

# Singapore NanoSafety Report

# Outline

1. Safety concerns in Nanotechnology
2. Regulations around the world
3. Online resources
4. A survey of management of safety
5. Summary

# Safety concerns in Nanotechnology

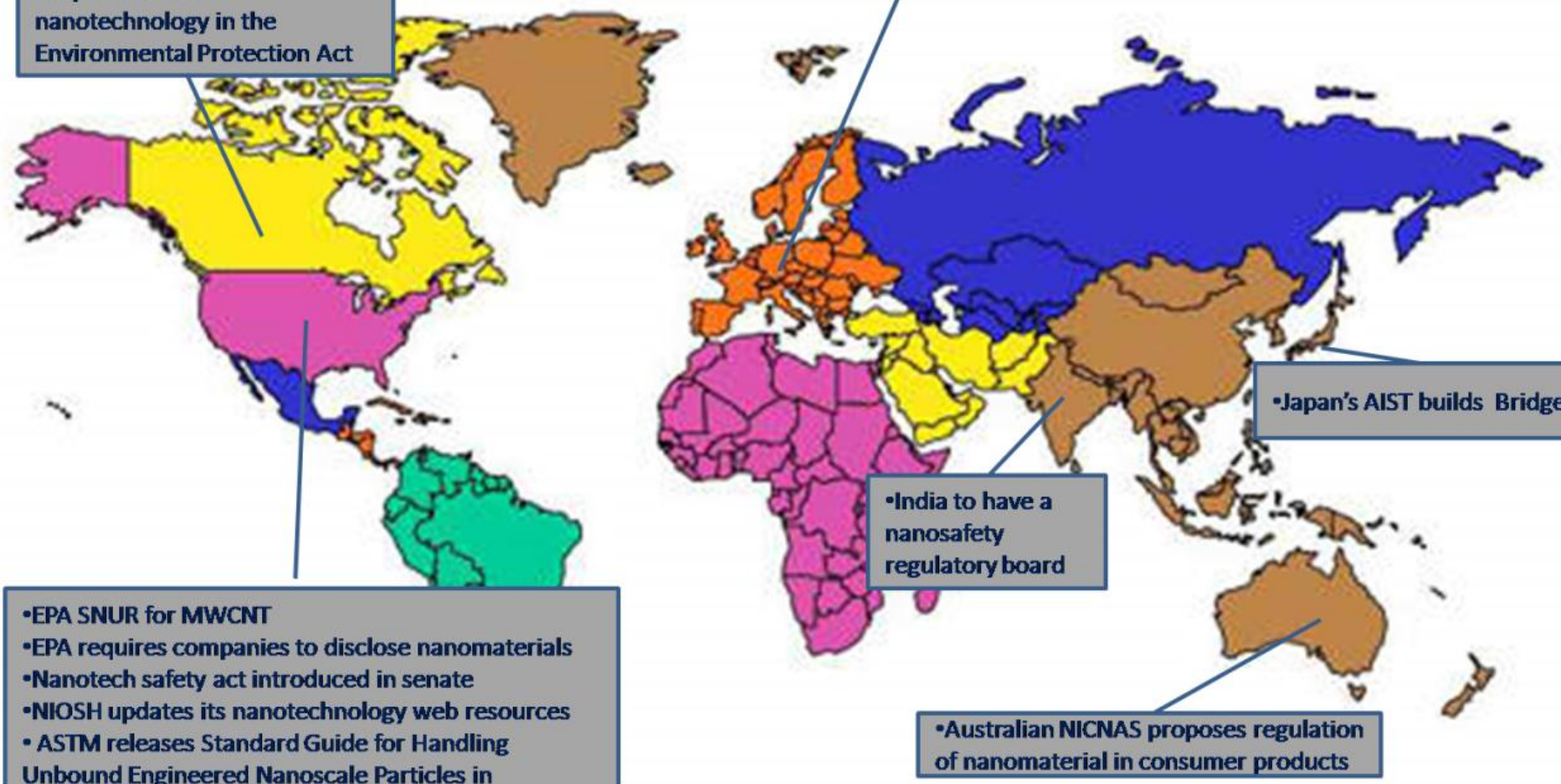
- $\text{TiO}_2$ ,  $\text{ZnO}_2$ , and nano-silver have been used in cosmetics for a long time
- Growing evidence of nanomaterial toxicity in human cells
- Nanomaterials ingested by animals move up the food chain
- Undefined nano-safety regulations introduces uncertainty, and impede business investments

