

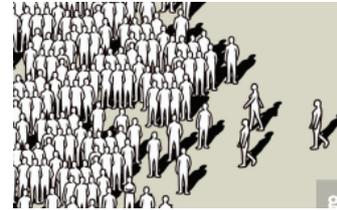
research



Fat and carbohydrate consumption p 445



Caution for the media on reporting deaths by suicide p 446



Spot quality research on risk prediction p 448

ORIGINAL RESEARCH Prospective cohort study of UK Biobank participants

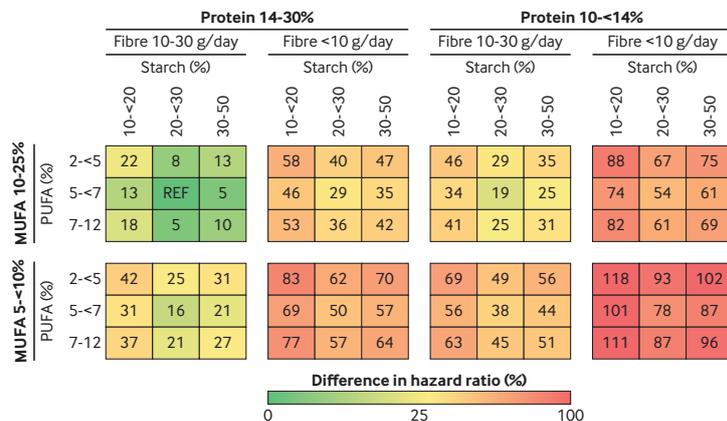
Associations of fat and carbohydrate intake with cardiovascular disease and mortality

Ho FK, Gray SR, Welsh P, et al
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Study question Simplistic dietary advices (eg, eat less carbohydrate) often implies health risks are directly proportional to intake—is the assumption true, or are the associations of macronutrient intake with all cause mortality and cardiovascular non-linear? Non-linear associations would mean dietary advice may need to be made based on current intake.

Methods This prospective cohort study comprised 195 658 participants in UK Biobank who completed at least one dietary questionnaire. Diet was assessed using Oxford WebQ, a web based 24 hour recall questionnaire, and nutrient intakes were estimated using standard methodology. Non-linear associations were studied using Cox proportional models with penalised cubic splines.

Study answer and limitations Carbohydrate intake showed a non-linear association with mortality; no association at 20-50% of total energy intake but a positive association at 50-70% of energy intake (3.14 v 2.75 per 1000 person



Dietary risk matrix for all cause mortality. Estimated based on multivariate Cox regression models. The cells represent alternative, isocaloric combinations of macronutrients and are coloured from green (lowest risk) to red (highest risk) based on the difference in hazard ratios as a percentage excess hazard relative to the reference category (REF). Cells with similar colours represent different dietary combinations that are associated with similar levels of risk. MUFA=monounsaturated fatty acids; PUFA=polyunsaturated fatty acids

years, average hazard ratio 1.14, 95% confidence interval 1.03 to 1.28 (60-70% v 50% of energy)). A similar pattern was observed for sugar but not for starch or fibre. A higher intake of monounsaturated fat (2.94 v 3.50 per 1000 person years, average hazard ratio 0.58, 0.51 to 0.66 (20-25% v 5% of energy)) and lower intake of polyunsaturated fat (2.66 v 3.04 per 1000 person years, 0.78, 0.75 to 0.81 (5-7% v 12% of energy)) and saturated fat (2.66 v 3.59 per 1000 person years, 0.67, 0.62 to 0.73 (5-10% v 20% of energy)) were associated with a lower risk of mortality. A dietary risk matrix was developed to illustrate how dietary advice can be given based

on current intake. Owing to the observational nature of the data, caution is needed in inferring a causal association.

What this study adds In this study, many of the associations between macronutrient intakes and health (risk of mortality and cardiovascular disease) were non-linear, and components of carbohydrates (total sugar and starch) had a differential association with health. Dietary advice could be tailored to current intake and consideration given to the components of macronutrients.

Funding, competing interests, and data sharing See full paper on bmj.com for funding. No additional data available.

