

intentions on a 7-point ranging from unlikely (-3) to likely (+3). Internal consistency for these items was excellent, with a high Cronbach alpha being observed ($\alpha = 0.99$).

Over a 2-week period, the researcher was on site at the social clubs to facilitate participation. Those interested were given a consent form, a questionnaire and verbal instructions on how to complete the questionnaire. As expected, due to arthritic, visual and literacy problems, some participants needed assistance; in these instances, the researcher aided with the completion of the questionnaires. No differences in intentions to vaccinate next season were found between those who were assisted ($n = 23$) and those who were not ($n = 170$; $t = -0.746$, $df = 190$, $P > 0.05$).

Statistical analysis

Data were analysed by the statistical computer package SPSS version 12. Data were checked for assumptions of multiple regression, and one outlier was removed; all remaining analyses were performed on 192 cases. Inter-relationships between the questionnaire variables were analysed by Pearsons product moment correlations. Hierarchical multiple regression analyses of the variables from the TPB, past behaviour and anticipated regret onto behavioural intentions were then computed. A P value of 0.05 (two-tailed) was selected as significant, and R^2 was used as a measure of effect size.

Results

From the data set, 46% of older adults received the vaccine every year over the 4-year period, 9% had it three times, 10% had it twice, 12% at least once and 23% of them reported that they never had the vaccine over this period; 77% self-reported positive intentions to vaccinate in the future. In addition, 13% of the sample visited their general practitioners (GPs) less than once a year, 18% once or twice and 69%

several times a year. As can be seen in Table 1, slightly more men than women chose not to vaccinate against influenza over this time period. Similarly, it illustrates that more people who were married/living together in comparison to those not married (single, divorced and widowed; 46%) chose not to receive the vaccine.

Initially, descriptive and correlation statistics were obtained (see Table 2). From potential minimum (-3) and maximum (+3) ranging scores, respondents indicated positive intentions to vaccinate against influenza in the next year ($M = 1.58$, $SD = 2.26$). Results from Pearsons product moment correlations demonstrated that attitudes, subjective norms, past behaviour and anticipated regret all had significant positive relationships with intentions to vaccinate against influenza, while PBC had a non-significant relationship. These data suggest that attitudes (e.g. the vaccine protects and is effective) towards the vaccine, social influences (GPs and families) and having being vaccinated previously, as well as regretting one's decision if one did not vaccinate, are influencing older adults' vaccination intentions.

In testing the predictive utility of the TPB as framework for understanding immunization motivating factors, attitudes, subjective norm and PBC (e.g. facilitating/inhibiting factors such as fear of needles and distance to GP surgery) were entered simultaneously in the first step of the regression equation (Table 3). Results showed that, overall, the TPB had an adequate fit with the data, with these variables explaining 48.2% of the variance of intentions to vaccinate. The subjective

Table 1 Respondents non-vaccination status by gender and marital status

Variables	Men	Women	Not married	Married
Number of participants (n)	23	21	20	22
Difference (%)	52.3	47.7	44.2	56.8

Table 2 Descriptives for the constructs of theory of planned behaviour (attitudes, subjective norms and PBC), anticipated regret and past behaviour data with inter-correlations among variables ($n = 192$)

Variable	1	2	3	4	5	Mean \pm SD
Intention	—					1.58 \pm 2.26
Attitude	0.429**	—				2.78 \pm 4.50
Subjective norms	0.691**	0.568**	—			10.82 \pm 7.38
PBC ^a	0.085	0.186*	0.184*	—		4.52 \pm 3.32
Past behaviour	0.610**	0.329**	0.456**	0.050	—	2.43 \pm 1.67
Anticipated regret	0.804**	0.465**	0.600**	0.072	0.640**	1.05 \pm 2.29

^aPBC = perceived behavioural control.
Correlation is significant at ** $P < 0.01$, * $P < 0.05$ (two-tailed).

