

Association between Colorectal Cancer Screening Rate, Related
Risk Factors and Mortality in Japanese Prefectures:
An Ecologic Analysis Based on Prefecture Level Data

by

Kazuya Inoki

22MP210

Master's Capstone Report submitted in partial satisfaction of the

requirements for the degree of

Master of Public Health

at

St. Luke's International University

Graduate School of Public Health

Supervisor: Mahbubur Rahman

12/1/2024

Abstract

Background: Colorectal cancer (CRC) is still a major public health concern in Japan. This study aims to examine the association between the colorectal cancer screening rate, related risk factors, and mortality in Japanese prefectures.

Methods: This ecologic study used publicly available prefecture-level data related to CRC screening rate (SR), detailed examination rate, CRC risk factors i.e., smoking, alcohol, obesity, physical activity, diabetes, red meat, income, and the number of gastroenterologists and endoscopists, stage of colorectal cancer and mortality. Several cross-sectional time series datasets were created using SR data in 2007, 2010, 2013, and 2016 along with CRC risk factor data and other related data. Random effect linear regression analyses were performed with the age-adjusted mortality rate (AMR) of CRC as a dependent variable and SR and other CRC risk factors as independent variables.

Results: Prefecture-level panel data showed heterogeneity of CRC AMR. Mean plots of AMR across years showed a declining trend of AMR over the years. The SR showed a negative association ($P < 0.001$, $P < 0.001$, $P = 0.002$ for 2007, 2010, and 2013), while alcohol consumption ($P = 0.024$, $P = 0.006$, $P = 0.038$) showed a positive association and income ($P < 0.001$, $P = 0.002$, $P = 0.020$) a negative association with CRC AMR based on all three-panel data sets. The detailed examination rate was significantly associated with CRC AMR in the 2007 and 2013 datasets ($P = 0.002$, $P = 0.008$), and the smoking rate in the 2010 and 2013 datasets ($P = 0.008$, $P = 0.004$).

Conclusion: CRC screening rate and several risk factors were significantly associated with CRC AMR in prefecture-level time series data.

Keywords: colorectal cancer, risk factor, screening rate