

Science Technology & Telecommunications Committee



Dean Patricia Finn, MD
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Shortages of Health Care Providers in New Mexico



Shortages in New Mexico by Profession

Health Profession	Practitioners Needed (2024)	Practitioners Needed (2035) ¹
Physicians	522	1,680
Nurses	5,952	10,520
Dental Hygienists	88	350
Physician Assistant	281	-
Physical Therapists	526	1,590
Occupational Therapists	114	610
Pharmacists & related roles*	482 ²	700
Public Health Professionals	100 ³	See footnote ⁴
Total	8,065	26,010

*Includes pharmacists, pharmacy aides,

⁷ pharmacy technicians

Improve Shortage
of Providers

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graph TD; A[Improve Shortage of Providers] --> B((Increase Number of Providers)); A --> C((Increase Productivity of Providers));
```

Increase
Number
of
Providers

Increase
Productivity
of
Providers

AI in Medicine

Pilot Echo

Introduction to AI Models

by

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Professor of Medicine

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AI in Medicine Pilot ECHO		
2nd and 4th Fridays from 12:00-1:00 pm MT		
July 26, 2024	Introduction to AI Models	David Perkins, MD, PhD UNM
August 9, 2024	Ethics, Bias, and Regulation of Artificial Intelligence	Matthew De Camp, MD, PhD University of Colorado
August 23, 2024	Large Language Models in Healthcare	Dawn Harrington, MS, BBA; Dusadee Sarangarm UNM
September 13, 2024	Wearables and Remote Monitoring	Ahmed Metwally, PhD Google
September 27, 2024	AI and Patient Communication	Ming Tai-Seale, PhD, MPH UCSD
October 11, 2024	Role of AI and EMRs	Mike Richards, MD; Randy Ko, MD, PhD candidate UNM
October 25, 2024	AI and Practical Applications	Chad Cole, MD UNM
November 8, 2024	AI and Clinical Management	Suresh Nelagaru, MD ⁵ Cardiologist & AI Entenpreneur

What is AI?

- **Not artificial**
- **Not intelligent**
- **BUT...will**
effect everything everywhere

What is a “large language model”?

- Input = text
- Predicts next word in prompt
- For example, chatGPT

GPT-3, had **175 billion parameters**. Reports indicate that GPT-4 might have around **1.76 trillion parameters**

Growth began with ChatGPT reaching **100 million users within just five days of its launch** in November 2022, making it one of the fastest-growing applications in history. The platform sees significant daily engagement, with about **25 million daily visits** reported in recent weeks

What is an “*hallucination*”?

- Output is probabilistic
- Therefore, potential for error
- Also, may produce bias

What is the “*singularity*”?

- Hypothetical time in the future when machines are smarter than humans
- Futurist Ray Kurzweil predicts this will occur in 2045!

