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Comparison of antibiotic provision associated with acute sore throat symptom management in community pharmacies in Wales and England: a natural policy experiment

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Background: Acute sore throat is managed in community pharmacies in England and Wales under different clinical pathways: Acute Sore Throat Pharmacy First (ASTPF) and Sore Throat Test and Treat (STTT), respectively. ASTPF launched in 2024 and allows antibiotic supply with FeverPAIN scores 4 and 5. STTT launched in 2018 and allows antibiotic supply with FeverPAIN ≥2 or Centor ≥3, if point-of-care testing confirms presence of group A *Streptococcus* (GAS).

Objectives: To compare antibiotic supply rates of ASTPF and STTT, between 1 February 2024 and 30 July 2024, covering the first 6 months of ASTPF.

Methods: A descriptive study using anonymized individual-level data from electronic pharmacy records of STTT and anonymized population-level aggregate data from electronic records of ASTPF consultations meeting the gateway criteria for reimbursement.

Results: During the study period, 317 864 ASTPF and 27 684 STTT consultations were recorded across participating pharmacies, representing 551.0 and 874.9 consultations per 100 000 population in England (57 690 300) and Wales (3 164 400), respectively. The antibiotic supply rate was 72.7% (95% CI: 72.5% to 72.8%) for ASTPF and 29.9% (95% CI: 29.4% to 30.5%) for STTT.

Conclusions: In this natural experiment in two similar healthcare systems with pharmacy-led sore throat services, we found different rates of antibiotic supply. Differences could be attributable to service implementation, pharmacists' initial training, engagement with GPs, pathway differences (e.g. gateway criteria and use of point-of-care tests), symptom severity, or most likely a combination of multiple factors. This early analysis suggests adapting the ASTPF pathway, to include point-of-care testing, could lead to reductions in unnecessary antibiotic supply.

Introduction

The NHS has established the Common Ailments Service (CAS) (Wales in 2013)[1] and the Pharmacy First service (England in 2024.).[2] Both are intended to enable patients to seek treatment directly from a pharmacy, without a GP appointment and release GP appointments for patients who need them more.[2,3] Patients can access both services directly or on referral from another healthcare professional. Pharmacists are enabled to supply antibiotics without a prescription using Patient Group Directions.[4] The

conditions that can be treated through the services differ. However, both enable pharmacists to assess and treat acute sore throat symptoms,[4,5] informed by FeverPAIN clinical scoring criteria in accordance with NICE guidelines (fever during previous 24 h; purulence; attendance within 3 days after onset of symptoms; severely inflamed tonsils; no cough or coryza).[6] The specific clinical pathways for management of acute sore throat in the two services are shown in Figure 1. The most notable differences are: in Wales, the requirement for pharmacists to confirm the presence of suspected group A *Streptococcus* (GAS), the most common cause of bacterial sore throat in the community,[5,8] using point-of-care testing (POCT)[6,9] in addition to clinical scoring; and, in England, the FeverPAIN score required (4 or 5) to supply antibiotics, which is higher than in Wales, where patients with a lower FeverPAIN score (2 or 3) are eligible for antibiotics if GAS is confirmed by POCT. The rationale behind the different FeverPAIN thresholds in England and Wales is not clear from published literature or policy documents; however, this research aims to elucidate the consequences of such policy decisions.

Antibiotic provision in Wales is contingent on a positive POCT[5] whereas POCT is not used in England.[7] The service in England follows the 2019 NICE[10] guidance, which explored the potential impact of POCT on antibiotic prescribing and patient outcomes in general practice, and concluded that their use is probably not cost-effective. However, at the time there were no published studies in community pharmacy, and the guidance highlighted that cost-effectiveness in this setting could not be assessed. The 'Sore Throat Test and Treat' (STTT) element within the CAS was introduced in 2018, prior to publication of this guidance, and has been extensively evaluated demonstrating appropriate antibiotic use and reductions in use of alternative healthcare providers, maintenance of patient safety, cost-effectiveness compared with consultation with general practice, and positive patient experience.[11–15]

Concerns regarding the potential of Pharmacy First to increase inappropriate antibiotic use have been raised.[16] The important design differences in these similar initiatives, with comparable objectives, operating in very similar healthcare systems, provided an opportunity for a natural policy experiment to compare antibiotic supply for acute sore throat between the two services during the first 6 months of England's Pharmacy First.

