



BEYOND EMERGING RISKS:  
**INNOVATING RESILIENCE AND  
ADAPTATION**



13<sup>th</sup> to 15<sup>th</sup> Nov || Mombasa, Kenya



## The Future of Predictive Analytics in Healthcare

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Research Contributions by: Zainab Shikely



# Time to flex your brain—It's Quiz time!



One right answer = one gift hamper

## Strange Yet True Uses of Predictive Analytics

**Which of these unusual but true uses of predictive analytics is related to preventing workplace stress?**

- A) Predicting which office microwave will break down next due to overuse.
- B) Analyzing email patterns to predict which employees are at risk of burnout before they even know it.
- C) Forecasting the next company lunch order based on past sandwich choices.
- D) Predicting which office plants will survive the longest with minimal care.

**Answer:** B) Analyzing email patterns to predict which employees are at risk of burnout before they even know it.

## Strange Yet True Uses of Predictive Analytics

**Which of these unusual but true applications of predictive analytics has actually been used in healthcare?**

- A) Predicting when patients are likely to fall asleep during a boring doctor's lecture
- B) Forecasting outbreaks of infectious diseases by analyzing tweets about cold symptoms
- C) Determining which hospital food menu item will be the least popular next week
- D) Predicting how many times a patient will ask, "How much longer, doctor?" during a visit

**Answer:** B) Forecasting outbreaks of infectious diseases by analyzing tweets about cold symptoms  
(Social media analysis in action!)

## Agenda

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- ❖ Introduction
- ❖ Current Applications of Predictive Analytics
- ❖ Challenges and Ethical Considerations
- ❖ Technological Advancements
- ❖ Future Trends and Innovations
- ❖ The Role of Actuaries in Predictive Analytics
- ❖ Zamara's Initiative

✔ **Better with  
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# Introduction

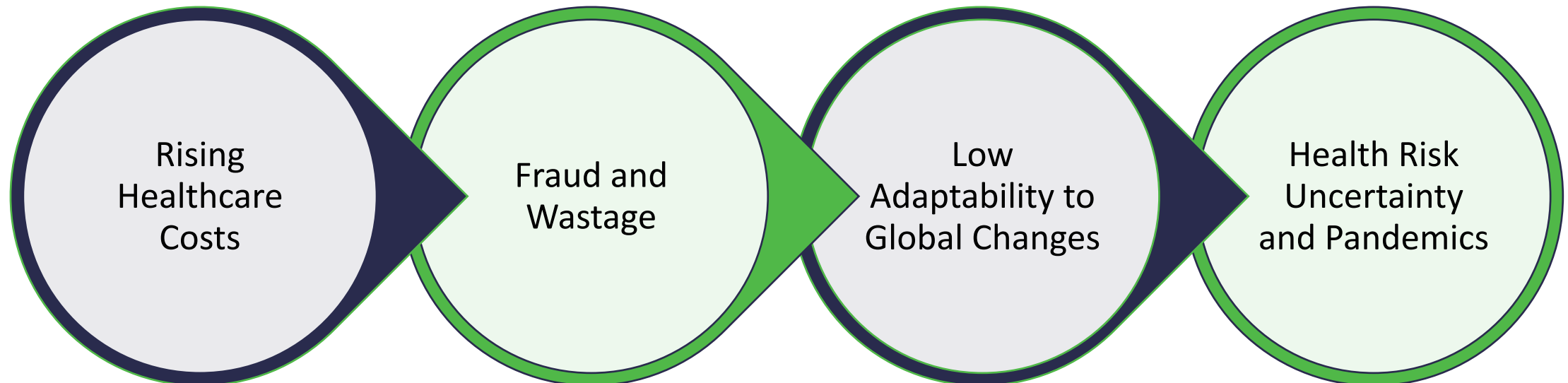
- **Predictive analytics** is a data-driven approach that leverages historical data, statistical algorithms, and machine learning techniques to predict future events or outcomes.



**Predictive  
Healthcare**

# Why Care?

- Predictive Analytics can help us tackle some of the **major pain points** within both the healthcare and insurance industries.



