ABSTRACT:
Evidence from animal models suggests that dietary fatty acids have both anticancer and tumor-promoting effects. Whether dietary fatty acids are associated with colorectal cancer (CRC) in humans remains inconclusive. We investigated associations between dietary fatty acid intake and risk of CRC among 59,986 men who participated in the Shanghai Men's Health Study (SMHS), an ongoing population-based prospective cohort study. We identified 876 incident CRC cases in the SMHS during a mean follow-up of 9.8 years. Associations between dietary fatty acid intake and CRC risk were evaluated by Cox proportional hazard regression analyses. Consumption of saturated fatty acids (SFA), monounsaturated fatty acids (MUFA) and polyunsaturated fatty acids (PUFA) was not significantly associated with CRC risk. Multivariate hazard ratios (HRs) and respective 95% confidence intervals (CIs) for Quartile 4 vs Quartile 1 were 0.92 (0.74-1.14; P trend = 0.47) for SFA, 0.95 (0.79-1.16; P trend = 0.74) for MUFA and 1.18 (0.95-1.46; P trend = 0.21) for PUFA. No significant associations were found for total n-6 PUFA or total n-3 PUFA. Additionally, we performed a meta-analysis to summarize results from the present study and 28 reports from 26 additional cohorts, which supported the overall null association between dietary fatty acid intake and CRC risk, among men. Docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) were associated with 11% to 12% reduced risk, and linoleic acid (LA) a 19% increased risk, of CRC in the meta-analysis of combined sexes. In conclusion, this population-based prospective study and meta-analysis of cohort studies found little evidence that dietary fatty acid intake was associated with risk of CRC in men.

OBJECTIVES:
This study evaluated the association of dietary fatty acid intake with the risk of CRC among Chinese men using data from a population-based cohort study, the SMHS. Additionally, a meta-analysis was performed to summarize the results from the most up-to-date literature and the current study.

METHODS:
ASSOCIATION OF DIETARY FATTY ACID INTAKE AND CRC RISK
Participants included 59,986 men aged 40 to 74 years from the SMHS.
Information on dietary intake at study enrollment and the first follow-up survey was collected by using validated semi-quantitative food-frequency questionnaires.
Individual nutrient intakes including SFA, MUFA, PUFA, and specific fatty acids were calculated as the sum of products of individual amounts of foods consumed, with nutrient contents based on in the 2002 Chinese Food Composition Table.
Incident CRC was identified through linkage to the Shanghai Cancer Registry and confirmed by home visit and medical chart review.
Associations between dietary intake of fatty acid and CRC risk were evaluated by Cox proportional hazard regression analyses with age as time metric and potential confounders adjusted.

META-ANALYSIS
A systematically search the PubMed database were carried out by using MESH terms to identify published prospective cohort studies that evaluated associations of specific dietary fatty acid intakes with the risk of CRC. Publications were carefully reviewed and selected based on selection criteria (Figure 1).

RESULTS:
ASSOCIATION OF DIETARY FATTY ACID INTAKE AND CRC RISK
No significant trend or association between dietary intake of total fatty acid (TFA), SFA, MUFA, and PUFA or specific PUFA subtypes or other specific fatty acid and CRC or its anatomic subsites, with one exception (Figure 2). The 4th quartile of alpha-linolenic acid (ALA) intake was associated with an increased risk of rectal cancer (HRp<sub>Quartile</sub> = 1.45; [1.03-2.05]; P trend = 0.01).
META ANALYSIS
In the overall meta-analysis, there was no significant association between TFA, SFA, MUFA or PUFA, including total n-6 PUFA, total n-3 PUFA, n-3 HUFA and marine-derived PUFA with CRC risk.
The combined RR and 95% CIs were 1.01 (0.92-1.10) for TFA, 0.98 (0.90-1.07) for SFA, 1.04 (0.93-1.15) for MUFA, 1.04 (0.92-1.17) for PUFA, 1.02 (0.93-1.11) for total n-6 PUFA, 1.00 (0.91-1.10) for total n-3 PUFA, and 0.94 (0.87-1.01) for n-3 HUFA, and 1.03 (0.92-1.13) for marine-derived PUFA (Figure 3).
No significant sex-specific, anatomic-specific or region-specific associations were found for TFA, SFA, MUFA or PUFA, including total n-6 PUFA, total n-3 PUFA, n-3 HUFA and marine-derived PUFA on CRC risk in the stratified analyses.

CONCLUSION:
In this comprehensive analysis of data from our population-based cohort study and meta-analysis of 26 additional cohorts, consumption of TFA, SFA, MUFA and PUFA, or specific PUFA subtypes or other specific fatty acid intake, was not significantly associated with the risk of CRC in overall, or sex-specific, anatomic-specific and region-specific analyses.
Meta-analysis of men and women combined revealed a positive association with LA intake, while EPA and DHA were inversely associated with CRC risk, particularly among European and Australian populations.
Further studies are needed to investigate the contributors to population-specific associations.

REFERENCE: