From Reactive to Proactive

Using Risk Stratification and Predictive Analytics to Design Affordable Universal Healthcare

International Arab Actuarial Conference 2026

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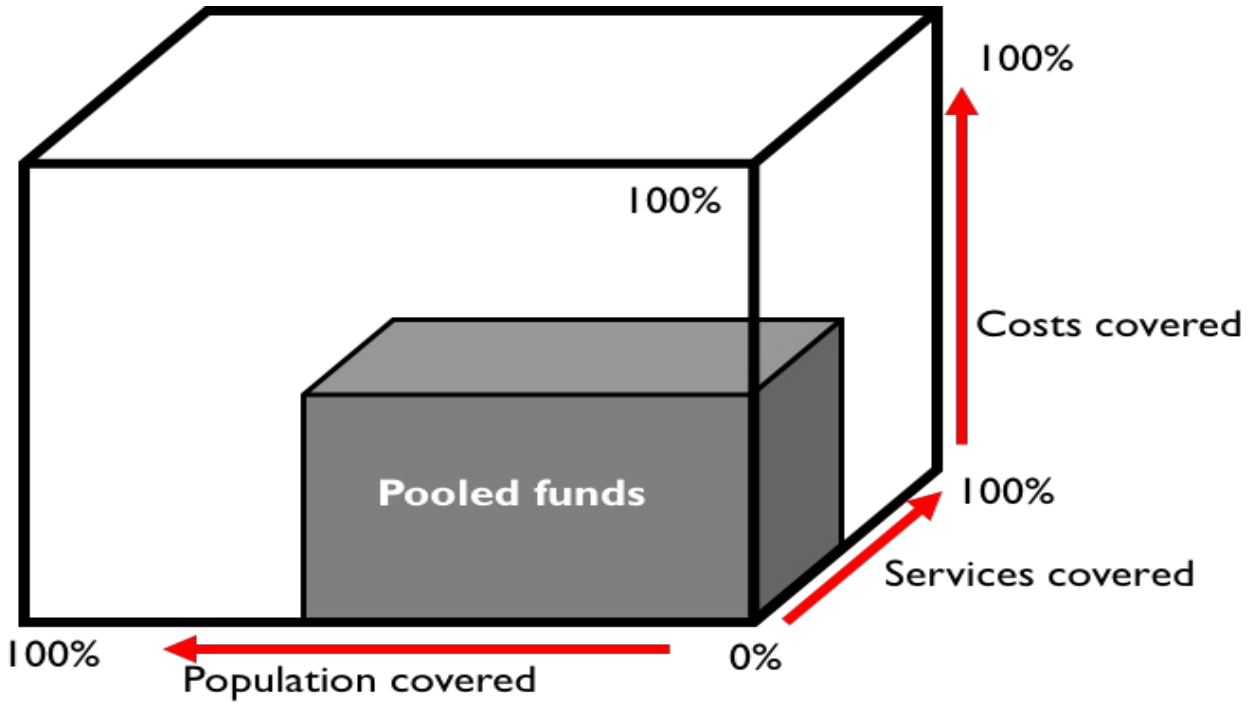
What is UHC?



World Health Organisation ("WHO"):

Universal Health Coverage - a scenario where all people have access to the health services they need, when and where they need them, without financial hardship.

Seeks to achieve equity, efficiency and quality

"Global health 2035: a world converging within a generation," vol. 382, 2013

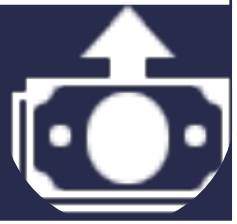
The UHC Paradox

The Sustainability Crisis

- Demographic shifts and ageing populations across many regions
- Chronic disease as a dominant driver of healthcare expenditure
- Healthcare cost growth consistently exceeding general economic growth

The "Reactive" Legacy

- Care delivery triggered after illness occurs
- Actuarial and financial models often backward-looking
- High-cost interventions concentrated at crisis points



