HSC Public Health Agency

Transmit

Health protection service bulletin

December 2015: Issue 9

Foreword

In the final Transmit of 2015, we have focussed on Antimicrobial Resistance and Healthcare Associated Infection.

The first article on Carbapenemase-producing Enterobacteriaceae illustrates the increasing public health threat arising from antimicrobial resistance when the drugs don't work. Most of the reports were from hospital settings affecting a range of age groups.

The second article describes an enhanced surveillance system for Clostridium difficile in community and primary care settings. It was noted that almost three quarters of "Community onset" Clostridium difficile had recently been on antimicrobials and two thirds had been hospitalised in the previous four weeks.

Tackling antimicrobial resistance and improving antimicrobial stewardship will be a priority for our service in 2016.

I would like to wish all our readers a Merry Christmas and good health in 2016.

Lorraine Doherty

Assistant Director of Public Health
(Health Protection)

Contents

Surveillance of Carbapenemase-producing Enterobacteriaceae (CPE) in NI

Overview

Carbapenems are commonly known as '*the antibiotics of last resort*' in the treatment of otherwise drug-resistant infectious diseases. However, carbapenems' clinical utility may be running out with the emergence of carbapenemase, which has threatened their ability to fight multi-resistant infections. Carbapenemase-producing organisms (CPOs), which include gram negative bacteria such as Enterobacteriaceae ("CPEs": E.coli, *Klebsiella* and *Enterobacter*) have emerged as a significant challenge in the past 20 years, not only because of their resistance profile, but also because of their potential for high rates of endemicity and mortality.

Enhanced Surveillance – 'Drug-Bug' Combinations in NI

The collection of all "unusual" drug-bug combination reported to PHA commenced in May 2012. These data are collected through two sources:

- Notifications received through the Health Protection Duty Room acute service (as part of clinical risk assessments) *and*

- Notifications received through E-lab reporting system from Public Health England reference laboratory.

These notifications form the basis of the enhanced surveillance of all CPE and CPO isolates reported to the PHA. Information such as patient demographics, specimen details, treatment and outcomes are collected and summarised.

Public Health England (PHE) has recently launched an enhanced surveillance programme for Carbapenemase-producing Gram-negative bacteria using an electronic reporting system. The system collects information on patient demographics, laboratory/specimen details, healthcare setting and risk factors. To ensure comparability and consistency across programmes, we are reviewing our current drug-bug reporting proforma to align with enhanced surveillance data collected by PHE. Notable changes include foreign travel history, current treatment details, inpatient information, and details related to screening and potential patient contact. A copy of the refreshed drug-bug proforma will be shared with HSC colleagues in early 2016.

Epidemiological Summary of CPE in NI

- Between 10/10/2011 (CPE surveillance commenced) and 20/11/2015 there have been 41 CPE reports of to PHA. The majority of organisms reported were *Klebsiella pneumonia* (68%, 28 reports), followed by *Enterobacter* sp (20%, 8 reports) and *Escherichia coli* (12%, 5 reports).

- Of 41 reports, 9 were from a community setting and 32 were from a hospital setting (Figure 1); 21 (51%) were female and 20 (49%) were male.

- 19 reports were from patients over the age of 65 (46%). 11 reports (27%) were from those between the ages of 55 and 64, and 11 (27%) were from those under the age of 55.

- **In 2015 so far,** 12 cases of CPE have been reported with varying resistance mechanisms (5 NDM, 5 VIM and 2 OXA48 (Figure 2)). Ten CPEs were reported from Belfast HSC Trust and two from Southern HSC Trust.

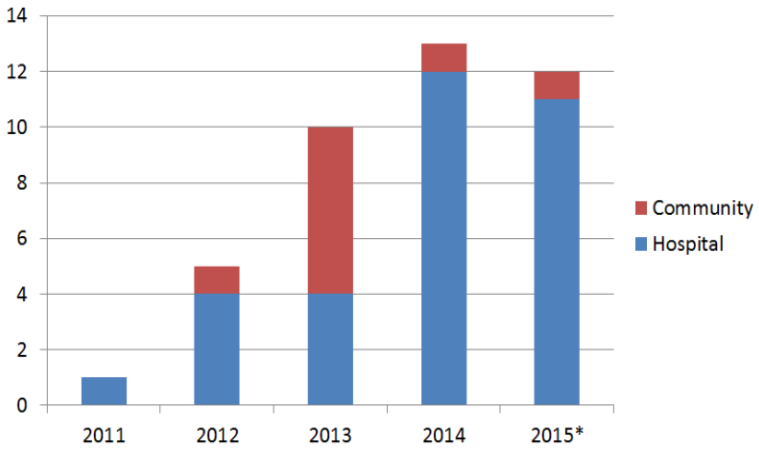

Figure 1 Carbapenemase-producing enterobacteriaceae by patient location at diagnosis in Northern Ireland, 2011-2015

