 8.5 | 7.9 | 7.5 | -0.47 (-0.85, -0.09) | 0.014 | -5.7% (-10.2%, -1.1%) |
| **Intervention components** | No BC intervention | BC intervention | No BC intervention | BC intervention | | | |
| **BC intervention vs no BC intervention** | 8.5 | 8.5 | 7.7 | 7.2 | -0.51 (-0.86, -0.16) | 0.005 | -6.1% (-10.4%, -1.9%) |
| | No HB comparator | HB Comparator | No HB comparator | HB comparator | | | |
| **HB comparator vs no HB** | 8.4 | 8.6 | 7.5 | 7.4 | -0.36 (-0.72, 0.01) | 0.057 | -4.3% (-8.6%, 0.1%) |
| | 3 monthly | 6 monthly | 3 monthly | 6 monthly | | | |
| **6 vs 3 monthly feedback** | 8.2 | 8.7 | 7.3 | 7.6 | 0.002 (-0.35, 0.35) | 0.989 | 0.02% (-4.2%, 4.2%) |

[a] All percentages standardised using control group baseline mean prescribing rate (8.3 unless stated otherwise)

# Results

## Primary Analysis

- Prescribing rate in the A&F group 6% lower than control
  - extrapolated decrease: 20,000 antibiotic items across Scotland
- For high prescribers at baseline rate in A&F group 12% lower than control

## Comparing Intervention Components

- Prescribing rate lower for dentists
  - receiving BC message (-6%)
  - provided with a HB comparator (-4%)
- Frequency of feedback did not make a difference

# Process Evaluation

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- **Aims: to explore**

  **1) the acceptability of the A&F strategies and**

  **2) to identify barriers and facilitators to evidence based antibiotic prescribing practice**

# Results – Aim 1

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- **Acceptability of the Intervention**
  - Dentists generally reacted positively to intervention
  - support the results from the data analysis
    - Some indicated preference for a comparator
    - the inclusion of guidance/instruction (by those in non BC intervention groups)
    - receive feedback biannually
  - highlighted areas where change has already been made
    - decisions to delay treatment with antibiotics
    - discussions with colleagues to agree goals/individual goals set
      - Practice review of prescribing patterns
      - Stop any unnecessary prescribing
  - suggestions on how to modify and/or improve the feedback
    - more localised comparator
    - patient data
    - breakdown by antibiotic

# Results – Aim 2

- **Theoretical Domains Framework-based analysis – theory-based content analysis**

# Environmental Context and Resources

## Workload and Time play a big part in managing bacterial infections

### Beliefs

- Time is a big issue for conducting local measures (n=14) vs.
- Lack of time does not affect my behaviour (n=6)

### Reasons

- Emergency patients cause chaos
- Time per patient is not long enough
- Lack of time to persuade/communicate with patients

*"I would attempt to **persuade** them to have the treatment carried out, but some of these patients will not respond to that, and given the **time constraints ...** I often resort, I have myself resorted to just giving them the antibiotics that they're looking for" (10545)*

*"... in some circumstances, where **time is an issue** prescribing an antibiotic can help in that situation and help the dentist time-wise" (11095)*

# Social influences
# Patients behaviour and demands influence my behaviour

## Beliefs

- I am resistant to patients demand (n= 10) vs.
- Patients behaviour influence my decision (n=15)

## Reasons

- It's tricky as cannot force treatments
- Patients belief: without antibiotics problem will not solve
- Anxious/phobic patients, going away, holiday, older patients/nurses

*"I get frustrated with the prescribing when you feel that you can't do the treatment that is best for the patient but, again, if you've not got consent then what can you do?" (10469)*

*"It's easy to write a prescription, because you can do something and the patient is satisfied and leaves and you know they're probably going to get a bit better" (10456)*

# Process evaluation

- **Suggested possible changes to the information provided in the feedback – testable.**

- **Demonstrated that audit and feedback may not be the optimum approach for further reductions, and that additional interventions may be needed**

- **Led us on to the TiPTAP trial**

**(Training in Practice Targeting Antibiotic Prescribing)**

# Dental Quality Improvement Team

- Last 10 years, Scotland has an infection control team that goes into practices and provides training on good decontamination practice

- Each practice should receive a visit every 3 years

- Given RAPiD Trial results, the Dental Educational Service wanted to provide additional in-practice training on antibiotic prescribing (so called "educational outreach")