The Missing Design Layer

- Traditional: Risk adjustment focused on fair payment for past utilisation
- Emerging: Risk stratification focused on targeted intervention for future health needs

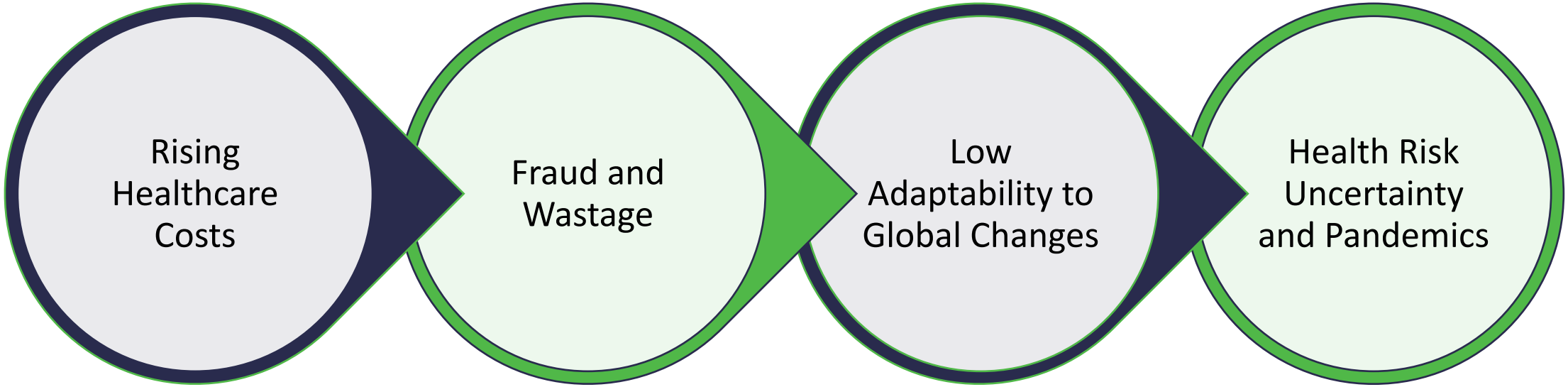
A proactive UHC system requires an intelligence layer between the patient and the provider

Predictive Analytics

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

Why Care?