Methods

Study design and population

This was a descriptive observational study using anonymized individual-level data from electronic pharmacy records of all STTT service users aged 6 years and older in Wales, and anonymized aggregated data from electronic records of all Acute Sore Throat Pharmacy First (ASTPF) patients aged 5 years and older meeting the gateway criteria for payment in England, between 1 February 2024 and 30 July 2024.

Data collection and preparation

Monthly STTT data for all consultations were obtained from the *Choose Pharmacy* IT application. These data were matched to health records in the Welsh Demographic Service. Monthly ASTPF data were obtained from NHS Business Service Authority (NHSBSA) (https://opendata.nhsbsa.net/dataset/foi-02234) covering aggregated consultations and, of those, the number of antibiotic courses supplied. NHSBSA data are used for reimbursement purposes, so are widely considered accurate.[17] We therefore assumed that all consultations that met the gateway criteria for payment (FeverPAIN score 2 and above) were included.[7] No individual-level data (patient demographics and FeverPAIN scores) were available for ASTPF. The populations of Wales and England were obtained from the Office of National Statistics mid-year estimates for 2023.[18]

Microsoft Excel® v2410 was used to prepare the master dataset, and the statistical analysis was undertaken using IBM SPSS Statistics® v29.0.2.0 (20).[19]

Outcomes and data analysis

We compared:

- Monthly counts of STTT and ASTPF consultations.
- The percentage of STTT and ASTPF consultations resulting in antibiotic supply, alongside CIs.[20]
- Acute sore throat consultation rate for each service per 100 000 population.

Ethical and regulatory considerations

Data were collected as part of routine clinical care, fully anonymized, with no identifiers that could link information to an individual. The study was deemed not to need ethical review by Cardiff University. It was registered with the Research and Development Department of Digital Health and Care Wales.

Results

During the study period, 27 684 STTT and 317 864 ASTPF consultations were undertaken, equal to 874.9 and 551.0 consultations per 100 000 population in Wales and England respectively (populations: Wales = 3 164 400; England = 57 690 300).

The percentage of consultations where an antibiotic was supplied was 72.7% (95% CI: 72.5% to 72.8%) for ASTPF and 29.9% (95% CI: 29.4% to 30.5%) for STTT. Antibiotic supply rates for ASTPF consultations were stable after February (Figure 2), when Pharmacy First was launched.

In STTT, 90% of consultations ($n = 25\,002$) used FeverPAIN to assess symptom severity (10% used Centor). Limiting analysis of consultations to only those where FeverPAIN was used to ensure comparability with NHSBSA data, did not significantly change the supply rate (29.5%, 95% CI: 29.0% to 30.1%). Supply rates by FeverPAIN scores are presented in Figure 2 and Table S1 (available as Supplementary data at *JAC* Online). Ninety-seven percent (6568/6784) of patients with a FeverPAIN score of 4 or more received a POCT, of whom 63% ($n = 4136$) tested positive, and of these 98% ($n = 4047$) received antibiotics. The rate of antibiotic supply in patients with FeverPAIN 4 and 5 was thus 59.7% (95% CI: 58.5% to 60.8%). Ninety percent (12 107/13 439) of patients with a FeverPAIN score of 2 and 3 received POCT, of whom 27% ($n = 3365$) tested positive, and of these 96% ($n = 3231$) received antibiotics. The rate of antibiotic supply in patients with FeverPAIN 2 and 3 was thus 24.0% (95% CI: 23.3% to 24.8%).

