

# AI and Public Health: Opportunities and Challenges

January 23 | 1:00 – 2:00 p.m. CT

## Moderator



### **Meghan Mead**

Deputy Director, Network for Public Health Law, Mid-States Region

# Learning Objectives

- **Gain a basic understanding of AI, and its potential risks, benefits and applications.**
- **Learn how state, territorial, and local health departments are using AI to advance public health and support their workforce.**
- **Understand the key strategic, operational, ethical, and policy considerations on AI use.**
- **Obtain an overview of ASTHO's legislative mapping work related to AI in state/territorial public health agencies.**

## Presenters



**Greg Papillon**

Director of Public Health  
Innovation, Association of State  
and Territorial Health Officials



**Vivian Singletary**

Executive Director, Public Health  
Informatics Institute



**Maggie Davis**

Director of State Health Policy,  
Association of State and Territorial  
Health Officials



**Philip Huang**

Director, Dallas County Health and  
Human Services





# Artificial Intelligence

## Overview

Vivian Singletary, Director, Public Health Informatics Institute



**"AI won't take your job, it's somebody using AI that will take your job."**



**Economist Richard Baldwin**

The background of the slide is a dark green field filled with vertical columns of glowing green characters and symbols, reminiscent of the 'Matrix' digital rain effect. The characters are a mix of letters, numbers, and symbols, appearing to flow downwards.

**"The term 'artificial intelligence' means a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations or decisions influencing real or virtual environments."**

The Turing Test  
1950

The term "artificial intelligence" is coined  
1956

The term "machine learning" is coined  
1959

The term "AI winter" is coined  
1984

Deep Blue defeats  
Garry Kasparov  
1997

CNNs applicability  
demonstrated  
1989

A Neural Probabilistic  
Language Model  
2000

Turing Natural Language Generation  
2019

Apple releases Siri  
2011

ChatGPT  
2022

1950

1957

1964

1971

1978

1985

1992

1999

2006

2013

2020

1950-1979

SNARC  
1951

Samuel Checkers-Playing Program  
1952

The Logic  
Theorist  
1956

The General Problem Solver  
1957

ELIZA and Shakey  
1966

Artificial Intelligence: A General Survey  
1973

The first AI winter begins  
1974

Symbolics Lisp machines commercialized  
1980

Fifth Generation Computer Systems  
1982

Bayesian networks causal analysis  
1985

A Statistical Approach to Language Translation  
1988

Large-Scale Deep Unsupervised Learning  
2009

2010-2014

Watson wins on Jeopardy!  
2011

Googles's deep neural network  
project  
2012

China's Tianhe-2 fastest system  
2013

Facebook introduces DeepFace  
2014

2015-2019

AlphaGo wins at Go  
2016

Sophia: the first robot  
with citizenship  
2017

Google introduces the Transformer  
2017

Cimon, GPT, Lovot  
2018

2020-2025

Curial GPT-3 LLM  
2020

Dall-E  
2021

GPT-4  
2023

# History of Artificial Intelligence (AI) timeline



# Types of Artificial Intelligence



## Narrow AI

Performs specific activities with a limited scope. This exists today and most if not all of us have some experience with this type of AI. (e.g. chatbots, facial recognition, autonomous driving vehicles, language translation.....)



## General AI

It can carry out any intellectual task that a human can. This is a hypothetical statement, but we are experiencing some of this today. (e.g. ChatGPT, Gemini, Co-Pilot ClaudeAI.....). These early models are not perfect and require significant human oversight.



## Super AI

It surpasses human intelligence. This is theoretical and does not exist today

# What is Generative AI?



## New Content Generation

Generative AI can create novel text, images, audio, and other media based on the input data it is trained on.



## Machine Learning Algorithms

Generative AI models are built using advanced machine learning techniques, such as deep learning, to learn patterns and generate new content.



## Diverse Applications

Generative AI has a wide range of applications, including content creation, language generation, image synthesis, and more.

**Generative AI represents a significant advancement in artificial intelligence, enabling the creation of novel and unique content that can be used in various industries and applications.**



# Practical Applications of Generative AI

## Content Generation

Generative AI can be used to create original text, articles, stories, scripts, and other forms of written content, saving time and effort for content creators.

## Language Translation

Generative AI models can be trained on large datasets of translated text, enabling them to translate between languages more accurately and efficiently than traditional rule-based approaches.

## Image Synthesis

Generative AI models like Stable Diffusion and DALL-E can generate realistic, high-quality images from textual descriptions, enabling the creation of custom visuals for a variety of applications.

## Task Automation

Generative AI can be used to automate repetitive or tedious tasks, such as generating marketing emails, summarizing long documents, or creating personalized product recommendations, improving efficiency and productivity.

## Personalized Assistance

Generative AI chatbots and virtual assistants can provide personalized guidance, answer questions, and offer tailored recommendations to users, enhancing their experience and improving customer satisfaction.

