

# Reported Practices & Perceived Risks in the Nanomaterials Industry

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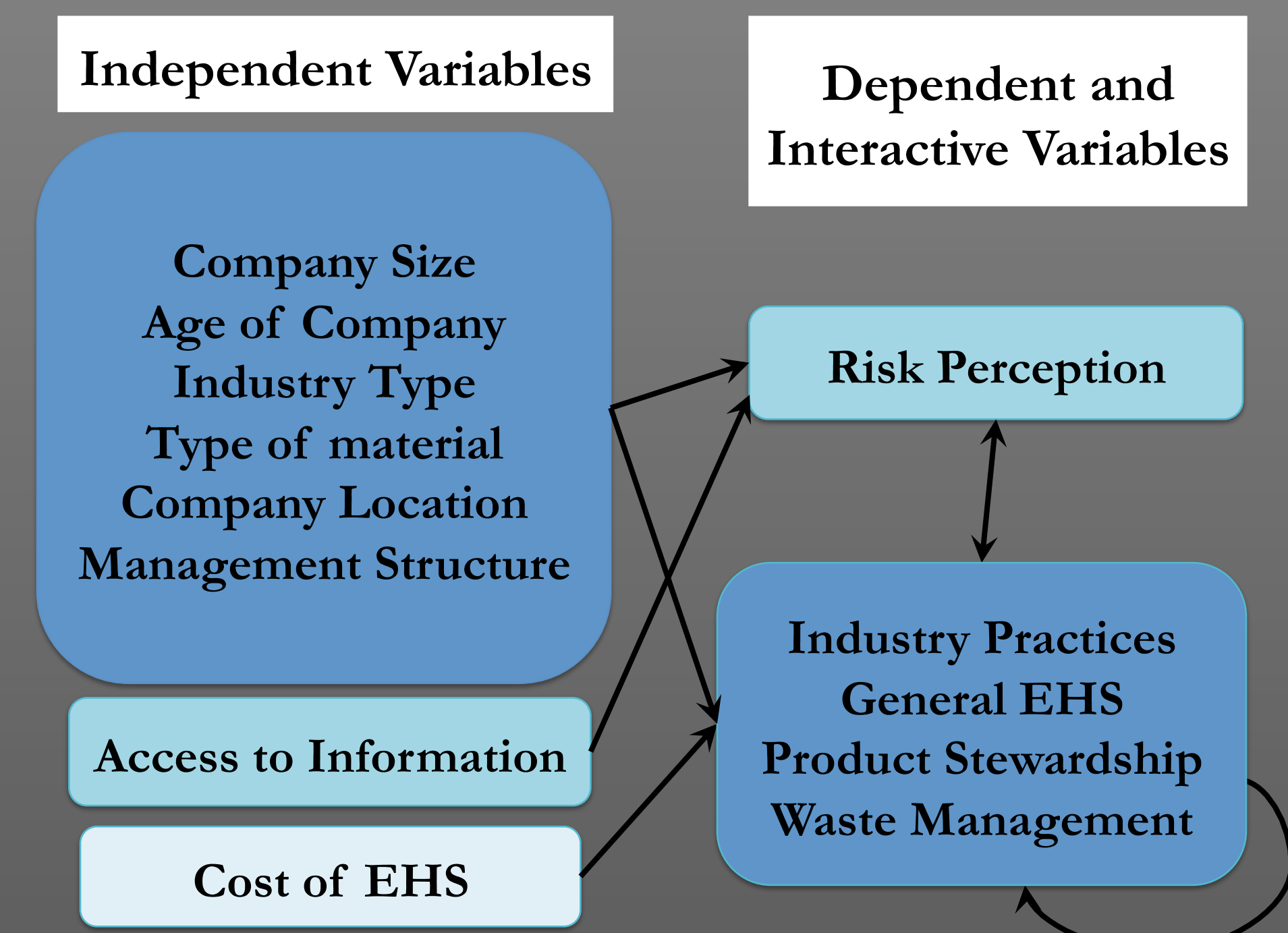
## INTRODUCTION

Motivated by the tremendous growth of the engineered nanomaterials (ENMs) industry, the safety of nanotechnology is garnering significant attention worldwide. Government agencies, industries, and nonprofit groups are in the process of determining which environmental health and safety (EHS) practices will best protect workers, consumers, and the environment. Without sufficient information or regulation, ENM industries may act independently to avoid risk, creating inconsistent methods for protecting worker safety and environmental health.

