



AMR and Behavioural Insights

JRC I.2 - Foresight, Modelling, Behavioural Insights and Design for Policy
Joint Research Centre

Emanuele Ciriolo

Joint Research Centre

As the European Commission's **science and knowledge service**, the Joint Research Centre (JRC) supports EU policies with independent scientific evidence throughout the whole policy cycle.



The JRC has six sites in five EU countries (Brussels, Geel, Ispra, Karlsruhe, Petten, Seville)

CCBI | Team



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Climate, energy, environment and misinformation



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Consumer, environment, gender, and vaccination



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Development economics, AI, consumer protection



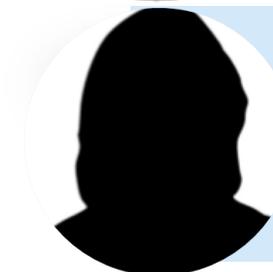
Andrea Blasco, PhD

Economist
Research and Innovation, migration



Michal Krawczyk, PhD

Behavioural economist
Gender, fairness, misinformation, risk



Being recruited

Behavioural economist/psychologist

Some behavioural work is also conducted in other JRC Units (e.g. C2, D4, H1), whom we cooperate closely with.



The **mission** of the **Competence Centre on Behavioural Insights** is to support EU policymaking with evidence on human behaviour.

Our **activities** include:

- ✓ conducting behavioural research
- ✓ managing and making sense of behavioural knowledge for EU policy
- ✓ raising awareness and building capacity on behavioural insights to inform EU policymaking
- ✓ monitoring the application of behavioural insights to policy and exploring future policy needs for behavioural evidence



The cost of non-BI

When we identify a **behavioural element**, can we afford to ignore **BI**?

JRC SCIENTIFIC AND POLICY REPORTS

Applying Behavioural Sciences
to EU Policy-making

2013

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EUR 26033 EN

©EU

No Vax

No Mask



 **European Commission** @EU_Commission · 1h

Bye, bye:
A+
A++
A+++

And welcome: a new, simpler A to G scale for #EnergyLabels! They will make it easier for you to choose the household appliances that consume less and reduce energy bills. ❤️

#EUGreenDeal @Energy4Europe



 European Commission

Provision of social norm feedback to high prescribers of antibiotics in general practice: a pragmatic national RCT" (Hallworth et al, 2016)

Our problem

FACTS

- *a large proportion of antibiotic prescriptions*
- *We also observe an extensive variation of prescriptions across practices!*

IMPLICATIONS/CONSEQUENCES

- *Individual "benefits" vs. collective costs:*

Unnecessary antibiotic prescription contributes to antimicrobial resistance

DATA AVAILABILITY by the HEALTH DEPARTMENT

Number of prescriptions / General Practitioner / by patient

What and when

Nationwide RCT of feedback intervention:

- *clinician-focused letter → September 2014*
- *patient-focused leaflet → December 2014*
- *practice-manager posters, leaflets, letter → Dec 4-11 2014*

Study effect of feedback on antibiotic prescription using:

- *Social norms*
- *Behavioural instruction*
- *High-profile messenger (Chief Medical Officer)*

MR A B SAMPLE
55 Sample Street
Sampleton
Sampleshire
SS5 5GS
+000001 11

30th March 2015

NOTE TO PRACTICE MANAGERS: PLEASE FORWARD IMMEDIATELY TO GP ADDRESSED

Dear Mr Sample

Antibiotic usage in your practice

Antimicrobial resistance is a serious and growing threat to our health. Reducing unnecessary prescriptions in primary care may help prevent a public health catastrophe.

The great majority (80%) of practices in Birmingham & the Black Country prescribe fewer antibiotics per head than yours.*

Many practices are already taking action to reduce antibiotic prescriptions while safeguarding patients' health. Please join them by taking three simple actions:

1. Give patients advice on self-care instead – you can use the leaflet enclosed or search online for the "TARGET antibiotics toolkit".
2. Consider offering a back-up (delayed) prescription instead – this could be post-dated or collected by the patient a few days later if still necessary.
3. Talk to other prescribers in your practice to ensure they are also acting – data on prescribing is recorded at practice level.

I know that prescribers are aware of this problem and that prescribing is not a simple issue. But there are small changes we can all make that will have a big effect on everyone's health. Please join us in reducing antibiotic use.

