

SUB-OPTIMAL HAND SANITISER USAGE IN A HOSPITAL ENTRANCE DURING AN INFLUENZA PANDEMIC, NEW ZEALAND, AUGUST 2009

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The hand hygiene behaviours of the public in response to the current H1N1 influenza pandemic 2009 (or other pandemics) have not previously been described. An observational study was undertaken to examine hand hygiene behaviours by people passing a hand sanitiser station in the foyer of a public hospital in New Zealand in August 2009. Of the 2,941 subjects observed, 449 (18.0%, 95% confidence interval: 16.6, 19.6) used the hand sanitiser. This is a far from optimal result in response to the health promotion initiatives in the setting of a pandemic. These findings suggest the need for more effective health promotion of hand hygiene and also provide baseline measurements for future evaluation of hygiene practices.

New Zealand surveillance and research efforts have described various aspects of the influenza A(H1N1)v pandemic in 2009. This work has covered the descriptive epidemiology of the pandemic [1-3], key epidemiological parameters [4], and characteristics of the virus [5]. However, there has been no analysis to date on the behavioural responses of the public to the pandemic in this country – including in the area of hygiene behaviour. Here we describe an observational study to measure hand sanitiser use at the entrance to the Wellington Regional Hospital in New Zealand (the main hospital in the capital city) in August 2009.

Pandemic influenza intervention recommendations from the World Health Organization state that 'handwashing (...) should be routine for all and strongly encouraged in public health messages; such practices should be facilitated by making hand-hygiene facilities available' [6]. There is strong evidence to indicate that good hand hygiene is effective in reducing the spread of infection [7]. Alcohol-based sanitisers (e.g. Sterigel™) are as effective as hand washing (with soap and water) for not visibly soiled hands [8-10]. The convenience of alcohol-based sanitisers increases hand washing compliance and reduces healthcare-associated infection rates [6,7].

Methods

Starting in July 2009 and continuing to the present (mid-September 2009), Wellington Regional Hospital had a hand sanitiser station placed in the middle of the entrance foyer (approximately 8 m from the entrance). This station included two

Sterigel™ pump dispensers positioned at a height of 1 m, an A3 laminated sheet recommending respiratory hygiene and a large banner stating 'please CLEANSE your hands when entering and leaving'. The Capital and Coast District Health Board (CCDHB) responsible for this hospital state that their goal in providing the sanitiser station was to create an environment where public and staff would cleanse their hands going into and out of the hospital.

In this study, people were observed entering and leaving the hospital foyer using the main entrance as the reference point. An initial data set was collected over four hours by two observers (one hour per day for four days), one noting the number of people who passed in and out of the hospital entrance and the other counting those who used the hand sanitiser. This allowed an estimation of the proportion of people who used the hand sanitiser.

A further phase of the study involved observation with the collection of additional demographic data (gender and estimated age-group), direction (entering or leaving), and an assessment on whether the person was a member of the public or hospital staff (identified as wearing a uniform or identity tag). We observed 30 min periods in the morning, midday and afternoon of a single day.

Data were analysed using Microsoft Office Excel 2003 and OpenEpi. Inter-observer variation was measured by two observers individually recording hand sanitiser use and demographics over an additional 30 min observation period. Cohen's kappa scores were then calculated.

Results

Data from all observations showed the proportion of people using hand sanitiser in the foyer of Wellington Regional Hospital was 18.0% (95% confidence interval (CI): 16.6%-19.6%) (Table). Use of hand sanitiser on entering the hospital was significantly higher than use when leaving (risk ratio (RR) = 4.8, 95% CI: 2.8 to 8.1). It was also significantly higher for adults than for children and teenagers (Table). However, no difference was identified with regards to gender or time of day.

Comparison of the individual data from the two observers showed variation only in the category of people entering or leaving the hospital. The kappa score for this activity was calculated as 0.84,

indicating high levels of chance-corrected agreement between the two observers.

Discussion

Key findings and interpretation

A level of hand sanitiser use of 18% in a hospital entrance and during an influenza pandemic is clearly far from optimal. Unfortunately there is no comparative data, as hand sanitisers are not routinely promoted to the public in New Zealand hospitals in non-pandemic situations. The fact that no signage for the hand sanitiser was visible to people exiting the hospital may explain the even lower usage rate (5%) for those exiting through this doorway. The reason for higher sanitiser use by adults compared to children and teenagers is not obvious but may reflect the fact that the dispenser is psychologically aimed at adults due to the signage and table height and that adults are more aware of the need for infection control.

Study validity and limitations

This observational study showed that it is feasible to systematically observe hand sanitiser use in a hospital setting (indeed, this is the first such study that we know of). The kappa score of 0.84 indicates it is unlikely there was substantive inter-observer variation.

Nevertheless, the single location and restricted time of data collection mean that the results may not be truly representative of hand-sanitising activity in the hospital, or may not hold external validity for other parts of New Zealand. Also, other opportunities to practice hand hygiene in the hospital setting (e.g. hand sanitisers on some of the wards) may have contributed to the lower proportion of people using the sanitiser in the entrance hall when leaving the hospital. Another issue was a possible Hawthorne effect, as we suspect that some people were aware of being observed and this may have increased sanitiser usage. Finally, it was not possible to reliably distinguish staff from members of the public through observation.

