

Antimicrobial stewardship in Northern Ireland during COVID-19

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This article provides an overview of the antimicrobial stewardship measures and prescribing trends in primary care in Northern Ireland (NI) over recent years. It discusses the impact of the COVID-19 pandemic on antibacterial prescribing in primary care (including by dentists), and the measures being taken to improve antimicrobial stewardship and reduce antimicrobial resistance in the future.

Antimicrobial stewardship is a high priority for all prescribers. In 2016, Lord O'Neill set out some harrowing predictions for the consequences of antimicrobial resistance (AMR). In his review, it was predicted that in 2050, 8.2 million people will die worldwide from cancer and a staggering 10 million people will die worldwide from infections caused by antimicrobial-resistant organisms.¹ The report details recommendations around 10 global initiatives to reduce AMR, including improvements in hygiene, public awareness, investment in research and development for new antibiotics, diagnostic tests and vaccinations, as well as reducing the unnecessary use of antibiotics in humans, animals and agriculture.¹ The UK's commitment to reducing AMR is detailed in the UK's five-year national action plan (2019–2024),² which builds on the previous action plan for 2013–2018.³

The aim of this article is to:

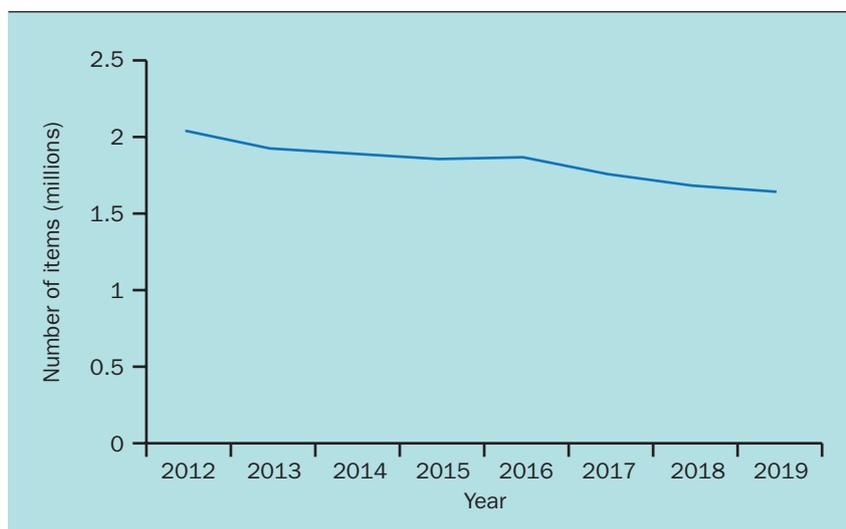


Figure 1. Trend graph of total number of antibacterial items prescribed in primary care in Northern Ireland (NI), 2012–2019. Data provided by the Business Service Organisation. Data includes prescribing in GP surgeries, out-of-hours centres, dentistry and hospices. It does not include private prescriptions

- Outline the main antimicrobial stewardship measures that have been undertaken in primary care in Northern Ireland (NI).
- Provide NI primary care antibacterial prescribing trends over the last seven years.
- Describe how the changes to consultations during COVID-19 have impacted on antibacterial prescribing levels in primary care, by comparing the number of antibacterial items prescribed during the three-month period of March, April and May 2020 (first wave of the pandemic) with the same time period in 2019.
- Outline some future plans and innovations for antimicrobial stewardship in NI.

In NI, the tasks of preventing and reducing antimicrobial-resistant infections, and reducing antimicrobial consumption are led by the Strategic Antimicrobial Resistance and Healthcare-associated Infection (SAMRHAI) group at the

Department of Health, which includes representatives responsible for animal and environmental as well as human health. For translating policy and strategy into action for human health, the Public Health Agency (PHA) leads a multiagency group, the Healthcare-associated Infection and Antimicrobial Stewardship Improvement Board, which has a number of themed subgroups that are responsible for regional efforts to reduce harm from antimicrobial use and resistance in different settings.

NI had a local five-year plan known as the NI Strategy for Tackling AMR (STAR), which was published in 2012 by the NI Department of Health (then the Department of Health, Social Services and Public Safety).⁴ STAR was concerned with human health only and was replaced in 2019 by a more encompassing One Health action plan, written by the Department of Health in conjunction with the Department of Agriculture, Environment and Rural Affairs (DAERA) and the Food Standards Agency (FSA).⁵ It includes measures to reduce the need for antibiotics by preventing infection through improved hygiene; biosecurity measures; and the implementation of effective vaccination strategies.

