Cheshire and Merseyside Public Health Network (CHaMPs)

Health Protection CPD event on Norovirus

12 May 2010

Norovirus Outbreaks: This year’s problems, next year’s solutions

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1. Executive Summary

This is one of a number of CPD events that the Cheshire and Merseyside Health Protection Unit has organised and run for CHaMPs. The overall aim of the CPD event was to prepare all partner organisations for prevention, control and management of norovirus infections for 2010-11 and following years.

The event was well attended and contributions were made from various professional groups who are involved in responding to norovirus, both at strategic and operational levels, locally and nationally.

The CPD event started with presentations by leading experts on diarrhoea and vomiting and norovirus. Participants then brainstormed on key issues regarding the effective, multi-agency management of D&V and norovirus outbreaks, both in the community and hospital settings. This was followed by the chair identifying the key themes for the two afternoon workshops, which had professional groups and locality representations. Each multi-professional group focused on a particular theme.

In writing this report, the authors have drawn heavily on the comprehensive notes taken by each workshop group. The outcomes of the workshops were analysed and categorised into two main groups: challenges identified, solutions proposed. These were considered as relevant to the management of norovirus across the local health economy (Cheshire and Merseyside). The critical literature review helped the authors to put the local comments into the context of the national agenda around norovirus prevention, control and management.

A summary of the findings include:

a) Important challenges identified:

**Community**
- The identification of elderly and vulnerable persons living at home or in sheltered accommodation, who need good information about D&V and norovirus and increased GP input to reduce inappropriate hospital admissions.

**Care homes**
- The need for advanced planning to deal with D&V, including the recognition of hydration in the care home as an important treatment.
- Limited adherence to infection control guidelines and the need for trained staff responsible for infection control 24 hours a day.
- The use of inadequate cleaning procedures and practices with a lack of assessment of the quality of cleaning.
- Reticence in declaring outbreaks due to seemingly adverse consequences for the care home, but resulting in hydration issues for the patients.
- Business reasons dictating decisions that result in low staffing levels, symptomatic staff working to retain pay and limited deep cleaning due to costs.
- Staff issues, including frequent turnover, the use of bank staff, staff with limited English and difficulties in maintaining a strict 48 hour exclusion of symptomatic staff.

**Primary Care**
- Need for a business continuity plan across the health economy.
- Need for increased contribution from GPs and community pharmacists in managing D&V at home.
• Need for a community rehydration care pathway.
• Need for support for residential homes without trained nurses who can reduce inappropriate referrals to hospital.
• Need for PCT providing support to care homes for deep cleaning.
• Need for database of training for all staff groups, to include standards and frequency of training.

Day centres, nurseries and schools
• Lack of information on reasons for absences with poor or untimely reporting to the local authority, PCT or HPU.

Acute trusts
• Leadership issues related to financial and resource priorities, including bed pressures, on the one side with infection control priorities on the other, and the resulting necessary ward closures being challenged by bed management because of effects on targets.
• Lack of clear admission criteria, responsible and identifiable persons and clear decision processes for D&V patients.
• Insufficient capacity in infection control teams.
• Insufficient capacity for cleaning at weekends and bank holidays.
• Regular and joint training and advanced planning with primary care staff for the norovirus season.
• Need for clear criteria and procedures for laboratories with regard to primary care and community staff undertaking D&V sampling.

Local Authority
• Need for identified Local Authority lead on D&V to liaise with other agencies.
• Limited capacity to integrate and implement preventive measures into routine work of Local Authority officers.

Health Protection Agency
• Need to improve the wider epidemiological understanding of norovirus and the resulting implications for the local health economy.
• Need to support wider education campaigns for the general public to encourage self-care.
• Better alerting and surveillance systems in place.

Care Quality Commission
• Need to enforce and encourage care homes to report outbreaks.
• Need to encourage commissioners of care home services or beds to explicitly state the standards of infection control expected in service level agreements.

b) Important solutions identified:

Community
• Local authority should identify elderly and vulnerable persons and support the health economy in the dissemination of appropriate information.
• Local authority should organise multi-agency input into alerting and raising awareness for vulnerable and elderly persons in the community.

Care homes
• Develop plans, with support from the health economy, to deal with individual cases and outbreaks, staff shortages and resources in some care homes.
• Ensure good personal and environmental hygiene in the care home.
• Refrain from making referrals to hospital without GP involvement and ensure exclusion of symptomatic staff is feasible and does not impact on care.

**Day care centres, nurseries, schools**
- Collate information on diarrhoea and vomiting children and report to local Primary Care Trust and Local Education Authority and to HPU as appropriate.
- Encourage parents to ring NHS Direct or GP if child is unwell, rather than attending a health care facility.

**Primary Care (PCT, GP and pharmacists)**
- PCT should consider ensuring health care staff have access to up to date information about norovirus prevention, control and management.
- PCT should consider developing community hydration services, including specialised staff and facilities, building on experience and publications of WHO and other international agencies.
- PCT should consider supporting care homes by ensuring access to supportive infection control services, support for deep cleaning and the development of a community rehydration care pathway.
- GPs and community pharmacists, with district nurse support, raise awareness that D&V can be managed at home and that D&V cases should not visit health care settings.

**Acute trusts**
- Should raise the profile of infection control.
- Support and develop better ways of addressing competing challenges, such as financial and resource priorities, including bed pressures, on the one side with infection control priorities on the other.
- Develop clear admission criteria with named senior clinical staff (single point of access) who is responsible for admission of D&V cases in and out of hours.
- Control the movement of patients and staff while improving the cleaning regime.
- Develop clear criteria and procedures for laboratories with regard to Primary Care and community staff undertaking D&V sampling.
- Undertake joint training and advanced planning with Primary Care staff in order to develop clear action plan.

**Health Protection Agency**
- Continue to develop the epidemiological understanding of norovirus and communicate this with the local health economy.
- Support education campaigns in community and health economy.
- Further develop alerting and surveillance systems for norovirus.

**Care Quality Commission**
- Enforce and encourage care homes to report outbreaks.
- Encourage commissioners of care home services, or beds, to explicitly state the standards of infection control expected in service level agreements.

**Recommendation**
There was a consensus at the CPD event that there is a clear imperative to have one action plan in place that covers the whole health economy, which can revised annually in the light of recent experiences, in order to inform the planning for the next and subsequent years.
2. Background

2.1 Introduction

Noroviruses are recognized as the leading global cause of viral gastroenteritis and a major contributor to food-borne illness. The disease was historically known as 'winter vomiting disease' due to its seasonality and typical symptoms. The virus has also been known as small round structured virus (SRSV) or Norwalk-like virus. Norovirus infections occur in people of all ages and outbreaks of the illness are common, particularly within semi-closed environments such as hospitals, nursing homes and schools.

