# An evaluation of our antimicrobial resistance introductory e-learning session, and national infection prevention and control training

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# Executive summary

The threat posed by antimicrobial resistance (AMR) to the future of modern medicine is of huge concern and the education of health and social care workers to help reduce this threat is vital. The government's call for action as set out in the UK Five Year Antimicrobial Resistance Strategy 2013 to 2018 requires Health Education England (HEE) to lead improvements in the education and training of healthcare workers and have a role in helping strengthen curricula on antimicrobial resistance, responsible prescribing, infection prevention and control and develop e-learning tools to support this.

In response we developed a basic introductory free e-learning session: 'Reducing Antimicrobial Resistance - An Introduction' that was launched in 2015 to coincide with World Antibiotic Awareness Week and European Antibiotics Awareness Day. This session is aimed at all health and social care workers and is freely available via open access on the e-Learning for Health (eLfH) platform.

Our 2016 – 2017 mandate "Delivering high quality, effective, compassionate care: Developing the right people with the right skills and the right values" requires us to evaluate the visibility and uptake of our introductory e-learning session on antimicrobial resistance, that has a particular focus on infection prevention and control, to assess individual and organisational buy-in and usage.

The findings of this work shows that awareness of the introductory e-learning session on antimicrobial resistance is good and respondents found this session beneficial in raising healthcare worker awareness of antimicrobial resistance (infection prevention and control and/or antimicrobial stewardship). The number of organisations who are actively promoting this session to staff could improve. There are opportunities for organisations to utilise this session as part of mandatory, induction and/or non-mandatory training specifically during 'periods of increased incidence' or outbreaks of infection and during 'special measures'.

# Contents

# Introduction

In 2015 we launched an e-learning session Reducing Antimicrobial Resistance: An Introduction, to support all health and social care staff – both clinical and non-clinical - in a variety of settings to understand the threats posed by antimicrobial resistance (CMO 2013 & O'Neill 2014), and ways they can help to tackle this major health issue.

This session also aims to support board-level executives and non-executives, lay members, receptionists, administrative staff, caterers, domestic staff, transport workers, porters, community pharmacy counter staff and maintenance staff, including those non-clinical staff working for independent contractors within the NHS, as well as volunteers across health and social care settings and service provision.

The session provides an overview of how to tackle antimicrobial (antibiotic) resistance (AMR), key facts about antimicrobial resistance and describes the important role everyone working in a health and social care environment has in tackling it. By undertaking this session, health and social care staff will be able to:
- discuss why there is such a concern about misuse of antibiotics and antimicrobial resistance
- list the key risks for development of antimicrobial resistance
- identify their role in tackling antimicrobial resistance.

# Key issues

This evaluation on the visibility and uptake of our introductory e-learning session on antimicrobial resistance comes at a time of increasing concerns about the threats posed by antimicrobial resistance to the future of modern day medicine. The very real threat of having no suitable antibiotics to treat infection has been highlighted in the Chief Medical Officer's 2013 report, and could result in minor surgery and routine operations becoming high risk procedures.

The Government commissioned review on antimicrobial resistance (2014) mentions the already manifesting damaging effects that currently claim at least 50,000 lives each year across Europe and the US alone. The review states that the threat of antimicrobial resistance might seem distant and an abstract risk to some, if it is known at all, and highlights the considerable human and economic cost that could result from any inaction (2014).

More recently the government has launched new plans to reduce infections in the NHS by halving the number of healthcare associated Gram-negative bloodstream infections by 2020 and halving inappropriate antibiotic prescribing, with the aim of being a world leader in reducing antimicrobial prescribing by 2020 (DH 2016a). Plans are therefore underway to improve training and information sharing so NHS staff can learn from the best in cutting infection rates (DH 2016b). System wide engagement and action will be needed to reduce the threat posed by

antimicrobial resistance (CMO 2013 & O'Neill 2014), and the workforce needs to be adequately equipped to help tackle this threat.

# Methods

The aims of this work were twofold:

## Antimicrobial resistance introductory session:

- Identify whether organisations are aware of and have considered using this introductory e-learning session on antimicrobial resistance as part of their organisational staff training, and if so whether this is a core component of mandatory training or offered as optional training.
- Identify the target groups that organisations are using this session for. Those organisations that are not using this session, identify what target groups they feel could benefit from this session.
- Identify any current gaps or barriers within this session based on feedback from respondents. For those organisations that are not using this session, identify what is stopping them from using this as a core component of their staff training.
- Identify what types of educational interventions around antimicrobial resistance organisations feel are useful in raising staff awareness on this subject.
- Invite feedback on successful educational strategies that organisations are using to combat the growing threat of antimicrobial resistance (CMO 2013 and O'Neill 2014).

## Infection prevention and control education

As training around infection prevention and control (IPC) practices are a requirement of the Health and Social Care Act 2008 Code of Practice on the prevention and control of infection and related guidance, we also aimed to explore:
- the training formats used in the system to deliver IPC training and the target audience for these
- examples of good practice on IPC training that could be shared, and
- examples of e-learning sessions that organisations are currently using for staff training on IPC.

A survey was devised by HEE in consultation with national leads from Public Health England, NHS Improvement and the Royal College of Nursing.

The questionnaire was targeted at Directors of Infection Prevention and Control (DIPC) and disseminated to the system via the NHS Improvement Infection Control Networks, Infection Prevention Society, Queen's Nursing Institute and United Kingdom Clinical Pharmacy Association Infection Management group. The questionnaire was also sent to private health organisations such as independent and private hospitals, community pharmacy organisations

(via Superintendent Pharmacists) and the care sector (via the National Care Association, National Care Forum and Registered Nursing Home Association). Pharmacists working in primary care and/or care homes and primary care nurses were also targeted as part of the dissemination strategy.