Why AI? Biology & Medicine are Complex



*Phenotype: Height
Meta-Analysis
GWAS
5,400,000 Individuals
12,111 Significant SNPs*

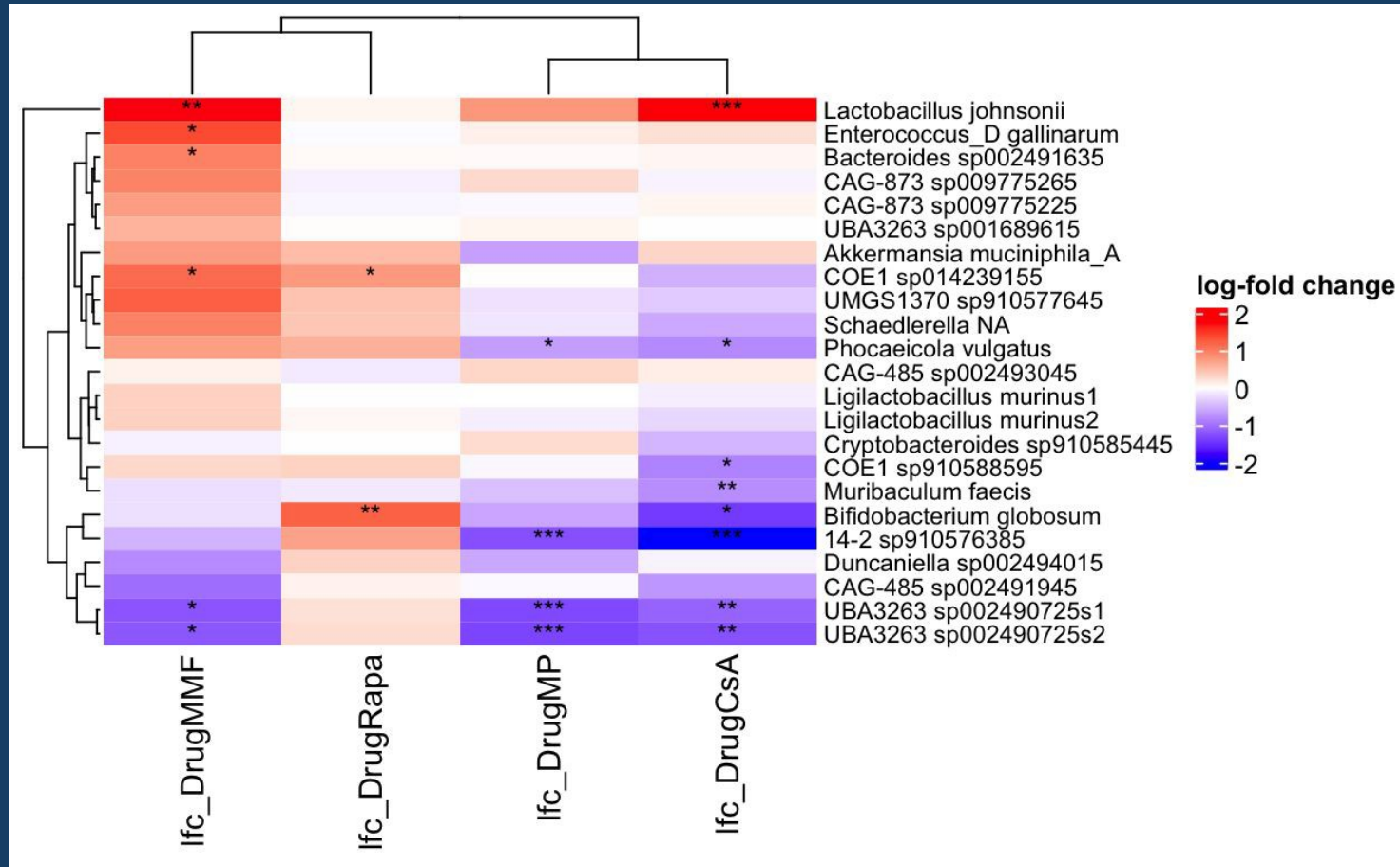
Why do you hallucinate?

Why do you hallucinate?

As an AI language model, I generate responses based on patterns in the data I was trained on, but I don't have true understanding or access to real-time information. Sometimes, my responses might not be accurate or could be based on incorrect or outdated information, which can be perceived as "hallucination." This is because my training data includes a vast range of texts from the internet, and while I aim to provide accurate and helpful responses, I can't always guarantee perfect accuracy.

These "hallucinations" occur because I don't actually understand the content in the way a human does—I generate responses based on probabilities and patterns from the data. My goal is to assist and provide useful information, but it's always good to double-check important details or consult a reliable human expert when necessary.