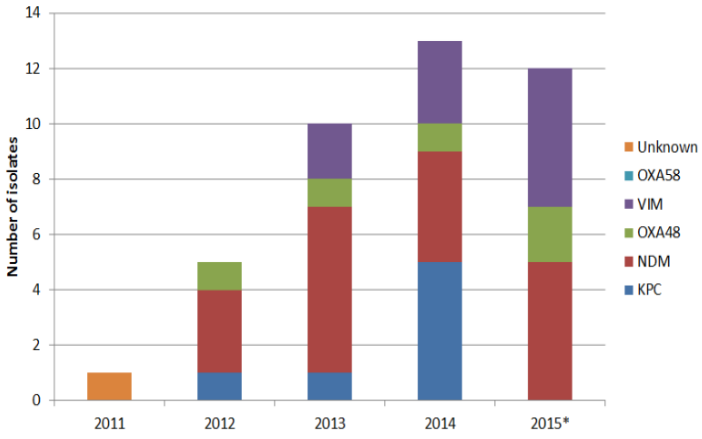

Figure 2 Carbapenemase-producing enterobacteriaceae confirmed isolates by resistance mechanism, in Northern Ireland, 2011-2015

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Surveillance of *Clostridium difficile* (CDI) in community and primary care settings

Overview

An enhanced surveillance programme for *Clostridium difficile infection* (CDI) began in January 2011. A '*Clostridium difficile* reporting form' (CDI-2) was created to capture information on CDI cases in community, primary care and emergency department settings. The CDI-2 proforma captures information on the patient's personal details, laboratory data, antimicrobials prescribed and risk factor information including previous hospitalisation. In 2011 a 'Community CDI Bulletin' was designed to report data collected through this enhanced surveillance programme. The latest edition of this bulletin, Issue 9 presenting data from 1st January - 30th June 2015 was circulated on 15th October 2015.

Surveillance Summary

307 CDI episodes were reported through the CDI surveillance system between 1st January and 30th June 2015 (Table 1).

The following definitions are used for attribution of CDI cases:

Hospital onset, community associated – a CDI that is identified less than 3 days following admission to a hospital and considered less likely to be associated with the current hospital stay.

Hospital onset, hospital associated - a CDI that is identified more than 3 days following admission to a hospital and considered more likely to be hospital associated.

Community onset, community associated - a CDI that is identified in the community where the patient has no history of admission to a hospital.

Community onset, hospital associated - a CDI that is identified in the community less than 4 weeks following discharge from a hospital and considered more likely to be hospital associated.

Table 1: Attribution of CDI episodes in Northern Ireland, 1st January to 30th June 2015 (N=307).

Categorisation	**Community Associated** (n=150)	**Hospital Associated** (n=151)	**Unknown** (n=6)
Hospital Onset (n = 203)	96	107	0
Community Onset (n = 104)	54	44	6

CDI cases classed as Community Onset

Source of stool:
Of a total of 104 "Community Onset" specimens, 58 (56%) were sent/requested by GP, 41 (39%) were sent/requested by a Nursing Home, 3 (3%) by a Residential Home and 2 (2%) by a Hospice.

Infection classification:
The following definitions are used to classify CDI cases:

New Infection - no previous history of a CDI

Continuing Infection - on-going CDI infection with no recovery since the initial notification

Repeat Infection - a CDI sample taken within 28 days of the initial infection

Relapse Infection - reoccurrence of the same CDI strain which tends to occur within the first two weeks after treatment has stopped

Of a total of 104 specimens, 59 (57%) were classified as having a new infection, 9 cases (9%) had a continuing infection, 32 cases (31%) had a repeat/relapse infection and classification for 4 cases (4%) was unknown at the time of surveillance.

