PRECISE- IHCC Conference 2024 (International Cohort Summit 6) Executive Summary

"From Cohorts to Clinics: The New Landscape of Global Healthcare"

This year's summit, the **PRECISE-IHCC Conference 2024**, was a collaborative effort between IHCC and PRECISE, held in Singapore from 21-23 August. Over 700 attendees from 30+ countries gathered to explore advancements in precision medicine and its global impact, from cohorts to clinics. With 55 speakers covering 17 thematic topics—ranging from cancer genetics to genomic science—the conference showcased cutting-edge research and fostered collaboration. Daily networking breaks, lunchtime industry talks, and oral presentations further enriched the experience, alongside 105 poster presentations. Each day all sessions, except for the lunchtime industry sessions, followed a panel format, with three speakers presenting for 20 minutes each, followed by a comprehensive group Q&A, fostering rich interaction and the exchange of ideas. The conference saw active engagement from 60+ early career investigators, especially during the fireside chat on Day 2. Watch our conference highlight video here!

Over the course of three days, the conference addressed these six aims:

- **Aim #1 Encourage Scientific Exchange**: Thought leaders, policymakers, researchers, and industry stakeholders in the field of precision medicine will have a platform to share their insights, discoveries and findings, facilitating cross-pollination of ideas and methodologies.
- **Aim #2 Translate Precision Science to Impact Patients**: Provide a unique opportunity to bring together the scientific community, clinicians, patients and other stakeholders to integrate scientific advances into patient care, reshaping the landscape of modern healthcare.
- **Aim #3 Showcase Global Advancements in Genomic and Precision Medicine**: Showcase cutting-edge, cost-effective, and clinically effective healthcare solutions and demonstrate a collective dedication to making these advancements accessible, equitable, and beneficial across different populations worldwide.
- **Aim #4 Bring Diverse Perspectives on Global Challenges**: Bring together esteemed speakers from global precision medicine programs across the globe, to provide diverse insights into the latest developments in this rapidly evolving field.
- **Aim #5 Champion Early-Career Scientists in Genomic and Precision Medicine**: Provide emerging researchers with opportunities to showcase their work, gain invaluable insights from the frontiers of genomic research and precision medicine, and engage with leading professionals.
- **Aim #6 Enhance Cohort Studies and Biobank Integration for Translational Impact**: Spotlight the critical role of extensive cohorts and biobanks in advancing genomic and

precision medicine to ensure that innovations reach the bedside with ethical integrity and global inclusivity.

Day 1 began with a welcome address by Prof. Patrick Tan, who emphasized the shared passion uniting the diverse audience: leveraging precision medicine to enhance patient outcomes, from research cohorts to clinical practice. This was followed by an opening address from the Guest of Honor, Dr. Janil Puthucheary, who highlighted the tangible impact of Singapore's National Precision Medicine Programme. He illustrated how the programme has transformed clinical outcomes, operations, and medical practices, showcasing Singapore's pivotal role in advancing population health and driving the development and implementation of precision medicine. Following the welcome & opening remarks, we heard from our first plenary speaker, Prof Dame Sue Hill on the UK's National Health Service leadership in the field and its commitment to integrating genomic medicine for both individual and population health through the NHS Genomic Medicine Service's efforts to integrate genomics into routine clinical practice while also ensuring equitable access to genomic medicine across the UK.

Following the first plenary, the conference continued with a series of engaging sessions throughout Day 1. In the morning, the **Ethics and Policy** session delved into multifaceted ethical considerations in precision medicine, from genetic testing and gene editing to the broader political and social implications of genomics. The session underscored the importance of inclusivity, transparency, and collaboration in shaping the future of ethical precision medicine.

