Impetus

Health Sciences Authority
Annual Report
2008-09

Contents

Impetus

Impetus

Over the past year, an unprecedented global financial economic crisis and the developing Influenza A (H1N1-2009) pandemic have combined with accelerating advances in the scientific areas of relevance to HSA to rescope the challenges of the dynamic environment in which our organisation operates.

HSA has responded to these developments with equanimity, reviewing our priorities, strategies and business continuity plans to ensure relevant and timely responses, while never losing sight of our vision of protecting and advancing national health and safety. We continue to be fired by the impetus of shaping an HSA that will not only meet the challenges of the present but take us into the future, living out our Core Values to fulfill our fundamental mission of safeguarding public health.

This impetus is driven by the unique combination of skills and strengths from the dedicated team that makes up HSA. Our Corporate Headquarters strategically drives all policies and programmes in sync with the organisation's overall direction. Our Health Products Regulation Group vigilantly ensures that its regulatory decisions are not only managing key issues in the ever-evolving biomedical, economic and social landscape, but are also addressing them in innovative ways. Our Blood Services Group steadfastly keeps in focus its mission to provide our nation with a safe and sustainable blood supply, while promoting cutting edge research in cell processing. Our Applied Sciences Group is consistently committed to authoritative actions that ensure sound and current decisions in the forensic and analytical sciences, and growing the new area of chemical metrology.

We are confident that we can and will continue to advance and meet the challenges of the future with momentum, focus, determination and ingenuity - a synergised scientific authority inspiring trust, serving our nation.

Our Vision

To be the leading innovative authority protecting and advancing national health and safety

Our Mission

- To wisely regulate health products
- To serve the administration of justice
- To secure the nation's blood supply
- To safeguard public health

Our Core Values

- **Service to the Nation**
  We are part of the Singapore Public Service, committed to integrity, excellence and efficiency.

- **Passion for Excellence**
  We aim to be the best in all that we do.

- **Develop Our Community**
  We value our people and build trusted teams.

- **Inspire Trust**
  We act with credibility, professionalism and integrity, to instill public trust and confidence.

- **Live Innovation**
  We seek constantly to improve and transform.

A Statutory Board of the Ministry of Health
The Singapore Public Service: Integrity, Service, Excellence

Our Accolades

ORGANISATIONAL EXCELLENCE

Singapore Quality Class
since 2009

People Developer Standard Certification
since 2002

Singapore Innovation Class
first public healthcare agency to be endorsed
2003

Singapore H.E.A.L.T.H. Gold Award
since 2005

Public Service Award for Organisational Excellence
2006

Meritorious Defence Partner Award
since 2005

Community Chest Awards
since 2003

Singapore Family Friendly Employer Award
2004

ISO 9001:2000
Information Management Department, Corporate HQ
2007

PROFESSIONAL EXCELLENCE

HEALTH PRODUCTS REGULATION GROUP

ISO 9001:2000
Tobacco Regulation Unit
March 2008

BLOOD SERVICES GROUP

American Society for Histocompatibility and Immunogenetics (ASHI)
August 2008

AABB Accreditation
first national blood service in Asia to be accredited
May 2006

Certified On-the-Job Training Centre
December 2005

Regional Quality Management Project Training Centre of the Western Pacific for Transfusion Medicine
since 2002

World Health Organisation Collaborating Centre for Transfusion Medicine
since 1992

APPLIED SCIENCES GROUP

Forensic Medicine Division

National Association of Medical Examiners (NAME)
first agency outside North America to be accredited
September 2005

Commendation for Significant Contribution in Helping Singapore Overcome SARS
March - May 2003

Accreditation of Laboratory for Pathology Training
by The Royal College of Pathologists of Australasia
since 1999

Forensic Science Division & Illicit Drugs and Toxicology Division

Excellence for Singapore Award
1999

American Society of Crime Laboratory Directors/
Laboratory Accreditation Board (ASCLD/LAB)
since June 1996

Pharmaceutical Division & Food Safety Division

Public Service Award for Organisational Excellence
July 2003

Singapore Quality Class
since August 2002

ISO/IEC 17025 Accreditation under Singapore Accreditation Council
– Singapore Laboratory Accreditation Scheme (SAC-SINGLAS)
since 1997

Pharmaceutical Division

World Health Organisation Collaborating Centre
for Tobacco Testing and Research
since June 2009

World Health Organisation Prequalified Quality Control Laboratory
since June 2009

EC-ASEAN Leading Country for Colourants and Tretinoin Analysis in Cosmetic Products
since 2004

World Health Organisation Collaborating Centre for Drug Quality Assurance
since February 1993

Food Safety Division

EC-ASEAN Reference Laboratory for Mycotoxins Analysis
since June 2004

World Health Organisation Collaborating Centre for Food Contamination Monitoring
since July 1992

Chairman's Foreword

Impetus – the eighth Annual Report of the Health Sciences Authority – fittingly encapsulates the essence of the agency's progress and priorities over the past year.

Driven by a spirit of innovation, we rose to meet the challenges and demands of our ever-evolving environment. Whether through adjustments of work processes, or by effecting major change in testing methods from our scientific research, we were constantly on the lookout for newer and better ways to run our business, advance our science-based agenda, and exceed the expectations of our stakeholders.

HSA continually strives to safeguard public health and has implemented plans and strategies in support of this. We do this with a strong mission-oriented mindset, conscious of the critical role we play in strengthening Singapore's reputation as a leading medical hub and centre of biomedical excellence.

We directed efforts towards strengthening ties and partnerships with parties and agencies in the public, private and people sectors, both locally and overseas. These collaborative alliances continue to provide us with a greater capacity to develop more creative and practical solutions to deal with global and local matters in the health sciences.

Through fresh approaches in our business operations and new communication channels, we redoubled our efforts to engage our customers and improve the experience of individuals and organisations interacting with HSA staff.

There was a palpable sense of excitement as we grew in new ways. We had the privilege of sharing our expertise, experiences and successes with various audiences around the world and who were keen to learn about our experiences. Such opportunities allow us to influence national and global public health and safety in a positive and sustainable manner.

Our distinctive blend of professional expertise and know-how presents unique possibilities to explore innovation in our regulatory and laboratory arenas. We continued to harness synergy within and across our organisation which helped us deliver on our key accountabilities more competently and efficiently. Our Applied Sciences Group expanded the accredited screening list for western drug adulterants in herbal medicines, as well as applied conventional and novel forensic techniques to enhance our Health Products Regulation Group's enforcement capabilities and advance our fight against illegal and counterfeit drugs. Drawing on this in-house expertise across a broad spectrum of scientific fields will not just strengthen the unified identity of HSA, but will empower us to forge fresh momentum to continually transform ourselves and actively shape our future.

As a science-based and science-led organisation, our decisions and actions are always guided by the highest standards of professional integrity and scientific rigour. This is strongly linked to our aim to inspire trust and confidence in meeting the needs of our stakeholders and finding solutions for critical issues that we deal with, regardless of how complex these may be.

We have much going for us, in spite of being a relatively young organisation. We have many good reasons to be optimistic about our future, and these give us the added impetus to grow and advance. Bolstered by the professionalism and passion of the HSA team, this outlook is founded on the underlying strengths of the firm scientific foundations and legacy on which our organisation is built, the tremendous potential of synergistic collaborations within the agency, the power of partnerships with our key counterparts locally and globally, and the promise of new breakthroughs in our research and scientific and organisational collaborations.

I would like to commend and thank the leadership and staff of HSA for another year of sterling work and dedication in enabling our agency to move decisively forward in serving the nation and the world.

Professor Edison Liu
Chairman

CEO's Preface

HSA continued to make good progress over the past year in a dynamic operating environment. Through the strong commitment of the HSA team, we became a Singapore Quality Class organisation this year and were also re-certified for the People Developer and Singapore Innovation Class standards. This affirmed that our key organisational systems, processes and initiatives are robust and responsive for our journey ahead. We continued to strongly emphasize our Core Values and living these out to grow the responsible, innovative culture rightfully associated with a national scientific and regulatory authority.

We completed a holistic review of our human capital framework that simplified and streamlined our schemes of service. From this, we rolled out a new performance appraisal framework to enable clearer target setting, enhanced transparency in performance assessment, and more fruitful interactions between supervisors and staff. The establishment of a HSA Professional Board, the introduction of a clear professional staff track, and the ongoing review of our talent development framework will serve to empower and grow all members of the HSA family as they contribute and achieve their potential. We also refreshed the connections between our business decisions and various social and environmental concerns through a new corporate social responsibility framework.

Our Corporate Headquarters was restructured to ensure better coordination in order to provide clear directions and support to better harness the synergies of our professional groups. Our strategic planning process and service quality initiatives continue to be enhanced, and we are looking into strengthening our risk management and process management systems.

At our Health Products Regulation Group, we continued with the rollout of the Health Products Act, particularly the requirements in the medical devices and cosmetics regulatory frameworks. This was balanced by initiatives to minimise unnecessary regulatory costs and administrative process. Listening to our stakeholders, responding to their concerns promptly, and refining our regulatory policies and frameworks accordingly were accorded high priority to strengthen our pro-enterprise orientation. We made several improvements to our work processes by introducing more efficient ways of working, while promoting integrity, responsibility and transparency in our public health protection mission.

Our Blood Services Group spared no effort in making sure that a safe and stable supply of whole blood and blood products is available to every patient in need. We achieved accreditation to the most stringent current international safety and quality standards for tissue typing and transplant support activities. We pressed on in developing procedures and practices to promote blood conservation and ensure we remain a premier blood bank and critical national resource. As an active member of the international community, we also made many useful contributions in blood banking and transfusion medicine through participation in global forums and providing consultancy advice to other standard-setting bodies. We also continued to advance on the pioneering research and service front. With the success of our pilot Cell Processing Laboratory, we are now expanding our facilities to undertake more collaborative projects with clinical colleagues, applying cells such as natural killer cells and haematopoietic stem cells for therapeutic use.

Stability, reliability, consistency and quality were what the laboratories at our Applied Sciences Group continued to offer to all our clients. This was made possible with a proven track record founded on sound scientific expertise and strong synergy amongst the various scientific disciplines across our laboratories. With our strong orientation towards creating more value-add for our customers, we developed a host of innovative products and testing methods in-house that will offer our customers faster turnaround times and renewed assurance in the quality of our services. We also look forward to the opening of our new Chemical Metrology Laboratory, currently being purpose-built in a cleanroom environment, in August 2009. This will add another new capability and dimension to our growing pool of expertise in the applied sciences.

A vibrant and productive research environment in our areas of scientific expertise will be a vital catalyst for the expansion of our current work scope and open up new areas of innovation and excellence. We are excited by new developments already shaping up in promising fields such as pharmacogenomics and cellular therapy, and seeing ideas and hypotheses being transformed into powerful, practical solutions to improve the quality of healthcare. This will enable an even stronger and more concrete expression of our mission imperatives.

Our ongoing ability to form new alliances will significantly add breadth and scale to our capabilities. These partnerships, particularly through worksharing collaborations with our international counterparts, give us the opportunity to share our unique perspectives and develop thought leadership as a valued global partner in health sciences. Having hosted the 3rd Summit of Heads of Medicines Regulatory Agencies in December last year, we now look forward to co-hosting the 14th International Conference of Drug Regulatory Authorities with the World Health Organisation, in September 2010.

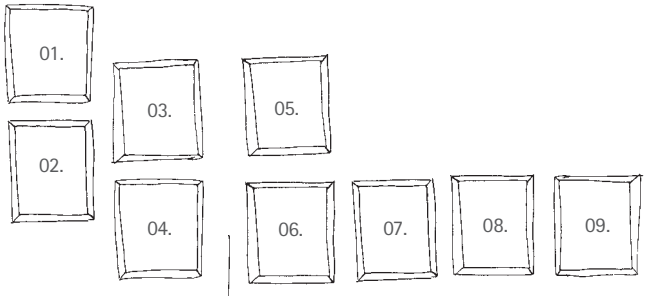
Much of what you will read in the following pages reflect the successful partnerships we have with our parent Ministry, our Board and our partners in Government, industry and overseas counterpart agencies. We thank them for their collaboration and counsel which not only have energised us but enabled us to function more effectively.

The future is uncertain but also exciting and full of opportunity. We choose to set our sights on the limitless possibilities, building our stakeholders' trust and confidence in what HSA has already accomplished and the potential and promise it holds. This will galvanise our thinking and actions throughout our organisation, and be the impetus for us to press on towards achieving our goals and mission in a transformational manner.

Dr John Lim
Chief Executive Officer

HSA Board

as at August 2009



Chairman

01. Professor Edison Liu
Executive Director
Genome Institute of Singapore

Board Members

02. Professor Alastair Campbell
Director, Centre for Biomedical Ethics
Yong Loo Lin School of Medicine
National University of Singapore

03. Dr Chong Yoke Sin
Chief Executive Officer
Integrated Health Information Systems Pte Ltd

04. Dr Lee Chien Earn
Senior Director
Healthcare Performance Group
Ministry of Heath

05. Dr Jennifer Lee
Senior Consultant
Primary & Community Care Division
Ministry of Health

06. Mdm Liew Wei Li
Principal
Xinmin Secondary School

07. Dr John Lim
Chief Executive Officer
Health Sciences Authority

08. Professor Walter Tan
Medical Director
Raffles Hospital

09. Ms Serene Wee
Chief Executive
Singapore Academy of Law

HSA Board Committees

as at August 2009

Audit Committee

• Ms Serene Wee	Chairman
• Dr Lee Chien Earn	Member
• Professor Walter Tan	Member

Staff Establishment Committee

• Dr Jennifer Lee	Chairman
• Professor Alastair Campbell	Member
• Mdm Liew Wei Li	Member

Finance Committee

• Dr Chong Yoke Sin	Chairman
• Dr Jennifer Lee	Member
• Dr Lee Chien Earn	Member

Board Changes

We would like to express our deepest appreciation to Professor Low Teck Seng who stepped down from the HSA Board on 31 January 2009.

Since 2002, Professor Low had served on the HSA Board and its committees, notably as Chairman of the Audit Committee. He has provided much valuable guidance and useful insight in advancing HSA's work.

We would like to thank him for his significant contributions, leadership and generous support of HSA's programmes and activities over the years.

