



## **Understanding the Debate:**

*A Critical Look at Reasons For and Against More Regulation in Nanotechnology*

**The Nanoethics Group**

[www.nanoethics.org](http://www.nanoethics.org)

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# [ Agenda ]

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- About us
- Why ethics in this debate?
- Explaining the “stricter law” argument
- Is the “stricter law” argument even plausible?
- Evaluating five (5) main objections to the argument
- Other considerations and conclusions

# [ About us ]

- Our mission:

*To bring balance to the study of nanotechnology's impact on ethics and society*

- Established in 2003
- We're educators
- We're also professional ethicists
- We're not activists, advocates or watchdogs
- Non-partisan group

# **[ Current projects ]**

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- Collaborative research globally
- Publishing – media and academic
- Speaking engagements
- Consulting work
- Other research projects

# [ *Why ethics in this debate?* ]

- There is a stalemate between science and policy:
  - (1) Research that shows at least some nanomaterials may be harmful to environmental, health and safety (EHS) interests; versus
  - (2) Opposing groups
    - Either objections to findings itself, or that the limited findings should not be extrapolated to guide broad policy
- Research cannot show that all nanomaterials are not harmful anyway (i.e., prove a negative)
  - And has yet to convincingly disprove research in (1) above
- Nanoethics re-frames the debate at a more basic, foundational level
  - Examines underlying principles

# [ The “stricter law” argument ]

- Some evidence that some engineered nanomaterials may be harmful to EHS interests
  - Carbon nanotubes have been compared to asbestos
  - How persistent are these super-strong materials in, e.g., our landfills?
  - Research shows nanoparticles can cause brain damage in fish
  - Can slip through air/water filters; slip through cells and into our food chain
- Current laws<sup>†</sup> may be inadequate against EHS risks from nano
  - Relevant laws were formulated decades ago, before “nanotech”
  - Based on available facts/circumstances of the time and foreseeable future, so could be incomplete, inadequate or evolving

<sup>†</sup> We use “laws” in this presentation, for the sake of convenience, to mean both laws and regulations; the distinction between the two is not material to this discussion.

# [ *The “stricter law” argument* ]

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(...continued)

- *Seems* to be common-sense to follow the Precautionary Principle
  - If an action might lead to an unacceptable consequence, then we should refrain from the action until that risk is mitigated
- How to mitigate? By either moratorium or updating laws (making them stricter)
  - Moratorium could be an over-reaction; therefore, updated (stricter) laws are the lesser of the two evils

# [ *Plausible or paranoid?* ]

- Are we over-worrying that existing laws are inadequate?
- No conspiracy needed for the “stricter law” argument to be plausible
  - Political haggling and corporate influence are part of the process; may result in insufficient protections
- History has shown that EHS laws are fallible
  - Distant past: asbestos, DDT, lead paint, PCB (Styrofoam), etc.
  - Today: PFOA (key Teflon chemical), PC manufacturing...and maybe mobile phones?
- At best, we can say we are uncertain whether current EHS laws are enough; at worst, they are not
  - Therefore, we should be open to considering updating laws, though that makes them stricter

# [ *Objections to the argument* ]

In the order of weakest to strongest...

1. *Ordinary Material Objection*: Nanomaterials are not any more harmful than other materials, so they need no special regulations
2. *Status Quo Objection*: Current regulations are enough to safeguard the public from these harms
3. *Precautionary Principle (PP) Objection*: The Precautionary Principle should not apply here, so the entire argument that rests on it is flawed
4. *Self-Regulation Objection*: Self-regulation, not more governmental regulation, is the answer
5. *Other Harms Objection*: Stricter regulation would stunt the growth of a nascent nanotechnology industry

# [ 1: Ordinary Materials objection ]

- Nanomaterials are essentially the same kinds of substances we've been using for decades and longer
  - Just smaller or different molecular arrangements
  - Many natural nanoparticles that are harmless

## ***Analysis***

- Concern is about *engineered* nanoparticles whose effects are still unknown
- Size matters: *e.g.*, aluminum powder can explode when in contact with air; nanoparticles can slip past filters and testing methods
- Arrangement matters: *e.g.*, carbon can become pencil lead or diamond
- Can't have your cake and eat it too – the allure of nanotech in the first place is that materials have unique, extraordinary and unpredictable properties