NI has the highest prescribing rates of antibacterial agents in the UK. In 2019, antibacterial prescribing in primary care in England was at a rate of 0.62 items per head of population compared with 0.87 items per head of population in NI.^{6,7} On a more positive note, antibacterial prescribing in primary care in NI reduced by 19.1% from 2012 to 2019. Figure 1 shows total antibacterial prescribing in primary care in NI in terms of the total number of items prescribed per year. Figure 2 shows the subset of antibacterial prescribing by dentists in NI, which fell by 19.7% from 2012 to 2019. In 2019, dental prescribing constituted 8.5% of antibacterial prescribing in NI.

Over the past 10 years, *Clostridium difficile* hospital inpatient cases (often due to infections originating in primary care) have dropped by 68% (from 1178 cases in 2008/09 to 381 cases in 2018/19) and methicillin-resistant *Staphylococcus aureus* (MRSA) cases

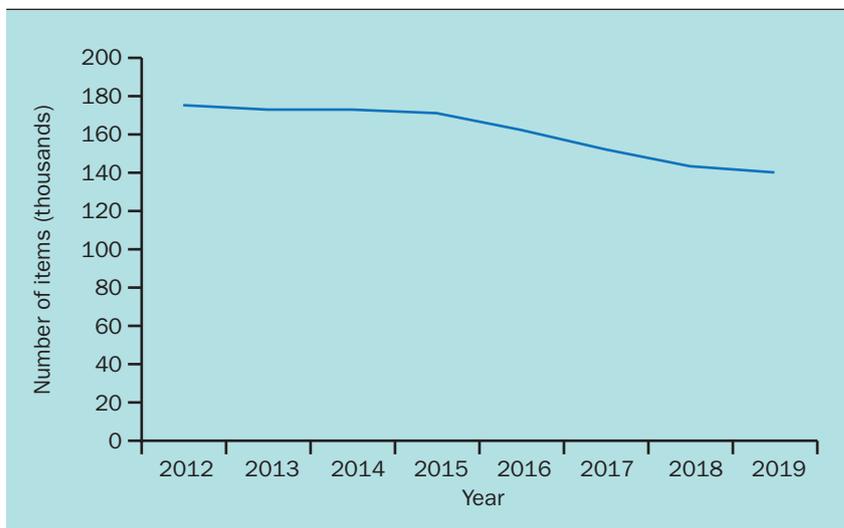


Figure 2. Trend graph of number of antibacterial items prescribed by dentists in primary care in Northern Ireland (NI), 2012–2019 (subset of Figure 1)

- Do not accept telephone requests for antibiotics without speaking to the patient and discourage these requests
- Limit telephone consultations for antibiotics to exceptional cases
- Prescribe an antibiotic ONLY when there is likely to be a clear clinical benefit
- Do not prescribe antibiotics for viral sore throat or simple coughs and colds
- Consider alternative measures such as cough bottles, analgesics, decongestants or delayed prescriptions
- Remember that over-the-counter (OTC) cough and cold medicines should not be used in children under six years of age.
- Avoid the use of co-amoxiclav, quinolones and cephalosporins to reduce the risk of MRSA and *Clostridium difficile*
- Prescribe antibiotics generically

Table 1. General prescribing advice within the Northern Ireland Management of Infection Guidelines for Primary and Community Care⁹

have dropped by 73% (from 203 cases in 2008/09 to 54 cases in 2018/19).⁸

Antimicrobial stewardship measures undertaken by primary care practitioners in NI

GPs and community pharmacists
GPs follow the NI management of infection guidelines for primary care, which are written jointly by the Health and Social Care Board (HSCB) and the PHA.⁹ The guidelines encourage the judicious use of antibiotics and provide the formulaic choice for the common conditions in primary care that may require an antibiotic. Some prescribing points from the guidelines are provided in Table 1.

In 2015, the Department of Health invested in pharmacists working in GP

surgeries throughout NI, with funding for 300 general practice pharmacists to be employed by 2021, with one of their key performance indicators being to reduce antimicrobial prescribing.⁵ As well as GP surgeries in NI having a general practice pharmacist, they are visited annually by pharmacy advisors, based at the HSCB. Pharmacy advisors promote the Pharmaceutical Clinical Effectiveness (PCE) programme, which is a suite of medicines management initiatives to improve the quality of prescribing and produce efficiencies across both primary and secondary care.¹⁰ Antimicrobials are a high priority area within PCE. Pharmacy advisors also signpost practitioners to various resources to help them reduce their antibiotic prescribing

and provide feedback on how their prescribing rates vary compared with other practices in NI via the practice's COMPASS report.