Yours,



PROFESSOR DAME SALLY C DAVIES
CHIEF MEDICAL OFFICER

* Your practice's prescribing data are available online. Data were taken from <http://www.hscic.gov.uk/iprescribingdata> and adjusted to take into account patient load and demographics. The 80% figure excludes outliers judged to be created by measurement error and does not include out-of-hours services. For more information on the consequences of antimicrobial resistance, see the UK 5 Year Antimicrobial Resistance Strategy.



Tackling over-prescription

Sept 14

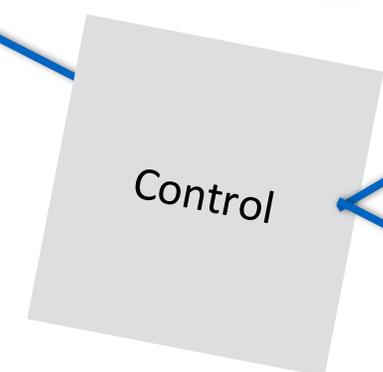
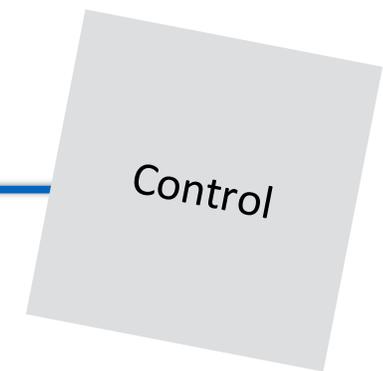
Oct 14

