

# Prescribing data (ePACT2) models of 'continuous' and 'intermittent' long term use

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In the absence of prescribing data (ePACT2) with patient identifiers, which would enable the analysis of recurrent and long term prescribing, it is difficult to understand the profile of patients receiving a medication. It is unknown whether a prescription is a 'one-off' or in fact the re-issue of an item prescribed for many years.

In some clinical areas, it would be an advantage to be able to identify those instances where there is a high proportion of recurrent prescribing. Particularly where Guidance, formularies and pathways have been implemented to affect prescribing behaviour.

There is no agreed definition of 'long term use'. However, it is generally considered that long term use may be characterised by 'a repeated prescription over 12 months' or 'continuous treatment ranging from 4 to more than 12 months duration'.<sup>1</sup>

## AIM & OBJECTIVES

### Aim:

- To develop a model of long term prescribing that uses ePACT2 prescribing data.

### Objectives:

- To estimate proportion of patients receiving prescriptions 'regularly' over ~12-18 months.
- Application of this model to multiple therapeutic areas.

## METHOD

ePACT2 searches were constructed based on statistical principles and a set of assumptions to estimate the number of unique patients that represented different models of 'long term use' for:

- Antimicrobials in Children
- Proton Pump Inhibitors (PPIs)

## Model of regular (Intermittent) Use

- Quarterly ePACT2 data over 12 months was analysed using a Venn diagram (4 way) to find the number of unique patients who have had an antimicrobial regularly.
- Unique patients who received an antimicrobial every month (over a 6 month time period) were excluded as this represents prophylactic or long-term treatment.
- Assumption: Regular use is defined as 'a minimum of one prescription at least every quarter for 12 months.

Note: it is not possible to differentiate repeat prescriptions within a single month.

## Model of Continuous Use (Antimicrobial and PPI models)

- Monthly ePACT2 data over 6 months was analysed using a Venn diagram (6-way, Figure. 1) to find the number of unique patients who have had a prescription (antimicrobial or PPI) consistently.
- Assumption: each prescription is for one month's supply and patient has received a prescription in each of the 6 months.

## Model of Continuous & Intermittent Use

- Quarterly ePACT2 data over 5 quarters was analysed using a Venn diagram (5-way) to find the number of unique patients who have had a PPI both consistently (every month) and intermittently (at least once in each of the 5 quarters).
- Assumption: 5 quarters is equivalent to a minimum of 11 months duration as a patient could receive a prescription at the end of Q1 and beginning of Q5.

