Methods Two cross-sectional, population-based studies were conducted by simple random sampling based on telephone interviews in 2006 and 2016–2017 respectively, including 1004 and 2,400 Chinese adults. The survey instrument used to measure the variables pertinent to the HBM, including the knowledge of the CRC, perceived susceptibility, severity, benefit, barriers, and cues to action for the CRC, has been validated by an expert panel. The changes of these factors were tested using the Pearson's chi-square test.

Results The results were shown in table 1. The proportion having a high level of knowledge (score ≥ 2) of CRC risk factors (34.0% vs. 16.0%), and CRC screening tests (67.4% vs. 42.4%) in 2016–2017 was higher than those in 2006 (both $p < 0.001$). The proportion of subjects having high perceived severity score (≥ 14) was greater in 2016–2017 (37.9%) than in 2006 (29.2%). In contrast, the perceived health/psychological and access barriers have decreased. A significantly higher proportion of subjects reported physician recommendations for CRC screening in 2016–2017 (55.3% vs. 8.4%). Other variables pertinent to HBM were not significant factors in the analysis.

Conclusions Based on the HBM, the knowledge of CRC risk factors; CRC screening tests; perceived severity of CRC increased, while perceived barriers to CRC testing decreased since 2006. Higher proportion received physician recommendations for CRC screening. These findings may imply the effectiveness of the government screening programme or impact of more intensive educational initiatives in the general population. This cause-and-effect relationship should be examined in future studies.

IDDF2018-ABS-0148 SCREENING FOR COLORECTAL CANCER IN HONG KONG: DOES THE THEORY OF PLANNED BEHAVIOUR MODEL PLAY A ROLE?

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Background Worldwide, colorectal cancer (CRC) is a leading cause of cancer mortality. Uptake of CRC screening is an important performance indicator that exerts a direct impact on programme success. We aimed to examine whether the Theory of Planned Behaviour (TPB) can predict the uptake of CRC screening that could further inform new strategies in the promotion of screening of its uptake in the general population.

Methods A population-based telephone survey was conducted in 2017. Individuals aged 61–70 years were randomly recruited. A total of 2400 eligible respondents were recruited, consisting of 1200 participants and 1200 non-participants of the government-subsidised CRC screening programme. A questionnaire validated by an expert panel of epidemiologists, gastroenterologists and public health practitioners was used to measure the attitudes towards CRC screening; normative beliefs; perceived behavioural control and intention for each participant. The association between CRC screening uptake and the factors pertinent to TPB was analysed by binary logistic regression analysis that adjusted for age, gender, education level, and household income.

Results The characteristics of respondents were shown in table 1. Multivariate regression model showed that high perceived behavioural control (AOR=5.94, 95% CI=4.76–7.41,

Abstract IDDF2018-ABS-0148 Table 1 Characteristics of the respondents

		N (%)				
		No CRC screening uptake		CRC screening uptake		p-value
Age	61–65	537	44.8	50	4.2	<0.001*
	66–70	663	55.3	1043	86.9	<0.001*
	71–76	0	0.0	93	7.8	<0.001*
Gender	Female	438	36.5	524	43.7	<0.001*
	Male	762	63.5	676	56.3	<0.001*
Educational level	Primary education or no schooling	646	53.8	583	48.6	<0.1*
	Secondary education	470	39.2	539	44.9	<0.01*
	Tertiary education/ others	79	6.6	69	5.8	0.41
Household income (HK\$)	0–10 000	516	43.0	672	56.0	<0.001*
	10001–20 000	303	25.3	204	17.0	<0.001*
	>20 000	193	16.1	145	12.1	<0.01*
	Refuse to answer	188	15.7	179	14.9	0.61
Normative beliefs	Low (score: 0–2.9)	1079	89.9	932	77.7	<0.001*
	High (score: 3–4)	121	10.1	268	22.3	<0.001*
Perceived behavioural control	Low (score: 0–2.9)	922	76.8	359	29.9	<0.001*
	High (score: 3–4)	278	23.2	841	70.1	<0.001*
Intention	Low (score: 0–2)	508	42.3	183	15.3	<0.001*
	High (score: 3–4)	680	56.7	1017	84.8	<0.001*

Abstract IDDF2018-ABS-0148 Table 2 Results of binary logistic regression for predicting the uptake of CRC screening

		Multivariate analysis	
		Adjusted OR (95% CI)	p-value
Age	Age	1.40 (1.33–1.46)	<0.001*
Gender	Male	Reference	
	Female	0.78 (0.63–0.970)	<0.1*
Educational level	Primary education or no schooling	Reference	
	Secondary education	1.34 (1.08–1.68)	<0.01*
	Tertiary education/others	0.78 (0.51–1.18)	0.238
Household income (HK\$)	0–10 000	Reference	
	10001–20 000	0.91 (0.69–1.19)	0.490
	20000-above	0.84 (0.61–1.14)	0.257
	Refuse to answer	1.54 (1.13–2.10)	<0.01*
Positive attitude towards CRC screening	Direct measurement	1.26 (1.10–1.45)	<0.001*
	Indirect measurement	1.23 (1.08–1.41)	<0.01*
Normative beliefs	Low (score: 0–2.9)	Reference	
	High (score: 3–4)	1.04 (0.78–1.40)	0.775
Perceived behavioural control	Low (score: 0–2.9)	Reference	
	High (score: 3–4)	5.94 (4.76–7.41)	<0.001*
Intention for CRC screening	Low (score: 0–2)	Reference	
	High (score: 3–4)	3.03 (2.39–3.83)	<0.001*

$p < 0.001$), high intention for CRC screening (AOR=3.03, 95% CI=2.39–3.83, $p < 0.001$) and positive attitude towards

CRC screening (direct measurement: adjusted odds ratio (AOR)=1.26, 95% confidence interval (CI)=1.10–1.45, $p<0.001$; for indirect measurement: AOR=1.23, 95% CI=1.08–1.41, $p<0.01$) were significantly associated with CRC screening uptake (table 2).