Nov 14

Dec 14

Jan 15

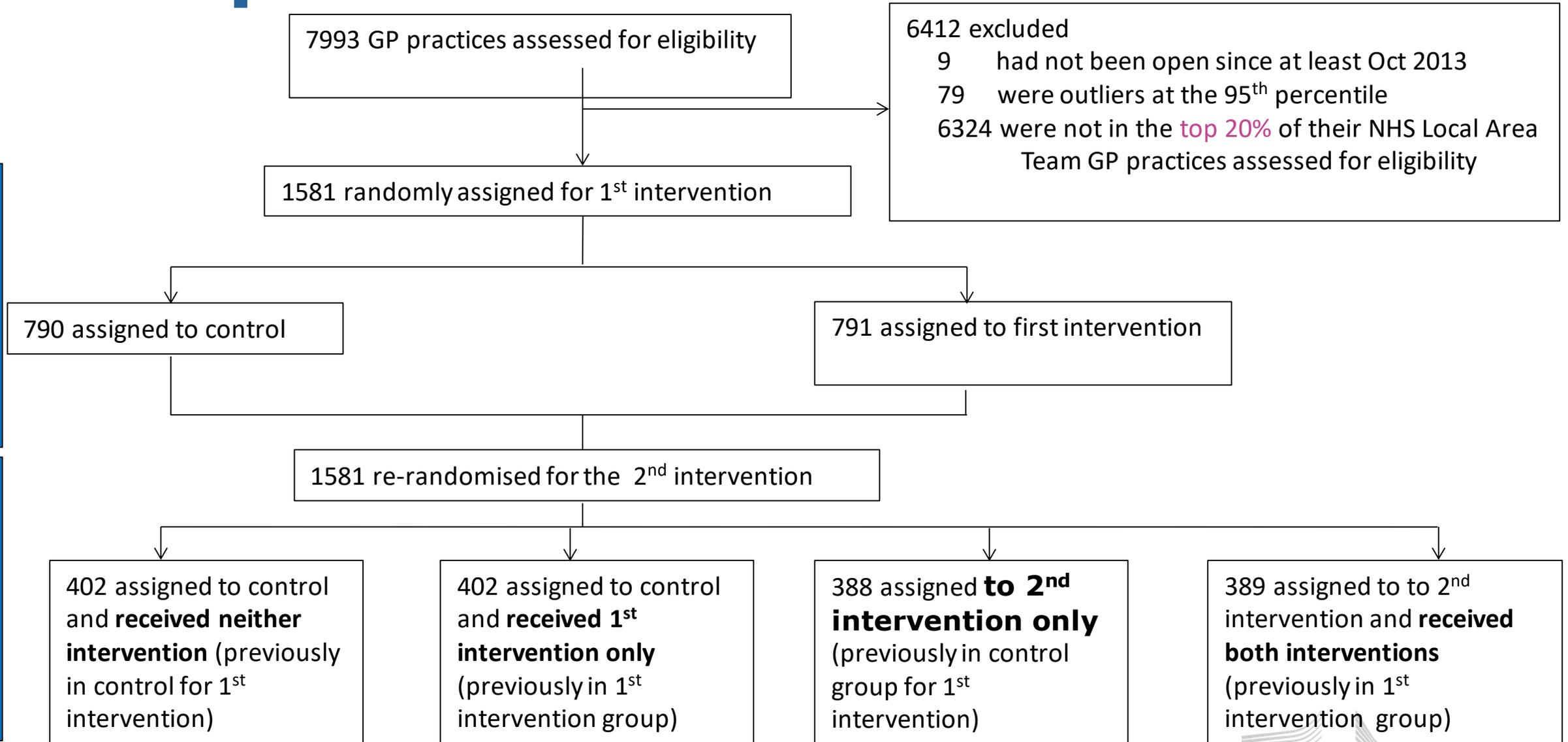
Feb 15



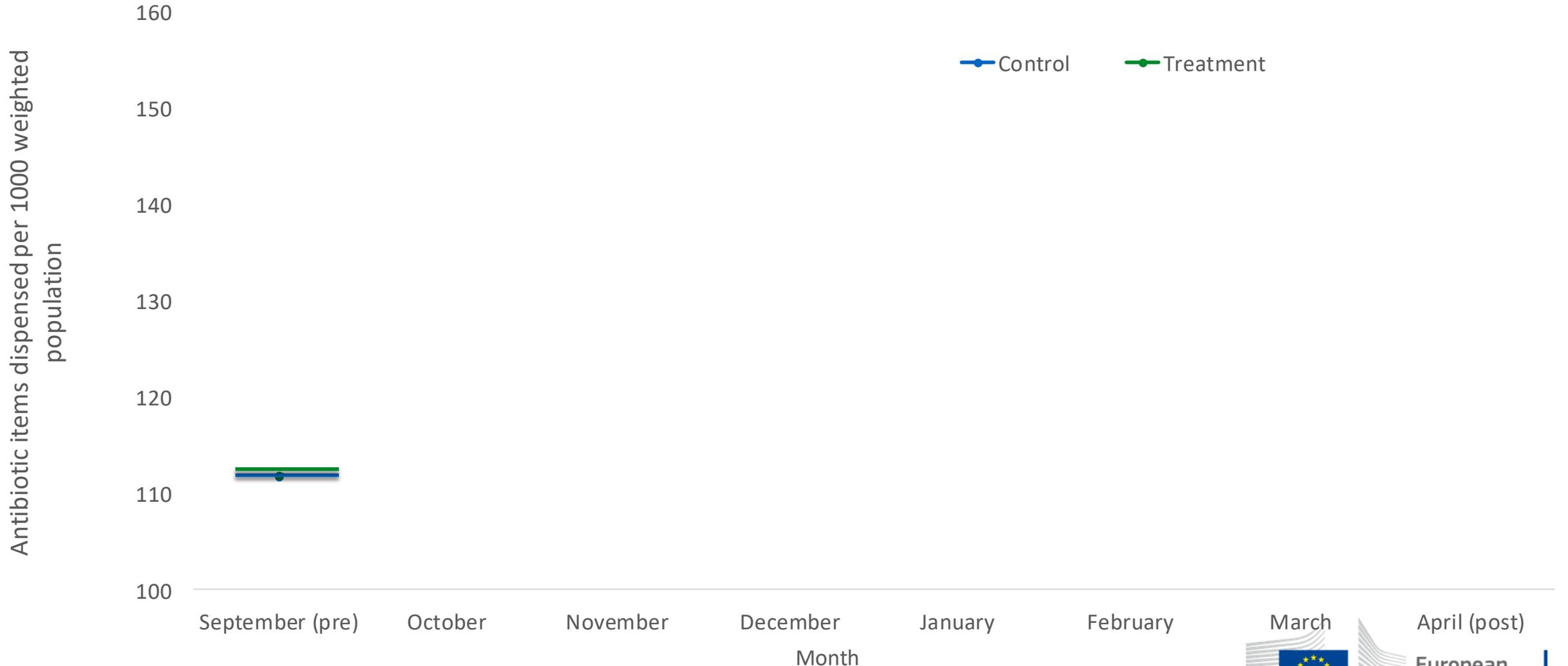
Trial profile

Oct 2014

Dec 2014



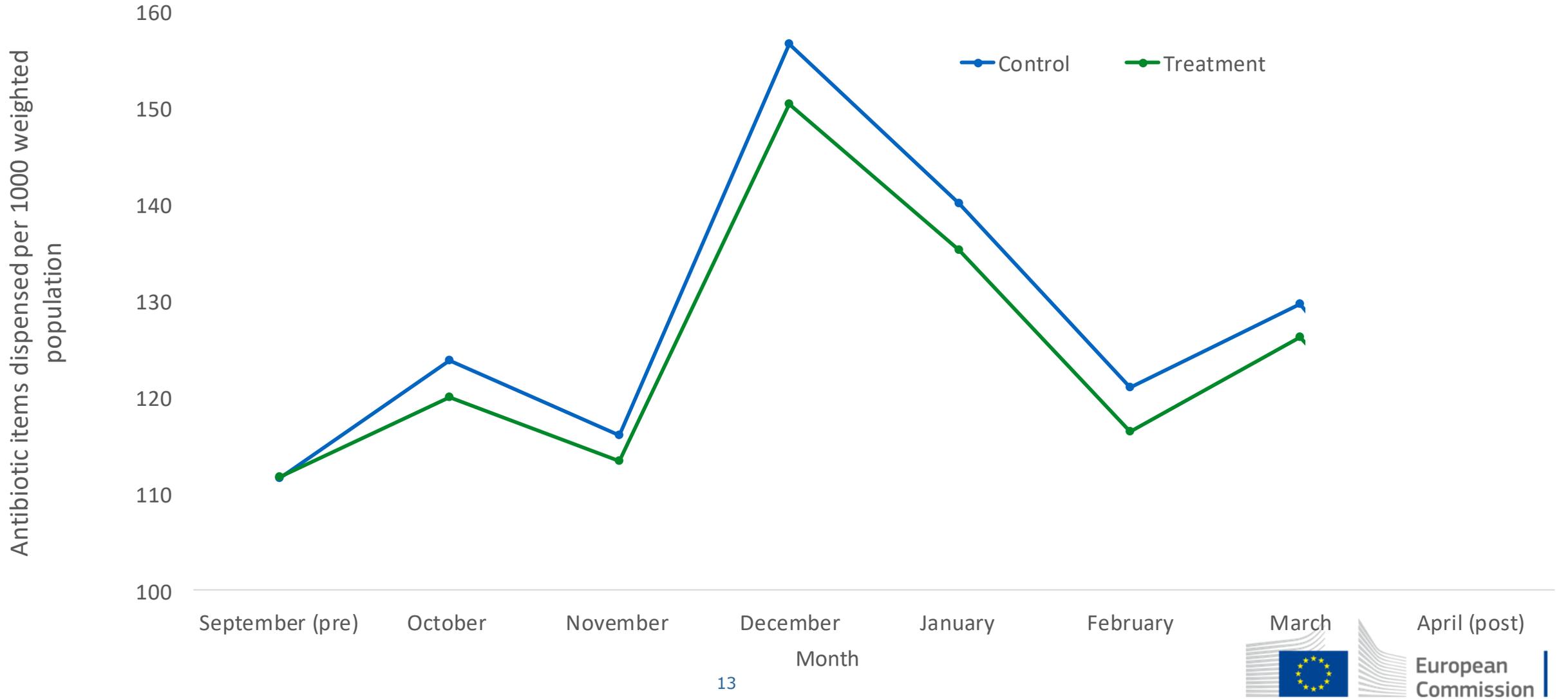
Tackling over-prescription



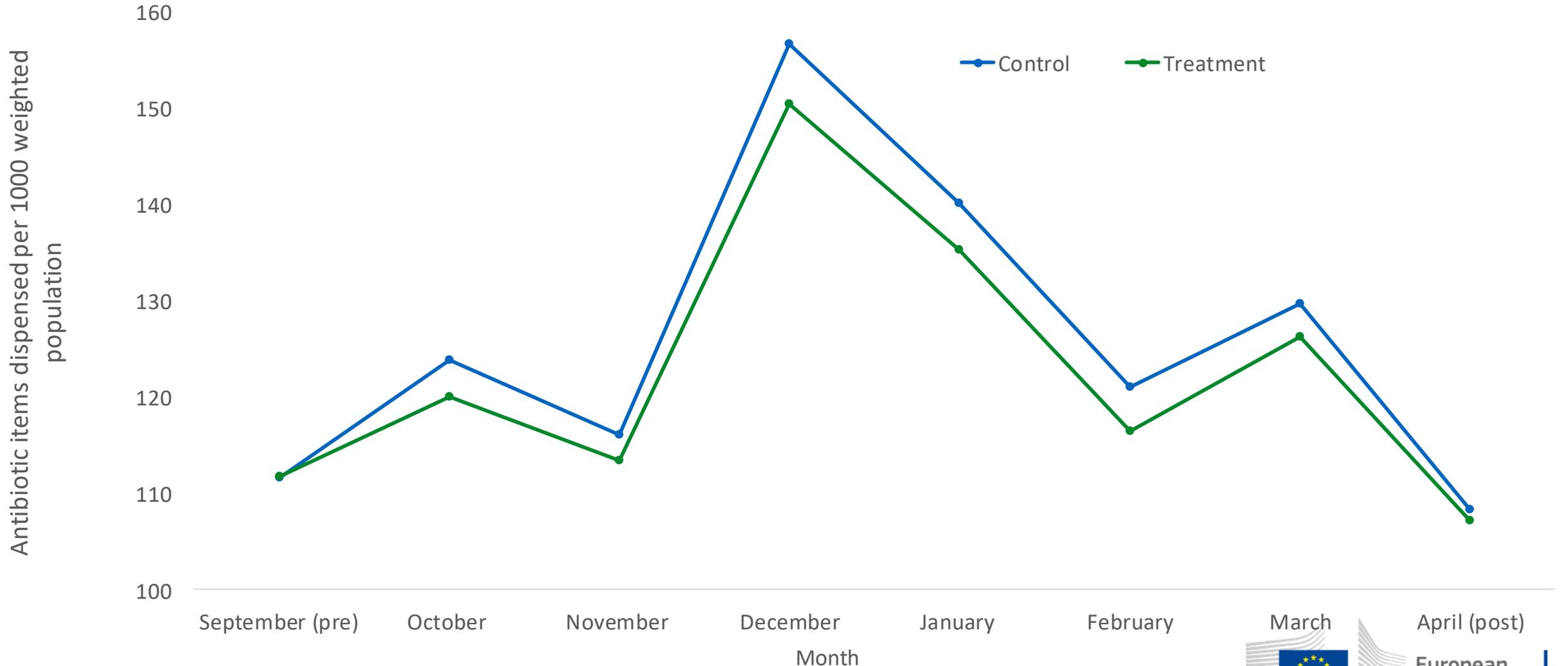
Tackling over-prescription



Tackling over-prescription



Tackling over-prescription



Results

The letter saved 73,406 doses



The direct cost saving from the drug is just short of £ 100,000

Though the long-term benefits are still unknown

Social marketing interventions



If you or your family take them when you don't need them, they're less likely to work when you do. Don't let bacteria build up resistance.

Antibiotics don't work for infections like colds and flu. Follow your doctor's advice.

Your doctor will only prescribe antibiotics to treat:

- conditions that are not especially serious but are unlikely to clear up without the use of antibiotics, such as moderately severe acne
- conditions that are not especially serious but could spread to other people if not promptly treated, such as the skin infection impetigo or the sexually transmitted infection chlamydia
- conditions where evidence suggests that antibiotics could significantly speed up recovery, such as a kidney infection
- conditions that carry a risk of more serious complications, such as cellulitis or pneumonia