Missing Data

As Tables 1 and 2 show, there was a substantial amount of missing data on some questions. For example, almost 16% of participants did not report their frequency of condom use in the previous 12 months. Excluding participants with missing data yielded a reduced sample of 509 (Subsample 1). The extent to which this loss of cases was associated with significant bias can be seen by comparing the frequency distributions in Table 1 and by comparing the means in Table 2. To examine this further, we compared, for each variable in Tables 1 and 2 for which there was any missing data, the frequency distribution (or mean score) in the reduced sample of 509 with the distribution in the remaining participants who had provided data on that question. We did so using chi-square contingency tests or *t* tests as appropriate. These comparisons indicated that listwise deletion of cases with missing values was associated with statistically significant but substantively small bias on several variables. Age at first intercourse, type of relationship, frequency of condom use in the previous 12 months, subjective norm, perceived ease, and perceived risk yielded no significant differences, indicating no significant bias on these measures. On the other hand, respondents in the reduced sample were significantly less likely to say that they would "always" use condoms in the future (25% vs. 37%), $\chi^2(4, N = 861) = 16.5, p < .01$, and significantly less likely to have had no sexual partners in the previous 12 months (1.4% vs. 13.3%), $\chi^2(3, N = 841) = 53.3, p < .001$. On the attitude and belief measures, the reduced sample had significantly higher scores on perceived control (*M*s = 3.4 and 3.3), $t(858) = 2.3, p < .05$, and self-efficacy (*M*s = 32.9 and 32.0), $t(767) = 2.2, p < .05$.

Predicting Intentions to Use Condoms in Subsample 1

Examination of the correlations above the diagonal in Table 4 shows that each of the attitude and belief measures was significantly related to intention in Subsample 1. Having a stronger intention to use condoms was associated with having a more positive attitude, a more positive subjective norm, and a greater sense of perceived control and self-efficacy; believing that condom use was relatively easy; and perceiving a higher risk of STDs.

A hierarchical multiple regression analysis was carried out to examine the predictors of intended frequency of

condom use (Table 5). First, the TRA variables (attitude and subjective norm) were entered as predictors (Step 1). Thirty-four percent of the variance was explained. Both beta coefficients were highly significant, and they did not differ significantly from each other. Adding perceived control and perceived ease (Step 2)—a test of the TPB over the TRA—did not significantly increase the variance explained; neither coefficient was significant. The coefficients for attitude and subjective norm were little changed. Including self-efficacy and perceived risk in the model (Step 3) significantly increased the *R*² value to .38, accounting for an additional 4% of the variance in intention. Perceived risk had a significant effect, with those respondents who felt more at risk for becoming infected with STDs having stronger intentions to use condoms in future. Surprisingly, self-efficacy did not have a significant effect. The coefficients for attitude and subjective norm were slightly reduced by controlling for self-efficacy and perceived risk, but they remained highly significant.

In the final step (Step 4), the remaining predictors were added (sociodemographic factors and measures of past experience and prior behavior). The *R*² value was boosted to .69, a highly significant improvement over Step 3. None of the sociodemographic variables were significant. Attitude toward the behavior, subjective norm, and perceived risk remained significant, but their coefficients were considerably attenuated. The other belief variables remained nonsignificant. The two largest coefficients were those for measures of recent condom use. Those young people who had a higher frequency of condom use in the previous 12 months and those who had used a condom on the most recent occasion of sexual intercourse had a higher intended frequency of condom use in the next 12 months. On the other hand, condom use on the first occasion of intercourse had no independent predictive effect. Age at first intercourse was unrelated to intention, as was number of partners in the previous 12 months. However, the nature of the relationship on the most recent occasion of sexual intercourse did seem to be important. In particular, those who said that they and their partner were married or living together had a relatively low intended frequency of condom use in the next 12 months.

To explore the role of relationship status further, we repeated the regression analyses excluding the 67 respon-

Table 4
Correlations Among the Reasoned Action-Planned Behavior Variables

Variable	1	2	3	4	5	6	7
1. Intention	—	.42**	.50**	.13**	.25**	.23**	.26**
2. Attitude	.37**	—	.26**	.17**	.29**	.40**	.03
3. Subjective norm	.43**	.37**	—	.04	.24**	.19**	.18**
4. Perceived control	.10	.24**	.12	—	.29**	.30**	-.17**
5. Perceived ease	.27**	.46**	.26**	.37**	—	.39**	.00
6. Self-efficacy	.28**	.45**	.28**	.43**	.49**	—	-.13**
7. Perceived risk	.09	-.09	.06	-.32**	-.08	-.23**	—

Note. Subsample 1 (*n* = 509) correlations appear above the diagonal, and subsample 2 (*n* = 171) correlations appear below the diagonal.
***p* < .01.

