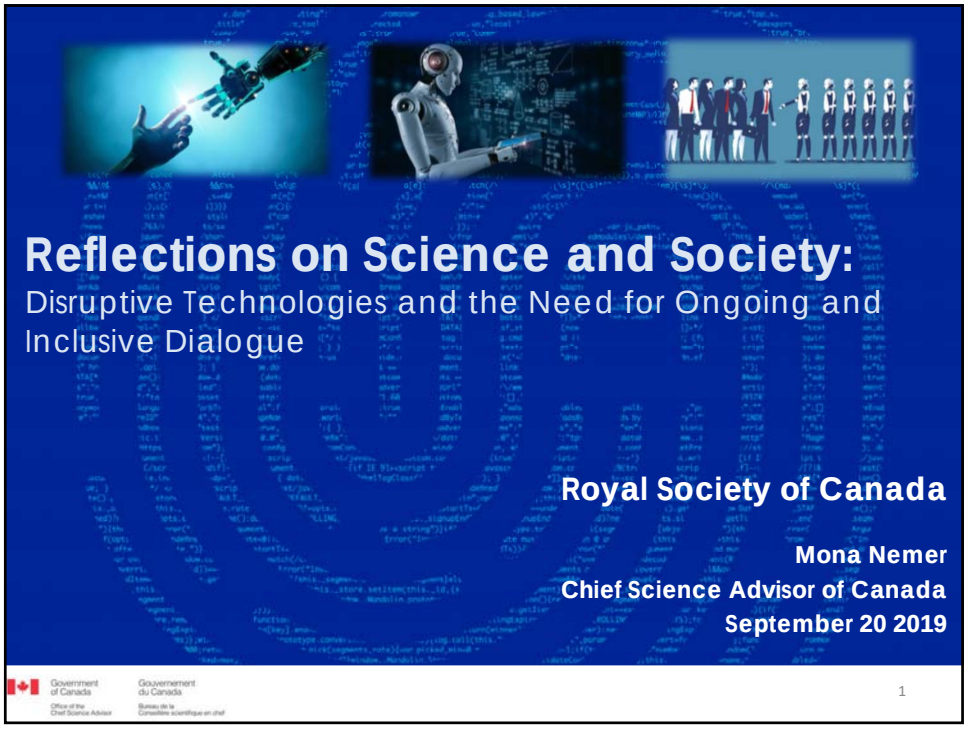
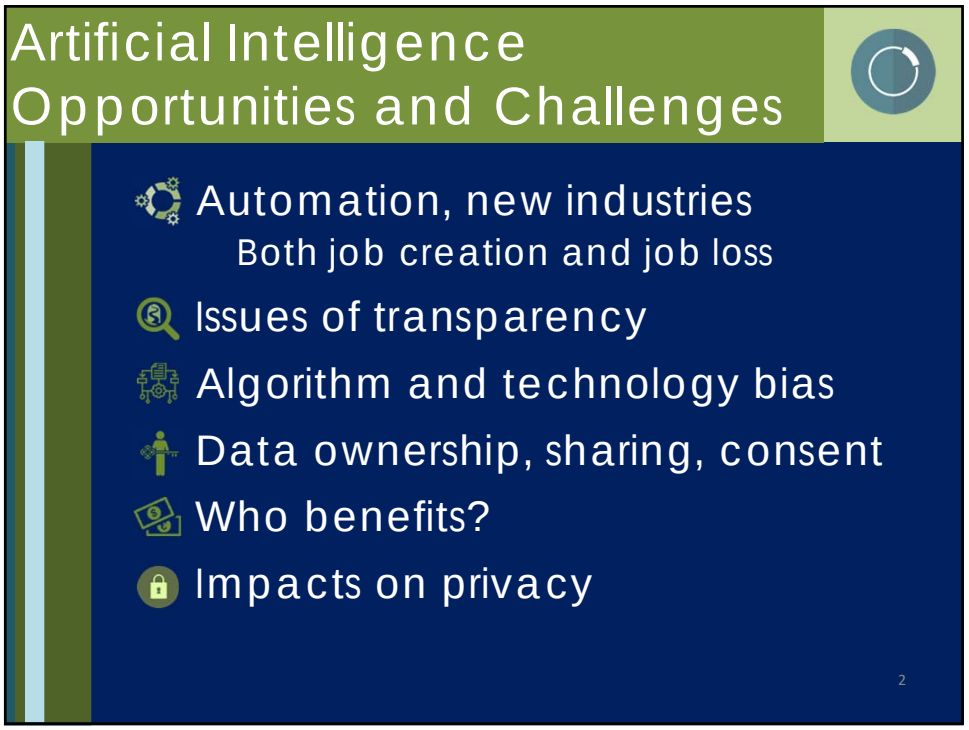