Data analysis



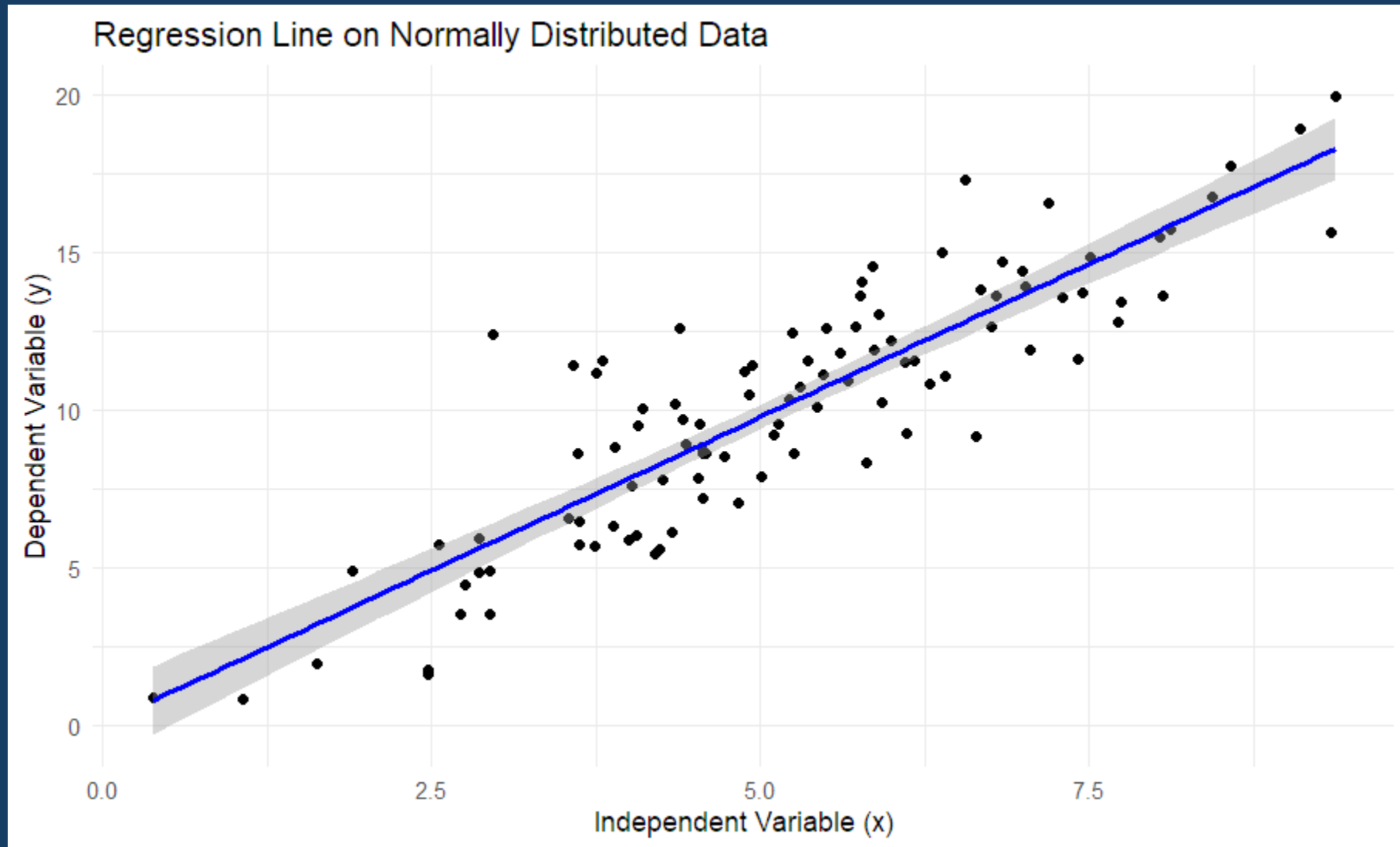
ChatGPT4o Output: Data Analysis

The **heatmap** indicates that **different microbial species respond uniquely to various drug treatments**, with some species showing significant changes in abundance. These findings suggest that specific drugs can modulate the gut microbiome composition, potentially impacting host health and therapeutic outcomes. Understanding these responses could guide personalized medicine approaches, especially in treatments targeting microbial dysbiosis.

Generate computer code

- Write R code that will generate a regression line using data sampled from a normal distribution

Generate computer code



Potential Benefits of AI Tools

- **1. Enhanced Diagnostics and Decision Support**
- **Remote Access to Expertise:** AI can provide diagnostic tools, such as image recognition for radiology or dermatology, that help rural practitioners without immediate access to specialists.