# Regulations around the world

- U.S. proposed a Nanotechnology Safety Act 2010 bill (Jan 2010)
- Canada proposed to include nanotechnology in the Canadian Environmental Protection Act (Mar 2010)
- EU included nanomaterials in their REACH Regulation (Jun 2009)
- OECD set up a working group to establish safety procedures for nanomaterials (Sep 2006)
- ISO technical committee recommends safety practices relevant to nanotechnologies (ISO/TR: 12885:2008)

- SAFENANO to lead advice on the assessment of nanomaterials under REACH
- ENHRS completes health and environmental safety nanomaterials
- RUSNANO-Takes MoU on nanosafety and standardization.
- UK FSA approved compilation of food industry research into nanotech
- Germany's BAuA publishes report on characterisation of ultrafine particles for workers protection

Proposal to include nanotechnology in the Environmental Protection Act



- EPA SNUR for MWCNT
- EPA requires companies to disclose nanomaterials
- Nanotech safety act introduced in senate
- NIOSH updates its nanotechnology web resources
- ASTM releases Standard Guide for Handling Unbound Engineered Nanoscale Particles in Occupational Settings

•Japan's AIST builds Bridge

•India to have a nanosafety regulatory board

•Australian NICNAS proposes regulation of nanomaterial in consumer products

- OECD releases report on current/planned activities related to the safety of manufactured nanomaterials
- TITNT launched

# Online resources

- [GoodNanoGuide \(goodnanoguide.org\)](http://goodnanoguide.org)
- [NanoCEO \(nanoceo.net\)](http://nanoceo.net)
- [Integrated Nano-Science & Commodity Exchange \(incx.com\)](http://incx.com)
- [AssuredNano \(assurednano.eu\)](http://assurednano.eu)