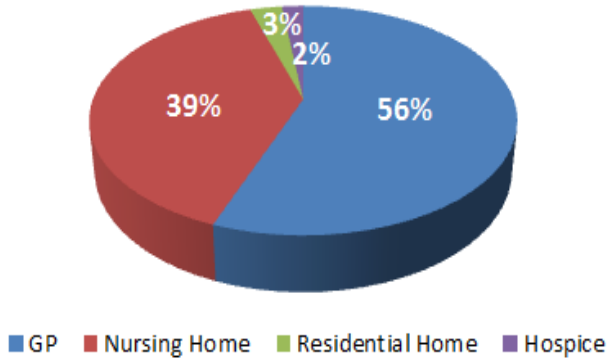


Figure 1. Source of Stool sample

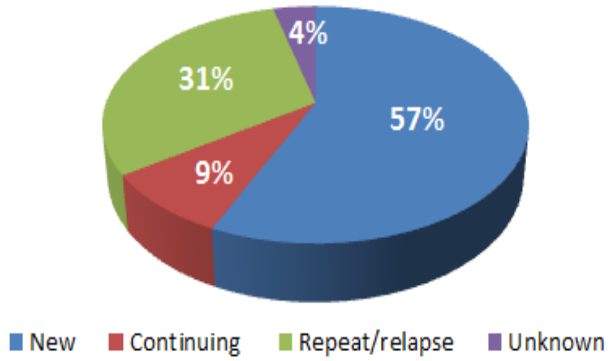
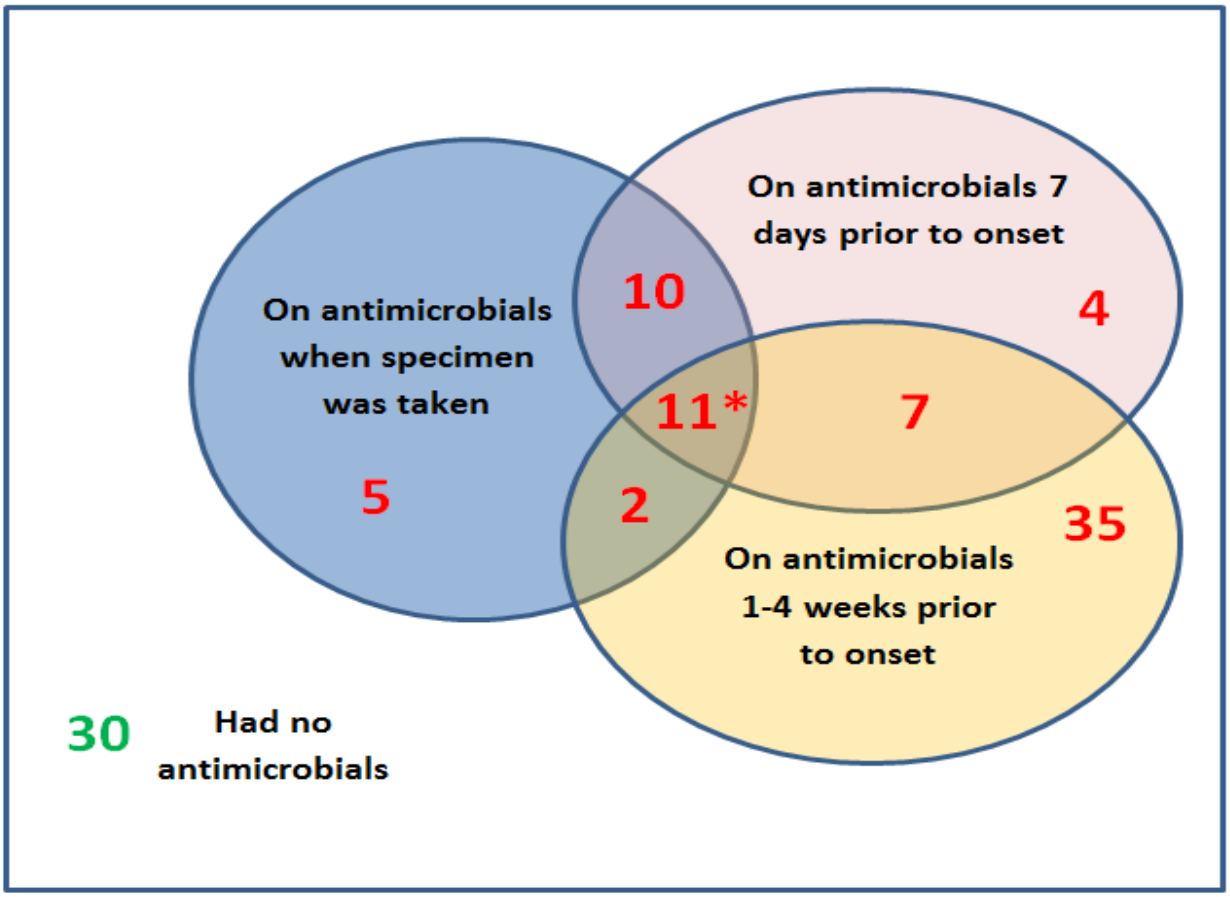