# Implementation laboratory - Optimising A&F

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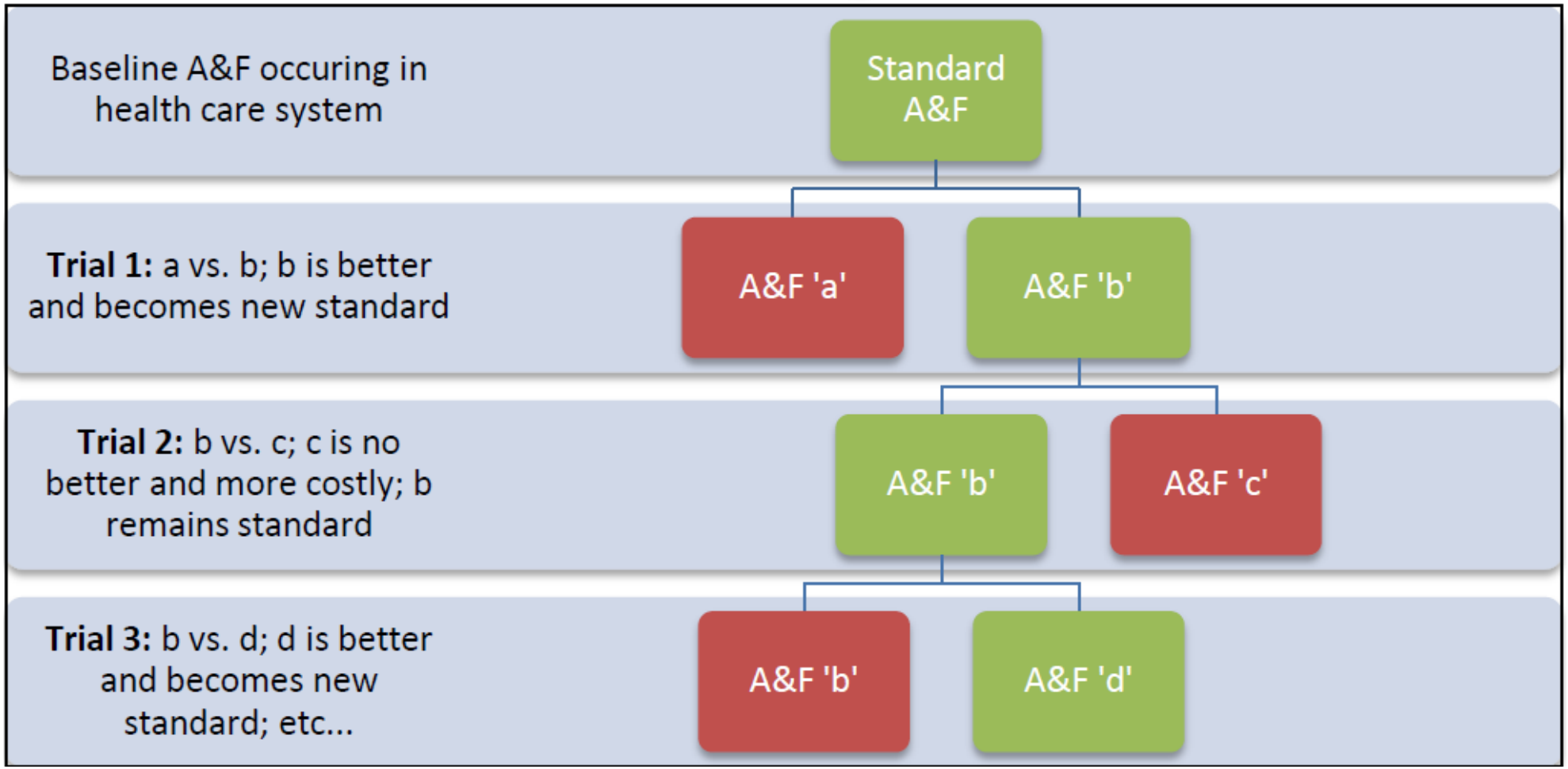