Norovirus is highly infectious. As such, noroviruses present a growing challenge in the control of health-care associated infection (HCAI). The virus can cause increased morbidity in vulnerable people, including the elderly and young. The emergence of a novel genotype GII.4 variant strain of the virus has resulted in multiple recent worldwide epidemics as well as outbreaks in health care and long-term care facilities.

Norovirus outbreaks add significantly to other winter pressures, such as influenza, *C. difficile* and health care associated infections. It is paramount that concerted effort by all relevant professionals and agencies is undertaken early to ensure robust preparedness so that plans and systems are in place.

2.2 Norovirus incidence (national, regional and local picture)

For every reported case of norovirus, it is estimated that there will be 1500 cases in the community (Food Standards Agency, 2000). It is estimated that noroviruses infect between 600,000 and one million people in the UK every year.

Figure 1: Seasonal laboratory reports, England & Wales
The total number of laboratory reports for the 2009-10 season (week 27 to week 10) is 8631 (figure 1). The number of laboratory reports from week 52 in 2009 to week 10 2010 (6443) is 71% higher than for the same period in 2009 (3775) and is now the highest number of reports received in one season.
Since 2006, changes made in the diagnostics at regional laboratories have increased the number of positive laboratory reports from specimens received at the laboratories. The testing is now much more sensitive in comparison to techniques used before then, which is likely to have resulted in more cases being diagnosed.

At the regional level, the number of laboratory reports in the North West has not changed significantly over the last 17 years, although there is variation between years, whereas significant increases have been seen in other areas (figure 2).

Similar to the national and regional picture, in Cheshire & Merseyside the epidemiology of outbreaks of viral gastroenteritis has a seasonal pattern, peaking in the winter months (figure 3). The proportion of outbreaks where norovirus is detected as the causative organism has reduced over the years (figure 4). All community settings, including schools, show the same patterns.

Figure 4: Causes of viral gastroenteritis outbreaks, Cheshire & Merseyside
3. Aim and objectives of the CPD event

Aim

- To minimize the impact of the annual rise in norovirus on hospitals, care homes, primary care and the general population.

Objectives

- To identify common experiences and lessons learnt
- To identify good practice and solutions to the problem of norovirus in health and social care settings
- To develop a network of communication between social care; primary care; community and hospital infection control teams; and DsIPC
- To develop guidance around prevention, preparedness and management
- To apply this knowledge to inform future planning in local areas
- To develop measures for evaluation of success

4. Methods

- Literature review
- Review of epidemiology of norovirus
- CPD session with workshops attended by multi-agency professionals, informed by presentations by experts (Appendix I and II):
  - Detailing the problem - Setting based groups identified common and key problems encountered
  - Identifying solutions - Health and social care teams identified essential solutions to identified problems

5. Outcomes

5.1 Problems or challenges identified

The following themes were identified by workshop members as problems or challenges in the effective prevention, identification, control and management of D&V cases and outbreaks of norovirus in both community and hospital settings:

5.1.1 Community

- Elderly and vulnerable persons living at home
- Very dependant on advice from GP, leading to time constraints on general practice and possible inappropriate referral to hospital
- Lack of clarity of role of district nurses in assessing D&V cases and liaising with GPs
- Lack of appropriate information for people with learning difficulties living in the community
- The majority of issues for care homes (below) apply to people living at home
Care homes

- **Leadership and advanced planning**
  - Need for clearly identified leadership on infection control in some care homes, as part of the Care Quality Commission requirements
  - Need for advanced planning to deal with individual cases and outbreaks, staff shortages and resources in some care homes
  - Need for link person for infection control in some care homes
  - Lack of availability of trained staff responsible for infection control 24 hours a day

- **Facilities and hygiene issues**
  - Limited number of single rooms with en-suite facilities
  - Use of inadequate cleaning procedures and practices and inappropriate cleaning materials
  - Inadequate hand-washing facilities in some care homes and over-reliance on hand rubs
  - Lack of good assessment of quality of cleaning and monitoring of hand hygiene compliance

- **Guidelines and policies**
  - Limited adherence to well-recognised infection control guidelines with a resulting need for greater enforcement
  - Limited recording of information related to cases and outbreaks leading to care home staff not knowing progress of outbreak or effectiveness of control measures
  - Lack of treatment plan, i.e. recognition of hydration within the home as an important treatment
  - Lack of proper induction for and awareness of food handlers re infection control issues

- **Financial pressures**
  - Low staffing levels
  - Symptomatic staff (including food handlers) may continue to work to retain pay
  - Inability to close care home to admissions for business reasons
  - Cost of deep clean, e.g. replacing curtains; insufficient resources for infection control

- **Staff issues**
  - Staff sickness exacerbates problems, e.g. use of bank staff
  - Staff competencies in English language
  - Staff turnover / shifts make a consistent approach difficult
  - Increased workload for small staff during outbreak
  - Difficulty in keeping to 48 hour exclusion of symptomatic staff
  - Difficulty of controlling staff movement within and between care homes
  - Lack of qualified nurses in residential homes has been raised as an issue because it increases likelihood of inappropriate referrals to hospital

- **Education and training**
  - Reticence in identifying diarrhoea due to implications, including the consequences of declaring an outbreak
  - Lack of proper and regular training on infection control and treatment pathways
  - Lack of information and advice for relatives and domiciliary staff
o Need for timely and regular updates to staff at reasonable intervals during the norovirus season
o Lack of training for care home staff on the importance of early hydration to prevent the patient’s condition worsening
o Limited of knowledge and understanding by staff and relatives about D&V and the fact that it is not an indication for referral to hospital in its own right

Day care centres, nurseries, schools

- Lack of data collection on reasons for absence
- Lack of timely reporting to the PCT / HPA / LA when D&V reported to school
- Difficulty in keeping to 48 hour exclusion of symptomatic staff

5.1.2 Primary Care (PCT, GP and pharmacies)

- **Leadership and advanced planning**
  - Need for business continuity plan throughout the health economy, including intermediate level care service
  - Insufficient collaborative working across health economy related to norovirus
  - Increasing support to care homes and acute trusts to manage challenging issues such as resources during norovirus season

- **Facilities and hygiene issues**
  - Need to consider providing support for deep clean by outside firms for major outbreaks, e.g. Liverpool PCT experience providing such a service without charge to nursing homes
  - Need for regular audit of hygiene facilities in primary care

- **Guidelines and policies**
  - Need for guidelines / crib sheets on factors / risk factors for D&V, including dietary and medicinal requirements, rehydration care pathway
  - Support for information gathering with clear guidance defining minimum dataset
  - Clear guidance on audit of infection control procedures and practices during D&V outbreaks

- **Financial pressures**
  - Decreasing resources and inadequate contingency plans to support the whole health economy during norovirus season
  - Limited bed capacity throughout the health economy, including care homes, acute and community trusts

- **Staff issues**
  - Limited infection control staff
  - Increased workload for small staff during outbreak
  - Need to consider support for residential homes without qualified nurses in order to reduce likelihood of inappropriate referrals to hospital during norovirus season