## [ 2: Status Quo objection ]

- Where's the “nano-victim”?
  - Current laws have served us reasonably well over the years
  - No definitive proof that nanomaterials are actually harmful in consumer products or their manufacturing
  - Therefore, it's premature to impose stricter laws

### **Analysis**

- See previous discussion re: asbestos, DDT, Teflon, *et al.*
- Even if current laws are adequate, nanotechnology is still evolving; we should be open to evolving its governance too
  - Is it unreasonable to think that as the world continues to change all around us, our policies/laws should remain static?
- May take years to identify a victim, as with previous harmful materials

## [ 3: PP objection ]

- The Precautionary Principle is too conservative a guideline
  - Risk-aversion is not the only life/business strategy
  - America was built on the backs of risk-takers
  - While nanotech may have risks, it also holds great promise – we could lose this unique opportunity to take the lead

### ***Analysis***

- Appeals to powerful emotions of national pride and adventure
- America's pioneers consented to risks; nano-product consumers and manufacturing workers have not
- Again, ignores the rights of others who have not given consent – and cannot infer full consent from mere participation in democratic process
- If stakes are high enough, minimizing risk seems to be a sensible guideline...but what exactly are the stakes?

## [ 4: Self-Regulation objection ]

- Industry self-regulation is another option to moratorium or more laws
  - Smaller government footprint on business and individual lives
  - Nano-industry knows its field better than lawmakers and has a real stake
  - Self-reg fosters a sense of responsibility within the industry
  - Other professional codes of ethics show that this can work

### ***Analysis***

- Does this let the fox guard the hen house, *i.e.*, conflict of interest or paradox?
- Easier to sidestep self-imposed regulations (Prisoners' Dilemma)
- Political haggling still occurs within industry coalitions
- No clearly defined nanotech “industry”
- ***Does not dispute soundness of stricter-law argument***

## [ 5: Other Harms objection ]

- Unacceptable harms to business/industry
  - Slows progress with longer product-development cycles, more regulatory hurdles
  - Longer time to market and revenue; impact on jobs
  - Other countries (e.g., Japan) are spending more on nano; US needs more support (e.g., easier IP processes), not more hurdles

### ***Analysis***

- Common objection to many proposed laws
- Loss of jobs/revenue by themselves are not necessarily bad, if there are other redeeming effects
- Every meaningful proposal has its trade-offs; difficult to weigh
- Ignores concept of rights (e.g., to not be unjustifiably harmed)
- ***Also does not dispute the soundness of the stricter-law argument...and is inconsistent with Self-Regulation objection***

# [ Other considerations ]

- What exactly are the stakes?
- What if we extended the time-horizon and scope in the Other Harms objection?
  - Competitive disadvantage with other nations
  - Military implications
  - Nanotech may *reverse* EHS risks
- Does risk-aversion still make sense given these other benefits/harms?
- *Why don't we see this kind of argument more?*
  - Requires making mid/far-term speculations about nanotech...which also opens the door for other ethical/societal concerns
  - Forces the unpleasant question of: what are the limits to our right not to be unjustifiably harmed?

# [ *And more considerations* ]

- Formidable, pragmatic challenges to enacting stricter laws
- Is the problem with current laws...or current EHS measures and testing methods?
  - That is, *why* are current laws not enough?
  - Is it a knee-jerk reaction to propose new laws as the solution, esp. in America where we litigate our problems?

# [ Conclusions ]

- The “stricter law” argument seems defensible
- But there’s understandably fierce resistance to new laws
  - Legislative inertia
  - Business interests
  - The “bigger picture” of possible benefits lost
  - Philosophical objection to more laws in general
- An interim or compromise solution may be needed until a “real victim” is identified to warrant new laws
  - Self-regulation may be better than nothing; it has worked before
  - Can also accelerate efforts/funding in EHS testing and other measures (e.g., creating air/water filters than catch nano-sized particles)
- But we should also be prepared to quickly implement new regulations if needed
  - ***What is our “Plan B” if, e.g., a real victim is produced?***

***Thank you!***

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**Slides available at:** [www.nanoethics.org/slides.pdf](http://www.nanoethics.org/slides.pdf)