

If you build it, they will come: an influenza assessment clinic

Matt Luther and Shane Lenson share some lessons from their involvement in setting up Calvary Health Care ACT's Influenza Assessment Clinic in response to the recent Swine Flu epidemic

Human swine influenza (HSI), now known as H1N1 09, is a new strain of the subtype H1N1 Influenza A and was first detected in Mexico during late April 2009. Xeno-transfer occurred through the mutation of a common swine influenza virus (SIV) into a zoonotic swine influenza virus that was not only stable within the human upper respiratory tract, it was capable of sustained human-to-human transmission on a community level. The intensity and speed of international travel rapidly saw the spread of the H1N1 09 virus initially to the United States then internationally within a matter of months.

Australia reported its first case when an Australian citizen returned from Los Angeles to Brisbane on 7 May, 2009 and tested positive to H1N1 09. Whilst this man returned a weak positive swab he was not infectious at that stage. On 22 May the Australian Government's Department of Health and Aging (DoHA) raised the pandemic alert level to CONTAIN. This phase naming suggests the actions conducted by varying authorities to contain the spread of influenza among the community. By the end of April there were 257 confirmed cases of H1N1 09 in 11 countries and by the end of May there were 15,510 confirmed cases affecting 53 countries.

With the rapid spread of H1N1 09, the World Health Organisation (WHO) declared a phase 6 global pandemic on 11 June. As of that date there were 28,774 confirmed cases of H1N1 09 in 74 countries and an international mortality total of 144 deaths directly associated with the human swine influenza strain.

Whilst the H1N1 09 strain of influenza spread rapidly around the globe it displayed a mild morbidity and mortality profile.

Even though the symptomology experienced by sufferers of H1N1 09 was mild to moderate, the situation that Australia was to experience was both unique and unpredictable compared to that of the northern hemisphere as the country moved into winter. Not only would Australia need to manage the normal impact of seasonal influenza it would now also need to prepare its health care sector for a possible proliferation of H1N1 09 cases and the associated complications of influenza such as pneumonia.

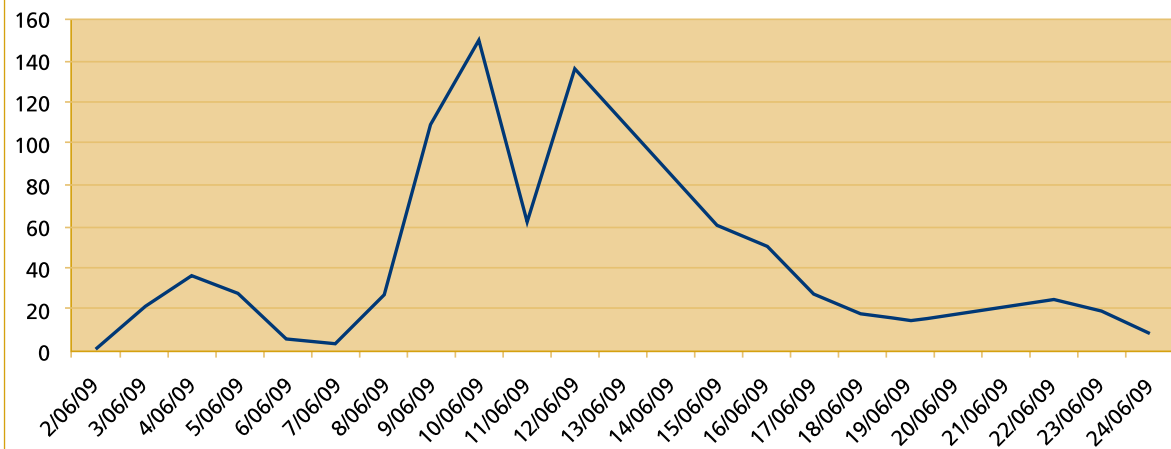
Much of this work had been done through prior preparations in response to the Severe Acute Respiratory Syndrome (SARS) and H5N1 Avian Influenza (AI) outbreaks. The AI outbreak in South East Asia during 2003 and the threat of a H5N1 pandemic mobilised the Department of Health and Aging to publish specific guideline documents such as the Australian Health Management for Pandemic Influenza (AHMPI) to help guide local State and Territory health sectors through the setup, operation and recovery responses required in the event of an influenza pandemic.

