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Predicting intention to uptake H1N1 influenza vaccine in a university sample

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Swine (H1N1) Flu

- On June 11, 2009 WHO declared a phase 6 pandemic alert for influenza A (H1N1), commonly referred to as 'swine flu'
- H1N1 was atypical of influenza in that it disproportionately impacted *those under the age of 35*.
- By mid-September 2009 H1N1 had spread to over 70 countries with 500,000 confirmed cases and in excess of 3,000 deaths (Girard et al. 2010).





Background

- The success of immunisation programmes is moderated by the level of vaccine uptake in the population
- The Theory of Planned Behaviour (TPB) (Ajzen, 1985) and the Health Belief Model (HBM) (Becker, 1974) have been applied to many such health behaviours.
- The TPB is an extensively applied health psychology model and postulates that the most immediate determinant of a person's behaviour is 'behavioural intent'.
- However, recent research on intentions to vaccinate against influenza revealed that the only TPB variable that significantly predicted intention to vaccinate was *subjective norm*, explaining 48% of the variance in intention (Gallagher & Povey, 2006).



Health Belief Model

- The HBM has been applied in many contexts including response to illness symptoms, preventive screening, and obtaining vaccinations.
- The underlying concept of the HBM is that beliefs about a disease, and strategies to reduce its occurrence, determine health behaviour.
- The HBM contains four main components:
 - perceived susceptibility
 - perceived severity
 - perceived barriers
 - perceived benefits of preventative strategies (e.g. vaccinating) against a disease.



Research on swine flu vaccination

- Zijtregtop *et al.* (2010) found 34.5% reported a negative intention to vaccinate for swine flu.
- Negative intention was associated with low: perceived risk of infection and death, certainty that vaccination will protect against future infection, and willingness to accept advice from the government.
- Being 'against a pandemic influenza vaccination in particular' was also associated with negative intent.



Rationale of the present study

The present research builds on this theme, but also:

- examines intention to uptake vaccine at the height of a declared pandemic alert
- The outcome variable, intention to vaccinate, was not hypothetical. The Irish government was actively promoting vaccination from H1N1
- Third, the study deals with a specific at-risk group, university students, who are at risk of influenza due to life-style, mobility, and social interaction but were of particular concern given the clinical pattern of H1N1.
- Fourth, it includes additional variables of interest, including self-efficacy, conscientiousness, comparative optimism and trust-in-authorities which have been associated with health decision making elsewhere



Aims of present study

- To examine the predictive utility of health belief variables (susceptibility, severity, barriers to vaccination and benefits of prevention).
- To explore the additional value of including subjective social norms relating to vaccination (Gallagher & Povey, 2006) and adapted variables (attitudes and social influence (Zijtregtop et al., 2010) to relate to H1N1, usually measured in the context of Theory of Planned Behaviour.
- We hypothesised that measures of individual difference (conscientiousness and optimism bias) and the HBM variables would be significant predictors of behavioural intent, and that subjective social norms, would add additional explanatory value to the initial model.

Design and participants

- A sample of 200 undergraduate students (142 females and 58 males) in 3rd level education at the National University of Ireland Galway served as study participants in this cross-sectional survey.





Measures

- The 106-item questionnaire incorporated elements of the protocol used by Zijtregtop *et al.* (2010) and assessed behavioural determinants of intention to vaccinate based on components of the HBM (Perceived benefits, Perceived susceptibility, Perceived severity, Perceived barriers, Attitudes) and other relevant variables :
 - Health status
 - Trust in authorities
 - Comparative optimism
 - Conscientiousness
 - Self-efficacy
 - Social influences

Primary outcome measure

- The primary outcome was the intention to be immunised against H1N1, measured by a single item;
 - “If the government requests all students to have the swine flu vaccination, would you take the vaccination when made available?”
(yes, no, or don't know).





