NIH Homomorphic Encryption and Privacy Enhancing Technologies Webinar Series and Workshop 2024

Presented at WPEC 2024, September 25
NIST Workshop on Privacy-Enhancing Cryptography 2024

SPEAKER

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OFFICE OF DATA SCIENCE STRATEGY

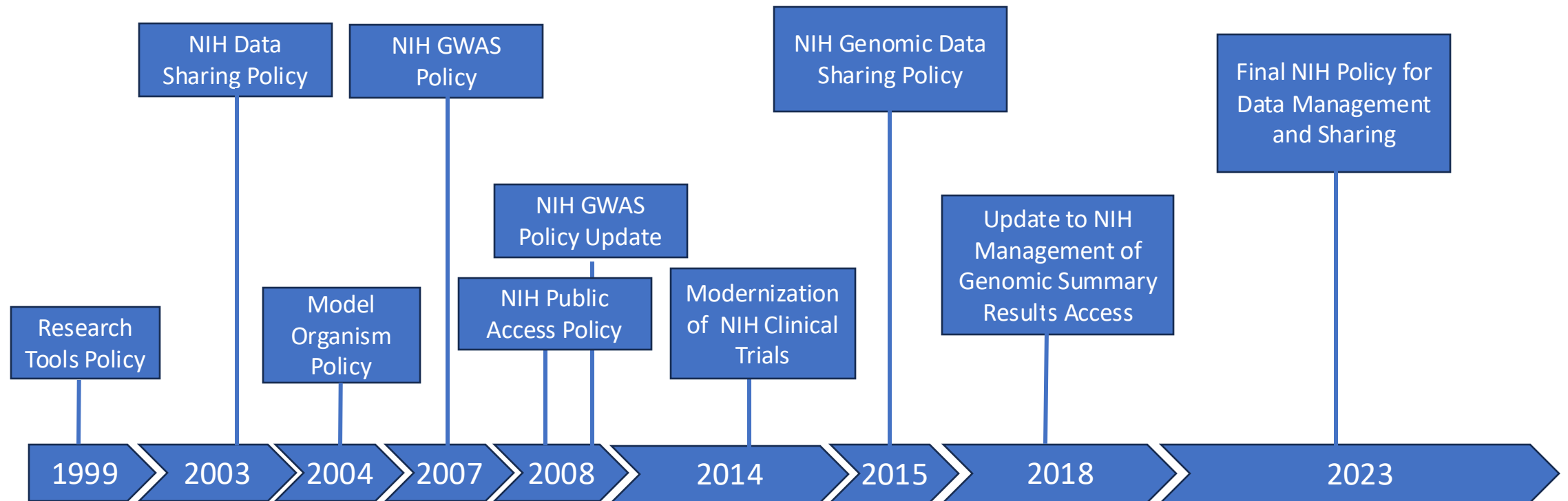NATIONAL INSTITUTES OF HEALTH

Co-author

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National institute on drug abuse

National institutes of health

National Institutes of Health
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Data Sharing

Why Share Data?

- Data is derived from public funds and may be used to further public good

- Sharing of data for secondary use allows for:
  - Validation of research results
  - Replication of research results
  - Combining available data allows to strengthen analysis
  - Facilitates data utility for other research endeavors (e.g. study other diseases, develop new methods/pipelines, etc.)

Timeline for NIH Data Sharing Policies

NIH Data Sharing Policy

NIH GWAS Policy

NIH Genomic Data Sharing Policy

Final NIH Policy for Data Management and Sharing

NIH GWAS Policy Update

Update to NIH Management of Genomic Summary Results Access

Research Tools Policy

Model Organism Policy

NIH Public Access Policy

Modernization of NIH Clinical Trials

1999 2003 2004 2007 2008 2014 2015 2018 2023

More information on NIH Data Sharing can be found at https://sharing.nih.gov/

Sharing of the Data via Controlled-Access

Oversight of secondary data use:

- Assures secondary research use of data aligns with the Data Use Limitations or Data Use Restrictions (based on the informed consents)
- Tracking of project progress
- Tracking of projects/publications citing use of data
- Identification of Data Management Incidences (DMIs)/compliance issues and subsequent remediation/enforcement actions

Homomorphic Encryption and Privacy Enhancing Technologies (PETs) Seminar Series

- NIH Office of Data Science Strategy and the National Institute on Drug Abuse hosted a public seminar series (April – August 2024) to explore technologies that can be leveraged for sharing of sensitive data

- Each seminar consisted of 1-3 20min presentations by experts on their respective fields followed by a 30min discussion period

- Webinar recordings and speaker information are available online https://datascience.nih.gov/homomorphic-encryption-and-privacy-enhancing-technologies-webinar-series

Homomorphic Encryption and Privacy Enhancing Technologies (PETs) Seminar Series

Webinars covered a wide range such as

- State of the art
  - Overview of homomorphic encryption and other privacy enhancing technologies
  - Identified barriers to enabling the technologies
- Putting the technologies to practice
  - Feasibility studies/ use cases
  - Parity
  - Data integrity and analysis outcomes
  - Costs vs benefits
- Ethical considerations
- Legal / Regulatory considerations

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Homomorphic Encryption and Privacy Enhancing Technologies (PETs) Workshop

- Webinars concluded in an in-person 1-day workshop with the webinar speakers and NIH staff on September 6, 2024

- Discussions were focused on:

  - Case for use of the technologies: transparency, data security, and privacy and confidentiality

  - Illustrative use cases in healthcare/biomedical research

  - How this should be implemented and current obstacles (including costs)

  - Societal impact

  - Incentive structures for sharing data

- Expected Output: 4000-word commentary to be published in a high impact journal on gaps and opportunities for adoption and implementation of these technologies

NIH Planning Committee

Leads:

- Shu Hui Chen

    NIH Office of Data Science Strategy (ODSS)

- Jonathan D. Pollock

    National Institute on Drug Abuse (NIDA)

Members:

- Elaine Collier

    National Center for Advancing Translational Sciences (NCATS)

- Craig Hayn

    National Cancer Institute (NCI)

- Rachel Leffler

    National Cancer Institute (NCI)

Members (continued):

- Roger Little

    National Institute on Drug Abuse (NIDA)

- Rui Pereira De Sa

    National Cancer Institute (NCI)

- Freddie Pruitt

    National Cancer Institute (NCI)

- Rebecca Rodriguez

    National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)

- Heidi Sophia

    National Library of Medicine (NLM)

- Susan Wright

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Thank you for your time and attention today

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