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POTENTIAL RETURN ON SUBSCRIPTION TO SMART-PHONE BASED DIGITAL HEALTH RISK ASSESSMENT

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Introduction

With more than 800 million people globally being obese, 6.4% of the world's population estimated to have diabetes by 2030 and with mental disease on the rise, the economic burden of medical interventions to address these issues is too high to sustain. To prevent the progression of this global health and economic crisis, there is an urgent need for effective prevention and treatment strategies at individual, community, and national levels, tailored to regional and socioeconomic contexts.
In parallel, technological advancements now make large scale risk assessment more accessible, and data science has evolved such that reliable analysis of risks is possible.

Technology

A smartphone-based tool to analyse digital biomarkers obtained through camera sensor inputs from the finger, face, and body in under 15 minutes, and returns a health risk assessment report in real time.

This technology reports information about potential health risks across six categories, including metabolic syndrome, diabetes, cardiovascular disease, and individual risk factors associated with these conditions, helping individuals make healthier choices or seek further assessment and treatment.

The assessment is based on proprietary risk assessment algorithms developed from extensive published literature, clinical guidelines, and expertise in medicine, science, and technology. It leverages AI trained using large datasets from real world databases including NHANES, and bespoke data collection.

Objective

Evaluate the budget impact of smartphone-based pre-screening in Singapore and the USA, where users with elevated risk estimates take action to prevent disease and avoid subsequent complications. Diseases screened for include metabolic syndrome, obesity, hypertension, type II diabetes, hyperlipidaemia, and mental health conditions (depression and general anxiety disorder).

Methodology

This study used a budget impact model to estimate cost savings from reducing clinical interventions for individuals who, due to early intervention, avoided disease onset or complications.

Health care costs—including professional services, hospitalisations, medications, and complication management—were obtained via PubMed for conditions such as obesity, metabolic syndrome, pre-diabetes, diabetes complications, depression, and anxiety.

A decision tree model evaluated the reduction in cases and complications achievable through early risk assessment and intervention for those at risk. Clinical outcomes data, including cases avoided and remission rates, were sourced from relevant literature to assess the budget impact of early preventive measures on disease progression.

