

Influenza A (H1N1) In Lanarkshire

1. Background

Influenza A (H1N1) came to prominence in March and April 2009 when Mexico experienced a high number of flu cases and associated deaths which were attributed to a new Influenza A virus subsequently designated Influenza A (H1N1). This novel H1N1 contains parts of viruses found in pigs, birds and humans which is adapted to spread in humans.

On 27 April 2009, WHO increased the pandemic influenza phase to 4, indicating that there were small clusters of the virus with limited human-to-human spread. On 29 April 2009, WHO increased the pandemic phase to 5 indicating that there were large clusters in many countries, but person to person spread was still localised. On 11 June 2009, WHO raised the level of pandemic influenza to phase 6 because there was an increased and sustained transmission in the general population in different countries. On 23 Feb 2010, WHO has indicated that there is no change in the pandemic phase based on the current epidemiological evidence and other relevant information.

As of 7 March 2010, worldwide more than 213 countries and overseas territories or communities have reported laboratory confirmed cases of pandemic influenza H1N1, including at least 16713 deaths (WHO Pandemic (H1N1) 2009 - update 91).

The European Centre for Disease Prevention and Control (ECDC) has published a Forward Look Risk Assessment for the influenza A(H1N1) pandemic and the 2010/2011 influenza season (March 2010). After assessing the current evidence, it concludes that, although no further pandemic waves are anticipated in Europe, the H1N1 virus is likely to continue to circulate and become the dominant virus in the coming winter season.

1.1. Epidemiology

The symptoms of H1N1 are similar to the symptoms of human seasonal flu infection and includes fever, cough, sore throat, runny nose, lymph and joint pain and headache. In addition, some patients have also had vomiting and diarrhoea.

Infection appears to be mild affecting relatively few older people (older than 60 years) and it disproportionately affects younger people aged 20-40 years and children. The attack rate, that is the proportion exposed to it that go on to get flu, is higher than seasonal flu and children appear to spread it more

readily. It is sensitive to the antiviral drugs Oseltamivir (“Tamiflu®”, Roche) or Zanamivir (“Relenza®”, GlaxoSmithKline (GSK)).

Since the first two cases of H1N1 were identified in Monklands Hospital at the end of April 2009 and until 06 July 2009 the policy was of containment of H1N1. The strategy was to decrease the transmission rate by investigating and treating cases and giving prophylaxis to contacts of cases. In addition, data was gathered to provide clinical and epidemiological information on the virus.

As case numbers continued to rise and outbreaks were reported indicating the spread of the pandemic virus, on 6 July a ‘treatment-only’ phase was initiated to manage the pandemic. This meant that antiviral treatment was offered to anyone who had an appropriate clinical illness, without the need for testing. Most people experienced a mild, typical influenza-like illness and the number of deaths in the first wave has been far fewer, compared with a typical influenza season. However, severe cases have occurred and the overall rate of hospitalisation ranged from 1.3% to 2.5%.

A total of 1540 individuals with confirmed H1N1v infection have ever been admitted to hospital in Scotland (as at midday 1 March, 2010). A high proportion of patients ever admitted to hospital were known to have underlying diseases, including chronic respiratory disease, diabetes or immunosuppression. Information obtained during the containment phase has indicated that, although there is a range of disease severity including some deaths in people with existing illness or disease, illness was relatively mild in the majority of the people. Information from studies reported from the Southern hemisphere and North America demonstrated that H1N1 had a substantial and sustained impact upon adult and paediatric critical care services.

The highest number of hospitalisations is among those aged less than 25 years (681/1540, 44%), particularly in those aged 0-4 years (267/1540, 17%). Cumulatively, there are more women than men who have been hospitalized during the period of monitoring. Intensive epidemiological and laboratory investigation of the ‘first few hundred’ cases and their household contacts during the containment phase estimated that the secondary household virologically confirmed attack rate was 7%; however, the rate was approximately four times higher in children (<16 years) than adults and >90% lower among household contacts who received antiviral prophylaxis.

Information from initial serological studies coordinated by the Health Protection Agency suggests that a sizeable proportion of people, especially those in younger age groups, were infected with the pandemic virus. Preliminary results of seroepidemiology studies indicate that, overall, about 15% of children in England were infected during the first wave.