# Potential Applications of AI

Creating project logo identities

Copy edit your writing

Drafting email responses

Language translation

Brainstorming ideas

Drafting grant proposals

Drafting job description

Taking and summarizing meeting minutes



# The Challenges of AI

- **Bias in Training Data**
- **Workforce Readiness**
- **AI Governance (process & policy)**
- **Potential for Misinformation**
- **Ethical Implications**
- **Technical Limitations**



# AI and Public Health:

## Opportunities and Challenges

January 23, 2025



# Get to know ASTHO

The **Association of State and Territorial Health Officials (ASTHO)** is a nonprofit organization committed to supporting state and territorial public health officials and developing excellence in public health policy and practice nationwide.

Our membership is comprised of 59 chief health officials from each of the 50 states, Washington, D.C., five U.S. territories, three Freely Associated States, and the over 100,000 public health professionals employed at these agencies.



# Today's Topics



**01**

**Background**

**02**

**State/Territorial Health  
Agency Considerations**

**03**

**State Legislative Trends**

# Artificial Intelligence and Machine Learning

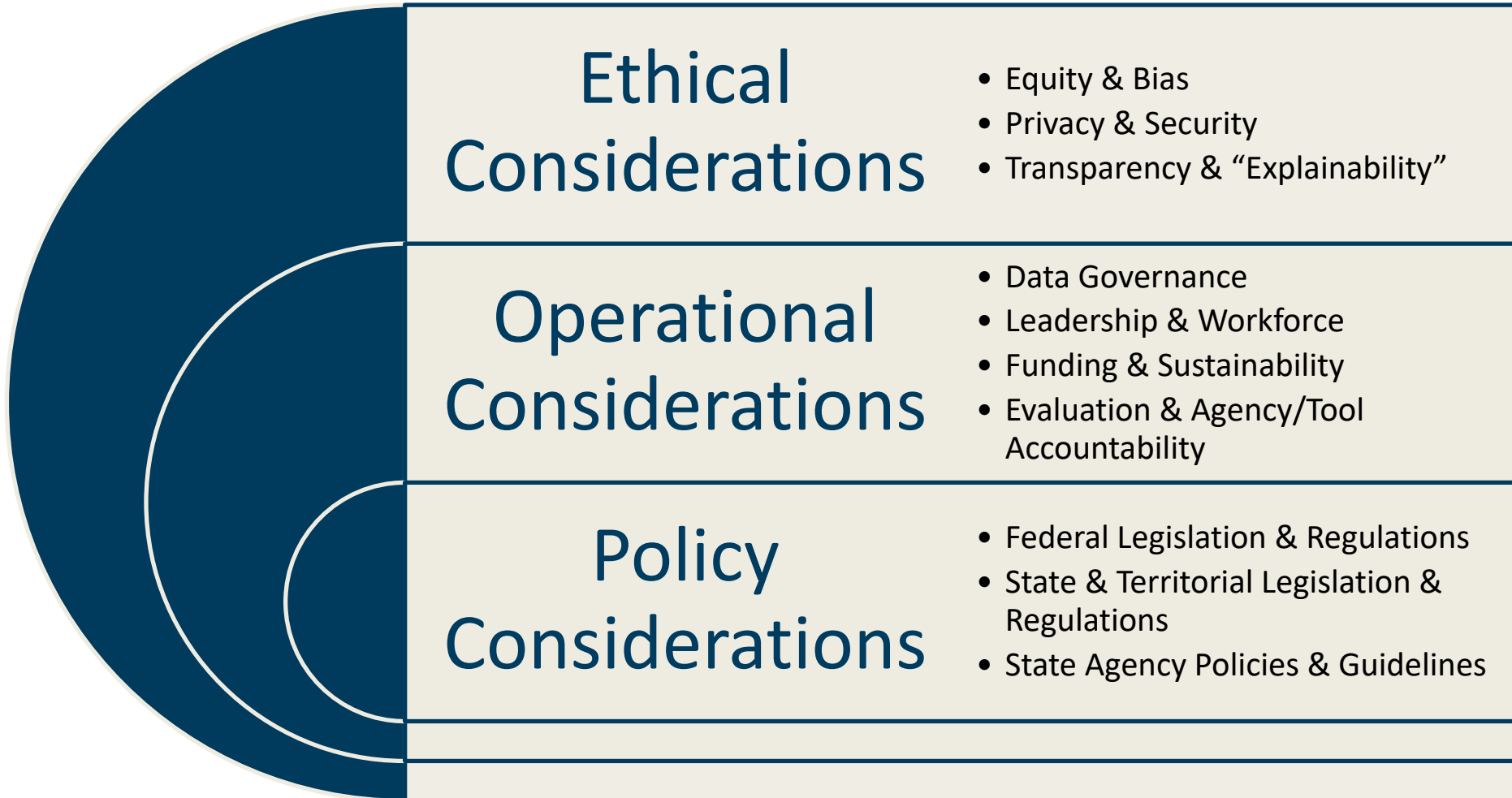
- **Artificial Intelligence (AI)** is the development, implementation, and use of computer systems that can perform tasks that typically require human intelligence. AI describes technology that makes computers (seem to) act rationally.
- **Machine learning (ML)** allows a computer to analyze data to do a task without being explicitly programmed. Common functions of machine learning are to (1) find patterns, like groupings of similar items and (2) to guess or predict an output based on a set of inputs.