Respondents were asked if they:
- were aware of our  introductory e-learning session on antimicrobial resistance,
- have found this session beneficial in raising health-worker awareness on antimicrobial resistance and/or infection prevention and control and/or antimicrobial stewardship,
- were actively promoting this session within their organisations,
- had encouraged staff to use this session as a recommended but non-mandatory training resource i.e.
    - as part of staff training during 'periods of increased incidence' or outbreaks of infection
    - as part of staff training during 'special measures'
    - induction training for all staff
    - induction training for clinical staff only
    - induction training for staff working in specific specialties/areas (please specify)
    - mandatory update for staff working in specific specialties/areas (please specify)
    - mandatory update for all staff in your organisation
    - mandatory update for all clinical staff only
    - other.
- were collecting data on the number of staff that have completed this session within their organisation,
- know of any barriers and gaps preventing them/their organisation from adopting this session as part of your core staff training,
- know what improvements could be made to this session to enhance uptake and address their organisation's learning needs around antimicrobial resistance for all staff, or for specific staff groups (if any),
- would consider making this session mandatory for all staff within their organisation,
- used any other training sessions for educating staff on antimicrobial resistance.

It is a requirement of the Health and Social Care Act 2008 Code of Practice on the prevention and control of infection and related guidance that the principles and practice of prevention of infection (including cleanliness) are included in induction and training programmes for new staff and that there is ongoing training for all relevant staff, including support staff, volunteers, agency/locum staff and staff employed by contractors. We therefore explored:
- the formats of training (e.g. face to face training [lectures etc.], distance learning or external e-learning [online], internally developed e-learning, videos, posters and leaflets and learning books),
- the topics covered as part of the training above (i.e. hand hygiene, personal protective equipment [PPE], management of blood and body fluid spillage, management of occupational exposure [including sharps], management of the environment, management

of care equipment, aseptic technique, decontamination [endoscopy], catheter insertion and line insertion),

- who the target audience were for each of the topics (i.e. clinical staff only or non-clinical staff only),
- examples of good practice that they could share with us,
- examples of e-learning sessions they use within their organisations (e.g. the National Skills Academy – Level 1 training on infection prevention and control (clinical) e-learning course, the National Skills Academy – Level 2 training on infection prevention and control (non-clinical) e-learning course, Skills for Care – Care Certificate, e-Learning for Health (eLfH) – Level 1 training on Infection Prevention and Control e-learning course, e-Learning for Health (eLfH) – Level 2 training on Infection Prevention and Control e-learning course and other).

Participation in national awareness raising campaigns by organisations was also explored.

# Findings

We received 37 responses from:
- 14 acute NHS trusts,
- 10 other (2 mental health and learning disability Trusts, 2 mental health and community services, 1 community service provider, 1 NHS acute and community service provider, 1 health visiting service, 1 GP practice, 1 community pharmacy and 1 higher education institute),
- 4 mental health NHS trusts,
- 4 primary care service providers,
- 3 community NHS hospitals,
- 1 Clinical Commissioning Group,
- 1 integrated care provider.

## Antimicrobial Resistance introductory session

29 (78%) organisations confirmed they were aware of HEE's introductory e-learning session on antimicrobial resistance.

20 (54%) organisations found this session beneficial in raising health-worker awareness on antimicrobial resistance and/or antimicrobial stewardship and/or infection prevention and control (5 acute NHS Trusts, 3 primary care service providers, 2 mental health NHS Trusts, 2 community NHS hospitals, 2 mental health and learning disability Trusts, 1 mental health and community service, 1 health visiting service, 1 integrated care provider, 1 GP practice, 1 community pharmacy and 1 higher education institute). 9 (24%) stated they did not find this session beneficial (8 acute NHS Trusts and 1 primary care service provider) and 8 (22%) did not provide a response.

13 (35%) organisations are actively promoting this session to staff whilst 21 (57%) are not.

| How organisations are encouraging staff to use this session | Number |
|---|---|
| As a recommended but non-mandatory training resource | 9 (24%) |
| Induction training for all staff | 1 (3%) |
| Induction training for staff working in specific specialties/areas | 1 (3%) |
| Mandatory update for staff working in specific specialties/areas | 1 (3%) |
| Mandatory update for all staff in your organisation | 1 (3%) |

None are currently encouraging staff to use this session as part of staff training during 'periods of increased incidence' or outbreaks of infection; as part of staff training during 'special measures'; induction training for clinical staff only; and mandatory update for all clinical staff only. Additional themes / comments provided by respondents included (further details in Appendix 2):

• still planning
• future promotion
• as part of infection control teaching
• adding to trust intranet site
• share with our learning and development team
• mandatory learning for those students on the Specialist Practice Qualification district nursing programmes
• direct students to the site.

3 (8%) organisations are collecting data on the number of staff that have completed this session.

25 (68%) organisations will consider making this session mandatory for all staff whilst 11 (30%) will not. Additional comments provided by respondents included:

• "mandatory status not yet discussed"
• "we will promote this amongst staff however at present we are unable to mandate this with all staff"
• "this is our intention"
• "in an ideal world"
• "currently experiencing staff recruitment issues leading to challenges associated with staff attending mandatory sessions. Education around antimicrobial resistance has to be integral to sessions already in place for the maximum impact"
• "for targeted staff rather than all staff"
• "local training provides sufficient information"
• "would have to be discussed with the Director of Infection Prevention and Control (DIPC) and the infection control committee (ICC) but wouldn't rule it out"
• "we have our own module"
• "making this mandatory for medical staff is being explored"

- "to look into the module before considering"
- "we may do so in the short term future"
- "training already provided from infection control"
- "I do not have the authority to require this however; I can see the value for the other students in our School of Health and Social Care and will promote this"
- "not applicable to all university staff/faculties".