Results - descriptives

- 63.5%(N = 127) = Intend to vaccinate
- 17.5% (N = 35) = Did not intend to vaccinate
- 18% (N = 36) = Don't know

- 4%(N = 8) = had not heard of swine 'flu
- 65% (N = 127) reported that they knew someone in their environment who had had swine 'flu.
- 21% (N = 41) listed themselves as 'at-risk' (68% of these had asthma).
- 71% of those who self-reported themselves as 'at-risk' intended to vaccinate.

Group differences based on intention to vaccinate

Variable	α	Intention to vaccinate			p^*
		Yes	No	Don't know	
		Mean (SD)	Mean (SD)	Mean (SD)	
Perceived benefits	.52	9.36 (2.13)	8.21 (2.23)	9.12 (1.37)	.047
Perceived susceptibility	.69	5.95 (1.59)	5.49 (1.27)	5.72 (1.49)	.298
Perceived barriers	.69	5.88 (1.95)	9.19 (2.67)	7.47 (1.67)	.000
Perceived severity	.54	12.67 (2.47)	12.06 (2.92)	12.88 (1.92)	.489
Attitude	.71	21.53 (2.99)	15.81 (2.83)	18.18 (2.71)	.000
Social influence	.68	11.30 (1.69)	8.60 (2.87)	10.94 (1.64)	.000
Conscientiousness	.91	158.05(20.29)	157.96(20.01)	157.79(21.82)	.789
Optimism	.88	46.15 (7.65)	46.14 (7.42)	47.15 (7.75)	.900
Self-efficacy	.77	29.30 (3.87)	28.85 (3.99)	28.68 (3.97)	.620
Age		20.45 (6.33)	23.60 (8.27)	19.00 (2.19)	.011
Trust in authorities		46.15 (7.65)	46.14 (7.42)	47.15 (7.75)	.222

Intercorrelations between variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1 Intention												
2 Age	-.22**											
3 Attitude	.58**	-.10										
4 Social influence	.40**	-.15	.63**									
5 Perceived barriers	.49**	-.01	.58**	.52**								
6 Perceived benefits	.19*	-.04	.23**	.23**	.18*							
7 Perceived susceptibility	.11	-.02	.13	.13	-.05	.01						
8 Perceived severity	.08	-.16	.23**	.21*	-.01	.00	.12					
9 Self-efficacy	.06	.12	.05	.11	.09	.02	-.08	-.09				
10 Conscientiousness	-.02	.20*	.07	.18*	.10	.04	.01	.17	.36*			
11 Optimism	.02	.04	.01	.07	-.08	.04	-.06	-.11	.10	.27*		
12 Trust in authorities	.13	-.17*	.24**	.36**	.18*	.12	.08	.08	.04	.02	-.03	
13 Gender	-.01	-.12	.00	.04	-.04	.00	.10	.09	.03	.04	-.17*	-.08

Logistic regression of negative intention to vaccinate

	β (SE)	Exp(B)	95% CI Lower	95% CI Upper	Predicted % (Yes) (No) (Total)
Block 1					
Age	-.07* (.02)	0.93	0.89	0.98	
Constant	2.90 (.63)	18.23	-	-	(97.5) (6.7) (79.1)
Block 2					
Age	-.06 (.04)	0.94	0.87	1.01	
Perceived Barriers	-.640** (.13)	0.53	0.41	0.69	
Perceived Benefits	.19 (.13)	1.20	0.93	1.56	
Constant	5.78 (1.77)	321.79	-	-	(94.9) (40.0) (83.8)
Block 3					
Age	-.01 (.05)	0.99	0.89	1.09	
Perceived Barriers	-.50* (.18)	0.61	0.43	0.87	
Perceived Benefits	.16 (.16)	1.18	0.87	1.61	
Social Influence	-.01 (.19)	0.99	0.68	1.43	
Attitudes	.63** (.16)	1.89	1.39	2.56	
Constant	-7.69 (3.73)	.00	-	-	(96.6) (73.3) (91.9)

R^2 Block 1 = .05 (Cox & Snell), .07 (Nagelkerke). R^2 Block 2 = .29 (Cox & Snell), .45 (Nagelkerke).