By the end of February 2010, the “snapshot” data showed that in Scotland:

- GP consultation rates for influenza-like illnesses was 73.1 per 100,000, (with a 95% confidence interval (CI) of 70.9, 75.4) in the week ending 28 February 2010. The consultation rate remained highest among those aged 0-4 years. Since mid August, an increasing trend was noted in most NHS boards in Scotland until mid to late November followed by a sharp decline in December and a rise to a further, smaller peak in late December.
- The H1N1 positivity rate of those consulting GPs was 0%. A reduction in swab positivity has been noted since mid November, with high positivity rates up to 45% being reported in the beginning of November.
- The total number of reports received of deaths among those with confirmed Influenza A H1N1v in Scotland, as at 1 March is 68.
- There is still limited evidence of antiviral resistance in Scotland: nine of the 40 oseltamivir resistant viruses in the UK have been identified in Scotland
- Levels of circulating non-flu viruses (e.g. RSV, coronavirus, human metapneumovirus and rhinovirus) remain relatively low.

2. Lanarkshire Planning For Pandemic Influenza

2.1. Lanarkshire Pandemic Influenza Plan

The Lanarkshire Pandemic Influenza Plan was signed off in October 2008 by NHS Lanarkshire, North Lanarkshire Council and South Lanarkshire Council. The plan outlines national, regional and local management and co-ordination arrangements and the key roles and responsibilities of the NHS and Local Authorities.

2.2. Lanarkshire Pandemic Influenza Problem Assessment Group (PAG)

The Lanarkshire Pandemic Influenza Plan provided for the setting up of the Problem Assessment Group as a multi-agency group convened by the Director of Public Health to deal with pandemic influenza. Following WHO raising the pandemic phase to 5 on 29 April 2009, the PAG met for the first time on 30 April. The PAG met on 23 occasions mostly on a weekly or fortnightly basis and the last meeting was held on the 20 January 2010. The PAG co-ordinated the response to H1N1 at a strategic level and had an oversight of the availability, supply and use of antiviral drugs, impact on services, the vaccination programme, staff issues, vulnerable groups, mortuary facilities and communications. The PAG ensured that there was high level commitment within its constituent organisations and the Pandemic Influenza Plan is being implemented.

2.3. NHSL Corporate Management Team (CMT)

From the initial two cases of H1N1 admitted to the Infectious Diseases Unit at Monklands Hospital, the CMT have been involved with active participation by Executive Directors (ED) on call, communications and public health. The CMT had Pandemic Influenza as their lead agenda item at their formal fortnightly meetings and on their informal weekly meetings. The system of on-call ED and overview by the CMT have worked well.

2.4. National Planning Assumptions

The national planning assumptions (NOT predictions) to the end of May 2010 for the pandemic in the UK were as follows:

- Clinical Attack Rate - 30% of population
- Peak Clinical Attack Rate
 - Nationally $\leq 6.5\%$ population per week
 - Locally 4.5-8% population per week
- Case Complication Ratio $\leq 15\%$ of cases
- Case Hospitalisation Ratio $\leq 1\%$ of clinical cases (of whom 25% will require intensive care)
- Case Fatality Ratio $\leq 0.1\%$ of clinical cases
- Peak Absence Rate $\leq 12\%$ of workforce.

However, the CMO issued revised planning assumptions for Scotland at the end of October 2009 advising that the worst clinical attack rate across the population was expected to be 12%, and 30% for the <16 years only and that the peak absence rate was expected to be around 5% of the workforce.