COMPASS reports are generated by the Business Services Organisation on a quarterly basis and provide feedback to GPs on various aspects of their prescribing, including antibiotics. The COMPASS report provides information on the most recent quarter of data showing the practice's prescribing rate compared with the mean rate of prescribing of other groups of practices within NI. Trend graphs show increases or decreases in prescribing over the previous two years. In terms of antibiotics, the data that COMPASS contains includes:

- Overall volume – the number of antibiotic items prescribed/1000 STAR-PU (Specific Therapeutic group Age-sex Related Prescribing Unit, a value calculated to reflect the number of patients in a practice, and the age and sex mix of that group).
- Percentage of all antibiotic items that are formulary choice.
- The practice's prescribing of cephalosporins, quinolones and co-amoxiclav (the prescribing of which is to be discouraged due to increased risk of resistance and emergence of pathogenic strains of bacteria such as MRSA and *C. difficile*).
- Information on how many patients in the practice have received three or more antibiotics in the previous six months, thereby increasing their risk of *C. difficile*, highlighting the numbers in particularly vulnerable groups, such as those aged 0–5 years or over 65 years and those resident in care homes. It also indicates how many patients are being prescribed long-term prophylaxis for urinary tract infections.

The aim of the report is to highlight areas that the practice could improve upon and to provide feedback on any antimicrobial stewardship measures practice staff have already implemented, as these will be reflected as changes in prescribing in COMPASS.

The TARGET antibiotic toolkit is widely promoted and used within NI and contains useful patient information leaflets,

posters for waiting rooms, audits, and antibiotic and diagnostic quick reference tools, as well as other educational resources.¹¹ The NI formulary also has a 'patient zone' with leaflets on self-care and managing minor ailments, such as coughs and colds.¹²

Community pharmacists in NI have a key role to play in antimicrobial stewardship. Patients are encouraged to consult with their local community pharmacists for various respiratory tract infections, such as sinusitis, sore throat, colds, etc. More than 500 community pharmacies have taken part in the Living Well service, which provides information and advice on key public health issues, including the management of acute conditions that patients may believe necessitate an antibiotic.¹³

The PHA also ran a media campaign aimed at raising public awareness about the risks of antibiotic resistance and urged people to take their healthcare professionals' advice about antibiotics. The Keep Antibiotics Working campaign ran during the winter months of 2018/19.¹⁴

Dentists

The dental profession is also highly committed to antimicrobial stewardship and the British Dental Association (BDA) has highlighted how it is working with the government to implement the UK five-year action plan.² The Chief Dental Officer in NI is part of the SAMRHA group based at the Department of Health, although it has been said that dental professionals were brought into the policy implementation "at a relatively late stage".¹⁵ Dentists in NI follow the UK guidelines on antimicrobial prescribing produced by the Faculty of General Dental Practice (FGDP).¹⁶ These guidelines state that "the majority of uncomplicated infected swellings of dental origin can be successfully treated by removal of the source of the infection by drainage of the associated abscess, removal of infected pulp contents or by extraction of the tooth. Antimicrobials are only indicated as an adjunct to definitive treatment where there is an elevated temperature, evidence of systemic spread of infection and local lymph node involvement."¹⁶

A free dental antimicrobial stewardship toolkit is available to members of the BDA, which includes information for patients and a self-audit tool to help dentists in primary care monitor their antimicrobial prescribing and ensure it is in line with the FGDP antimicrobial guidance. The BDA has highlighted the issues relevant to the dentistry profession in the UK in general that need to be addressed to improve antimicrobial stewardship. These include funding for urgent care, time required to discuss treatment options with patients, patient education to improve their oral health, reducing waiting lists for general anaesthetic extractions and improvements to IT infrastructure.¹⁷

Antimicrobial stewardship may be particularly challenging in NI as highlighted by an article written by Roz McMullan, in which she states that NI has some of the worst levels of oral health among the UK.¹⁸ High levels of tooth decay in NI have led to increased numbers of patients presenting with infected teeth. The rate of general anaesthetic extractions for children in NI is three times higher (*pro rata*) than for children in England, and some of these children will have been given antibiotics to treat infections while they await the extraction. Long waiting lists, particularly in the Belfast area, have resulted in children being given antibiotics to manage the problem. Protected and appropriately funded urgent treatment time has been called for, to allow dentists to establish a diagnosis and provide the appropriate interventional treatment.¹⁸