R^2 Block 3 = .43 (Cox & Snell), .68 (Nagelkerke). Model χ^2 (5) = 83.28, $p < .0005$. * $p < .01$, ** $p < .001$.

Comparison between no and yes groups on individual barriers and attitudes to intention to vaccinate

Variable	No ^a Mean (SD)	Yes ^b Mean (SD)	t
Against vaccination in general	3.12 (1.19)	1.61 (0.66)	7.03 ^{c***}
Against SFV in particular	3.15 (1.20)	1.74 (0.81)	6.35 ^{c***}
SFV can cause SF infection	2.91 (1.01)	2.55 (1.09)	1.75
Unnecessary to get vaccinated even if people in environment are vaccinated	2.21 (0.98)	1.76 (0.82)	2.68 [*]
Can protect against SF by taking SFV.	2.47 (0.86)	3.88 (0.78)	-8.65 ^{c***}
Important for government to encourage people to vaccinate	3.34 (1.26)	4.24 (0.64)	-4.09 ^{c***}
Should be mandatory for all citizens to get a SFV	1.65 (0.77)	3.10 (1.11)	-8.78 ^{c***}
GP (doctor) thinks it important to get vaccinated against SF	2.31 (0.68)	2.96 (0.86)	-4.10 ^{***}
People who are close think it important to get vaccinated against SF	2.26 (0.95)	3.03(1.02)	-4.02 ^{***}

Note: ^a N = 33, ^b N = 125, ^c Correction for unequal variances made **p* < .05, *** *p* < 0.001



Discussion

- The research was conducted at a time when the pandemic was at peak levels, people were dying in Ireland and intensive campaigns to promote uptake were widespread.
- 64% of students (identified as an 'at-risk group) intended to vaccinate suggesting that this campaign was working relatively well.
- 18% did not intend to take up the vaccination. (compared with 34.5% in the Dutch study).



Predictors of intention

- Perceived barriers to vaccination, and a belief that it is important to get vaccinated even if those in the environment are vaccinated, were significant contributors to the model.
- Supports existing research - perceived barriers to action associated with compliance with recommended health behaviour, including inoculation (Hofmann et al., 2006).



Profiling non-intenders

○ In comparison to those who intended to vaccinate, those who did not reported significantly...

- fewer positive attitudes towards vaccination (large effect),
- greater perceived barriers (medium effect)
- were less influenced by social influences (medium effect)
- perceived less benefits of vaccination (small effect)
- Were older (small effect).

*Perceived barriers and attitudes predicted between 43% and 68% of intention



Components of behavioural determinants

- In contrast to those who intended to vaccinate, those who did not reported
 - greater opposition to vaccinations in general,
 - and also specifically to H1N1 vaccination.
- Conversely, those who intended to vaccinate reported
 - a stronger belief that vaccination for H1N1 protects against the infection
 - that vaccination should be mandatory.
 - higher levels of pro-vaccine attitudes among their GPs and close 'others'



Discussion -Benefits and social influence

- Contrary to expectations, perceived benefits of vaccination and social influence did not contribute to this model.
- PB Reason = low internal consistency of the 2-item benefits scale ($\alpha = .52$) ?
- SI Reason = social influence and attitudes were strongly correlated ($r = .63, p < .01$)?
- When the logistic regression was re-run without the attitudes variable, social influence was a sig. predictor.



Conclusion

- The implication for health practitioners is that behavioural intent may be open to influence where psycho-education can create pro-vaccine attitudes and beliefs.
- Useful to expose this conclusion to empirical testing in an intervention design that tests the efficacy of specific types of messages changing attitudes and beliefs and if such change impacts on vaccine intent.



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Thank you for your attention!



*(Note: this study has been accepted for publication
in the British Journal of Health Psychology)*