3. Lanarkshire Experience

3.1. Cases

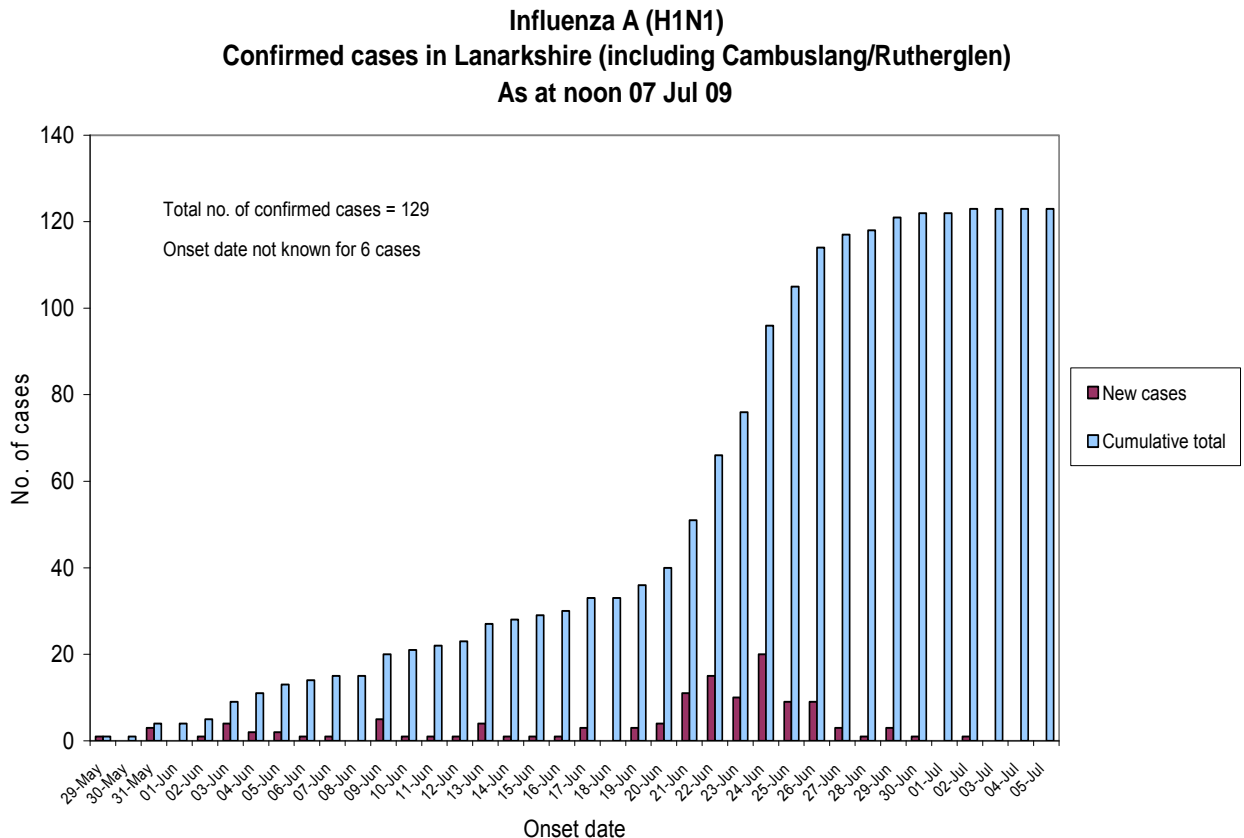
Although there was initial, intense bout of activity at the end of April/early May when there were two cases from Forth Valley in Monklands Hospital, the first two Lanarkshire cases were not confirmed until Saturday 06 June. Following these cases, there was a steady increase in number of cases and other associated work which included contact tracing, providing prophylaxis in schools and nurseries and closing schools or sending some school years home. The initial contact tracing involved workplace and air travel passengers. However, a review of evidence on transmission in these settings resulted in a change with contact tracing being discontinued.

The move on 06 July to treatment phase throughout the U.K. meant that laboratory testing was no longer required to diagnose H1N1 and only cases would be treated, not close contacts (except in exceptional circumstances).

