

## Public Health Association of Australia: Policy-at-a-glance – Public Health Impacts of Nanotechnology Policy

- Key message:**
1. Nanotechnology is currently used widely in manufacture and the consumer market.
  2. Within the body they cross cell membranes and the blood brain barrier. This give them potential as novel medicine delivery agents.
  3. Where nanoparticles are not fixed, there is concern that free nanoparticles could be inhaled, ingested or enter the body through the skin.
  4. Evidence is sparse, but beginning to emerge, that there may be health effects from exposure. There are also risks from nanomedicines affecting non-target organs.

**Summary:** Increasingly evidence is indicating that nanotechnology may potentially pose significant health, safety and environmental hazards as well as social, economic and ethical challenges. PHAA will advocate for Federal, State and Territory governments to develop a nanotechnology strategy and regulatory framework to address health and safety concerns.

**Audience:** Federal, State and Territory Governments, regulatory authorities, policy makers and program managers.

**Responsibility:** PHAA's Ecology and Environment Special Interest Group (SIG).

**Date policy adopted:** October 2017

*(Note: this 2017 version will not be updated until further notice)*

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## Public Health Impact of Nanotechnology Policy Statement

### The Public Health Association of Australia notes that:

1. Nanotechnology is a broad term used to cover a variety of technologies that use materials at a 'nano' scale.
2. Its purpose is 'to create materials, devices, and systems with fundamentally new properties and functions due to their small structure'.<sup>1</sup> That is, the 'physico-chemical' properties of nanoparticles may be different from larger particles of the same compound.<sup>2</sup>
3. Nanoparticles occur in nature (generated in bushfires, volcanic activity and atmospheric electrical activity,<sup>3</sup> in clays (e.g. bentonite clay), and as by-products of human activity, including motor vehicle exhaust,<sup>4</sup> and in the manufacture of computer chips, polymers, optical, electronic and magnetic goods, suntan lotions and cosmetics, clothing and antibacterial substances.<sup>5</sup>
4. 'Nanomedicine' could revolutionise health care using nanoparticles that travel between cell walls or can enter the cell itself, replacing contemporary medicines at a comparatively miniscule cost.
5. However, these novel characteristics may also have unforeseen effects if particles come into contact with non-target cells in the human body.<sup>6</sup>
6. The safety risks arise where nanoparticles are not fixed, and may be inhaled, ingested or enter the body through the skin.<sup>5</sup>
7. Harmful and potentially harmful human health effects from nanoparticles have been identified via the following routes of exposure Inhalation, Gastrointestinal absorption, Dermal exposure, Intradermal exposure, Environmental release
8. The National Enabling Technology Strategy (NETS) – Public Awareness and Engagement Program (PACE) started in February 2010 and was stopped in June 2013.<sup>7</sup> Australia now lacks a mechanism with which to communicate reliable and balanced nanotechnology information to the public.
9. Nanotechnology product use is widespread although not actually quantifiable.<sup>8</sup> The rapid commercialisation of nanotechnology over the past two decades has left regulatory agencies without:
  - a. The means to assess the potential toxicity of different nanotechnology materials
  - b. A surveillance system to oversee the use of nanotechnology in consumer products
  - c. A surveillance system to monitor potential impacts on people as use of nanotechnology enhanced products become more common

- d. Baseline information nor a substantial body of research that explores the potential downstream effects of nanotechnology.
10. A crucial gap in Australia’s nanotechnology regulatory framework was first documented in 2007.<sup>9</sup> Despite this, some agencies are contributing what they can.<sup>10-12</sup>
11. To date research has concentrated too much on commercialisation of nanotechnology, with insufficient effort being placed into determining health and safety issues.

**The Public Health Association of Australia affirms the following principles:**

12. Applying the precautionary principle means the burden of proof for potentially harmful actions by industry or government rests on the assurance of safety and that when there are threats of serious damage, scientific uncertainty must be resolved in favour of prevention.<sup>13</sup> Since nanotechnology potentially poses significant health, safety and environmental hazards, the PHAA advocates a precautionary approach.

**The Public Health Association of Australia believes that the following steps should be undertaken:**

13. The Commonwealth, State and Territory governments develop a nanotechnology strategy and regulatory framework that:
- a. Is guided by the above principle
  - b. Provides for uniformity of approach across medicines and medicinal products, food additives, contaminants and natural toxins, agricultural and veterinary chemicals, industrial chemicals and occupational health and safety regulation.
  - c. Promulgates mandatory regulation immediately (as current legislation provides inadequate oversight. A regulatory system must be an integral aspect of the development of nanotechnologies).
  - d. Classifies nanomaterials as new substances for assessment and regulatory purposes, because of their novel properties and the associated risks.
  - e. Institutes occupational health and safety oversight to prevent known and potential exposures.
  - f. Prioritise research on occupational health and safety issues as a condition of Government funding for research in nanotechnologies.
  - g. Undertakes full lifecycle assessments of health, safety and environmental issues prior to further commercialisation of nanotechnologies. Government funding of health, safety and

environmental research must be increased significantly and a risk strategy plan for the development/commercialisation of nanotechnologies delineated.

- h. Enables transparency in decision-making in regard to nanotechnology, including the labelling of all consumer products that contain nanomaterials, workplace right to know laws, protective measures, and public accessibility to health and safety information.
- i. Enhances meaningful participation in the decision-making process around social impact, ethical assessments, equity, justice and individual community preference to guide the allocation of public policy development.
- j. Enshrines manufacturer liability in the regulatory system ensuring all who develop and market nano-products are held accountable for liabilities incurred from their products.

**The Public Health Association of Australia resolves to undertake the following actions:**

- 14. Advocate for the re-establishment of a national NETS-PACE like program to address health and safety, social and economic, workplace safety, ethical and regulatory concerns.
- 15. Advocate to address safety concerns in all areas of public health work in collaboration with relevant NGOs and NanoSafe Australia.
- 16. Continue to communicate concerns about the use of nanomaterials to all relevant health, environmental, agricultural, occupational health and safety agencies and all chemical regulatory authorities, at all levels, seeking a commitment to the recommendations and the principles outlined above.

**ADOPTED 2007, REVISED AND RE-ENDORSED IN 2011, 2014 and 2017**

***First adopted at the 2007 Annual General Meeting of the Public Health Association of Australia. The latest revision has been undertaken as part of the 2017 policy review process.***

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