This project surveyed nanomaterials firms, including industrial producers and users of ENMs, to discover what steps these firms are taking to ensure the safety of workers, customers, the public, and the environment, and to reduce potential risks associated with ENMs. Participants also reported on their company's risk management practices and personal risk perceptions.

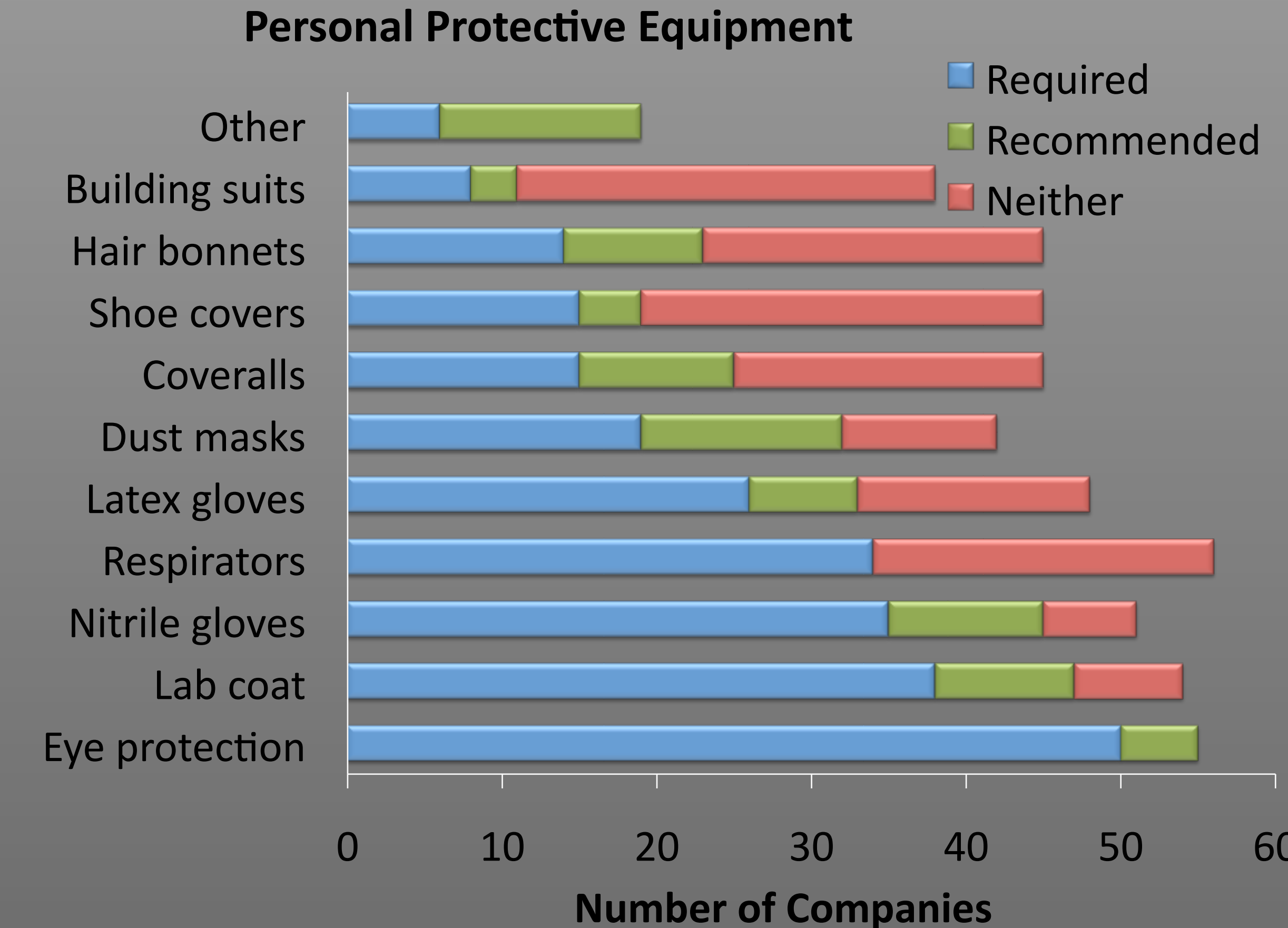