Figure 2. Class of Infection

Antimicrobial Therapy:
Prior to symptom onset, 66 out of 104 CDI cases (66%) were not on antimicrobials.
74 CDI cases (71%) classed as “Community Onset” were on antimicrobials either when specimens were taken, within the 7 days prior to symptom onset or within the previous 1 to 4 weeks.

Figure 3:



Antimicrobial Therapy

Previous hospital contact
Almost two thirds of CDI cases (45 cases, 64%) classified as 'Community Onset' had been hospitalised within the previous 4 weeks. 17 cases (24%) had been hospitalised in the previous 4 to 12 weeks and 6 (9%) had attended as an Outpatient. 2 patients (3%) had visited a hospital facility 4 weeks prior to their diagnosis.

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Surgical Site Infection (SSI) Surveillance

Innovative Data Capture
Standard data collection methods for SSI surveillance have traditionally focused on collecting patient level information on each operation, irrespective of whether there was an infection or not. These data included risk factor information, thus facilitating risk-adjusted, inter-hospital comparisons. In 2011, European Centre for Disease Prevention and Control (ECDC) introduced a new 'light' methodology for unit/ward-based SSI surveillance.

The light protocol is less labour intensive and requires fewer resources than the 'standard' protocol. It enables local teams to collect information only for the surgical site infections detected. However, to improve the quality of inter-hospital comparisons, post-operative SSI rates must be risk-adjusted, so that variations due to differences in patient case-mix are reduced.

Our HCAI Surveillance Team explored the possibility of providing risk-adjustment while also reducing the workload for clinical teams by combining elements of both the 'Standard' and the 'Light' surveillance protocols. To achieve this 'hybrid' methodology data collection was split into two areas: denominator data and numerator data.

Denominator Data (patient/procedure data):
In conjunction with PHA, Trusts provide denominator data on each patient/operation from an existing information source – namely Theatre Management System (TMS). Information recorded in TMS includes most of the required data elements to facilitate risk-adjustment.
Numerator Data (surgical site infection data):

PHA designed a WebForm to collect a core set of data on each surgical site infection developed post-operatively. All patients are monitored for signs of infection until discharge from hospital, readmission to the operating hospital or another hospital. If a surgical site infection is identified a WebForm is completed and data is submitted via a secure website to PHA. Infections (numerator data) are then merged with the procedure (denominator data) that led to the development of the infection.

Roll-out of the new SSI 'hybrid' methodology
SSI surveillance following orthopaedic procedures was chosen as the first specialty to implement this methodology. Each Trust completed a Data Access Agreement for transmission of TMS data to PHA.