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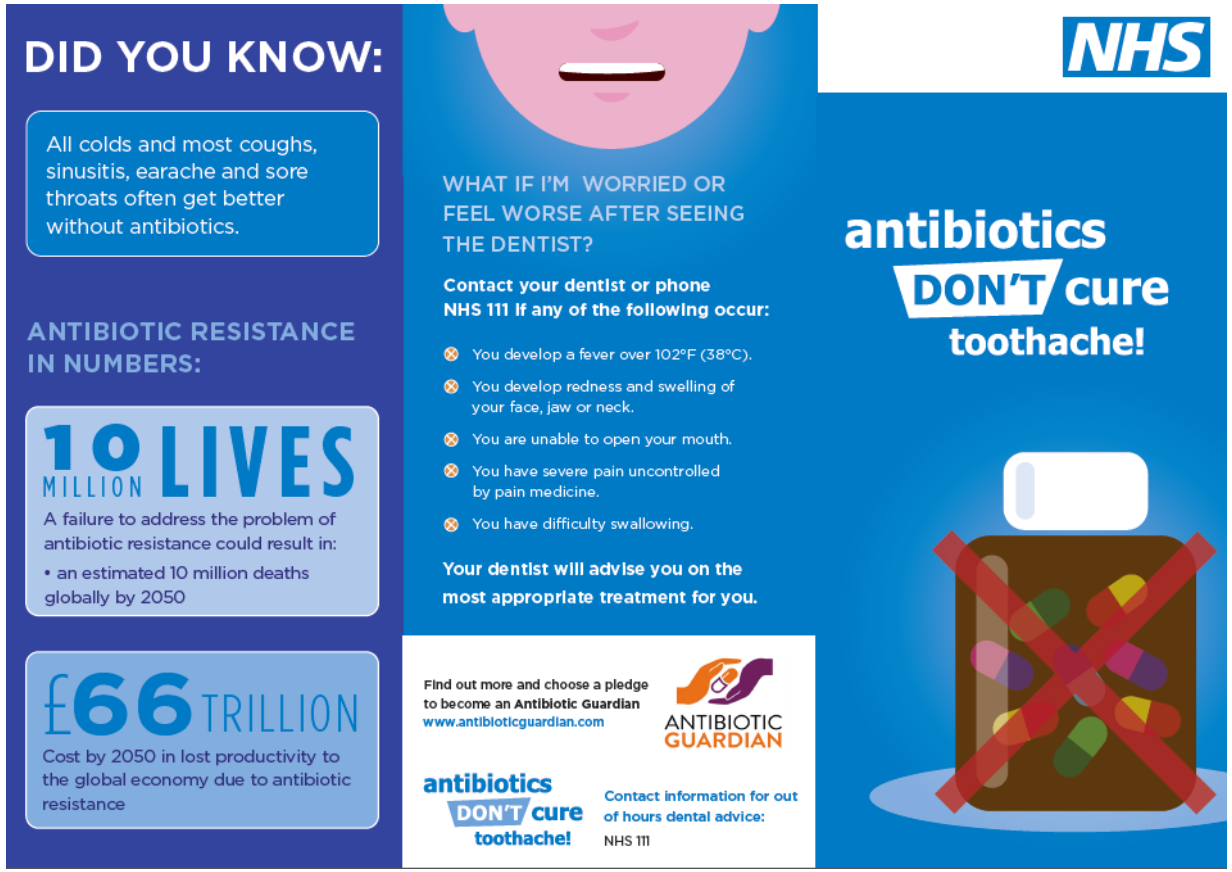
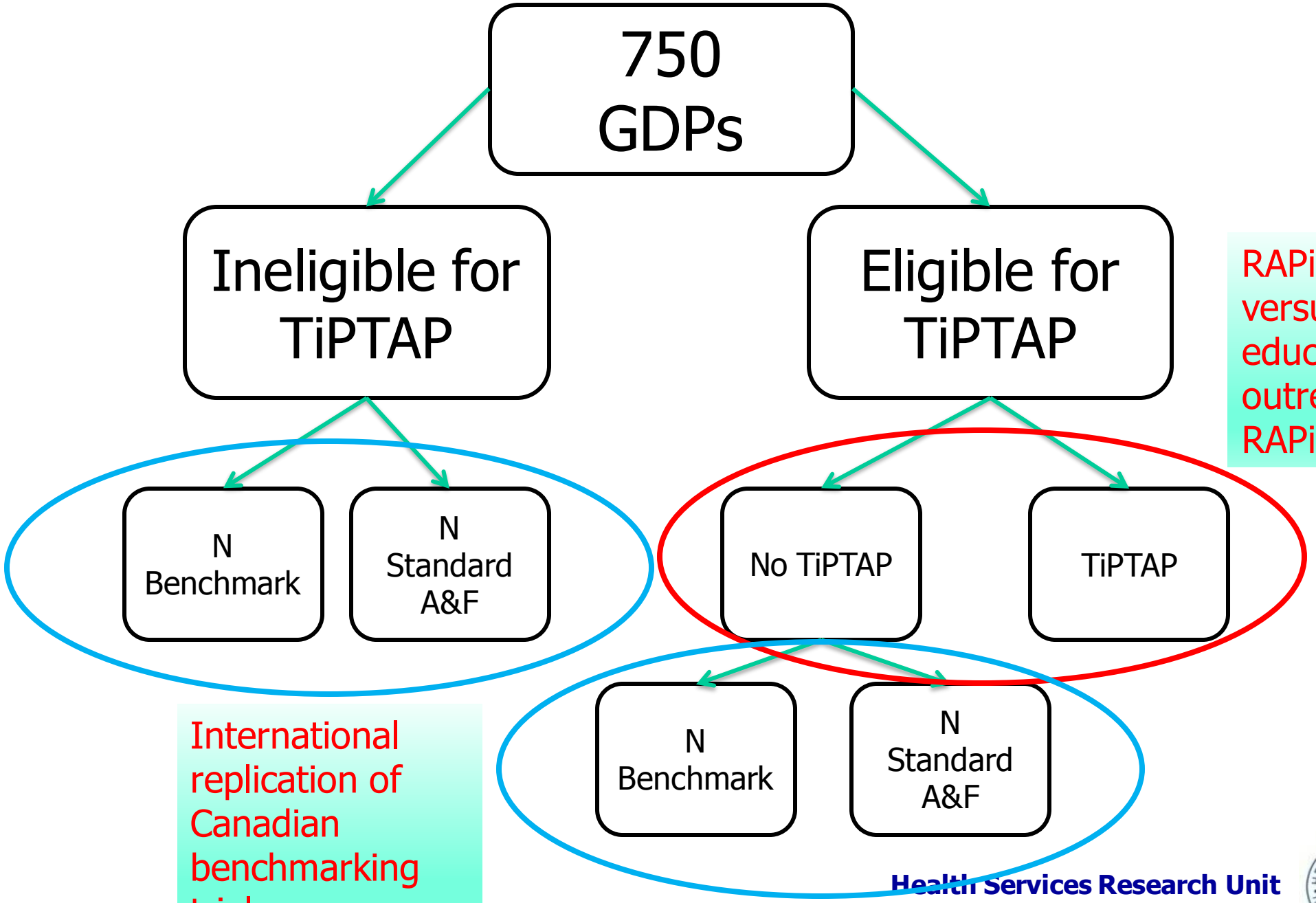
| Intervention component | Mode of delivery | Delivered to | When |
|---|---|---|---|
| **Feedback of individuals antibiotic prescribing data** | Documents sent electronically | Dentists in practice | Prior to team visit |
| **Power point presentation** | Face to face (group) | Whole practice team | On the team visit before infection control and decontamination training |
| **Problem solving discussion** | Face to face (group) | Whole practice team | On the team visit day after the power point presentation |
| **Toolkit**<br>**-Posters -leaflets**<br>**-Scripts – delayed prescribing – SDCEP flow chart** | Provision of documents given at face to face group visit | Practice team (tailored to identified problems) | During problem solving discussion on team visit day |
| **Action plans** | Discussed at face to face training visit<br>Completed and returned electronically | Nominated practice contact | To be completed and returned within 6 weeks |





# Toolkit included posters and leaflets




RAPiD style A&F versus educational outreach plus RAPiD style A&F

International replication of Canadian benchmarking trial

# Summary

- RAPiD Trial example of what can be achieved when embedding A&F intervention into the service
- TRiaDS provided and created a cohesive, multidisciplinary research team and an established panel of service, professional and academic excellence and expertise
  - do not need to bring together a new team for each project
- Activities directly relevant to dental care priorities
- Substantial measured improvement on prescribing
- Enabled "learning" for future interventions and we are currently piloting the next step in collaboration with Dental Services

# Disclosure

**Session: Recent large-scale evaluations of Audit & Feedback**

**Presenter: Craig Ramsay**

**Relationship with commercial interests: None**

**This work has received no commercial support and there are no other mitigating potential biases.**

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**www.SDCEP.org.uk**