Suicide and the media: reporting could cost lives

ORIGINAL RESEARCH Systematic review and meta-analysis

Association between suicide reporting in the media and suicide

Niederkrotenthaler T, Braun M, Pirkis J, et al

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Study question Is reporting on suicides, and especially on deaths of celebrities by suicide, associated with an increase in the number of subsequent suicides in the general population?

Methods This systematic review and meta-analysis included data from studies adopting an interrupted time series design, or single or multiple arm before-and-after

comparisons. Data sources were PubMed/Medline, PsychInfo, Scopus, Web of Science, Embase, and Google Scholar, searched up to September 2019. Studies were eligible if they compared at least one time point before and one time point after reports of suicide, follow-up was two months or less, and the outcome was death by suicide.

Study answer and limitations 31 studies were identified and analysed, and 20 studies at moderate risk of bias were included in the main analyses. The risk of suicide increased by 13% in the period after the media reported the death of a celebrity by suicide (rate ratio 1.13, 95% confidence interval 1.08 to 1.18, 14 studies; median

follow-up 28 days, range 7-60 days). When the suicide method used by the celebrity was reported, there was an associated 30% increase in deaths by the same method (rate ratio 1.30, 95% confidence interval 1.18 to 1.44; 11 studies; median follow-up 28 days, range 14-60 days). For general reporting of suicide, the rate ratio was 1.002 (0.997 to 1.008; five studies; median follow-up 1 day, range 1-8 days) for a one article increase in the number of reports on suicide. The large amount of heterogeneity was partially explained by celebrity and methodological factors. Enhanced funnel plots suggested some publication bias in the literature. Limitations included an inability to test causality because of the designs of

COMMENTARY Detail, sensationalism, and accounts of the method used are unnecessary and harmful

News coverage of television presenter Caroline Flack's recent death by suicide once again raises public health concerns about media reporting of suicide. Freedom of the press is one of the fundamental pillars of a democratic society, but is regulation around some aspects of the media reporting of suicide required?

Niederkrotenthaler and colleagues suggest that the answer could be "yes." The team synthesised findings from 31 studies investigating associations between media reporting of deaths by suicide and population suicide rates. Most studies looked at the reporting of deaths of celebrities by suicide. The phenomenon has been studied in Europe, Asia, North America, and Australia, highlighting the international extent of concerns. Suicide rates increased by 13% (95% confidence interval 8% to 18%) on average in the period (median 28 days) following media reports of the death of a celebrity by suicide.

This effect is substantial. In the UK, where 6507 people died by suicide in 2018 (542 per month),² a 13% increase would amount to around 70 additional deaths. In the five months following the death of the international celebrity Robin

Williams by suicide, deaths by suicide increased by almost 10% (n=1841) in the United States.³

It could be argued that producing one summary estimate of risk from such a diverse range of studies is misleading.

There was marked variation between study findings and evidence of publication bias. Furthermore, any association between the reporting of a celebrity's death and wider suicide rates will be confounded by the popularity of the celebrity, which influences

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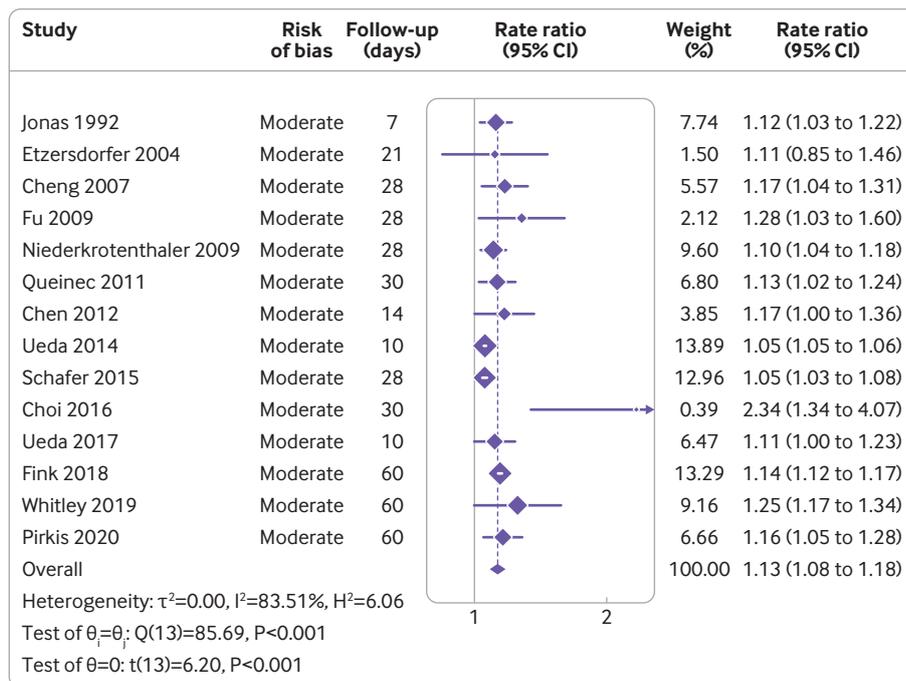