Respondents were asked what barriers and gaps prevent them / their organisation from adopting this session as part of their core staff training (if any). The key words that emerged were access, awareness and pressures. The overall themes included (further details can be found in Appendix 3):
- IT setup issues
- time to complete session
- capacity issues and staff resource pressures
- existing / competing mandatory training requirements
- competing e-learning programmes
- content not adequate for clinical staff
- data only if mandatory training
- lack of awareness
- target audience.

Respondents were asked about improvements that could be made to this session to enhance uptake and address their organisation's learning needs around antimicrobial resistance for all staff, or for specific staff groups (if any). The key words that emerged were access, basic and mandatory. The overall themes included (further details can be found in Appendix 4):
- paediatric specific module
- make mandatory / compulsory on induction and update
- linking to the 5 moments of hand hygiene
- locate on a platform accessible to all staff groups
- no registration
- content very basic
- more information for prescribers
- suitable for clinical staff
- comprehensive as is
- better promotion / advertising
- good for all levels of staff
- access issues.

26 (70%) organisations use other training sessions for educating staff on antimicrobial resistance whilst 11 (30%) do not. Additional comments provided by respondents included:
- "presentations by consultant microbiologist and lead pharmacist"

- "face-to-face nurse training, face-to-face induction sessions for medical staff, competency e-learning for junior doctors"
- "a session on induction of and regular face to face training of medical staff. Part of the infection prevention and control induction and on-going training for all staff."
- "mandatory clinical sessions / staff induction / link practitioners training"
- "non-medical prescribers group with targeted training"
- "grand round presentations, Trust induction for foundation year one doctors, foundation year two doctors and staff nurses, and training for medical students"
- "microbiologists have educational sessions with doctors including the students & juniors. It is also included in the clinical staffs annual mandatory training"
- "mandatory session and ad-hoc training sessions on foundation year one doctors and foundation year two doctors training program throughout the year; ad-hoc sessions with core medical trainees, specialty trainees and consultants; executive led walk-rounds (every 3 months) and antibiotic awareness walk-rounds (yearly); and training sessions with link care workers on infection control and AMR"
- "it is included in our IPC mandatory training, study days, link nurse meetings, during routine ward visits, intranet, twitter, antibiotic prescribing data is monitored across the trust and challenged"
- "antibiotic lead clinician and pharmacist - we have changed the drug charts to ensure that there is a check on antibiotic use at 48hrs"
- "grand round presentations, medical staff newsletter and infection prevention newsletter"
- "in house e-learning package"
- "in house e learning module, face-to-face sessions for foundation trainees"
- "training for medical staff and awareness to clinical and non-clinical staff"
- "induction session for all doctors by a microbiologist and AMR awareness included in mandatory IPC for all staff"
- "all clinical staff who prescribe antibiotics are given antibiotic training"
- "antimicrobial resistance is promoted by our current mandatory training with infection control nurses"
- "during influenza vaccination training for community pharmacists"
- "statutory training day - trust run"
- "this is an issue addressed within the prescribing modules that the students undertake"
- "antimicrobial stewardship"
- "blue line training"
- "infection control updates".

## Antimicrobial Resistance introductory session e-LfH usage data

As of 1 June 2017 there had been 1,380 logins to the e-Learning for Healthcare learning management system (i.e. learning tracked), of which 867 had completed this session. This equates to 525 learning hours or around 70 working days since the module was launched in

November 2015. 7,174 accessed the programme via the open access route (learning is not tracked so we cannot determine how many who accessed this way completed the module).

## Time Spent (hours)
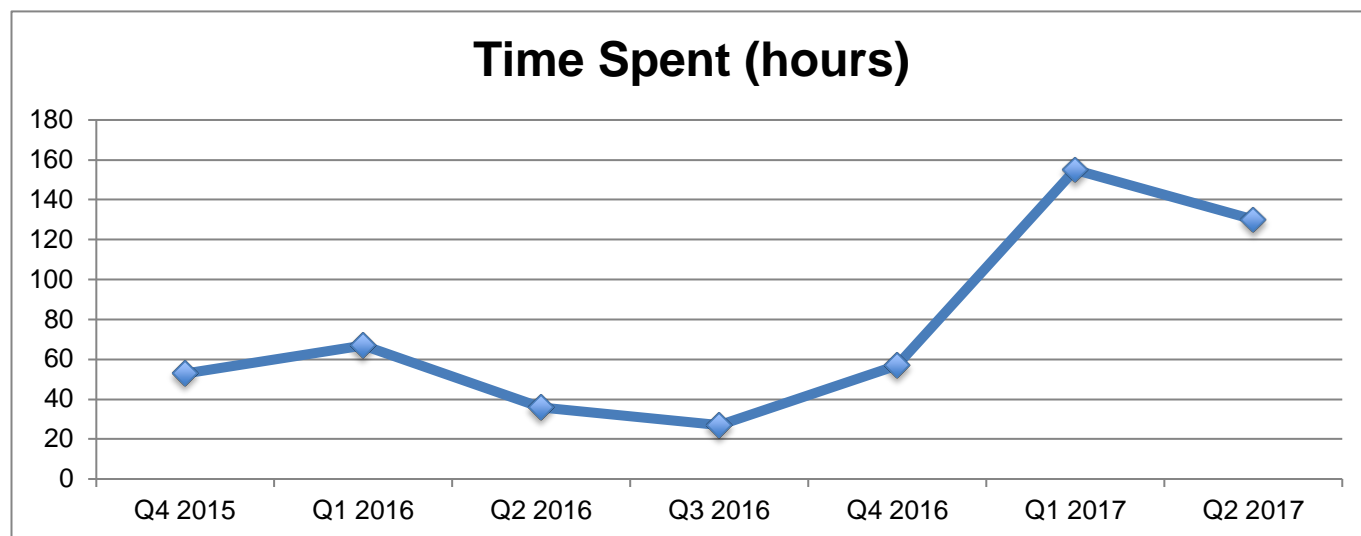


The increase in Q1 (2017) was as a result of access by a wide range of healthcare workers in a variety of clinical settings (that could have coincided with when this survey was sent out).