- **Education and training**
  - Limited capacity to undertake education and training of all relevant staff in the whole health economy, especially during norovirus season
o Need to develop database of staff training with clear plans regarding the standard and frequency of training for the various professional groups
o Need to work with Local Authorities to raise awareness of all the issues around norovirus in identified vulnerable and elderly people living in the community
o Need for timely and regular updates to all primary care staff at reasonable intervals during the norovirus season

5.1.3 Acute Trust

- **Leadership and advanced planning**
  o Need for advanced planning to deal with outbreaks of D&V during norovirus season
  o Ward closures adversely affect targets and bed management, necessitating stronger understanding and leadership from senior managers
  o Clashes between financial and resource management priorities with infection control priorities give rise to pressures and stresses
  o Implementation of infection control procedures and policies across the trust, including hand washing by staff

- **Facilities and hygiene issues**
  o Bed pressures to partly open wards; re-opening too soon; inability to discharge patients
  o Insufficient capacity for isolation within trust as whole
  o Limited number of single rooms with en-suite facilities
  o Pressure from trust management to open wards prematurely
  o Weekend and bank holiday pressures on beds due to decreased discharges lead to increased length of stay in A&Es which usually have poorer cohorting facilities
  o Wearing of uniforms outside trusts because of lack of changing facilities for staff
  o Necessary ward closures, resulting in public relations difficulties with visitors
  o Visitor numbers give rise to a number of pressures, including the implementation of infection control measures

- **Guidelines and policies**
  o Limited adherence to well-recognised infection control guidelines with a resulting need for greater enforcement
  o Limited recording of information related to cases and outbreaks leading to incomplete surveillance data which is important for outbreak control
  o Lack of clear admission criteria for D&V cases
  o Lack of clear gatekeeper (single point access) to hospital for admission of D&V cases in and out of hours
  o Lack of clear guidance on the seniority / grade of person making admission decision during norovirus season

- **Financial pressures**
  o Efficiency savings affecting all decisions in trust
  o Targets may override clinical decisions
  o Limited bed capacity, especially isolation facilities, including single rooms
  o Inability to discharge patients on time due to blocked beds in care homes
  o Exclusion of symptomatic staff for 48 hours due to staffing needs or increased workload
- **Cost of protracted outbreaks and deep cleaning**

**Staff issues**
- Insufficient capacity in infection control teams, especially during norovirus season resulting, for example, in incomplete data collection for surveillance
- Insufficient capacity for cleaning, particularly at weekends and bank holidays (small number of cleaning staff)
- Insufficient link nurses for infection control in some wards
- Staff sickness exacerbates problems, e.g. use of bank staff
- Reduced overlap of staff shifts, especially nursing staff, make a consistent approach difficult to implement
- Difficulty of controlling staff movement within the trust

**Education and training**
- Need for timely and regular updates to hospital staff at reasonable intervals during the norovirus season
- Training of admissions gatekeeper and team
- Regular and joint training with Primary Care staff prior to and during norovirus season
- Evaluation of training programmes with evidence clearly recorded

**NHS microbiology laboratory**
- Need for clear procedures for primary and community staff regarding D&V samples
- Need explicit criteria for submission and testing of samples and agreed reporting criteria within a reasonable time frame

### 5.1.4 Local Authority

**Leadership and advanced planning**
- Need for identified local authority lead on D&V to liaise with other agencies as appropriate
- Limited capacity to integrate and implement preventive measures into routine work of officers

**Guidelines and policies**
- Need for clear guidance on roles and responsibilities of local authority staff in relation to D&V outbreaks in the community and care homes
- Need for further support in the implementation of Care Quality Commission standards, e.g. food handlers, kitchen and hygiene facilities

**Financial pressures**
- Efficiency savings affecting all decisions in Local Authorities

**Staff issues**
- Support of infection prevention and control teams in relation to D&V outbreaks
- Limited staffing to support routine infection prevention and control actions

**Education and training**
- Need for provision of timely and regular information for vulnerable and elderly community members during the norovirus season
- Need for more support for other agencies, including Care Quality Commission, striving to improve infection control standards in care homes
o Regular and joint training with Primary Care staff prior to and during norovirus season

5.1.5 Health Protection Agency

- **Leadership and advanced planning**
  o Need for local Health Protection Unit via the Consultant in Communicable Disease Control (CCDC) to ensure easier access to evidence-based approaches and guidelines
  o Need to contribute to local health economy working group strategy to prevent and control D&V
  o Need to improve the understanding of the local, regional and national epidemiology of norovirus and the implications for the local health economy

- **Guidelines and policies**
  o Need for clearer guidelines with the evidence base for prevention, control and effective management of D&V and norovirus cases and outbreaks
  o Improved reporting of surveillance data in a regular and timely manner to all local partners
  o Improved timely dissemination of national, regional and local guidelines to PCTs, acute trusts and care homes as and when appropriate
  o Better support of partner organisations for communicating norovirus information

- **Financial pressures**
  o Efficiency savings affecting the HPA
  o Limited staff to undertake infection prevention and control

- **Education and training**
  o Need to support wider education campaigns to the general public to encourage self-care and raise awareness of signs and symptoms of D&V and the need to keep individuals, including children, away from health care settings
  o Need for greater support to partner organisations in providing education and training around D&V and norovirus
  o Need to increase public awareness that D&V can be effectively managed at home and in the community

5.1.6 Care Quality Commission

- Need to set explicit criteria and regulations to enforce infection control policy
- Need to enforce standards, e.g. serve care home with notice if not compliant
- Need to increase the number of random visits to care homes, similar to Ofsted
- Variation in standards of Commission visits to care homes needs to be addressed
- Need to enforce and find ways of encouraging care homes to report outbreaks
- Need to encourage commissioners of care home services or beds to explicitly state the standards of infection control that should be adhered to in any service level agreement
5.2 Solutions Identified

The following themes were identified by workshop members as solutions or actions that can be taken by the relevant agencies and organisations to prevent, control and manage D&V cases and outbreaks in both community and hospital settings:

5.2.1 Managing diarrhoea and vomiting at the patient’s private home

What can family members and other social support do?
- Ensure regular contact with those living alone
- Encourage proper diet
- Encourage and support good personal hygiene
- Contact NHS Direct for advice if individual develops symptoms
- Encourage and support adequate diet and hydration when ill
- Contact GP by phone if NHS Direct advice is to do so

What can a GP do?
- GPs (and pharmacists) should lead on education and training by raising awareness in their communities that D&V can be managed at home and that D&V cases should not visit health care settings
- Provide advice and support by phone initially
- Utilise the support and expertise of district nurses
- Provide diagnosis and initial management
- Strive to keep the patient in their own home with good care
- If referral is considered, examine and assess the patient in person before making referral or arranging transport to hospital
- If admission is required, discuss with hospital appropriateness of admission
- When patient is discharged, ensure appropriate advice is provided to prevent recurrence of the illness and further admissions to hospital