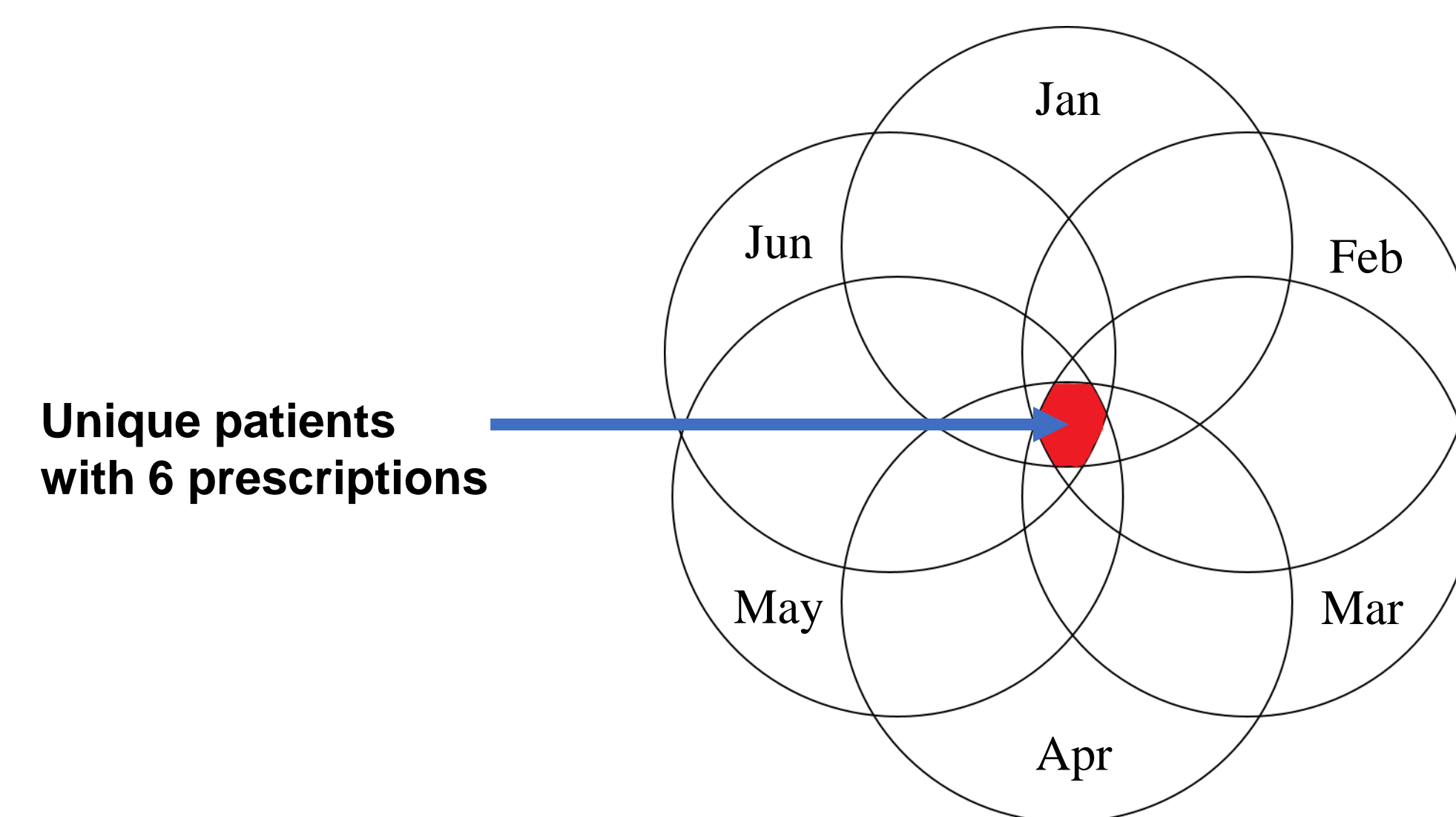


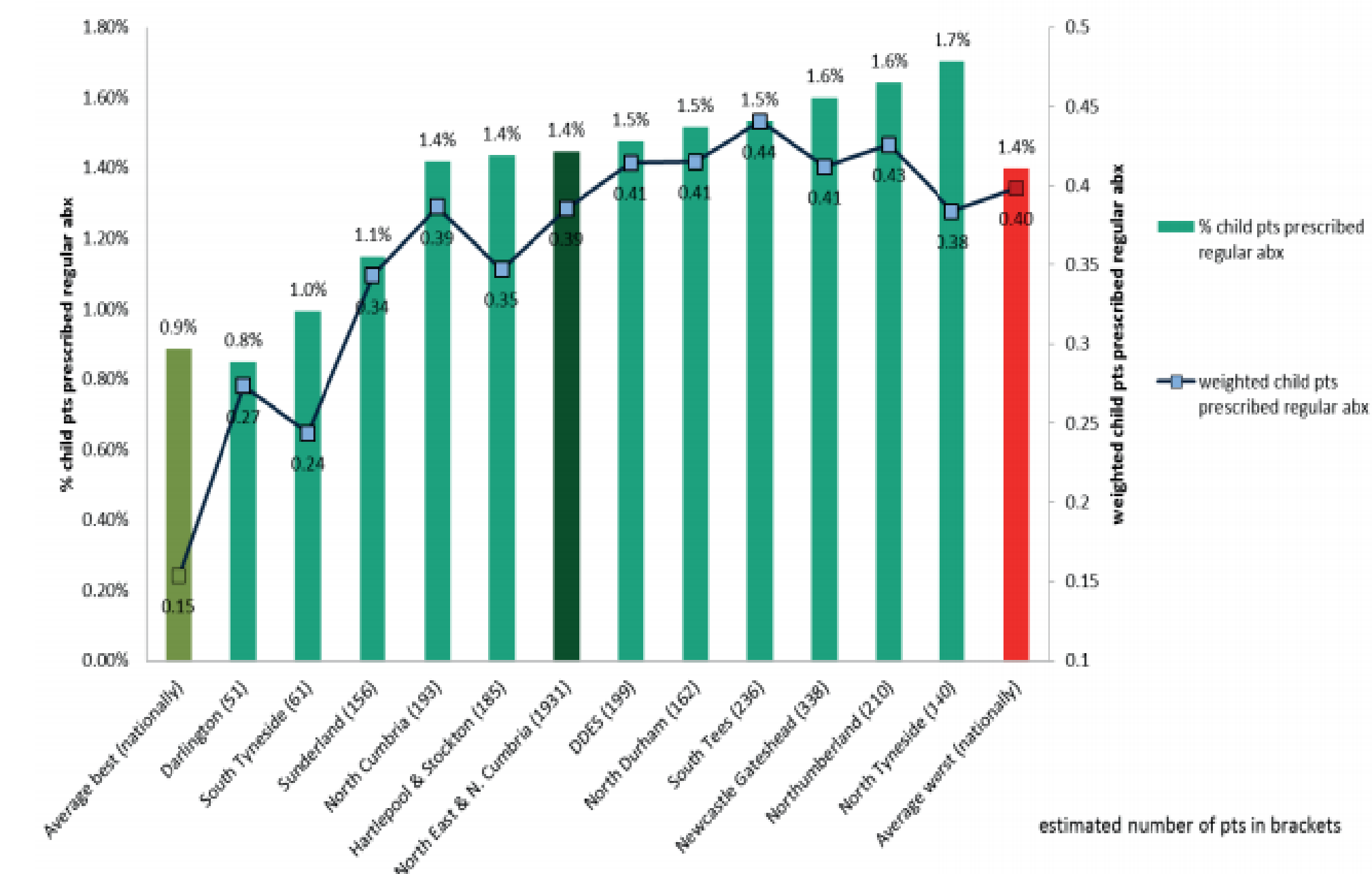
Figure 1. Venn diagram example; 6-way circle.

The red coloured 'set' represents unique patients who have had at least 6 prescriptions in the 6 time periods (Jan-June) chosen.

## RESULTS

A model of 'regular use antimicrobials' in unique patients (0-14 years) was developed<sup>2</sup> as described above.

North East and North Cumbria: Unique patients (aged 0-14) receiving regular antimicrobial prescriptions every quarter Jul 18 - Jun 19