HSA Executive Committee (EXCO)

(as at August 2009)

L to R:

Dr Diana Teo
- Group Director, Blood Services Group
- Chairman, Professional Board

Ms Doreen Loh
- Division Director, Human Capital & Legal Division, Corporate Headquarters

Dr Lam Kian Ming
- Division Director, Strategic Planning, Operations & Communications Division, Corporate Headquarters

Ms Maureen Goh
- Quality Service Manager
- Director, Quality Management Department, Corporate Headquarters

Dr John Lim
- Chief Executive Officer
- Group Director (covering), Health Products Regulation Group

Dr Paul Chui
- Group Director, Applied Sciences Group
- Division Director, Forensic Medicine Division, Applied Sciences Group

Dr Christina Lim
- Deputy Group Director, Health Products Regulation Group

Corporate Governance Statement

The HSA Board and Senior Management Team are committed to maintain a high standard of corporate governance and advocate the recommendations set out by the Code of Corporate Governance. The Board believes that good governance is essential in enhancing corporate performance and accountability, ensuring transparency and protecting stakeholders' interests at all times. Our stakeholders include the Ministry of Health, Ministry of Finance, other government agencies, the healthcare industry, our clients, our suppliers and the public at large.

This statement outlines the main corporate governance practices of the organisation that are in place.

The Board

The Board comprises the Chairman and its members, who are appointed by the Minister for Health for a 3-year term. It aims to meet every two months to set strategic directions and formulate policies, assuming the role of monitoring and reviewing of policies leading to HSA's improved management and performance.

Board Members' Remuneration

HSA follows the Government's Directorship and Consultancy Appointments Council (DCAC) guidelines in determining the remuneration of the Board Members.

Notice and Declaration of Directorships and Interest in Shares and Debentures

Board Members are required to declare their directorships in various organisations and their interests in shares and debentures in various corporations. Board Members deemed to be interested in any such transactions made during the meetings are reminded and required to declare their interest; they are to refrain from any deliberation made when such an interest has been declared.

Accountability and Audit

HSA's Senior Management Team is accountable to the Board. In return, the Board is accountable to the Minister for Health. To allow the Board to discharge their duties adequately, Senior Management and staff are required to provide periodic updates and answer any queries that the Board may have on the operations and planning of the organisation.

For Accountability purposes, the Board has established the following sub-committees:

(a) The Audit Committee

This Committee assists the Board to review and assess the adequacy of internal accounting controls and financial reporting controls. It meets at least twice a year with the Management and auditors to determine the scope of the external and internal audit and to review the findings of its appointed auditors.

(b) The Staff Establishment Committee

The Staff Establishment Committee assists the Board in reviewing the adequacy of manpower numbers and budgets to meet operational needs and major Human Resource Policies regarding compensation. It oversees some staff matters such as the appointment of senior management positions.

(c) The Finance Committee

This Committee assists the Board in ensuring that financial resources are managed and utilised prudently and in the most effective and efficient manner, contributing towards the organisation's overall mission.

Communication with Stakeholders

The professional groups conduct regular consultations with the industry and their clients, seeking to keep them informed of new directions and regulations, and to listen to their concerns. HSA publishes an annual report to meet statutory requirements and to provide information to our stakeholders.

In addition, regular updates on matters of interest to our stakeholders are posted on our Internet website. Our Quality Service Manager promptly handles all feedback and queries received from interested parties.

Code of Business Conduct

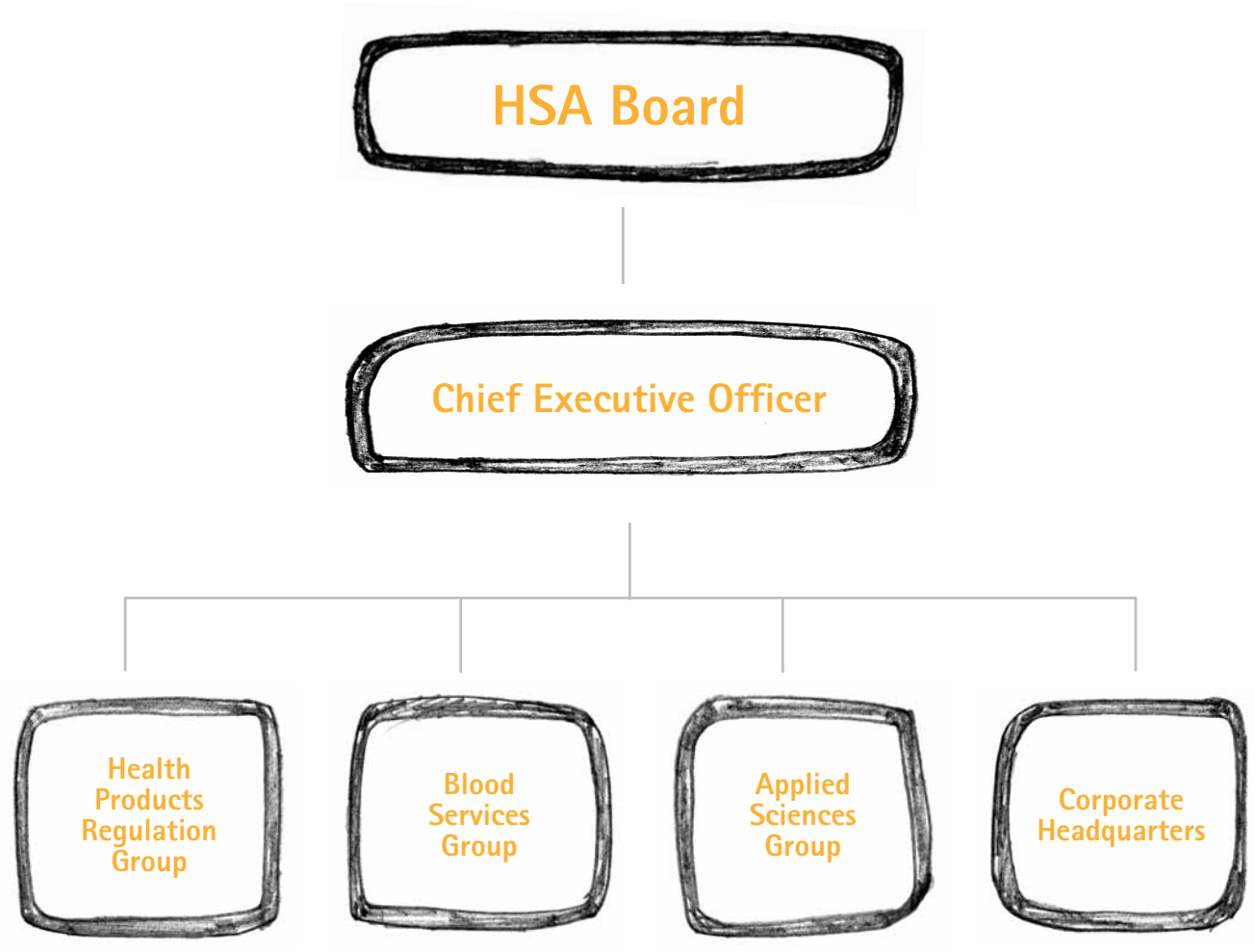
The Board, officers and employees are required to observe and maintain high standards of integrity, and are in compliance with the law and government regulations, and organisation policies.

Risk Management

The Management is continually reviewing and improving the business and operational activities to identify areas of significant business risks as well as appropriate measures to control and mitigate these risks. The Management also reviews all significant control policies and procedures and highlights all significant matters to the Board and the Audit Committee.

Organisation Chart

as at August 2009



Principal Officers

as at August 2009

CORPORATE HEADQUARTERS

STRATEGIC PLANNING, OPERATIONS & COMMUNICATIONS DIVISION
Division Director
Dr Lam Kian Ming

Corporate Communications
Director
Ms Jeannie Thng

HUMAN CAPITAL & LEGAL DIVISION
Division Director
Ms Doreen Loh

Manpower Planning & Staffing
Director
Mrs Sarojini Padmanathan

Legal
Head
Ms Linda Chen

FINANCE DEPARTMENT
Director
Ms Grace Chan

OPERATIONS MANAGEMENT DEPARTMENT
Chief Information Officer & Director
Lam Kee Sin

Facilities Management
Director
Chua Hong Tong

Information Management
Director
Chan Chin Wai

QUALITY MANAGEMENT DEPARTMENT
Director/Quality Service Manager
Ms Maureen Goh

PROFESSIONAL QUALITY/WORKPLACE SAFETY AND HEALTH DEPARTMENT
Director
Professor Bosco Chen Bloodworth

L to R:
• Chua Hong Tong • Ms Grace Chan • Lam Kee Sin
• Chan Chin Wai • Professor Bosco Chen Bloodworth
• Ms Jeannie Thng • Mrs Sarojini Padmanathan

Absent:
• Ms Linda Chen

HEALTH PRODUCTS REGULATION GROUP

Group Director (covering)
Dr John Lim

Deputy Group Director
Dr Christina Lim

GROUP DIRECTOR'S OFFICE
Director, Administration
Mdm Suwarin Chaturapit

Director, Regulatory Operations & Planning
Dr Daniel Tan

Director, Research
Ms Chan Cheng Leng

Deputy Director, Regulatory Policy & Planning
Ms Lee Hui Keng

Deputy Director, Legislative Policy
Kelvin Tan

THERAPEUTIC PRODUCTS DIVISION
Pharmaceuticals & Biologics Branch
Deputy Director
Dr Thomas Soo

Deputy Director, Clinical Regulatory Unit
Dr Lou Huei-Xin

Deputy Director, Quality Regulatory Unit
Dr Sannie Chong

Clinical Trials Branch
Deputy Director
Foo Yang Tong

Medical Device Branch
Director
Ms Joanna Koh

Deputy Director, Licensing & Surveillance Unit
(vacant)

Deputy Director, Evaluation Unit
Seet Wing Gang

COMPLEMENTARY HEALTH PRODUCTS DIVISION
Division Director
Yee Shen Kuan

Deputy Division Director &
Deputy Director, Cosmetics Control Unit
Mrs Marie Tham

Complementary Medicines Branch
Director &
Deputy Director (covering),
Chinese Propriety Medicines Unit
Ms Chu Swee Seng

Deputy Director, Health Supplements Unit
Victor Wong

L to R
Front:
• Dr Sannie Chong • Mdm Suwarin Chaturapit • Dr Daniel Tan
• Mrs Marie Tham

Back:
• Ms Joanna Koh • Foo Yang Tong • Dr Thomas Soo • Ms Lee Hui Keng
• Ms Chan Cheng Leng

Absent:
• Kelvin Tan • Dr Lou Huei-Xin • Seet Wing Gang

MANUFACTURING & QUALITY AUDIT DIVISION

Division Director &
Deputy Director (covering), Pharmaceutical Audit Unit
Sia Chong Hock

GMP Audit Branch
Consultant, Biologics & Cell & Tissue Therapy Audit Unit
Ms Jessica Teo

Deputy Director, Natural Health Products Audit Unit
Ng Liong Thiam

Deputy Director, Overseas Audit Unit
Boon Meow Hoe

Deputy Director, Good Distribution Practice Unit
Ms Hui Foong Mei

Deputy Director, Certification Unit
Dr Lai Weng Fai

PHARMACOVIGILANCE & COMPLIANCE DIVISION

Division Director &
Director (covering), Pharmacovigilance Branch
Ms Chan Cheng Leng

Deputy Director, Medical Advertisements Unit
Ms Lee Puey Ngee

ENFORCEMENT DIVISION

Division Director
Yee Shen Kuan

Enforcement Branch
Deputy Director &
Deputy Director, Prosecution Unit
Kelvin Tan

Deputy Director, Enforcement Intelligence Unit
Ms Ling Boon Lee

Deputy Director, Surveillance Unit
R. Sivalingam

Deputy Director, Enforcement Operations Unit
Ms Ruth Lee

Deputy Director, Tobacco Regulation Unit
Norman Chong

L to R
Front:
• Ms Hui Foong Mei • Sia Chong Hock • Ng Liong Thiam
• Ms Ling Boon Lee • Ms Jessica Teo

Back:
• Norman Chong • Victor Wong • R. Sivalingam
• Boon Meow Hoe • Ms Ruth Lee

Absent:
• Yee Shen Kuan • Ms Chu Swee Seng • Dr Lai Weng Fai
• Ms Lee Puey Ngee

BLOOD SERVICES GROUP

Group Director
Dr Diana Teo

GROUP DIRECTOR'S OFFICE
Director, Blood Service Operations
Ms Koh Geok Tin

Senior Manager, Capability Development
Ms Leou Kwee Kim

Senior Manager, Quality
Ms J Thilakavathi

BLOOD SUPPLY DIVISION
Deputy Division Director
Dr Tan Hwee Huang

Acting Branch Director, Blood Resource
Ms Toh Ching Lian

Acting Laboratory Director, Blood Supply Management
Ms Sally Lam

Senior Laboratory Manager, Blood Supply Management
Ng Kok Quan

PATIENT SERVICES DIVISION
Division Director
Dr Mickey Koh

Acting Laboratory Director, Immunohaematology & Cell Therapy Support
Dr Marieta Chan

Senior Laboratory Manager, Immunohaematology & Cell Therapy Support
Ms Phang Chew Yen

L to R:
Ms J Thilakavathi • Ms Leow Kwee Kim• Ms Sally Lam • Ms Koh Geok Tin • Dr Mickey Koh • Dr Marieta Chan • Dr Tan Hwee Huang • Ng Kok Quan • Ms Toh Ching Lian • Ms Phang Chew Yen

APPLIED SCIENCES GROUP

Group Director
Dr Paul Chui

GROUP DIRECTOR'S OFFICE
Senior Scientific Advisor
Professor Bosco Chen Bloodworth

FORENSIC MEDICINE DIVISION
Division Director
Dr Paul Chui

1 Director, Forensic Medicine Operations Branch
Dr Cuthbert Teo

2 Director, Forensic Medicine Operations Branch
Dr George Paul

Director, Professional Practice Branch
A/Professor Gilbert Lau

FORENSIC SCIENCE DIVISION
Division Director
Dr Michael Tay

Director, Forensic Chemistry & Physics Laboratory
Ms Lim Chin Chin

Director, Forensic Biology Laboratory &
Director, DNA Database Laboratory
Mrs Tan Wai Fun

ILLICIT DRUGS AND TOXICOLOGY DIVISION
Division Director &
Director, Analytical Toxicology Laboratory
Dr Lui Chi Pang

Director, Illicit Drugs Laboratory
Dr Angeline Yap

Director, Analytical Toxicology Laboratory
Dr Yao Yi Ju

PHARMACEUTICAL DIVISION
Division Director &
Director, Pharmaceutical Laboratory
Ms Low Min Yong

Director, Cosmetics Laboratory &
Director, Cigarette Testing Laboratory
Ms Cheah Nuan Ping

FOOD SAFETY DIVISION
Division Director &
Director, Food Safety Laboratory
Ms Joanne Chan

CHEMICAL METROLOGY DIVISION
Division Director
Dr Lee Tong Kooi

Director, Chemical Metrology Laboratory
Ms Joanne Chan

L to R
Front:
• Dr Michael Tay • Dr Lee Tong Kooi • Ms Low Min Yong • Dr Lui Chi Pang • Dr Yao Yi Ju

Back:
• Dr Angeline Yap • Ms Lim Chin Chin • Ms Joanne Chan • Dr George Paul • Mrs Tan Wai Fun • Dr Cuthbert Teo

Absent:
• A/Professor Gilbert Lau • Ms Cheah Nuan Ping

Corporate Headquarters

Our Corporate Headquarters (HQ) draws together the scientific perspectives and expertise from our three professional groups, and provides both leadership and administrative support to drive these in sync with the strategic directions charted for the organisation. It is the effective coordination and drawing together of the diverse skill sets and ideas across our organisation that will determine how successfully we can meet our national and global commitments today, and provide us the impetus to expand our public health responsibilities and provide thought leadership for tomorrow.