With early reports of H1N1 09 outbreaks occurring in countries outside of Mexico and the continental United States, especially Japan and New Zealand, the need for pandemic-scale planning was becoming more evident. The proliferation of confirmed H1N1 09 cases noted in Victoria on 28 June indicated the requirement to conduct a local needs analysis. Initially this process was reactive to experiences of Emergency Departments in the Melbourne metro area. Canberra's Calvary Hospital Emergency Department (ED), in consultation with the hospital Executive and hospital emergency plan (HEPLAN), developed trigger points for escalation within the ED which expanded over time to occupy other isolatable areas.

As a result of extensive media coverage of the H1N1 09 escalation in Victoria, Calvary realised that the demand for influenza assessment would have a greater impact on the ED's business continuity than the actual treatment of positive influenza-like illness (ILI) cases. A close relationship between the ED and ACT Public Health Unit meant that when contact tracing was required for the first confirmed H1N1 09 case in Canberra on 26 May 2009, the ED was well placed to assist with the clinical aspects of that tracing.

The first influenza assessment clinic was run for one day, 26 May, using the foyer of the Older Persons Mental Health Unit (OPHU) of the hospital. This site was chosen as it provided a separate entry with a waiting room, clerical position and 4 assessment-sized rooms all in close proximity. While the location and system worked, there were many lessons learnt from that first contact trace clinic. The most important of which was the staggering of presentations where possible. ACT Public Health had contacted all persons in direct contact with

Figure 1: Presentations per day



the positive HSI case, according to the CONTAIN phase guidelines, approximately 60 persons, and referred them to the contact tracing clinic. These patients then arrived when convenient to their day plan, e.g. in the morning before work, and found an extensive wait before them. Signage was another salient issue. As the site was an adaptation of a pre-existing area, many people visiting the OPHU found it difficult to find the alternate entry and cross-contamination of these visitors was narrowly avoided through the use of security staff directing people prior to entry into the modified assessment area. Along with signage, feedback indicated that information was required for clinical staff regarding infection control issues and influenza. While it wasn't initially considered, staff are also affected by media hype and had formed, while misguided, valid personal health concerns.

Referencing the above lessons, the AHMPI and the local Australian Capital Territory Health Management Plan for Pandemic Influenza (ACT HMPPI) an Influenza Assessment Clinic (IAC) was established.

Surge presentation to the contact trace clinic identified the need for the IAC design to directly support efficient patient flow through the clinic. The IAC team envisaged and later experienced that the IAC would treat large volumes of the worried well—persons with an upper respiratory tract infection (URTI) and/or ILI of mild symptomology or not of the H1N1 09 strain. Thus consultation time within the IAC would be minimal.

Flow-modelling and trialling of the IAC concept, was achieved through the use of a modified Emergo Train System (ETS) where virtual patients of the IAC were mobilised from front door-to-discharge while taking into account real time constraints. Choke points were identified and minimised or eliminated where possible. Through this modelling it was found that a continuous linear approach would be the most efficient, with each room being allocated a number along a patient's journey.

Another issue that directly affects the operation of an IAC is the case definition applied to the H1N1 09 virus by DoHA. While the virus remains the same, the case definition, a risk-satisfying descriptor for the likelihood of a person contracting the virus, varies with the spread of the disease and the response phase associated at the time. This case definition will directly affect the workload of an IAC through the requirement for: contact tracing, viral swabbing, antiviral medication issuing and finally the number of persons that fall into the case definition. As the spread of a disease is hard to predict, all aspects of an IAC structure and design must remain flexible to accommodate changes in the case definition in a timely manner. Information fed down from the lead Commonwealth bodies needs to be inserted into local policy and paperwork for implementation.

With each dependant requirement taken into account:

Step 1: is an initial waiting room to accommodate a surge in presentations that the clerical staff are not able to attend to immediately.

Step 2: consists of registration and generation of medical record paperwork and patient labels.

Step 3: includes the collection of clinical observations with referral back to the ED if required.

Step 4: is the IAC waiting room. Whilst waiting, each patient is asked to complete a questionnaire including demographic information that may be required in contact tracing and symptomology of their ILI.

Step 5: is where the patient is assessed against the H1N1 09 case definition. If the patient meets the case definition then they are referred to Step 6 for swabbing and or antiviral medications. If the patient doesn't meet case definition they are assessed against URTI criteria and given the appropriate health advice before being discharged directly from the clinic.