What can a PCT do?
- Ensure relevant information is available for the general public
- Ensure GPs have access to up to date information about norovirus prevention, control and management
- Ensure relevant information is available for all primary care staff
- Develop, with GPs and Acute Trust, criteria for hospital referral and admission (if required)
- Inform HPA of any community outbreaks of norovirus

What can the HPA do?
- Provide information to primary and secondary care professionals
- Support local publicity
- Ensure adequate data is available to alert relevant organisations
- Ensure appropriate management of major norovirus outbreaks
- Support public communication plans

What can others do?
- Local Authorities should identify elderly and vulnerable groups in the community and ensure norovirus information is communicated to them during the norovirus season
5.2.2 Managing diarrhoea and vomiting in nurseries, day care centres & schools
(Schools include primary & secondary schools, colleges and other institutions)

What can parents and family members do?
- Keep children with diarrhoea &/or vomiting at home
- Ensure children are kept off school and away from other social gatherings (e.g. birthday parties) for 48 hours after symptoms end
- Report to school why the child is off
- Encourage and support good personal hygiene
- Encourage and support good hydration when ill
- Contact NHS Direct for advice if child feels unwell
- Contact GP by phone if NHS Direct advice is to do so; do not attend GP practice, walk-in centre, out of hours or A&E with sick child

What can a school do?
- Discourage sick children and staff from attending while symptomatic and for 48 hours after symptoms stop
- Send any child with diarrhoea and vomiting home immediately
- Consider alerting parents (e.g. by text message) if D&V outbreak is affecting the school or nursery
- Increase frequency of cleaning during outbreaks or clusters of D&V cases, especially in kitchens and toilets
- Collate information on diarrhoea and vomiting children and report to local Primary Care Trust and Local Education Authority
- Discourage parents to take children to GP surgery or any other health care setting
- Encourage parents to ring NHS Direct or GP if child is unwell

What can a GP do?
- Provide advice and support by phone to children or parents
- Provide diagnosis and initial management for children or parents
- Discuss good personal hygiene with children or parents
- Discourage children from attending school or any health care setting
- If referral is considered, examine and assess the child in person before making referral
- If admission is required, discuss with hospital appropriateness of admission
- When patient is discharged, ensure appropriate advice is provided to prevent recurrence of the illness and further admissions to hospital

What can a PCT do?
- Ensure relevant information is available for schools
- Ensure local GPs have access to up to date information about norovirus prevention, control and management
- Ensure relevant information is available for all primary care staff
- Inform HPA of any school outbreaks of norovirus

What can the HPA do?
- Provide information to nurseries, primary and secondary schools
- Support local publicity
- Ensure adequate data is collected from schools
- Ensure appropriate management of major norovirus outbreaks
- Support public communication plans

What can the Local Education Authority do?
- Provide support and information for schools before outbreaks
- Encourage schools to collect relevant health information
- Raise awareness amongst other local, including private, schools
- Support affected schools to keep sick children away from school

5.2.3 Managing diarrhoea and vomiting in a care home (residential and nursing)

**What can parents and family members do?**
- Individuals with diarrhoea &/or vomiting (including children) should stay away from visiting care homes
- Encourage and support good personal hygiene in their relatives and family members in the home
- Encourage and support good hydration when ill

**What can the care home do?**
- Identify cases early
- Ensure good personal and environmental hygiene in the care home
- Ensure cases are well hydrated and fed as much as practical
- Increase frequency of cleaning during outbreaks or clusters of D&V cases, especially in kitchens and toilets
- If concerned about individual cases, contact GP as soon as possible, requesting a visit if appropriate
- Refrain from making referrals to hospital without GP involvement
- Ensure symptomatic staff are excluded while symptomatic and for 48 hours after symptoms stop
- Discourage sick visitors to attend while symptomatic and for 48 hours after symptoms stop
- Report illness of D&V in more than one person in the care home to local Primary Care Trust
- Share information about D&V / norovirus status of care home with relatives

**What can a GP do?**
- Provide advice and support to care homes as necessary
- Provide diagnosis and initial management for all D&V cases in care homes
- Utilise the support and expertise of district nurses in advising and assessing patients and preventing unnecessary hospital admissions
- If assessment indicates, visit the care home before considering referral to hospital
- Strive to keep the patient in their own home with good care
- If referral is considered, examine and assess the patient in person before making referral or arranging transport to hospital
- If admission is required, discuss with hospital re appropriateness of admission
- Ensure appropriate advice is provided to community nurses to prevent recurrence of the illness and further admissions to hospital

**What can a PCT do?**
- Ensure relevant information is available for care homes
- Ensure local GPs and other Primary Care staff, including community nurses, have access to up to date information about norovirus prevention, control and management
- Ensure and support immediate care for D&V cases, including hydration in the care home to reduce the need for hospitalisation
- PCT need to consider the provision of facilities open in the community for rehydration purposes when norovirus D&V affects a large part of their population
- Develop hydration supporters who can recognise dehydration and prompt appropriate levels of response, supported by care pathways and flow charts. There is a wealth of experience and material on management of dehydration published by WHO and other international agencies based on developing countries experience that could easily be adapted during norovirus seasons
- Ensure care homes have access to Infection Control Nurses as required
- Provide education and training for care home staff in the hydration and the care of D&V patients and the environment in collaboration with Environmental Health Officers as appropriate
- Ensure relevant specimens are taken and sent to the laboratory with appropriate forms, in a timely fashion
- Inform local Health Protection Unit (HPU) of any care home outbreaks of norovirus

What can the HPA do?
- Support Primary Care in the provision of information to care homes
- Support local publicity, particularly in the norovirus season
- Ensure adequate data is collected from care homes
- Ensure appropriate management of major norovirus outbreaks in care homes
- Alert local hospitals with regard to outbreaks of norovirus in the community, including care homes

What can the Local Authority do?
- Provide support and information for care homes before outbreaks
- Encourage care homes to collect relevant health information
- Raise awareness amongst other care homes
- Support PCT infection control nurses as needed, especially if food borne illness is suspected
- Ensure sample pots are available in care homes with appropriate forms and training to facilitate early sample-taking and improve diagnosis
- Visit care home if required
- Communicate with local HPU as appropriate

What can the Care Quality Commission do?
- Encourage and, if necessary, enforce care homes to report outbreaks
- Encourage commissioners of care home services or beds to explicitly state the standards of infection control expected in service level agreements
- Consider random visits to care home in a manner similar to Ofsted visits to schools

5.2.4 Prevention of unnecessary referrals to acute trusts

What can parents and family members do?
- Encourage and support good personal hygiene in their family members, especially children and those who cannot look after themselves
- Encourage and support good hydration when any family member is ill with diarrhoea or vomiting
- Ring NHS Direct or contact GP by phone if concerned about the health of any individual in the family
- Individuals with diarrhoea &/or vomiting (including children) should stay away from visiting hospitals and any other health care setting

