
Editorial

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The special issue on nanotechnology and social cohesion explores how new technologies may have significant impacts on the social cohesiveness of different kinds of communities. Social cohesion is described as the ‘features of social organisation such as networks, norms and social trust that facilitate coordination and cooperation for mutual benefit’ [1]. In other words, social cohesion is the connections that bring people together in society, particularly in the context of cultural diversity. One British government report identified five different dimensions of social cohesion:

- 1 material conditions (employment, income, health, education and housing)
- 2 passive relationships (social order and safety)
- 3 active relationships (information sharing and trust between individuals and communities)
- 4 inclusion (integration of individuals in mainstream institutions)
- 5 equality (equitable distributions of opportunities and material goods such as income, health or quality of life).

Thus, social cohesion is a multifaceted idea covering many different kinds of social phenomena in which nanotechnology’s predicted innovation may impact. The manuscripts within the special issue analyse nanotechnology’s potential impacts to the various dimensions of social cohesion.

To avoid negative impacts to social cohesion from nanotechnology development it is important to understand how nanotechnology is affecting the ‘enterprise of science’ in universities, industry and government. Additionally, what role do individuals and civil society play in the acceptance and discourse over nanotechnology? The papers by Vinck and Arnaldi discuss the dimensions of passive/active relationships, inclusiveness and equity by analysing two different, recent examples. Vinck reviews the impacts on social cohesion from the ‘enterprise of science’ carried out by a major nanoscience and technology cluster in Grenoble, France. Similarly, Arnaldi analysed the Italian daily press coverage of selected nanotechnology applications with media discourse that assigns an almost exclusive social mandate for development of nanotechnologies to scientists and to a lesser extent decision-makers who have a supporting role. Both examples as recent case studies reveal that there is little room for public discourse or public involvement in nanotechnology R&D activities and science policy development of nanotechnology; this can lead to direct impacts on social cohesion with decreased acceptance of nanotechnology and loss of trust by the public. The paper by Wolbring argues that the

impacts on social cohesion by nanotechnology development, related to the development of nanotechnology in key areas (especially the NBICS nano-bio-info-cogno-synbio) will suffer similar negative effects due to ethical and equity concerns. Effects on social cohesion will become more pronounced, he anticipates, due to the increased speed of the innovation cycle if the very discourse pertaining to nanotechnology is not radically changed.

Beyond its technocratic development nanotechnology applications will continue to become more pervasive in society through consumer goods, medical applications and industrial processing. How will the incorporation of nanotechnology impact communities affect global trade and distort international stability? The paper by Darshan discusses the dimension of material conditions (health impacts) by analysis of recent trends in medical nanotechnology, while Burnett discusses material conditions focusing on nano-patents and importance of social capital. The paper by Tyshenko extends this discussion of material conditions to include sustainability and considers nanotechnology's impact on other social cohesion dimensions of inclusiveness and equity.

In their paper, Bowman and Hodge remind us that, due to the diversity of interests involved and the economic reality associated with the commercialisation of nanotechnologies, achieving cohesion on regulatory policy will be a difficult task – even when civil society organisations play a pivotal role. However, some societal disharmony is bound to exist over regulatory matters, but may be minimised through active participation and dialogue and through efforts to build trust within and across sectoral boundaries through inclusive policy and regulatory processes. The paper by Tyshenko et al. explores how a precautionary approach may be overlaid on nanotechnology's four stages of development for improved management of nanotechnology risks. Not only does the application of a cautious approach allow for preemptive management of increasingly complex 'next generation' nanotechnology applications it also provides a 'space' for public engagement and discourse surrounding the impacts on social cohesion. Concerns over individual exposure risks, ethical use of technology, occupational health risks, equity of shared benefits and risks, fate of nanoparticles in the environment (stewardship) and impacts on social capital will all affect public acceptability of different nanotechnology applications. The final paper by Könninger et al. provides insights into public reaction to nanotechnology in society.

Nanotechnology's benefits are predicted to be revolutionary while the risks to social cohesion remain poorly quantified. From the collection of papers in this special issue it is apparent that nanotechnology's increasing pervasiveness with applications across multiple sectors warrants increased public discourse. Potential risks from nanotechnology to social cohesion's five dimensions may never come to pass; however, allowing transparent, inclusive public discourse of issues beyond the basic science will greatly help towards maintaining public trust, acceptance and social cohesion.

References

- 1 Putnam, R.D. (1995) 'Bowling alone: America's declining social capital', *Journal of Democracy*, Vol. 6, No. 1, pp.65–78.