Critical Assessment/Perspective

Ethics, morality, and conflicting interests: how questionable professional integrity in some scientists supports global corporate influence in public health

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Clinical and public health research, education, and medical practice are vulnerable to influence by corporate interests driven by the for-profit motive. Developments over the last 10 years have shown that transparency and self-reporting of corporate ties do not always mitigate bias. In this article, we provide examples of how sound scientific reasoning and evidence-gathering are undermined through compromised scientific enquiry resulting in misleading science, decision-making, and policy intervention. Various medical disciplines provide reference literature essential for informing public, environmental, and occupational health policy. Published literature impacts clinical and laboratory methods, the validity of respective clinical guidelines, and the development and implementation of public health regulations. Said literature is also used in expert testimony related to resolving tort actions on work-related illnesses and environmental risks. We call for increased sensitivity, full transparency, and the implementation of effective ethical and professional praxis rules at all relevant regulatory levels to rout out inappropriate corporate influence in science. This is needed because influencing the integrity of scientists who engage in such activities cannot be depended upon.

Keywords: Conflict of interest, Corporate ties, Ethics in medical science, Moral dimension of bioscience, Environmental health

Introduction

Science and research in public, environmental, and occupational health are frequently conflicted by financial self-interest resulting in pernicious alliances between scientists and corporations (industry, insurance, and other lobby groups), raising ethical and scientific concerns that call into question the integrity and the competence of all involved in such work. All medical subspecialties have been subjected to increased influence by financial ties with industry (especially the pharmaceutical and chemical industries), insurance companies, and other groups with strong vested interests. Several review articles have documented how such ties influence medical guidelines (e.g. trying to change the *status quo* weaken or eliminate regulatory protections), risk assessments, and public, environmental, and occupational health policy-makers.[1–9]

Professional ethics and personal integrity, in addition to specialized competence, are vital to ensuring sound scientific research. However, conflicting interests may affect the ethics and morality of scientists engaging in such work. Developments over the last 10 years show that transparency and self-reporting of corporate ties do not always mitigate bias, especially if disclosure statements are ambiguous or incomplete, or if conflicting interests are deliberately withheld.

How do medicine and science become compromised and vulnerable to inappropriate corporate influence (e.g. lobby funded research)? Science compromised through influence results in junk science, biased

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application of methods (i.e. using inappropriate animal tests for human long-term effects or inappropriate reference cohorts), and manipulation to cast uncertainty and doubt. This misleads scientific working groups and decision-makers on public, occupational, and environmental health questions.[10] One reason for conflicting interests is that resources for research and disease treatment and prevention are scarce, and researchers must, therefore, decide how best to apply their limited resources in pursuit of scientific truth. However, to abide by their ethical and moral duties, scientists and physicians cannot be subordinate to other interests, including their own stakeholder interests. Unfortunately, this is frequently not the case.

Examples of Corporate Influence in Public Health

Well-known examples of compromised medical and public health research with profound influence over public policy processes, from tobacco, asbestos, chemical, pharmaceutical, and car industries have been well documented. Examples include:

1. Misleading reporting and misrepresentation of pharmaceutical industry-sponsored research. Examples include the fight over the drug fenoterol and its link to the epidemic of asthma deaths in New Zealand[11] and industry impact on clinical guidelines in psychiatry[3] and pediatrics.[12,13]
2. Denying the risks of environmentally hazardous pollutants including agricultural pesticides, persistent organic pollutants, fossil fuel soot, benzene, phthalates, formaldehyde, trichloroethylene, silica, and lead by the chemical industry.[2,14] Examples also include challenges that fossil fuel emissions cause global warming, rejection of chlorofluorocarbon (CFC) gases as contributing to the hole in the ozone layer, and denial that pollution and/or diesel exhaust causes increased in morbidity and mortality.
3. Pernicious influence of industry on public health regulations through misleading reporting and misrepresentation of industry-sponsored research. The refutation of the adverse effects of certain chemicals as endocrine disruptors on the central and peripheral nervous system,[1,15] the influence of the chemical industry of carcinogenic chemicals (the ongoing "war on carcinogens"),[2] and respective recent academic scandals.[14] These publications only show the tip of the iceberg of such pernicious influences on public health. Corporate influences extend also to traffic and transport regulations, threshold limit values for the classification of hazardous substances, hazardous materials bans, and surveillance of at-risk or harmed workers.[4–6]
4. Misleading reporting and misrepresentation of tobacco industry-sponsored research on public health regulations: Tobacco company funded studies supporting the development of "reduced-harm" cigarettes.[16] Tong and Glantz[16] recently outlined how industry initially questioned scientific evidence of the harmful effects of secondhand smoke. The denial that cigarette smoke causes lung cancer and of the harmful effects of secondhand smoke in order to fight regulations for smoke-free environments are also examples of biased research.[16]
5. Further examples of misleading reporting and misrepresentation of asbestos industry-funded research influencing public health regulations. The asbestos industry's funding of defective scientific studies to create the false impression that chrysotile asbestos can be used safely[9,17] and falsely stating that the World Health Organization supports the use of chrysotile asbestos in Zimbabwe.[18] These efforts have been well planned, financed, and supported for decades by the industry's scientific lobbyists (example in Ref. 9).