In Lanarkshire, during the containment phase, information was collected on 520 cases, 129 of which were confirmed and the rest were possible cases and regular reports included:

- Daily summary report of confirmed cases and contact numbers (mandatory requirement for Health Protection Scotland (HPS))
- Daily position statement showing confirmed and possible cases by locality (distributed to PAG members and selected other NHS and Council staff)
- Graphical output to monitor trends (see Figure 1 for an example from the end of the containment phase)

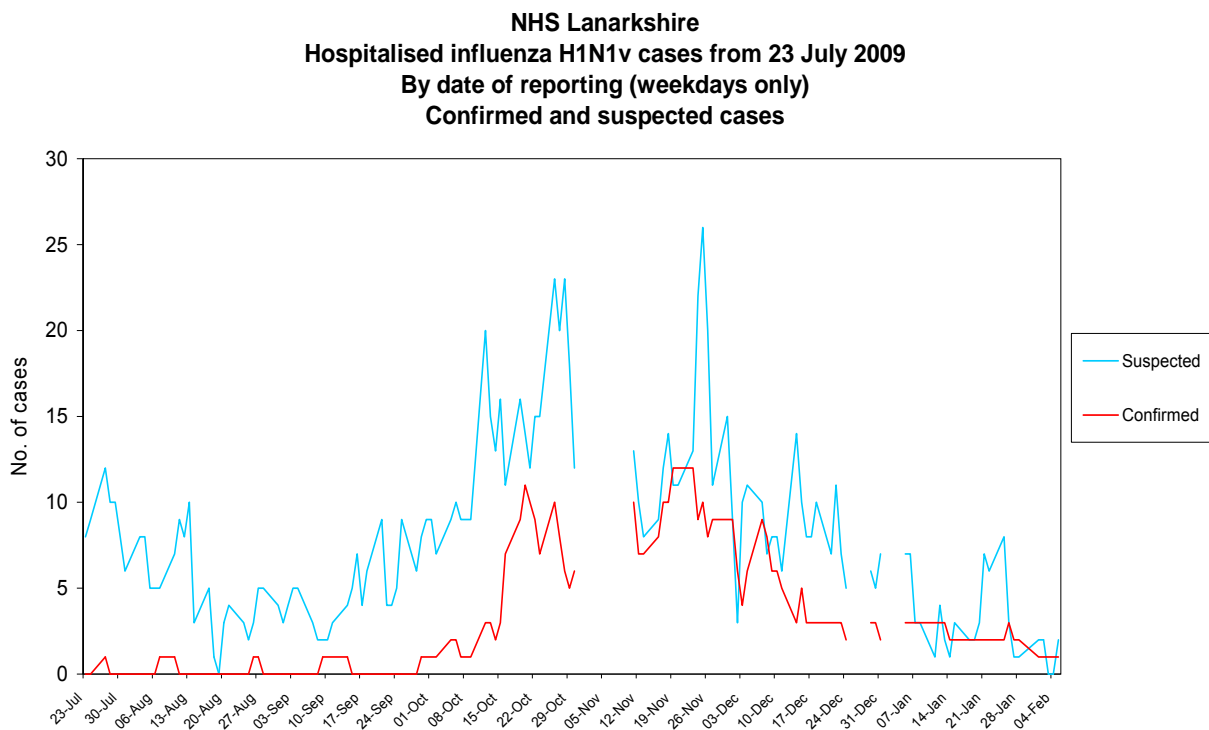
Figure 1: Total number of confirmed H1N1 cases in Lanarkshire at the end of the containment phase



In the treatment phase, case-specific information on suspected and confirmed hospitalised H1N1 cases was provided each weekday to the Health Protection Team (HPT) by Infection Control Nurses (ICNs) at the 3 acute hospitals. This was used to produce regular and ad hoc reports including:

- Daily aggregated summary table and enhanced dataset for hospitalized H1N1 cases (mandatory requirement for HPS).
- Daily H1N1 hospital activity report (distributed to selected NHSL staff and members of the PAG) showing suspected and confirmed cases by hospital continued to be produced and distributed until 5 February 2010.
- Graphical output to monitor trends (see Figure 2 for an example from the end of the treatment phase; data for some weeks are missing when the transition occurred to reporting of hospitalized H1N1v cases through the Electronic Communication of Surveillance in Scotland system (ECOSS)).

Figure 2: Number of confirmed and suspected cases of H1N1 in Lanarkshire (Jul 09 to Feb 10)



There were a total number of 138 confirmed cases hospitalised in Lanarkshire up to 6 February 2010.