Overall access by occupation:

| Sector *(n)* | Occupation / Grade *(n)* where specified: |
|---|---|
| Administrative services *(96)* | • Administration *(2)*<br>• Clerical Worker *(26): Band 3 (6), Band 5 (2), Band 4 (1)*<br>• Human Resources/Education worker *(1)*<br>• Medical Secretary *(5)*<br>• Officer *(1): Band 2 (1)*<br>• Receptionist *(56): Band 2 (3), Band 3 (2)*<br>• Secretary *(5): Band 4 (3), Band 3 (1)* |
| Allied Health *(9)* | • Radiographer *(2): Band 8a (2)*<br>• Radiographer - Student – Diagnostic *(4)*<br>• Radiographer – Therapeutic *(3): Band 7 (2), Band 6 (1)* |
| Apprenticeships *(1)* | • Apprentice – Student *(1)* |
| Emergency services *(9)* | • Paramedic *(9): Band 7 (7), Band 8a (1) Band 5 (1)* |
| Health science services *(10)* | • Biomedical Scientist *(5): Band 5 (2), Band 6 (2), Band 8d (1)*<br>• Clinical Scientist *(3): Band 7 (2), Band 6 (1)*<br>• Technician *(2):  Band 3 (1), Band 6 (1)* |
| Health / care / clinical support workers *(145)* | • Adviser *(1): Band 4 (1)*<br>• Associate Practitioner *(1): Band 4 (1)*<br>• Care Worker *(12)*<br>• Health Adviser *(1): Band 7 (1)*<br>• Healthcare Assistant *(70): Band 2 (21), Band 3 (16), Band 4 (9), Student (2), Band 1 (1)*<br>• Health Care Support Worker *(15): Band 4 (10), Band 3* |

|  | |
|---|---|
|  | *(4), Band 2 (1)*<br>• Health Visitor *(3): Band 6 (2), Band 7 (1)*<br>• Helper/Assistant *(3): Band 2 (3)*<br>• Phlebotomist *(2): Band 1 (1) Student (1)*<br>• Physician Associate *(3): Band 2 (2), Band 7 (1)*<br>• Senior Care Assistant *(13)*<br>• Senior Health Care Assistant *(6)*<br>• Social Care Support Worker *(14)*<br>• Support, Time, Recovery Worker *(1): Band 4 (1)* |
| Directors *(2)* | • Non-Executive Director *(2)* |
| Dental *(40)* | • Dental Hygienist *(2)*<br>• Dental Nurse *(2)*<br>• Dental Student *(1): Undergraduate Year 6*<br>• Dental Therapist *(4)*<br>• Non-Trainee Dentist *(26): General Dental Practitioner (22); Specialist [post CCT] (3); Consultant (1)*<br>• Trainee Dentist *(5): DFY1 (4) DFY2 (1)* |
| Management *(29)* | • Management (Admin) (2)<br>• Management (Patient care) (1)<br>• Manager *(26): Band 8c (4), Band 8a (2), Band 5 (2)*<br>• Senior manager *(6): Band 8b (1), Band 5 (1)* |
| Medical *(327)* | • General Practitioner - GP *(2)*<br>• General Practitioner Trainer *(2)*<br>• Non-Trainee Doctor (199): *GP Principal (82), Consultant (49), GP Locum (17), GP Salaried (36), Career Grade [SAS] (13), Specialist [post CCT] (2)*<br>• Trainee Doctor *(111): FY2 (34), FY1 (29), GP Registrar (11), ST3/CT3 (10), ST2/CT2 (8), ST1/CT1 (6), ST5 (5), Clinical Fellow [Post CCT] (3), ST4 (2), ST6 (2), ST7 (2)*<br>• Medical Student *(13): UG Year 1 (9), Other (4)* |
| Midwifery *(15)* | • Midwife *(15): Student (13), Band 6 (2)* |
| Nursing *(377)* | • Community Learning Disabilities Nurse – Student *(1)*<br>• District Nurse – Student *(27)*<br>• Nurse *(323): Band 7 (129), Band 6 (100), Band 5 (56), Band 8a (24), NA (5), Band 8b (4), Band 1 (3), Band 8c (1), Band 8d (1), Other (1)*<br>• Nurse - Student - Adult Branch *(5)*<br>• Practice Nurse – Student *(21)* |
| Other *(30)* | • Other *(7)*<br>• Student Other *(21)*<br>• e-LfH staff member *(2)* |
| Pharmacy *(272)* | • Pharmacist *(229): NA (91), Band 8a (44), Band 7 (40), Band 8b (29), Band 8c (8), Band 6 (8), Band 8d (5), Band 5 (4) Band 9 (1)*<br>• Pharmacy – Trainee *(6)*<br>• Pharmacy Technician *(37)* |
| Public Health *(7)* | • Public Health Registrar *(7): Band 8d (3), NA (2),* |

| | |
|---|---|
| | *Band 9 (1), Band 8a (1)* |

*CCT = Certificates of Completion of Training; **DFY1/Y2** = Dental Foundation Year 1 / Year 2;*
***SAS** = Staff, Associate Specialist and Specialty; **FY1/Y2** = Foundation Year 1 / Year 2; **CT** =*
*Core Training; **ST** = Specialist Training; NA = Not Applicable.*