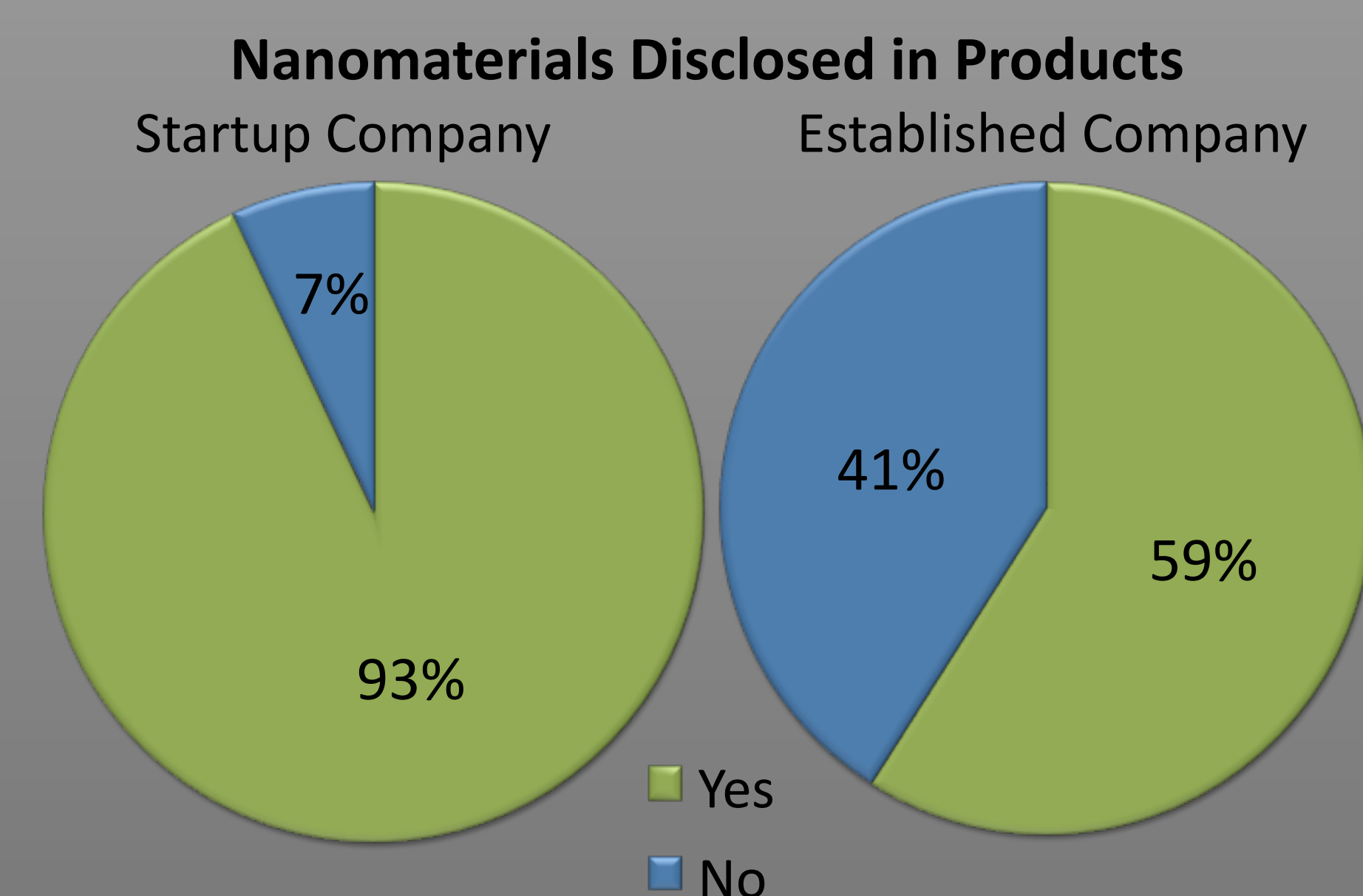
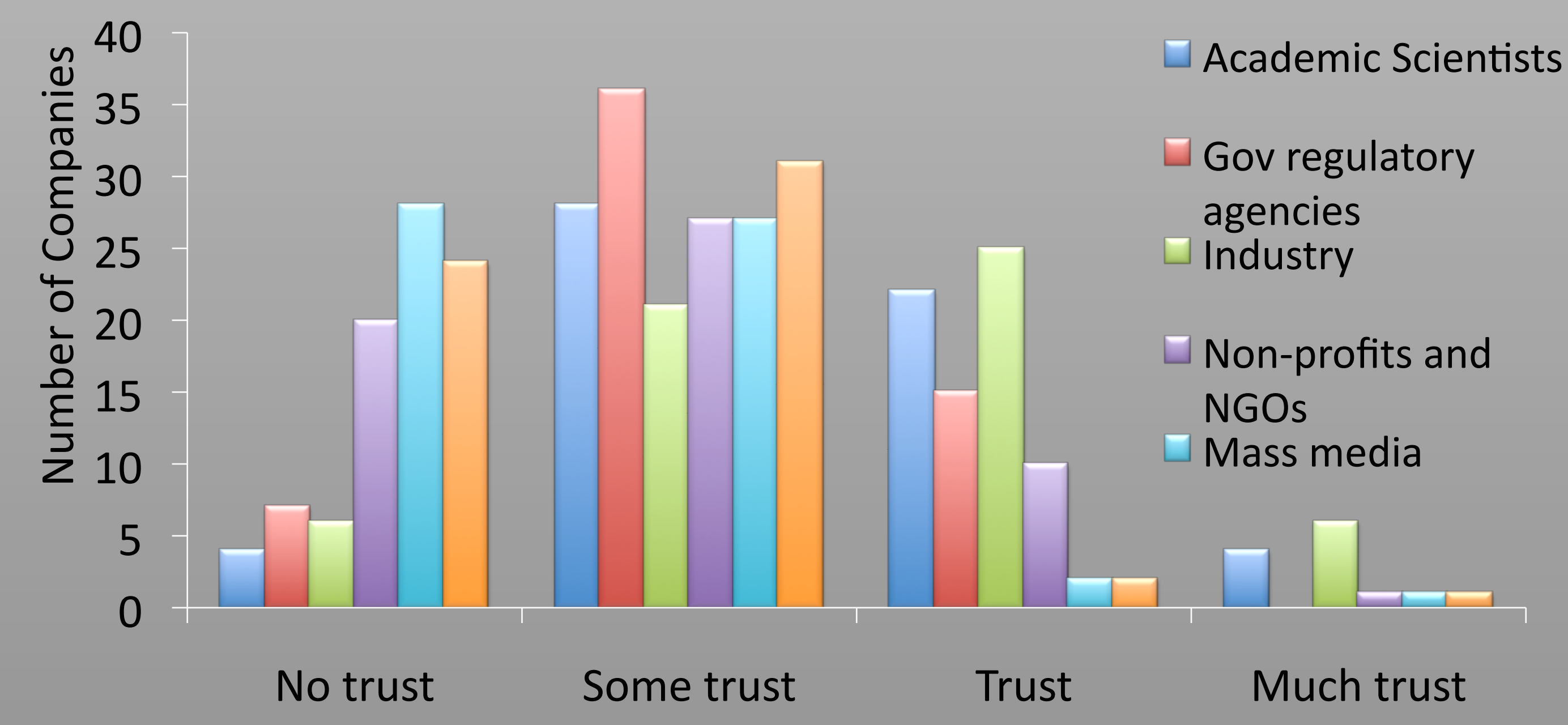
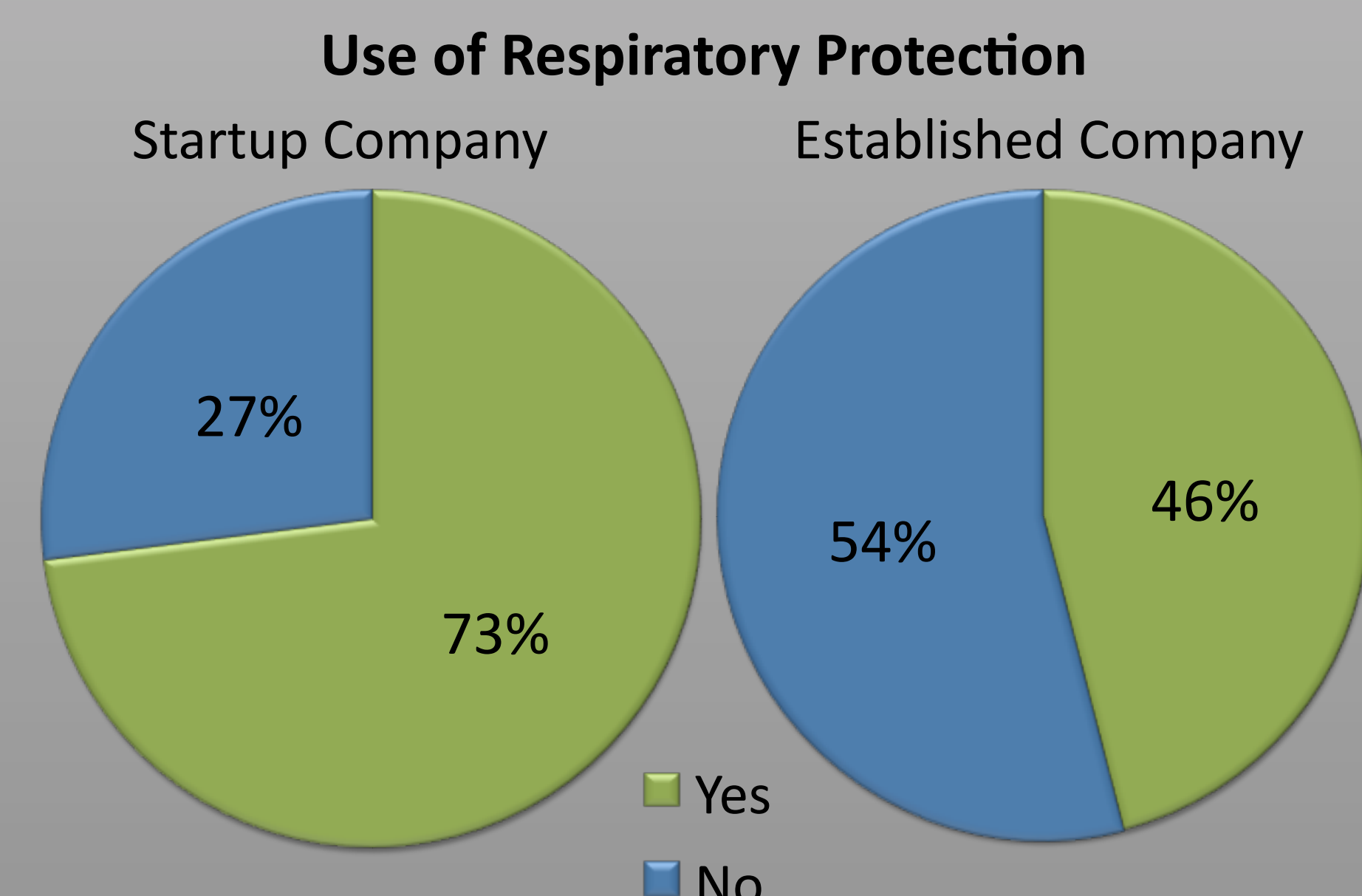