# Current Applications of Predictive Analytics





# Current Applications of Predictive Analytics

- Early Intervention Programs
- Early Warning Systems (EWS)
- Hospital Readmissions

Patient Risk Scoring and Stratification

Disease Outbreak Prediction

- Epidemiological Models (SIR and SEIR Models)
- Hybrid Models

- Optimizing Resource Allocation and Staffing Management
- Fraud Analytics

Operational Efficiency

Population Health Management

- Chronic Disease Management
- Targeted Interventions
- Cost Management

# Case Study

- **Vitality** is a health and wellness program that integrates health incentives with insurance products to promote healthier lifestyles.
- Vitality and Predictive Analytics in Healthcare:
  - Integration with Wearable Technology and Real-Time Data
  - Personalized Health Risk Assessments
  - Behavioral Predictive Models and Incentive Optimization
  - Product Development and Partnerships
  - Cost Prediction and Insurance Premium Adjustment
- Vitality leverages the power of **predictive analytics** to **reduce healthcare costs and premiums** by incentivizing healthy behaviors.

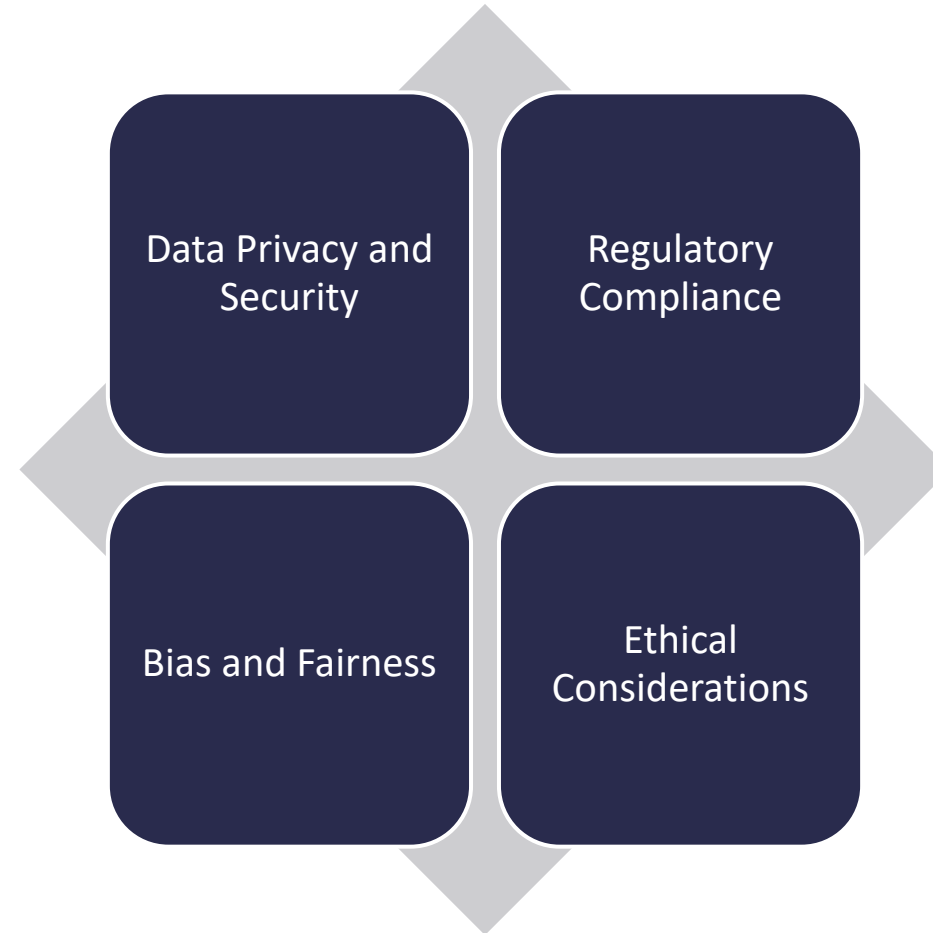


Vitality

# Challenges and Ethical Considerations



# Challenges and Ethical Considerations



“With great power comes great responsibility” ~ Uncle Ben

# Bias and Fairness

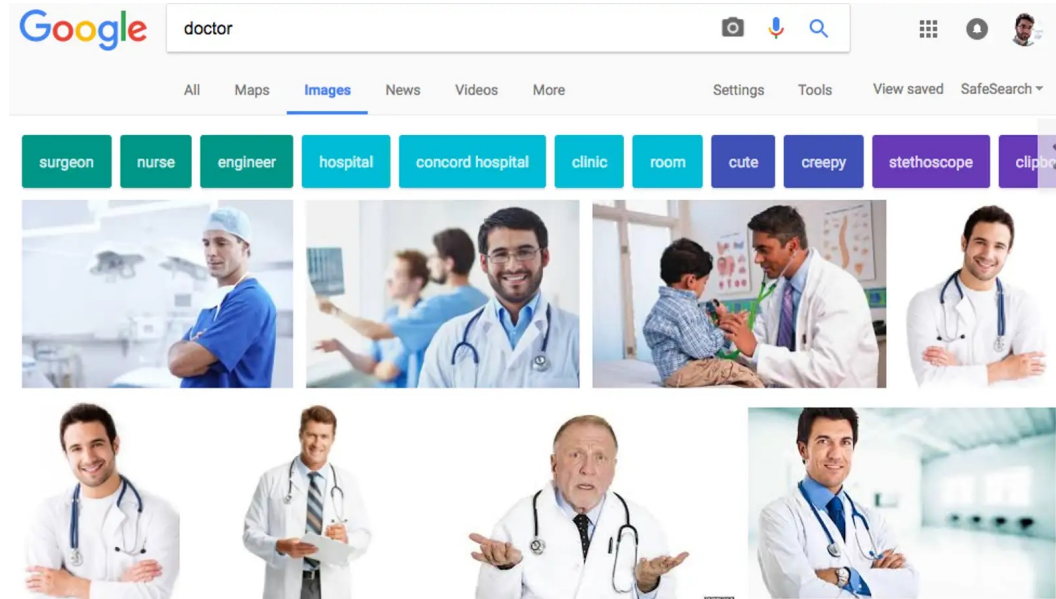
- **Algorithms**, no matter how sophisticated, reflect the biases and assumptions of the humans who create them.

## Google Image Search Results (2016)

“Doctor”

vs

“Nurse”



**"Algorithms are opinions embedded in code."** ~ Cathy O'Neil, data scientist and author of *Weapons of Math Destruction*

# Ethical Considerations

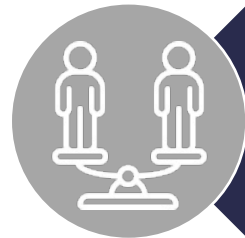
