Unintended effects of health screening

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Abstract

We study the changes in demand for health that occur after cancer screening, and more specifically, whether these changes in demand vary with human capital in terms of education level. We expect that misinterpretation of a negative test results may initiate less preventive effort and occur more frequently among individuals with a low level of human capital compared with individuals with a high level of human capital, i.e. human capital makes the information updating based on the screening result more accurate. If this is true, there are important implications for health policy.

The analyses are based on unique data from a randomized controlled screening experiment in Norway, NORCCAP (NORwegian Colorectal Cancer Prevention) running from 1999 to 2001. The dataset consists of approximately 50 000 individuals born between 1935 and 1950, of whom 21 000 were invited to participate in a once only screening with sigmoidoscopy. Information on screening participation status and screening outcome (positive and negative test and cancer diagnosis) was provided by the Cancer Registry of Norway. For all individuals we also have information on outpatient consultations and inpatient stays, human capital measured by education, income, wealth, marital status and working status. Since we are working with data from a randomized trial, we can approximate the result of health behavior by health care utilization both ex ante and ex post of screening. The result of health behavior is mainly measured by lifestyle related diseases, such as chronic obstructive pulmonary disease, hypertension and diabetes type 2, identified by ICD-10 codes either as main or secondary diagnosis. To control for the time trend of change in health care utilization, we also include health care utilization in the same period for non-lifestyle related diseases, such as hip fractures and hearing aid.

Linear probability models and two stage least squares regressions are used to estimate whether the interaction between screening outcome and education changes the utilization of health care for lifestyle related diseases. We start by dividing the sample into invited and control groups, to see if there are changes in lifestyle related utilization in an intention-to-treat setting. Further, we divide the invited according to participation status, and finally participants according to screening outcome. In these models

we take account of the non-random selection of the participants among the invited by using the random assignment to screening as an instrumental variable.

The results according to intention-to-treat indicate that the occurrence of lifestyle related diseases due to screening is smaller among individuals with a high level of education. These results are supported by the further analyses among individuals with a negative screening test result.