
HOPE
TRUST
CONNECT
& ADVANCE
HSA Annual Report 2012-13
CAPABILITIES
LEADERSHIP
STRATEGIES

CONTENTS

CONNECT & ADVANCE

At HSA, good things happen when we connect.

Lives are saved. Justice is served with the help of forensic and analytical sciences. Safety and quality of health products are ensured. Through strong and meaningful connections, HSA is lending a vital hand to protect and advance public health and safety in Singapore.

It's these connections – with industry leaders, peer agencies, researchers, international and local experts, healthcare professionals and institutions, academics and the man on the street – that continue to spur us on. Our open and collaborative approach has led to advancements in a multitude of fields, benefiting analytical sciences and public healthcare on our island nation, and beyond its shores.

This year's annual report theme celebrates our valuable connections that advance us every day towards our blueprint for the future, and pave a better way to make a difference to Singapore and the world.

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.

INSPIRE TRUST
We act with credibility, professionalism and integrity, to instil public trust and confidence.

LIVE INNOVATION
We seek constantly to improve and transform.

DEVELOP OUR COMMUNITY
We value our people and build trusted teams.

PASSION FOR EXCELLENCE
We aim to be the best in all that we do.

OUR ACCOLADES

ORGANISATIONAL EXCELLENCE

The Public Service Milestone Award
2010

Singapore Quality Class
since 2009

People Developer Certification
since 2002

Singapore Innovation Class
first public healthcare agency to be endorsed
2003

Singapore H.E.A.L.T.H. Platinum Award
2012

Public Service Award for Organisational Excellence
2006

Meritorious Defence Partner Award
since 2005

Meritorious Home Team Partner Award
since 2008

Community Chest Awards
since 2003

Singapore Family Friendly Employer Award
2004

ISO 9001:2008
Information Management Department
Corporate Headquarters
since 2011

OUR ACCOLADES

PROFESSIONAL EXCELLENCE

HEALTH PRODUCTS REGULATION GROUP

ISO 9001:2008
Tobacco Regulation Branch
since February 2011

Accreditation to Pharmaceutical Inspection Co-operation Scheme (PIC/S)
Audit & Licensing Division
since January 2000

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

World Health Organization 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, Biology Division, Illicit Drugs Division and Analytical Toxicology Division

Excellence for Singapore Award
1999

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

Pharmaceutical Division and 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 Organization Collaborating Centre for Tobacco Testing and Research
since June 2009

ASEAN Leading Country for Colorants and Tretinoin Analysis in Cosmetic Products
since 2004

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

Food Safety Division

ASEAN Reference Laboratory for Mycotoxins Analysis
since June 2004

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

CHAT WITH OUR CHAIRMAN

Our scientists, health professionals and administrators must continue to be of the highest calibre and integrity, and share our vision to build an organisation that serves our national needs and is well respected internationally.

Q WHAT IS YOUR VIEW OF HSA IN THE SECOND YEAR OF YOUR CHAIRMANSHIP?

A HSA is a unique organisation that covers broad and diverse areas in protecting public health and safety. What binds these areas together is the critical impact they have on the lives and well-being of Singaporeans. Our three professional groups play significant national roles through their scientific and regulatory responsibilities. I am keenly aware that this is made possible by the strong pool of dedicated and professional staff who are focused and committed to fulfilling HSA's mission, and I am very grateful for their professionalism and sense of duty.

Professor John Wong
Chairman

Q HOW CAN HSA CONTINUE TO BUILD ON THE STRONG FOUNDATION IT HAS ESTABLISHED?

A HSA has done well in its first twelve years, but it will always need to keep up with the increasingly rapid pace of science and technology. We must always ensure that we can run a transfusion medicine service and apply analytical and regulatory science that are at the forefront of current knowledge to the benefit of Singapore.

The expertise and standing of our staff will always be the critical factor. Our scientists, health professionals and administrators must continue to be of the highest calibre and integrity, and share our vision to build an organisation that serves our national needs and is well respected internationally. Our priority must be to create an environment and culture that can effectively attract, retain, and develop our people through relevant training, good mentoring and robust succession planning.

We must continue strengthening and expanding our partnerships with local academic institutions and our counterpart agencies globally. We have to collaborate with them, learn from them, and leverage on their strengths to optimise our small talent base.

We always have to be sensitive to the scientific and social environment in which we function. These include the impact of an aging population on the demand for safe and sustainable blood products, the implications of our globally interconnected world on the regulation of health products across international supply chains, and developing enhanced capabilities in forensic and analytical testing to support the administration of justice.

It is important that we proactively upgrade and renew our infrastructure to enable the organisation to meet current as well as future needs. This includes systems, processes, equipment and physical space so that our staff are able to carry out their work in an optimal setting and with the relevant means to do their jobs well.

