Confidence in Scientific Opinions

Scientific opinions play a key role in decision making. Scientific opinions need to reflect the state of the art in science and be unbiased. This ensures their validity and is the basis for trust and confidence. This equally applies to opinions used by Government, Industry, NGOs and Society at large.

The scientific robustness and public confidence in the outcome of scientific opinions can be advanced by:

- Openness and transparency in the application of the science itself as well as the process of developing an opinion,
- The scientific qualifications of the individual scientists involved,
- Absence of bias and interests with a potential to cause a conflict of interest with the individual scientists or that may be perceived as such,
- Diversity amongst the team of scientists responsible for developing the opinion regarding their background.

Opinion and Bias

Science aims at advancing the understanding of the world in which we are working and living. Science studies anything from the universe to the smallest sub-atomic particle. Science is acknowledged to be impartial. It is objective by relying on observations that can be reproduced to verify and thereby to validate an opinion[1] of a scientist. Scientists are considered independent as long as they pursue these objectives.

That scientists are independent is not taken for granted anymore. It is just like the objectivity of doctors, judges, etc that is challenged as well. Today people have better means to develop their own views, which makes them less dependent on experts. Last but not least professionals, who were expected to serve their profession first and foremost, on occasion have appeared to be willing to put other interests before their professional obligations.

Today the independence of professionals such as scientists can be questioned and should be questioned as well. This in itself is a good thing. In questioning scientists' independence, clarity about what is independent and when a scientist cannot be considered independent is needed. Clarity about why independence is important too. Understanding what interests are jeopardised when independence has gone is important. Independence matters in particular when the public cause or the interest of the public is at stake[2].

Trust and confidence are founded on this independence of scientists while carrying out their profession. That makes people comfortable depending on the scientist's expert opinion. Lack of confidence and lack of trust in the scientists' opinion is often the primary cause for questioning their independence.

What matters is assurance or better evidence that the opinion, view or advice of a scientist is based on the current state of science applied in a comprehensive way. The opinion should be based on what today is known and what we know we don't know. Unsubstantiated assumptions or convictions should not influence an opinion.

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[1] Defined in this paper as: Formal statement by expert when consulted of what he/she holds to be the fact or the right course, professional advice.

[2] The independence of EFSA is in its foundation through the Regulation. The independence of its scientists needs continued managing. The independence of its opinions is what matters.

Considerations or worse, concerns about the possible consequences of that particular opinion, should not influence an opinion either.

Scientists are ordinary mortals. They have more stakes in life than science alone. It has happened too often in the past that other considerations than scientific ones have influenced scientists' opinions. It is unusual to be upfront about it. Just like anybody else scientists aren't always aware of their own prejudices. Therefore other people 'find out'. As a consequence the public ask themselves how to distinguish science-based opinions from views or flawed or 'coloured' advice

History gives many examples. Galileo denouncing his science-based view on the solar system is just one well-known case. It seems to happen when scientists are under pressure. Pressure can have various origins:

1. Science based pressure: New evidence may necessitate changing an opinion. This is common in science as it is continuously developing. However, people can be under pressure and reluctant to change their view because this can be perceived as incompetence because 'they were wrong' before.
2. Society related pressure: When it is likely that an opinion will be negatively discussed in the media, for example because it is considered controversial, it will put the scientists involved under a lot of pressure. This can influence their opinion or how they express their opinion.
3. Employment related pressure: An opinion in a commercial environment can have impact on the economic prospects of products or services of a company. This will put scientists under severe pressure. Even when not scrutinised by management, they themselves are very much aware of the implications. Similarly in a governmental environment a scientific opinion can cause political problems for a minister resulting in pressure on the scientist. In both scenarios there can be additional pressure when people have reason be concerned about their job.
4. Finance based pressure: Scientists can have a direct personal financial interest in research and the resulting opinion. It can also be that the results of research reduce the likelihood of success to generate funding for further research or in a more general sense the financial condition of the organisation that is employing the scientist. These are strong factors that have proven to be capable of influencing scientists' opinions in the past.

In summary, there seems to be no area that is exempt when looking for situations where scientists have given opinions or conclusions that were influenced by non-science based considerations. It has happened in industry, in government run institutions and academic environments.

Expectations from Society

Scientific opinions matter to society in particular when they play a role in deciding what is good or bad, right or wrong for society or more in particular for the individual members of that society. Governments and Regulators take many such decisions on a daily basis as does Industry regarding the products and services it offers. Most decisions are taken based on opinions that do not need input from science. In matters relating to public health, safety and the environment decisions are taken taking into consideration many aspects. However, in almost all cases the outcome and interpretation of scientific studies and therefore the opinion of scientists are a key consideration leading to a decision.

Society expects that these scientific opinions are not influenced by other considerations than those that relate to science and are justified on scientific grounds. This is where the discussion about 'independence of scientists' starts. It is about trust, confidence in the opinion they deliver. Society does not accept that decisions about their health and their environment are based on scientific opinions that cannot be justified from a scientific perspective and are influenced by other considerations irrespective of their nature.

The question is how a situation can be achieved where the expectations from society can be met in a credible way. Those responsible and intimately involved in the work of scientists knowing that the scientific opinions are science based and not biased is not good enough. The public should be able to verify and 'to see with their own eyes'.

Confidence in Opinions

Credibility, trust and confidence are things that cannot be 'engineered'. The bottom line is that regulators and politicians are responsible for creating the right conditions for scientists to develop their opinions. Scientists have to discharge their responsibility by doing a professional job. The public, society, will decide on their own whether they believe that the opinions from the scientists are credible or not.

To obtain opinions that are scientifically sound that therefore should be trusted several requirements need to be fulfilled:

Openness and Transparency: There should be clarity about how the scientists developed the opinion from data collection to data selection, accurately identifying the question addressed by the opinion and how it was developed. Equally, the questions that are not addressed by the opinion should be made explicit and explained. It should included the level of (un)certainty of the opinion. The process and line of reasoning should be recorded as an integral part of the opinion. Where possible the public should have access to the process.

Qualification of the Scientists: Each individual scientist should have the right qualifications and sufficient experience for the opinion at hand.

Absence of Bias: Scientists that have a direct stake, financial or otherwise, in an opinion should not be involved in developing that opinion. That's because on the one hand separating the professional job at hand from the personal implications of the outcome could put them under too much pressure. On the other hand it is unavoidable that people who depend on the expert judgement of the professionals will question whether their interest have been taken care of in the most responsible way, in particular when their health or the environment are at stake.

Diversity: As long as everyone is shaped and therefore influenced by parents, school teachers, friends, peers etc there is no such thing as pure or 100% non-bias. The social and cultural environments of people influence their views and understanding. Having people on the team that is responsible for a risk assessment with a wide range of backgrounds will reduce the risk of a common bias amongst the team.

It is the scientific robustness of an opinion that matters. Ultimately it is how an opinion has been developed that will allow the public to have confidence or not.

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