Discussion

To our knowledge, this is the first cross-sectional analysis of data from electronic pharmacy records from all available consultations for the two national clinical pathways outlining management of acute sore throat symptoms in community pharmacies. Lower antibiotic supply rates were observed for STTT than for ASTPF. Limiting analysis to consultations with FeverPAIN scores of 4 or

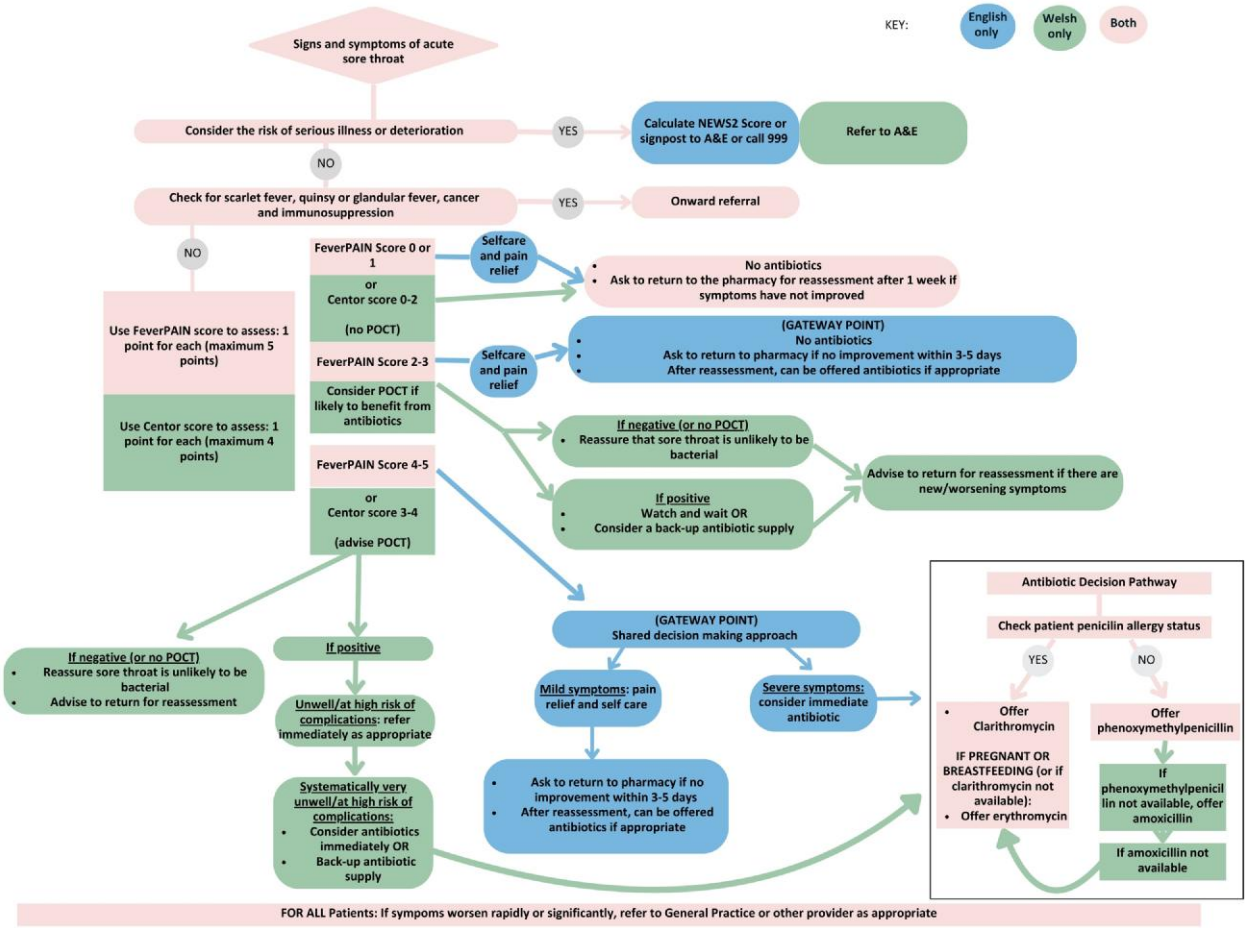

Figure 1. Acute sore throat treatment pathways in England (Acute Sore Throat Pharmacy First—ASTPF) and Wales (Sore Throat Test and Treat—STTT). A&E, Accident and Emergency (Department). Adapted from NHS England and NHS Wales.[4,5,7]

more increased the prescribing rate in STTT to 59.7% (95% CI: 58.5% to 60.8%) but this remained significantly lower than the ASTPF at 72.7% (95% CI: 72.5% to 72.8%).