Access by specialty where stated:

| Specialty | (n) |
|---|---|
| Acute Internal Medicine | 4 |
| Adult Mental Illness | 21 |
| Anaesthetics | 11 |
| Cardiology | 11 |
| Clinical Oncology (Previously Radiotherapy) | 3 |
| Clinical Pharmacology | 18 |
| Community Medicine | 45 |
| Community Sexual and Reproductive Health | 7 |
| Continuing Healthcare | 3 |
| Critical Care Medicine | 21 |
| Dental Medicine Specialties | 5 |
| Dermatology | 9 |
| Emergency Medicine | 40 |
| Endicronology | 6 |
| Foundation Programme | 63 |
| General Dental Practice | 15 |
| General Medical Practice | 318 |
| General Medicine | 31 |
| General Surgery | 24 |
| Genito Urinary Medicine | 2 |
| Geriatric Medicine | 8 |
| Gynaecology | 3 |
| Haemotology | 2 |
| Infectious Diseases | 87 |
| Medical Microbiology | 34 |
| Medical Microbiology & Virology | 9 |
| Medical Oncology | 3 |
| Medical Opthalmology | 1 |
| Midwife | 12 |
| Nephrology | 4 |
| Not applicable | 227 |
| Nursing | 12 |
| Obstetrics | 2 |
| Obstetrics & Gynaecology | 10 |
| Old Age Psychiatry | 2 |
| Other | 206 |
| Paediatrics | 9 |
| Palliative Medicine | 33 |
| Psychiatry of Learning Disabilities | 3 |

| | |
|---|---|
| Psychiatry: Forensic | *6* |
| Public Health Dental | *1* |
| Public Health Medicine | *9* |
| Radiology | *2* |
| Rehabilitation | *3* |
| Respiratory Medicine | *14* |
| Rheumatology | *1* |
| Special Care Dentistry | *2* |
| Trauma and Orthopaedics | *5* |
| Urology | *11* |

## Participation in national awareness raising campaigns

26 (70%) organisations actively promote and participate in <u>European Antibiotic Awareness Day</u> (held annually on 18 November) and <u>World Antibiotic Awareness Week</u> (held in the same week as EAAD) and 9 (24%) did not (2 acute NHS trusts, 2 primary care service providers, 1 health visiting service, 1 mental health NHS trust, 1 GP practice, 1 community pharmacy and 1 higher education institute).

27 (73%) organisations actively promote and participate in <u>International Infection Prevention Week</u> (held annually in October) and 9 (24%) did not (3 acute NHS trusts, 2 primary care service providers, 1 mental health NHS trust, 1 GP practice, 1 community pharmacy and 1 higher education institute).

26 (70%) organisations actively promote and participate in <u>World Hand Hygiene day</u> (held annually on 5 May) and 9 (24%) did not (2 acute NHS trusts, 2 primary care service providers, 1 mental health NHS trust, 1 GP practice, 1 community pharmacy, 1 health visiting service and 1 higher education institute).

## Infection prevention and control education

A variety of learning formats are used to provide infection prevention and control education to both clinical and non-clinical staff and includes face to face training (lectures etc.); distance learning or external e-learning (online); internally developed e-learning; videos; posters and leaflets; learning books; practical assessment of competence; and tests.

For clinical staff these formats covered learning on hand hygiene (89% of organisations); management of blood and body fluid spillage (84% of organisations); management of occupational exposure [including sharps] (84% of organisations); management of the environment (84% of organisations); personal protective equipment [PPE] (84% of organisations); management of care equipment (84% of organisations); aseptic technique (84% of organisations); catheter insertion (78% of organisations); line insertion (70% of organisations); and decontamination [endoscopy] (68% of organisations).

For non-clinical staff these formats covered learning on hand hygiene (78% of organisations); management of blood and body fluid spillage (70% of organisations); management of occupational exposure [including sharps] (70% of organisations); management of the environment (70% of organisations); personal protective equipment [PPE] (68% of organisations); management of care equipment (65% of organisations); aseptic technique (49% of organisations); decontamination [endoscopy] (46% of organisations); catheter insertion (43% of organisations) and line insertion (43% of organisations).

Responses on good practice examples received included:
- "Monthly IPC newsletter sent to all users"
- "Pocket guides"
- "Webpage for the European antibiotic awareness campaign, with links to resources"
- "Short sharp targeted training in clinical areas"
- "Additional learning package on our IPC website"
- "Monthly 'bug of the month' newsletter to all in the trust"
- "Quarterly Infection Matters newsletters"
- "Ad hoc hand hygiene sessions as requested"
- "Scenario and quiz based mandatory training with the attendees being in teams - they are also required to demonstrate the correct wearing and removal of personal protective equipment"
- "One staff member responsible for Infection control attends meetings and disseminates to staff".

Learning formats are used for meeting this requirement:

| Options | FF | DL | ID | V | PL | LB | PA | T | O |
|---|---|---|---|---|---|---|---|---|---|
| Hand Hygiene | 16 | 2 | 3 | 0 | 2 | 0 | 5 | 0 | 5 |
| Personal protective equipment (PPE) | 17 | 2 | 4 | 0 | 1 | 0 | 2 | 0 | 5 |
| Management of blood and body fluid spillage | 14 | 4 | 5 | 0 | 1 | 0 | 2 | 0 | 5 |
| Management of occupational exposure (including sharps) | 14 | 5 | 5 | 0 | 1 | 0 | 1 | 0 | 5 |
| Management of the environment | 14 | 4 | 5 | 0 | 0 | 0 | 1 | 0 | 7 |
| Management of care equipment | 12 | 4 | 5 | 0 | 2 | 0 | 1 | 0 | 7 |
| Aseptic technique | 12 | 6 | 4 | 0 | 0 | 0 | 4 | 0 | 5 |
| Decontamination (endoscopy) | 8 | 3 | 2 | 0 | 1 | 0 | 3 | 0 | 8 |
| Catheter insertion | 13 | 1 | 2 | 0 | 0 | 0 | 7 | 0 | 6 |
| Line insertion | 11 | 0 | 2 | 0 | 0 | 0 | 7 | 0 | 6 |

**Option**: *[FF] face to face training (lectures etc.); [DL] distance learning or external e-learning (online); [ID] internally developed e-learning; [V] videos; [PL] Posters and leaflets; [LB] learning books; [PA] practical assessment of competence; [T] tests; [O] Other.*

Use of nationally available resources are as follows:
- Skills for Care – Care Certificate: 57% of respondents.
- National Skills Academy – Level 1 training on infection prevention and control (clinical) e-learning course: 50% of respondents.
- e-Learning for Health (eLfH) – Level 2 training on Infection Prevention and Control e-learning course: 43% of respondents.
- e-Learning for Health (eLfH) – Level 1 training on Infection Prevention and Control e-learning course: 36% of respondents.
- National Skills Academy – Level 2 training on infection prevention and control (non-clinical) e-learning course: 36% of respondents.