Q THE BOARD OF DIRECTORS HAS BEEN RENEWED. WHAT ARE YOUR THOUGHTS ABOUT THE ROLE OF THE BOARD AS HSA CONTINUES TO DEVELOP?

A First, I would like to acknowledge and appreciate the immense contributions of the Board members who have stepped down. We are extremely grateful to Dr Jennifer Lee, Adjunct Associate Professor Lee Chien Earn, Dr Chong Yoke Sin, Professor Alastair Campbell and Professor Walter Tan for their dedicated service after having served on the Board for six and more years. They have worked closely with HSA's leadership to strengthen the organisation's capability as a trusted regulator and scientific authority, and have given much wise guidance to develop HSA's strategic direction and areas of priority that have enabled the organisation to attain its current status.

We extend our warmest welcome to Mr Max Loh, Mrs Tan Li Lian, Mr Adam Abdur Rahman and Mr Tai Lee Siang as our new Board members. We look forward to their fresh perspectives and strong work experience from the private sector. With their experience in audit, communications, risk management and infrastructure development, the new Board members will help to ensure continued good governance while HSA continues to advance. The Board will also work with Senior Management to focus the organisation on critical systems, development, and strategies to better future proof HSA in an increasingly challenging environment.

I am grateful for a Board and Senior Management team with such a collective sense of purpose ensuring that HSA fulfils its fundamental mission to protect and advance Singapore's national health and safety.

Assoc Professor John Lim
Chief Executive Officer

Q&A WITH OUR CEO

Q WITH THIS YEAR'S THEME BEING "CONNECT AND ADVANCE", HOW WOULD YOU DESCRIBE HSA'S CONNECTION WITH ITS STAKEHOLDERS?

A We continued to remain connected with our partners – local and global. It is this strong collaboration with our counterparts that has allowed us to harness the collective power of sharing ideas and knowledge to inspire new solutions. For example, our inaugural roundtable on medical devices brought together international and local experts from government, industry and academia to discuss significant issues and make recommendations to enhance the Singapore regulatory framework. To further boost research and regulatory affairs cooperation, we signed a series of Memoranda of Understanding with overseas regulatory counterparts and academic institutions that added to our significant collaborative network.

We also organised a series of international conferences on blood, forensic science and drug regulation. We continue to support scientific and regulatory harmonisation and convergence around the world by participating in global working groups related to the World Health Organization, the Asian Forensic Sciences Network, ASEAN and the European Network of Forensic Sciences Institutes.

Throughout the year, we maintained and strengthened connections with our industry clients and hospitals. We launched the "NEX2US – Connecting with Our Partners" newsletter to keep partners informed of our regulatory activities. Our partnership with the law enforcement agencies continued to be refined and deepened through the Service Level Agreement with the Ministry of Home Affairs.

Engaging the Singapore public is vital for us. Our role in keeping the public updated empowers individuals to make more informed decisions on their own health and safety. This year, we launched our second large-scale public education campaign which saw success in boosting awareness of counterfeit products.

To better meet today's challenges, we are focused on capability building across our professional groups.

Q WHAT ARE SOME OF HSA'S KEY ACHIEVEMENTS?

A During the year, we made significant progress in expanding our core capabilities, and increasing customer engagement and service quality.

To better meet today's challenges, we are focused on capability building across our professional groups. These include new testing services for food safety and new testing methodologies for drug abuse using hair samples to support enforcement agencies. We have also introduced new buffy-coat method of platelet preparation to provide hospitals with better quality platelet products. Massive blood transfusion protocols were also developed in collaboration with hospitals to provide swift and efficient blood support to trauma patients and obstetric patients with severe bleeding.

The formation of the Service Management & Industry Development Office (SMIDO) in the Health Products Regulation Group has deepened our engagement with stakeholders in the healthcare sector and the industry. In addition, our new HSA-wide customer relationship management system is now in place to manage feedback and engage our stakeholders more effectively and efficiently.

With regard to service quality, both our Applied Sciences and Blood Services Groups embarked on 13 Lean Six Sigma projects, leading to significant improvements in processes and performance. As a result, our partners and stakeholders have benefited from better and faster service. In the same vein, the second DNA Profiling Laboratory was set up to handle increased workload demands and ensure business continuity. We also set up our second satellite site, Bloodbank@Dhoby Ghaut, to make blood donation more convenient and accessible for our donors in the city area, and to reach out to new younger donors.

We are focusing on further building our risk management frameworks and upgrading systems to ensure greater transparency, openness and feedback.

Q WHAT AREAS OF DEVELOPMENT ARE HSA WORKING ON RIGHT NOW?

A As an organisation, we continually look at reviewing, refining and refreshing our internal processes. We are focusing on further building our risk management frameworks and upgrading systems to ensure greater transparency, openness and feedback. We have a dedicated Internal Audit and Risk Management department that ensures our audit mechanisms continue to be broadened and strengthened. Through working with experts, we make sure that our organisational risk management framework is better customised to HSA's unique scientific responsibilities.