Reflections on Science and Society:
Disruptive Technologies and the Need for Ongoing and Inclusive Dialogue
Royal Society of Canada
Mona Nemer
Chief Science Advisor of Canada
September 20 2019
Government of Canada
Gouvernement du Canada
1


Artificial Intelligence
Opportunities and Challenges
Automation, new industries
Both job creation and job loss
Issues of transparency
Algorithm and technology bias
Data ownership, sharing, consent
Who benefits?
Impacts on privacy
2

Parallels between DNA and AI

As DNA technology evolved, we had to confront multiple issues

Inability to Predict the Unintended Consequences of Change

Autonomy and Privacy

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New Technologies Leading to New Ethical Questions

- 1964 - Herbert Boyer and Stanley Cohen's experiment to edit genes by transferring DNA from one organism to another
- 1974 - Paul Berg's (USA) experiment with recombinant DNA
- 1974 - Concerns regarding public safety led to a scientist-imposed moratorium
- 1975 - Scientists led the Asilomar conference to come to a consensus over best practices
- 1997 - UNESCO established the Universal Declaration on the Human Genome and Human Rights
- 2004 - Canada legislated the Assisted Human Reproduction Act
- 2018 - WHO Advisory committee for the governance of genome editing
- 2019 - NAS-RS commission on human gene editing

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Ownership, Rights and Privacy

Rights to Genetic Data

- Human cell lines were commercialized for years without donor's consent (first noted incident in 1951)
- 2002 -CIHR developed policies on maintaining anonymity of tissue donors
- 2003 - UNESCO published the International Declaration on Human Genetic Data
- 2017 - Canada legislated the Genetic Non-Discrimination Act

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Genetic technologies Lessons learned

- New tech creates new industries that benefit society
  - Insulin
  - Food security (GMO)
  - Reproductive technologies
  - Genetic testing and therapeutics
- What did we learn
  - Developing a framework nationally and internationally
  - How to manage data, privacy, informed consent, defining data and biomaterial ownership
  - Importance of early and sustained dialogue with public
  - International consensus can be reached on acceptable applications BUT legislations are nation-specific
  - Social and cultural norms play big role in regulation of technologies

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Echoes of DNA and Lessons for AI

- Self-regulated codes of conduct
- Domestic legislative agendas
- Harmonized global approach

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The Way Forward

We need:

- Ongoing dialogue between all relevant sectors and disciplines
- Ongoing science communication, involve the public in policy development, maintain trust
- Be proactive, not only reactive
- Stay alert to further developments

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Recent Developments

- EU: General Data Protection Regulation (GDPR) - came into force in May 2018
- Canada has conducted the national consultations on digital and data transformation (June - October 2018)
- Montréal Declaration for Responsible Development of Artificial Intelligence (Dec. 2018)
- Directive on Automated Decision-Making (March 2019) / Algorithmic Impact Assessment
- Data Strategy Roadmap for the Federal Public Service
- Working at modernizing the Canadian Privacy Act

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AI – Canada's International Leadership

AI- recurrent topic at G20/G7

Scale.AI & IA within superclusters

OECD Principles on AI

Creation of **Global partnership on AI**

D9 approach on responsible use of AI within government

Canada-UE Dialogue

Canada And France Are Working Together

Support and guide responsible use of AI

Facilitate international collaboration with multiple partners

Monitor and draw on work being done domestically and internationally

Provide a mechanism for analysis, foresight and policy development

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Thank you!