# Discussion

We received a low response rate to this survey although respondents came from a variety of settings.

From the information we collected we can deduce that:
- Awareness of HEE's introductory e-learning session on antimicrobial resistance is high.
- More than half of the respondents found this session beneficial in raising health-worker awareness on antimicrobial resistance and/or infection prevention and control and/or antimicrobial stewardship.
- More than half are not actively promoting this session to staff although there is enthusiasm for organisations to do more to promote this to staff.
- The majority of organisations are recommending this session as a non-mandatory training resource although more than half will consider making this mandatory for all staff.
- There are a number of barriers that prevent organisations from adopting this session as part of their core staff training e.g. IT access issues, module awareness, staff time and commitment pressures, existing / competing mandatory training requirements, target audience for the module, and other available learning sessions.
- More than half of respondents use other training sessions for educating staff on antimicrobial resistance.
- Participation of organisations in national awareness raising campaigns is high.
- Infection prevention and control education amongst both clinical and non-clinical staff is high although hand hygiene training for non-clinical staff could improve.
- Face to face training (lectures etc.) is the most popular format for delivering infection prevention and control education.

These deductions and potential solutions have been discussed in-depth below.

## Access to the antimicrobial resistance introductory learning module

From the responses received on the awareness of the introductory e-learning session, the numbers that have found this session beneficial, and are actively promoting this session to staff are encouraging. Even more encouraging is the number that have said they will consider making this session mandatory for all staff. Although no organisations are currently using this session during 'periods of increased incidence' or outbreaks of infection; as part of staff training during 'special measures'; induction training for clinical staff only; and mandatory update for all clinical staff only; there may be scope to do this in the future.

The learning session can be found on the e-Learning for Healthcare (eLfH) platform that is a Health Education England programme, run in partnership with the NHS and professional bodies. The platform is freely available for the training of the NHS workforce across the UK, and all staff with NHSmail email accounts can register including those with an OpenAthens account, and it can also be accessed via the NHS electronic staff record (ESR). Care home staff, hospice staff and social care professionals can also freely access this session. Staff are encouraged to register and to log in to the e-LfH Hub before enrolling on to the session / antimicrobial resistance programme. Doing so will enable the collection of data on the number of individuals that complete this session to support national reporting. More details can be found on the 'how to access' webpage.

Organisations and staff outside the NHS and social care setting can also access this session via the open access option without having to log in. However, data on the number of individuals that complete this session cannot be collected via this option as it is not tracked and individuals will not be able to generate a record of completion. Therefore, all NHS and social care staff are encouraged to log in as highlighted above.

For organisations that have invested in their own learning management systems (LMS), the eLfH team can make content available if the LMS supports a particular e-learning technical standard called the 'aviation industry CBT [computer-based training] committee' (AICC) standard. The only drawback is that the eLfH platform/team will not be able to collect data on the numbers who have completed this learning session. Organisations will need to collect this information through their learning management systems and report externally if needed.

The eLfH team has recently been working with Oxford University Hospitals NHS Trust to make the antimicrobial resistance introductory learning session available via the organisations own learning management system as part of their mandatory training for staff. The learning management system is currently provided by a company called 'enterprise study' and the eLfH team has been able to successfully transfer over content from the antimicrobial resistance introductory learning session. Plans are underway to share other learning sessions found on the eLfH platform with the Trust too.

Enquiries about this should be directed to the eLfH support team.

## Enhancing staff antimicrobial resistance awareness

Infection prevention and control is an integral part of antimicrobial resistance prevention strategies as highlighted by the 'O'Neill review on antimicrobial resistance' (2016). In response to this review, the government aims to reduce healthcare associated Gram-negative bloodstream infections in England by 50% by 2020 (DH 2016a).

Training on infection prevention and control is a requirement of the Health and Social Care Act 2008 Code of Practice on the prevention and control of infection and related guidance. Therefore, healthcare and training providers need to ensure that this training covers aspects on the prevention of antimicrobial resistance and the ambitions to reduce healthcare associated Gram-negative bloodstream infections in England by 50% by 2020 (DH 2016a). As face to face training (lectures etc.) is the most popular format for delivering infection prevention and control education, local educators and infection prevention and control leads working with the antimicrobial management team should consider actioning this locally. Reference to the antimicrobial resistance introductory e-learning session could also be made as part of these locally delivered training sessions to help address any gaps in learning needs. Locally developed e-learning on infection prevention and control should also include awareness on antimicrobial resistance and the new ambitions mentioned above and could signpost learners to the antimicrobial resistance introductory e-learning session.