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



Risk Stratification

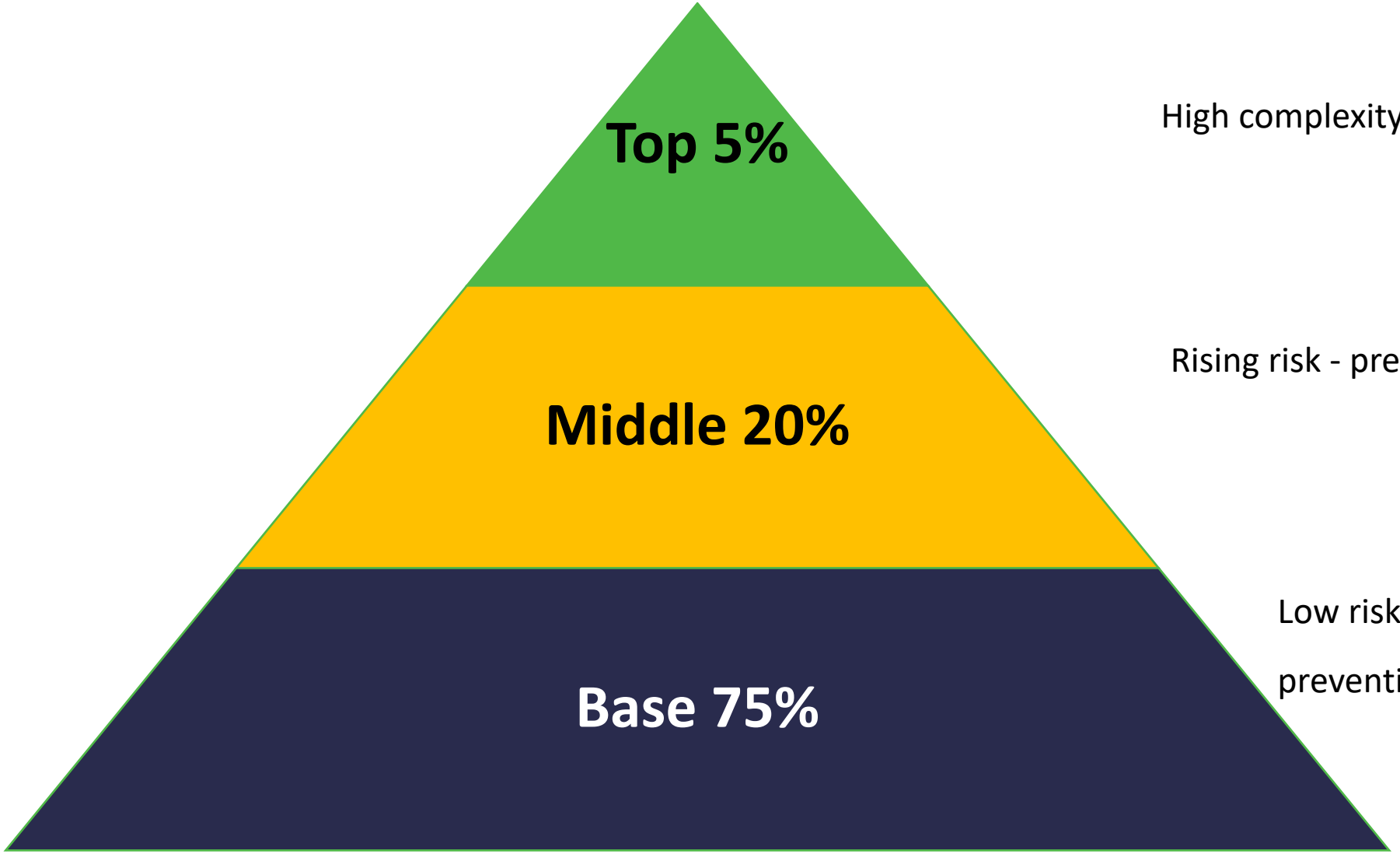
Risk stratification is the systematic grouping of individuals based on their likelihood of experiencing future health events, using clinical, utilisation, and demographic data to guide proactive care and resource allocation.

Low Risk

Rising Risk

High Risk

The Population Health Pyramid



High complexity - intensive management

Rising risk - prevention and progression control

Low risk - efficient population prevention

Case Study - **Singapore's Healthier SG & Discovery AI**

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The Challenge

- Hospitals alone are unsustainable
- Need to prevent chronic disease complications

Proactive Approach

- Citizens enrolled with a single-family physician
- Discovery AI integrates health records, lifestyle, and admissions

Actuarial Models

- Predicts multiple readmissions (~70% accuracy)
- Flags risks 40 weeks before clinical crisis
- Shifts spending from hospital claims → preventive care

Impact

- Reduces nurse vetting workload by 10–15%
- Enables proactive budget allocation
- Focuses resources on high-risk patients

Challenges & Ethical Considerations

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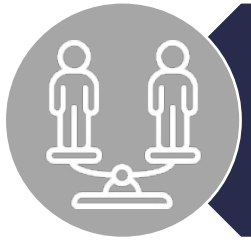
Balancing Accuracy and Fairness

Patient Autonomy and Informed Consent



Equitable Access

Zamara's Initiative

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

The Actuarial Call to Action

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From Data Crunchers to System Architects

- Integrate fragmented data into usable intelligence
- Focus on rising-risk populations
- Measure success through health outcomes, not just cost containment

Thank You!

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