# In Summary...

**Currently nano-specific standards in most countries are in draft form**

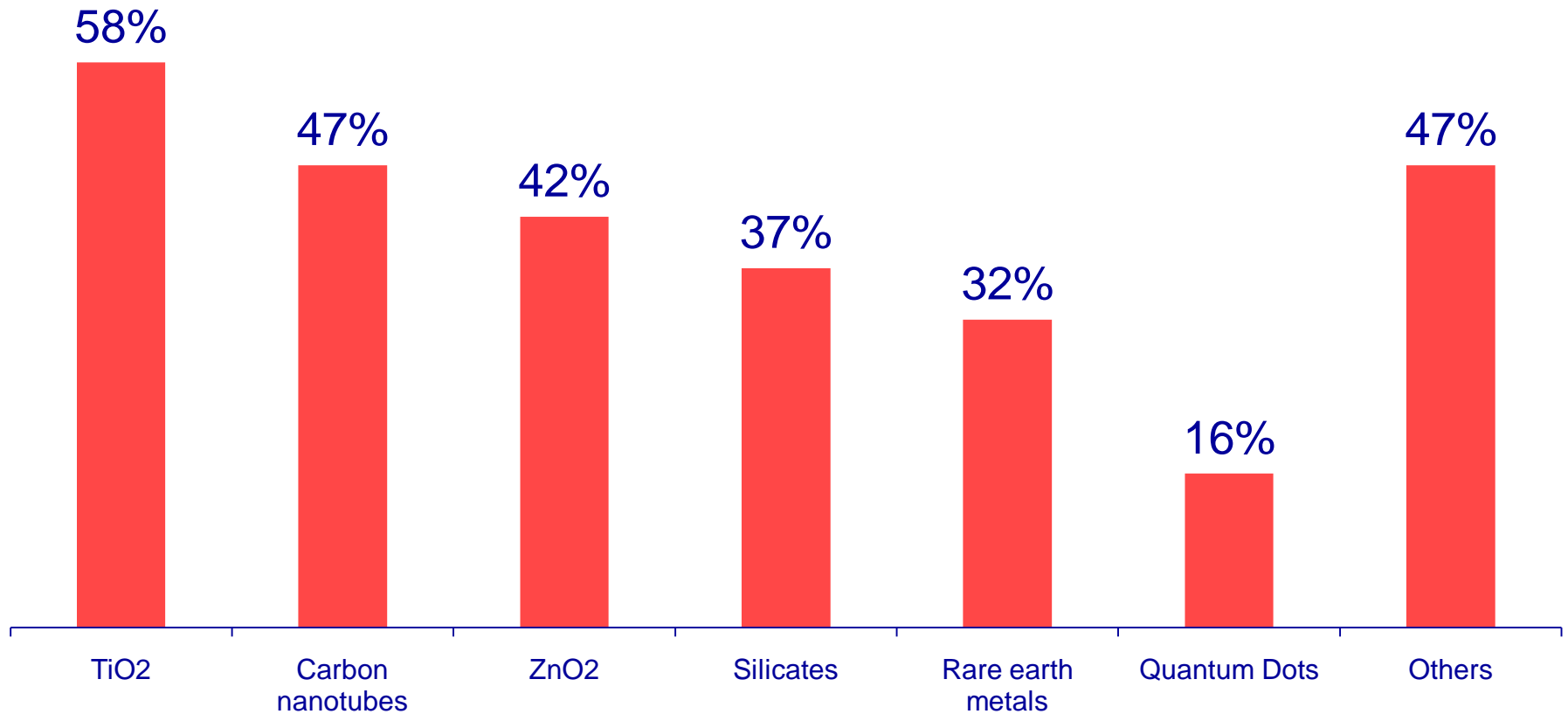
# Singapore NanoSafety Survey

- Jointly commissioned by Ministry of Manpower and Singapore Economic Development Board and administered by NanoConsulting
- Objective
  - To gather information on the profile of usage of nanomaterials and current occupational safety and health practices in establishments handling nanomaterials in Singapore.

