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## Impact of the COVID-19 pandemic on provision of antimicrobial stewardship education and training in UK health service sites

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### ABSTRACT

The impact of the COVID-19 pandemic on antimicrobial stewardship is a cause for serious concern. There is evidence of increased antibiotic usage in many settings and fears of over-use, especially of broad-spectrum antibiotics in patients with COVID-19, raising concerns about potential impact on antimicrobial resistance globally. At the same time, the pandemic has impacted the provision of education and training throughout the health and education sectors, during a period when health services and staff were under unprecedented pressure. All-Wales Antimicrobial Resistance Educators (AWARE) is an interprofessional network of healthcare professionals whose roles include provision of antimicrobial stewardship education in National Health Service health boards across Wales. The aim of this report was to use AWARE project data to study the impact of the pandemic on the provision of antimicrobial stewardship education and training in healthcare settings in Wales in 2020, compared to 2019. Overall, the number of staff reached by education increased by 10%, despite the number of educational sessions falling by 26% and the number of hours of teaching by 43%. Rapid switch to virtual education allowed fewer, shorter, educational sessions, allowing more staff to be reached.

### ARTICLE HISTORY

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### KEYWORDS

Antibiotics; antimicrobial stewardship; COVID-19; education

### Introduction

The impact of the COVID-19 pandemic on antimicrobial stewardship is a cause for serious concern. There is evidence of increased antibiotic usage in many settings and fears that there has been overuse of antibiotics in affected patients (Van Duin et al., 2020). A meta-analysis by Langford et al. (2021) including over 30,000 patients found that antibiotics were prescribed in approximately 75% of patients, although only an estimated 8% had evidence of bacterial infection. The ISARIC WHO study (Russell et al., 2021) reported that an even higher proportion, 85%, of 49,000 patients with COVID-19, received antibiotics in hospital, with the highest use in critical care, and 37% of patients had been prescribed antibiotics prior to admission. Antibiotics used included many World Health Organization watch and reserve category antibiotics, although only approximately 2% had documented bacterial infection. Russell et al. (2021) argued that overuse of antibiotics, especially broad-spectrum antibiotics, in patients with COVID-19 raises significant concerns about the potential impact on antimicrobial resistance globally; they stressed the importance of efforts to safely reduce and control antibiotic prescribing for COVID-19. At the same time, the pandemic has affected the provision of education and training throughout the health and education sectors, during a period when health services and staff have been under unprecedented pressure.

### Background

All Wales Antimicrobial Resistance Educators (AWARE) is an interprofessional network of healthcare professionals whose roles include provision of antimicrobial stewardship (AMS) education for NHS health boards across Wales. The network includes specialist antimicrobial pharmacists, infection prevention and control nurses, medical microbiologists, and general practitioners. The AWARE project was established for these healthcare professionals to share educational resources and good practice and has collected data annually on the number of hours of training and education provided by network members, and the numbers and staff groups of healthcare workers and students reached by that training. The aim of this report was to use AWARE project data to study the impact of the pandemic on the provision of antimicrobial stewardship education and training in healthcare settings in Wales in 2020, by comparison with 2019.

### Method

In December 2019 and December 2020, all members of the AWARE interprofessional community across Wales were contacted by e-mail to invite them to submit data regarding their educational activities. Any healthcare professional working in antimicrobial stewardship in Wales is eligible to join the AWARE network. Members are located across Wales in all Health Boards (National Health Service organizations which

run the hospitals and primary care settings in a particular region). Participation was entirely voluntary. The request asked members to provide details of all educational sessions provided over the course of the year to healthcare workers: number of educational sessions, target staff group, length of session, number attending, and format of teaching session (e.g., face to face, virtual). In 2019, the data was collected by asking all participants to return a questionnaire provided on a Word-document as an attachment. In 2020, the same questions were included on a Google Forms link (2020). The forms were returned to AWARE by members.

For the analysis in this report, data were only included from Health Boards or individual sites that had provided robust and complete datasets that were directly comparable between 2019 and 2020. All other data were excluded. Because participation was voluntary, some Health Boards had not included an identical dataset in both years (e.g., they did not provide data from each of their sites or from the same combination of sites).

After including only sites for which a valid direct comparison could be made between 2019 and 2020, data were included for one large Welsh Health Board (site A) comprising community practices and several district hospitals, and from two individual district general hospitals (sites B and C) belonging to two other Health Boards.

## Results

Data from sites A, B, and C, which provided complete, reliable, and comparable datasets in both years of the survey, are shown in Table 1. The format of teaching varied between sites.