## Two Types of Artificial Intelligence

- **Narrow AI** also known as “weak” or “traditional” AI, focuses on performing specific tasks within a limited domain, such as image recognition, speech synthesis, or playing chess. Narrow AI has been in use for decades (decision support, google searches)
- **General AI** refers to highly autonomous systems that feel like they possess human-level intelligence and can handle various cognitive tasks across different domains. Large language models (LLMs) are the major advancement in general AI.
  - **Generative AI (genAI)** refers to artificial intelligence systems that can create new, original content, such as text, images, or music, by learning patterns and structures from existing data.



# Ethical, Operational, and Policy Considerations



## State/Territorial Health Agency Considerations

# Ethical Considerations

### Equity & Bias

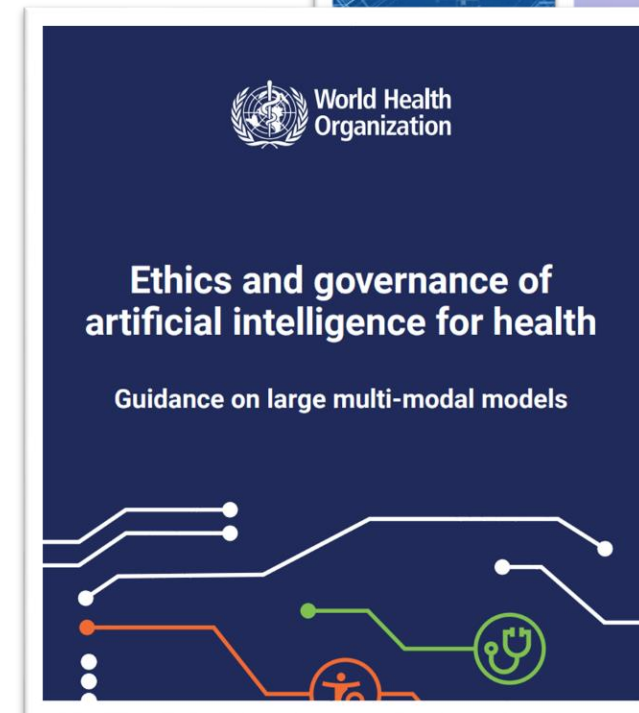
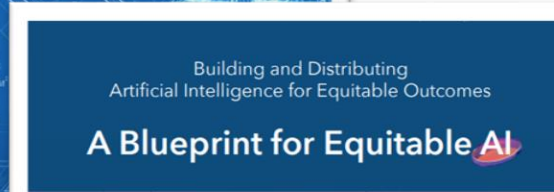
The importance of designing and deploying AI systems in a manner that ensures fairness and avoids perpetuating or amplifying societal biases, crucial for equitable public health outcomes

### Privacy & Security

The safeguarding of sensitive health data against unauthorized access and breaches, emphasizing the protection of individual privacy in AI applications

### Transparency & “Explainability”

The need for AI systems to be understandable and decisions justifiable to stakeholders, ensuring accountability and trust in public health decisions



# Operational Considerations

|  |  |
|--|--|
| <b>Data Governance</b>                             | The strategies for managing, storing, and using data in a way that complies with legal and ethical standards, ensuring data integrity and security in AI projects  |
| <b>Leadership &amp; Workforce</b>                  | Building AI literacy and capabilities within the health agency's leadership and workforce, ensuring the team is prepared to implement and manage AI solutions  |
| <b>Funding &amp; Sustainability</b>                | Securing and managing financial resources to support AI initiatives over time, ensuring long-term viability and impact of AI investments   |
| <b>Evaluation &amp; Agency/Tool Accountability</b> | The regular assessment of AI tools and initiatives to measure effectiveness, impact, and compliance with ethical standards, ensuring ongoing accountability of both individual tools and broader agency strategy |



# Policy Considerations

## Federal Legislation & Regulations

The landscape of federal laws and regulations governing AI, informing how state and territorial health agencies can align with or navigate these broader rules

## State/Territorial Legislation & Regulations

The specific regulatory environment at the state or territorial level, guiding the permissible use of AI within those jurisdictions

## State Agency Policies & Guidelines

The internal policies and guidelines that govern AI use within state health agencies themselves, whether established by the health agency or by a central administrative/IT agency, directing the responsible and effective adoption of AI technologies



OCTOBER 30, 2023

# Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence

BRIEFING ROOM PRESIDENTIAL ACTIONS

By the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered as follows:

**Section 1. Purpose.** Artificial intelligence (AI) holds extraordinary potential for both promise and peril. Responsible AI use has the potential to help solve urgent challenges while making our world more prosperous, productive, innovative, and secure. At the same time, irresponsible use could exacerbate societal harms such as fraud, discrimination, bias, and disinformation; displace and disempower workers; stifle competition; and pose risks to national security. Harnessing AI for good and realizing its myriad benefits requires mitigating its substantial risks. This endeavor demands a society-wide effort that includes government, the private sector, academia, and civil society.