Table 5
Summary of Hierarchical Regression Analysis Predicting Intended Condom Use in Subsample 1 (n = 509)

Step and variable	β	R^2	ΔR^2
Step 1		.34***	.34***
Attitude toward the behavior	.31***		
Subjective norm	.42***		
Step 2		.34***	.01
Attitude toward the behavior	.29***		
Subjective norm	.41***		
Perceived control	.05		
Perceived ease	.05		
Step 3		.38***	.04***
Attitude toward the behavior	.28***		
Subjective norm	.37***		
Perceived control	.08*		
Perceived ease	.04		
Self-efficacy	.04		
Perceived risk	.21***		
Step 4		.69***	.31***
Gender ^a	-.03		
Age group ^b	.01		
Social class			
Nonmanual (vs. other) ^c	-.02		
Manual (vs. other) ^c	-.03		
Attitude toward the behavior	.11***		
Subjective norm	.12***		
Perceived control	-.00		
Perceived ease	.00		
Self-efficacy	.01		
Perceived risk	.09**		
Frequency of condom use in previous 12 months	.30***		
Condom use on most recent occasion of intercourse ^d	.29***		
Other contraceptive use on most recent occasion ^d	-.12**		
Married-living together (vs. not steady partners) ^e	-.11*		
Steady partners (vs. not steady partners) ^e	-.04		
Age at first intercourse ^e	-.03		
Condom use on first occasion of intercourse ^d	.01		
Other contraceptive use on first occasion ^d	.00		
Number of partners in previous 12 months	.01		

^a1 = female, 2 = male. ^b1 = 16-19 years, 2 = 20-24 years. ^cCoded 1 or 0. ^d1 = yes, 0 = no. ^e1 = less than 16 years, 0 = 16 years or more.
* $p < .05$. ** $p < .01$. *** $p < .001$.

dents who said they were married to the person with whom they last had sexual intercourse. The results were almost identical to those reported in Table 5, indicating that relationship status did not moderate the predictors of condom use intentions.

Gender Differences

There were significant gender differences on a number of variables. Men had higher expectations for using condoms in the next 12 months; 28.7% of men said they would "always" use condoms in the future, as compared with 22.3% of women, $\chi^2(4, N = 509) = 16.7, p < .01$. Men had

also been using condoms more frequently in the previous 12 months; 30.1% of men said that they had "always" used condoms in the last 12 months, as compared with 17.7% of women, $\chi^2(4, N = 509) = 18.7, p < .001$. Consistent with this, men were also more likely to have used a condom on the most recent occasion of sex (51.2% of men vs. 34.0% of women), $\chi^2(1, N = 509) = 15.1, p < .001$, although women were more likely to have used another contraceptive method (55.0% of women vs. 36.8% of men), $\chi^2(1, N = 509) = 16.3, p < .001$. Men had had more sexual partners; 27.3% of men reported having had three or more sexual partners in the previous 12 months, in comparison with 11.7% of women, $\chi^2(3, N = 509) = 23.5, p < .001$. Men saw themselves as being at higher risk for STDs ($M_s = 3.2$ and 2.8), $t(507) = 3.8, p < .001$, and perceived greater normative pressure to use condoms ($M_s = 44.1$ and 36.8), $t(507) = 6.3, p < .001$. On the other hand, men and women did not differ significantly in their attitude toward condom use or, surprisingly, in perceived control over condom use, perceived ease of condom use, or self-efficacy.

The question of whether different predictors of condom use intentions emerge for men and women was examined by computing product terms to represent the interaction between gender and each of the other predictor variables (including perceived control, perceived ease, and self-efficacy) and then adding these 18 terms as a set to the final model shown in Table 5. There was a negligible and nonsignificant increase in the proportion of variance explained, and none of the interaction terms were individually significant, indicating that the predictors of intended condom use did not differ between the sexes. This was confirmed by running separate regression analyses for men and women and testing differences in beta coefficients.

Testing the Multiplicative Assumption

The multiplicative assumption underlying attitude and subjective norm was tested via the procedure used by Sutton (1979) and Doll and Orth (1993). The two product-sum terms (attitude and subjective norm) in the final model in Table 5 were replaced by terms representing the sum of the behavioral beliefs (with weights of 1 for positive outcomes and -1 for negative outcomes) and the sum of the normative beliefs. Then, two terms representing the summed outcome evaluations and the summed motivations to comply were added. This produced a nonsignificant increase in the R^2 value. Finally, the two product sums were added. This significantly increased the variance explained in intention but by less than 1 percentage point. This analysis indicates rather weak evidence for the multiplicative assumption and suggests that the summed behavioral beliefs and the summed normative beliefs can be substituted for the two product-sum terms in the final model with little loss of predictive power. This was indeed the case; the R^2 value was identical (.69) when this substitution was made.

Predicting Intentions to Use Condoms in Subsample 2

A parallel set of analyses was conducted on a subset of Subsample 1 comprising respondents who had had two or