These examples show how compromised science and medicine can lead to death, disease, disability, and dismemberment rather than their prevention. Without addressing these concerns, corporations and their retained researchers increase profits through the distortion of basic science. Furthermore, scientists challenging this corrupted science and call for evidence-based action to protect public health typically lack resources to support their work and at times are subjected to intimidation and retaliation. Indeed, this problem became so pervasive that in 2000 the International Society for Environmental Epidemiology launched a procedure designed to provide moral support to scientists subjected to such pressures[19] (http://www.iseepi.org/About/Docs/iseeprocedurefordealingwithbeleagueredcolleagues.pdf).

Discussion and Perspectives

There is an urgent need for an increase in independent research funding for occupational and environmental public health science. Both privately and publicly funded research should be scrutinized for potential bias, and research funding should be transparent through full disclosure of any potential financial interests. Funding sources and researcher affiliations, including all potential conflicting interests, must be disclosed. Without full disclosure, it is all the more difficult to identify what vested interests or biases are reflected in research.[1] However, developments over the last 10 years have shown transparency alone is not enough to mitigate bias. Widely distributed "pro-industry habit of thoughts" perpetuated by corporate sponsoring of undisclosed grants, contracts, travel expenses and accommodation, honoraria, consultation, and gifts should be banned.[3] This does not mean that corporations should have no role in scientific decisions. In fact, they have a responsibility to protect their workers by being at the forefront of determining the toxicity of the products they use or manufacture and to which their workers and populations are exposed. Good corporate citizenship needs to be reestablished.

Members of guideline panels and decision-making regulatory boards and researchers should be scrutinized[20] and demonstrate integrity by remaining independent

from vested interests.[21,22] They must be concerned not only with the science, but also with the ethical and moral dimensions of scientific enquiry. How can we enforce this? How can scientists avoid being seduced by the financial rewards that place excessive greed above scientific values? A challenging first step is to prevent the undermining of scientific advisory boards (e.g. WHO agencies, state organizations). Inappropriate interventions by vested interests in public policy processes have frequently been reported. These include examples of pressure from industry or from lobby groups on international organizations such as the International Labor Organization, the International Agency for Research on Cancer, European Union regulation concerning the Registration, Evaluation, Authorization and Restriction of Chemicals, and Occupational Safety and Health Administration. Other examples include scientific lobbyists not disclosing funding by industry in becoming members of an advisory boards. The latter have long been known as "industrial apologists."

Hardell and colleagues have called for actions to ensure the ethical credibility of medical research. They referenced a publication evaluating funding sources in published manuscripts from two well-recognized medical journals.[23,24] They found that when one or more of the authors reported a financial association with the funding source, the resulting research was twice as likely to report results supporting the funding sources' products or views. Others have also identified this so-called "funding effect."[25–27] Friedman and Richter state that remuneration does not necessarily result in unethical behavior, but that it can provide a strong incentive.[24]

Scientists can play a key role in preventing disease epidemics related to tobacco, asbestos, pesticides, lead in paint, food, and other industrial products known to harm population health. They have the credibility and the expertise to challenge industry's misinformation and demand evidence-based public health policy that serves the public interest. When scientific evidence is distorted to endanger health, silence is complicity, not neutrality. Scientists have a professional and ethical duty to expose misinformation disseminated by vested interests and challenge the double standard whereby vulnerable populations (in particular those overseas) are more likely to be exposed to exported harmful products.

Scientists must hold policy-makers, particularly those charged with protecting health, accountable, intervening to ensure the presentation of independent, reputable scientific evidence. They have a professional obligation to share their expertise with the public to counter the lobbying efforts of vested interests. The challenge lies in being able to counter industry-driven arguments without any of the resources that industry contributes to manufacturing doubt, paying millions annually to lobbyists to derail public interest science. Additionally, corporations should be incentivized through tax regimes to not produce misleading science. Instead they should be responsible for determining occupational exposures, product toxicity, and the prevention of morbidity and mortality.

Summary and Recommendations

In summary, inclusive policies to address conflicting interests have been prepared by scientific societies, governmental/WHO advisory bodies, and scientific journals. These policies call for transparency, with special regard to providing appropriate access to vital information and pertinent data through the disclosure of financial relationships, affiliations, dependencies, or other potential conflicts, including the expertise of the researcher and limitations of analyzed data.

We call for the implementation of strategies that expose self-interest over the public interest, rigorous unbiased peer review in scientific literature, and ethics guidelines pertaining both to research and practice in the health sciences.

We recommend the creating of standards for the selection and conduct of scientific advisory groups and policy makers to ensure that only uncompromised scientific findings with valid and appropriate scientific methods are accepted.

Scientists should be credited also for their service in the public interest (as they are for teaching and research). Their voluntary participation in the development of diagnostic guidelines, in health and environmental risk assessment, and in limit values panels, should be recognized through credit at the academic level. In addition, ethics departments of medical schools should focus on conflict-of-interest policies within the regular curriculum.[28]

Finally, increased sensitivity of health professionals and the public with respect to possible conflicting interests, and a more critical evaluation of medical and environmental health information must be required with the application of ethics and sound professional practices. These efforts will better ensure the reduction of the weight of junk science in health decisions affecting society.

Disclaimer Statements

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