The HSA Academy aims to be a growth engine for fostering scientific thought leadership. In helping the three HSA Professional Groups seek expert advice and co-develop solutions, the Academy has been engaging stakeholders and international experts in discussing key scientific issues with a view to identify innovative yet practical approaches that can define ways for HSA to better fulfil our public health mission.

As people are our critical resource, we have also been working on enhancing our talent management, retention and development programmes. We aim to develop and optimise our existing talents, strengthen succession, and more effectively collaborate with our international partners and experts, as well as local academic institutions, through specialist panels and joint appointments.

Sharing, mentoring, training and developmental efforts are being stepped up to ensure that with a larger and more diverse family, we can still maintain our high scientific and service standards, grounded on our Core Values and HSA identity. Many HSAians are already highly valued for their advice and contributions in a wide range of international forums and settings. This is something we must continue to build on and develop, especially in growing our next generation of professional and scientific experts.

We will continue to review our physical infrastructure needs and scientific requirements to ensure our future readiness and nurture the next generations of scientific and regulatory experts.

Q WHAT CAN WE LOOK FORWARD TO IN THE YEAR AHEAD?

A Looking forward to the next year and beyond, we remain committed to serving Singaporeans and the world in advancing the areas of health sciences we are accountable for. We will keep our focus and continue to collaborate with our stakeholders to ensure sustainable business models, in particular the Applied Sciences and Blood Services Groups.

HSA will be embarking on its 4-in-1 organisational excellence certification exercise. We will also continue to review our physical infrastructure needs and scientific requirements to ensure our future readiness, and nurture the next generations of scientific and regulatory experts across our applied sciences, blood services and health products regulation roles.

I would like to thank our many stakeholders, customers, and industry partners for their valued perspectives. I would also like to especially express my gratitude to and admiration for all my HSA colleagues for their dedication to advancing and fulfilling our organisational mission. We are collectively committed to our mandate of safeguarding and advancing national health and safety, and it is the HSA community that makes me confident that we can achieve this.

HSA BOARD

AS AT AUGUST 2013

CHAIRMAN

Professor John Wong
Isabel Chan Professor in Medical Sciences
National University Health System, Singapore
National University of Singapore
National University Cancer Institute, Singapore

BOARD MEMBERS

Ms Serene Wee
Chief Executive
Singapore Academy of Law

Mr Max Loh
Country Managing Partner
Ernst & Young Singapore
Managing Director, ASEAN Sub-Area
Ernst & Young Solutions LLP

Professor K. Ranga Krishnan
Dean
Duke-NUS Graduate Medical School

Ms Liew Wei Li
Director
Student Development Curriculum Division
Ministry of Education

Assoc Professor John Lim
Chief Executive Officer
Health Sciences Authority

Mr Adam Abdur Rahman
Managing Director
Head of Corporate Affairs
Citi Singapore

Mr Tai Lee Siang
Group Managing Director
ONG&ONG Pte Ltd

Mr Clifton Tan
Director
Pembrooke Investments Pte Ltd

Mrs Tan Li Lian
Director
Contemporara Holdings Pte Ltd

HSA BOARD COMMITTEES

AS AT AUGUST 2013

Board Executive Committee

Professor John Wong	Chairman
Assoc Professor John Lim	Member
Ms Serene Wee	Member
Professor K. Ranga Krishnan	Member
Mrs Tan Li Lian	Member

Audit Committee

Mr Max Loh	Chairman
Mr Clifton Tan	Member
Ms Liew Wei Li	Member
Mr Adam Abdur Rahman	Member

BOARD UPDATES

We would like to express our sincere appreciation to Dr Jennifer Lee, Adj Assoc Professor Lee Chien Earn, Dr Chong Yoke Sin, Professor Alastair Campbell and Professor Walter Tan for their invaluable support and contributions as members of the HSA Board over the past six to seven years of HSA's development and growth. They have worked closely with HSA's senior management to provide key inputs for the organisation's strategic direction and help ensure sound financial, personnel and ethical governance. They have also provided invaluable guidance to strengthen the organisation's scientific and regulatory standing, and given holistic inputs on policy issues reflecting the wide range of HSA's responsibilities.

We warmly welcome four new Board members – Mr Max Loh, Mr Adam Abdur Rahman, Mr Tai Lee Siang and Mrs Tan Li Lian – to the HSA family with effect from 1 April 2013. With their strong experience in the private sector, we look forward to their fresh perspectives and guidance, especially in organisational risk management, communications and infrastructure development.

