

## Abstract

### **Potential excess mortality rate of non-cardiovascular with low cholesterol, compared to cardiovascular death.**

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**Background:** Contrary to popular belief, no comprehensive study to date has provided evidence that lowering cholesterol concentrations extends overall survival.

**Design and Method:** A number of observational cohort studies in a variety of settings have demonstrated that all-cause mortality has a “U”, “J”, or “L” shaped relationship to serum cholesterol. An inverse association of low cholesterol with excess non-cardiovascular (CVD) death was investigated in an Italian population of 30,179 males and 26,005 females, age 20-69 years.

**Results:** During the 9 years follow-up period there were 1906 deaths. Among males there were 882 non-CVD and 557 CVD deaths. Among females 332 non-CVD and 135 CVD deaths were identified. There was a significant inverse association of total cholesterol with unadjusted and age adjusted death rates for 1439 all cause deaths, 882 total non-CVD, 600 cancer and 74 non-cancer liver dysfunction (NCLD) deaths for males. These inverse associations remained significant after controlling for potential confounding variables by multivariate adjusted relative risk (RR) for cholesterol levels <160 mg/dl for all cause (RR=1.5;95% confidence interval (CI):1.19-1.89), total non-CVD (RR=2.06;95% CI:1.54-2.74), cancer (RR=1.52;95% CI: 1.06-2.18) and NCLD (RR=10.73;95% CI: 3.74-30.18) deaths. However, for females there were no significant inverse associations of total cholesterol with unadjusted and age adjusted rates for all causes of death. Similar to the male population, there was a significant inverse association after multivariate adjusted RR for cholesterol levels <160 mg/dl for 467 all cause (RR=1.53; 95% CI: 3.09-217.70).

**Conclusion:** Factors related to underlying health status likely account for the excess mortality among persons with low cholesterol.

**Keywords:** Low cholesterol, Excess mortality rate. non-CVD, CVD.