After a short break, the afternoon plenary session took place, where Prof Patrick Tan discussed how Singapore's National Precision Medicine (NPM) Programme is shaping the future of healthcare in Singapore and beyond, with a strong focus on precision medicine, data integration, and global collaboration. The NPM prioritizes genomic diversity and inclusion and is transforming not only healthcare delivery but also the health economy, benefiting individuals and communities through personalized, data-driven strategies using high-quality longitudinal health data. This session was followed by two sets of afternoon parallel tracks. Attendees could choose between the first set of tracks: Data-Driven Discovery or Complex Traits/Variant Resolution. The **Data-Driven Discovery** session highlighted how data-driven approaches, including the use of AI and genomics, are revolutionizing drug development and precision medicine. Global data sharing, strong collaborations, integration of diverse data, and a focus on prevention and early intervention were emphasized as critical for improving patient outcomes and advancing personalized healthcare. The **Complex Traits/Variant Resolution** session emphasized the importance of using multi-trait PRS models, advanced machine learning, and new technologies like MapBatch in precision medicine. Furthermore, there is a need for including diverse populations in genomic research to make predictive models accurate for different genetic backgrounds. The second set of afternoon tracks allowed attendees to choose between Cancer Genetics or Genomic Screening. The **Cancer Genetics** session highlighted the importance of personalized, data-driven approaches in cancer care, the need for targeted genetic research, and the role of global collaboration and data sharing in advancing cancer detection and treatment. The **Genomic Screening** session noted the shift toward more

comprehensive, cost-effective, and accessible genetic testing, including expanded carrier screening and newborn screening. Advanced technologies like multiplex PCR and WGS enable more accurate early detection of genetic diseases. However, ethical concerns, data re-evaluation, and the role of genetic counselors remain key challenges as genomic screening expands.

Day 2 started with a powerful key note from Prof Kathryn North with a message on the transformative potential of genomic medicine to improve patient outcomes through strategic collaboration, government support, and a focus on equity. She discussed the importance of building a genomically literate workforce and Australia's success in integrating genomic testing into healthcare. The following session on **Biobanks for Precision Medicine** highlighted how biobanks and large-scale cohort studies advance precision medicine by providing diverse genomic data, promoting equity with inclusion of underrepresented populations, enabling global collaborations, and delivering actionable results to improve patient care. In the next morning session, we explored rethinking **Pharmacogenomics in** Asia and Africa, emphasizing the importance of training healthcare professionals in pharmacogenomic implementation, and developing tailored strategies to address regional differences in disease burden, genetic diversity, and drug metabolism.

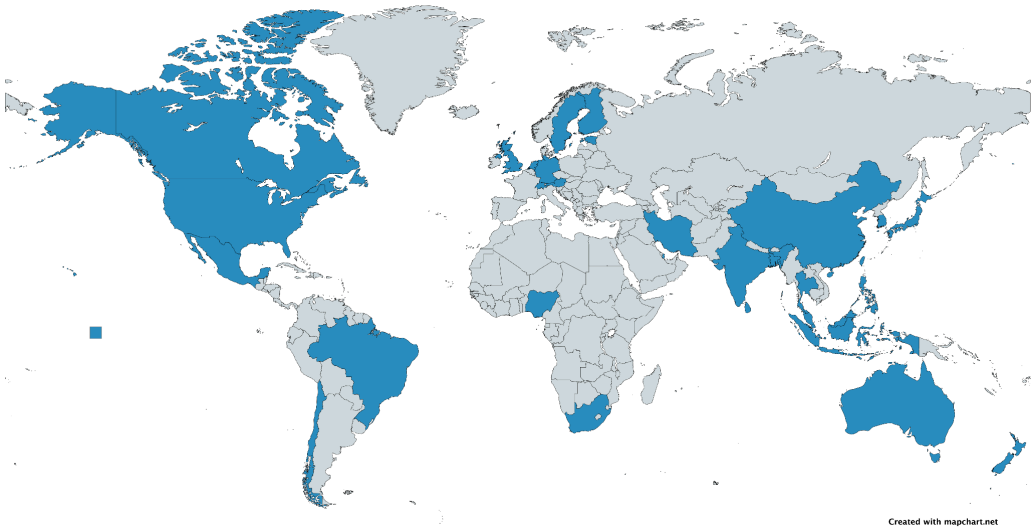
In the afternoon, there was a fireside chat with senior researchers where early career investigators were encouraged to pursue mentorship, build strong networks, embrace adaptability, and explore opportunities that align with their passions while navigating the unique challenges of academia and industry. The sessions parallel to the fireside chat covered Rare Diseases and a continuation of the morning topic, Biobanks for Precision Medicine. The second **Biobanks for Precision Medicine** session highlighted the importance of innovative data collection, data linkage to health records, and integration of various data sources such as genetic, epigenetic, proteomic, and clinical data across biobanks. While the session on **Rare Diseases** highlighted the challenges in diagnosing rare diseases, knowledge exchange and sharing of resources, and the transformative role of technology in rare disease research, including genomic sequencing, AI-assisted phenotypic analysis, and hybrid models that combine local and international resources. These innovations are crucial in addressing diagnostic challenges and improving patient care in resource-limited settings. The following parallel session on **Genomic/Precision Medicine for Therapeutic Research & Development** advocated for embedding multimodal discovery in pharmaceutical R&D and transforming drug discovery with large-scale genomics and collaborative public-private partnerships. At the same time, the session on **Training/Early Career Scientists** highlighted the importance of integrating genomic research with clinical practice, advocating for tailored training programs that equip early-career scientists with the skills necessary to bridge this gap between basic research and clinical practice. The session showcased global training initiatives, such as the African Genomic Medicine Training Initiative, which addresses the need for customized educational frameworks aligning with the cultural and contextual needs of local genomic researchers, ultimately preparing them to tackle real-world clinical challenges.