What can a care home do?
- Identify cases early
- Take every possible step to keep the patient in the home and prevent deterioration of their health by ensuring adequate hydration
- Ensure good personal and environmental hygiene in the care home
- Increase frequency of cleaning during outbreaks or clusters of D&V cases, especially in kitchens and toilets
- If concerned about individual cases, contact GP as soon as possible, requesting a visit if appropriate
- Refrain from making referrals to hospital without GP involvement
- Ensure symptomatic staff are excluded while symptomatic and for 48 hours after symptoms stop
- Report illness of D&V in more than one person in the care home to local Primary Care Trust and Health Protection Unit
- If, following assessment by GP, a decision is made to refer the patient to hospital, the home, or the GP, needs to alert the hospital regarding the illness prior to organising transport

**What can a GP do?**
- Provide diagnosis and initial management for all D&V cases in care homes
- If assessment indicates, visit the care home before considering referral to hospital
- Strive to keep the patient in the care home with good care and rehydration programme
- If referral is considered, examine and assess the patient in person before making referral or arranging transport to hospital
- If admission is considered, discuss with hospital re appropriateness of admission
- Ensure community nurses provide appropriate support and advice to prevent recurrence of the illness and re-admission to hospital

**What can a PCT do?**
- Warn hospitals about local, community D&V outbreaks
- Develop stringent criteria for referral to hospital by GPs, with appropriate monitoring and audit systems
- Ensure local GPs and other Primary Care staff, including community nurses, have access to up to date information about norovirus prevention, control and management
- Ensure and support immediate care for D&V cases, including hydration in the care home, to reduce the need for hospitalisation
- Ensure professionals have access to the support of Infection Control Nurses as required
- Provide health care professionals with education and training in hydration and the care of D&V patients and the home environment, in collaboration with Environmental Health Officers as appropriate
- Inform HPA of any community outbreaks of norovirus

**What can the HPA do?**
- Support Primary Care in the provision of information to health care professionals
- Support local publicity, particularly in the norovirus season
- Ensure adequate data is collected from the community to enable early alerting and warning of local health care establishments
- Ensure appropriate management of community norovirus outbreaks
- Alert local hospitals with regard to community norovirus outbreaks

**What can the Local Authority do?**
- Provide support and information to care homes, nurseries and schools
- Support PCT infection control nurses as needed, especially if food borne illness is suspected
- Visit care home if required
- Communicate with local HPU as appropriate
Ensure good local publicity in relation to advising communities about personal care, hydration and the need to avoid attending health care settings

5.2.5 Prevention of spread and improved management of outbreaks in:

a) Nursing/ care homes
- Training of staff
- Increased vigilance, particularly in the winter
- Early identification and isolation of cases with D&V
- If isolation is not an option, consideration of cohort nursing is essential
- Implementation of strict enteric precautions
- Exclusion of staff with symptoms for 48 hours after resolution of symptoms
- Control and management of patient and staff movements
- Increased frequency of cleaning
- Deep clean after incidents and once outbreak has been resolved

b) Acute trusts
- Intensive education and training of staff, in part with local Primary Care staff
- Increase vigilance, particularly in the winter, throughout the trust
- Early identification and isolation of cases with D&V
- Develop clear admission criteria for D&V cases
- Identify a gate keeper amongst senior clinical staff (single point of access) who is responsible for admission of D&V cases in and out of hours
- If isolation is not an option, consideration of cohort nursing and the establishment of an isolation unit is essential
- Implementation of strict enteric precautions for both staff and patients
- Immediate exclusion of staff with symptoms for 48 hours after resolution of symptoms
- Control and manage the movements of patients, staff, equipment and facilities
- Increase the frequency of rigorous and enhanced cleaning; this is particularly important at weekends and bank holidays
- Deep clean after incidents and once outbreak has been resolved
- Establishment of good communication systems throughout the trust
- Early discharge of patients who have recovered from norovirus
- Develop clear criteria and procedures for laboratories with regard to Primary Care and community staff undertaking D&V sampling, including reporting

5.2.6 Improved communication between community, primary care, secondary care and surveillance issues

- Each organisation to establish an internal alerting system during the winter season, e.g. use of email and staff intranet for briefings
- Each organisation to establish and maintain good links with other local organisations for early warning and reporting of outbreaks
- Primary and secondary care Directors of Infection Prevention and Control to establish a network to share good practice and other relevant information and facilitate joint training of staff; establishing a local health economy group dealing with the annual norovirus season might facilitate this
- Ensure robust arrangements are in place between all health care settings: to and from primary care and secondary care; to and from secondary care and community trusts; to and from secondary care and secondary care

21
Consideration of ways to improve communications with local health care professionals, using leaflets, bulletins and other means, during the norovirus season, e.g. HPA norovirus bulletin or similar

- All agencies should have agreed standards and joint approaches to the use of the local media for public communication to raise awareness of norovirus
- The HPA should continue to develop the epidemiological understanding of norovirus and communicate this with the local health economy.

6. Discussion

Once established, outbreaks are difficult to control, both in the community and in closed facilities (Johnston et al., 2007, Lopman et al., 2004). There is also an economic cost to norovirus infection: outbreaks in the United Kingdom have been estimated to cost >£600,000 per 1000 hospital beds (Lopman et al., 2004), with an estimated 80 deaths each year in people aged ≥65. (Harris et al., 2008)

6.1 Epidemiology of norovirus infection

Laboratory reports to the Health Protection Agency show a consistent increase in the annual number of reports since 2002-2003. This increase is likely to reflect (a) more laboratories are routinely testing for norovirus and (b) testing is now much more sensitive in comparison to techniques used before. Both of these factors make it likely that more cases are now being diagnosed. However, the data also shows that, although infection can happen any time of the year, the incidence is higher in winter months.

The proportion of outbreaks where norovirus is detected as a causative organism has reduced over the past few years. This is probably the result of a combination of factors, including fewer samples being collected, laboratories only testing samples where the faecal contents "take the shape of the container" (i.e. diarrhoea) and database not being updated in a timely manner when results of the organism being detected become available later in the investigation of an outbreak.

6.2 Norovirus transmission

The transmission dynamics of norovirus during outbreaks in closed communities are poorly understood. It is recognized that environmental and fomite contamination are the most likely sources of transmission in health care settings. However, vomiting with airborne norovirus dispersion may also be an important route of virus dissemination. An analysis of an outbreak in a large hotel demonstrated that victims’ attack rates were inversely related to their distance from a woman who vomited during her meal (Marks et al., 2000). An outbreak in an elementary school demonstrated that attack rates were directly related to the number of times pupils were exposed to vomiting episodes, suggesting that spread occurred by the inhalation and swallowing of viral particles (Marks et al., 2003). Transmission has even occurred to individuals walking through an emergency department in which a vomiting patient was being evaluated (Sawyer et al., 1988).