HSA EXECUTIVE COMMITTEE (EXCO)

AS AT AUGUST 2013

Assoc Professor John Lim
Chief Executive Officer

Dr Lam Kian Ming
Group Director
Applied Sciences Group
Blood Services Group

Asst Professor Raymond Chua
Group Director
Health Products Regulation Group

Principal Director
HSA Academy

Dr Mok Ying Jang
Group Director
Corporate Services Group

Assoc Professor Chan Cheng Leng
Deputy Group Director
Health Products Regulation Group

Dr Diana Teo
Senior Director
Blood Services Group

Dr Christina Lim
Senior Director
HSA Academy

CORPORATE GOVERNANCE STATEMENT

The HSA Board and Senior Management Team are committed to maintaining a high standard of corporate governance and complying with 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 2-year term. It aims to meet every two to three 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 its 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) Board Executive Committee

The Executive Committee has taken over the functions of the previous Staff Establishment and Finance committees. The Committee assists the Board to review and decide on governance and operational issues. These include assessing the adequacy of manpower numbers and budgets to meet operational needs, as well as ensuring that financial resources are managed and utilised prudently and in the most effective and efficient manner.

(b) 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.

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, and best corporate practices.

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, the Executive Committee, and the Audit Committee.

ORGANISATION CHART

AS AT AUGUST 2013

HSA BOARD

CHIEF EXECUTIVE OFFICER

Internal Audit & Risk Management

Quality Service Manager & Quality Director / Workplace Safety and Health

HSA Academy

Corporate Services Group

Departments
- Corporate Communications
- Emergency Preparedness
- Facilities Management
- Finance
- Human Capital Management
- Information Management
- Legal & Prosecution
- Organisation Development & Excellence
- Strategy & Business Transformation

Health Products Regulation Group

Divisions
- Pre-marketing
- Vigilance, Compliance & Enforcement
- Audit & Licensing

Blood Services Group

Branches
- Blood Resources
- Blood Supply
- Patient Services
- Clinical Services

Applied Sciences Group

Divisions
- Forensic Medicine
- Forensic Science
- Illicit Drugs
- Analytical Toxicology
- Biology
- Pharmaceutical
- Food Safety
- Chemical Metrology

PRINCIPAL OFFICERS

AS AT AUGUST 2013

CORPORATE HEADQUARTERS

Chief Executive Officer
Assoc Professor John Lim

Professional Board
Chair
Dr Diana Teo

Quality Service Manager & Quality
Director
Professor Bosco Chen Bloodworth

Internal Audit & Risk Management
Director
Mr Axel Chan

HSA Academy
Principal Director
Asst Professor Raymond Chua

Senior Director
Dr Christina Lim

CORPORATE SERVICES GROUP

Group Director
Dr Mok Ying Jang

Corporate Communications
Director
Mr Adrian Chia

Human Capital Management
Director
Ms Lily Goh

Legal & Prosecution
General Counsel
Ms Linda Chen

Finance
Director
Ms Grace Chan

Facilities Management
Deputy Director
Ms Lynette Goh

Information Management
Director
Mr Santhanam Srinivasan

Organisation Development & Excellence
Learning & Organisation Development
Assistant Director
Mr Finian Yeo

Organisational Excellence
Assistant Director
Ms Joyce Nang

Strategy & Business Transformation
Director
Mr Prashant Dhami

Emergency Preparedness
Senior Manager
Mr Christopher Ooi

Quality Management
Senior Manager
Mr Toi Shean Hoon

HEALTH PRODUCTS REGULATION GROUP

Group Director
Asst Professor Raymond Chua

Deputy Group Director
Assoc Professor Chan Cheng Leng

GROUP DIRECTOR'S OFFICE
Director
Ms Ling Boon Lee

SERVICE MANAGEMENT & INDUSTRY DEVELOPMENT OFFICE
Deputy Director
Ms Valerie Wee

PHARMACOECONOMICS & DRUG UTILISATION
Acting Deputy Director
Mr Benjamin Ong

INTERNATIONAL COLLABORATION
Deputy Director
Ms Chua Siew Wei

QUALITY ASSURANCE OFFICE
Director
Mr Sia Chong Hock

PRE-MARKETING
Acting Assistant Group Director
Ms Lee Hui Keng

Scientific Advisory Office
Acting Director
Ms Agnes Chan

Clinical Trials Branch
Director
Mr Foo Yang Tong

Therapeutic Products Branch
Acting 1 Director
Ms Jalene Poh

Therapeutic Products Branch
Acting 2 Director
Dr Dinesh Khokal

Medical Device Branch
Director
Ms Wong Woei Jiuang

Complementary Health Products Branch
Director (covering)
Ms Lee Hui Keng

Advanced Therapy Products Unit
Head
Dr Kellathur Nadathur Srinivasan

VIGILANCE, COMPLIANCE & ENFORCEMENT
Assistant Group Director (covering)
Assoc Professor Chan Cheng Leng

