

to make guidelines and public health policy that ignore emerging evidence which challenges existing beliefs.

Recognizing what we know, and perhaps more importantly, what we don't know, is the first step towards progress. The public and our patients deserve a rational, balanced and unbiased approach to resolving the salt controversy. The scientific community should not fail them.

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Commentary: The salt wars described but not explained—an invited commentary on 'Why do we think we know what we know? A metaknowledge analysis of the salt controversy'

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Researchers in the salt space are a polarized, uncompromising and self-serving lot, according to this week's paper by Trinquart *et al*.¹ Those that believe in salt reduction shout it loud from one hilltop and those that don't do the same from another. Neither listens and neither pays sufficient attention to those in the valley below wanting to know whether to salt their fries. The tools used by Trinquart *et al*. are fairly blunt, but these conclusions don't sound

too far from reality. So how did this happen? And what do we actually know about the effects of salt on health?

Climate change is the area of scientific argument best known to most, and there are parallels with the salt debate—not least the two key factors fuelling the argument, an imperfect evidence base open to manipulation and misinterpretation, and strong commercial interests vested in one side of the case.² But whereas the climate

change debate appears to be resolving in favour of the protagonists, the same is not true for salt.

Certainty in medicine is now deemed to have been met when an adequately powered, well-conducted randomized trial, or an overview of such trials, has been completed.³ This is high-quality evidence and it rightly drives guideline development, policy decisions and treatment reimbursement strategies around the world. Evidence of this type changes practice and has delivered real health gains for hundreds of millions.⁴ It's the way medicine and public health should be practised and it's something to aspire to. Unfortunately, clarity of this type is not available for most health issues because the data to define truth are lacking.

The absence of definitive data doesn't, however, mean we can't make an informed and rational decision. It just requires more sophisticated thinking and the capacity to deal with uncertainty. The current focus on just the highest-grade studies gives the illusion that medical decision making is a black-and-white process, when it is not. This has undermined the capacity of individuals and institutions to interpret weaker data and take reasonable actions based on the likely, but uncertain, overall balance of benefits and risks.⁵

Central to decision making is the capacity to evaluate the totality of the applicable evidence and draw conclusions that accommodate the various strengths and weaknesses of the contributing parts. The highly structured nature of data evaluation protocols for guidelines can conspire against this, with evidence assessment compartmentalized according to types of study designs and selected questions identified a priori.⁶ This strategy brings objectivity to the assessment process and works well when trials and meta-analyses abound, but can limit the capacity of experts to synthesize findings across a weaker set of data. Expert opinion as the basis for health care decisions is clearly not where we want to return, but the skilled and informed collation of systematically identified and summarized data from diverse sources is a valid process and an exercise of significant worth.

Another challenge to achieving rational decision making in regard to salt reduction is the commercial interest of vested parties.² Whereas salt itself is a low-cost commodity, it plays a central role in enhancing product value through food processing. Together with sugar and fat, salt can transform cheap, low-quality base ingredients into high-value merchandise with optimized technical qualities. The taste for salt habituates customers to salty foods and drives repeat purchasing behaviour. Transnational food companies are among the largest businesses in the world and fiercely protect their commercial positions. In many countries, the food industry is a leading employer and major, contributor to the tax base. Food industry influence

has resulted in the rejection of public health calls for mandated controls on the amount of salt added to products in most countries, with governments opting for inaction or weak voluntary measures.⁷ There is also evidence that the food industry is fomenting debate and stifling action on diet-related ill health, using subversive tactics pioneered by the tobacco and alcohol industries.

The research done by Trinquart *et al.*¹ offers new insights into the nature of the debate, and the meta knowledge assessment is a novel method for quantifying the issue. The conclusions that can be drawn about the underlying validity of the debate are, however, limited. There is little doubt that the reported antagonistic publishing and referencing practices are real, but the absence of any assessment of the quality of the research most frequently referred to makes it difficult to know what this means. Debate and polarization do not necessarily indicate true uncertainty. Controversial research reports generate column inches and, whether based on weak or strong data, can be highly cited. Most medical publishing houses operate a business model dependent for success upon readership and citations, and publishing controversy is at least one way of achieving that. Climate change shows that debate, polarized views and vocal advocates do not necessarily equate to genuine scientific uncertainty.

So, where does this leave us? The evidence base for salt is imperfect, but there are nonetheless important conclusions that can be gleaned from the totality of the available data. These conclusions cannot be delivered with certainty, but they have proved compelling for multiple and highly credible organizations. In particular, through the World Health Organization, the United Nations recommend salt reduction to all member states:⁸ as do the governments and learned societies of almost every country that take a view on the matter. A balanced assessment of the multiple strands of evidence suggests a much higher likelihood of harm than benefit from current levels of salt consumption, and a strong likelihood that salt reduction will deliver net health gains without harms. That makes the protagonists more than just an opinionated, obdurate bunch shouting loud from a hilltop, and raises important questions about the reasoning skills of the non-believers.

Conflict of interest: BN is Chair of the Australian Division of World Action on Salt and Health.

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Commentary: Salt and the assault of opinion on evidence

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The meta knowledge analysis by Trinquart and colleagues¹ shows a clear polarization of the literature on salt reduction. Most authors publish, cite, review and conclude systematically in favour of the salt hypothesis, but many others systematically cluster against it. The two groups have little communication between them. When *IJE* invited commentaries on the paper from leading scientists, that polarization was immediately evident. One scientist whom I admire declined our invitation saying that ‘the paper ... is rubbish ... there doesn’t seem to be any realization that the majority of those papers that are against salt reduction are funded by the food or salt industry, just like the tobacco industry did (or still does for that matter) for cigarettes ... I wouldn’t want to have anything to do with it’. Bruce Neal² kindly agreed to write a commentary, but he also focused eventually on the point that the food industry is standing behind the unconvinced and concluded that ‘a balanced assessment of the multiple strands of evidence ... raises important questions about the reasoning of the non-believers’. Conversely, Martin O’Donnell and colleagues³ argued that the evidence on salt reduction (from moderate to low levels) is inconclusive, so apparently they are among those non-believers. They even argued³ that believers should be drastically extradited from guidelines,

and suggest excluding from the guideline development process everybody who has ever expressed an opinion on salt. Anyone left out there?

Several major issues are confounded in this controversy. There are potentially millions of lives jeopardized, and the Damoclean moral argument is that whoever is wrong may be dooming those people to death intentionally or unintentionally. Then there is also my personal pet topic: the industry distorts the evidence in its favour, and as an academic and public health researcher I want to rise to the occasion and defend the community against corporate greed. At the same time, there are also clearly strong academic opinions here and allegiance, confirmation and other academic bias can sometimes be worse than financial allurements.⁴ Trinquart and colleagues¹ have meta-analysed the network of the published evidence plus the published comments and interpretations on the evidence, but this published corpus is just the selective end product of a long manipulative process. How that primary evidence and its comments and interpretations have accumulated is akin to sausage making (hmm, talking about sausages, another hot public health debate). It gives me pause when I wonder how it is decided what studies are done, how they are conducted, how they are analysed, how they are reported,