

# Bug Watch: a prospective community cohort study on common infections

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## BACKGROUND

- Improving antibiotic stewardship requires identification of opportunities to safely reduce prescriptions.
- Promoting safe self-management of mild common infections may aid antibiotic stewardship by reducing medical consultations and therefore prescriptions.
- Over-prescription of antibiotics for patients presenting at primary care with common infections has been widely reported.
- However, more information is needed on how different types of infections are usually managed in the community and what proportion lead to consultation and antibiotic use.

## AIM

To quantify consultation and prescribing patterns in the community for a range of acute common infection syndromes (respiratory, gastrointestinal, skin/soft tissue, mouth/dental, eye, urinary tract).

The Bug Watch study is part of a larger programme of work, Preserving Antibiotics through Safe Stewardship (PASS). Results from Bug Watch will be synthesised with related qualitative work to inform development of behavioural interventions for improved antibiotic stewardship in the community and general practice.



Fig. 1: Recruitment and follow-up

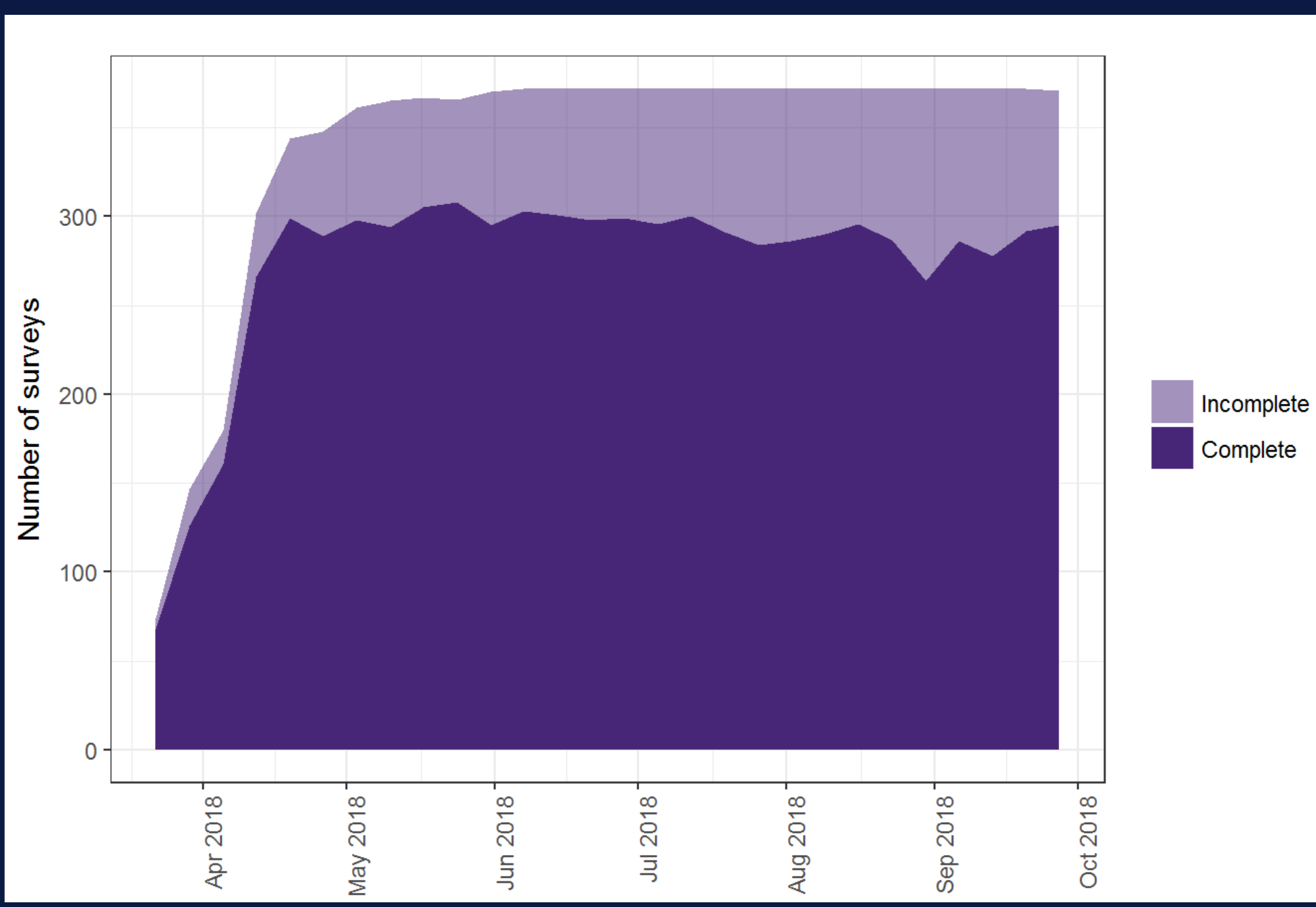
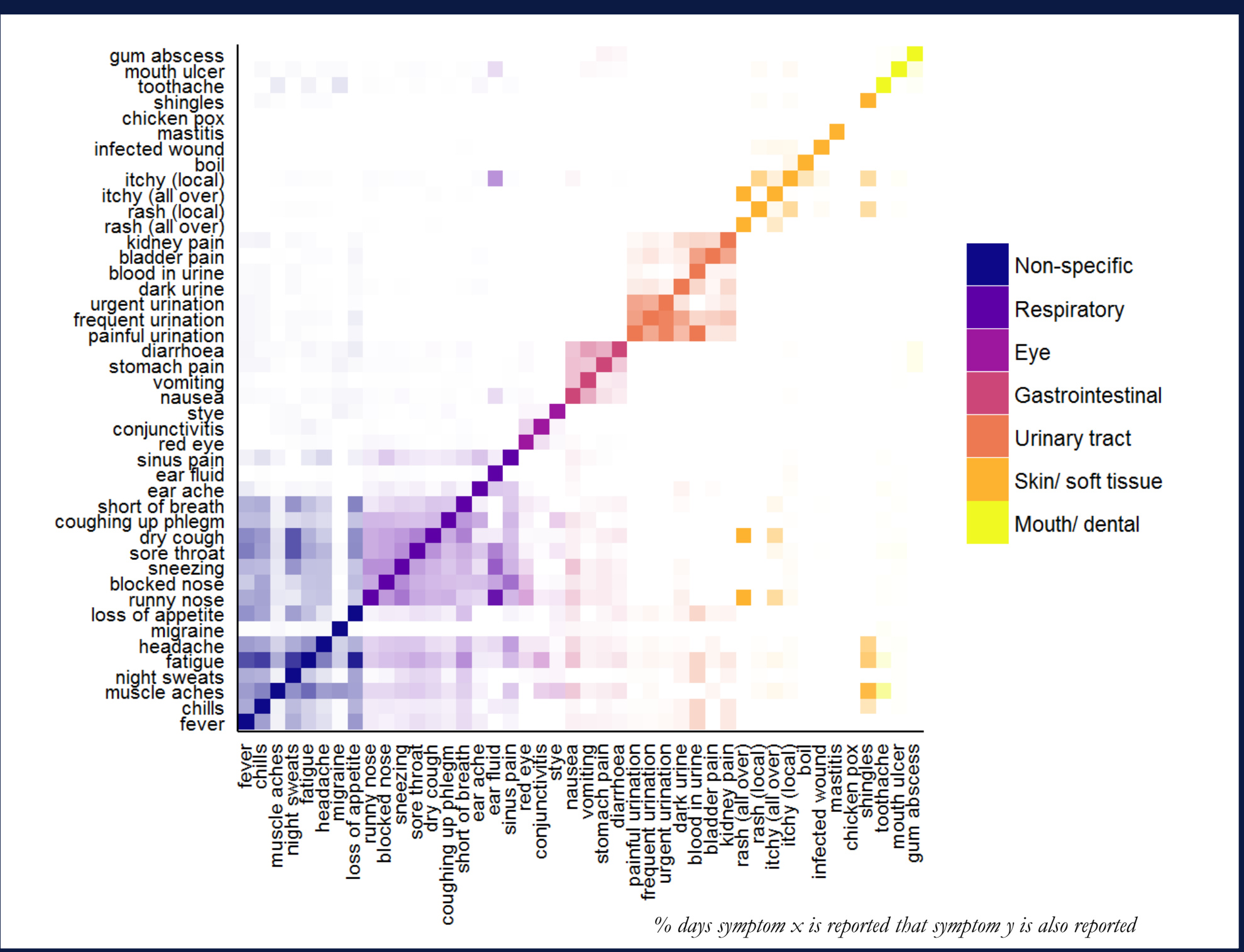