Enforcement Branch
Director
Ms Ruth Lee

Vigilance Branch
Director
Dr Dorothy Toh

Compliance Branch
Director
Mrs Joanna Koh

Tobacco Regulation Branch
Acting Director
Mr Norman Chong

AUDIT & LICENSING
Division Director (covering)
Mr Sia Chong Hock

Deputy Division Director
Ms Jessica Teo

Audit Branch
Director (covering)
Ms Jessica Teo

Licensing & Certification Branch
Director
Dr Lai Weng Fai

BLOOD SERVICES GROUP

Group Director
Dr Lam Kian Ming

Senior Director
Dr Diana Teo

Assistant Group Director (Administration)
Col (NS) Tay Kim Chiew

Assistant Group Director (Professional)
Dr Ang Ai Leen

Division Director
Dr Tan Hwee Huang

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

Capability Development & Knowledge Management
Senior Manager
Ms Leou Kwee Kim

Quality & Accreditation
Senior Manager
Ms J Thilakavathi

BLOOD RESOURCES BRANCH
Blood Resources
Branch Director
Mr William Sim

BLOOD SUPPLY MANAGEMENT BRANCH
Blood Supply Management
Laboratory Director
Ms Sally Lam

Blood Supply Management
Senior Laboratory Manager
Ms Shu Pei Huey

PATIENT SERVICES BRANCH

Immunohaematology & Cell Therapy Support
Laboratory Director
Dr Marieta Chan

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

APPLIED SCIENCES GROUP

Group Director
Dr Lam Kian Ming

GROUP DIRECTOR'S OFFICE

Head
Mr Shao Fay

QUALITY

Director
Dr Chow Shui Tse

FORENSIC MEDICINE

Chief
Dr Paul Chui

Forensic Medicine Division
Division Director (covering)
Dr Paul Chui

Professional Practice Branch
Branch Director
Assoc Professor Gilbert Lau

Operations Branch
1 Branch Director
Assoc Professor Cuthbert Teo

2 Branch Director
Dr George Paul

FORENSIC SCIENCE

Assistant Group Director
Dr Angeline Yap

Professional Training & Education
Director
Dr Michael Tay

Analytical Toxicology Division
Division Director
Dr Yao Yi Ju

Biology Division
Division Director
Asst Professor Christopher Syn

Forensic Science Division
Division Director
Ms Lim Chin Chin

Illicit Drugs Division
Division Director (covering)
Dr Angeline Yap

ANALYTICAL SCIENCE

Assistant Group Director
Ms Low Min Yong

Senior Scientific Advisor
Professor Bosco Chen Bloodworth

Chemical Metrology Division
Division Director
Dr Lee Tong Kooi

Food Safety Division
Division Director
Ms Joanne Chan

Pharmaceutical Division
Division Director (covering)
Ms Low Min Yong

Working with healthcare professionals, industry players, and law enforcement agencies, these valuable connections help us sharpen our capabilities and enhance the effectiveness of health products regulation in Singapore.

STAKEHOLDERS

CONNECT & ADVANCE

Health Products Regulation Group

TRUST

Through a robust and progressive regulatory framework as well as a responsive and collaborative approach that includes strong international regulatory networking, we ensure that health products in Singapore meet required safety, quality and efficacy standards.

ENSURING SAFETY, QUALITY & EFFICACY

Working with manufacturers, importers and the healthcare industry in Singapore as well as our regulatory partners around the world, we ensure safety, quality and efficacy standards are met before health products are allowed into Singapore. They are then tracked by robust post-market surveillance and enforcement.

Validity of GMP Certificate Extended

Good Manufacturing Practice (GMP) Certificates issued to manufacturers of medicinal products and active pharmaceutical ingredients are now valid for three years, instead of two. This took effect on 1 February 2013 after considering international practice and feedback from the industry.

Reduced Requirements and Costs for Class A Device Dealers

Introduced on 1 January 2013, importers and wholesalers dealing solely with low-risk Class A medical devices are exempted from the Good Distribution Practice for Medical Devices in Singapore (GDPMDS) certification issued by accredited third party bodies. Instead, they are assessed by HSA based on their compliance with Quality Management System Requirements for Class A Only Medical Device Importers and Wholesalers (QMS CAD), and subject to post-market surveillance and monitoring. This new system benefits dealers through less documentation and saves them the cost of GDPMDS certification fees.

MAKING IT FRIENDLY FOR OUR PARTNERS

We are always on the lookout for new and innovative ways to improve our stakeholders' experience. From feedback and surveys, we review our processes and practices constantly to facilitate smooth processes for all our partners.

Simpler Submissions

Submissions are now made simpler for medical device registrations and complementary health products notifications with the launch of step-by-step guides.

Improved System for Change Notification

From 1 October 2012, applicants of minor variations applications (MIV-2) no longer need to wait for 40 working days after submission. They are now notified once the processing of the MIV-2 has been completed. This provides greater transparency and allows faster implementation of proposed changes by applicants.

EVOLUTION IN HEALTH PRODUCTS REGULATION

Berberine is Back

We have relaxed the control of Chinese Proprietary Medicines (CPM) containing berberine in Singapore. From January 2013, sale of CPM containing berberine has been allowed, as long as the product is listed with HSA. Products containing berberine will, however, require cautionary labels to inform consumers of the potential adverse effects and contraindications.