My Administration places the highest urgency on governing the development and use of AI safely and responsibly, and is therefore advancing a coordinated, Federal Government-wide approach to doing so. The rapid speed at which AI capabilities are advancing compels the United States to lead in this moment for the sake of our security, economy, and society.

In the end, AI reflects the principles of the people who build it, the people who use it, and the data upon which it is built. I firmly believe that the power of our ideals; the foundations of our society; and the creativity, diversity, and decency of our people are the reasons that America thrived in past eras of rapid change. They are the reasons we will succeed again in this moment. We are more than capable of harnessing AI for justice, security, and opportunity for all.



# Documented Use Cases of AI in Public Health



# ASTHO's Legislative Prospectus

Modernizing Public Health Data and Protecting Privacy

## Legislative Trends

- Enhancing Consumer Health Data Privacy and Supporting Public Health Data Access
- Health Information Exchange access and use
- Vital Records enhancements

## Looking Ahead

- Strengthening protections for consumer health data
- Allowing PHA access to more secure platforms and exchange networks (e.g. TEFCA)
- Developing standards for AI in public health

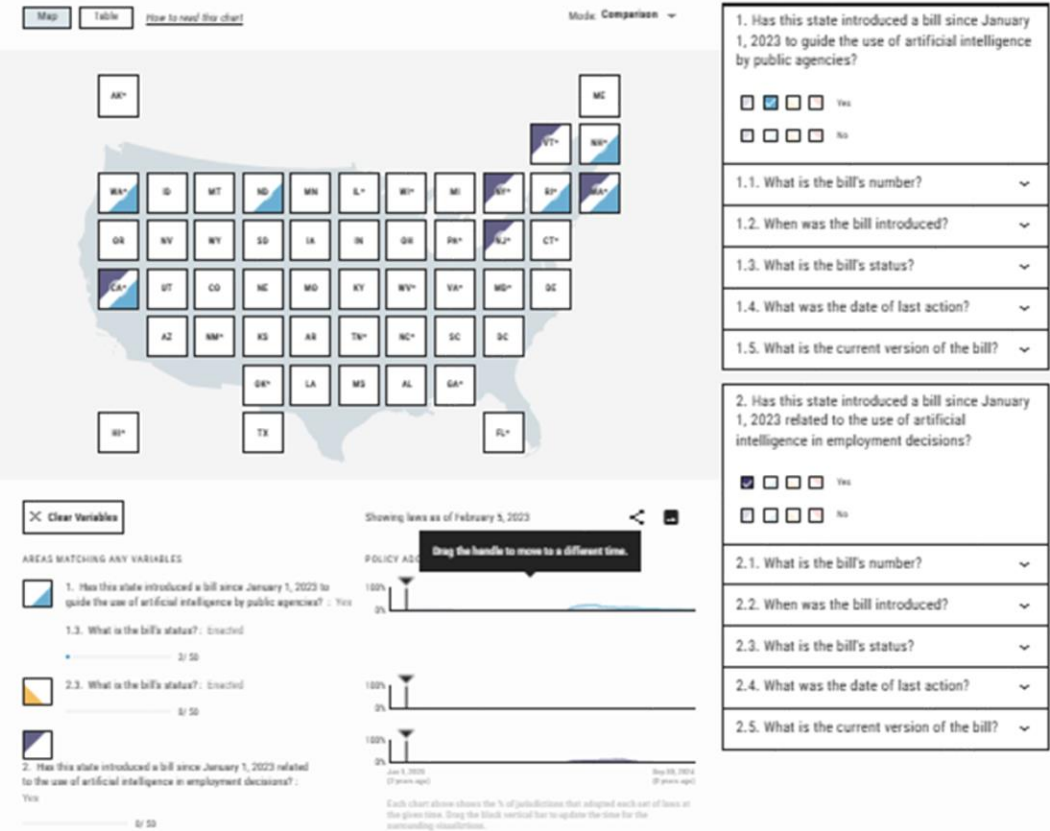


# Legislative Tracking Tools

Access the tool here:

<https://www.astho.org/advocacy/state-health-policy/public-health-legal-mapping-center/infrastructure/>

## ASTHO: Public Health Infrastructure Legislative Tracking: Artificial Intelligence



# State Legislative Trends

## Governmental Use of AI

- At least 27 states considered, and 14 states passed, bills related to governmental use of AI in the 2023-2024 legislative sessions.
- Largely state legislatures are convening taskforces or commissions to study governmental use of AI and make recommendations for future use.
- New York's new law requires the state have 'continued and operational meaningful human review' of automated decision-making systems related to public assistance benefits or those that would materially impact civil liberties, statutory or constitutional rights.