It may be noted that there are two room 5s, this is due to an identified choke point in patient assessment.

Step 6: is the final stage prior to discharge where viral swabbing and or dispensing of antiviral medications.

The selection of room 6 needs consideration regard the infection control and risk of aerosolising of upper airway secretions during swabbing techniques. In this case we selected a room without curtains and all washable surfaces. While some staff in other areas of the building required reassurance, air-conditioning was not of concern due to the virus's droplet mode of transmission and the positive (verses recycled) nature of most hospital air-conditioning systems.

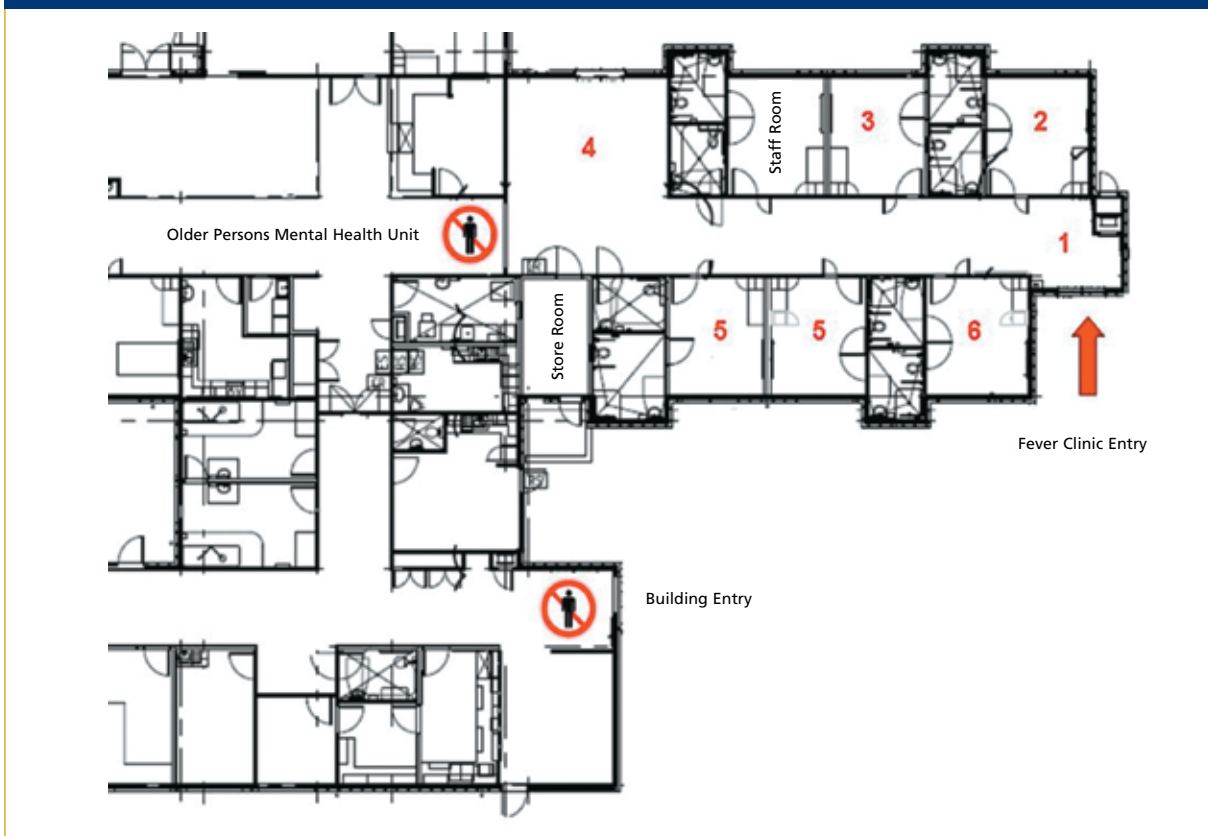
Due to the reactive nature of the establishment of an IAC, staffing will always be complex. While the operation of an IAC sits comfortably in the realms of community health the establishment of such a clinic at short notice to receive high numbers of initial presentations, is best suited to ED staff due to their comfort and familiarity with surge response. In the interest of business continuity and sustainability a finite timeframe should be placed on this staffing model. In the Calvary plan we factored that the community health team take over staffing of the IAC after a seven-day period. This time buffer should be sufficient for the community health model to be established, adjusted and staffed for what could be a sustained intervention.