This study uses the natural experiment resulting from two subtly different clinical pathways, operating in similar, neighbouring healthcare systems. Our analysis provides valuable insight into how increasing access to first contact primary healthcare can have differing impacts on antibiotic supply contingent on implementation and design decisions.

There are a number of factors potentially contributing to the differences observed in antibiotic supply: how the two schemes were implemented; the training provided to pharmacists; the influence of experience gathered over time; and the differences in the two sore throat treatment pathways, including the use of POCT, which evidence suggests contributes to reduced antibiotic prescribing rates in primary care.[21,22] The STTT service was introduced gradually, starting with a pilot in 56 pharmacies and extended following an evaluation, which has continued throughout the service's rollout.[9,11–15] In contrast, ASTPF was implemented at scale,[4] and alongside six other Pharmacy First clinical pathway services. ASTPF sets a higher threshold for antibiotic supply than STTT, but unlike STTT, does not require POCT for confirmation of GAS infection.[5]

The difference in antibiotic supply rates will reflect each of these differences in approach to some degree.[15] It could be argued that the threshold in Pharmacy First could mean patients presenting at pharmacies in England are more likely to require antibiotics. Different thresholds for reimbursement also mean that FeverPAIN scores in England are likely to skew away from 0s and 1s towards 2–5 scores in the NHSBA data used for analysis.

However, sensitivity analysis including only patients in Wales with the most severe symptoms (FeverPAIN 4/5) found that this group were still less likely to receive antibiotics than patients in England. Although it would not be appropriate to make a direct comparison of the potential value of POCT between England and Wales, STTT data show that 4 in 10 of its patients with FeverPAIN score 4/5, who would be recommended for antibiotics were they in ASTPF, do not test positive for GAS and are thus unlikely to need an antibiotic.

Demographic and socioeconomic differences exist between Wales and England.[23] Although England's population is younger, indicators of overall health suggest that patients in Wales are likely to be more poorly, and have more difficulty accessing alternative services such as general practice due to greater rurality, and hence have higher levels of unmet need.[23–25] A final