## AI in Employment Decisions

- At least 15 states considered, and 2 passed, bills relating to the use of AI in employment processes, often in relation to machine learning systems and 'consequential decisions.'



# Use of AI at the Local Health Level

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PHILIP HUANG, MD, MPH

DIRECTOR, DALLAS COUNTY HEALTH & HUMAN SERVICES



**DCHHS**  
*Safe families, healthy lives*  
Dallas County Health and Human Services



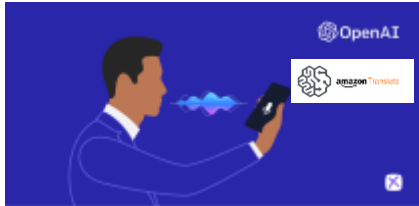
# Generative AI is pushing creative expression forward by giving people tools to create content and can optimize organizations

## Code

For developers who enabled it, 40% of their code is written by CoPilot, GitHub's AI assistant or AWS CodeWhisperer. This will make the creative use of code more accessible to non-developers

## Text

The most advanced domain, which has already passed Medical, Law, and Business exams. As models improve, we will see higher-quality outputs and longer-form content.



## Video

The Crow, an AI movie, won the 2022 Cannes festival in the category of short films

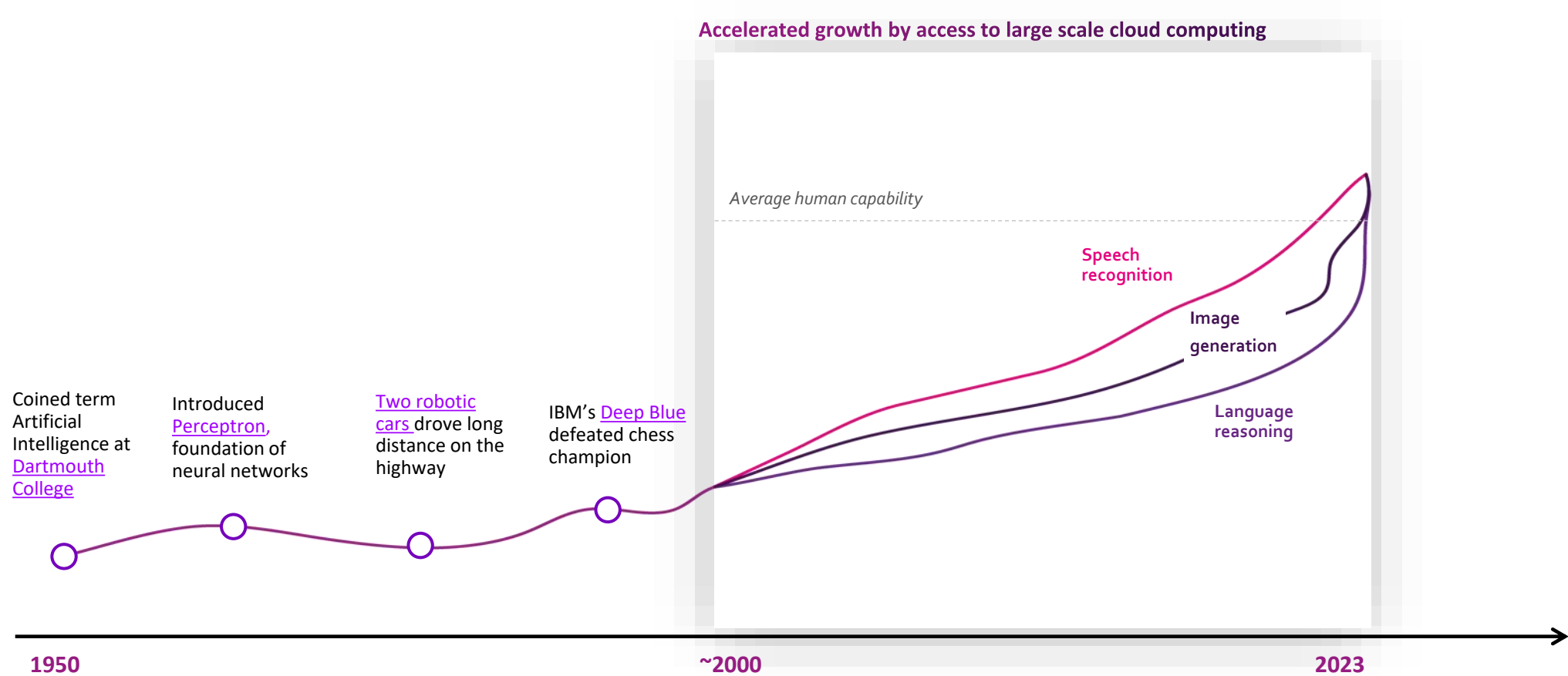
## Images

This is one of the most famous applications as the images AI can create are incredible and even won the top prize in a painting competition

## Speech synthesis and translation

Whisper understands speech better than humans, even with background noise, and can translate between virtually any language.