At site A, in 2020, 11.75 hours of the total 40 hours teaching (29%) was by Microsoft Teams<sup>R</sup> or other virtual platforms, compared with none the previous year, possibly explaining how despite fewer than half as many hours of teaching, there was only a 10% reduction in numbers of people reached. Staff at site A reported that changes in training were largely due to continuation of mandatory sessions such as induction and foundation programmes, and scaling back or discontinuation of other training such as grand rounds in secondary care and lead prescriber meetings in primary care. A compounding factor was the suspension of face-to-face activities for World Antibiotic Awareness Week, where teams would usually provide additional educational events.

At sites B and C, small reductions in numbers of sessions and numbers of hours teaching were seen, although these were less marked than at site A. At Sites B and C, most provision from March 2020 onwards was virtual. Increases of 55% and 47% in staff reached were achieved at sites B and C,

respectively, despite fewer and shorter sessions being delivered, because of rapid and successful adaptation by all staff to virtual teaching sessions as soon as the pandemic started. Here, staff also reported having to scale back on non-mandatory training sessions, often due to staff being redeployed to work in other areas and the priority to deal with the COVID-19 site pressure. Continued attempts were made to undertake the mandatory elements, but attendance was relatively low.

## Staff groups reached

More pharmacists received AMS education than any other group, representing 40% of the staff reached. Thirty-one percent were nursing staff, and 19% of those reached were medical staff in primary and secondary care. Non-physician prescribers represented only 3% of those reached and were all at one site. Another 3% were midwives. It is likely that the high relative proportion of pharmacists reached reflects the fact that the educators were pharmacists themselves. Prescribers both [physicians and non-physicians] accounted for only just over a fifth of those educated (22%).

## Discussion

The role of AMS education and training has never been more important. However, COVID-19 might have been expected to have had an impact on educational provision within the NHS over the course of 2020, with most of the year affected by the pandemic, potentially affecting both staff time and availability and the ability to run in-person teaching. AMS education efforts might have been temporarily sidelined in the face of the acute crisis. However, this education continued across Wales, with more staff reached overall in 2020 than in 2019.

Overall, in 2020, compared with the previous year, the number of staff reached across sites A, B, and C increased by 10%, despite the constraints imposed by the pandemic. The number of educational sessions provided fell at all the sites and by 26% overall, whilst the overall numbers of hours of teaching provided fell even more dramatically by 43%. Large increases in staff reached at sites B and C resulted from the use of virtual platforms and outweighed a small decrease in Health Board A, where adaptation to virtual provision still helped mitigate for fewer hours of teaching. Although the pandemic limited face-to-face events, it also provided opportunities, both to reach larger groups due to the rapid adoption of Microsoft Teams in NHS Wales, and also to deliver sessions relating to AMS in the context of COVID-19, which were well attended due to clinical interest.

At all sites, the results are consistent with a pattern of provision of shorter teaching sessions suited to delivery by MS Teams or similar platforms, which overall allowed more staff to attend at one time and allowed educators to reach more staff than in 2019, even despite the pandemic. Data from this work has been used to inform the Public Health Wales Antimicrobial Resistance Delivery Board's Education and Training workstream, which is in the process of developing

**Table 1.** Data from sites A, B, and C in 2019 and 2020.

|                       | Numbers of staff reached |             | Number of educational sessions provided |           | Hours of teaching provided |           |
|-----------------------|--------------------------|-------------|---|-----------|----------------------------|-----------|
|                       | 2019                     | 2020        | 2019                                    | 2020      | 2019                       | 2020      |
| Site A (Health Board) | 810                      | 730         | 54                                      | 40        | 92.5                       | 40        |
| Site B (DGH)          | 174                      | 269         | 26                                      | 22        | 28                         | 25        |
| Site C (DGH)          | 214                      | 314         | 16                                      | 9         | 15                         | 12        |
| <b>Total</b>          | <b>1198</b>              | <b>1313</b> | <b>96</b>                               | <b>71</b> | <b>135.5</b>               | <b>77</b> |
| % Change 2019–2020    | +10%                     |             | –26%                                    |           | –43%                       |           |

sustainable and accessible interprofessional training for all NHS Wales healthcare professionals, in collaboration with Health Education and Improvement Wales.

## Conclusion

It is testament to the dedication of the AMS community across Wales that education and training continued during the pandemic and indeed reached more healthcare workers than it did in the previous year. The advent of virtual teaching represents an efficient educational tool and may bring a long-term benefit in terms of numbers of staff reached and perhaps also to learners, because time to travel to teaching is also likely to have also been less. An ideal training strategy is likely to combine the reach of virtual teaching with in-person engagement for greater and more sustainable impact, and this is the focus of the Public Health Wales Antimicrobial Resistance Delivery Board's current Education and Training workstream, which is informed by this work.

## Disclosure statement

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