the original studies. Furthermore, it was not possible to generate absolute risk estimates because the included studies mostly did not report the baseline risk of suicide in their respective settings.

What this study adds This study indicates that suicide reporting, especially on deaths of celebrities by suicide, is associated with a meaningful increase in suicide in the general population.

Funding, competing interests, and data sharing No specific funding for this study. Full details of competing interests are on bmj.com. The authors have no competing interests. No additional data available.

Study registration PROSPERO CRD42019086559.



Forest plot for primary analysis: media reporting of deaths of celebrities by suicide

both the extent of media reporting and the reader's emotional connection to the death. Even so, the estimate reported by Niederkrotenthaler and colleagues will help give media outlets a clearer sense of the potential effect of their reporting.



If reporting of suicide methods promotes a shift from less lethal to more lethal methods, this could increase overall suicide rates

Media reporting of suicide methods is a particular concern, because it risks making specific methods “cognitively available.” The authors found that reporting the method of suicide used by a celebrity was associated with a 30% increase in deaths by the same method. This proportion is consistent with studies in which survivors of serious suicide attempts describe media reports as influencing their choice of method.⁴ If reporting of suicide methods promotes a shift from less lethal to more lethal methods, this could increase overall suicide rates.

Although the review found no increase in the rate of death by suicide following media reports of non-celebrity suicides, this is not grounds for complacency. A US study⁵ found evidence that news reporting of suicides could trigger suicide clusters in young people; a higher risk was associated with front page reporting, description of the suicide method, and detailed accounts of the suicide. These concerns are perhaps particularly salient in relation to recent high profile news reporting of deaths of students by suicide in the UK.⁶

Media coverage of suicide is important. Suicide is a leading cause of premature death, and responsible reporting can lead to greater public understanding. Indeed, some reporting (such as descriptions of people overcoming a suicidal crisis) could have a beneficial effect on suicide rates.¹⁰ A tension, however, remains between the so-called public interest and the interest of the public.

Following the death of a celebrity by suicide, potentially harmful information could flood into individuals' news feeds as it is reposted, begins trending, and is commented on. Exposure is repeated and accompanied by a new layer of unregulated social discourse on suicide, the effect of which is not easily quantified but likely contributes to Niederkrotenthaler and colleagues' suggested explanations for a rise in suicide rates following media reporting: increased identification with the deceased person, and normalisation of suicide as a solution to adversity.

Journalists, news editors, and social media platforms must be made to consider more carefully the costs to population health, and impacts on families and friends,¹² of sensationalist, detailed reporting of these tragic deaths.

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Calculating the sample size required for developing a clinical prediction model

Riley RD, Ensor J, Snell KIE, et al

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Find this at: <http://dx.doi.org/10.1136/bmj.m441>

Clinical prediction models aim to predict whether an individual is likely to have an outcome (eg, pre-eclampsia in pregnancy), using information recorded (predictors), such as age, sex, blood pressure, and blood test results. Hundreds of prediction models aiming to inform diagnosis and prognosis are published in the medical literature each year. Yet many models are developed using a dataset that has too few participants or outcome events.