Although aerosol spread may initiate an outbreak, continued propagation of a norovirus disease outbreak can, in some instances, be attributed to the role of subsequent environmental or fomite contamination (Barker et al., 2004). In an outbreak
in Wales linked to a concert hall and involving 300 people, the epidemic investigation suggested a point source outbreak initiated by an attendee who had vomited in the auditorium, with continued case accumulation through environmental contact by people coming to the concert hall over several subsequent days (Evans et al., 2002).

Health care facilities, in particular, are susceptible to environmental and fomite contamination. Swabs taken from a paediatric intensive care unit demonstrated norovirus to be the most common virus detected, most frequently from such sites as toilet door handles and toilet taps that are readily soiled with minute amounts of faeces (Gallimore et al., 2006). Norovirus can persist for several weeks on environmental surfaces. Swabbing of environmental surfaces in a long-term care veterans facility a full two weeks after the peak of norovirus outbreak demonstrated norovirus on toilet seats, a bed rail, a dining table, and an elevator button, even after extensive cleaning of the facility (Wu et al., 2005).

Person-to-person contact is especially important in the health care and long-term care settings, where close living quarters, shared bathrooms, and incontinent patients increase the risk that norovirus can spread from one person to another.

Prospective studies of >170 inpatient units in England demonstrated that outbreak rates increased with the number of beds in a unit and shorter lengths of stay and were especially high in geriatric and general medical care units (Lopman et al., 2005).

Recent data suggests that protracted norovirus excretion may occur after illnesses, lasting a median of 28 days, with ~104 viral copies/g of stool (Tu et al., 2008). The precise contributions of person-to-person spread, environmental contamination, and / or other factors to ongoing transmission in outbreak situations are unclear.

### 6.3 Control measures

In controlling outbreaks, particular attention to good hygiene measures should be observed during the outbreak. It is very important to wash hands with soap and water after contact with someone who is ill. Similarly, washing hands after using the toilet, especially if an individual has symptoms, is critical.

Thorough cleaning of hard surfaces with a bleach solution, paying particular attention to the toilet and toilet area and cleaning up vomit and the surrounding area quickly, will help to reduce environmental contamination and thereby reduce the risk of infection in others who may come into contact with these surfaces later on.

In one UK study (Lopman et al., 2004), units where wards were closed within three days of an outbreak had a shorter mean duration of outbreak: 7.9 days v 15.4 days (p = 0.002). These wards also had lower attack rates for patients and staff, and fewer cases, although these findings were not statistically significant. It is clear that early isolation of cases is critical for management of onward transmission of norovirus.

Evidence from a review of outbreaks of viral gastroenteritis in care homes in Cheshire and Merseyside suggests that, once an outbreak starts, good hygiene and infection control standards, alongside prompt reporting and close working with community infection control staff, can help minimise its impact (Appendix III)
7. Conclusions

- Norovirus causes mild self-limiting disease, and is a common cause of acute gastroenteritis in individuals in the UK as well as being the commonest cause of outbreaks of acute gastroenteritis.

- The public health impact of norovirus infection is greatest in the healthcare sector, with over 80% of outbreaks being spread from person to person, although there is a considerable economic burden to the local health economy, particularly from the costs of deep cleaning, compensation and adverse publicity.

- Implications for infection control are as follows: the virus is easily transmitted; there is a large impact on vulnerable populations; there is limited capacity for isolation across the health economy; environmental contamination is a significant factor in continuing transmission resulting in prolonged outbreaks; early recognition of cases may not always be possible; managing patient and staff movements is challenging; there may be inadequate documentation of symptoms and other relevant information due to work pressures.

- The impact of norovirus outbreaks in hospital includes severe staff shortages due to illness, major disruption to hospital activities, the impact on elective activity and waiting times with implications for regional & critical care services.

- There are conflicts for managers, which include: bed pressures; impact on waiting time targets; impact on elective admissions and assessment units; increased patient movement between wards in part due to clinical need; decisions around ward closures and duration; admission of patients to outbreak ward; length of staff exclusion; discharge delays and delays in undertaking terminal cleaning.

- Patient challenges include complying with infection control measures including hand washing and restricted movements; reporting symptoms promptly to staff; understanding the importance of ward closure and communicating with visitors.

- Visitor Challenges include: not seeing loved ones as wanted; complying with infection control measures; restricting visits including children, vulnerable adults and the symptomatic; understanding the importance of ward closure and compliance.

- Staff Challenges include: shortage of staff with its resulting impact on patient care; financial implications for all staff (including agency and bank staff and compliance with 48 hour exclusion) as well as the difficulty of getting staff to work on an outbreak ward; restricting staff movement; frequent hand washing (i.e. not using alcohol hand gel); supporting environmental disinfection (e.g. disinfection of commodes, access to patient chairs); understanding the importance of ward closure and their role with compliance.

8. Recommendations

Detailed recommendations for each agency and professional groups are listed above as suggested solutions (section 5.2). There was a consensus at the CPD event that there is a clear imperative to have one action plan in place that covers the whole health economy, which can revised annually in the light of recent experiences, in order to inform the planning for the next and subsequent years.
9. References


This CPD event is organised by the ChaMPs Health Protection Group

Norovirus Outbreaks:
This year’s problems, next year’s solutions

Wednesday May 12\textsuperscript{th} 2010
(12 noon for registration)
Stobart Stadium, Longlooms Lane, Widnes,
Cheshire WA8 7DZ

\textbf{Purpose:} To minimize the impact of the annual rise in norovirus on hospitals, care homes, primary care and the general population.

\textbf{Objectives}

- To identify common experiences and lessons learnt,
- To identify good practice and solutions to the problem of norovirus in health and social care settings
- To develop a network of communication between social care; primary care; community and hospital infection control teams; and DsIPC.
- To develop guidance around prevention, preparedness and management
- To apply this knowledge to inform future planning in local areas.
- To develop measures for evaluation of success.

\textbf{Who should attend?}
This Health Protection CPD event is aimed at colleagues from agencies across the wider public health workforce - including representatives from Local Authority, LMC, DsIPC, Infection control teams, CsCDC, Health protection practitioners, microbiology, regional epidemiology, CQC, SHA, Social services and the private sector.
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 midday</td>
<td>Registration and Networking lunch</td>
</tr>
</tbody>
</table>
| 13.00-13.10 | Welcome and introduction  
Dr Sam Ghebrehewet, CCDC C&M HPU.  
Dr Rita Robertson, DPH Warrington |
Mrs Sue Wynne, Infection control nurse specialist, Halton and St Helen’s PCT. |
| 13.25-13.40 | The problem: The cost to the trust  
Dr. Paul Shears, WUTH DIPC |
| 13.40-14.30 | Workshop: Detailing the problem  
Dr. Joanna L. Cartwright, CCDC  
• Setting based groups to identify common and key problems encountered.  
• Facilitator and note taker provided. |
| 14.30-15.00 | Feedback: Sharing the burden                                           |
| 15.00-15.15 | Refreshments                                                          |
| 15.15-15.30 | The solution: what works in infection control?  
Dr John Cheesebrough, Consultant Microbiologist, Lancashire Teaching Hospitals NHS Foundation Trust. |
| 15.30-16.15 | Workshop: Identifying solutions (Five Groups)  
Dr. Joanna L. Cartwright, CCDC  
• Health and social care teams to identify essential solutions to identified problems  
• Facilitator and note taker provided. |
| 16.15-16.30 | Conclusion: Committing to the answer                                  |

This half day session attracts 3 CPD points.