Prof Vajira Dissanyake, the chairman of the GGMC Board of Directors, opened the final day of the conference with a plenary session encouraging global collaboration to integrate genomic medicine into universal health coverage, emphasizing its transformative potential to improve patient outcomes, particularly in low- and middle-income countries, through education, capacity building, and strategic investments in infrastructure. After the plenary, the session on **Genomic Diversity** noted addressing underrepresentation of non-European populations and conducting genetic studies tailored to specific populations as essential to improving health equity and the effectiveness of precision medicine. The following session on **Research in LMICs** showcased the transformative potential of genomics through international collaboration, capacity building, and cost-effective innovations tailored to resource-constrained settings. It illustrated the importance of localized data, ethical practices, and scalable study designs to overcome challenges and integrate precision medicine into patient care, advancing global health equity. The afternoon parallel session on from **Cohorts to Data Validation** emphasized the critical need for high-quality, harmonized, and standardized cohort data to advance biomedical research and improve healthcare outcomes. Effective data management, including addressing cross-border migrations, population diversity, and legal frameworks for data protection, was noted as essential for integrating and interpreting data across diverse settings. The parallel session on **Genetic Counseling and Community Engagement** focused on the pivotal role of genetic counseling in precision medicine, detailing initiatives like Malaysia's Global Innovation and Creativity Centre project and Qatar's genetic services that integrate genetic testing into healthcare. The speakers stressed the importance of community engagement, ethical data handling, and addressing challenges like workforce shortages and data standardization to translate genomic insights into improved patient care and health outcomes. The last two parallel sessions were **Population Health** and **Genomic Science in Cohorts**. The population health session explored using diverse population genetics and environmental data to improve disease prevention and treatment through tailored, collaborative, and community-specific healthcare interventions. While, the Genomic Science in Cohorts session demonstrated how mapping underrepresented populations can uncover novel genetic variations and structural variants that improve understanding of health outcomes and enable equitable precision medicine across global communities.

Overall, the conference successfully advanced the concept of ‘From Cohorts to Clinics’ by fostering a dynamic platform for scientific exchange, showcasing global advancements in precision medicine, and translating cutting edge genomic research into actionable patient care. Through diverse perspectives, equitable solutions, and support for early-career scientists, the conference emphasized the critical role of biobanks and cohort studies in transforming modern healthcare. We extend our sincere thanks to all participants and contributors for making this conference a significant step forward in reshaping the future of precision medicine. We look forward to continuing our work and reconvening at the next conference.

Videos of all presentations given during this conference can be found on the GGMC YouTube channel here.

718 participants | 32 countries | 200+ organizations



On behalf of the organizing and scientific committee of the PRECISE-IHCC Conference 2024, we extend our deepest gratitude to our generous sponsors. Your support was instrumental in making this global gathering of healthcare professionals, researchers, and innovators possible. THANK YOU!

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