Small datasets lead to inaccurate predictions from a model and consequently incorrect healthcare decisions for some people. In this article, guidance is provided on how to calculate the sample size required to develop a clinical prediction model. Firstly, the data should be of sufficient quality and representative of the target population (that is, those participants and settings for which predictions are required). Secondly, all available data should be used for model development; there is no need to split data into a subset for model development and a subset for model testing as it is more efficient to use all data to develop the model and apply resampling methods (eg, bootstrapping) for validation. Thirdly, the widely used rule of thumb that the dataset must contain 10 events for every predictor in the model is too simplistic, as the actual sample size required is context specific—for example, depending on the proportion of participants with the outcome and the model's

overall fit (eg, in terms of R^2 , the proportion of variance explained by the model).

To tackle this, an approach is described that calculates the sample size required for model development based on specifying the overall outcome risk in the target population, the number of predictors to be included in the model, and the anticipated model performance. The approach aims to ensure that predictions from the model are accurate. The calculations can be implemented using the `pmsampsize` package available in the statistical software Stata or R, and should be applied when deciding how many participants to recruit to a new research study and also when evaluating whether an existing dataset is large enough. The article provides detailed examples for situations with continuous, binary, and survival outcomes.

FOUR SUGGESTED STEPS FOR SAMPLE SIZE CALCULATION TO ENSURE PRECISE PREDICTIONS AND MINIMISE OVERFITTING (SEE FULL PAPER ON BMJ.COM FOR CALCULATIONS)

Step 1

Choose a sample size that will produce a precise estimate of the overall outcome risk or mean outcome value

Step 2

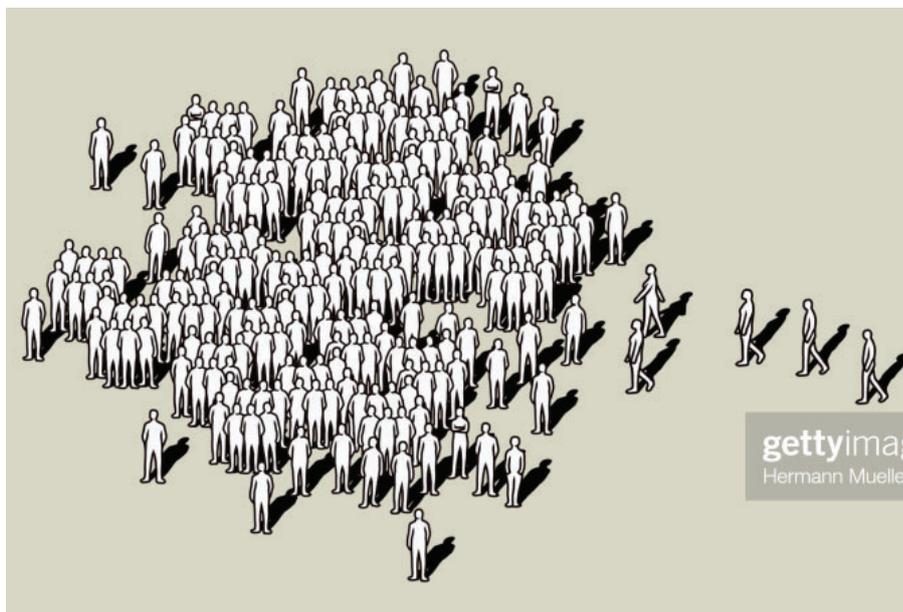
Ensure the sample size will produce predicted values that have a small mean error across all individuals

Step 3

Determine what sample size will produce a small required shrinkage of predictor effects

Step 4

Determine what sample size will produce a small optimism in apparent model fit



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CORRECTION

Algorithm based smartphone apps to assess risk of skin cancer in adults: systematic review of diagnostic accuracy studies

In this research article by Freeman and colleagues (*BMJ* 2020;368:m127, doi:10.1136/bmj.m127; 10 February 2020), the app named “SkinScan” in the 2014 Chadwick et al study is a predecessor of the SkinVision app and not related to the currently available CE marked TeleSkin “skinScan” app as was implied. The paper and linked editorial have been updated.