Streamlining for Greater Synergies

To enable us to respond more nimbly to business challenges as we journey ahead, we restructured our professional and corporate groups in August 2008 to further streamline our operations and promote synergies across the organisation. This move marks the completion of an organisational review initiated since 2007 to enhance greater synergies and collaboration of our professional groups and Corporate HQ, and across HSA as a whole.

With the restructuring, the professional centres were removed and are now reorganised as functional divisions comprising branches/units/laboratories under the three consolidated professional groups: the Health Products Regulation Group, Blood Services Group (previously known as the Health Services Group and renamed to more accurately reflect its functions as the national blood service), and the Applied Sciences Group.

The Corporate HQ structure was streamlined in January 2009 for tighter operational effectiveness to enhance its value in defining strategic direction and providing corporate support for the organisation and its three professional groups.

The Strategic Planning, Operations and Communications Division was formed to better rationalise the functions across the Operations and Strategy Department, and Planning and Development Department, and also to incorporate the organisation's Corporate Communications capabilities. The Human Capital and Legal Division was formed to reflect the emphasis in people development and capacity-building, as well as Organisational Development, to help drive HSA's strategic direction and objectives.

A restructuring of the roles and functions of the Quality Management Office was effected. This enables a more holistic approach to managing customer feedback and interfaces feedback, and driving overall service outcomes to achieve organisational excellence. In order to enhance HSA's health and safe workplace initiatives, a Workplace Health and Safety Department was also established.

A Winning Workplace and Workforce

Following an integrated assessment by SPRING Singapore in mid-March 2009, HSA was awarded the Singapore Quality Class (SQC). We also received renewals of the People Developer (PD) and Singapore Innovation Class (I-Class) awards.

The conferment of these awards is a major milestone for HSA. This validates our efforts in enhancing overall organisational excellence and promoting innovation as a key driver to improving work processes and customer responsiveness. Through the PD award, we are also heartened to receive recognition for putting a priority in creating an environment for our staff to grow and make the most of their talents and careers. These awards will be invaluable as we gear up and benchmark ourselves for even better performance going forward.

Inspired by Innovation

We continued to strengthen the innovation culture and encourage the contribution of innovative ideas to drive value creation within the organisation.

This was especially evident through the ramping up of our research initiatives to advance innovation and thought leadership in diverse areas. Our aim is for our research to contribute to best practices within the global forensic, scientific and biomedical communities, and also serve to advance scientific boundaries and human health. Key projects in the line-up will focus on developing innovative regulatory practices, building new scientific and forensic capabilities, and exploring new technologies in blood safety and quality. We signed a Memorandum of Understanding (MOU) with the National Healthcare Group's Domain Specific Review Board to provide us with additional insights as an independent ethics evaluator for our research projects. This MOU will help to facilitate HSA's efforts to continue conducting biomedical research activities in a transparent and stringent manner in accordance with the highest ethical standards.

Several cross-functional project groups and taskforces were also created to generate high value ideas that are directly linked to key corporate objectives. Mechanisms and recognition systems for staff members to contribute suggestions were also reviewed. The improvements done were to make it easier for staff to encourage the generation of quality ideas.

Capabilities Augmented by Technology

The year saw HSA further leveraging on and optimising our IT resources to accelerate our responses to new business opportunities and deliver more effectively on our core responsibilities. By integrating and expanding our applications and systems, we significantly improved our operating efficiencies and attained better customer service delivery standards.

Several key business-friendly improvements were made to our licensing system, PRISM, to provide us with even greater bandwidth to respond promptly to the regulatory and licensing needs of businesses. The enhanced system now allows companies to transact with us electronically for online applications and amendments, automatic renewal of licences and progressive payments. We will continue to fine-tune PRISM so as to further rationalise our existing work processes and improve our customers' experience in this core area of our regulatory business.

The FIONA (Forensic Integrated Operations Network Applications) system came into full swing at the Mortuary@HSA. With real-time data capturing at source now possible, work processes at the Mortuary@HSA have been further streamlined and expedited.

At our Applied Sciences Laboratories, work efficiency and service levels to our clients moved up several notches with the implementation of the LISA (Laboratory Integrated Scientific Administration) system. With LISA, all laboratory processes are now fully automated end-to-end and clients can also receive email or SMS notifications when their reports are ready for collection.

We have also brought the benefits of the Internet to our blood donors in more ways through the DonorCare system - they now have a time-saving option to fill in their health questionnaires online before visiting the Bloodbank@HSA for their donations.

The HSA-wide KEN (Knowledge Enterprise Network) was officially launched during the year. Apart from being a rich repository of information to promote good knowledge management and sharing practices, its new media tools such as forums and blogs create an interactive platform for staff to share tips and information on work-related and recreational issues. This in turn helps to enhance the innovation climate for cross learning and sharing.

We are also gearing up for the full rollout of CREST (Collaborating [for a] Reliable, Efficient, Shared System, Together) in the later part of 2009. Jointly developed by HSA with our four partner agencies, the Health Promotion Board, Media Development Authority, National Library Board and SPRING Singapore, CREST will enable greater integration of information to facilitate faster and better-informed decision making to enhance our human resources, finance and administration functions. This effort to develop a shared system will allow all CREST agencies to enjoy greater economies of scale.

Moving ahead, a key priority will be implementing several key initiatives under our new IT Master Plan that will significantly sharpen our capabilities in our regulatory mission. This includes the development of a new real-time system that monitors the blood inventories of hospitals and a Unique Health Products Identifier (UHPI) system that aims to develop unique codes that will be used at the national level to identify specific drugs and medical devices in the healthcare cluster. Our overall IT infrastructure will also be revamped to include new equipment and greener technology.

Delighting our Customers

Various structured platforms were introduced to better engage with our customers and industry partners. These include regular meetings between clients and industry associations and the HSA management to gather inputs and to better understand their concerns. Through these interactions, we are better able to ensure that our practices and polices are parallel to changing business needs and are also market sensitive.

A Customer Satisfaction Survey was commissioned in mid 2008 to understand how we can better respond to our customers and also improve our service delivery standards. Further enhancements were made on the curriculum of the service quality training for staff to equip them with the relevant skills required in managing customer interfaces and to deliver good customer service. Two in-house awards were launched to recognise staff for their service delivery and to identify role models of excellent service to inspire others.

HSA gearing up for a brave new world

Regulator adding to its expertise in cell therapy, biologics and managing risk

By CHEN HUIFEN

[SINGAPORE] The Health Sciences Authority (HSA) is looking to grow its expertise as it copes with the evolving life sciences landscape.

With Singapore's biomedical drive running at full steam and as more new products emerge, regulatory authorities too have to innovate and move along, said HSA chief executive John Lim.

"As HSA is a small agency compared to regulatory counterparts in developed countries, our focus is on

Putting the Public at the Forefront

We remained committed to providing clear, timely and authoritative information to the public on safety issues related to health products through media releases, alerts and advisories. By creating a heightened public awareness and deeper appreciation of HSA's roles and responsibilities as a regulator in an increasingly complex environment, we continued to strengthen relationships with the media and community by reinforcing the importance of the need for the public to be our co-partners in protecting public health.

A new segment within our corporate website was developed specially with consumers in mind. This project is a significant step forward in our outreach efforts to empower consumers with information on the responsible use of health products. It features write-ups on HSA's responsibilities such as our regulatory philosophy and what this means for consumers in layman language, and also contains useful guides presenting consumer-friendly safety tips on reducing the risks associated with products ranging from cosmetics to prescription medicine. The segment also houses a microsite on information related to illegal health products and advice on the steps the public can take to protect themselves and their loved ones.

Apart from enjoying positive media coverage through various prominent feature stories profiling our key role as a champion for public health and safety in the major dailies, the intriguing work and outstanding capabilities of our forensic medicine and forensic science teams were also featured in an exclusive episode of Unexpected Access, a highly popular prime time Mediacorp television series.

International Alliances that Work

Recognising that the challenges and opportunities encountered by national regulators of health products are similar across the globe, HSA continued to build on the firm partnerships with our overseas counterparts. Through these strong networks, we hope to generate greater efficiency and innovativeness in managing these challenges, as we share resources and leverage on systems to strengthen capabilities and synergies.

HSA hosted the 3rd Summit of Heads of Medicines Regulatory Agencies on 3 and 4 December 2008. This provided a platform for regulatory agencies from some 20 countries to engage in dialogue on issues directly related to their national responsibilities. These include immediate priorities as well as future challenges. The forum also aimed to enable agency heads to interact in an informal setting to develop a deeper understanding of each other's work, stimulate new ideas generation, and explore new areas for collaboration. We put in significant effort to ensure that the programme was substantial and fruitful, and that delegates had a unique and enjoyable experience of Singapore, borne out by the positive feedback we received on the Summit event.

We inked two more MOUs during the course of the year – one with Sweden's Medical Products Agency in November and another with the Medicines and Healthcare Products Regulatory Agency, United Kingdom in December. These collaborative arrangements – together with those earlier established with our other MOU partners including the US Food and Drug Administration, Health Canada's Health Products and Food Branch, Australia's Therapeutic Goods Administration, China's State Food and Drug Administration, and Swissmedic – will continue to pave the way to improve the safety, quality, and efficacy of health products marketed in each country.

During the year, we also launched projects within our Regulatory Worksharing Grouping comprising the Therapeutic Goods Administration, Health Canada, Swissmedic and HSA. These included managing the quality and integrity of supply chain through joint inspections, building up post-approval pharmacovigilance efforts through adverse effects monitoring, and implementing a staff exchange programme.

We are honoured to have been selected to co-host the 14th International Conference of Drug Regulatory Authorities (ICDRA) with the World Health Organisation (WHO), in Singapore from 6 to 11 September 2010. As one of the major conferences involving health regulators around the globe, ICDRA has been held since 1980 with the aim of promoting exchange of information and collaborative approaches to health issues of common concerns. We are proud to be involved in playing a major role in facilitating the discussions and decisions to be made at this platform, which is an important consultative forum for WHO and drug regulatory authorities in their efforts to harmonise regulation and improve the safety, efficacy and quality of medicines.

HSA's increasing involvement on the global stage reflects our role as a valued global partner on the international scene. The alliances with our global partners endorse our capabilities and expertise as a trusted regulatory body. Through the exchange of knowledge and best practices, we can better anticipate issues, and make swifter decisions to fulfill our core mission to protect and advance national health and safety effectively.

We are now in the midst of exploring the establishment of a centralised academy set-up that will add significant value to the organisation by consolidating, supporting and developing our training, research and thought leadership capabilities, and enable us to make greater contributions to the international community.

Powered by People

Building a workforce that is competent, resilient and engaged by attracting, developing, motivating and retaining core employees remained at the centre of all our people policies during the year. This is because we recognise that our success as an organisation is a key outcome of the optimal match between each employee's professional growth, personal goals and our business goals.

We introduced new schemes of service to create a more holistic people management system that enhances career progression opportunities for staff. Our performance management system was also revamped to place a greater emphasis on the staff's individual performance and competencies. This tied in with a new compensation framework which was finetuned for greater alignment with market practices.

In line with our core value to Develop our Community, we remained committed to investing in our people through a comprehensive range of training programmes. The learning experience at HSA continued to be a systematic focused process that takes into account business goals and objectives and the skills needed by staff to meet the challenges of the changing environment around us. All officers were given many opportunities throughout the year to sharpen and enrich their skills, knowledge and competencies, to take them further in their current roles or to take on new ones within the organisation.

The HSA Professional Board was formed in January 2009 to advise and make recommendations to the CEO on issues relating to professional staff development and professional excellence. The Board is chaired by Dr Diana Teo, Group Director of the Blood Services Group, and comprises advisors and members of staff from different scientific fields such as science, pharmacy, medicine and nursing. Its key priorities include further sharpening the strategic skills and competencies of our staff with a longer-term aspiration to develop HSA into a renowned medical, scientific and regulatory education, training and research centre.

Because we believe firmly that a supportive and welcoming work culture plays a big part in motivating staff to give of their best to the organisation, the HSA Recreation Team worked hard to present an exciting menu of activities to all staff. From fitness walks and movie nights to anniversary parties, these successfully injected not only more fun, but created a stronger sense of unity and community within the HSA family.

We continued to cultivate meaningful relationships amongst colleagues. Our staff members participated in regular dialogues and meet-up sessions with management. We are also working towards a Collective Agreement between the management and staff union to signify the commitment from both sides in building a people-centred organisation.

Our exemplary efforts in supporting staff development and well-being were recognised in more ways than one. Apart from being recertified as a People Developer organisation, we bagged the Singapore H.E.A.L.T.H. Gold Award for the third time in recognition of our policies in promoting healthy workplace practices among our staff. We also received the Minister for Defence Award and the Home Team NS Award (Commendation) for the support given to our officers to be away from work because of National Service duties.

Beyond our Mission

Besides delivering on our core responsibilities, HSA is committed to making a positive difference to our community and environment as well. This promise was renewed during the year through a review of the framework and policies relating to our Corporate Social Responsibility (CSR) framework. The revised CARE Framework, as defined through its acronym for "Community Action, Responsible for our Environment", is aimed at developing a caring culture among all staff and encouraging them to contribute to various social causes in our community.

Various programmes were organised during the year to encourage active volunteerism among staff. These included HSA's own blood donation drives and various fund raising projects for the Community Chest as well as victims affected by the Sichuan earthquake in China and the cyclone in Myanmar. We also lent our support to programmes organised as part of the Yellow Ribbon Project, and conducted several recycling and energy conservation drives. Our CSR-oriented mindset, which is inherently embedded in our mission of protecting and promoting public health, will continue to be an integral part in the business decisions we make.

