

**INFECTIOUS
DISEASE
TASKFORCE
REPORT**

EXECUTIVE SUMMARY

1. Emerging and re-emerging infectious diseases (IDs) continue to pose a substantial threat worldwide, due to their health, social, and economic impact. With improved global connectivity, Singapore as a travel and trade hub is increasingly exposed and vulnerable to threats posed by emerging IDs (EIDs) around the world. In addition, Singapore continues to grapple with the challenges posed by endemic IDs such as dengue fever, tuberculosis (TB), antimicrobial-resistant (AMR) pathogens and the human immunodeficiency virus (HIV).

2. Research plays an important role in helping Singapore tackle these challenges. ID is one of the domains which has received substantial research funding in Singapore. As part of the planning of the Health and Biomedical Sciences (HBMS) Integrated Strategy, the HBMS Executive Committee (EXCO) appointed the ID Taskforce (IDTF) to develop a national strategy to guide future efforts in ID research.

3. The IDTF has identified priority disease areas for the HBMS initiative to devote resources to fund key research areas in an “all-the-way” manner, based on criteria such as (a) local disease burden; (b) overall impact on Singapore (including social and economic impact); (c) impact of research to disease control programmes and policy; (d) impact of research on scientific excellence; (e) current talent and future development; (f) potential for Singapore to be an international leader; and (g) attractiveness to industry.

4. The IDTF has also identified the top three disease areas for future Open Fund – Large Collaborative Grant (OF-LCG) research themes:

(i) **Respiratory tract infections (RTIs) and pandemic threats;**

Challenge Statement: To utilise basic, clinical, public health and translational research to build capabilities to understand the factors influencing the transmission of pathogens, and to develop novel pharmacological and public health approaches for disease control. These capabilities will be used to build a system¹ that could provide early detection of RTIs/EIDs and aid in prevention of tertiary transmission of these diseases in Singapore’s densely urban context, contributing to the reduction of case counts and socio-economic costs.

(ii) **AMR/healthcare-associated infections (HAIs); and**

Challenge Statement: To utilise basic, clinical, public health and translational research to understand the characteristics and development of antimicrobial resistance, to develop better infection prevention measures, and to reduce inappropriate prescription of antimicrobial agents. This will contribute to a significant and sustained reduction in the burden of HAIs and AMR in Singapore hospitals, particularly with regard to carbapenem-resistant Enterobacteriaceae (CRE) and/or methicillin-resistant *Staphylococcus aureus* (MRSA).

¹ The actual implementation of the system should not be funded from the OF-LCG.

(iii) **Dengue and vector control.**

Challenge Statement: To utilise basic, clinical, public health and translational research to understand the virus, host and entomological factors influencing dengue spread, to develop new dengue prevention and vector control methods, and to determine the effectiveness of these methods in the Singapore context. This will support the national goal to reduce the overall burden and impact of adult dengue, and other IDs transmitted by the same vectors.

5. In addition, the IDTF recommends that Singapore invest in the following research priority areas in the next 5–10 years: (i) pandemic threats, (ii) RTIs, (iii) AMR and HAIs, (iv) vector-borne diseases, (v) AIDS/HIV, (vi) TB and (vii) health services research (HSR) and socio-behavioural sciences.

6. To assist in the development of the roadmap, the IDTF has identified gaps in the current ecosystem that impede ID research in Singapore, and recommended ways to address them. The recommendations are as follows:

- a. Establish leadership and mechanisms to address ID research needs, translate research into health and economic outcomes, and improve coordination;
- b. Build research capabilities in social science in ID;
- c. Build and participate in regional and global ID research networks; and
- d. Building a talent pool (especially PhDs) in (i) microbiology and bacteriology, (ii) socio-behavioural sciences, (iii) health economics and HSR and (iv) applied biostatistics, computational biology, bioinformatics and big data analysis.