Faster Access, Lower Costs for Medical Devices

Following changes to various regulatory frameworks, patients now have quicker access to medical devices as a result of shorter turnaround times. Over the year, enhancements were made to Class B, C and D device registration through the introduction of new expedited evaluation routes with lower fees. Class A devices, with the exception of sterile devices, have been exempted from registration. In addition, Special Authorisation Route fees were lowered to help patients with unmet medical needs.

Facilitating Exchange and Understanding

Forums and dialogue sessions were organised for healthcare professionals, academic institutions and the industry, to encourage a culture of sharing and learning from each other. Through these engagements, our stakeholders' understanding of health products regulations have been enhanced. At the same time, this allows us to better understand their needs.

KEEPING CONSUMERS SAFE BY STAYING VIGILANT

We are committed to patient safety. This means keeping our eyes and ears open to issues that may be associated with the use of health products. We have robust systems in place for patients and physicians to report suspected adverse events related to health products.

Reaching Out for Patient Safety

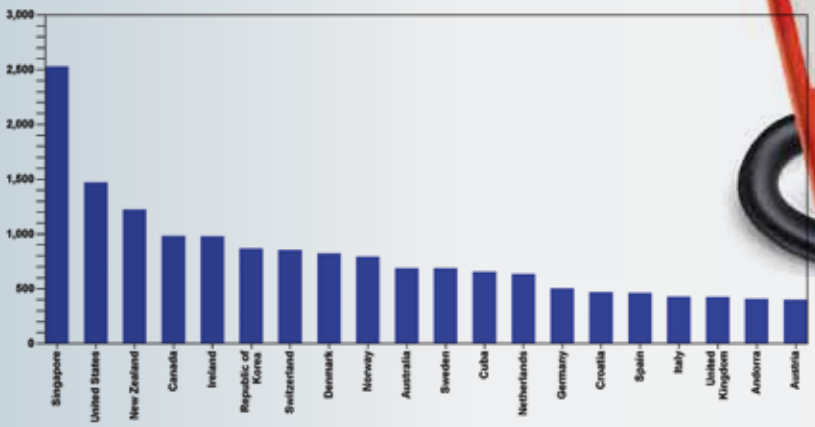
To promote medical device safety and encourage adverse event reporting by healthcare professionals, we conducted meetings with senior management and roadshows at various healthcare institutions.

In ensuring timely dissemination of pertinent health products safety and regulatory information, 11 Dear Healthcare Professional Letters (DHCPL) and 30 company DHCPLs were issued during the year. We also introduced the Medical Device Alerts Circular to highlight significant Field Safety Corrective Actions or adverse events. Two brochures were also published to promote adverse event reporting – an English version for healthcare professionals, and a Chinese version for traditional Chinese medical physicians.

Adverse Event Reporting

Based on the WHO Uppsala Monitoring Centre, Singapore has retained its top ranking as the country with the highest number of active individual case safety reports per million inhabitants for two consecutive years – 2011 and 2012. At the same time, HSA has increased its vigilance activities by encouraging voluntary reporting of adverse events for medical devices by healthcare professionals in addition to mandatory reporting by the industry.

Active Individual Case Safety Reports (ICSR) in the WHO Global ICSR Database Per Million Inhabitants from 22 March 2008 to 22 March 2013



Vigilant on Vaccinations

Keeping our population properly immunised helps protect Singapore from preventable diseases. We support immunisation through evaluation of new vaccines as well as monitoring the safety profile of vaccines used in Singapore. In the year, we received 245 cases of suspected vaccine adverse events (VAE).

KK Women's and Children's Hospital (KKH) contributed 70% of the VAE reports. Safety signals identified include lymphadenitis with BCG vaccination and Hepatitis B infection in infants born to Hepatitis B carrier mothers despite immunoprophylaxis. Safety assessment reports of the vaccines were subsequently surfaced to MOH's Expert Committee on Immunisation in September 2012, which determined that the benefit-risk profile of the vaccines continued to be favourable.

Keeping Complementary Health Products in Check

Over the year, 130 adverse events associated with complementary health products were reported.

To promote traditional Chinese medicine (TCM) adverse event reporting, we organised roadshows and distributed leaflets in Chinese on adverse event reporting to reach out to TCM physicians, herbalists and TCM students from NTU's School of Biological Sciences and Thong Chai TCM Medical Institution.

Maintaining Drug Safety

As a result of our post-market surveillance activities, we detected serious cutaneous reactions such as Stevens - Johnson Syndrome and Toxic Epidermal Necrolysis associated with Protos®, a drug used for postmenopausal osteoporosis. We also recommended the licence suspension of Tredaptive™ and a Class 2 retail level recall following a joint benefit-risk assessment. This was based on the preliminary data from the HPS2-THRIVE (Heart Protection Study 2 – Treatment of HDL to Reduce the Incidence of Vascular Events) study which failed to show an improved beneficial effect on the reduction of major vascular events.

