**Fish Consumption and Risk of All-Cause and Cardiovascular Mortality: A Dose-Response Meta-analysis of Prospective Observational Studies.**

**Supplementary material including two supplementary tables, and three supplementary figures.**

**Supplemental Table 1.** Reported risk estimates in studies included in meta-analysis of fish consumption and risk of all-cause and cardiovascular mortality.

|  |  |  |
| --- | --- | --- |
| **Fish categories** | **No of cases/ personyears (PY) or participants** | **Reported risk estimates (95%CI)** |
| Daviglus 10, 1997All-cause mortality  |
| 0 gr/day  | 105/189 | 1.00 |
| 1 – 17 | 377/646 | 1.02 (0.82-1.27) |
| 18 – 34  | 432/745 | 0.98 (0.79-1.22) |
| ≥ 35  | 128/242 | 0.85 (0.64-1.10) |
| Daviglus 10, 1997Cardiovascular mortality |
| 0 gr/day  | 61/189 | 1.00  |
| 1 – 17 | 208/646 | 0.94 (0.70-1.25) |
| 18 – 34  | 235/745 | 0.89 (0.67-1.19) |
| ≥ 35  | 69/242 | 0.74 (0.52-1.06) |
| Albert 11, 1998All-cause mortality  |
| < 1 time/month | 50/637  | 1.00 |
| 1 – 3 times/month | 101/1262  | 0.79 (0.59-1.06) |
| 1 - < 2 times/week | 514/6443 | 0.71 (0.55-0.91) |
| 2 - < 5 times/week | 808/9997  | 0.70 (0.54-0.89) |
| ≥ 5 times/week | 179/2212  | 0.73 (0.55-0.96) |
| Albert 11, 1998Cardiovascular mortality |
| < 1 time/month | 17/637  | 1.00 |
| 1 – 3 times/month | 34/1262  | 0.96 (0.57-1.61) |
| 1 - < 2 times/week | 170/6443 | 0.79 (0.51-1.23) |
| 2 - < 5 times/week | 268/9997  | 0.84 (0.54-1.30) |
| ≥ 5 times/week | 59/2212  | 0.81 (0.49-1.33) |
| Bellavia 29, 2016All-cause, Men |
| 0 – 17 gr/day | 2183/7710 | 1.10 (1.01-1.20) |
| 17.1 – 25.5  | 2059/7710 | 1.02 (0.94-1.11) |
| 25.6 – 34  | 1501/7710 | 1.00 |
| 34.1 – 47  | 1749/7710 | 1.03 (0.95-1.12) |
| 47.1 – 120  | 1802/7709 | 0.99 (0.91-1.08) |
| Bellavia 29, 2016All-cause, Women |
| 0 – 15 gr/day | 2020/6795 | 1.09 (0.99-1.19) |
| 15.5 – 20 | 1224/6795 | 0.97 (0.88-1.06) |
| 20.5 – 30 | 1270/6795 | 1.00 |
| 30.5 – 37.5 | 915/6795 | 0.94 (0.85-1.04) |
| 38 - 120 | 1572/6793 | 1.12 (1.02-1.23) |
| Bellavia 29, 2016Cardiovascular mortality  |
| 0 – 15.5 gr/day | 1332/14283 | 1.18 (1.06-1.32) |
| 15.6 – 23 | 837/14414 | 1.09 (0.97-1.23) |
| 23.1 – 32 | 913/14294 | 1.00 |
| 32.1 – 43 | 850/14237 | 1.04 (0.93-1.16) |
| 43.1 - 120 | 967/14156 | 1.12 (1.00-1.26) |
| Engeset 30, 2015All-cause mortality, Men  |
| 1.19 gr/day | 2427/28636 | 0.96 (0.85-1.08)a |
| 10.8 | 2769/28636 | 0.95 (0.84-1.07) |
| 21.1 | 3334/28636 | 1.00 |
| 34.2 | 3407/28636 | 1.02 (0.91-1.16) |
| 76.2 | 3047/28636 | 1.04 (0.93-1.18) |
| Engeset 30, 2015All-cause mortality, Women |
| 1.19 gr/day | 3403/67470 | 1.05 (0.94-1.18)a |
| 10.8 | 3383/67470 | 0.99 (0.88-1.10) |
| 21.1 | 3728/67470 | 1.00 |
| 34.2 | 3690/67470 | 1.02 (0.91-1.14) |
| 76.2 | 3399/67470 | 1.06 (0.95-1.18) |
| Nagata 31, 2002All-cause mortality, Men |
| 46.2 gr/day | 214/18292 PY | 1.00  |
| 68.1 | 210/18232 PY | 0.92 (0.76-1.11) |
| 86.8 | 212/18317 PY | 0.91 (0.75-1.10) |
| 111.9 | 243/18150 PY | 0.90 (0.75-1.09) |
| 157.8 | 284/18045 PY | 0.94 (0.78-1.12) |
| Nagata 31, 2002All-cause mortality, Women |