Health Products Regulation Group

The Health Products Regulation Group of HSA not only keeps in step with the wide spectrum of global trends in development and technological advancements in medical drugs and devices, but is also actively involved in defining new regulatory frameworks and pursuing new areas of research in regulatory science. This is what enables our regulatory group to ensure that health products in Singapore meet internationally benchmarked standards of safety, efficacy and quality, but can also begin to pioneer innovative regulatory approaches that can serve as models for other smaller regulators who need to optimise the resources and expertise available to them. We recognise the challenges in this role, with changes around us taking place at an astounding pace. However, through our scientifically sound pre-and-post market regulatory processes and firm collaborations with other local and overseas agencies that share our mission, we have greater impetus to create the best outcomes for all – be they consumers or businesses whose products we regulate.

On Track Towards a More Robust Regulatory System

The past year saw new requirements under the Health Products Act coming into effect for medical devices and cosmetic products as part of the ongoing roll-out of their respective regulations. These were the first two groups of products brought under the the new Act after it was passed by Parliament in February 2007.

The Health Products Act serves to amalgamate the existing controls for regulating health products, which currently reside in various pieces of legislation, into one omnibus Act. When it comes into full effect, the Act will provide more flexibility for tailoring regulatory mechanisms for specific product groups, as well as strengthened powers for post-market monitoring and enforcement.

Moving forward, we plan to bring other groups such as complementary health products and therapeutic pharmaceutical products under the ambit of the Health Products Act. As part of the rollout, we will consult and communicate with our stakeholders, and also adopt a phased approach in the implementation for the smoothest transition possible for businesses. In the past year, we were sensitive to the economic downturn and adjusted the implementation measures or offered appropriate assistance to mitigate the impact on companies. These plans are all part of the ongoing efforts to develop a more robust regulatory system necessary to better protect, and ensure safer, higher quality products for our people.

Medical Devices Safety Enhanced

The regulation of medical devices is being implemented in three phases. Phase 1, which started from 1 November 2007, requires dealers to report all adverse events to HSA, notify us regarding voluntary product recalls and keep product movement records. We commenced Phase 2 in November 2008. We now accept applications for the product registration of medical devices, and the licensing of importers, wholesalers and manufacturers has taken place. Industry briefings, workshops and several training sessions were conducted to familarise our industry partners on our new regulatory guidances. We also worked with Singapore Accreditation Council to certify third party certification bodies that can perform audit and certification of Good Distribution Practices for Medical Devices (GDPMDS). The objective of GDPMDS standard is to provide a quality system for maintaining the quality of medical devices throughout the distribution chain.

A Closer Watch over Cosmetic Products

The ASEAN Cosmetic Directive (ACD) has been implemented in all ASEAN Member States except Myanmar and Indonesia. Under the ACD which sets the regulatory requirements for cosmetic products sold in Singapore and other ASEAN member countries, dealers are required to notify HSA before importing any cosmetic product and making it available for sale. This facilitates the creation of a full database of all cosmetic products in Singapore which in turn enables HSA to implement responsive post-market procedures to effect swift recall of unsafe products from the market.

Companies benefit from the simple and fast notification process, and can launch products immediately after notification, so long as they ensure that the safety and quality of products conform to international standards. On their part, consumers can enjoy quicker access to safe and quality cosmetic products and wider choices. At the same time, they are also better protected through post-market surveillance initiatives under the ACD such as adverse events reporting, targeted periodic sampling and testing, proper labelling, documentary evaluations and global alerts.

Singapore hosted the 11th ASEAN Cosmetic Committee (ACC) Meeting in November 2008. The session discussed updates on the implementation and enforcement of the ACD and the latest developments in ASEAN Economic Integration, and agreed on proposals from the ASEAN Cosmetic Scientific Body (ACSB). Singapore, as the lead country also updated the meeting on the ASEAN Cosmetic Reference Laboratories (ACRL) Network and the ASEAN Post-marketing Alert System.

Manufacturing Standards Across ASEAN Aligned

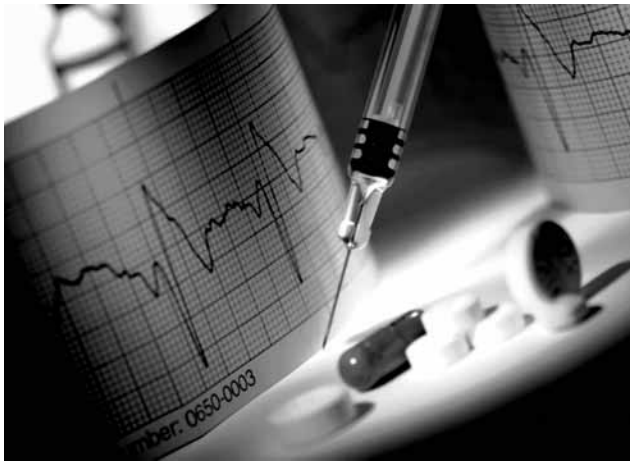
We participated in the ASEAN Consultative Committee for Standards & Quality Pharmaceutical Product Working Group (ACCSQ PPWG) Meeting held in July 2008 during which several key decisions were made. The meeting agreed on the full implementation of the ASEAN Common Technical Dossier (ACTD) in January 2009, marking a significant milestone in regional harmonisation efforts in the pharmaceutical sector. A common technical dossier format will now be accepted by all member states for drug registration purposes. Another key achievement was the finalisation and subsequent signing of the Sectoral Mutual Recognition Arrangement (MRA) on Good Manufacturing Practice Inspection. This is a key step towards ensuring internationally-recognised manufacturing standards of pharmaceuticals in ASEAN.

With Business Needs in Mind

Creating a positive experience for businesses transacting with us remains a prime consideration as we refine our policies and practices. We commenced a major Business Process Review (BPR) in January 2009 to review and redesign key regulatory processes. This is with the broader objective to enhance efficiency, clarity, consistency and customer-friendliness in our work procedures. Inputs from stakeholders including the Ministry of Health, healthcare practitioners, industry and overseas health products regulators were taken into account during the review, which is expected to be completed by the third quarter of 2009.

Several initiatives have been implemented resulting from the preliminary review. In February 2009, a new office to address the unique needs of Small and Medium Enterprises (SMEs) was set-up. The SME Office seeks to be a one-stop centre offering SMEs assistance on submission matters and provides these companies with additional support in regulatory affairs. It is staffed by a pool of specially trained Client Liaison Officers, most of whom have professional backgrounds in various scientific fields, and who also possess a sound understanding of all our regulatory requirements. Our officers personally attend to our SME clients' concerns on technical issues, advise them on documentation requirements and provide a single point of contact for all matters pertaining to their respective submissions.

We organised a series of regular meetings with industry partners at various levels - from line managers to CEOs - to explain our new regulatory policies and decisions, and also to seek feedback and responses on upcoming plans. An industry newsletter *HSA Connects* has been introduced to keep industry stakeholders updated on our various new initiatives and ongoing regulatory news. To complement this, we conducted workshops to familarise businesses with the regulatory requirements needed when making submissions and upcoming policy changes. The sessions provided a useful forum for companies to discuss and clarify on our regulatory processes and technical issues, thus reducing uncertainty on steps needed for product submissions.



Keeping in close touch with our stakeholders such as companies, industry associations and other service partners has enabled us to develop processes that are more enterprise-centric, transparent and in tandem with the business climate.

In view of the current downturn, we have put in place a Progressive Payment Scheme which lowers the upfront cost of product approval fees for companies. Under this scheme, evaluation fees for medical products are paid in four installments and each installment is paid only when the product advances to the next stage of the evaluation process.

We also implemented a new auto-renewal system for product licences during the year. Converting the system to an opt-out one means that companies need only indicate which licences they do not wish to renew. This improvement resulted in considerable time savings and greater convenience for companies who have many product licences to maintain as they no longer need to submit annual renewals.

In March 2009, HSA received a Commendation Award in the 2nd Frontier Licence Review Award organised by the Ministry of Trade and Industry for the proposal to revamp its licence review framework to reduce costs and administrative effort on the part of companies whose products we regulate. The merits of the proposal include the recommendation of converting the most number of licences to lifetime licensing (10 licences in total).

As part of our commitment to constantly improve in our role as a national regulator, our priority will be on strengthening our capabilities in conducting risk assessments of new health products. This will allow even more timely evaluations and approvals of medically needed health products.

Strengthening Risk Management

In spite of our best efforts to ensure that health products are as safe as possible before being placed on the market, we recognise that no product is 100 per cent safe. Our risk-based post-market system to sample and test products from the shelves, complemented by our Adverse Drug Reaction (ADR) Monitoring Programme enabled swift corrective responses when safety concerns came to light. The ADR Monitoring Programme, drawing on a network of local healthcare professionals to report products which caused unwanted and unexpected effects, was effective in tracking and identifying safety trends.

The number of local spontaneous ADR reports reviewed by HSA increased from 1,740 in 2007 to 3,155 in 2008. Amongst the ADR reports received in 2008, about 55% were serious. 17 adulterated products were detected via ADR reports in 2008.

We moved up the World Health Organisation's (WHO) ranking of ADR reports per million from 14th position in 2007 to 10th position in 2008. This reflects that our ADR reporting system is robust and amongst the world's best, in which our healthcare professionals are proactively reporting ADRs they observe in their practice. This in turn helps us to pick up safety signals from the local use of marketed products more efficiently, and facilitates quick recalls if needed.

We made information on emerging safety issues more readily available and easily accessible to healthcare professionals through our *Adverse Drug Reaction News Bulletin* to increase the awareness of ADRs and promote ADR reporting. This publication has been accredited by the Singapore Medical Council, the Singapore Dental Council and the Singapore Pharmacy Board, for Continuing Education points. This encouraging move reflects the healthcare professional fraternity's appreciation of the publication's quality. It is also testament of the fraternity's recognition that keeping abreast of drug safety issues is essential for professional knowledge and healthcare practice.

We further enhanced our review of risk management plans (RMPs) submitted by product licence holders as part of the life cycle approach to minimise the risks associated with new products. From the period June 2008 to May 2009, we reviewed about 20 RMPs that were submitted either at pre-market evaluation or post-market stage, including Revlimid®, Yondelis® and Exjade®. Some of the regulatory actions resulting from the review of the RMPs included safety updates to the product insert and the submission of safety reports to address potential safety concerns not identified at the point of product registration.

Last year, we initiated the recall of 22 health products from the market. These came from various product groups, including pharmaceutical products, Chinese Proprietary Medicines and health supplements. Five of these products were recalled as they were adulterated, while the remaining ones were found to be unsafe because they were out-of-specification.

Going forward, we will continue to strengthen our risk management tools, to better manage risk of health products throughout their life cycles. Efforts in risk communication to healthcare professionals will be stepped up, through early warnings of emerging or potential drug safety problems and promoting safer use of drugs and health products.

Our Unwavering Stance

Our enforcement efforts against illegal health products were stepped up during the year through more intensive surveillance operations and intelligence gathering. Through more than 2,500 investigations conducted, about 10,600,000 units (comprising dosage forms of tablets, capsules, liquids and creams) of counterfeit and unregistered health products were seized. Assuming an estimated street value of $2.50 per tablet, the seizures amounted to about $26,504,800.

We took our fight against illegal health products to the global front as well. We participated in the 3rd General Meeting of the World Health Organisation's International Medical Products Anti-Counterfeiting Taskforce (IMPACT) in Tunisia in December 2008. Singapore, together with the rest of the members of the IMPACT Planning Group, was re-nominated into office by the assembly for another two years. WHO launched IMPACT in 2006 to combat the global problem of counterfeit pharmaceuticals. Bringing together nearly two hundred countries, as well as organisations with expertise in enforcement, manufacturing, and patient advocacy, IMPACT has called attention to the commercial and public health costs of medicines that are deliberately and fraudulently mislabelled and offered a global forum for discussing solutions. This latest meeting agreed on a revised version of the term "Counterfeit Medical Product". This new text will provide greater clarity and transparency in differentiating and addressing various contentious issues raised by members.

We hosted the 11th Permanent Forum on International Pharmaceutical Crime (PFIPC) Meeting from 2 to 5 June 2008. The closed-door session was attended by representatives from more than 14 member countries and organisations from the USA, UK, Australia and Switzerland. This included presentations, information exchanges and discussions on the latest trends in pharmaceutical crime activity and enforcement related issues on dealing with increasing sophistication of such activities.

In partnership with the PFIPC, we conducted a coordinated operation against illegal websites selling medicines over the Internet on 12 November 2008, which was designated International Internet Day of Action. The main objective of this coordinated sweep was to take action to prevent and tackle deceptive marketing practices through a global initiative. The global and borderless nature of the Internet and the ease with which illegal medicines can be bought and sold in different countries around the world pose a threat to public health. Such coordinated international efforts demonstrate an international will to tackle the Internet problem, and are considered most strategically effective in addressing this public health challenge.

In our efforts to curb the supply of tobacco products to underage smokers, we apprehended over 60 sellers who sold tobacco products to underage youths. A total of 6,662 underage smokers were caught during the year. Together with the Health Promotion Board, we produced a Tobacco Retailer Educational Toolkit to assist tobacco retailers in Singapore to better comply with the law governing tobacco products and to adopt the "best practices" to avoid sale of tobacco products to underage customers.

Sharpening Capabilities

To deepen and broaden our pharmacogenetics knowledge, and in turn, boost our capacity for advancements in drug regulation and safety, we commenced work on a project to create an innovative surveillance network to quickly capture serious ADRs that should be investigated for possible pharmacogenetics linkage.

The project, which will establish the necessary infrastructure and frameworks in pharmacogenetics, will bring about immediate benefits such as reducing the risk of ADRs through the identification and/or validation of genetic associations and in the longer term, facilitate the development of an innovative post-marketing system. It will also enable the efficient management of pharmacogenetic data submissions for new drug application or product label updates.

The groundwork for this project was established with the formation of an operational group within HSA working in collaboration with a network of research facilities and hospitals. This network will facilitate the collection of patients' samples and clinical histories arising from targeted ADRs. We built a network of collaborations and partnerships with researchers and clinicians for the analysis and interpretation of pharmacogenetic assays, and convened a Pharmacogenetics Advisory Committee to advise HSA in these efforts. We also participated in international activities that have similar goals to share data and to glean information about polymorphisms in Asian populations.