# Cloud-based AI engines are surpassing human capabilities

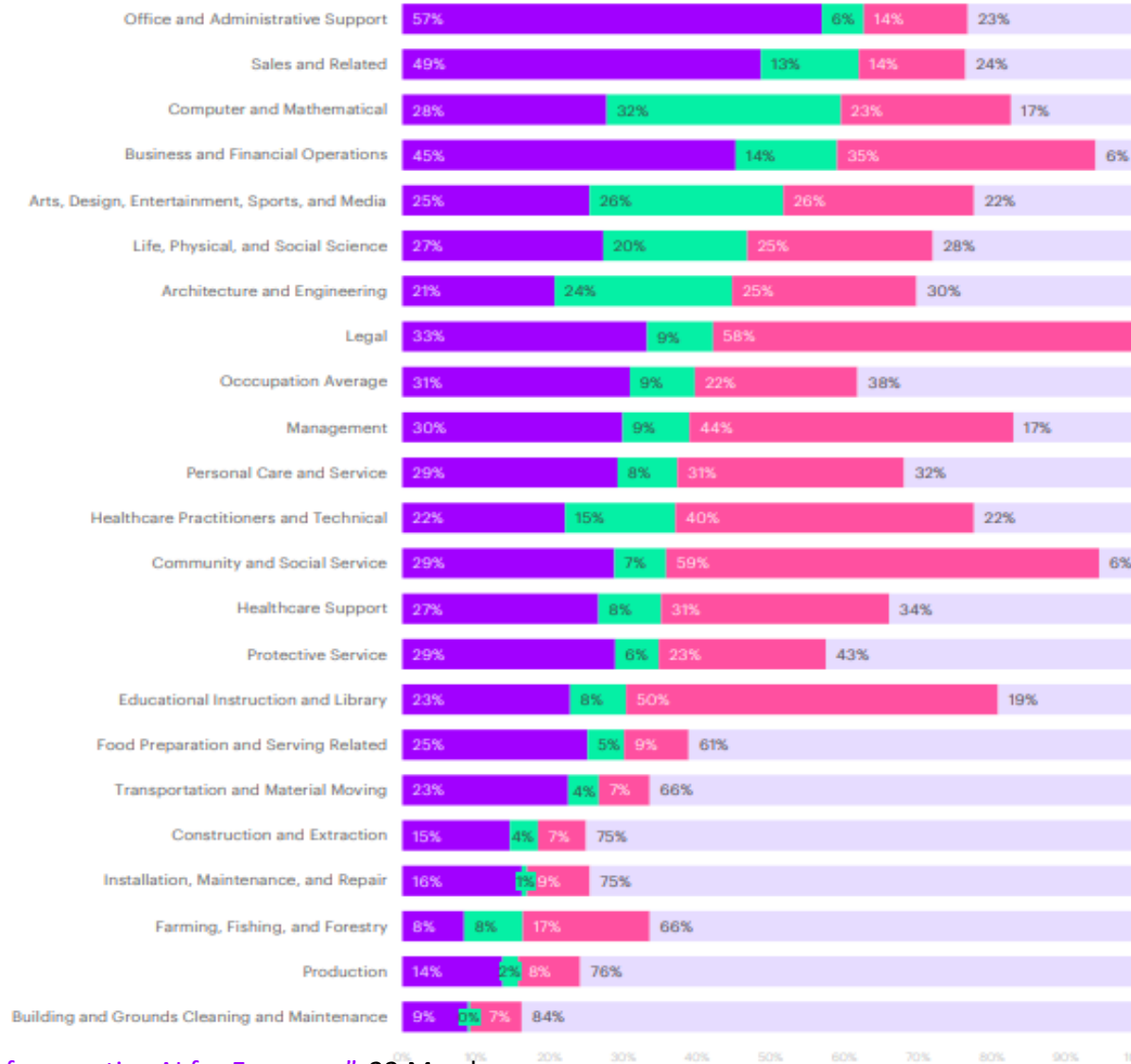


We are at an inflection point where AI capabilities are reaching and driving beyond human capabilities at generalized skills

# Generative AI Will transform work across every job category

## Take a people-first approach

Success with generative AI requires an equal attention on people and training as it does on technology. Companies should therefore dramatically ramp up investment in talent to address two distinct challenges: creating AI and using AI. This means both building talent in technical competencies like AI engineering and enterprise architecture and training people across the organization to work effectively with AI-infused processes. In our analysis across 22 job categories, for example, we found that LLMs will impact every category, ranging from 9% of a workday at the low end to 63% at the high end. More than half of working hours in 5 of the 22 occupations can be transformed by LLMs.