# Results of the Singapore NanoSafety Survey

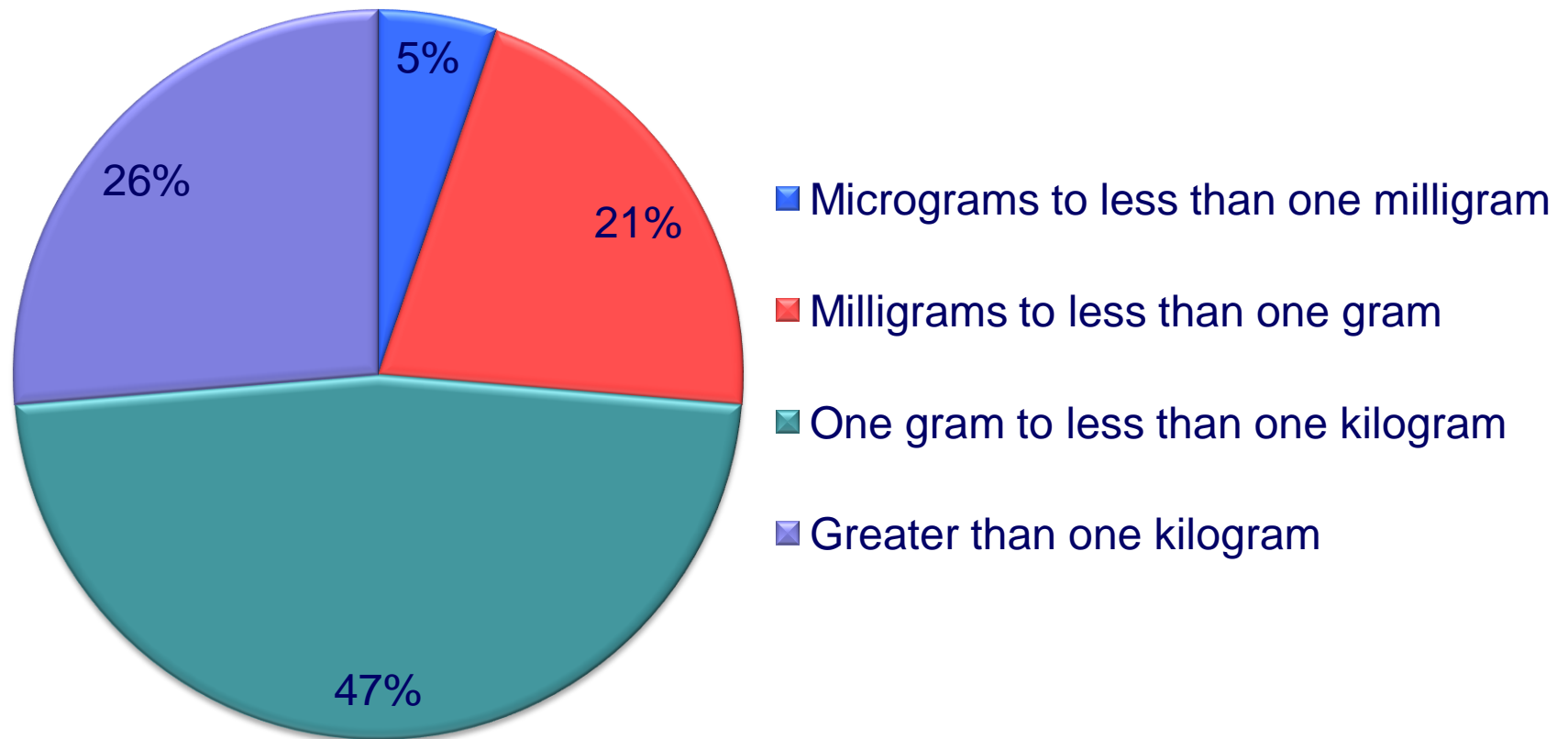
# Management of Nanomaterials Survey

Different types of nanomaterials used



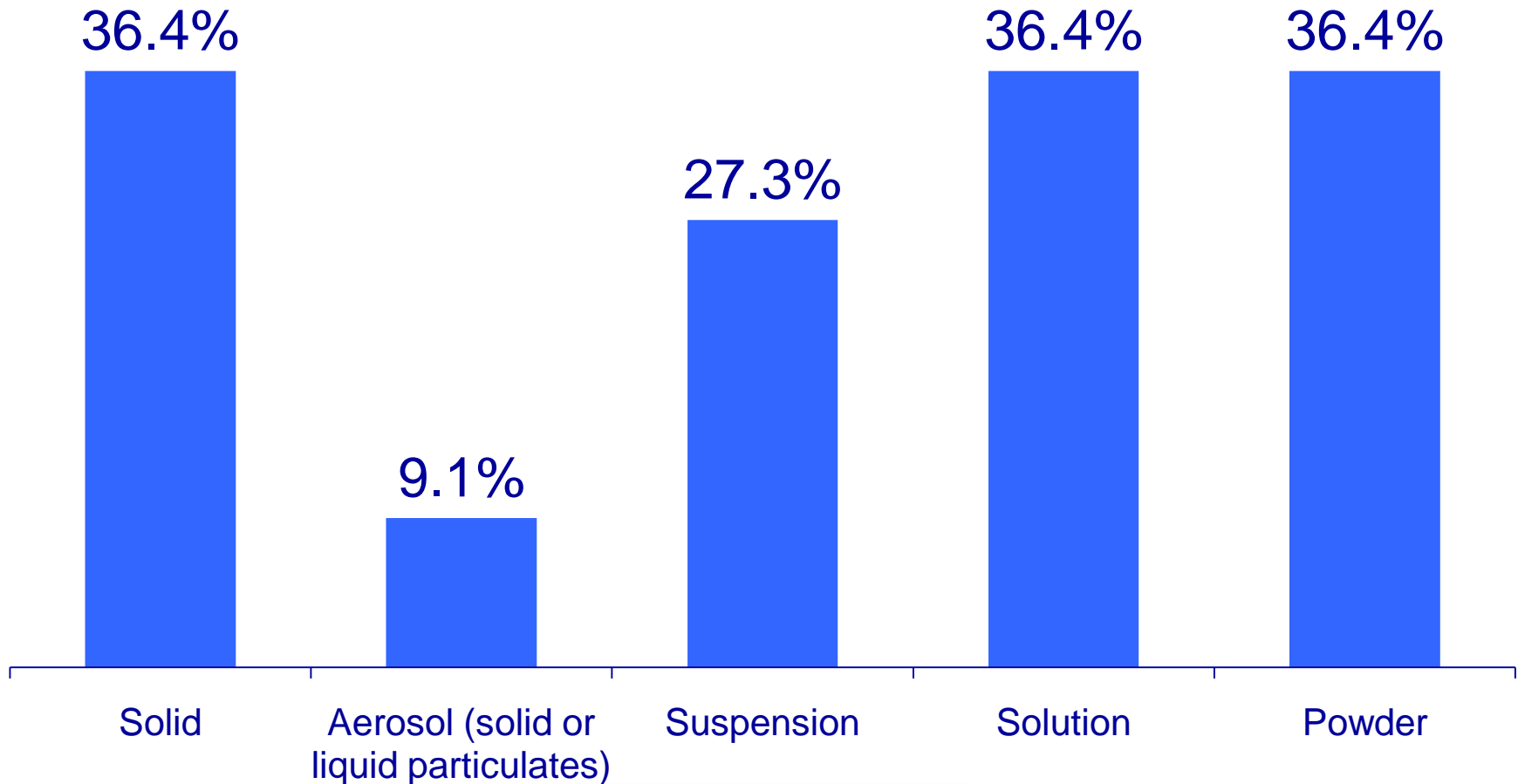
# Management of Nanomaterials Survey

Amounts of nanomaterials that employees typically work with at a time



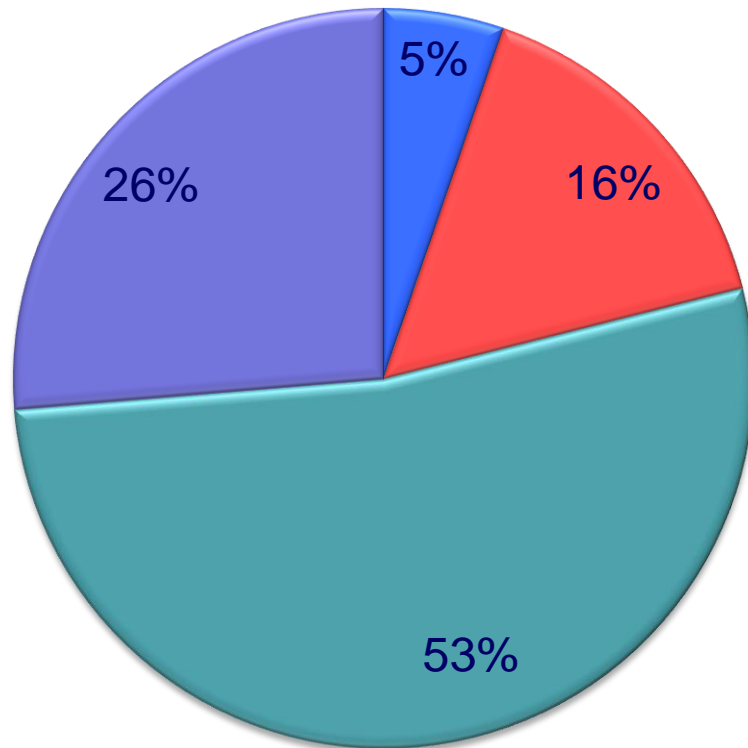
# Management of Nanomaterials Survey

## Physical forms of nanomaterials used



# Management of Nanomaterials Survey

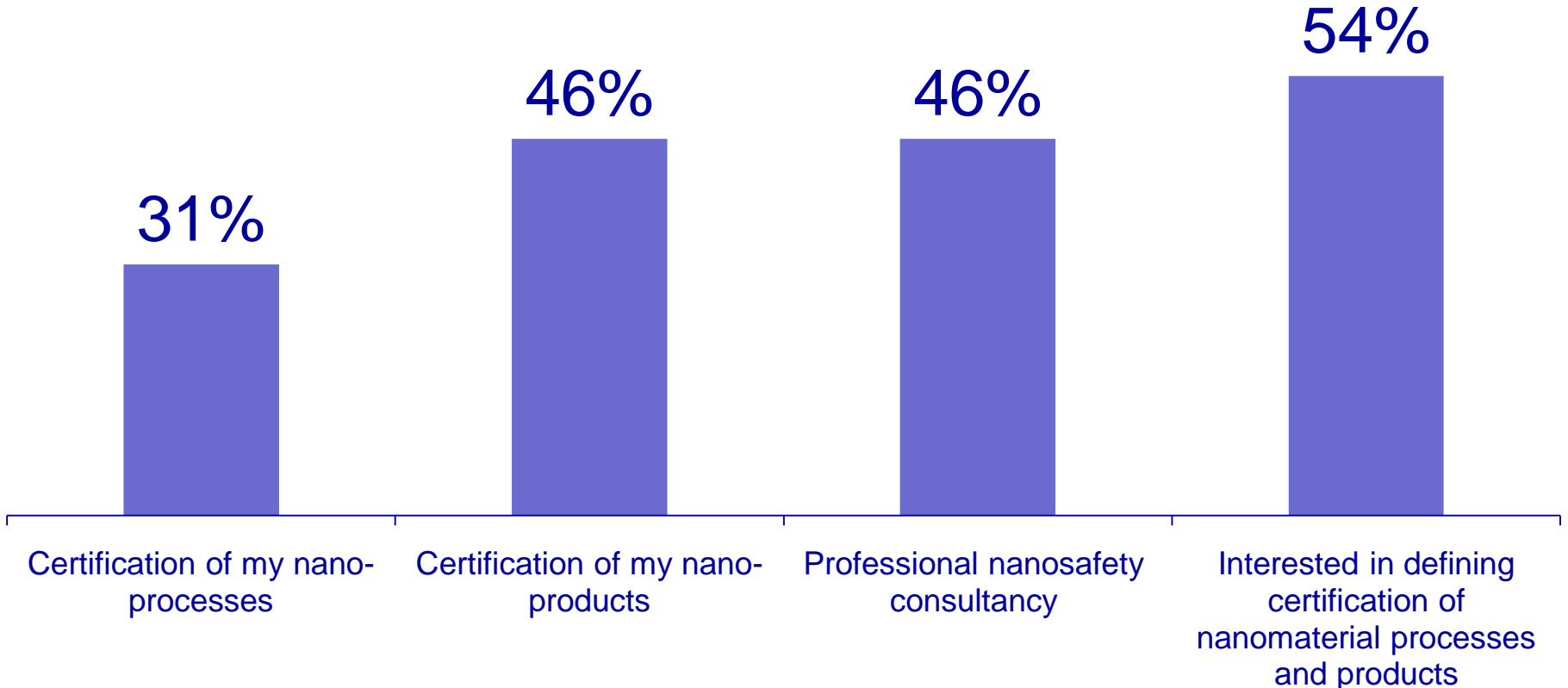