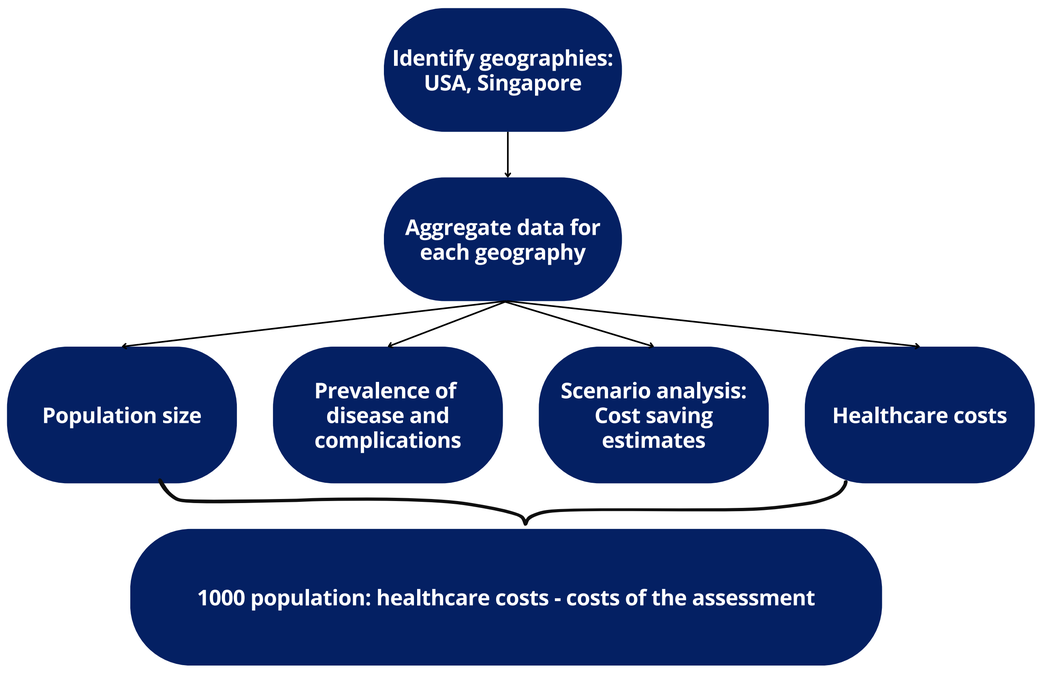
Results

Clinical outcomes
From literature, we identified a range of estimates for prevention rates achievable through identification of risk factors and early intervention with metformin or diet and exercise. The more conservative estimates found that prevention of up to 15% of diabetes type II cases was possible over two years in Singapore and up to 10% over five years in the USA. Screening for depression and anxiety may increase the identification of new cases requiring treatment by 20% within the screened group, enabling earlier intervention.

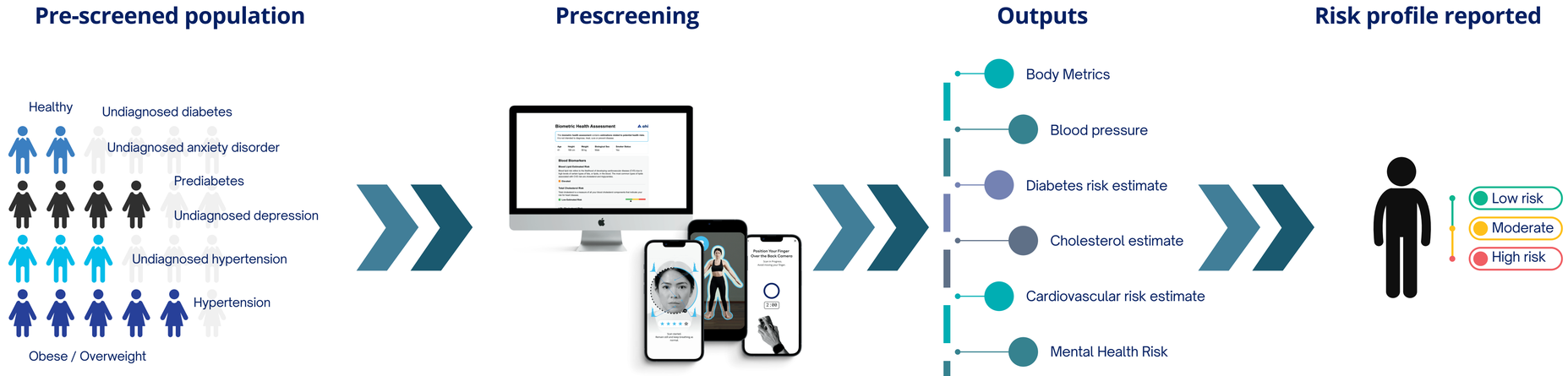
Associated cost savings
A base case analysis was conducted on smartphone-based health assessments on 100,000 individuals per market at a cost of SG$1.2 million in Singapore and US$5–10 million in the USA.

In Singapore, reduced complications and resource use could save SG$76.52 per person over two years, with potential savings rising to SG$134 and a conservative cost-benefit ratio of 2.0. Savings include costs for treatment, hospitalisation, and complication management.
In the USA, per-person savings of US$344.01 over five years could total US$29 million, with a cost-benefit ratio of 2.91 to 5.82. These savings come from reduced second-line therapies and lower treatment costs for complications.

Process to determine ROI



Risk estimation process



Conclusions

Early intervention is advocated, to provide considerable cost savings in the medium to longer term in both geographies.

The availability of remote risk assessment and disease prediction technology and its advanced ability to also predict graded risk using AI, may be very cost-effective.

The potential for the solution to give a very favourable return on investment in health systems and to give valuable insights into the health of users served, is high.

The easy-to-use technology makes greater proactivity in assessing large populations, cost-effective and less prohibitive.

The return on investment model should be adaptable to other geographies.

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A more comprehensive list of references is available

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