Powerful Partnerships

HSA strives to be synonymous with partnerships. We are keenly aware that the challenges facing regulatory agencies today cannot be addressed single-handedly by any one organisation, but through joint efforts. This is why we value every opportunity to learn from others, and in turn bring into these collaborative arrangements our cross-disciplinary perspectives. Only through partnerships can we be strong today and even stronger tomorrow as we pursue our mission with vigour.

We were included as a member of the Global Co-operation Group (GCG) for the International Conference for Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH), and participated in our first conference in June 2008. The focus of ICH has been on the technical requirements for medicinal products containing new drugs and comprises regulatory and industry members from Europe, Japan and the USA. The GCG is a sub-committee of the ICH Steering Committee and includes members from non-ICH regions. Our induction into the Group is recognition of our role as an active contributor in drugs development and regulatory standards.

We continued our efforts to broaden our global network and strengthen co-operation with regulators internationally through the signing of Memoranda of Understanding (MOU) with the Medical Products Agency (Sweden), and the Medicines and Healthcare Products Regulatory Agency (United Kingdom) during the year. The scope of the MOUs encompasses mutual exchanges and scientific collaborations spanning a range of work areas. These include therapeutic products evaluation, establishment inspection, adverse events investigation, worksharing on pharmacovigilance activities, expertise in IT information and management, and training and development. The MOUs formalise the strategic alliances and co-operation between HSA and our regulatory counterparts, and create opportunities for us to leverage on the abilities of collaborating authorities to make timely, effective and scientifically sound regulatory decisions.

We also saw successes in our collaborative arrangements with our other MOU partners - including the US Food and Drug Administration, Health Canada's Health Products and Food Branch, Australia's Therapeutic Goods Administration, China's State Food and Drug Administration, and Switzerland's Swissmedic. These were through the areas of product evaluations, pharmacovigilance, Good Manufacturing Practice inspections and staff exchange programmes.

Potential new partnerships were explored as well. We hosted a visit in March 2009 by Dr Tatsuo Kurokawa, a Professor for Pharmaceutical Development at Chiba University, Japan and previously the Japanese representative to the ICH Steering Committee. During his stay, Dr Kurokawa shared from his experience on pharmacovigilance activities and global drug development initiatives in Japan, and also heard from HSA and external stakeholders such as the National Healthcare Group and the Economic Development Board on Singapore's progress in these areas. Through this visit, bilateral relations between both countries were strengthened and new possibilities for future opportunities for collaboration with Japan were created.

KEY STATISTICS

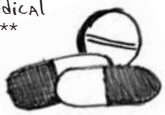
New Product Licences Issued
174

Registered Medicinal Products*
5,389

Chinese Proprietary Medicines Listed
8,519

Cosmetic Products Notified under ACD*
108,200

Number of Product Registration Applications for Medium and High Risk Medical Devices**
334



Number of Product Registration Applications for Low Risk Medical Devices**
118

Clinical Trials Certificates Granted***
281

Medical Advertisement Permits Issued
2,089

Site Audits Conducted for Good Manufacturing & Good Distribution Practices
(April 2008 – March 2009)
520

Premises, Dealers and Importers & Exporters of Health Products Licensed/ Certified****
(April 2008 – March 2009)
3,540

Authorisation Letters for Travellers Bringing Personal Medication into Singapore
(April 2008 – March 2009)
1,031

Spontaneous Adverse Drug Reaction Reports Received***
17,317

Total Number of Units (Tablets / Capsules) Seized
10,101,920

Tobacco Retail Outlets Licensed*
5,168

Underage Youth Smokers Caught
1,112

* *as at 31 March 2009*
** *from 1 November 2008 to 31 March 2009*
*** *from January to December 2008*
**** *includes new, renewal and amendment applications*

PRE-MARKET ACTIVITIES

Evaluation, Licensing & Certification

Drugs and Biologics

New Product Licences Issued	**174**
Innovators' Products:	
• Chemicals	72
• Biologics	40
• Generics	62
Variations in Product Licences	**2,469**
• Chemicals	2,120
• Biologics	349
Registered Medicinal Products (as at 31 March 2009)	**5,389**
• Prescription-Only Medicines (70.53%)	3,801
• Pharmacy-Only Medicines (12.32%)	664
• General Sale List Medicines (17.15%)	924
Import of Medicinal Products for Re-Export	2,959
Import of Medicinal Products on Named-Patient Basis	4,982
Travellers' Medication Permits Issued*	1,031

** Permits issued to visitors bringing in personal medications containing a Controlled Substance*

Chinese Proprietary Medicines (CPM)

CPM Listed (as at 31 March 2009)	**8,579**
Number of Product Listing Applications Received	901
Number of Rejected Applications	0
Number of Licensed CPM Importers*	169
Number of Licensed CPM Manufacturers*	25
Number of Licensed CPM Re-Packers*	28
Number of Licensed CPM Wholesalers*	247

** as at 31 March 2009*

Cosmetic Products

Cosmetic Products Notified	**108,200**
New Cosmetic Product Licences	83,300
Total Cosmetic Product Licences	24,900
New Importers Licensed	0
Cosmetic Products Rejected	270
Letters of Free Sales for Export	5

Health Supplements

Enquires on Classification, Import and Sales Requirements	4,488

Medical Advertisements

Medical Advertisement Permits Issued	**2,089**
• Western Medicines	45%
• Chinese Proprietary Medicines	21%

Compliance with GMP and GDP – Premises, Dealers, Importers and Exporters

Premises, Dealers, Importers & Exporters Licensed/Certified*	**3,540**
Manufacturers/Assemblers Licences Issued*	120
Wholesale Dealer's Licences Issued*	495
Import Licences Issued*	808
Export Licences Issued*	182
Pharmacy Certificates Issued*	356
Form A Poisons Licence Issued*	607
Form C Poisons Licence Issued*	552
Certificate of Pharmaceutical Products	229
Good Manufacturing Practice (GMP) Certificates Issued	33
Good Distribution Practice (GDP) Certificates Issued	1
Free Sale Certificates	119
Statement of Licensing Status Issued	8
GMP Clearance for Overseas Manufacturers	70

** Includes new, renewal and amendment applications*

Clinical Trials (January to December 2008)

Clinical Trials Certificates* Granted	**286**
• Phase I	54
• Phase II	61
• Phase III	140
• Phase IV	31
Clinical Trials Applications Approved	188
Clinical Trials by Therapeutic Areas:	
• Oncology	32%
• Clinical Pharmacology	22%
• Cardiology	11%
• Neurology	6%
• Gastroenterology/Hepatology	3%
• Ophthalmology	3%
• Others	23%
Initial Reports of Adverse Drug Reactions (ADRs)	2,774
Follow-up Reports of ADRs	4,570

** a Clinical Trial Certificate is issued for each participating site in a clinical trial*
NB: More than one suspected drug may be implicated in an ADR report.

POST-MARKET ACTIVITIES

Investigation, Surveillance and Prosecution

Total Number of Units (Tablets or Capsules) Seized	**10,601,920**
Complaints Received	2,568
Prosecution Cases Completed	62
Offenders Sentenced to Imprisonment	35

Adverse Drug Reaction (ADR) Monitoring (January to December 2008)

Total Number of Spontaneous Reports of Suspected ADRs to All Health Products (Pharmaceuticals, Complementary Medicines & Cosmetics)	**17,367**
ADR Reports from Public Hospitals	47.9 %*
ADR Reports from Government Clinics	43.3%*
ADR Reports from Private Hospitals and Clinics	3.8 %*
ADR Reports from Pharmaceutical Companies	4.3 %*
ADR Reports from Community Pharmacies	0.7%*
ADR Reports Associated with Pharmaceutical Products	89.1 %*

** Based on 3,155 ADR reports analysed*

Top 10 Drugs Suspected of Serious ADRs

	Active ingredient	No.
1	Atenolol	157
2	Hydrochlorothiazide	116
3	Simvastatin	108
4	Diclofenac	106
5	Metoclopramide	83
6	Coamoxiclav	79
7	Enalapril	77
8	Paracetamol	74
9	Docetaxel	73
10	Cotrimoxazole	65

Top 5 System-Organ Classes Affected by ADRs

Active Ingredient	No.
1 Skin & Appendages	1,193 (22.4%)
2 Body as a Whole	782 (14.7%)
3 Nervous System	603 (11.3%)
4 Respiratory System	463 (8.7%)
5 Gastro-intestinal System	442 (8.3%)

Tobacco Regulation

Tobacco Retail Outlets Licensed (as at 31 March 2009)	**5,768**
Tobacco Importer/Wholesaler Licensed (as at 31 March 2009)	63
Exemptions for Advertisement Issued	143
Total Cigarettes Seized	13,726
Complaints of Offences Received	640
Underage Youth Smokers*** Caught	6,662
Retailers Caught Selling Tobacco to Underage Youths	64
Compounding Cases Completed	6,346
Prosecution Cases Completed	472

*** *Persons under 18 years of age*

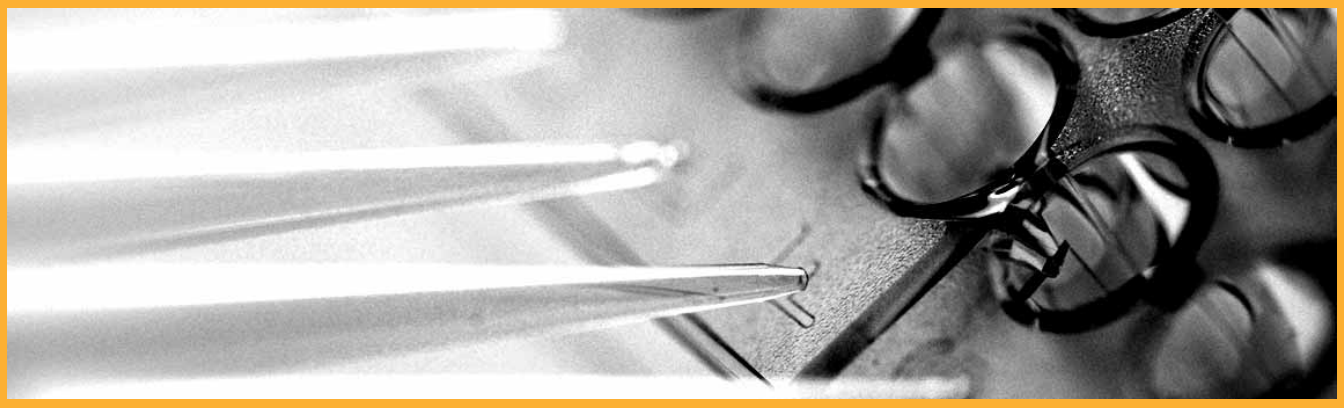
Medical Devices

Number of Product Registration Applications for Medium and High Risk Medical Devices[1]	334
Number of Product Registration Applications for Low Risk Medical Devices[1]	118
Number of Manufacturer's Licence Applications[1]	3
Number of Importer's Licence Applications[1]	20
Number of Wholesaler's Licence Applications[1]	21
Field Safety Corrective Actions (FSCA)[2]	412
Reported Adverse Events Relating to Medical Devices[2]	173

1 Data for the period 1 November 2008 to 31 March 2009
2 Data for the period 1 April 2008 to 31 March 2009
FSCA are actions taken by the medical device manufacturer to ensure public safety when using a medical device (e.g., product recalls).

Blood Services Group

As the national blood service, the Blood Services Group of HSA diligently keeps in focus its critical life saving and life giving mission in every aspect of its operations. Quality and safety are guaranteed through internationally accredited blood bank and transfusion medicine protocols, thus ensuring every patient access to the safest possible blood supply appropriate to clinical need. To lend further impetus to our commitment to deliver a world-class blood service, we continually strive to achieve the highest level of excellence. By judiciously adopting latest knowledge and innovatively adapting new technologies, we maintain our edge in the fields of transfusion medicine, immunohaematology and tissue typing so that we can continue to deliver blood products and services of the highest standards. At the same time, we are actively engaged in cutting edge areas of therapeutic research such as cell processing.



Reaching Out to Blood Donors

Our partnership with the Singapore Red Cross for the National Blood Programme entered its eighth year. The number of blood donors coming forward continues to increase annually, with 60,654 donors making 92,454 whole blood and 9,506 apheresis donations in 2008. Donor recruitment programmes focused on the campaign theme of "Are you my type?" that targeted young people between 16 to 25 years and aimed to entrench blood donation as an iconic part of their youth culture.

Every year, World Blood Donor Day is celebrated globally to honour voluntary altruistic blood donors who regularly donate the 'Gift of Life' to help those in need of blood transfusion. In 2008, World Blood Donor Day was celebrated in Singapore on 14 June with the theme of "Giving Blood Regularly". Blood donors were invited to celebrate with their families and friends at the Singapore Zoo. 1,318 Champion Blood Donors were honoured at ceremonies held in the picturesque settings overlooking the lake. 37 bloodmobile organisers were also recognised for their invaluable contributions to the community during the ceremonies.

Continuing with our drive over previous years to make blood donation more convenient, several new initiatives were introduced. To reduce the waiting time for donation, blood donors making blood donation appointments online have the option of completing their pre-donation health assessment questionnaires online before coming down to the Bloodbank@HSA.

The health and safety of our blood donors remains an important area of focus. To protect the iron levels of our blood donors, iron-rich desserts were added to the post-donation refreshments provided. We have also enhanced the care of regular donors with low haemoglobin levels, putting in place programmes to monitor their iron levels and provide counselling on how to improve the haemoglobin levels.

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Adopting New Technologies to Enhance Blood Supply Safety and Quality

Maintaining stringent and strong quality systems in blood processing, testing, inventory management and distribution remains the top priority of our Blood Supply Management Laboratories. With rapid advances in blood bank technology, new and improved systems for processing and testing the blood supply are continuously made available. By wisely adopting new technologies that are appropriate to our blood service and continuously adapting existing processes innovatively, we aim to ensure that our national blood supply is efficiently and effectively managed.

New technologies were adopted to ensure that blood donations continue to be screened for blood types and transfusion-transmitted infectious diseases using state-of-the-art systems. New protocols to screen blood donations for malaria were explored to improve the safety of blood collected from donors who had returned from malaria endemic areas. New blood bag systems incorporating sample diversion pouches were introduced, thus reducing the risk of bacterial infection as well as improving workplace safety for our staff.

We are also studying the new developments in pathogen reduction technology that will enable blood components such as platelets and plasma to be treated to inactivate low levels of viruses, bacteria and parasites that may be present. A two-year pilot study is ongoing to assess the clinical use of methylene-blue treated fresh frozen plasma. Research projects are also in progress to study the effectiveness of two types of pathogen inactivation protocols (psoralen and riboflavin) available for platelets.