During the containment phase, there were three primary schools and a nursery which had confirmed cases reported to the HPT. In addition, there were two incidents which involved teachers who worked across different schools and extensive contact tracing was undertaken in all of the above

situations. During the treatment phase, when there were reports of suspected or confirmed cases in schools, letters were issued to all parents of the particular schools involved. The letter informed them of the situation, highlighted the symptoms of H1N1 asking them to seek clinical advice from their GP if required and the importance of curtailing spread through good hand and respiratory hygiene.

182 NHS Lanarkshire staff members fulfilled the criteria for onward referral to their GP or NHS 24 for further assessment and or treatment of H1N1 until the end of February 2010 and a very small number of staff required hospital admission.

3.2. NHS Lanarkshire

3.2.1. Public Health and Corporate Services

Following the admission of the two cases to Monklands Hospital on 25 April 2009, an Operations Room was set up in the Board Room at Beckford Street. This was discontinued after a few days, but reinstigated in June when the number of cases locally rose rapidly. The Operations Room was necessary for the Department of Public Health to identify possible cases and manage them according to the HPS algorithms, the follow up of contacts, management of clusters in schools, distribution of updated guidance to staff, and maintaining links to HPS and other NHS Boards and the Scottish Government via daily teleconferences, and to be able to produce timely situation reports.

Daily teleconferences coordinated by HPS were invaluable to discuss key areas of concern and management. However, there were issues with centrally issued clinical advice which is a priority and preparation and dissemination of epidemiological reports by HPS could have been more timely. There were issues with regards to assessing resilience and capacity at the Regional Virus Laboratory (RVL) which were unresolved and proved a limiting factor in the effective management of cases locally. Establishment of a database of calls at health board level from day one would have greatly facilitated access to relevant information especially for call handlers.

The Operations Room was supported by staff in Beckford Street and by staff who were nominated from CHPs, Acute Division and from both Local Authorities. Although there were some teething problems in getting the Operations Room up and running, these were overcome. In addition, experience was gained of practical issues in setting up an Operations Room and the involvement of BankAide in helping to staff the Operations Room.

The availability of an Operations Room with appropriate IT and teleconferencing facilities that can be activated at short notice with adequate staff including a supervisor to coordinate arrangements is imperative to facilitate an effective response in the event of similar incidents. Training sessions were organised for staff who volunteered to provide support in the Operations Room. Availability of a brief but structured training session to cover key areas was found to be helpful.

In particular, some members of the Department of Public Health worked extremely long hours, and the support from other staff in Beckford Street and the rest of the organisation was invaluable. Consultant staff in the Department re-arranged rotas to have second on-call and for a large period of time, and all members of the Department prioritised H1N1 work with ongoing implications for other work.

The management of clusters in schools, especially special schools was challenging in many ways, however a good partnership and working relationship, and good lines of communication between schools, education authorities and NHS Lanarkshire and provision of information for parents were crucial factors for successful management.

The collection of epidemiological information whilst maintaining clinical continuity, recognised to be vital in understanding the nature and impact of the pandemic, was challenging for clinical staff. A locally developed information system such as Management Information Lanarkshire (MiLAN) might provide a feasible option for linking all the divisions within NHS Lanarkshire to access key clinical data.

Work was undertaken in both primary care and acute divisions to identify support requirements and any gaps in workforce provision and there was agreement on minimum staffing and service levels including discussion of implications at the Corporate Management Team. National Guidance which recommended risk assessment and redeployment if indicated was not always practicable. Guidance on excluding staff from work, with a particular focus on vulnerable staff groups e.g. pregnant staff should be developed as a priority to ensure a consistent approach across the statutory sector.

The national "Pandemic Flu Framework" was helpful in preparing the local plan. However, the planning assumptions were based on a severe pandemic with higher levels of mortality and morbidity and repeated reductions in these assumptions during the pandemic were undertaken. Modification of targets at a national level could have been considered in light of the increased activity during both phases and information on criteria to assist decision making on scaling back elective work would have been useful.

3.2.2. Primary Care and Out of Hours

In addition to coping with the immediate requirements of the pandemic, extensive work and planning has been undertaken in primary care including surge capacity, business continuity, antivirals distribution and arrangements for vaccination.