All infection prevention and control training formats could make reference to the antibiotic guardian campaign and encourage learners to sign-up as antibiotic guardians. Organisations could encourage staff involvement in national awareness raising campaigns such as the European Antibiotic Awareness Day (EAAD, held annually on 18 November) and World Antibiotic Awareness Week (WAAW, held in the same week as EAAD); International Infection Prevention Week (held annually in October); and World Hand Hygiene day (held annually on 5 May). Locally delivered campaigns could include awareness on the threats posed by antimicrobial resistance (CMO 2013 & O'Neill 2014) and could be used to promote the antimicrobial resistance introductory e-learning session and antibiotic guardian campaign. Locally, such awareness raising could be extended from health and social care settings into other settings, for example educating children and teenagers on antimicrobial resistance using e-bug resources. Commissioners could benefit from the infection prevention and control commissioning toolkit developed jointly by the Royal College of Nursing (RCN) and the Infection Prevention Society (IPS).

NHS Improvement has recently launched an improvement resource to help health and social care economies reduce the number of gram-negative bloodstream infections (BSIs) with an initial focus on Escherichia coli (E.coli). This makes reference to the antimicrobial resistance introductory e-learning session and additional resources on infection prevention and control available on the eLfH platform.

The eLfH statutory and mandatory training for infection prevention and control (Level 1) learning has session has been designed to meet the relevant learning outcomes in the UK Core Skills Training Framework and core components of the Advisory Committee on Antimicrobial

Resistance and Healthcare Associated Infections (ARHAI) and Public Health England (PHE) antimicrobial prescribing and stewardship competencies.

This learning session has recently been updated to include elements of antimicrobial resistance in addition to the new ambitions mentioned above. Learners have been encouraged to sign-up as antibiotic guardians and they have been encouraged to undertake further learning via antimicrobial resistance the introductory e-learning module. The eLfH statutory and mandatory training for infection prevention and control (Level 2) session is currently undergoing an update and will make similar references. *

\* Both the Level 1 and Level 2 statutory and mandatory infection prevention and control sessions are currently not available via the AICC standard to allow remote access via organisations individual learning management systems. These new sessions have been developed within a new e-learning authoring tool/framework called 'Adapt' which handles display and navigation through the sessions on both desktop and tablet/phone devices. Work is underway on introducing the AICC functionality to these sessions that should be completed in the foreseeable future.

# Conclusion

Awareness of the introductory e-learning session on antimicrobial resistance is good and that respondents found this session beneficial in raising health-worker awareness of antimicrobial resistance (infection prevention and control and/or antimicrobial stewardship). The number of organisations who are actively promoting this session to staff could improve. There are opportunities to utilise this session as part of mandatory, induction and/or non-mandatory training specifically during 'periods of increased incidence' or outbreaks of infection and during 'special measures'. As infection prevention and control training is mandated for all staff, antimicrobial resistance awareness could be covered as part of these mandated sessions by health and social care and training providers. National infection prevention and control learning sessions could mention the threats posed by antimicrobial resistance (CMO 2013 & O'Neill 2014) and the new national ambitions to reduce healthcare associated Gran-negative bloodstream infections in England by 50% by 2020.

To help achieve the aims above, we have set out a number of actions targeted at ourselves, and recommendations healthcare providers and other stakeholders.

# Actions and recommendations

## Actions agreed by Health Education England

1. Ensure that the educational package targeted at management and executive teams to be created this year on sepsis covers elements of antimicrobial resistance, infection prevention and control and antimicrobial stewardship (HEE 2016 & HEE 2017).

2. Include learning sessions on infection prevention and control and antimicrobial resistance within the guide that signposts prescribers and other staff to available educational sessions that will help support learning in the system (HEE 2017).

3. Include elements of infection prevention and control and antimicrobial resistance and stewardship as part of the work exploring the role of an individualised online formative assessment tool for health students and professionals (HEE 2016a & HEE 2017).

4. Update learning materials found on the eLfH platform to reflect the new national ambitions to reduce healthcare associated Gram-negative bloodstream infections in England by 50% by 2020.

5. Work with NHS Improvement and Public Health England to improve information sharing around antimicrobial resistance training focussing on the educational resources that can be made available to support the target to reduce Gram-negative healthcare acquired infections.

6. Create a centralised webpage on the eLfH platform for education and training resources around antimicrobial resistance - infection prevention and control and antimicrobial stewardship.

7. Promote learning resources on antimicrobial resistance, infection prevention and control and antimicrobial stewardship via our Technology Enhanced Learning (TEL) Hub,currently being built.

8. Consider feedback on improvements that could be made to the introductory e-learning session on antimicrobial resistance as part of future updates.

## Recommendations to healthcare and training provider

1. Promote the introductory e-learning session on antimicrobial resistance to all staff in both the public and private sectors.

2. Consider covering antimicrobial resistance as part of training solutions for learners via training frameworks or educational training sessions on infection prevention and control.

3. Consider the inclusion of the threats posed by antimicrobial resistance to the future of modern medicine (CMO 2013 & O'Neill 2014) within mandatory infection prevention and control training at induction and updates.

4. Raise awareness of the new national ambitions to reduce healthcare associated Gram-negative bloodstream infections in England by 50% by 2020 as part of training solutions provided to staff around infection prevention and control, antimicrobial resistance and antimicrobial stewardship.

5. Assess the role of the introductory e-learning session on antimicrobial resistance as part of mandatory, induction and/or non-mandatory training specifically during 'periods of increased incidence' or outbreaks of infection and during 'special measures'.

6. Consider the role of nationally available training materials on antimicrobial resistance - infection prevention and control and antimicrobial stewardship as part of local staff training solutions.

7. Consider the role of national awareness raising campaigns in improving staff awareness on the threats posed by antimicrobial resistance (CMO 2013 & O'Neill 2014) and new national ambitions on antimicrobial resistance, infection prevention and control and antimicrobial stewardship.

8. Promote the Antibiotic Guardian campaign  and encourage staff in both the public and private sectors to sign-up as antibiotic guardians.

