EXECUTIVE SUMMARY

1. Rising life expectancy and increased prevalence of neurodegenerative risk factors such as stroke, obesity, diabetes and hypertension have contributed to rapid increases in the worldwide prevalence of neurological and sense disorders (NSD). The World Health Organization (WHO) predicts that by 2040, as many developed countries' population age, neurodegenerative diseases such as dementia, and Parkinson's disease, will overtake cancer to become the second leading cause of death after cardiovascular diseases. Singapore mimics global trends in life expectancy and the prevalence of NSD. For instance, the prevalence of Parkinson's disease in Singapore is found to be comparable to Western countries. Singapore's population is also ageing rapidly.

2. Research plays an important role in helping Singapore tackle these challenges. NSD is one of the domains which has received substantial research funding in Singapore, and is also a priority disease area for research as identified by MOH. As part of the planning of the Health and Biomedical Sciences (HBMS) Integrated Strategy, the HBMS Executive Committee (EXCO) appointed the Neurological and Sense Disorders Taskforce (NSTF) to develop a national strategy to guide future efforts in NSD research.

3. In order to identify priority disease areas for the HBMS initiative to devote resources to fund key research areas in an "all the way" manner, the NSTF adopted a consultative approach and solicited feedback from researchers, clinicians and policymakers through a workshop and an email survey. Four subpanels were established within the NSTF to conduct a deeper analysis of the main priority areas which have been identified, namely (1) Ageing related diseases and complications; (2) Neuropsychiatry; (3) Neurotechnology; and (4) Sense Disorders. The Taskforce developed a mixed qualitative and quantitative matrix to evaluate and rank the various research areas based on factors such as local disease burden, availability of research talent and capabilities, and industry interest.

4. Through this process, the Taskforce identified **Neurodegenerative diseases** as a single priority theme in NSD research for the HBMS Open Fund - Large Collaborative Grant (OF-LCG), specifically focusing on the following sub-themes:

a. **Vascular dementia & Parkinson's disease**
   Challenge Statement: To reduce the disease burden and hospital readmission rates of vascular dementia and Parkinson's disease by 10-20% in ten years.
b. **Age-related macular degeneration (AMD) & glaucoma**
   Challenge Statement: To reduce the prevalence of age-related blindness and vision loss by 20% within ten years in the national population and reducing complication of eye diseases by 20% within ten years in the at-risk population in Singapore.

5. In addition to the recommended theme for the OF-LCG, the NSTF recommends focusing on building capabilities in the mental health and neurotechnology fields over the next ten years. The research focus areas for the ten-year roadmap are:

a. Neurodegenerative diseases (vascular dementia & Parkinson's disease);
b. Neurodegenerative eye diseases (AMD and glaucoma);

c. Mental health research (depression);
d. Neurotechnology (neuro-imaging and analytics, brain and nerve stimulation, brain-computer interfaces (BCI), and clinical translation technologies);
e. Other diseases;
    i. Myopia;
    ii. Stroke.

6. The long term vision of NSTF is to advance Singapore into a world leader in NSD research, particularly in neurodegenerative diseases such as vascular dementia, Parkinson's disease and neurodegenerative eye diseases such as AMD and glaucoma, to create health and economic value for Singaporeans. To achieve this vision, the NSTF identified several roadblocks and made specific recommendations to improve the local research ecosystem in this report. The recommendations are as follow:

a. Provide a clear framework for the translation of research outcomes into health and economic benefits;
b. Increase public engagement;
c. Resolve regulatory, ethical and legislative barriers;
d. Establish national infrastructure platforms and services;
e. Improve coordination and collaboration of research efforts; and
f. Establish clear pathways for career development and groom manpower trained in interdisciplinary skills.