| 36.6 gr/day | 207/21906 PY | 1.00 |
| 53.9 | 177/22018 PY | 0.93 (0.76-1.14) |
| 68.8 | 171/21979 PY | 0.96 (0.79-1.18) |
| 88.1 | 173/22091 PY | 0.93 (0.76-1.14) |
| 122.4 | 171/22128 PY | 0.86 (0.70-1.05) |
| Takata 32, 2013All-cause mortality, Men  |
| < 10.8 gr/day | 682/12228 | 1.00 |
| 10.9 – 25 | 471/12228 | 0.91 (0.80-1.02) |
| 25.1 – 39.1 | 375/12228 | 0.88 (0.77-1.00) |
| 39.1 – 59.8 | 330/12228 | 0.87 (0.75-1.00) |
| 59.8 – 107.2 | 312/12228 | 0.86 (0.74-1.00) |
| Takata 32, 2013All-cause mortality, Women |
| < 10.4 | 1247/14632 | 1.00 |
| 10.4 – 24.3 | 797/14632 | 0.92 (0.84-1.01) |
| 24.3 – 38.5 | 619/14632 | 0.88 (0.79-0.97) |
| 38.5 – 58.7 | 539/14631 | 0.86 (0.77-0.96) |
| 58.7 – 105.2 | 464/14631 | 0.82 (0.73-0.93) |
| Takata 32, 2013Cardiovascular mortality, Men |
| < 10.8 gr/day | 237/12228 | 1.00 |
| 10.9 – 25 | 156/12228 | 0.94 (0.76-1.16) |
| 25.1 – 39.1 | 122/12228 | 0.94 (0.74-1.18) |
| 39.1 – 59.8 | 86/12228 | 0.77 (0.59-1.00) |
| 59.8 – 107.2 | 98/12228 | 0.96 (0.74-1.26) |
| Takata 32, 2013Cardiovascular mortality, Women |
| < 10.4 | 423/14632 | 1.00 |
| 10.4 – 24.3 | 240/14632 | 0.89 (0.75-1.05) |
| 24.3 – 38.5 | 158/14632 | 0.76 (0.62-0.92) |
| 38.5 – 58.7 | 149/14631 | 0.84 (0.69-1.03) |
| 58.7 – 105.2 | 120/14631 | 0.78 (0.62-0.98) |
| Yamagishi 33, 2008All-cause mortality  |
| 20.50 gr/day | 1429/11594 | 1.00 |
| 33 | 1288/11595 | 0.97 (0.90-1.06) |
| 45.5 | 1328/11594 | 0.94 (0.86-1.02) |
| 62 | 1397/11595 | 0.94 (0.85-1.03) |
| 85.5 | 1566/11594 | 0.92 (0.84-1.02) |
| Yamagishi 33, 2008Cardiovascular mortality  |
| 20.50 gr/day | 360/11594 | 1.00 |
| 33 | 367/11595 | 0.93 (0.80-1.09) |
| 45.5 | 412/11594 | 0.91 (0.78-1.07) |
| 62 | 388/11595 | 0.81 (0.68-0.96) |
| 85.5 | 518/11594 | 0.81 (0.67-0.98) |
| Owen 34, 2015All-cause mortality  |
| < 1 serving/month | 162/1377 | 1.00 |
| 1 – 3 servings/month | 222/2819 | 0.74 (0.57-0.91) |
| 1 serving/week | 409/3576 | 0.82 (0.65-0.99) |
| ≥ 2 servings/week | 414/3271 | 0.97 (0.80-1.13) |
| Owen 34, 2015Cardiovascular mortality |
| < 1 serving/month | 41/1377 | 1.00 |
| 1 – 3 servings/month | 53/2819 | 0.83 (0.28-1.38) |
| 1 serving/week | 93/3576 | 0.79 (0.41-1.16) |
| ≥ 2 servings/week | 78/3271 | 0.73 (0.39-1.07) |
| Bell 35, 2014All-cause mortality |
| 0 time/year | 1395/24917 | 1.00 |
| 6 – 12 | 694/16508 | 0.95 (0.86-1.04) |
| 14 – 28 | 594/16732 | 0.88 (0.79-0.97) |
| ≥ 42 | 368/12338 | 0.86 (0.76-0.98) |
| Folsom 36, 2004All-cause mortality  |
| < 0.5 serving/week | 606/50038 PY | 1.00 |
| 0.5 – 1.0 | 833/77410 PY | 0.99 (0.88-1.11) |
| 1.0 – 1.5 | 1848/174852 PY | 0.97 (0.88-1.07) |
| 1.5 – 2.5 | 476/48325 PY | 0.93 (0.83-1.05) |
| ≥ 2.5 | 890/92341 PY | 0.93 (0.83-1.05) |
| Folsom 36, 2004Cardiovascular mortality |
| < 0.5 serving/week | 220/50038 PY | 1.00 |
| 0.5 – 1.0 | 304/77410 PY | 1.03 (0.85-1.23) |
| 1.0 – 1.5 | 590/174852 PY | 0.86 (0.73-1.02) |
| 1.5 – 2.5 | 144/48325 PY | 0.79 (0.63-0.99) |
| ≥ 2.5 | 331/92341 PY | 0.95 (0.78-1.15) |
| a Hazard ratioswere reported with 99% CI, and were recalculated to 95%CI for inclusion in meta-analysis.  |