Impact of COVID-19

GP consultations

Figures released from the Department of Health in NI estimate that GP appointments have dropped by 19% when comparing the time period 9 March to 17 April 2020 with 9 March to 17 April 2019. This would be in keeping with a reduction in capacity of 20% (average 84 appointments per practice) per week since each GP surgery has been providing six sessions at a COVID centre. Video consultations, which were previously only carried out in very low numbers, are now embedded into the service. All patients

requesting an appointment at a GP surgery in NI are telephone triaged for approximately five minutes. Exact figures are not available, but a report by the Department of Health states “the triage addresses issues at this first contact stage for a significantly increased number of patients, reducing the levels requiring a more detailed consultation. The consultation is often made by video or telephone, but could also be in person.”¹⁹

Dental consultations

As a result of the COVID-19 pandemic, routine dental care in all dental practices and normal out-of-hours dental practices in NI were suspended by 24 March 2020. Guidance to general dental practitioners was to triage dental issues and manage with advice, analgesics and antimicrobials (AAA) where possible, to restrict face-to-face contact, and to refer to urgent or emergency care when AAA could not address the presenting complaint. General dental practitioners were advised that they could still see patients who do not meet the COVID-19 case definition and have an urgent dental need. However, care must be limited to non-aerosol-generating procedures. Five urgent dental care (UDC) centres were established, into which general dental practitioners could refer patients, if required.²⁰ Although restoration of general dental services in NI resumed on 29 June 2020, full normal services have not yet recommenced. UDCs remain open at weekends and recognised public holidays and dentists can refer to the UDCs if clinically appropriate.

With far fewer patients being seen in person, the authors investigated whether or not this resulted in GPs and/or dentists prescribing more antibacterial agents.

Antibacterial prescribing data

Figure 3 shows the total primary care prescribing of antibacterial agents in NI during the three-month period during which COVID-19 had high activity in the UK (first wave of the pandemic) and the same period the previous year. Overall, antibacterial prescribing fell by 5.49% during March, April and May 2020 compared with the same period the previous year.

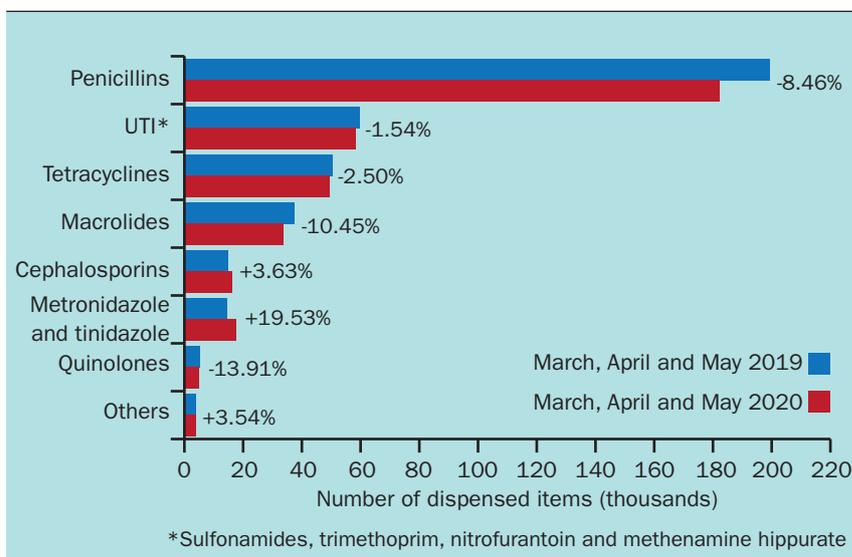


Figure 3. Total antibacterial prescribing in primary care in NI, comparing March, April and May 2020 with the same months the previous year. Data provided by the Business Service Organisation. Data includes prescribing in GP surgeries, out-of-hours centres, dentistry and hospices. It does not include private prescriptions

Table 2 shows the subset of dental antibacterial prescribing, which increased by 33.08% during this time period.

Our data show that overall primary care prescribing of antimicrobials in NI fell during the first wave of the pandemic. However, during this time, dental prescribing rose, suggesting that COVID-19 has presented a particular challenge for dentists in NI in terms of antimicrobial stewardship. During this period, general dental practitioners were severely restricted in providing operative dental treatment, particularly aerosol-generating procedures, which constitute the vast majority of dental treatments. Advice to general dental practitioners was to manage acute dental issues with AAA where possible. This is likely to have been the reason for the rise in dental prescribing in NI of penicillins (amoxicillin and phenoxymethylpenicillin) and metronidazole, which are first-line antibiotics for bacterial dental abscesses, and the rise in macrolides and clindamycin, which are second-line antibiotics for dental abscesses.^{16,21}