In addition, much work is taking place to develop effective strategies to manage the blood supply in the face of emerging threats such as dengue, chikungunya and novel influenza strains. Research was also done to assess the risk of non-infectious transfusion complications such as Transfusion Associated Acute Lung Injury (TRALI) and to assess appropriate measures to reduce these risks. Successful strategies must always balance the need to ensure patient safety without compromise to the availability of supply and timely access to blood transfusions when required.

Providing High Quality Immunohaematology and Tissue Typing Support

With introduction of new medical procedures and treatments in our healthcare institutions, it is critical to put in place timely and relevant laboratory and blood transfusion support to assure best possible outcomes for the patient. For example, with the introduction of ABO-incompatible kidney transplants in Singapore, our Immunohaematology Laboratories provided critical laboratory testing to support the treatment.

The Immunohaematology Laboratories also continued to upgrade and expand our capabilities to meet international standards as a red cell reference laboratory. Research projects in the area of molecular-based blood group typing contribute towards the development of expertise in this growing area of transfusion medicine.

The Tissue Typing Laboratory continued to provide high quality support to the haematopoietic stem cell and solid organ transplant programmes in Singapore, as well as some other countries in our Region. To assure that transplant programmes are provided with the best possible laboratory support, the laboratory introduced new techniques of HLA antibody detection based on flow cytometry. Even newer technologies involving more sensitive and speedy methods of antibody detection and identification are also being evaluated, as well as the study of possible genetic sequencing methods for HLA typing in future.

Collaborations with Clinical Colleagues

As a reference centre for transfusion medicine, immunohaematology and tissue typing, we maintain strong links with our hospitals with the aim of providing patients the best possible care through our clinical consultative services.

To ensure that blood and blood components are appropriately transfused for the correct clinical indications, our doctors worked closely with their hospital colleagues to develop robust protocols for handling complicated medical situations needing blood. Such protocols continue to improve the speed and effectiveness of blood transfusion support, for example, during liver transplants and obstetric emergencies.

The National Haemovigilance Programme, initiated in 2003 in collaboration with public and private Hospital Transfusion Committees, continued to function effectively to gather local data to assess the frequency of blood transfusion complications and to enable continued improvement efforts to be taken to reduce such complications. A new initiative has been the inclusion of donor haemovigilance to study the complications associated with blood donation.

The Haemovigilance Programme in Singapore is part of wider groups such as the International Haemovigilance Network (IHN) and the International Society for Blood Transfusion Working Party on Haemovigilance. Through such collaborations, our Blood Services Group is able to compare data and information, as well as to participate actively in the development of international standards, definitions and indicators.

Attaining International Benchmarks of Excellence

We were proud to achieve accreditation in August 2008 by the American Society for Histocompatibility and Immunogenetics (ASHI) for tissue typing and transplant support activities. The guiding principle of emphasising excellence in all areas of our work enabled our Tissue Typing Laboratory to attain this distinction, which is awarded only upon demonstration of the highest standards of reliability and quality in Histocompatibility testing laboratories. HSA's Blood Services Group is one of only two national blood services in Asia to have achieved this accreditation.

The ASHI accreditation follows our international accreditation by AABB (formerly known as American Association of Blood Banks) for blood banking activities since 2006. The AABB accreditation for blood banking and transfusion activities demonstrates our commitment to advanced learning, continuous improvement and innovation by striving to sustain the highest possible levels of patient and donor care.

KEY STATISTICS

Consolidating Our Position as a Centre for Excellence in Transfusion Medicine

We continued another term of appointment by the World Health Organisation (WHO) as a WHO Collaborating Centre for Transfusion Medicine. As a valued partner of WHO in its work to promote and improve standards of blood supply quality and safety globally, we participated in global and regional expert consultations, fora and workshops to develop appropriate policies, recommendations and guidelines relevant to blood supply quality and safety. We also conducted training programmes covering the full spectrum of our work, sharing our experiences during study visits and attachment programmes involving health officials, blood banks and hospital staff from other countries.

A key initiative with WHO has been the Singapore-WHO Joint Training Workshop on Management of National Blood Programmes. With the support from the Singapore Government and WHO, the workshop has been held annually since 2007 and aims to provide directors and national managers from blood services in the region with knowledge of current concepts and practices in planning, managing and monitoring national blood programmes. It has also served as an excellent platform for close networking and cooperation amongst blood services in our region. The 2nd workshop was held in July 2008, and focused on critical areas such as donor recruitment programmes, human resource management, training and education, inventory and supply management, and clinical aspects.

Through our many strategic partnerships and collaborations, we have been able to participate in valuable information sharing initiatives, significant research and developmental projects, and formulation of wide-ranging international guidelines and policies. An important regional initiative has been the Asia Pacific Blood Network (APBN) of which Singapore is a founding member, and which aims to strengthen regional cooperation and networking, and promote blood safety and efficiency of blood service operations among members. Activities include information updates, comparison of practices, joint purchasing initiatives, regional disaster management and emergency frameworks, formulation of white papers and regional guidelines.

Other major regional initiatives included two training programmes organised with our colleagues in the blood services of Malaysia and Myanmar. The first Malaysia-Singapore Joint Workshop on Blood Donor Management was held at the National Blood Centre in Kuala Lumpur in December 2008. During the two-and-a-half day programme, participants were able to share ideas and information, exchange experiences, and discuss issues of common concern. Through the many lively group discussions, presentations, forums and role-playing activities, the workshop was an invaluable opportunity to further cement the strong ties between the two blood services.

The Blood Group Serology Project is a technical skills training programme jointly organised between HSA's Blood Services Group and the National Blood Centre in Yangon. Sponsored by the Singapore International Foundation, the three-year programme seeks to enhance the blood serology and clinical transfusion programmes in the blood services in Myanmar. Laboratory and medical staff from our Blood Services Group and the Singapore General Hospital will provide hands-on laboratory training. Since the first training workshop in 2007, signficant benefits have been realised and partnerships developed.

Looking Forward to the Future

Exciting developments have been taking place at our Cell Processing Laboratory. Medical advances have demonstrated that different human immune cells may play vital roles in the treatment of cancer and other diseases. The Cell Processing Laboratory enables the selection and expansion of these cells outside the human body in a sterile and stringent manner, so that they can be safely and effectively infused into the patients for treatment.

One particular focus is on a type of immune cell called the natural killer (NK) cells. Researchers in our laboratory continue to study molecular mechanisms underlying enhanced killing of defective cells using NK cytotoxicity, and through this knowledge, developing the means to improve NK expansion procedures.

An ongoing clinical study in collaboration with clinical colleagues from the Singapore General Hospital involved in stem cell transplantation involves the administration of another special type of immune cell called the cytokine induced killer (CIK) cells. CIK cells are cultured in our laboratory and infused into patients with various blood malignancies such as leukaemia.

With the success of the pilot Cell Processing Laboratory and increasing demand for laboratory space, plans are underway to expand it to an internationally accredited Cellular Therapy Facility. With an additional four processing rooms, the future facility will provide a cutting-edge translational platform for clinicians and scientists to scale up promising research protocols in the transition from bench to bedside.

Future research programmes will include developing novel cell therapy products arising from promising findings in genomics, immunology and proteonomics. Our new capacities and capabilities will continue to strengthen our valued partnership with hospitals and biomedical research institutions in clinical translational trials. It will also give additional advantage to the thrust towards becoming a regional and international reference centre for new advances in cellular therapy.

Applied Sciences Group

Representing the national expertise in forensic medicine and science, analytical testing and metrology in chemistry, the Applied Sciences Group of HSA is in action around the clock. Rigorous and robust scientific principles are applied in our constant pursuit for breakthroughs in new frontiers achieved through innovative research in testing methodologies. Upgrading our capabilities and upscaling our capacities gives us fresh impetus to consistently provide the highest quality forensic response and scientific analysis to support other regulatory and compliance agencies clients in the administration of justice and the safeguarding of public health.

Poised for More Breakthroughs

The work processes at the Mortuary@HSA continued to be transformed by technology following the full implementation of FIONA (Forensic Integrated Operations Network Applications) during the year. Some of the system's key features include Radio-Frequency Identification (RFID) tracking of bodies and WiFi networks combined with tablet PCs to enable mortuary staff to capture essential data in real time and at source within their respective environments. Such enhancements add to greater operational process efficiency and accountability.

We successfully conducted an exercise to field test the operational readiness of our containerised mobile biosafety level 4 (BSL4) autopsy facility. A patented invention by HSA and local firm ACRE Engineering Pte Ltd, the mobile facility provides a high level containment space and protection for our forensic pathologists to conduct autopsies on bodies which could be infected with highly infectious diseases. Apart from allowing maximum containment capability at the national level during a disease outbreak situation, the facility also has the capacity for investigations on homicidal deaths arising from acts of bioterrorism to be conducted.

Abuzz with In-house Innovations

We collaborated with the Bomb and Explosives Investigation Department of the Singapore Police Force to conceptualise and create a local Vehicle Paint Database for criminal and counter-terrorism investigations in Singapore. The database comprises vehicle information and chemical information of vehicle paint collected from a representative population of local vehicles. The physical features and chemical compositions of unknown paint fragments recovered from scenes can be searched through the database to obtain vital information such as the vehicle make, model and even, colour of the unknown vehicle. Statistical and trend analyses also allow tracking of paint formulation changes in different vehicle makes and models over the years. Such details will facilitate investigations in hit-and-run traffic accidents, the search for crime vehicles and also possible vehicles used as vehicle bombs in a terrorist attack.

A total of 3,200 evidence collection kits and blood screening kits developed and produced in-house were supplied to the Police. These kits, which come in seven different types, were customised to local law enforcement needs, quality assured, and self-contained with the necessary tools to preserve evidence collected at crime scenes. They have been designed to enable evidence collection at crime scenes to proceed more efficiently and quickly while protecting evidence integrity, which is of utmost importance to withstand court scrutiny and ensure error-free results.

Vibrancy and Verve at our Labs

During the year, we saw several new work methods and processes being developed at our stable of laboratories. We invested in advanced instruments to meet the increasing demands of emerging techniques, which require an advanced level of precision and accuracy. These efforts fortify our core capabilities to meet or exceed our customers' expectations through our authoritative, evidence-based, and value-added solutions.

Towards Safer Pharmaceuticals

Our Pharmaceutical Laboratory expanded its accredited screening list for western drug adulterants in herbal medicines by 33 new drugs to a total of 413 western drugs. In addition, the screening of two new alkaloids, berberine and tetrahydroplamatine, using Liquid Chromatography Tandem Mass Spectrometry was also successfully accredited according to ISO standards. The laboratory also successfully renewed its ISO/IEC 17025:2005 accreditation for three years.

We made advancements in our fight against illegal products through the development of a methodology for quick and non-destructive screening of counterfeit drugs in Singapore. Conventional forensic techniques resulted in rapid and easy differentiations between unknown and authentic samples. We are also currently developing new advanced techniques in identifying common sources of origin of the counterfeit drugs with the acquisition of a highly sensitive instrument, the Isotope Ratio Mass Spectrometer - the first-of-its-kind in Singapore.

An Added Boost for Food Safety

Our Food Safety Laboratory enjoyed a record achievement when it was reassessed and accredited by SAC-SINGLAS for six new tests in November 2008, and 24 new tests in March 2009. With the successful accreditation of the various new testing methods for food additives, food packaging contaminants, environmental contaminants and mycotoxins, we are now offering our clients a wider range of reliable services, while providing them renewed confidence and assurance in the quality of our analytical services.

One such example is a test method that incorporates the accelerated solvent extraction system to extract analytes more efficiently. As fewer solvents and reagents are used, this method is not only environmentally friendlier, but also significantly reduces the operating costs and solvent disposal costs involved. This in turn offers our clients a more cost-effective and timely service.

Going forward, we will be working on a project to develop a method for the extraction and analysis of Nitropropionic acid (NPA) and Nitropropanol (NPOH) from sugarcane juices. As the mycotoxin 3-Nitropronionic acid has only been recently discovered, there has been no scientific data available for the analysis of both NPA and NPOH yet. Our completed method will serve as an additional service for our customers, such as the Agrifood and Veterinary Authority, and facilitate decisions on implementing suitable regulations on food safety.

Beyond upscaling our scientific capabilities, we remained committed to providing a total package that enhances our clients' experience with us. This is especially so during critical periods when turnaround times can have a pressing impact on business priorities and consumer safety. For instance, during the melamine crisis in October 2008, our Food Safety Laboratory provided a host of other value-added services to our customers apart from food testing. We created a database on the melamine content of all the milk products from all the different international branches of a global customer, enabling it to keep track of the quality of its products internationally. We also exercised flexibility in customising the payment arrangements for each of the branches for their convenience.

More Testing Services for Cosmetics

To meet the increasing demands of regulatory needs, our Cosmetic Laboratory also introduced five new testing services: Diethylene glycol by Gas Chromatography/Mass Spectrometry and carcinogenic dyes (Para Red and Sudan I-IV) by Liquid Chromatography Tandem Mass Spectrometry. The laboratory's SAC-SINGLAS accreditation was also successfully renewed during the year.

A Significant Step Forward

HSA was officially appointed by the National Metrology Centre at the Agency of Science, Technology and Research (A*STAR) as a Designated Institute for Chemical Metrology in the medical and pharmaceutical fields, as well as in the areas of food, healthcare and forensics. The HSA Act was amended to empower HSA to take on this additional responsibility.

A new Chemical Metrology Division was also formed within HSA's Applied Sciences Group to establish the chemical metrology infrastructure and building up capabilities. It will support the work of the joint HSA-A*STAR Metrology in Chemistry Steering Committee, which will oversee the development of the chemical metrology programme in Singapore.

With this new capability being added to our growing pool of expertise in the applied sciences, we are now recognised by the Bureau International des Poids et Mesures (BIPM), an international body that ensures worldwide uniformity of measurements and their traceability to the International System of Units, and have also become a full member of the Asia-Pacific Metrology Programme. Through study visits and attachment programmes, we strengthened ties with overseas agencies such as the National Measurement Institute (Australia) and the National Institute of Metrology (China).

Our Chemical Metrology Laboratory, currently being built in a clean-room environment, is slated to be operational by August 2009. It will house a special "metal-free section" for inorganic analysis and will boast state-of-the-art instruments. Going forward, we will focus on organising proficiency testing surveys in partnership with the Singapore Accreditation Council to assess the quality data produced by local testing laboratories and promoting this new field to the industry.

