

## Artificial Intelligence (AI) in Public Health

**Introduction.** This factsheet provides an overview of AI types and their applications for state and local health departments.

### Types of AI and Their Applications

**Machine Learning (ML).** Machine learning algorithms learn patterns from data to make predictions or decisions without explicit programming. **Applications:**

- Predicting high-risk pregnancies by analyzing electronic health records
- Identifying social determinants of health that impact birth outcomes
- Detecting patterns in infant mortality data across geographic regions

**Natural Language Processing (NLP) and Language Models.** NLP and advanced language models enable computers to understand, interpret, and generate human language. **Applications:**

- Analyzing patient feedback and community health needs assessments
- Mining social media data for public health surveillance
- Generating customized health education materials (including multilingual)

**AI-Powered Content Generation.** Large Language Models (LLMs) and other AI tools can assist in creating educational content for both healthcare workers and families. **Applications:**

**For the Workforce:**

- Developing case studies and scenario-based learning exercises
- Creating assessment tools and knowledge checks
- Adapting materials for different learning styles and expertise levels

**For Family Outreach and Education:**

- Generating age-appropriate child development information
- Crafting engaging social media content and infographics
- Personalizing educational content based on family needs

**Best Practices for AI-Generated Content:**

- Human review and validation of all generated materials
- Cultural and linguistic appropriateness/health literacy review
- Community feedback integration

**Computer Vision.** Computer vision systems analyze and interpret visual information. **Applications:**

- Analyzing satellite imagery to map healthcare access
- Analyzing ultrasound images for early detection of complications
- Screening newborn health conditions through image analysis

### Implementation Considerations

**Health Outcomes Impact**

- Assess AI systems for bias in data representation
- Evaluate impact on historically marginalized communities
- Ensure AI solutions don't exacerbate existing disparities

**Data Representation**

- Include diverse populations in training data
- Consider social, cultural, linguistic, and geographic contexts
- Address gaps in historical health data

**Access and Accessibility**

- Design solutions for various technology literacy levels
- Consider internet and device accessibility
- Ensure compatibility with assistive technologies

**Cultural Competency**

- Incorporate cultural beliefs and practices
- Respect traditional health approaches
- Consider family and community structures

### Community Engagement

- Include community voices in AI development
- Gather feedback from affected populations
- Build trust through transparency

### Language and Communication

- Provide materials in multiple languages
- Use culturally appropriate terminology
- Consider health literacy levels

### Privacy and Consent

- Protect sensitive health information
- Ensure informed consent processes
- Consider community privacy concerns

## Best Practices for Implementation

### Planning Phase

1. Assess organizational readiness and capacity
2. Identify specific problems AI can address
3. Engage partners and community members
4. Evaluate available resources and constraints
5. Develop clear success metrics

### Implementation Phase

1. Start with pilot projects
2. Ensure staff training and support
3. Monitor system performance
4. Collect user feedback
5. Adjust and optimize as needed

### Evaluation Phase

1. Measure impact on health outcomes
2. Assess cost-effectiveness
3. Review ethical implications
4. Document lessons learned
5. Share results with partners

## Additional Resources

- **Introductory Resources:**
  - [Artificial Intelligence in Public Health: Digital Transformation Toolkit](#). Pan American Health Organization and World Health Organization. 2021.
  - [Artificial Intelligence: Generative AI Technologies and Their Commercial Applications](#). U.S. Government Accountability Office. 2024.
- **Research:**
  - Hattab G, Irrgang C, et al. [The Way Forward to Embrace Artificial Intelligence in Public Health](#). Am J Public Health. 2025 Feb;115(2):123-128. doi: 10.2105/AJPH.2024.307888.
  - Bharel M, Auerbach J, Nguyen V, DeSalvo KB. [Transforming Public Health Practice with Generative Artificial Intelligence](#). Health Affairs (Millwood). 2024 Jun;43(6):776-782. doi: 10.1377/hlthaff.2024.00050.
- **Trainings:**
  - [AI and Public Health: Opportunities and Challenges](#). Network for Public Health Law. 61 minutes. 2025.
  - [The Role of Public Health Practitioners in the Age of Artificial Intelligence](#). Canadian Public Health Association. 60 minutes. 2024.

### Artificial Intelligence in Public Health: Technical Assistance Brief

July, 2024 Access other resources at <https://www.mchevidence.org>

This project is supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) under grant number U02MC31613, Strengthen the Evidence for Maternal and Child Health Programs, \$3.5 M. This information or content and conclusions are those of the author and should not be construed as the official position or policy of, nor should any endorsements be inferred by HRSA, HHS or the U.S. Government.