Today’s presentations will be available on the ChaMPs website following the event...
Appendix II

**Final Evaluation**  
*Norovirus Outbreaks*  
*This year’s problems, next year’s solutions*  
*12th May 2010*

<table>
<thead>
<tr>
<th>Registered 67</th>
<th>Walkins 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apologies 5</td>
<td>Attended 63</td>
</tr>
<tr>
<td>DNAs 9</td>
<td></td>
</tr>
</tbody>
</table>

24 Evaluation forms returned

1. **How do you rate the content of the event overall?**

<table>
<thead>
<tr>
<th></th>
<th>Very poor</th>
<th>Poor</th>
<th>Average 1</th>
<th>Good 30</th>
<th>Very good 18</th>
</tr>
</thead>
</table>

2. **What did you find most useful?**

- The practical ideas generated
- Group discussions x 30
- Understanding impact/burden of condition on community and hospitals
- Epidemiology
- What infection control works
- All good
- The practical ideas generated
- Dr Cheesbrough’s presentation x 10
- Meeting people from different areas of public health – learning other people’s roles
- Networking
- Discussing issues with different disciplines
- Norovirus control – what works
- Very useful discussions and good cross section of professionals
- The practical ideas generated

3. **What did you find least useful?**

- The feedback after the first workshop became quite repetitive
- Sound quality for the first three speakers was too quiet
- Probably short presentations about facts that are known
- All useful – good balance of talks and discussion
- Some elements a bit repetitive but reinforced key messages
4. Did the programme meet your CPD requirements and why?
- Yes very relevant
- Yes, understanding complexity and multi level of interventions required
- Yes – new information, reflection, networking
- Always good to increase professional knowledge and be able to produce the evidence for this
- Yes – very specific to my role as an Infection Control Nurse
- Yes – ability to share best practice
- Yes, but would like more specific information on the effective cleaning agents to be used, understanding the virus
- Yes, critical reflection of problems and consideration of solutions
- Updating on current situation – ideas to take forward. Will feedback info in next team meeting
- Improved knowledge of Norovirus and practical problems and ideas for managing problem
- Increased knowledge about what has happened with other providers this year
- With strategies to deal with Norovirus
- Enhanced knowledge in acute care management of Norovirus
- It raised my awareness and means I can understand the Infection Control Team’s requirements
- Gave information I can cascade to care homes and schools

5. The event achieved the objectives set out

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neither</th>
<th>Agree 38</th>
<th>Strongly agree 11</th>
</tr>
</thead>
</table>

6. I will change/modify my practice as a result of today’s CPD event

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neither</th>
<th>Agree 30</th>
<th>Strongly agree 1</th>
</tr>
</thead>
</table>
7. As result of this CPD event, how will you modify your practice?
- Input new technologies for hand hygiene/environmental hygiene
- This is just the beginning of a very big programme. Surprised not to see GPs, Community Matrons here as they link in with this very much
- Not sure yet
- If involved with project work with PCT – hopefully there will be more joint working Environmental Health/PCT following this event
- Will require joined up thinking and wider strategies to deal with the solutions to be able to put into practice what has been discussed today. Therefore cannot state agree as yet.
- Will continue to put into practice
- Closer working with Nursing Home Matrons
- Will continue to put into practice/educate/cascade information to relevant staff
- Today reassured me that my Trust has high standards of practice and effective methods of outbreak control
- More emphasis on hand washing with soap and water rather than hand gels.
- Focus on better response and isolation of cases and cleaning measures
- Improve my knowledge which is applicable when I take up role in health protection attachments
- Consult more with infection control
- More aware of how actions may impact on others
- Consider the role of district nurse team to reduce hospital admissions from care homes
- Consider the implications of CQC requirements for SLAs for infection control
- Give better information to care homes and schools
- Yes, good mix of speakers
- Develop new communication/surveillance across health economy
- Improve awareness within primary care
- I will push harder for a strategic overview in my Trust
- Improved knowledge on subject – more informed advice
- Review access to testing procedures out of hours
- Review epidemiology in our Trust
- Develop more effective links with PCT and EHOs
- Target efforts at care homes
- Engagement of public
- Will ensure acute care are always kept informed of care home outbreaks

8. How do you rate:
- the venue?
  - Very poor
  - Poor
  - Average
  - Good
  - Very good

- the administration?
  - Very poor
  - Poor
  - Average
  - Good
  - Very good
### Appendix II

<table>
<thead>
<tr>
<th>the structure of the event</th>
<th>Very poor</th>
<th>Poor</th>
<th>Average</th>
<th>Good</th>
<th>Very good</th>
</tr>
</thead>
<tbody>
<tr>
<td>the short presentations</td>
<td>Very poor</td>
<td>Poor</td>
<td>Average</td>
<td>Good</td>
<td>Very good</td>
</tr>
<tr>
<td>workshop 1. ‘Detailing the problem’</td>
<td>Very poor</td>
<td>Poor</td>
<td>Average</td>
<td>Good</td>
<td>Very good</td>
</tr>
<tr>
<td>workshop 2. ‘Identifying solutions’</td>
<td>Very Poor</td>
<td>Poor</td>
<td>Average</td>
<td>Good</td>
<td>Very good</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10. How can future CPD sessions be improved?</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Identifying solutions session could possibly have been improved by making the questions a bit more focused</td>
</tr>
<tr>
<td>➢ Continue as they are</td>
</tr>
<tr>
<td>➢ Feedback on resulting action – follow up seminar</td>
</tr>
<tr>
<td>➢ Doesn’t need improvement</td>
</tr>
<tr>
<td>➢ Clearer sides, particularly those showing data/graphs</td>
</tr>
<tr>
<td>➢ Attendance by other individuals, i.e. GPs (how else can we communicate more effectively/efficiently if they are absent participants in the health economy</td>
</tr>
<tr>
<td>➢ More intro to the problem/issues to begin with – especially when delegates are from such a variety of areas</td>
</tr>
<tr>
<td>➢ Keeping to time – but not a big issue today</td>
</tr>
<tr>
<td>➢ Can we have expertise – nationally</td>
</tr>
<tr>
<td>➢ Very well organised and interactive – interesting</td>
</tr>
<tr>
<td>➢ A whole day would be good</td>
</tr>
<tr>
<td>➢ Innovation re improvements for next session to share good practice</td>
</tr>
<tr>
<td>➢ We weren’t familiar with some abbreviations, e.g. DIPC – would be useful for people to be more explanatory</td>
</tr>
<tr>
<td>➢ This had a good balance between formal teaching and discussion groups</td>
</tr>
<tr>
<td>➢ Focus on message to Trusts Executive teams to take a strategic overview and not just use infection control teams as bed managers in Acute Trusts</td>
</tr>
</tbody>
</table>
11. Would you like to see the timing around CPD events changing, do you think this would be a positive change, could you please tick your preference:

