

ECOLOGICAL CORRELATIONS BETWEEN FOOD AVAILABILITY AND MORTALITY: MORE THAN YOU CAN EAT?

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Aim

There is little information regarding the impact of diet on disease incidence and mortality in Switzerland. We aimed at assessing the associations between food availability and disease using ecological correlations.

Conclusion

Ecologic associations between food availability and disease vary considerably whether mortality or incidence rates are used. Great care should be taken when interpreting the results.

Methods

Time-trend ecologic study for period 1970 to 2009. Food availability was measured through the FAO food balance sheets. Standardized mortality rates (SMRs) were obtained from the Swiss Federal Office of Statistics. Cancer incidence data was obtained from the WHO Health for all database and the Vaud cancer registry. Association between food availability and mortality/incidence was assessed at lags 0, 5, 10 and 15 years by Spearman correlation.

Results

Ecological correlations between secular trends in food availability and European-standardized mortality rates for all causes and cardiovascular diseases, Switzerland.

	Diseases of the			
	Total mortality	circulatory system	Ischemic heart disease	Cerebrovascular diseases
Total energy	0.265	0.254	0.193	0.266
Vegetal products	-0.223	-0.236	-0.498	-0.226
Animal products	0.560	0.562	0.800	0.558
Cereals	0.025	0.018	-0.214	0.020
Sugar & sweeteners	-0.523	-0.539	-0.682	-0.526
Vegetable oils	-0.390	-0.393	-0.687	-0.387
Alcoholic beverages	0.812	0.808	0.756	0.813
Meat	0.502	0.503	0.751	0.501
Milk	0.403	0.407	0.678	0.396
Fish	-0.883	-0.883	-0.739	-0.885
Fruits	0.896	0.902	0.843	0.900
Vegetables	-0.402	-0.403	-0.080	-0.409
Animal fats	0.620	0.632	0.781	0.627

Results are expressed as Spearman nonparametric correlations. Coefficients beyond a cut-off of ± 0.70 are indicated in bold.

Results

Ecological correlations between secular trends in food availability and cancer incidence and mortality rates for period 1970 to 2009, Switzerland.

	All cancers		Trachea / lung		Cervix		Breast	
	Mortality	Incidence	Mortality	Incidence	Mortality	Incidence	Mortality	Incidence
Total energy	0.277	-0.147	-0.024	0.217	0.284	0.086	0.068	-0.165
Vegetal products	-0.280	0.736	-0.705	0.282	-0.216	-0.725	-0.610	0.715
Animal products	0.626	-0.893	0.876	-0.280	0.558	0.858	0.811	-0.880
Cereals	-0.058	0.373	-0.485	-0.158	0.012	-0.396	-0.361	0.424
Sugar & sweeteners	-0.520	0.802	-0.713	0.564	-0.523	-0.746	-0.659	0.737
Vegetable oils	-0.469	0.867	-0.840	0.231	-0.376	-0.846	-0.734	0.824
Alcoholic beverages	0.853	-0.793	0.583	-0.072	0.793	0.712	0.710	-0.788
Meat	0.587	-0.860	0.901	-0.178	0.521	0.810	0.803	-0.892
Milk	0.447	-0.803	0.720	-0.181	0.389	0.740	0.602	-0.796
Fish	-0.827	0.679	-0.359	0.323	-0.894	-0.692	-0.458	0.763
Fruits	0.849	-0.888	0.590	-0.376	0.907	0.855	0.706	-0.858
Vegetables	-0.310	-0.165	0.072	-0.299	-0.427	0.218	-0.090	-0.015
Animal fats	0.650	-0.737	0.545	-0.421	0.603	0.812	0.579	-0.682

Results are expressed as Spearman nonparametric correlations. Coefficients beyond a cut-off of ± 0.70 are indicated in bold.

Effect of lag time on the association of food availability with overall and breast cancer incidence rates for period 1970 to 2009, Switzerland.

Lag time (years)	All cancers				Breast cancer			
	0	5	10	15	0	5	10	15
Total energy	-0.147	-0.231	-0.662	-0.412	-0.165	-0.314	-0.605	-0.455
Vegetal products	0.736	0.532	-0.331	-0.403	0.715	0.436	-0.362	-0.539
Animal products	-0.893	-0.717	-0.122	0.414	-0.880	-0.686	-0.024	0.520
Cereals	0.373	0.391	-0.254	-0.362	0.424	0.302	-0.229	-0.569
Sugar & sweeteners	0.802	0.672	-0.124	-0.200	0.737	0.614	-0.204	-0.206
Vegetable oils	0.867	0.507	-0.243	-0.599	0.824	0.470	-0.273	-0.674
Alcoholic beverages	-0.793	-0.754	-0.806	-0.468	-0.788	-0.779	-0.763	-0.423
Meat	-0.860	-0.668	-0.064	0.523	-0.892	-0.633	0.035	0.637
Milk	-0.803	-0.802	-0.161	0.133	-0.796	-0.788	-0.053	0.179
Fish	0.679	0.792	0.860	0.924	0.763	0.720	0.898	0.877
Fruits	-0.888	-0.876	-0.755	-0.670	-0.858	-0.797	-0.755	-0.542
Vegetables	-0.165	0.456	0.508	0.489	-0.015	0.378	0.459	0.523
Animal fats	-0.737	-0.572	-0.297	-0.188	-0.682	-0.579	-0.361	-0.043

Results are expressed as Spearman nonparametric correlations. Coefficients beyond a cut-off of ± 0.70 are indicated in bold.