- **Clinical Decision Support Systems (CDSS):** AI-powered CDSS can assist in diagnosing diseases, offering treatment recommendations based on up-to-date clinical guidelines, which can be crucial in areas with limited access to medical expertise.

Potential Benefits of AI Tools

- **2. Telemedicine Integration**

- **Virtual Consultations:** AI can facilitate virtual consultations, enabling rural healthcare providers to consult with specialists remotely, providing patients with higher levels of care.
- **Chatbots for Primary Care:** AI chatbots can handle common queries, triage patients, or provide health education, reducing the burden on rural practitioners and ensuring patients with minor concerns receive timely advice.

Potential Benefits of AI Tools

- **3. Resource Optimization**

- **Efficient Use of Limited Resources:** AI can help optimize resource allocation by predicting patient influx, analyzing local health trends, and managing medical inventory. This ensures that rural clinics have the necessary medications and supplies when needed.
- **Predictive Analytics:** AI models can predict outbreaks or disease trends in rural populations, allowing for preventive measures, vaccination drives, or resource deployment.

Potential Benefits of AI Tools

- **4. Training and Education**

- **Access to AI-Powered Learning:** AI can provide ongoing training and education to rural practitioners, keeping them updated with the latest medical advancements through adaptive learning platforms.
- **Simulations and Virtual Reality:** AI-driven simulations can help train rural healthcare workers in emergency protocols or rare case scenarios, providing practical experience even in remote settings.

Potential Benefits of AI Tools

- **5. Mobile Health (mHealth) Applications**
- **AI-Enhanced Health Apps:** mHealth apps powered by AI can allow rural practitioners to monitor chronic conditions (like diabetes or hypertension) remotely, reducing the need for frequent patient visits.
- **Self-Management Tools:** AI tools for patients can support self-management of chronic diseases, which is especially useful in rural areas where regular visits to the clinic might be challenging.

Potential Benefits of AI Tools

- **6. Addressing Workforce Shortages**
- **AI-Assisted Automation:** Administrative tasks, such as appointment scheduling, medical documentation, and patient follow-ups, can be automated using AI, allowing rural practitioners to focus more on patient care.
- **Task Shifting:** AI can support non-specialist healthcare workers, like community health workers or nurses, in performing more complex medical tasks safely.

Potential Benefits of AI Tools

- **7. Improved Patient Outcomes**
- **Personalized Treatment Plans:** AI can analyze patient data to recommend personalized treatments, considering local constraints and individual patient needs.
- **Remote Monitoring:** AI can enable continuous monitoring of patients with chronic conditions, sending alerts to practitioners when intervention is needed, which is crucial in remote areas with limited emergency care.

Potential Benefits of AI Tools

- **8. Cost Efficiency**
- **Affordable Diagnostic Tools:** AI-driven diagnostic tools (e.g., smartphone-based imaging) can reduce the cost of healthcare delivery, making it more accessible to rural populations.
- **Lower Travel Requirements:** By enabling remote consultations and diagnostics, AI can reduce the need for patients or doctors to travel long distances for medical care.