Keep antibiotics in good health

Treating your infection

Patients Name _____

Your doctor or nurse recommends that you self-care

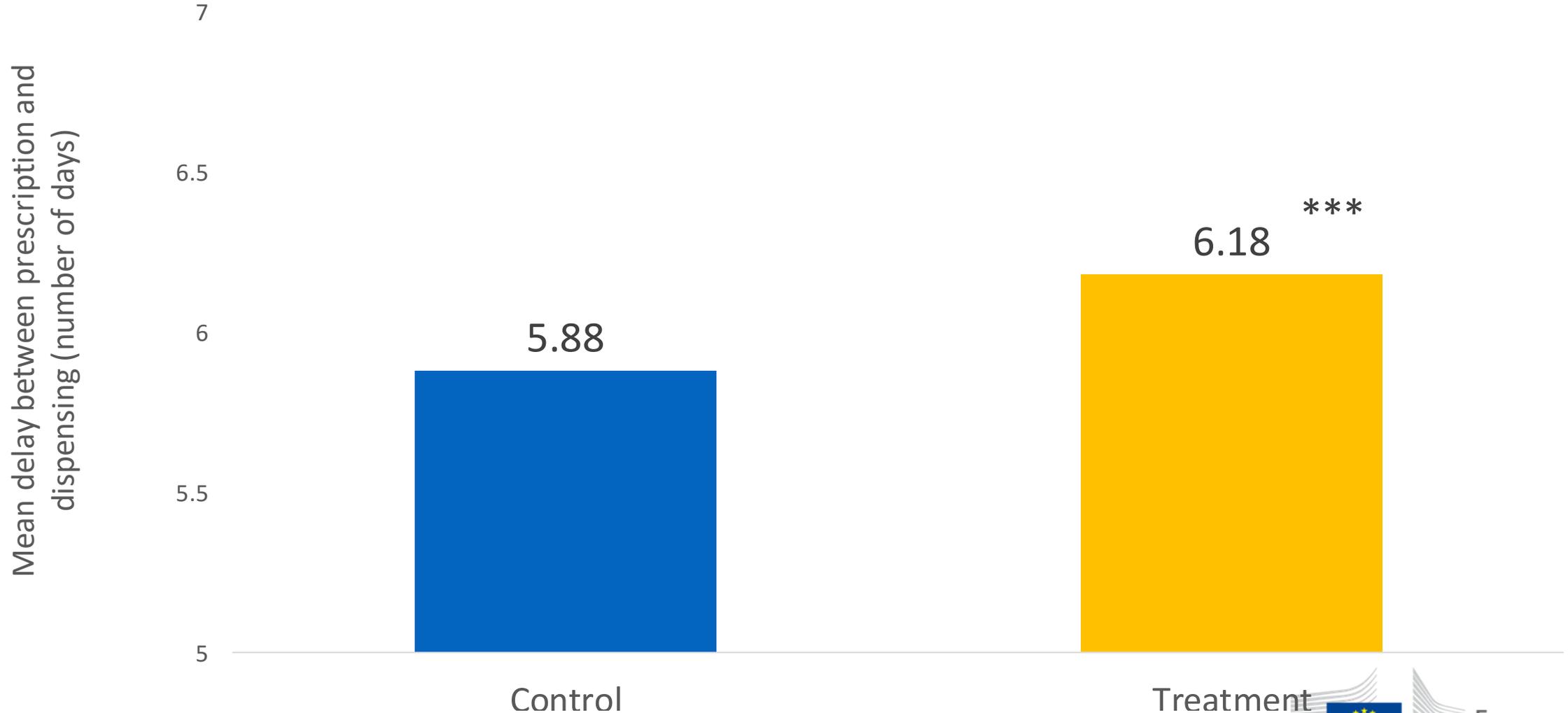
Back-up antibiotic prescription issued

The table below shows you how long these illnesses normally last, what you can do to ease your symptoms.

Your infection	Usually lasts	How to treat yourself better for these infections, now and next time
<input type="checkbox"/> Middle-ear infection	4 days	<ul style="list-style-type: none"> • Have plenty of rest. • Drink enough fluids to avoid feeling thirsty. • Ask your local pharmacist to recommend medicines to help your symptoms or pain (or both). • Fever is a sign the body is fighting the infection and usually gets better by itself in most cases. You can use paracetamol (or ibuprofen) if you or your child are uncomfortable as a result of a fever. • Other things you can do suggested by GP or nurse:
<input type="checkbox"/> Sore throat	7 days	
<input type="checkbox"/> Common cold	10 days	
<input type="checkbox"/> Sinusitis	18 days	
<input type="checkbox"/> Cough or bronchitis	21 days	
<input type="checkbox"/> Other infection		

