

6-Month project to fit test at-risk healthcare workers for P2 Respirators

Irene Wilkinson
Manager, Infection Control Service
Communicable Disease Control Branch

and

Beth Bint
Infection Control Project Officer
Emergency Management Unit



Pandemic Preparedness

- > Infection control precautions are important because:
 - Lack of a vaccine in early stages
 - Antivirals only ~70-80% effective for prophylaxis
 - Quarantine measures alone not sufficient
- > Mathematical modelling indicates that a combination of IC precautions, targeted antiviral prophylaxis & social distancing measures can be effective in slowing the progress of an epidemic ([J Glass et al. EID,12:1671-1681](#))

SA Health

How is influenza transmitted?

- > Direct contact with respiratory secretions
- > Indirect contact - via hands from contaminated surfaces
- > Airborne – inhalation of droplet nuclei
- > Factors that can influenza droplet size
 - low humidity
 - medical instrumentation or practices
 - Aerosol generating procedures



Relative importance of each mode is uncertain

R Tellier, EID, Dec 2006

G Brankston, Lancet Infect Dis, Jan 2007

SA Health

Evidence for type of mask

- > Comparison of elastomeric, N95 masks and surgical masks performance
- > Simulated workplace tests using PortaCount® Plus

Results:



Elastomeric > N95 mask > Surgical mask

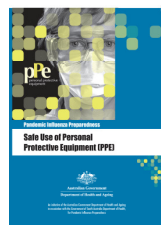
Difference between elastomeric and N95 mask less than between N95 and surgical mask

Lawrence et al, 2006, J Occ Env Hyg; 3: 465

SA Health

Australian Pandemic IC Guidelines recommendations for PPE

- > All close patient contacts (within 1 metre):
 - Contact & droplet precautions
 - Fluid repellent gown, gloves & protective eyewear
 - P2 (or N95) mask, properly fitted
- > Aerosol-generating procedures:
 - Contact precautions, and
 - Full airborne precautions, incl. P2 (or N95) mask & negative pressure isolation room, if available



SA Health

Why is fit testing necessary?

- > AS/NZS 1715:1994 Selection, use and maintenance of respiratory protection (Draft revision still pending)
 - “in order for the designed performance to be achieved by a respirator, it is essential the respirator be properly fitted to the individual to whom it is assigned.”*
- > Relevant OHSW Regulations and Occupational Health, Safety And Welfare Act in each state or territory.

SA Health

Fit testing vs Fit checking

- > **Fit testing**
 - determine brand and size best suited to the individual's face
 - measures the inward leakage around the face seal **plus** the passage of particles through the filter material
 - used for initial assignment respirator and,
 - if significant change in facial shape eg; weight loss or gain
 - assess user competence
 - change in product availability
- > **Fit checking**
 - User seal check performed each time the P2 is worn to determine if properly donned
- > A fit check is **not** a substitute for a fit test:

Ref: Derrick et al. J Hosp Infect, 2005;59 :152

SA Health

High risk situations & priorities

1. "Flu hospitals":
 - Emergency Departments / teams
 - Intensive care units
 - Bronchoscopy suites
 - Respiratory wards
2. Emergency patient transport
3. Primary care – GPs, flu clinics
4. Nursing homes & residential aged care
5. Other agencies in accordance with risk assessment

SA Health

The South Australian experience

- > SA Ambulance Service – using hood + saccharine method for several years
- > Hospitals and community nursing service began fit testing using hood method in mid 2004
 - Variable results - many found not to achieve a satisfactory fit
 - Only a limited number of tests per day possible due to saccharine contamination of environment
- > Began using PortaCount®Plus method in two hospitals in late 2005:
 - More consistent results, permanent record created
 - Requires resources

SA Health

SA Fit Testing Project

- > October 2006 Funding for pandemic influenza preparedness (until end June 2007)
- > Respirator fit testing of health care workers was seen as a priority by the pandemic planning team
- > Approx \$0.7million allocated:
 - PortaCounts® and P2 masks purchased
 - Project officers recruited for testing and PPE education.

SA Health

Overall Aim of Project

- > To ensure all health care workers who have the highest risk of exposure to a potential pandemic influenza virus have been:
 1. Fit tested to determine the most appropriate respirator for them
 2. Given adequate information and training on use of disposable respirators
 3. Instructed in the appropriate application of IC precautions for a potentially airborne respiratory infection

SA Health

Key Project Objectives

- > Prioritise Health Care workers according to level of expected risk of exposure
- > Set targets to achieve fit testing of at least 90% of highest risk category staff by project end
- > Ensure consistent messages about PPE and IC principles are delivered to all HCWs
- > Coordinate documentation of staff participation and fit testing results
- > Develop a strategy for ongoing fit testing and education for lower priority staff (in conjunction with facility IC and OH&S units)

SA Health

Risk Assessment

- > Review employee roles to determine risk
- > Where possible redesign work practices to avoid direct contact

		Level of Exposure to Confirmed or Suspected Case					
		> 1 meter in an open area with good ventilation	> 1 meter in a confined space with poor ventilation	≤ 1 metre of PPE use	Physical contact with PPE use	Proximity to respiratory activity	
Likelihood of Contact	Expected to occur on most shifts	Almost Certain	2	3	4	4	4
	Probably will occur during the shift	Likely	2	3	4	4	4
	Might occur at sometimes during the shift	Possible	2	2	3	3	4
	Could occur but not usually	Unlikely	1	1	2	2	2
	May occur but only in exceptional circumstances	Rare	1	1	2	2	2

SA Health

Project Plan

- > ICS Pandemic Project Officer co-ordinated project
- > First steps:
 - Determine the number of instruments and project officers required to achieve main objective
 - Determine optimum allocation of resources according to identified need
 - Recruit staff

SA Health

Project Plan – cont.