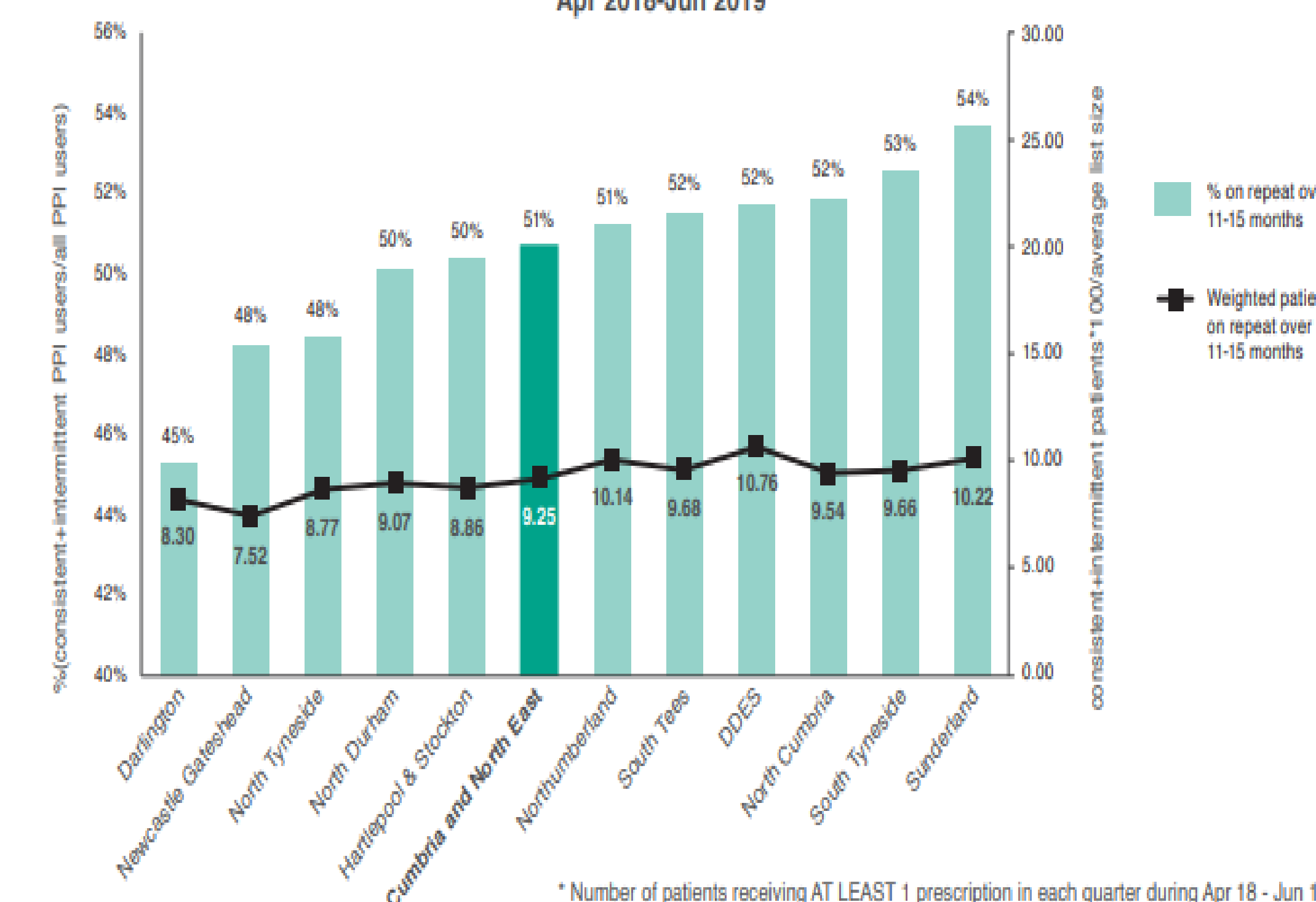


## Application of this model identified:

- Variation in prescribing practice and behaviour between geographical clusters.
- A significant correlation between socio-economic deprivation and the weighted number of unique patients prescribed 'regular use' antibiotics.
- A minimum of 5.4% of the antibiotic items prescribed for children (0-14 years) were attributable to 'regular use' in the North East North Cumbria Integrated Care System (ICS) footprint.

A model of Intermittent (on-demand) and consistent use of PPIs over a minimum of 11-15 months duration was developed<sup>3</sup> as described above.

North East & Cumbria: Percentage of patients intermittently OR consistently\* using PPIs over 11-15 months Apr 2018-Jun 2019



## Application of this model identified:

- Variation in prescribing practice and behaviour between geographical clusters.

- 45- 54% of all PPI users per CCG, were long term use (all PPI indications including appropriate long term use), with an average of 51% across the NENC ICS footprint.
- A UK based study using the Clinical practice research database, identified indications for 84% of PPI prescriptions (n = 596 334); of which only 11.5% of PPI prescriptions could be considered as indications appropriate for long term use (14% of indications were not identifiable).<sup>4</sup>

## CONCLUSION

Models of long term and intermittent use have been developed that utilise ePACT2 data.

The antimicrobials model has potential application to support monitoring of 'area level strategies'<sup>5</sup> and 'targeted interventions'<sup>6</sup> for health inequality and antimicrobial stewardship in this patient population.

The second model; Long-term use of PPIs<sup>3</sup>, was developed because PPIs are not recommended long term in several indications due to the risk of adverse effects including hypomagnesaemia, vitamin B12 deficiency, increased fracture risk and increased risk of MI. The model developed here highlights the significant number of people who are receiving PPIs long term (including those on an intermittent basis). NICE guidance CG184 recommends an annual review of patients who require long-term management of dyspepsia symptoms. The long term intermittent use population should also be included in this review process.

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