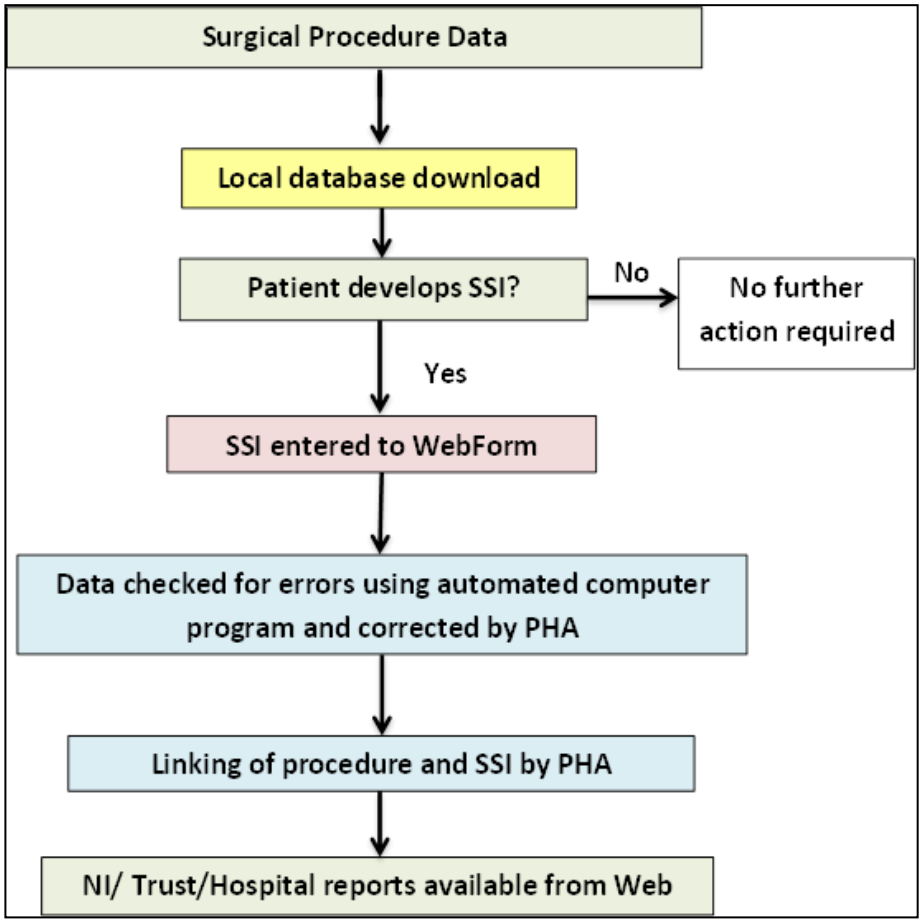
The roll-out was implemented on a hospital-by-hospital basis and training was provided to the relevant staff. Craigavon Area Hospital commenced in July 2014 and all other hospitals had transitioned to hybrid methodology by July 2015.

The benefits of this new 'hybrid' methodology are significant:

- Remove paper forms - eliminates 95% of workload on clinical staff
- Eliminates data processing for PHA surveillance staff
- Captures all surgical site infections – inpatient, readmissions, post-discharge
- Infections are accurately attributed to the correct hospital and procedure
- In-built validation checks – higher quality data with fewer errors
- Risk stratification is maintained

Future
We intend to extend this methodology to the other surgical specialties where SSI surveillance is mandated (e.g. caesarean section). This methodology will also be used to expand surveillance to surgical specialties that have, up to now, not benefitted from participation in a regional SSI surveillance programme.

PHA SURGICAL Site infection Data Handling Process



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Point Prevalence Survey of healthcare associated infections (HCAIs), antimicrobial use 9AMU) and device use in Northern Ireland – PPS 2017

In 2011/12, the European Centre for Disease Control (ECDC) co-ordinated a European-wide point prevalence survey of healthcare-associated infections, antimicrobial use and medical device use (PPS 2012).

All 16 hospitals providing acute care in Northern Ireland participated in PPS 2012. Of 3,992 patients surveyed, 166 had 1 or more healthcare–associated infection (prevalence: 4.2%; 95% CI: 3.6-4.8). The most common infections were pneumonia and surgical-site infections. Almost one-third (30%) of patients surveyed were receiving antimicrobials. The highest antimicrobial use was reported in adult intensive care units followed by medical wards. The most frequently recorded micro-organisms were *Staphylococcus aureus*, Enterococcus spp.; Proteus spp.; *Escherichia coli* and *Clostridium difficile*.

ECDC has announced its intention to repeat the PPS survey across. Member States are asked to undertake the survey at one particular point between 2016 and 2017. The survey outcomes will provide a better understanding of the burden of all types of healthcare–associated infections and antimicrobial and device use across acute care patient groups in each Member State.

The Strategic Antimicrobial Resistance & Healthcare Associated Infection (SAMRHAI) Group in DHSSPS has endorsed Northern Ireland's participation in PPS 2016/17, advising that acute hospitals across HSC would participate. DHSSPS will issue a letter, in early 2016, indicating that data collection for PPS 2016/17 will be undertaken in April/May 2017 in Northern Ireland.

The PPS 2017 survey will provide local hospitals with information to help target areas for HCAI prevention and control. It will also be significant in its ability to inform current practices in antimicrobial prescribing and stewardship.

PHA's HCAI Surveillance Team will provide training and support for HSC staff involved in PPS 2017, using ECDC prepared materials and protocols. Further information will be provided in the coming months. It is very important that we have a full understanding of infections and antimicrobial use across HSC. Your assistance in ensuring the success of the survey will be very much appreciated.