Fig. 2: Symptom reporting



## METHODS

**Design and setting:** Online prospective community cohort study in England.

**Recruitment:** 4,925 Adults who took part in the Health Survey for England in 2013, 2014 or 2015 were invited to the first wave of Bug Watch in March 2018. Adults were asked to register children. Three further waves of recruitment took place in June, September and November 2018 (data not presented here).

**Data collection:** Data were collected using REDCap in the UCL Data Safe Haven environment (ISO27001 certified). Baseline surveys included demographics, general health and knowledge and attitudes towards antibiotics. Weekly follow-up surveys were sent for six months and included symptoms of infection, healthcare-seeking behaviour, and use of treatments including antibiotics.

**Statistical analysis:** We identified infection syndromes by combining reports of related symptoms and non-specific symptoms. We calculated proportions of infection syndromes that led to GP consultation and antibiotic use and described variations.

**Ethics:** This study has been given ethical approval by the UCL Research Ethics Committee (ID 11813/001). Each participant provided informed consent upon registration.

## RESULTS

- 379 individuals were recruited to wave 1 of the study (332 adults, 47 children; response rate 7%)
- 232 were female (61%) and the median age was 57 (IQR 38-67).
- 80% (7655/9547) weekly surveys were completed (Fig. 1); and 76.5% individuals completed at least three quarters of weekly surveys (included in further analyses).
- Non-specific symptoms (e.g. headache, fever) were commonly reported with respiratory, eye and gastrointestinal symptoms; less often with urinary tract, skin/soft tissue and dental/mouth. There was little reporting of symptoms in different categories on the same day (Fig. 2).
- Incident infection syndromes identified: 447, of which 76 (17%) led to GP (or dentist) consultation and 66 (15%) to antibiotic use.
- There were substantial clinical “icebergs” of infection – individuals who had symptoms but do not consult (Fig. 3).
- Antibiotic use was highest for urinary tract infections (17/30, 57%), and lowest for gastrointestinal (1/75, 1%) (Fig. 4).
- A total of 21 different types of antibiotics were reported; amoxicillin (18 reports), nitrofurantoin (10), flucloxacillin (8) and doxycycline (7) were the most common.