**Supplemental Table 2.** Relative risk of cardiovascular mortality for a 20 gr/day increment in fish consumption.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Comparison  |  | n | Pooled RRs | Heterogeneity (*I*2), *P* value |
| **All studies**  |  | 8 | 0.96 (0.94-0.98) | 0.0%, 0.61 |
| **Sex**  |  |  |  |  |
|  Men  |  | 3 | 0.98 (0.0.94-1.02) | 11.2%, 0.32 |
|  women |  | 2 | 0.96 (0.92-1.00) | 0.0%, 1.00 |
|  Both  |  | 3 | 0.95 (0.93-0.98) | 0.0%, 0.45 |
| **Region**  |  |  |  |  |
|  US + Europe |  | 4 | 0.97 (0.94-1.00) | 0.0%, 0.58 |
|  Asia (Japan + China) |  | 3 | 0.96 (0.93-0.99) | 24.7%, 0.26 |
|  Australia |  | 1 | 0.98 (0.71-1.06) | - |
| **Follow-up duration**  |  |  |  |  |
|  < 13 years  |  | 5 | 0.96 (0.94-0.99) | 0.0%, 0.42 |
|  > 13 years  |  | 3 | 0.96 (0.93-1.00) | 0.0%, 0.49 |
| **Number of cases**  |  |  |  |  |
|  < 1000 |  | 4 | 0.98 (0.94-1.01) | 8.0%, 0.35 |
|  > 1000 |  | 4 | 0.96 (0.93-0.98) | 0.0%, 0.77 |
| **Excluded history of CVD**  | Yes  | 6 | 0.96 (0.94-0.98) | 0.0%, 0.47 |
|  | No  | 2 | 0.97 (0.93-1.01) | 0.0%, 0.38 |
| **Energy adjusted**  | Yes  | 7 | 0.96 (0.94-0.98) | 0.0%, 0.58 |
|  | No  | 1 | 0.99 (0.92-1.06) | - |
| **BMI adjusted**  | Yes | 5 | 0.96 (0.93-0.98) | 0.0%, 0.54 |
|  | No  | 3 | 0.97 (0.94-1.00) | 0.0%, 0.40 |
| **Smoking adjusted**  | Yes | 8 | 0.96 (0.94-0.98) | 0.0%, 0.61 |
|  | No  | - | - | - |
| **Alcohol adjusted**  | Yes | 7 | 0.96 (0.94-0.98) | 0.0%, 0.58 |
|  | No  | 1 | 0.89 (0.71-1.06) | - |
| **Physical activity adjusted**  | Yes | 7 | 0.96 (0.95-0.98) | 0.0%, 0.67 |
|  | No  | 1 | 0.89 (0.76-1.01) | - |



**Supplemental Fig. 1**. Relative risk of all-cause mortality, associated with a 20 gr/day increment in fish consumption.



**Supplemental Fig. 2**. Funnel plot of the relative risks of 14 studies (10 publications) on fish consumption and risk of all-cause mortality. Begg’s test *P*=0.70, Egger’s test *P*=0.008. Log RR: natural logarithm of relative risk. s.e: standard error.



**Supplemental Fig. 3.** Relative risk of cardiovascular mortality, associated with a 20 gr/day increment in fish consumption.