Next steps:

- Determine KPIs & reporting framework
- Conduct “train-the-trainer” workshops
- Organise supplies of masks and fit testing consumables
- Provide educational materials & resources
- > Monitor progress and adjust allocations & targets as necessary
- > 20 PortaCounts® in total

SA Health

Program evaluation

- > Program evaluation & research agenda:
 - Determine a simple method of *a priori* mask selection
 - Assistance from Adelaide University, Dept Public Health (A/Prof Dino Pisaniello)
- > Questionnaire developed – 2 parts:
 1. Record of fit testing session (participant)
 2. Record of facial characteristics - overall shape, nose size and shape (tester)

SA Health

Reporting on KPIs

- > Designed a monthly report form to record:
 - Total no. of staff in “high risk” category
 - Total no. fit tested by risk category
 - Work category – ED, ICU, respiratory, surgical, medical, other
 - Occupational group – Doctor, Nurse, Allied Health, Support staff
 - Progress on objectives / planned changes
 - Risk management issues identified

SA Health

Resource allocation

Priority given to:

- > Designated “flu” hospitals in metropolitan and country areas
- > SA Ambulance Service
- > Private hospitals with emergency depts.
- > Community nursing organisations
- > Nursing agency staff
- > General Practitioners

SA Health

The project begins

- > 16 PortaCount[®] instruments purchased
 - 21 in total in SA
- > Staff recruited by 1st week of December
 - 18.5 FTE staff
- > Train-the-Trainer workshop held in 1st week Dec
 - Day 1 general education on pandemic influenza, bioaerosols, infection control and PPE application
 - Day 2 – hands on training with PortaCount[®]
 - Distributor (Kenelec Scientific Pty Ltd) involved
- > Fit testing began mid January in most areas

SA Health

Keeping on Track

- > PortaCount Users Group established
 - Monthly meetings scheduled from January 2007
 - Share troubleshooting tips & tricks
 - Experienced users invited
 - Support for country Project Officers in particular
 - Identify issues of concern, barriers & limitations
- > Encouraged phone contact with ICS

SA Health

Project KPI Results

Region	Total High Risk HCWs	Fit Tested to Date	KPI
Metro Hospitals	6254	4120	66%
Country Hospitals	806	655	81%
Priv. Hosp/Agencies	695	384	55%
Community/GPs	2531	809	32%
Overall statewide	12617	6777	53%
SAAS	2136*	193	9%

Overall number of fit tests 7989 SA Health

Observations

- > Ability to achieve a fit test pass depends on several factors:
 - Experience & prior knowledge of tester
 - Prior experience of subject with use of P2 masks
 - Knowledge & attitude of subject with respect to risk (of airborne exposure, likelihood of pandemic occurring, etc)
 - Facial characteristics? – still to be determined
- > Allow at least 30 mins per person
- > HCF can be a difficult environment for fit testing
 - Efficient air conditioning

SA Health

Issues Identified

- > Need for contingency plans when supplies of consumables are delayed
- > Accessing staff in HCFs to attend sessions
 - Need support from Managers to release staff for testing
- > Dealing with scepticism and lack of cooperation
- > Need for several attempts to find a suitable mask in some cases – extends the time required to achieve objectives

SA Health

Lessons Learned

Or...what would we do differently next time...?

- > Need Executive level “buy-in”
 - better communication & consultation up front
- > Can’t buy experience...
 - Hold a second training workshop for project officers who need it, especially IT skills (backing up data, etc)
- > Take a little more time to plan in advance, despite constraints
- > Project risk assessment & contingency plans

SA Health

Further work

- > Commonwealth funding
 - Analysis of questionnaires and PortaCount® data
 - Contract with University of Adelaide, Data Management and Analysis Centre (DMAC)
 - Report due end of June
 - Results to be published in a peer review journal by end of year
- > Qualitative research
 - A/Prof Dino Pisaniello, Dept Public Health Adelaide University
 - Interviewing testers re: experiences and observations

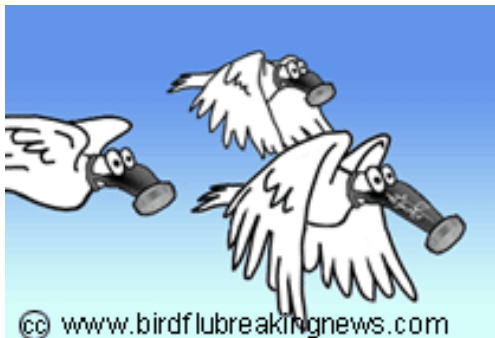
SA Health

Overall aims of analysis

- > Provide guidance for others
- > Correlation between observed facial characteristics and particular mask styles, sizes and brands
- > Determine an assessment process to assist in mask selection in the first instance.
 - Initial feedback from tester group indicates that this would reduce testing time.

SA Health

If only!!!!



SA Health