## Work time distribution by major occupation and potential AI impact

Based on their employment levels in the US in 2021



In 5 out of 22 occupation groups, Generative AI can affect more than half of all hours worked

**Source:** Accenture Research based on analysis of Occupational Information Network (O\*NET), US Dept. of Labor; US Bureau of Labor Statistics.

**Notes:** We manually identified 200 tasks related to language (out of 332 included in BLS), which were linked to industries using their share in each occupation and the occupations' employment level in each job category. Tasks with higher potential for automation can be transformed by LLMs with reduced involvement from a human worker. Tasks with higher potential for augmentation are those in which LLMs would need more involvement from human workers.

Source: [Accenture research "A new Era of generative AI for Everyone"](#), 22 March





# NACCHO 2024 Public Health Informatics Profile (Released August 2024)

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- Most local health departments were not using AI or machine learning, but 39% of these local health departments were somewhat or very interested in doing so.
- Large local health departments (24%) were more likely to currently be using AI or have plans to use AI in the next year, compared to small (5%) and medium (7%) local health departments.
- Among the 5% of local health departments currently using AI, the most common use was for generating communication materials or plans.
- Seventy-eight percent of local health departments perceived threats related to using AI, with the most common concerns being the reliability of AI and the potential threat to data security.

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**The future of AI  
is accelerating**

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# AI Issues and Use Cases for Local Health Departments

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## Text Generation

- Drafting correspondence
- Grant writing

## Information Processing

- Summarizing reports or legislation

## Health communication

- AI-Driven Chat bots and virtual assistants for public health education
- Language Translation
- Enhancing outreach and engagement through personalized communication strategies

## Health Informatics

- Natural Language Processing
- Data Integration and management

## Disease Surveillance

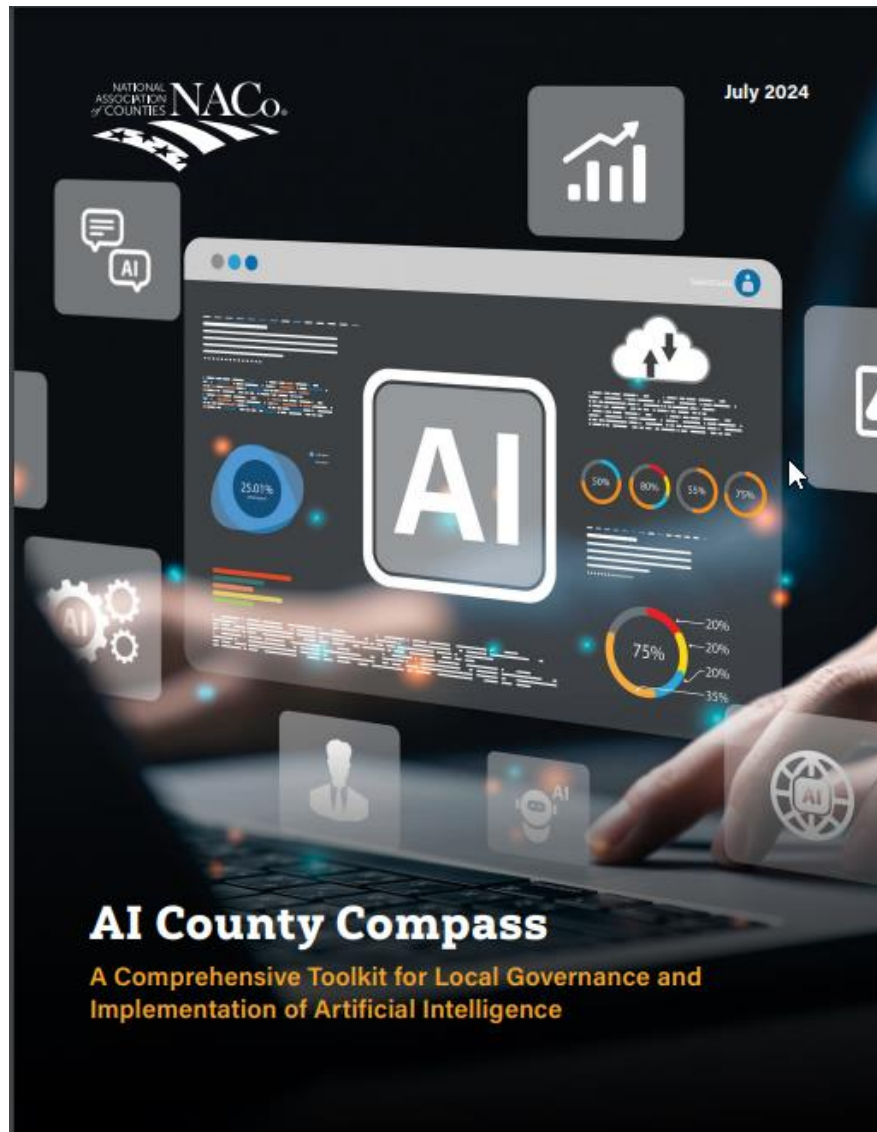
- Real-time tracking systems and mapping
- Predictive analytics