Conclusions The variables pertinent to the TPB could successfully predict the uptake of CRC screening. Promotion of CRC screening based on enhancing perceived behavioural control as well as behavioural intention could be effective in increasing screening uptake. Further studies are needed to establish a cause-and-effect relationship between these variables and uptake, as well as to evaluate the cost-effectiveness of such interventions.

IDDF2018-ABS-0149 **MANIPULATION OF GUT MICROBIOTA IN IN VITRO MODEL OF COLORECTAL CANCER: POSITIVE EFFECTS OF LACTOBACILLUS RHAMNOSUS AGAINST FUSOBACTERIUM NUCLEATUM**

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Background Colorectal cancer (CRC), a leading cause of morbidity and mortality worldwide, is affecting more than 1.36 million people every year. It is a well-known multifactorial disease, and the aetiology is a complex interaction between genetic, lifestyle and environmental factors. However, there has been a general consensus exists that the composition of the human intestinal microbiota is linked to health status. They mainly play a role in modulating normal gut immune function, and most of them are largely beneficial to human. *Fusobacterium nucleatum* is an anaerobic oral commensal and a periodontal pathogen associated with a wide spectrum of human diseases. Findings from human and animal models have revealed that *fusobacterium nucleatum* plays a role in colorectal carcinogenesis by suppressing the immune response of the hosts to tumour. The aim of the present study is to determine the role of a probiotic strain in competing with a selected colorectal cancer pathogen.

Methods Thus, *lactobacillus rhamnosus* was investigated *in vitro* to examine its ability to protect, displace and compete with *fusobacterium nucleatum*. In this study, three different types of assay (protection assay, displacement assay and competitive assay) were performed using SW480, a colorectal cancer cell line as a host cell. Cell proliferation assay was applied to determine the proliferation rate of the cells by measuring the cell metabolic activity.

Results In a competitive assay, *lactobacillus rhamnosus* showed greater ability of adherence to host cells than *fusobacterium nucleatum* with a ratio of 1400:1. *Lactobacillus rhamnosus* could significantly decrease the proliferation rate induced by *fusobacterium nucleatum* in protection assay ($p<0.001$). In addition, the proliferation rate induced by *fusobacterium nucleatum* was also decreased up to 48.6% in displacement assay by *lactobacillus rhamnosus*.

Conclusions This finding may suggest that *lactobacillus rhamnosus* could help limiting cell proliferation of the cancerous

cells in response to pathogens. In conclusion, *lactobacillus rhamnosus* has a positive impact in reducing the risk of colorectal cancer and possibly an option for preventive.

IDDF2018-ABS-0152 **THE PREOPERATIVE CEA CAN BE AN INDEPENDENT PREDICTIVE FACTOR FOR COLORECTAL CANCER PATIENTS AFTER CURATIVE RESECTION IN LONG-TERM OUTCOME**

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Background The preoperative carcinoembryonic antigen (CEA) level as a prognostic factor of colorectal cancer (CRC) has been in debate.

Methods A consecutive case series were collected from our database of CRC from 1995 to 2010. Clinicopathological factors were matched by propensity score methods with calliper width of 0.05 and a 1:4 ratio. Long-term overall survival (OS) and disease-specific survival (DSS) were analysed and compared between 3 different serum CEA levels.

Results A total number of 9634 patients were included initially. After exclusion and matching, a number of 6099 cases were matched by propensity score matching methods with median follow-up period 86 months.

The survival analysis showed poor OS in elevated serum CEA groups than normal CEA level (5 year survival rate: 75% vs. 66% vs. 61%) and was also presented in both subgroups divided by lymph node (LN) stage (LN positive: 69% vs. 56% vs. 50%, LN negative: 83% vs. 77% vs. 72%) but not between elevated groups. In contrast, DSS showed significantly poor outcome between each group and was proportional to serum CEA elevation (5 year survival rate: 83% vs. 76% vs. 69%, $p<0.03$ between each group) and in LN negative subgroup (5 year survival rate: 92% vs. 87% vs. 82%). In contrast, the elevated CEA in LN positive subgroup showed poor DSS (5 year survival rate: 75% vs. 65% vs. 56%) than non-elevated group ($p<0.001$) but not between elevated groups ($p=0.064$).

In multivariate Cox regression model after adjusted with TNM stage, smoking, DM, renal insufficiency, liver cirrhosis and other factors, elevated CEA showed higher risk in DSS (5 to 10 ng/ml HR=1.540, >10 ng/ml HR=1.910, both $p<0.001$).

Conclusions Elevated preoperative serum CEA can be an independent prognostic factor for stage I to III CRC patients after curative resection with poor long-term overall and oncological outcome.

IDDF2018-ABS-0158 **ENDOSCOPIC PREDICTORS OF THE DEPTH INFILTRATION OF COLORECTAL LATERALLY SPREADING TUMOURS**

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