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Balancing Accuracy and Fairness



Patient Autonomy and Informed Consent



Equitable Access

# Technological Advancements



# Technological Advancements

BIG DATA

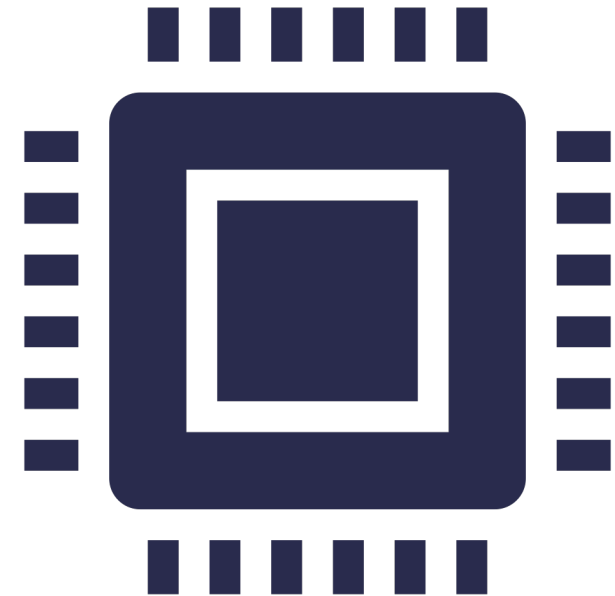
IS BIG DATA DEAD?

DATA INFRASTRUCTURE

ARTIFICIAL INTELLIGENCE

CONTAINMENT MUST BE POSSIBLE

MACHINE LEARNING





# Future Trends and Innovations



- Predictive analytics is set to revolutionize the future by providing data driven insights that enhance the personalization of care.



## AI-Assisted Decision Support Systems

- Virtual Health Assistants



## Future Innovations

- Patient Digital Twins

# The Role of Actuaries in Predictive Analytics



# The Role of Actuaries in Predictive Analytics

The role of actuaries is constantly evolving to incorporate new technologies and ideas.



Risk and Financial Impact  
Assessment



Model Development and  
Evaluation



Claims Management and  
Fraud Detection



Population Health  
Management



# Zamara's Initiative



# Zamara's Initiative

At Zamara, our aim is to help companies **unlock the power of their data.**



## Key Takeaways



# Key Takeaways

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- We should leverage the power of predictive Analytics
- We as black people should build our own Tech
- Simplicity of Data Infrastructure
- Change is here





Any Questions?

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For further inquiries, kindly contact us on:

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THANK YOU

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