Policy implications

Changes to the design and location of the hand sanitiser station would probably increase compliance. Such measures could include: positioning the station closer to the door, targeting signage and visual promotional material to both inflowing and outflowing traffic, ensuring that prompts are multi-lingual and simple, life-size posters depicting 'model behaviour' (e.g. of a nurse using the sanitiser) and, to encourage even higher compliance, having an official hospital worker present overseeing sanitiser use.

Part of the New Zealand Ministry of Health's response to the pandemic was to increase public awareness in the area of good

TABLE

Hand sanitiser use in a hospital entrance by activity, gender, age-group and time of day, Wellington Regional Hospital foyer, August 2009

Characteristics	Used hand sanitiser		Passed hand sanitiser		Risk Ratio (95% confidence interval)
	Number		Number	%	
All observations (5.75 hours)	449		2,492	18.0 (95% CI: 16.6-19.66)	
Observation period with additional data collection					
Direction of movement*					
Entering the hospital	90		407	20.1	4.8 (2.8-8.1)
Leaving the hospital	15		324	4.6	Reference (1.0)
Total	105		731	14.4	
Gender**					
Male	43		287	15.0	1.1 (0.7-1.5)
Female	55		386	14.2	Reference (1.0)
Age group**					
Child (<12)	0		14	0.0	
Teenager (12-18)	0		12	0.0	
(Child/Teenager Combined)	(0)		(26)	0.0	Undefined
Adult (>18)	98		647	15.1	Undefined (p=0.031)***
Time of day**					
Morning (08:20-08:50h)	23		179	12.8	1.0 (0.6-1.7)
Mid-day (12:50-13:20h)	46		263	17.5	1.4 (0.9-2.1)
Afternoon (15:55-16:25h)	29		231	12.6	Reference (1.0)
Total**	98		673	14.6	

CI: confidence interval

* Total of 1.75 hours of observation with data excluded from those 'milling around' (i.e. those who had no clear direction of movement) and using the hand sanitiser.

** Total of an additional 1.5 hours of observation with data included from those 'milling around' and using the hand sanitiser.

*** Result was statistically significant (p=0.031) using Fisher exact test, 2-tailed.

hand hygiene practices through a televised mass media campaign. As hand hygiene during a pandemic has not, to our knowledge, been measured before, we cannot draw conclusions on the effectiveness of such media campaigns. Our findings could, however, be used as baseline measurements to allow for future campaign evaluation.

Research implications

Further research, be it observational or interventional, could aim to capture staff versus public activity, eliminate possible Hawthorne effects and capture additional data on children and teenagers. The possible occurrence of 'clustering effects' could also be studied: The observers noticed that people were more likely to stop and sanitise if they saw another person using the hand sanitiser. For the design of more effective hygiene promotional material, an interventional study could be undertaken investigating the effect of depicting authority figures role-modelling appropriate hygiene behaviours in hospital settings.

Members of the Wellington Respiratory and Hand Hygiene Study Group included:

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References

1. Jackson G, Thornley S. Burden of novel influenza A virus (H1N1) in Auckland and Counties Manukau DHBs (July 2009): a capture-recapture analysis. *N Z Med J.* 2009;122(1301):66-69.
2. Baker MG, Wilson N, Huang QS, Paine S, Lopez L, Bandaranayake D, et al. Pandemic influenza A(H1N1)v in New Zealand: the experience from April to August 2009. *Euro Surveill.* 2009;14(34);pii=19319. Available online: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19319>
3. Centers for Disease Control and Prevention (CDC). Surveillance for the 2009 pandemic influenza A (H1N1) virus and seasonal influenza viruses - New Zealand, 2009. *MMWR Morb Mortal Wkly Rep.* 2009;58(33):918-21.
4. Nishiura H, Wilson N, Baker M. Estimating the reproduction number of the novel influenza A virus (H1N1) in a Southern Hemisphere setting: preliminary estimate in New Zealand. *N Z Med J.* 2009;122(1299):73-7.
5. Huang QS, Lopez LD, McCallum L, Adlam B. Influenza surveillance and immunisation in New Zealand, 1997-2006. *Influenza Other Respi Viruses.* 2008;2(4):139-45.
6. Bell DM, World Health Organization Writing Group. Non-pharmaceutical interventions for pandemic influenza, national and community measures. *Emerg Infect Dis.* 2006;12(1):88-94.
7. Collignon PJ, Carnie JA. Infection control and pandemic influenza. *Med J Aust.* 2006;185 (10 Suppl):S54-7.
8. Fendler EJ, Ali Y, Hammond BS, Lyons MK, Kelley MB, Vowell NA. The impact of alcohol hand sanitizer use on infection rates in an extended care facility. *Am J Infect Control.* 2002;30(4):226-33.
9. Boyce JM. Using alcohol for hand antisepsis: dispelling old myths. *Infect Control Hosp Epidemiol.* 2000;21(7):438-41.
10. Widmer AF. Replace hand washing with use of a waterless alcohol hand rub? *Clin Infect Dis.* 2000;31(1):136-43.