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# Appendixes

## Appendix 1: Respondents

Airedale NHS Foundation Trust
Birmingham Community Healthcare Foundation Trust
Bridgewater Community Healthcare NHS Foundation Trust
Buckinghamshire Healthcare NHS Trust
Calderdale and Huddersfield NHS Foundation Trust
Carlton Group Practice
Cheshire and Wirral Partnership NHS Foundation Trust
Christie NHS Foundation Trust
Colchester Hospital University NHS Foundation Trust
County Durham and Darlington NHS Foundation Trust
Doncaster and Bassetlaw Hospitals NHS Foundation Trust
East Sussex Healthcare NHS Trust
Hertfordshire Community NHS Trust
Hertfordshire Partnership University Foundation Trust
Hull and East Yorkshire Hospitals NHS Trust
Humber NHS Foundation Trust
James Paget University NHS Foundation Trust
Leeds Community Healthcare NHS Trust
Lincolnshire Community Health Services NHS Trust
NHS Bromley CCG
Nottinghamshire Healthcare NHS Foundation Trust
Nottingham University Hospital NHS Trust
PCT Healthcare Ltd
Sheffield Children's NHS Foundation Trust
Sheffield Teaching Hospitals NHS Foundation Trust
South London and Maudsley NHS Foundation Trust
Stockport NHS Foundation Trust
Sussex Community NHS Foundation Trust
Teesside University
The Robert Frew Medical Centre
West Hertfordshire Hospitals NHS Trust
West Suffolk NHS Foundation Trust
Wye Valley NHS Trust
York medical group

## Appendix 2: If you have been actively promoting this module, how have you encouraged staff to use this?

| Additional information on promoting / encouraging use | Themes |
|---|---|
| "Discussing with my team, planning with my team" | Still planning |
| "Future promotion of package" | |
| "We are still in the process of instigating this module" | Future promotion |
| "As part of infection control teaching at Trust Friday lunch time teaching" | As part of infection control teaching |
| "We have not used the module to date, however we are now considering adding it to our trust Intranet site and encouraging all staff to complete" | Adding to trust intranet site |
| "Not implemented this in the organisation as yet" | Share with our L&D team |
| "Not applicable" | |
| "I was not aware until receiving this e -mail but would plan to share with our L&D team" | |
| "Mandatory learning for those students on the Specialist Practice Qualification district nursing programmes" | |
| "Direct students to the site" | |

## Appendix 3: Please state what barriers and gaps prevent you/your organisation from adopting this module as part of your core staff training (if any)?

| Perceived barriers and gaps | Themes |
|---|---|
| "It doesn't work with our IT setup, so we can't use it" | IT setup issues |
| "Releasing staff for a period of time to be able to complete the module in addition to existing mandatory training requirements" | Time to complete session |
| "To be assessed" | |
| "Time to complete this training" | Capacity issues and staff resource pressures |
| "None identified to date" | |
| "Capacity issues and current pressures on staffing resources" | |
| "Currently IT access difficult as not on the learning platform" | Existing / competing mandatory training requirements |
| "Access to IT, we already have a number of competing e-learning programmes" | |
| "Content not felt adequate for clinical staff" | Competing e-learning programmes |
| "Have to make it mandatory for clinical staff, so data can be collected" | |
| "The main barrier is time for staff to complete the module as clinical staff will still be required to attend the mandatory infection control training" | Content not adequate for clinical staff |
| "Competing priorities for mandatory training and adopting AMR e-learning for mandatory training. How to keep records of completion" | Data only if mandatory training |
| "This hasn't been implemented in the organisation as yet but this will be looked at in the near future" | Lack of awareness |
| "Only just become aware of it-will be promoting it" | Target audience |
| "Cumbersome and difficult to access" | |
| "Not applicable" | |
| "Acute external pressures on services. The mandatory training requirements currently in place." | |
| "N/A" | |
| "No communication about course to staff members at our level" | |
| "I think once aware they may adopt" | |
| "They have only just found out about the package" | |
| "None at this time" | |
| "Time to complete training" | |
| "The greater awareness of the programme. Whether this will be accessible via branch computer systems. The time element to complete for all levels of staff" | |
| "Training for staff available on trust statutory training day" | |
| "None" | |
| "More suitable for students working out in clinical practice, but do have some staff who a have undertaken the module" | |
| "We are competing an alternative on line training" | |

## Appendix 4: What improvements could be made to this module to enhance uptake and address your organisation's learning needs around antimicrobial resistance for all staff, or for specific staff groups (if any)?

| Improvements to enhance uptake and address learning needs | Themes |
| --- | --- |
| "Paediatric specific module. Even where concepts are transferable, staff working in paediatrics tend not to engage when modules appear adult-focused" | Paediatric specific module |
| "Mandatory status within the trust" | Make mandatory / compulsory on induction and update |
| "More concise" | |
| "Linkage of the hand hygiene section to the 5 moments" | Linking to the 5 moments of hand hygiene |
| "To ensure this is placed on the learning platform for all staff groups to access" | Locate on a platform accessible to all staff groups |
| "Not having to register for access" | No registration |
| "Content is very basic" | Content very basic |
| "None" | |
| "Current e-learning is very good in covering the basics. Would need more information for prescribers with possible case examples to achieve senior level buy in" | More information for prescribers |
| "Make it easier to access and use" | |
| "Not applicable" | Suitable for clinical staff |
| "Comprehensive as is" | |
| "This would be suitable for our clinical staff however some staff in other areas would not consider this useful" | Comprehensive as is |
| "Unable to comment" | |
| "Communication and course should be compulsory for all staff. Include on update days or mandatory training" | Better promotion / advertising |
| "Needs to be better promoted" | |
| "None, it is a very good for all levels of staff" | Good for all levels of staff |
| "None at this time" | |
| "Easier to access the links some staff couldn't access module" | Access issues |
| "Unsure at the moment" | |
| "It is a good broad introduction to the subject although quite basic for those who already have a healthcare qualification which these students do" | |
| More awareness through advertising | |