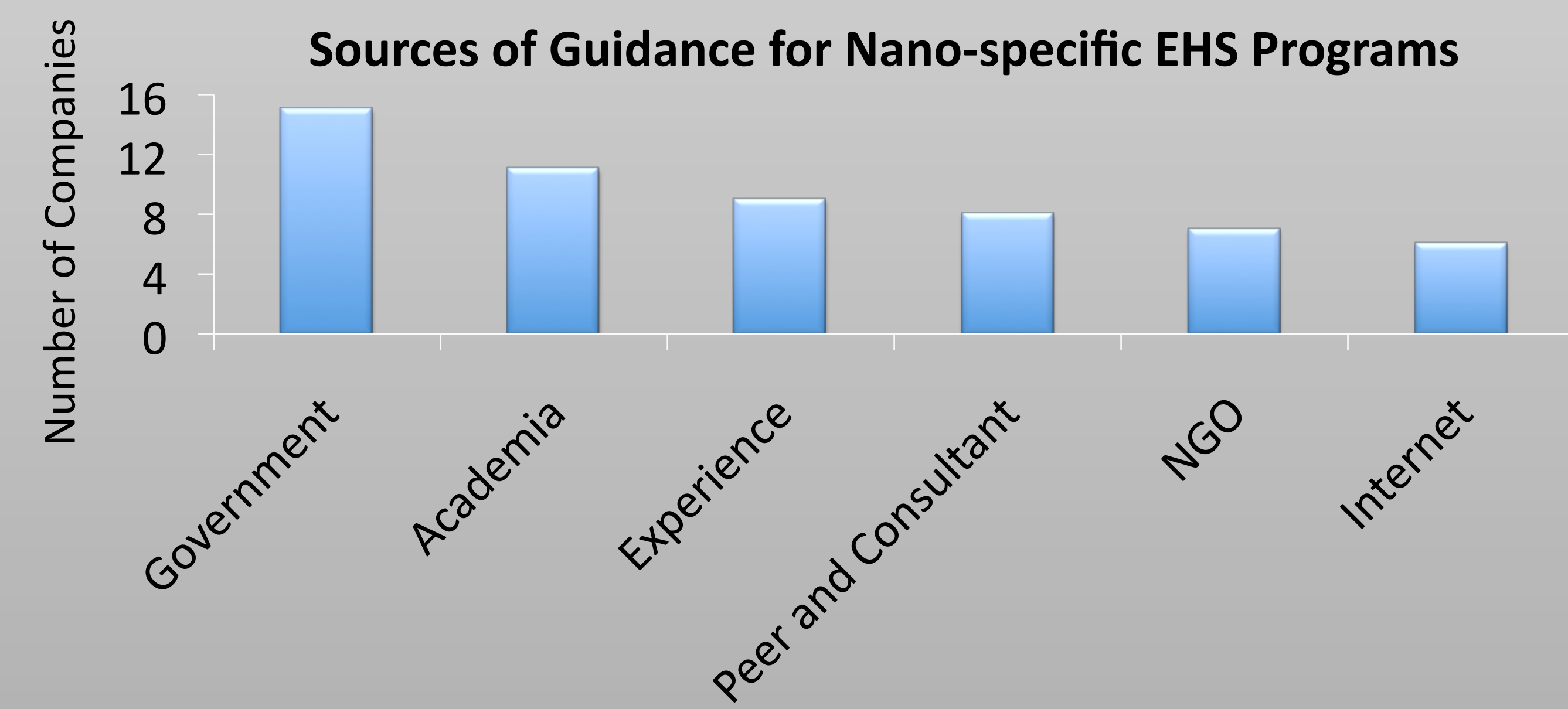
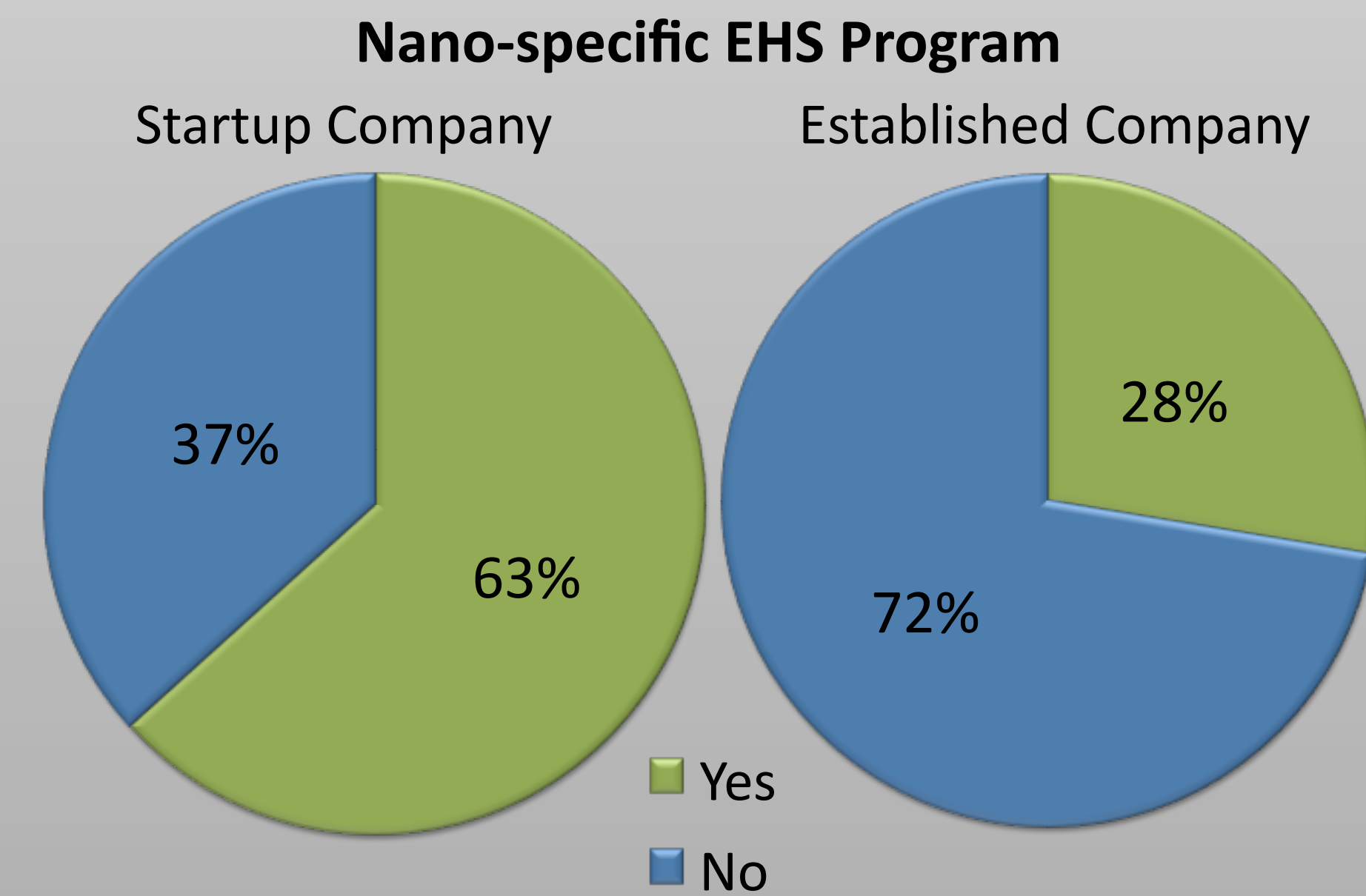
## SURVEY INSTRUMENT