Eight local risk management plans for drugs, namely Botox®, Brinavess®, Dynastat®, Nivestim®, Pradaxa®, Protos®, Tarceva®, and Tysabri®, have also been formulated in response to safety concerns observed either at the point of market approval or as part of post-market surveillance. Components of these local risk management plans included requests for risk mitigation activities such as:

- Issuing educational materials for physicians and patients and highlighting safety concerns
- Submission of periodic safety update reports
- Strengthening safety warnings in the package inserts

ADVANCING NEW SCIENTIFIC AND MEDICAL KNOWLEDGE

Clinical trials offer an important avenue in discovering new treatments and medicines. We ensure that clinical drug trials in Singapore are carried out safely, adhering to stringent international ethical and scientific quality standards.

A Registry for Clinical Trials

In August 2012, we launched a public clinical drug trials registry. With this registry, healthcare professionals and individuals are able to find out the types of clinical trials taking place and the ones they may consider for participation. It also enables the clinical research industry to make informed strategic decisions on conducting local clinical trials.

Enhancing Quality

We have been conducting training, workshops and providing consultations to help stakeholders better understand the expectations of regulatory standards and the critical system process controls. Educational guides and newsletters on Good Clinical Practice have also been published to improve quality control and assurance management.

An Eye on Pharmacogenetics

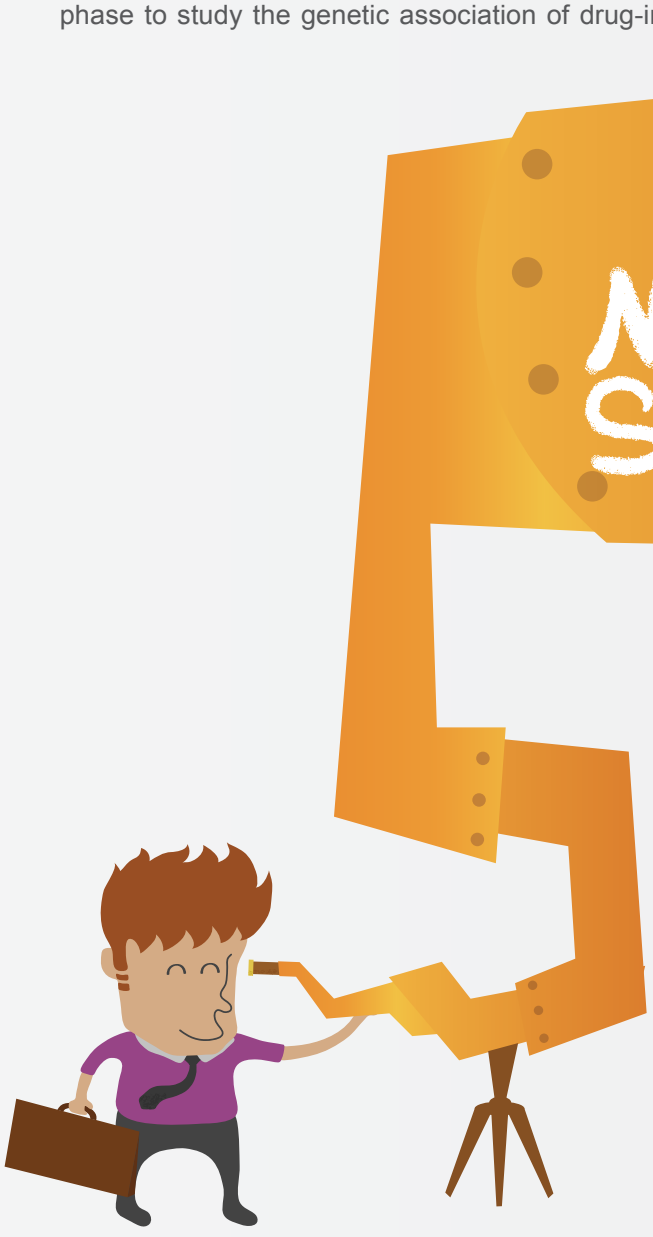
HSA and the National University of Singapore's Saw Swee Hock School of Public Health (SSHSPH) jointly developed the Singapore Pharmacogenomics Portal for comparison of genetic variation between the main ethnic groups in Singapore and other populations from around the world. This portal aims to facilitate regulators and researchers to compare genetic variations across several global and local populations for genetic variants that affect drug responses, dosages and adverse drug reactions.