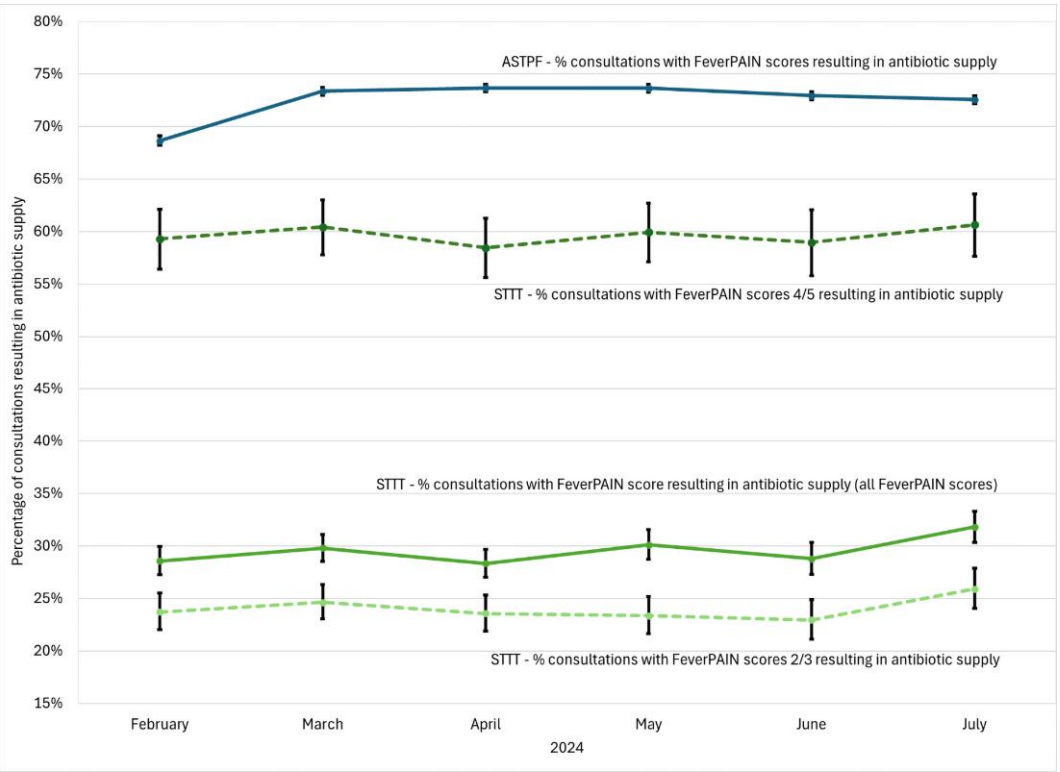

Figure 2. Acute sore throat consultations resulting in supply of antibiotics in England (Pharmacy First service, consultations meeting gateway criteria for reimbursement) and in Wales (Sore Throat Test and Treat service, consultations where FeverPAIN score was used) (percentage and 95% CIs) by FeverPAIN scores, between February and July 2024. ASTPF, Acute Sore Throat Pharmacy First; STTT, Sore Throat Test and Treat.

potentially important difference lies in the duration of the two services. Pharmacy First is new, and we may see different trends as it matures; the content and implementation (e.g. training of pharmacists and GPs) of the pathways in the service may change as experience grows.

Since this is a natural experiment, we cannot rule out the effect of other unknown confounders, such as differences in health status and deprivation in England versus Wales, as well as differences in skillset and experience of community pharmacy staff in both countries with respect to sore throat treatment. The STTT service was introduced in stages, starting with an evaluated pilot in 56 pharmacies, training of community pharmacy staff and collaborative work with GPs.[9,11–15] The English sore throat pathway was implemented at pace, nationally, alongside six other services, with no formal accreditation required to offer the service. Individual data on FeverPAIN scores are not available in the current English NHSBHA dataset. Future work to disaggregate the English data is possible as part of the Pharmacy First evaluation, when this becomes available.[26,27] Overall, this early analysis of the ASTPF pathway appears to demonstrate that there is scope to adapt it to include POCT, perhaps in a pilot, and further evaluate if there is any impact such as reductions in unnecessary antibiotic dispensing.[26,27]

Strengths and limitations

The datasets cover all consultations in Wales, and all reported consultations meeting gateway criteria in England. Although the English dataset is not fully representative, with the severity caveats noted above, it is the fullest dataset currently available. Data entry during consultations for STTT and ASTPF is completed contemporaneously and is mostly structured, and, for the NHS BSA, linked to reimbursement, so data quality and completeness are high.

No individual-level data were available for ASTPF. As a result, it was not possible to compare patient demographics, consultations by clinical score, or severity of acute sore throat presentation based on clinical scoring, between the two services.

Given the time period of Pharmacy First implementation and the study focusing on a rapid evaluation, only the first 6 months of data were available, which does not account for any impact of seasonal variability in illness that may also impact antibiotic use. However, the benefit of comparing these two neighbouring countries, with dense transport links and population movement across borders, is that any seasonality effect on upper respiratory illness is unlikely to affect solely one country. Hence, the policy difference in responding to sore throat makes this study an excellent natural policy experiment.

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Transparency declarations

None to declare.

Supplementary data

Table S1 is available as Supplementary data at *JAC* Online.

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