Fig. 3: Clinical “icebergs” of infection

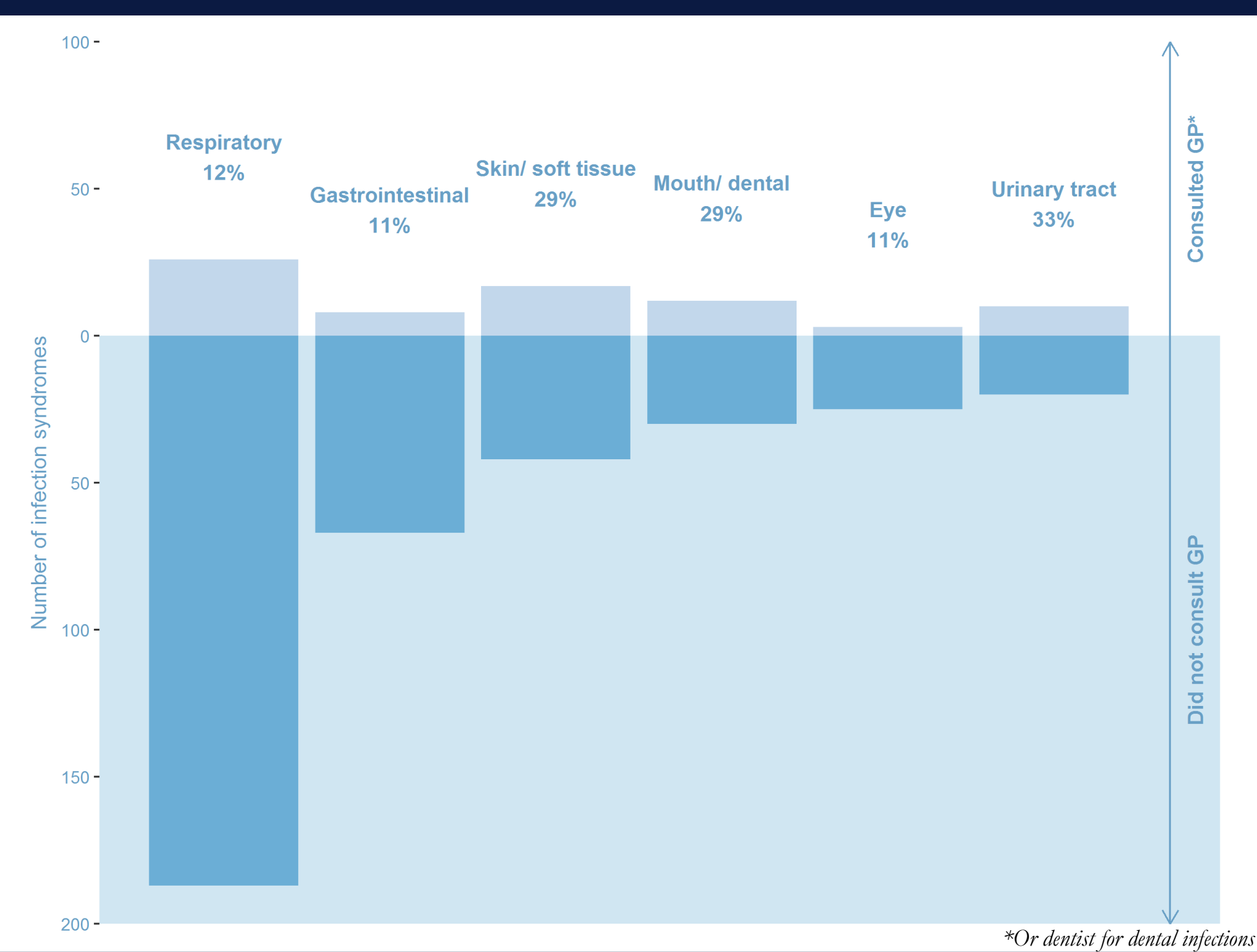


Fig. 4: GP consultation and antibiotic use

Infection syndrome	Incident episodes	GP* consultation	Antibiotic used
Respiratory tract	213	26 (12%)	20 (9%)
Gastrointestinal	75	7 (11%)	1 (1%)
Urinary tract	30	10 (33%)	17 (57%)
Skin/ soft tissue	59	17 (29%)	16 (27%)
Mouth/ dental	42	12 (29%)	5 (12%)
Eye	28	3 (11%)	7 (25%)

\*Or dentist for dental infections

## DISCUSSION

### Strengths and limitations

- Prospective community cohort design enabled information to be captured about symptoms irrespective of medical consultation.
- Participants were recruited from a sample that is representative of the population living in private households in England. However, individuals who responded to the study invitation were more likely to be female and older in age.
- Data were collected on a large set of symptoms, covering six different categories of infection syndrome.
- Drop-out rate during follow-up was relatively low.
- Data were self-reported: Reports of symptoms and severity are subjective; Healthcare-seeking behaviours and antibiotic prescriptions were not verified in medical records.
- Identification of infection syndromes in the analysis relied on assumptions about the plausible length of time between symptoms caused by the same infection.

### Conclusions and future work

We have described a novel and efficient method for collection of information about symptoms and healthcare-seeking behaviours at scale. Follow-up over all four study waves will increase power and allow seasonal variations to be investigated. Further analyses will investigate variations in healthcare-seeking and prescribing practice by symptom severity and individual characteristics.