1. Events to start at 9.00am and finish at 1.30pm – venue to remain the same – x 3
2. Events to start at 12.00pm and finish at 4.30pm – venue to remain same x 34

12. Other comments: Please comment on aspects such as facilitators, chair, time allocated for discussion

- Found the session enjoyable and informative
- Thanks for all your hard work
- Well run with plenty of time for discussion
- Enjoyed being a facilitator at event
- All were excellent
- Very useful – good mix of professionals attending
- Good timing and chairing
- I think that the time table for the event worked very well. From workshop discussion it became apparent that communication is essential and using the local authority as resources especially in care homes to help prevent the spread from care homes to the acute trusts
- Very good session
- Timely and well organised
- I will feed back to Medical Director and others – maybe need a future event to look at involving GPs, CMs and links with acute trusts
- Very good – overall a very good and informative day
- Very good session. ? if nursing home representative should have been there
- Good. Constructive. Good interaction with various groups
- Would have been useful if some GPs present
- First event I have attended but found it very interesting, well organised and enjoyable
- Couldn’t hear some of the presentations
Factors affecting prevention and control of viral gastroenteritis outbreaks in care homes.

Work conducted at Cheshire & Merseyside HPU by

Dr Ayo Oyinloye
Dr Roberto Vivancos

Correspondence to: Roberto.vivancos@hpa.org.uk

*Acknowledgements:* We acknowledge the help provided on this project by Dr Alex Keenan (Surveillance and Epidemiology Analyst), who helped putting together the database and with the analysis of the data.
INTRODUCTION

Norovirus is the commonest cause of viral gastroenteritis worldwide. Spread is primarily from person to person. Infection tends to affect children and the elderly disproportionately, as a result outbreaks in care homes and other residential settings for the elderly are relatively common. Understanding what factors affect both the occurrence of outbreaks of gastroenteritis and their outcomes is important to better prevent and control them.

DESCRIPTION OF THE PROJECT

We aimed to assess what factors affect outbreak prevention and control in care homes in Cheshire & Merseyside. To do this we combined CQC data for 2008, using the overall rating and environment standards closely linked to infection control (e.g. Hygiene or Infection Control), with the HPU database of outbreaks in care homes occurred during 2009.

We used multivariable regression analysis to model factors associated with outbreak occurrence, and the influence of these in the attack rate in residents in care homes affected with outbreaks.

FINDINGS

There are 438 registered care homes in Cheshire and Merseyside, with outbreaks in 136, and 26 with more than one outbreak. The table below shows the breakdown of outbreaks by Local Authority in Cheshire & Merseyside. The number of outbreaks that occurred in all local authorities in proportion to the number of care homes they have is similar in all of them except for the Wirral, which appeared to have significantly fewer outbreaks. It is not clear why there would be fewer outbreaks in the Wirral compared to other areas.

Outbreak occurrence

Whether a care home had an outbreak did not appear to be associated with either overall quality or individual environmental standards scores in the CQC inspection; however care home size was associated with occurrence of outbreaks (RR 1.013, 95% CI 1.008-1.018, per additional place). This is probably because norovirus infection in care homes is a random occurrence and as a result, the greater the number of residents, the greater the chance to have an outbreak.

Similar association is also present for the occurrence of multiple outbreaks.
Table 1: Distribution of outbreaks by Local Authority in Cheshire & Merseyside in 2009.

<table>
<thead>
<tr>
<th>Council</th>
<th>Number of Care Homes n=481</th>
<th>Outbreaks (%) n=136</th>
<th>p-value</th>
<th>CH with Multiple-Outbreaks* (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheshire East</td>
<td>80</td>
<td>29 (36.25%)</td>
<td>-</td>
<td>8 (10%)</td>
<td>1</td>
</tr>
<tr>
<td>Cheshire West and Chester</td>
<td>62</td>
<td>21 (33.87%)</td>
<td>0.769</td>
<td>5 (8.06%)</td>
<td>0.692</td>
</tr>
<tr>
<td>Halton</td>
<td>13</td>
<td>6 (46.15%)</td>
<td>0.496</td>
<td>1 (8.33%)</td>
<td>0.856</td>
</tr>
<tr>
<td>Knowsley</td>
<td>20</td>
<td>7 (35%)</td>
<td>0.917</td>
<td>1 (5%)</td>
<td>0.494</td>
</tr>
<tr>
<td>Liverpool</td>
<td>69</td>
<td>21 (30.43%)</td>
<td>0.454</td>
<td>4 (5.80%)</td>
<td>0.353</td>
</tr>
<tr>
<td>Sefton</td>
<td>91</td>
<td>24 (26.37%)</td>
<td>0.165</td>
<td>5 (5.49%)</td>
<td>0.274</td>
</tr>
<tr>
<td>St Helens</td>
<td>27</td>
<td>6 (22.22%)</td>
<td>0.184</td>
<td>1 (3.70%)</td>
<td>0.328</td>
</tr>
<tr>
<td>Warrington</td>
<td>29</td>
<td>11 (37.93%)</td>
<td>0.872</td>
<td>1 (3.45%)</td>
<td>0.295</td>
</tr>
<tr>
<td>Wirral</td>
<td>90</td>
<td>11 (12.22%)</td>
<td>&lt;0.001</td>
<td>0 (0%)</td>
<td>-</td>
</tr>
</tbody>
</table>

*Multiple outbreaks= 2 or more outbreaks in the same nursing home.

**Outbreak control**

Once outbreaks occurred, the size of the care home (total capacity), and hygiene and infection control standard scores were associated with lower attack rate in residents, whilst delayed reporting of the outbreak to the Health Protection Unit was associated with higher attack rates. The significance of this is that good standards of infection control and early involvement of infection control can help minimise the impact of an outbreak once it starts.

**RECOMMENDATIONS**

Outbreaks are random occurrences and as such, quality of care has little impact on their prevention. However, once an outbreak starts, good hygiene and infection control standards alongside prompt reporting and close working with community infection control staff can help minimise its impact. As a result we recommend that:

- Primary Care Trusts and Social Care services should work with care homes in their areas to improve standards of hygiene and infection control. Particular attention may need to be paid to developing robust infection control policies in care homes.

- We acknowledge the limitations that care homes face in controlling outbreaks of viral gastroenteritis. Our analysis suggests that reporting the outbreak early reduces the overall impact to the care home. By involving the HPU and the Infection Control Nurses at an early stage the care homes gets additional expert advice that will help them to curtail an outbreak.