The programme of work will be led by:

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Survey for Independent Sector Care Homes

Introduction

In February 2015 all Independent Sector Care Homes were invited to participate in a short survey about the support they receive from Health Protection Nursing Team in PHA. In addition to general information (e.g. Location of Care Facility, Position of individual completing the survey and IPC Education of staff in the facility), the survey addressed risk assessment support, facility visits and the IPC Link System for Independent Sector Care Homes provided by PHA HP Nursing Team.

Method

SurveyMonkey was used to create the survey, collect responses and analyse the results. Participation in the survey was voluntary and Care Homes participated anonymously in the online survey. A total of 460 Independent Sector Care Homes were invited to participate and 113 responses were received; a response rate of 25%. The responding facilities provide a range of specialist care to their residents and the survey was completed by a variety of staff within participating the Care Homes; facility owners, managers and other members of staff e.g. nursing and/or care staff and administrators.

Results

General Information

All but one of the facilities who participated in the survey receives IPC Training with the majority of responses indicating that this training is delivered annually (91%). Less than 10% receive IPC Training less frequently or more often; 6% receive training twice a year and 3% receive it every two years or more frequently if requested e.g. if there is an outbreak of infection. IPC training is facilitated both internally within the Care Homes (44%) and externally by a private provider (35%). The mode of delivery varies from face to face training (75%) to E-learning (42%) and other methods (5%) including accessing HSC Trust IPC training or using DVDs and questionnaire.

Health Protection Nurse Risk Assessment/Support Visits

Approximately one third (35%) of the facilities surveyed indicated that they had had a visit from a member of PHA HP nursing team within the last 4 years. The majority of these visits were undertaken in response to a care of *Clostridium difficile* infection (30%) or an outbreak of vomiting and diarrhoea (30%). Other reasons for a facility visit included an outbreak of infection such as PVL or iGAS, to provide training/education and in response to an outbreak of Flu.

Over 90% of respondents were fully informed, prior to the visit, as to the reason why the visit was being undertaken and a suitable date and time for the visit was prearranged. Some Care Facilities may not have been fully informed of the reason, as a support visit may have been required urgently e.g. on request from RQIA or if there was suspicion of an outbreak of *Clostridium difficile* infection.

Over 80% indicated that they found the visit very helpful, and less than 20% found the visit quite helpful; none indicated that they found the visit to be unhelpful. All of the respondents found the advice and guidance provided at the time of the visit was clear and relevant with over 50% receiving supplementary information after the visit had taken place.

> The nurse was very helpful on her visit; our HPN was terrific and really helped us; very helpful, great service making sure things are being done right – another pair of eyes.

IPC Link System for Independent Sector Care Homes

An IPC link system was established by PHA in 2011. Each of the Independent Sector Care Homes were asked to identify a member of their staff to be their 'IPC Link Practitioner'; that person was a key member of staff who would act as a key liaison between the Care Home and the PHA.

Just over 65% of the respondents to this survey were aware of/familiar with the IPC Link System. Three quarters of the facilities have a named IPC Link Nurse/Person with 21% having a named Nurse/person responsible for antibiotic stewardship within the facility. Less than half (44%) of the Care Homes who participated had actually attended an IPC Link meeting hosted by PHA between 2011 and 2013. The majority of those who attended a meeting found them to be very useful or quite useful and over half of those who attended suggested that the information obtained at the meeting was shared with other staff members in their facilities. 90% stated that the location of the IPC Link Meetings was suitable and the majority (94%) thought that the IPC Link System was a worthwhile service.

> What benefits does a IPC Link System provide? Up to date information and reiterating importance of procedures, sharing of information, facility to share experiences, links the Homes to best practice guidance, creates an awareness of IPC within the Private Sector, very informative and interesting and a good source of information

Varying preferences were expressed regarding for preferred frequency and duration of any future IPC link meetings; it was a fair split between 2–4 hours/4 times a year, half a day biannually or a full day annually.

> This is an invaluable link to the Independent Sector, Link system meetings were excellent, positive outcome for all, and it depends on staffing levels whether people could attend, please provide the continued support – very much needed and please bring them back

Summary

This survey of Independent Sector Care Homes, addressed the PHA HP Nursing Team support for risk assessment, facility visits and the IPC Link System. It provided Care Homes with an opportunity to feedback on the service they have received from our Team. It also provided us with information to improve our service and to inform future work we will undertake with care homes.

