

Leveraging Technology to Advance Public Health in Africa

Introduction

In today's interconnected world, social media serves as a real-time lens into public sentiment and concerns — including health. **HealthScopeAI** introduces a novel approach to public health surveillance, applying artificial intelligence to detect and map **physical and mental health trends** from social media, with a special focus on **Kenya and the broader African context**.

🦊 The SDG Challenge: Health and Well-being in Africa

UN Sustainable Development Goal 3 (SDG 3) seeks to "Ensure healthy lives and promote well-being for all at all ages." However, Africa faces several persistent health challenges:

- **Limited healthcare infrastructure**: Many regions lack adequate facilities and trained personnel.
- **Delayed outbreak detection**: Health risks are often identified too late.
- Neglect of mental health: Mental health issues are underreported and underfunded.
- Data scarcity: Lack of real-time data hinders decision-making.
- **Geographic disparities**: Regional health differences are poorly captured by existing systems.

These directly relate to SDG targets:

- 3.3: Combat communicable diseases
- 3.4: Reduce mortality from non-communicable diseases and promote mental health
- 3.d: Strengthen early warning systems for health risks

HealthScopeAl addresses these challenges by combining **Natural Language Processing (NLP)**, **Machine Learning**, and **Geospatial Analysis** into one powerful, accessible tool.

*** Key Components**

1. Early Detection System

Real-time monitoring of social media allows HealthScopeAI to detect early signs of disease or psychological distress, enabling faster response by authorities.

2. Geospatial Mapping

Health trends are analyzed by location, allowing targeted responses and resource distribution.

3. Mental Health Focus

Uncommon in traditional tools, HealthScopeAl includes sentiment analysis and keyword detection to track mental health indicators.

4. Multilingual Support

Supports English, Swahili, and Sheng to reflect Kenya's language diversity.

5. Accessible Dashboard

Built with **Streamlit**, the dashboard makes health intelligence accessible to non-technical users.

SDG Alignment

HealthScopeAI contributes to several SDG 3 targets:

- SDG 3.3: Early warning for communicable diseases
- SDG 3.4: Monitoring for mental health challenges
- **SDG 3.d**: Capacity-building for risk management
- SDG 17.18: Promoting timely, high-quality, and reliable data

Ethical Considerations

HealthScopeAI is developed with strong ethical foundations:

• **Privacy**: Aggregated analysis only, no personal identifiers stored

• Bias Mitigation: Trained on multilingual, regionally relevant datasets

• Transparency: Open-source and community-auditable

• **Cultural Respect**: Language and context-aware implementation

Data Collection Twitter, Reddit, Kaggle APIs

Text Processing spaCy, NLTK, TF-IDF, BERT

Machine Learning scikit-learn, TensorFlow, PyTorch

Geospatial Analysis GeoPandas, Folium, Plotly

Dashboard Streamlit

Impact and Future Vision

Current Impact

- Early disease detection
- Mental health awareness by region
- Resource optimization
- Data-driven policy decisions

Roadmap for Expansion

1. Expanded Social Media Sources

- Facebook, Instagram, TikTok
- Local platforms and WhatsApp communities

2. Integration with Health Institutions

- Public and private hospitals
- Pharmacies and emergency services

3. Access to Official Data

- Ministry of Health databases
- WHO regional data, DHS surveys

4. Environmental Context

• Weather, water, air quality, population movement

5. Community Reporting Tools

- Volunteer health worker apps
- Anonymous public submissions
- School absenteeism tracking

Conclusion

NLP, ML, and geospatial tools, it offers a comprehensive, proactive, and inclusive approach to SDG 3.

In regions where traditional infrastructure is lacking, HealthScopeAl brings powerful, cost-effective, scalable health monitoring capabilities. As it evolves, its impact can shape policies, guide interventions, and most importantly, **save lives**.

We welcome collaborations with governments, NGOs, researchers, and health practitioners to expand this vision.

HealthScopeAI — Giving Public Health a Social Pulse

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