

Organization, Team, and the Initiative



Ministry Of Health is an innovative, people-centred organisation, committed to medical excellence, the promotion of good health, the reduction of illness, and access to good and affordable healthcare for all Singaporeans, appropriate to their needs.



Data Analytics Division is a team of data scientists, data analysts, and health economists that apply AI, ML, operations research, systems modelling, geospatial analytics, forecasting, econometrics, visualisation, and primary research in support of MOH's priorities in policy formulation and review, service planning, and operations.

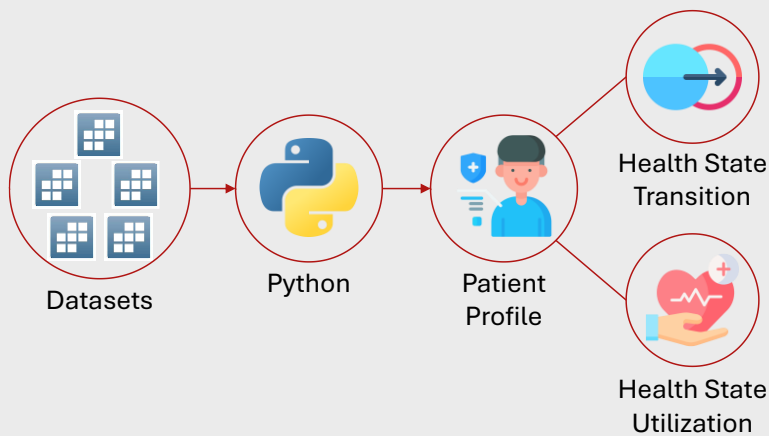


Healthier SG is a major transformation initiative of Singapore's healthcare system that intends to shift the emphasis from reactively caring for those who are sick, to proactively preventing individuals from falling ill.

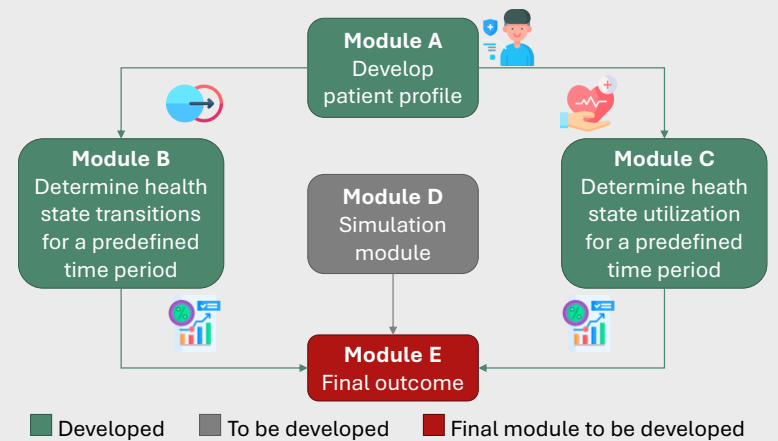
The Project – Data, Tools, Model, and the Modules



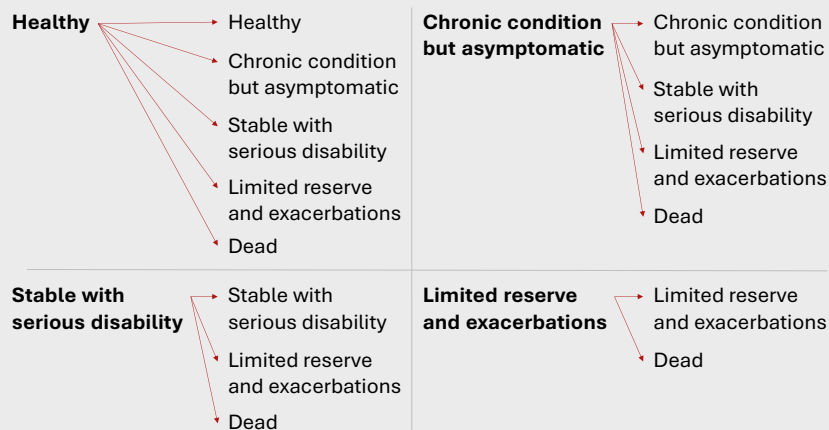
Objective: Develop a systems dynamic model that could quantify and simulate the impact of Healthier SG features on chronic disease prevalence, infection, and healthcare utilization in Singapore. A systems dynamic model is a continuous simulation model that uses hypothesized relations across activities and processes, dealing with complex data and datasets (Olson, 2003).



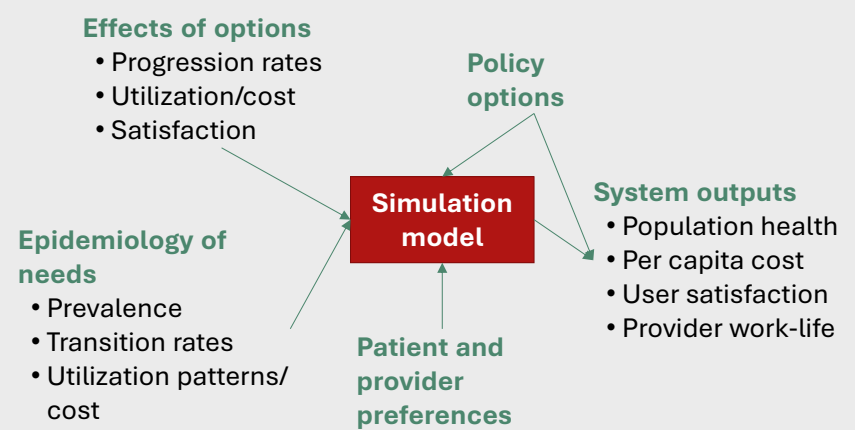
Data Exploration and Patient Profiling



Representation of Modules of the Systems Dynamic Model



Representation of Health State Transitions (Matchar, 2021)



Representation of the Simulation Module (Matchar, 2021)

Results



- The model can efficiently **calculate and project population transition** into different health states and the corresponding **healthcare service utilization** up to 2040
- Forms the backbone** as the team can include other parameters in the model based on scope development, helping with simulation in the future
- Forms the foundation for future iterations** as the same framework can be used to simulate other kinds of policy interventions
- Imperative for policy making decisions**, such as **resource planning** including ramping up of infrastructure and manpower
- The parameterized and modularized format** of the model can be seamlessly tailored to accommodate the expanding scope



Technical takeaways

- Develop an MVP** for the users to get a first-hand experience and enable a feedback and continuous improvement loop.
- Parameterize variables** for seamless scope expansion
- Modularize** to enable simultaneous ownership and programming of the model by a team of analysts
- Maintain change log, progress files, and documentation** for efficient handover
- Address the anomalies and the gaps** through research and SME insights



Non-technical takeaways

- Be proactive** about updating the leadership and relevant stakeholders about the progress of the project
- Liaise with SMEs and specialist third parties** to improve model inputs, and the outcome
- Keep **communication** lines clear
- Network** with member of one's team and other teams and learn from their experience and tacit knowledge

Acknowledgement



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