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IPC Pilot Projects with Independent Sector Care Homes

The following pilot projects are currently in progress with care homes, each is being led by a member of HP Nursing Team in PHA:

- **Improving knowledge and management of MRSA in the care home setting** – this is a study to determine the current knowledge of care home staff about MRSA, to deliver an educational intervention to help improve the knowledge and management of MRSA in elderly patients and to evaluate the effectiveness of the educational intervention with reference to knowledge of MRSA, hand hygiene and antimicrobial stewardship.

  This project has commenced and is being led by **Mr Eamon Nancarrow, eamon.nancarrow@hscni.net**

- **Improving the diagnosis and management of Urinary Tract Infections (UTI's) in the care home setting** – this is a study to determine the current knowledge and practices of primary care providers and care home staff in the diagnosis and management of UTI's, to deliver an educational intervention to help improve diagnosis and management of UTI's in elderly residents and to evaluate the effectiveness of the educational intervention in reducing inappropriate treatment of UTI's in elderly residents.

  This project has commenced and is being led by **Ms Alison Quinn, alison.quinn@hscni.net**

- A third pilot project will focus on the identification and management of outbreaks of gastroenteritis across care homes in Northern Ireland. An audit of current reporting and management arrangements will be undertaken, to consider areas of for improvement both within the care homes and in relation to IPC and management support provided by HP Nursing team within PHA.

  This project will commence in early 2016 and will be led by **Mr Michael Lavelle, michael.lavelle@hscni.net**

PHA Web Links to Surveillance Data

Surveillance data on the main topics of Public Health interest are available through the following web links:

Notifications of Infectious Diseases:
http://www.publichealth.hscni.net/directorate-public-health/health-protection/notifications-infectious-diseases

Group B Streptococcus:
http://www.publichealth.hscni.net/directorate-public-health/health-protection/group-b-streptococcus

Vaccination coverage:
http://www.publichealthagency.org/directorate-public-health/health-protection/vaccination-coverage

Avian Influenza:
http://www.publichealthagency.org/directorate-public-health/health-protection/avian-influenza

Brucellosis:
http://www.publichealthagency.org/directorate-public-health/health-protection/brucellosis-human

Gastrointestinal infections:
http://www.publichealthagency.org/directorate-public-health/health-protection/gastrointestinal-infections

Hepatitis:
http://www.publichealthagency.org/directorate-public-health/hepatitis

Healthcare Associated Infections:
http://www.publichealthagency.org/directorate-public-health/health-protection/healthcare-associated-infections

Meningococcal disease:
http://www.publichealthagency.org/directorate-public-health/health-protection/meningococcal-disease

Respiratory infections:
http://www.publichealthagency.org/directorate-public-health/health-protection/respiratory-infections

Sexually transmitted infections:
http://www.publichealthagency.org/directorate-public-health/health-protection/sexually-transmitted-infections

Tuberculosis:
http://www.publichealthagency.org/directorate-public-health/health-protection/tuberculosis

DHSSPS Web Links

CMO Letters and Urgent Communications relevant to Health Protection, and issued in the three months preceding publication of this edition of Transmit, are accessible through the following web links:

Co-Poisoning
HSS (MD) 19/2015 17 November 2015 - Carbon Monoxide Poisoning: ongoing vigilance to ensure recognition and prevention PDF (624)

CBRN
HSS (MD) 4/2015 24 March 2015 (PDF 178 KB)

Ebola
HSS (MD) 41/2014 22 December 2014 (PDF 266 KB)

Meningococcal C
HSS (MD) 39/2014 3 December 2014 (PDF 231 KB)

MERS Coronavirus Infection
HSS (MD) 6/2015 5 June 2015 (PDF 187 KB)

Pertussis
HSS (MD) 27/2014 18 August 2014 (PDF 246KB)

Seasonal Flu
HSS (MD) 15/2015 22 September 2015 - Management of seasonal flu 2015/16 - contains appendices PDF (520 KB)

Vaccinations
HSS (MD) 10a/2015 13 July 2015 - Meningococcal ACWY Conjugate Vaccination Programme (MEN ACWY) PDF (346 KB)

HSS (MD) 8/2015 26 June 2015 - Shingles Vaccination Programme - Eligibility Criteria for 2015/16 PDF (318 KB)

HSS (MD) 9/2015 3 July 2015 Meningococcal B Vaccination Programme (MEN B) PDF (301 KB)

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