At the time of writing, the ED have operated the IAC for 3 weeks thankfully the severity of the disease was mild-to-moderate and the ALERT phase was changed early in the epidemiological curve, leading to a lower, more sustainable workload. The severity of the morbidity and or mortality associated with the disease may affect the preference for and availability of ED staff due to concurrent loading of the ED with acutely unwell persons.

Another advantage identified with the initial use of ED staff is the minimal training and orientation requirement. The work conducted by an IAC was very similar to that of an ED, patients present requiring a rapid workup and definitive disposition, many of whom have minor ILI complaints. A combination of eLearning and competency assessment was used to ensure a best practice and consistent approach from all staff working within the IAC regarding the use of personal protective equipment (PPE), infection control and viral swabbing. IAC staff were required to attend to eLearning units on: hand hygiene (specifically the use of antimicrobial hand rubs) influenza pandemic PPE, donning and doffing, and the collection of nasopharyngeal 'flocked' and oropharyngeal viral swabs. On completion of these units staff were observed using competency assessments of the physical application of these skills.

Equipment availability was another issue that had to be overcome to ensure efficient throughput of persons in the IAC. Three main areas were identified—information

Figure 2: Floor Plan.



technology, clinical and environmental. While all the equipment required by the IAC was available in the hospital setting, it was all being used for day-to-day business, thus alternatives were sort. Computers, printer/fax and phones are all readily available from suppliers though have to be costed in at short notice as with the clinical examination equipment. While there were many requests for the weird and wonderful, for the purposes of an IAC there were few clinical examination pieces of equipment that were actually required. These included a multifunction observation tower such as the Welch Allyn LXi and an otoscope. Obviously, it is important to acquire thermometers that don't involve oral access as this is difficult with patients wearing surgical masks.

Environmentally there is also a demand for chairs, desks and signage. While chairs and desks are a little harder to acquire, temporary signage is a little easier with access to a large printer and lamination equipment. To aid in directing patients to the IAC, and avoid patients walking through the main hospital, we employed sandwich board signage on the roadways around the campus.

An IAC needs a lot of Consumables—predominantly PPE supplies. Accordingly, with large quantities of consumables comes a corresponding quantity of infectious waste. Many health care institutions found after the declaration of the H1N1 09 pandemic, access to PPE stock was difficult and, in many cases, controlled. As PPE is essential to the operation of an IAC it is important that IACs hold a stock of PPE above that of the normal hospital supply. Calvary found that at least one month's supply calculated on hand run and surgical masks for 50 patients a day and gowns, hand rub, gloves (S/M/L), surgical and N95(P2) masks with 3 changes per shift, should provide adequate stores of PPE. Goggles and or face masks are also suggested when conducting close examinations of the patient or when acquiring naso/oropharyngeal viral swabs. Other consumables used were: batteries and disposable plastic tips for the otoscopes; tongue depressors, paper, pens, plastic sleeves, patient labels, tissues, infectious waste and normal rubbish bags, cups and water.

Communication within the healthcare sector, pre-hospital providers and the community has been an on-going issue for all involved. The greatest factor surrounding communication is the ability of the greater pandemic healthcare governance system to provide timely clinical information such as the current case definitions. Centrally held digital forms and advice sheets are an essential tool to alleviate some of these issues, while a local or national digital pandemic influenza assessment form would be the ultimate tool, providing consistency and timely information to all healthcare providers. It was also found that while email is a powerful and readily used communication tool when the digital communication load increases dramatically as seen during a pandemic, even of mild symptomology,

a timely response may not be achieved and email communication may need to be supported with direct voice communications to ensure compliance.

From the opening of the influenza assessment clinic at the Calvary facility on 2 June until the change over from ALERT level from CONTAIN to PROTECT on the 17 June 2009, twenty-one people presented to the Emergency Department with flu like symptoms while 711 people presented to the Influenza Assessment Clinic. During this period the influenza assessment clinic and the ACT Public Health Unit identified 71 new confirmed cases of H1N1 09. These numbers are indicative of the need for an IAC to protect ED business continuity during the initial stage of an influenza pandemic response, though it should be noted that this ED driven response should be limited and a definitive staffing model such as that offered by Community Health put in place as soon as possible to enable an sustained response.

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About the authors

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