The potential for this had already been highlighted by Susie Sanderson (BDA Health and Science Committee and member of the Working Group on Antibiotics), who stated: “We have seen

a worrying rise in stories of antibiotics apparently being overprescribed for dental pain since the outbreak of COVID-19. Anecdotal evidence suggests that some patients with dental pain have been prescribed multiple courses of antibiotics to no benefit. This is alarming, as it risks harming the patient and undoing the great work done by dentists on antimicrobial resistance.”²²

A joint letter from Public Health England, the Royal College of Surgeons, the FGDP and the BDA was issued to all general dental practitioners, including those in NI, with further guidance on the correct use of antibiotics during the COVID-19 pandemic.²³

Future plans

In terms of how the world in general is progressing with antimicrobial stewardship, the O’Neill report has been revisited recently, where it was concluded that the Review on AMR has had a global impact as an advocacy tool, raising the profile of AMR on the international agenda, although unfortunately there has been very little progress on transforming research and development incentives for antibiotics, vaccines and diagnostics.²⁴

Continuing to reduce the volume of antibiotics used and adhering to formu-

Type of antibacterial agent	No. items dispensed in March, April and May 2019	No. items dispensed in March, April and May 2020	Difference	% Difference
Penicillins	23,208	30,864	7656	32.99%
Cephalosporins	92	84	-8	-8.70%
Tetracyclines	119	102	-17	-14.29%
Macrolides	985	1250	265	26.90%
Clindamycin	217	290	73	33.64%
Metronidazole	10,149	13,681	3532	34.80%
Total	34,770	46,271	11,501	33.08%

Table 2. Dental antibacterial prescribing in primary care in NI, comparing March, April and May 2020 with the same months the previous year (subset of Figure 3)

lary choices when prescribing an antibiotic are probably the key interventions that primary care practitioners can make to preserve antimicrobial effectiveness for future generations. Primary care in NI has made significant reductions in the prescribing of antibacterial agents, but could practitioners be helped to do more?

In England, all CCG and GP prescribing of antibacterial agents are available to the public on the PresQIPP website. This shows how each practice is performing against the AMR Quality Premium Indicators (which are similar to those contained in COMPASS reports: antibacterial items/STAR-PUs and encouraging reduction of co-amoxiclav, cephalosporins and quinolones).²⁵ In addition, CCGs in England are rewarded financially when practices make improvements to the AMR indicators. This scheme has been shown to be very effective, with a 23% reduction in broad-spectrum antibiotic prescribing in year 2 of the scheme.²⁶ Incentive schemes and benchmarking prescribing data are considered to be powerful tools to engage practices, facilitating an element of competition and peer pressure.²⁷

Scotland has a dedicated AMR digital platform – the Infection Intelligence Platform (IIP).²⁸ The IIP provides integrated information on infection (eg by combining risk factors, demographics, healthcare activity, medicines usage and clinical data), and enables better analysis of infection information to improve

KEY POINTS

- Northern Ireland (NI) has higher primary care prescribing levels of antibacterial agents than the rest of the UK
- The volume of antibacterial prescribing in primary care in NI dropped by 19.1% from 2012 to 2019
- Dental prescribing of antibacterial agents in primary care in NI dropped by 19.7% from 2012 to 2019
- Antimicrobial stewardship is high on the agenda of practitioners in general practice, community pharmacists and dentists in NI
- Total primary care antibacterial prescribing in NI fell by 5.5% during March, April and May 2020 compared with the same period in 2019 but dental prescribing rose by 33.1% in the same period

patient outcomes and reduce harm from infection.

In NI, the One Health action plan has indicated plans to display antimicrobial consumption, healthcare-associated infection and AMR rates on a public-facing online dashboard in the future.⁵ In addition, a new national digital platform – Encompass – has been developed to integrate all medical records across primary and secondary care in NI,²⁹ and has the potential to improve surveillance of antibiotic use in NI.³⁰

Conclusion

Although prescribing levels are higher than the rest of the UK, primary care prescribers have made significant reductions to antimicrobial prescribing volume in NI in recent years, and there are plans for more integrated national surveillance

of antimicrobial use and resistance patterns. The COVID-19 pandemic has unfortunately impeded the antimicrobial stewardship measures taken by dentists in NI, as shown by an increased volume of antibacterial prescribing during this time. This is not surprising given the current arrangements regarding dental consultations. We hope that our findings will support dentists in their continued campaign for the funding they need for additional urgent care slots in order to maximise the use of appropriate interventional dental treatments rather than antibiotics.

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Declaration of interests

None to declare.

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