## Epidemiologic Analysis

- Writing code
- Scenario analysis and planning

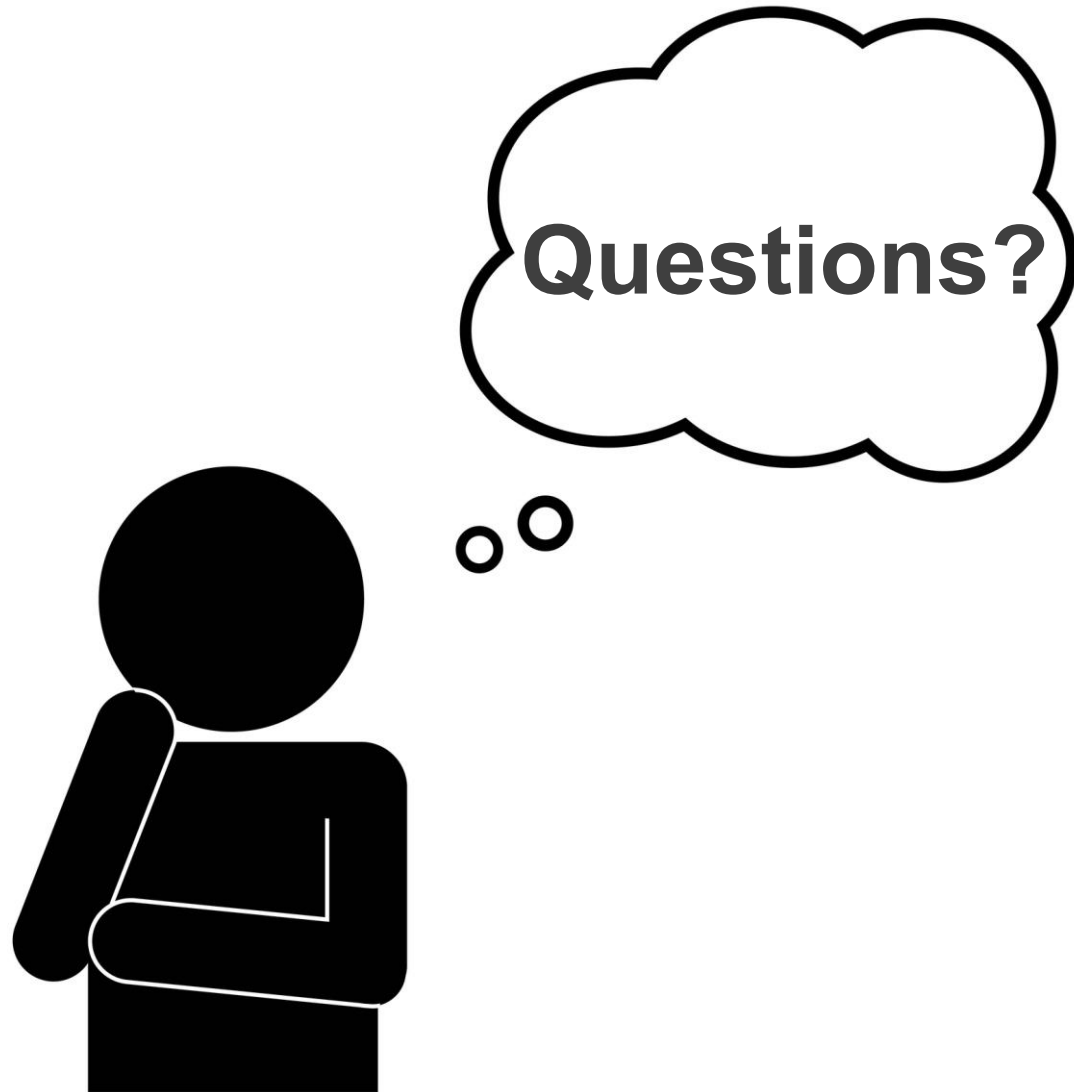
## Ethical and Privacy Considerations

- Data Privacy and Security
- Transparency – Ensuring AI decisions are explainable and trusted
- Addressing biases in AI algorithms



## Guiding Principles

1. Be agile, flexible and creative. Think big!
2. Set the outcome(s) that you want to achieve for your county and in your community by identifying and evaluating use cases.
3. Be proactive, not reactive. Approach staff utilization of GenAI with guardrails and guidance, rather than saying “we won’t allow or implement” AI or GenAI.
4. Maintain vigilance when it comes to accuracy, privacy, bias and ethical challenges.
5. Communicate how GenAI can bring positive change to the workforce, and address challenges up front.
6. Establish functional requirements for implementing AI systems that include strong data governance measures.
7. Plan ahead for the transition to GenAI technologies and tools, which will involve financial commitment, staff time and resources.





**Thank you for attending.**

**You will receive an email notification when the slides and recording of today's webinar have been posted on the Network website.**



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healthier, stronger, and more equitable communities.**

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