The gathering of epidemiological information during the containment phase placed particular pressure on general practice and was a departure from established practice. When this became unsustainable or challenged ethical thinking such as when dealing with young children, a pragmatic approach was adopted.

In July, Primary Care came under particular pressure especially in some hot spots e.g. Carluke. Although the numbers of cases decreased in August, GP consultations for influenza like illnesses increased since late August throughout Scotland until the decline in consultation rates was noted. Similarly, the out-of-hours (OOH) service has also come under pressure at various times since July, but the flexibility of approach has ensured that they met the challenges.

3.2.3. Acute Division

As with Primary Care, there has been extensive work and planning in the Acute Division. This included prioritisation of work, surge capacity planning, infection control especially with regards to isolation and cohorting, which might impact negatively on critical care and the elective programme, and fit testing of FFP3 masks by staff that may need them. Issues about ensuring fit-testing of all relevant staff and the masks to be used have taken up considerable time to resolve as the recommendations locally about the masks to use have differed from the advice from Scottish Government.

A NHS Lanarkshire wide plan was developed for critical care services, radiology, laboratories, estates and hotel services. Planning which covered local paediatrics, local intensive and high dependency care and paediatric intensive and high dependency care at Yorkhill was effective in producing a comprehensive plan and ensuring the availability of ventilators suitable for children. Close monitoring of the epidemiology of the developing epidemic during September to October enabled a series of iterations of worst case scenarios which informed the planning process.

3.3 Local Authorities

Both North and South Lanarkshire Councils were represented on the PAG and, in addition, Executive Directors met with the Council leaders and

deputy Chief Executives to ensure that everyone was clear about the implementation of the Lanarkshire Pandemic Influenza Plan. Issues were discussed at a strategic level in the PAG and operationally with the CHPs at locality level. When decisions had to be made about closing classes or schools it was particularly helpful to have staff input, especially from South Lanarkshire Council's education department, who helped with contacting parents and opening up schools for distribution of prophylaxis out of hours.

3.4 Infection Control

Infection Control issues have been discussed at the PAG and advice was given by the Health Protection Team in Public Health, the Infectious Diseases Unit at Monklands, and by the HAI Team in NHS Lanarkshire.

3.5 Antiviral Distribution

Antiviral distribution has been extensively discussed and detailed plans put in place in three stages to cope with increasing antiviral distribution as required. The three hospital pharmacies were involved initially in the containment phase and as the need increased for antivirals, Antiviral Collection Points (ACPs) based in health centres were organised and six Locality based ACPs were in operation during the treatment phase. The decision to operate a limited number of ACPs ensured smooth operation. Although plans included arrangements for mass distribution through sites such as sport centres which was progressed with the Local Authorities and Leisure Trusts, there was no requirement to activate these.

3.6 Communications

Communications about H1N1 have been directed by the Scottish Government Health Directorate. A key feature of communications in Lanarkshire has been to ensure that staff are adequately informed. Information to staff in primary care and the acute division was sent in partnership with Primary Care, Acute Division and HPT as and when required, which was managed well. Regular bulletins were issued from the Communications Department to NHSL staff, by a section on First Port on H1N1, updates from Primary Care to Primary Care Teams, and working across organisations to ensure a consistency in approach and message from the organisations represented on the PAG.

3.7 Vaccination

This will be covered in a separate paper.

4 Conclusions

H1N1 has posed unique problems for NHS Lanarkshire and its partners. It has not behaved as the Pandemic Influenza planning suggested e.g. the prolonged containment phase and relatively mild nature. However, many of these challenges have been met in the first wave of the pandemic including by primary care, secondary care and public health. At times, these services have been stretched, but ultimately, coped.

Planning for the second and subsequent waves of the pandemic meant considerable resources were devoted to, e.g. antiviral collection points, vaccination plans (subsequently not needed because of the U.K. wide GP agreement), increasing critical care capacity, training staff and prioritising services.

A workshop to look at the response to the pandemic was organised for PAG members in October 2009 to discuss key learning points and an Action Plan was drawn up to address any gaps and ensure better preparedness for subsequent waves. A PAG paper reviewing the pandemic will be produced by the end of September 2010.

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