Potential Benefits of AI Tools

- **9. Health Data Analytics**

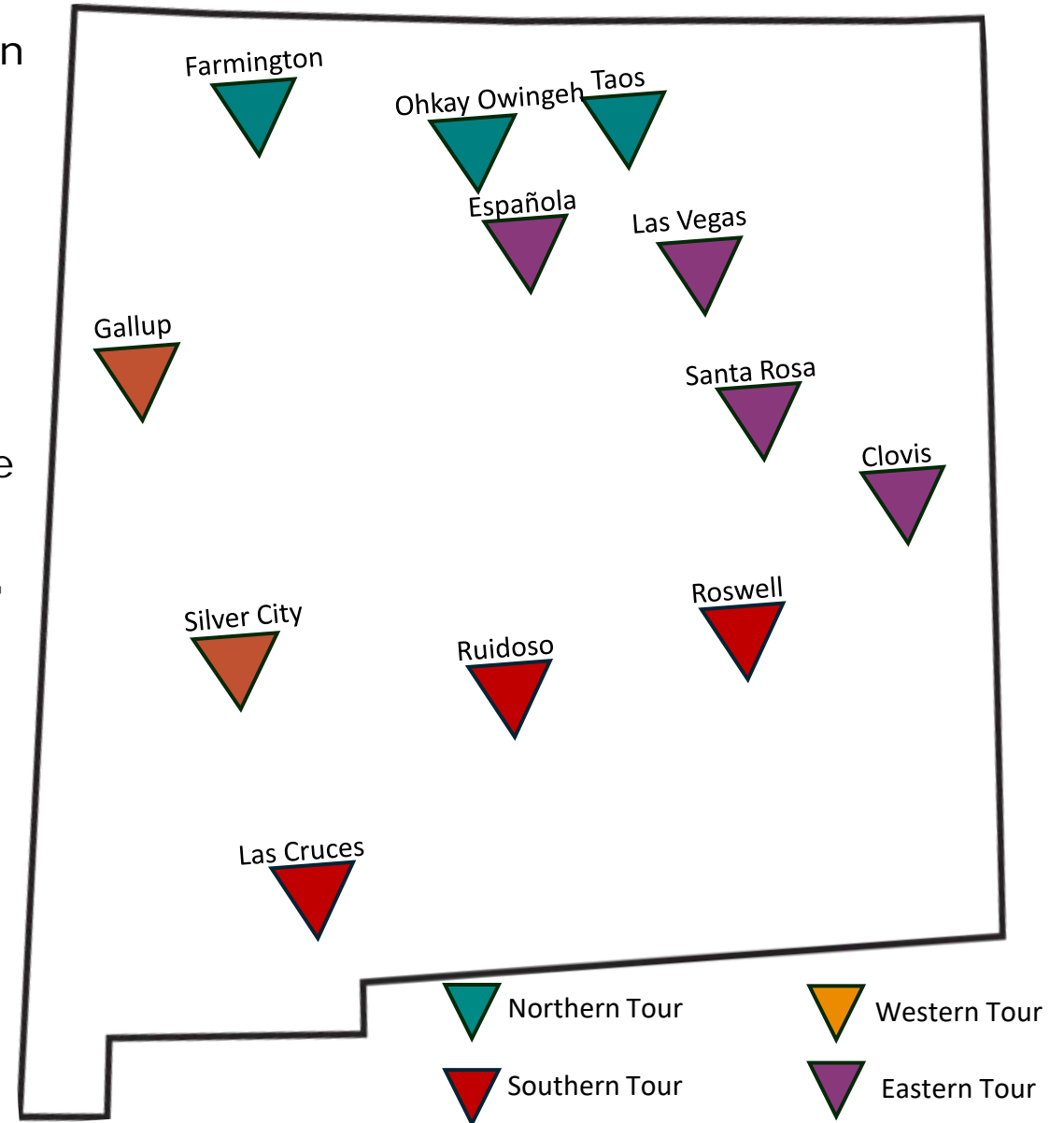
- **Data-Driven Insights:** AI can analyze population health data to identify prevalent health issues in rural areas, helping to shape public health interventions and improve community health.
- By leveraging AI, rural healthcare providers can improve service delivery, enhance patient outcomes, and tackle some of the unique challenges posed by distance and resource constraints in rural medicine.

The Dean's New Mexico Tour:



The UNM School of Medicine Dean is connecting with New Mexico communities and understands their healthcare needs.

The tours gathered valuable insights on enhancing access to care, especially in rural areas, and shaped future strategies for medical education and healthcare delivery improvements



Key Findings from the Tour:

- **Healthcare Access:** Identified significant barriers in rural areas, including a need for better infrastructure.
- **Community Needs:** Emphasized the importance of local input in shaping healthcare services.
- **Future Initiatives:** Plans to expand medical education and integrate advanced technologies like telehealth.
- **Collaborative Efforts:** Strengthened partnerships with local stakeholders to enhance healthcare delivery.

Thank You