Tapping on our Built-in Edge

The year saw us sharpening the synergies across the fields of expertise within the Group and across the organisation in more ways. This multi-disciplinary approach in our planning and execution processes will continue to strengthen our ability to respond effectively to our business environment, and also demonstrate the value of our work to all we serve.

KEY STATISTICS

A Synthesis of Skill Sets

The joint capabilities from our Forensic Chemistry and Physics Laboratory and Pharmaceutical Laboratory have contributed in significant ways to the fight against counterfeit drugs. On its part, the Forensic Chemistry and Physics Laboratory thoroughly conducts microscopic examinations of packaging materials, tablets and capsules and chemical profiling of counterfeit drugs through various sophisticated techniques. It is the only laboratory in Singapore and one of the few worldwide able to trace the drugs to their source of origin by characterising their stable isotope ratios through Isotope Ratio Mass Spectrometry. Complementing this, the Pharmaceutical Laboratory meticulously works towards confirming the identity of the active pharmaceutical ingredients found in the counterfeits, using various chromatographic techniques. Chemical assays of the active pharmaceutical ingredients, which may be present only in minute amounts, are also conducted to quantify them.

With the synergistic application of the capabilities from these two laboratories, HSA is able to provide a more complete and comprehensive characterisation and identification of counterfeit drugs.

Our laboratories provided analyses for suspicious samples of health products seized locally by the Enforcement Branch in our Health Products Regulation Group, and also those through Operation Storm, an INTERPOL-WHO initiative against the transnational trafficking of counterfeit medicines in the Great Mekong Sub-region. The examination of samples received contributes to a database on counterfeit drugs maintained by HSA. Last year, 252 counterfeit drug samples were analysed. These included antibiotics, antimalarials, anti-platelet, antipsychotics and erectile dysfunction drugs. Our international collaboration with INTERPOL-WHO has established us as a reputable reference centre for counterfeit drug analysis and investigation. We are proud to be able to play a part in tackling the global issue of counterfeit medicines on the global stage. Counterfeit medicines not only impact the business bottomlines of responsible drug companies, but many of them have been shown to cause extremely harmful and damaging health issues such as drug resistance, adverse reactions and even death.

Expertise Pooled to Investigate Suspected Arsenic Poisoning Case

We successfully assisted the Police in the analytical investigation of a suspected arsenic poisoning case by pooling together a unique cross-functioning team of highly specialised expertise in forensic and analytical sciences. The case had involved the testing for arsenic in food products, unknown substances and biological specimens (blood, urine, hair and nail clippings).

While our Analytical Toxicology Laboratory provided expertise to analyse biological specimens, we were able to utilise the advanced instrument, Inductively Coupled Plasma/Mass Spectrometery (ICP/MS) available at our Food Safety Laboratory, combined with the experiences of our Food Safety and Pharmaceutical Laboratories in heavy metals analysis.

With such synergies, we are also able to leverage on shared resources, technological capabilities and extensive state-of-the-art equipment that have resulted in significant cost savings and faster turnaround time.

Practices In Forensic Medicine Boost Safety Standards at Cigarette Testing Laboratory

Drawing from the experience of Forensic Medicine in good biosafety practices and risk reduction, officers at our Cigarette Testing Laboratory are also now using the Jupiter Suit as their personal protective equipment against the inhalation of smoke particulates generated during smoking experiments. This transfer of experience from biosafety practices in our Forensic Medicine Division to a laboratory environment offers better protection to staff and has improved the safety standards across the organisation. Officials from the World Health Organisation observed this practice in our laboratory during a visit and have recommended that this be put in place across all laboratories in Singapore conducting similar activities.

Synergistic Steps Towards Health Product Safety

Our laboratories also supported the surveillance and enforcement operations of our regulatory role by sourcing for portable instruments for on-site screening of health products. Scientists will help to maintain the equipment and ensure that the library of drugs is regularly updated. This in turn will bring about a radical change to and enhance our surveillance and enforcement capabilities.

Following an alert on several brands of hot/cold compress packs being recalled in Australia, our laboratories conducted an urgent analysis of the contents of samples found in Singapore. The tests confirmed that the packs sold in Singapore also contained the highly toxic antifreeze agent found in those overseas. This in turn led to our regulatory arm initiating a nationwide retail recall of the packs immediately before they could cause any harm to consumers.

More cross-functional projects are in the pipeline. Our laboratories are exploring a faster and more cost-effective technique to detect and quantify the amount of leaching of potentially hazardous plasticisers from medical devices made of PVC. This project will provide scientific support to our regulatory operations to minimise the risks associated with devices containing PVC.

Strengthening Ties at Home and Globally

We continued to place high priority on deepening and broadening our partnerships during the year. This is driven by a keen awareness that collaborative arrangements are the way to go in today's ever changing environment.

An agreement between HSA and the National University of Singapore signed in November 2008 has made it possible for undergraduates to immerse themselves in the intriguing field of forensic sciences through a new minor programme. The Advanced Forensic Science module, the first and only in Singapore, will enable undergraduates to hear HSA's practising forensic scientists share on topics such as scientific ethics, trace evidence, DNA profiling, drugs and toxicology. The module, which includes both theory and practical sessions, places a great emphasis on the rigorous application of science, objective reasoning and sound interpretation of physical evidence to serve the needs of the justice system.

A forensic group network meeting involving six ASEAN countries was held at HSA from 14 to 15 October 2008. The meeting, co-hosted by HSA, KIMIA Malaysia and the United Nations Office on Drugs and Crime, concluded with the formation of the Asian Forensic Sciences Network. Dr Paul Chui, Group Director, Applied Sciences Group, HSA, was elected as the interim president of this forum. Our involvement in this forum paves the way for us to contribute as a thought leader to the network's goals of promoting, advancing and enhancing the quality of professional forensic scientific practice in Asia.

We signed a Letter of Collaboration with the Shanghai Institute of Food and Drug Control to formalise a new framework of cooperation on issues related to Traditional Chinese Medicines and health supplements. This will be done through cross training of technical staff, information exchanges, provision of consultancy services and the identification of more scientific activities for collaboration.

In the year under review, our Pharmaceutical Laboratory was designated a WHO Prequalified Quality Control Laboratory in pharmaceuticals under the WHO Prequalification of Medicines Programme. As the only WHO-recognised pharmaceutical laboratory in Singapore, HSA joins nine other laboratories worldwide to provide the United Nations agencies with the testing service for pharmaceutical products the agencies intend to procure to benefit those in need.

Our Cigarette Testing Laboratory celebrated the honour to be the first testing laboratory in the Western Pacific Region to be designated a WHO Collaborating Centre for Tobacco Testing and Research. Our laboratory was also appointed by the Ministry of Health, Brunei, as its reference laboratory for tar and nicotine testing on regulatory compliance.

Our Food Safety Laboratory was successfully re-designated as a WHO Collaborating Centre for Food Contamination Monitoring in September 2008 for another four years. Our food database on the analytical results of food samples carried out over the years will continue to provide useful information for WHO to identify trends to reinforce food safety for consumers.

In our capacity as a WHO Collaborating Centre and an EC-ASEAN Reference Laboratory for Mycotoxin Analysis, we also had the privilege of sharing our expertise to help overseas agencies gain new knowledge and skills to apply in their home countries.

Research Papers and Projects

Health Products Regulation

TITLE OF RESEARCH PAPER	AUTHOR(S)	PROFESSIONAL PUBLICATION
Bilateral Posterior Ischemic Optic Neuropathy Associated with Use of Sildenafil	Su Hsien Wen, Ang Pei San & Tow Lee Choon	Journal of Neuro-Ophthalmolology, March 2008, 28(1), 75
Severe Hypoglycemia Associated with an Illegal Sexual Enhancement Product Adulterated with Glibenclamide: MR Imaging Findings	Tchoyoson Lim, Robert Gan, Chan Cheng Leng, Alvin Tan, Joan Khoo, Chia Su Ynn, Dr Kao Shih Ling, John Abisheganaden & Sitoh Yih Yian	Radiology, Neuroradiology, January 2009, 250, 193-201
Clinical Trials SUSAR Reports in Singapore	Dorothy Toh, Chong Limei & Foo Yang Tong	Regulatory Affairs Journal - Pharma, February 2009, 20(2), p 93-94

TITLE OF RESEARCH PRESENTATION	AUTHOR(S)	PROFESSIONAL EVENT
A Cluster of Serious ADR Caused by Illegal Products Adulterated with Glibenclamide	Belinda Tan	WHO 31st Annual Meeting of National Centres Participating in the WHO Programme for International Drug Monitoring, Uppsala, Sweden, 20 - 23 October 2008

TITLE OF RESEARCH PROJECT	PRINCIPAL INVESTIGATORS
Study on Chinese Medicinal Herbs in Singapore	Yee Shen Kuan, Chu Swee Seng, Victor Wong, Dr Zhang Qian, Li Chunwei, Liu Yichun, Monica Wong, Tay Swee Ling & Choo Peck Lin

Transfusion Medicine

TITLE OF RESEARCH PAPER/ ABSTRACT	AUTHOR(S)	PROFESSIONAL PUBLICATION/ EVENT
Is Dengue a Threat to the Blood Supply?	Dr Diana Teo, Ng Lee Ching & Sally Lam	Transfusion Medicine, 2009, 19, 66-77
Stem Cell Transplantation Programme at Singapore General Hospital	Dr Mickey Koh, Lim Tsyr Jong, Madelaine Niam, Dr Garnet Suck, Dr Marieta Chan & Phang Chew Yen	Bone Marrow Transplantation (2008), 42, p S121-124
Transcriptional Profiling of Tumor Target Stimulated CD56+CD8+ Versus CD56+CD8- NK Cells with Relevance for Cancer Cellular Therapy, 2008	Dr Garnet Suck, Selina Chu Sixian, Madelaine Niam, Lim Tsyr Jong, Kam Mun Hui & Dr Mickey Koh	American Association for Cancer Research (AACR) Annual Conference, San Diego, CA, USA, 12 - 16 April 2008
Inhibitory Effect of Demecolcine on NK Cell Functions - Implications for Cancer Therapy	Dr Garnet Suck & Dr Mickey Koh	Ehrlich II - 2nd World Conference on Magic Bullets, Nuernberg, Germany, 3 - 5 October 2008 (Abstract Book)

Transfusion Medicine

TITLE OF RESEARCH PAPER/ ABSTRACT	AUTHOR(S)	PROFESSIONAL PUBLICATION/ EVENT
Comparative Analysis of LFA-1 Activation State and Functional Involvement in Enhanced Cytotoxicity of NK Cell Lines KHYG-1 and NK-92	Dr Garnet Suck, Tan Suet Mien, Selina Chu Sixian, Madelaine Niam, Lim Tsyr Jong & Dr Mickey Koh	American Society of Haematology (ASH) Annual Conference, San Diego, CA, USA, 6 - 9 December 2008
Cytokine Induced Killer Cells are Feasible and Safe for Both Autologous and Allogeneic Applications in Patients with Haematological Malignancies	Dr Linn Yeh Ching, Lim Tsyr Jong, Madelaine Niam, Dr Garnet Suck, Dr Goh Yeow Tee, Dr William Hwang, Dr Yvonne Loh & Dr Mickey Koh	Blood (ASH Annual Meeting Abstracts) 2008, p 112: Abstract 2917, American Society of Haematology (ASH); Annual Conference, San Diego, CA, USA, 6 - 9 December 2008

TITLE OF RESEARCH PRESENTATION	AUTHOR(S)	PROFESSIONAL EVENT
Donor Adverse Events Amongst Apheresis Donors in our Blood Centre	Noorhayati Rahamat, Rohaidah Ramli, Dr Ramir Alcantara, Dr Tan Hwee Huang & Dr Diana Teo	29th American Society for Apheresis (ASFA) Annual Meeting, Texas, USA, 9 - 12 April 2008
RhD Genotyping of Different Ethnic Groups in Singapore	He Pei Ru, Michael Ng & Dr Marieta Chan	School of Biological Sciences - Nanyang Technological University Annual Poster Day, 6 May 2008
Every Drop Counts	Toh Ching Lian, Loh Siew Ling, Amajit Kaur, Dr Tan Hwee Huang & Dr Diana Teo	XXXth International Congress of ISBT, Macao, SAR, China, 7 - 12 June 2008
Recruitment and Retention of First-Time Platelet Donors	P.Pyone, Poo L H, Debbie Joan Pennefather, Dr Tan Hwee Huang & Dr Diana Teo	XXXth International Congress of ISBT, Macao, SAR, China, 7 - 12 June 2008
Screening of ABO Titers in Group O Apheresis Donors in Singapore	Alcantara Armi Grace, Dr Ramir Alcantara, Dr Tan Hwee Huang & Dr Mickey Koh	XXXth International Congress of ISBT, Macao, SAR, China, 7 - 12 June 2008
To Assess the Presence of Clinically Significant Anti-MUT in Patients Screened by CSL Abtectcell Red Cell Reagent	Kang Kok Sheng, Prof Robert Flower & Dr Mickey Koh	AABB Annual Meeting, Montreal, Canada, 4 - 7 October 2008
Screening for High Risk and HLA Alloimmunised Female Donors as a Strategy to Reduce TRALI	Dr Ramir Alcantara, Alcantara Armi Grace, Dr Tan Hwee Huang & Dr Mickey Koh	AABB Annual Meeting, Montreal, Canada, 4 - 7 October 2008

TITLE OF RESEARCH PROJECT	PRINCIPAL INVESTIGATORS
Dengue Prevalence Study on Blood Donors	Sally Lam & Dr Diana Teo
Evaluation of Immunoassay Test for Malaria at Risk Donors	Sally Lam & Dr Diana Teo
Host Response and Immunopathogenesis of DF/DHF/DSS	Dr Mickey Koh, Ng Kok Quan & Novartis