## General attitude towards nano-safety



- It is a topic of no immediate interest to us.
- We know very little about this topic and want to learn more.
- We want help in defining specific nano-safety measures we can implement in our organization.
- We have state-of-the-art nano-safety measures in place

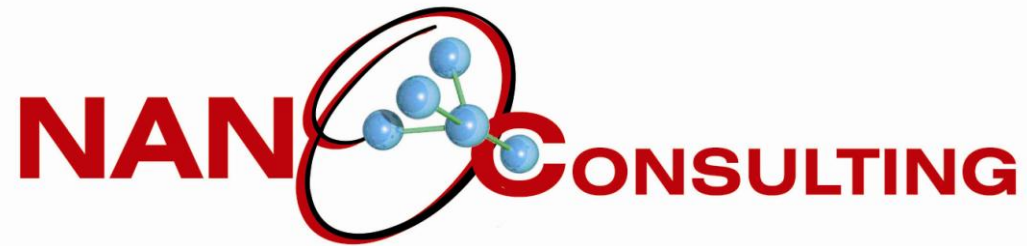
# Management of Nanomaterials Survey

Organizations that believe some form of regulation is beneficial



# Summary

- Multiple forms of nanomaterials used in Singapore
  - Most commonly used nanomaterials are TiO<sub>2</sub>, CNT and ZnO<sub>2</sub>
- Usage of nanomaterials are mostly less than one kilogram.
- Most commonly used Nanomaterials are in solid, powder, solution form
- Organisations in Singapore are generally interested in learning more or need help in defining specific nano-safety measures



For more information

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