- Revised from a previous study (Conti *et al.*, 2008)
- Sixty-five primarily close-ended questions
- Measured one or more independent or dependent variables (see figure below)
  - Created to guide question creation, and to enable further data analysis following data collection

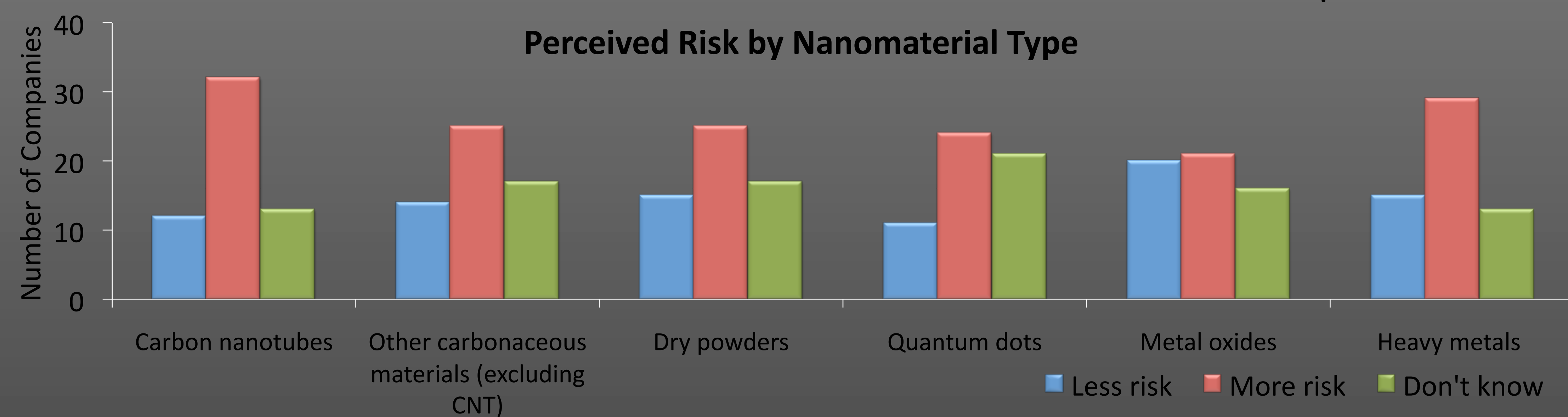


## SURVEY POPULATION

- Exclusive focus on private nanomaterial handling companies
  - Omitted all government, academic, or otherwise public research and production facilities
- Response rate of 13.4% (60 companies surveyed from 449 companies contacted)
  - Twenty-six telephone interviews
  - Thirty-four online surveys



Conti *et al.* (2008) found that 58% of companies reported implementing a nano-specific EHS program. Of the respondents to this survey, only 45% reported a nano-specific EHS program, a decrease of 13%.



## Company Characteristics, n=60

Characteristic	Value	Count
Location	North America	44
	Europe	11
	Asia	5
Age	0 - 9 years	31
	10+ years	29
Number of years handling ENMs	0 - 9 years	40
	10+ years	20
Number of employees	1 - 19	24
	20 - 249	20
	250+	16
Number of employees that work directly with nanomaterials	1 - 6	21
	7 - 30	30
	31+	9

## CONCLUSIONS

- The smaller, younger companies that responded to this survey appear to be more attentive to risks and risk management associated with nanomaterials
- Participants indicated using government and academic guidance to develop nano-specific EHS programs but did not report high trust in government and academia to adequately communicate the benefits of nanotechnology
- Most companies reported using eye protection, lab coats, nitrile gloves, and respirators recommended by guidance documents; however, some companies reported using latex gloves and dust masks which were specifically identified as ineffective protection from some nanomaterials
- Participants perceived carbon nanotubes as a greater risk to human health and the environment than other nanomaterials

Conti, J.A., Killpack, K., Gerritzen, G., Huang, L., Mircheva, M., Delmas, M., Harthorn, B.H., Appelbaum, R.P., & Holden, P.A. (2008). Health and safety practices in the nanomaterials workplace: results from an international survey. *Environmental Science and Technology*, 42, 3155-3162.

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