Transfusion Medicine

TITLE OF RESEARCH PROJECT	PRINCIPAL INVESTIGATORS
Immune Function in Healthy Singaporeans (Intracellular Cytokine & Surface Marker Staining of Immune Cells - Part I)	Dr Marieta Chan, Dr Diana Teo & Prof Kemeny
Development and Implementation of a Rh Anti-D Quantitation Procedure	Dr Marieta Chan, Michael Ng, Kang Kok Seng, Leou Kwee Kim & Dr Diana Teo
Correlative Studies on Panel Reactive Antibody of Highly Sensitised Patient Performed by Complement-Dependent Cytotoxicity and Flow Cytometry	Dr Marieta Chan, Phang Chew Yen, Lai May Ling, Tang Ei Mei & Dr Diana Teo
RhD Genotyping of Different Ethnic Groups in Singapore	Dr Marieta Chan, Michael Ng & He Pei Ru
Study of Serum Protein and Globulin Levels of Apheresis Donors Who Have Donated 12 Times Per Year	Dr Tan Hwee Huang, Debbie Joan Pennefather & Dr Tang Yoke Mei
Evaluation of Feasibility of Collecting High Plasma Volume Components from Female Donors Without HLA Antibodies to Reduce the Risk of TRALI	Dr Ramir Alcantara & Dr Tan Hwee Huang
CD56+CD8+ and Tumour-Activated NLK Cells as Potential Candidates for Cancer Cellular Therapy: Molecular Profiling and Mechanistic Analyses of their High Cytotoxic Potentialutics	Dr Garnet Suck & Dr Mickey Koh
Enhancing NK Cell Cytotoxicity to Improve Current Cancer Cell Therapies by Ex Vivo Stimulation with Neuropeptides	Dr Garnet Suck, Dr Mickey Koh, Madelaine Niam & Lim Tsyr Jong

Forensic Medicine

TITLE OF RESEARCH PAPER	AUTHOR(S)	PROFESSIONAL PUBLICATION
Fatal Cerebral Infarction Complicating Therapeutic Embolisation of a Facial Cavernous Haemangioma: A Case Report	A/Prof Gilbert Lau	Med Sci Law 2008 July; 48(3): 256-260

Forensic Science

TITLE OF RESEARCH PAPER	AUTHOR(S)	PROFESSIONAL PUBLICATION
The Effects of Asian Population Substructure on Y STR Forensic Analyses	Bruce Budowle, Ge Jianye, Joyce Low, Crystal Lai, Wong Hang Yee, Grace Law, Tan Wai Fun, Chang Yuet Meng, Revathi Perumal, Phoon Yoong Keat, Natsuko Mizuno, Kentaro Kasai, Kazumasa Sekiguchi & Ranajit Chakraborty	Legal Medicine (Tokyo) 2009 March; 11(2) 64-69
A Servant of Truth and Justice - Forensic Science Exclusive	Dr Michael Tay Ming Kiong	Inter Se, Singapore Academy of Law, January - June 2009 issue, p 35-43

TITLE OF RESEARCH PRESENTATION	AUTHOR(S)	PROFESSIONAL EVENT
Application of Liquid Chromatography-tandem Mass Spectrometry (LC/MS/MS) in Clinical and Forensic Toxicology	Dai Guan Hong, Moy Hooi Yan & Dr Yao Yi Ju	School of Biological Sciences - Nanyang Technological University Annual Poster Day, 6 May 2008
Application of Liquid Chromatography with Mass Spectrometry (LC/MS) in Clinical and Forensic Toxicology - Project 2	Koh Eng Lye & Dr Yao Yi Ju	School of Biological Sciences - Nanyang Technological University Annual Poster Day, 6 May 2008
Chemical Fingerprinting of Counterfeit Drugs	Lim Chin Chin, Lim Thiam Bon, Yang Chiew Yung & Dr Michael Tay Ming Kiong	Permanent Forum on International Pharmaceutical Crime, Singapore 4 June 2008
Lab Analysis Results - Value and Challenges	Lim Thiam Bon, Yang Chiew Yung, Joyce Kiang, Pan Xinghua, Low Min Yong & Lim Chin Chin	Interpol-WHO Operation Storm Review Meeting, Vietnam, 2 July 2008
Applying Chemical and Physical Techniques to Forensic Investigations	Dr Michael Tay Ming Kiong	3rd International Forensic Science & Medical Science Conference: Resolving the Southern Crises, Naresuan University, Phitsanulok, Thailand, 28 - 29 July 2008
Urinary Toluene Distribution in Glue Sniffers	Alex Low Xuankai, Imran Bin Marjuki, Tan Joo Chin, Dr Lui Chi Pang & Dr Yao Yi Ju	19th International Symposium on the Forensic Sciences, Melbourne, Australia, 6 - 9 October 2008
Update of DNA Profiling Work in Singapore	Tan Wai Fun	International DNA Symposium 2008: "Towards the International Quality", Bangkok, Thailand, 9 - 11 November 2008
Lab Analysis Results of 110 Operation Storm Samples	Lim Chin Chin, Lim Thiam Bon, Yang Chiew Yung, Pan Xinghua, Dr Kee Chee Leong, Low Min Yong & Ruth Lee	Interpol-WHO Operation Storm Final Meeting, Cambodia, 17 November 2008

Analytical Science

TITLE OF RESEARCH PAPER	AUTHOR(S)	PROFESSIONAL PUBLICATION
Isolation and Identification of Hydroxythiohomosildenafil in Herbal Dietary Supplements Sold as Sexual Performance Enhancement Products	Li Lin, Low Min Yong, Aliwarfa, Jessie Teo, Dr Ge Xiaowei, Dr Zeng Yun, Prof Bosco Chen Bloodworth & A/Prof Koh Hwee Ling	Food Additives and Contaminants (2008), iFirst, 1-7
Structural Elucidation of a PDE-5 Inhibitor Detected as an Adulterant in a Health Supplement	Dr Ge Xiaowei, Low Min Yong, Zou Peng, Li Lin, Sharon Oh Sze Yin, Prof Bosco Chen Bloodworth & A/Prof Koh Hwee Ling	Journal of Pharmaceutical and Biomedical Analysis, 48 (2008), 1070-1075

TITLE OF RESEARCH PRESENTATION	AUTHOR(S)	PROFESSIONAL EVENT
Tobacco Specific Nitrosamines in Mainstream Cigarette Smoke	Cheah Nuan Ping, Chung Loi Hian, Faridatul Akman B Morsed & Kantipon Numpilai	4th WHO Tobacco Laboratory Network, Rio de Janeiro, Brazil, 26 March 2009
Safety Aspects of a Smoking Laboratory	Cheah Nuan Ping, Chung Loi Hian, Faridatul Akman B Morsed & Kantipon Numpilai	4th WHO Tobacco Laboratory Network, Rio de Janeiro, Brazil, 26 March 2009
Rapid Analysis of Polybrominated Diphenyl Ethers in Food Using Selective Pressurized Liquid Extraction Followed by Gas Chromatography Tandem Mass Spectrometry	Li Fangyan & Joanne Chan Sheot Harn	122nd AOAC Annual Meeting & Exposition, Dallas, Texas, USA, 21 - 24 September 2008
The Role of Chemistry in Food Safety in Singapore	Joanne Chan Sheot Harn	Guest Lecture at the National University of Singapore, Singapore, 21 October 2008
Trace Level Determination of Melamine in Food by Liquid Chromatography with Tandem Mass Spectrometry	Shao Fay, Joanne Chan Sheot Harn & Lee Lin Min	5th Asian Conference on Food & Nutrition, Cebu, Philippines, 3 - 7 November 2008
A Fast Method for the Simultaneous Determination of Bisphenol A, Bisphenol F, Bisphenol A Diglycidyl Ether, and Bisphenol F Diglycidyl Ether and their Derivatives in Canned Foods by Ultra-Performance Liquid Chromatography (UPLC)	Debbie Sun Cuilian, Leong Lai Peng, Joanne Chan Sheot Harn & Prof Bosco Chen Bloodworth	4th International Symposium on Food Packaging, Prague, Czech Republic, 19 - 21 November 2008

TITLE OF RESEARCH PROJECT	PRINCIPAL INVESTIGATOR(S)
Tobacco Specific Nitrosamines (TSNAs) Validation Studies and Market Survey on Cigarette on Sale in Singapore	Cheah Nuan Ping, Chung Loi Hian, Faridatul Akman B Morsed & Kantipon Numpilai

Financial Highlights FY08

Balance Sheet

	FY08/09 $'000	FY07/08 $'000	Increase/ (Decrease) $'000	%
Property, Plant & Equipment	99,360	89,817	9,543	11
Intangibles	10,429	10,902	(473)	(4)
Current Assets	38,522	40,853	(2,331)	(6)
Total Assets	**148,311**	**141,572**	**6,739**	**5**
Equity	70,629	63,107	7,522	12
Long-term Loans	22,750	25,263	(2,513)	(10)
Other Non-Current Liabilities	17,206	19,855	(2,649)	(13)
Current Liabilities	37,726	33,347	4,379	13
Total Equity and Liabilities	**148,311**	**141,572**	**6,739**	**5**

Income & Expenditure Statement

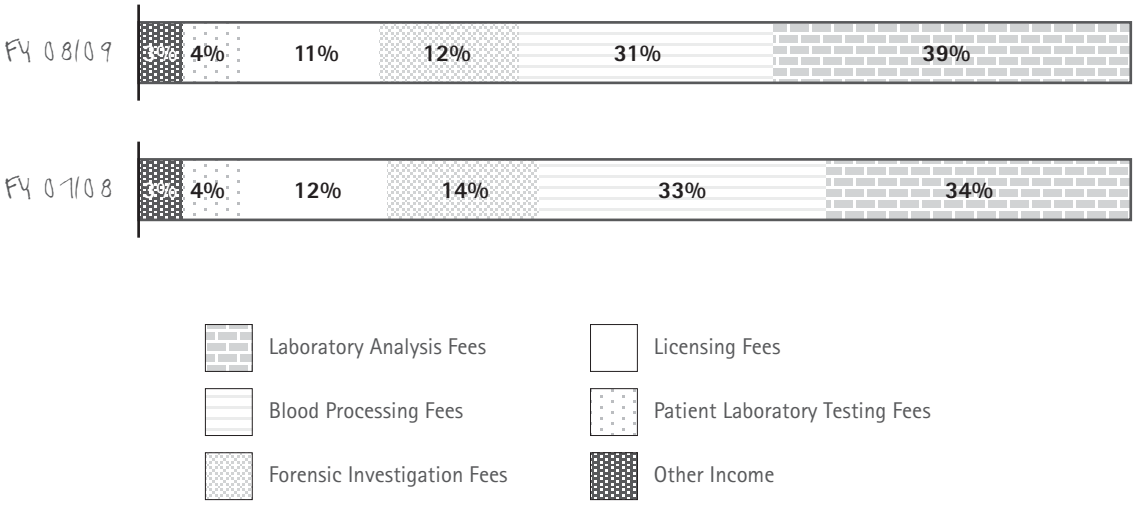
The Authority has achieved an overall net surplus of $4.6m for FY08/09

	FY08/09 $'000	FY07/08 $'000	Increase/ (Decrease) $'000	%
Operating Income	66,795	63,219	3,576	6
Operating Expenditure	(117,256)	(106,755)	(10,501)	10
Deficit before Government Grants	**(50,461)**	**(43,536)**	**(6,925)**	**16**
Government Grants	56,079	46,417	9,662	21
Surplus before Contribution to Consolidated Fund	**5,618**	**2,881**	**2,737**	**95**
Contribution to Consolidated Fund	(1,011)	(287)	(724)	252
Net Surplus	**4,607**	**2,594**	**2,013**	**78**

Operating Income

The Authority earned a total operating income of $66.8m in FY08/09, an increase of $3.6m (6%) over FY07/08's revenue of $63.2m.

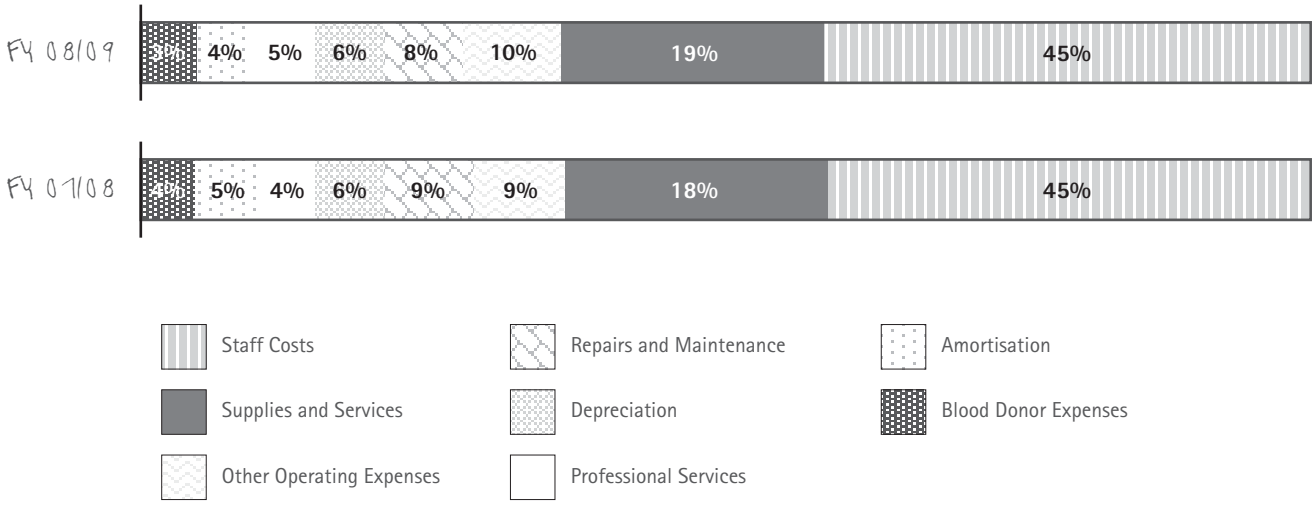
	FY08/09 $'000	FY07/08 $'000	Increase/ (Decrease) $'000	%
Laboratory Analysis Fees	25,657	22,316	3,341	15
Blood Processing Fees	20,565	20,779	(214)	(1)
Patient Laboratory Testing Fees	2,602	2,266	336	15
Forensic Investigation Fees	8,264	8,622	(358)	(4)
Licensing Fees	7,529	7,403	126	2
Other Income	2,178	1,833	345	19
Total Operating Income	**66,795**	**63,219**	**3,576**	**6**



Operating Expenditure

The Authority incurred a total operating expenditure of $117.3m in FY08/09, an increase of $10.5m (10%) over FY07/08's expenditure of $106.8m.

	FY08/09 $'000	FY07/08 $'000	Increase/ (Decrease) $'000	%
Staff Costs	53,238	48,943	4,295	9
Supplies and Services	22,254	19,750	2,504	13
Repairs and Maintenance	9,442	9,156	286	3
Depreciation	6,969	6,050	919	15
Professional Services	5,716	4,563	1,153	25
Amortisation	4,664	5,030	(366)	(7)
Blood Donor Expenses	3,288	4,046	(758)	(19)
Other Operating Expenses	11,685	9,217	2,468	27
Total Operating Expenses	**117,256**	**106,755**	**10,501**	**10**



Notes

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