- A3 Poster
- A4 Poster
- Handout
- “Treating your infection” leaflet
- Briefing sheet for GPs and practice manager

The delay between prescribing and dispensing was larger in the treatment group



N= 49,765 (October and November 2014 only)

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Treatment

European
Commission

Outcomes and statistical approach

- A. Primary outcome measure: rate of antibiotic items dispensed per 1,000 pop, (controlling for age, sex and previous year's prescribing levels)
- B. Panel regression model
- C. Overall savings figure (based on specific assumptions)

Results for the 1st intervention

	Antibiotic items dispensed per 1000 weighted population* (95% CI)		IRR* (95% CI)	p value
	Control	Feedback intervention		
September, 2014 (pre-intervention)	111.65 (109.96–113.34)	111.72 (109.51–113.93)	1.001 (0.981–1.020)	0.9450
October, 2014	123.82 (122.15–125.51)	120.04 (117.93–122.16)	0.969 (0.952–0.987)	0.0005
November, 2014	116.10 (114.43–117.78)	113.44 (111.33–115.56)	0.977 (0.959–0.995)	0.0135
December, 2014	156.70 (155.03–158.37)	150.38 (148.26–152.49)	0.960 (0.946–0.973)	<0.0001
January, 2015	140.07 (138.39–141.75)	135.30 (133.19–137.42)	0.966 (0.951–0.981)	<0.0001
February, 2015	121.02 (119.34–122.69)	116.43 (114.32–118.55)	0.962 (0.945–0.980)	<0.0001
March, 2015	129.76 (128.08–131.43)	126.28 (124.17–128.40)	0.973 (0.957–0.990)	0.0013
April, 2015 (post-intervention)	108.29 (106.64–109.94)	107.14 (105.05–109.23)	0.989 (0.970–1.009)	0.281
October, 2014–March, 2015 (pooled)	131.25 (130.33–132.16)	126.98 (125.68–128.27)	0.967 (0.957–0.977)	<0.0001

*Controlling for previous prescribing levels.

Table 2: Antibiotic items dispensed per 1000 weighted population for the feedback intervention, September, 2014, to April, 2015

=> 73,406 fewer antibiotic items were dispensed

=> £92,356 saving in direct prescribing costs for the public sector

Results for the 2nd intervention

	Antibiotic items dispensed per 1000 weighted population* (95% CI)		IRR* (95% CI)	p value
	Control	Patient-focused intervention		
December, 2014	151.43 (149.86–153.11)	155.64 (153.63–157.64)	1.027 (1.014–1.040)	0.0001
January, 2015	137.22 (135.60–138.85)	138.14 (136.13–140.15)	1.006 (0.992–1.021)	0.369
February, 2015	119.24 (117.61–120.88)	118.16 (116.15–120.17)	0.990 (0.974–1.007)	0.293
March, 2015	127.98 (126.35–129.61)	128.03 (126.02–130.04)	1.000 (0.984–1.016)	0.957
December, 2014–March, 2015 (pooled)	133.98 (133.06–134.90)	135.00 (133.77–136.22)	1.007 (0.998–1.016)	0.105

*Controlling for previous prescribing levels.

Table 4: Antibiotic items dispensed per 1000 weighted population for the patient-focused intervention, December, 2014, to March, 2015

Actors involved

- *BIT UK*
- *Public Health England*
- *Health and Social Care Information Centre (HSCIC)*
- *NHS Local Area Teams*
- *NHS Research and Ethics Committee*
- *Prescribing Advisors*
- *Experts on antimicrobial stewardship*
- *Public Health practitioner*
- *GPs*
- *Patients*
- *Mothers of children from a range of socio-economic background*

Advantages & limitations

Advantages

- *low-cost*
- *scalability*
- *publicly available data*

Limitations

- *Health outcomes not measured*
- *Rate of delayed prescribing not measured*
- *Risk of contamination between experimental groups*
- *Estimate of savings concerns prescribing costs only*
- *One-off intervention (what about the long-term effects?)*
- *Single intervention group*

General Implications

1. *Policy and local experts know the datasets (HSCIC, in this case, had prescribing data)*
2. *It's an RCT which also incorporates elements of design and qualitative methods*
3. *These findings call for a careful assessment of patient-focused information-based interventions (relevant for a number of EC initiatives)*

Thank you!