Separately, in a collaboration with National University Hospital, Singapore General Hospital, Changi General Hospital and the Singapore Immunology Network, the first phase to study the genetic association of drug-induced Stevens-Johnson Syndrome and Toxic Epidermal Necrolysis (SJS/TEN) in the local population was completed by the end of 2012. A key outcome from this initiative showed a strong association between the antiepileptic drug carbamazepine (CBZ) and SJS/TEN in Singaporeans who carry the HLA-B*1502 allele. A cost-effectiveness study by the Duke-NUS Graduate Medical School, in collaboration with HSA, also showed that it is cost-effective to genotype newly-diagnosed epilepsy patients in Singapore.

Together with MOH, we announced genetic testing of HLA-B*1502 prior to initiation of CBZ therapy in new Asian patients as a standard of care from April 2013. MOH also approved a 75% subsidy for this genetic test for subsidised patients in the restructured hospitals and institutions.

OUR NEXT STEPS

From new research studies on genetic testing, improving the systems for medical devices, to enhancing legislation, here are some of our key developments in the year.



Enhanced Legislation on Tobacco Products and Packaging

Significant measures implemented on 1 March 2013, in line with the WHO's Framework Convention on Tobacco Control, were:

- Revision of health warning labelling pictorials and text messages on all tobacco packaging to improve the impact on health messages to users
- Banning of descriptors on packaging (for example "light", "mild", "low-tar"), to prevent users from being misled that certain tobacco products are less harmful than others
- Lowering of cigarette tar and nicotine yield limits from 15 mg to 10 mg and from 1.3 mg to 1.0 mg in line with international benchmark limits
- Requiring all cigarillos to be sold in packets of 20 sticks to make it less affordable for the young

STOPPING ILLEGAL SALES

Clampdown on Illegal Codeine Sale

In two operations, we cracked the illegal sale of codeine cough syrup to addicts through medical clinics.

In Operation Shenton, a clinic employee and three patients were found selling 2,450 bottles of cough syrup and profited a sum of $24,500. They were sentenced to between two and three months in prison.

In Operation Focus, a medical practitioner was found to have sold excess codeine to three patients. These patients, who were also addicts, went on to supply the cough syrup to the black market. Investigations revealed that the doctor illegally supplied more than 800 canisters of cough syrup and had profited over $500,000. The medical practitioner was sentenced to 7.5 months imprisonment and fined $60,000. The patients were each sentenced to between two and four months of imprisonment.

We take a holistic approach, incorporating enforcement to complement our regulatory system to keep the market and public safe. During the year, we uncovered various activities that contravened the health product laws and followed through with swift and decisive actions.

Stubbing Out Illegal Electronic Cigarettes

A network of four local major suppliers of electronic cigarettes was stubbed out during the 3-day Operation Trident. The identities of the suppliers were established through cyber forensics and intelligence gathering. A total of 491 electronic cigarettes, valued at an estimated profit worth of $59,000 and $73,000, were seized.

Adulterated Capsules for Joint Pain

After two people suffered serious adverse reactions from consuming complementary medicine capsules to relieve joint pain, HSA initiated investigations. These capsules were found to contain dexamethasone, a potent steroid used for anti-inflammatory purposes. A sting operation was conducted to disrupt the source of the adulterated products. The accused were charged and sentenced to between two and four months of imprisonment.

Operation Pangea: A Global Crackdown

HSA took part in Operation Pangea, for the fifth year in a row, from 25 September to 2 October 2012. In this concerted week of action, 38 Internet platforms were screened, and 15 sites were found to be selling illegal health products. We seized close to 13,000 units of products worth an estimated $18,000. Ten individuals were investigated for suspected illegal sale of these products, which included medicines such as oral contraceptives, weight-loss products and medical devices such as contact lenses, condoms and pregnancy test strips. One of our cases was featured in INTERPOL's Operation Pangea Public awareness video.

Errant Tobacco Retailers and Underage Smoking

A total of 22 tobacco retail licensees received a 6-month suspension for selling tobacco products to minors (persons under 18 years of age). This was on top of the three tobacco retail licences that were revoked and prosecuted in court for selling tobacco products to minors in school uniforms.

Through regular checks on tobacco retail outlets and popular sites where minors congregate, HSA and its authorised officers caught 5,711 underage smokers during the year.

Swift Action against Illegal Online Sales

We detained a female suspect for the sale of birth control pills, Viagra tablets and pregnancy test strips online. In her possession were 3,000 units of oral contraceptives, condoms and pregnancy test kits amounting to a street value of $5,685. This was the highest value of products seized from an individual caught for illegal online sale and the first case of illegal online sale involving both medicinal products and medical devices. The suspect was convicted and fined $19,000 in lieu of 38 weeks of imprisonment. It was the most severe penalty meted out to an individual for the sale of illegal health products online.

Illegal Health Products Fight Goes Primetime

We collaborated with the Singapore Police Force, and worked with MediaCorp to produce an episode for CrimeWatch to alert the public on the dangers of illegal health products and at the same time, assure the public that illegal peddlers would be caught and punished. The episode was aired in the four official languages – English, Chinese, Malay and Tamil in May and June 2012.

Awarded for Excellence

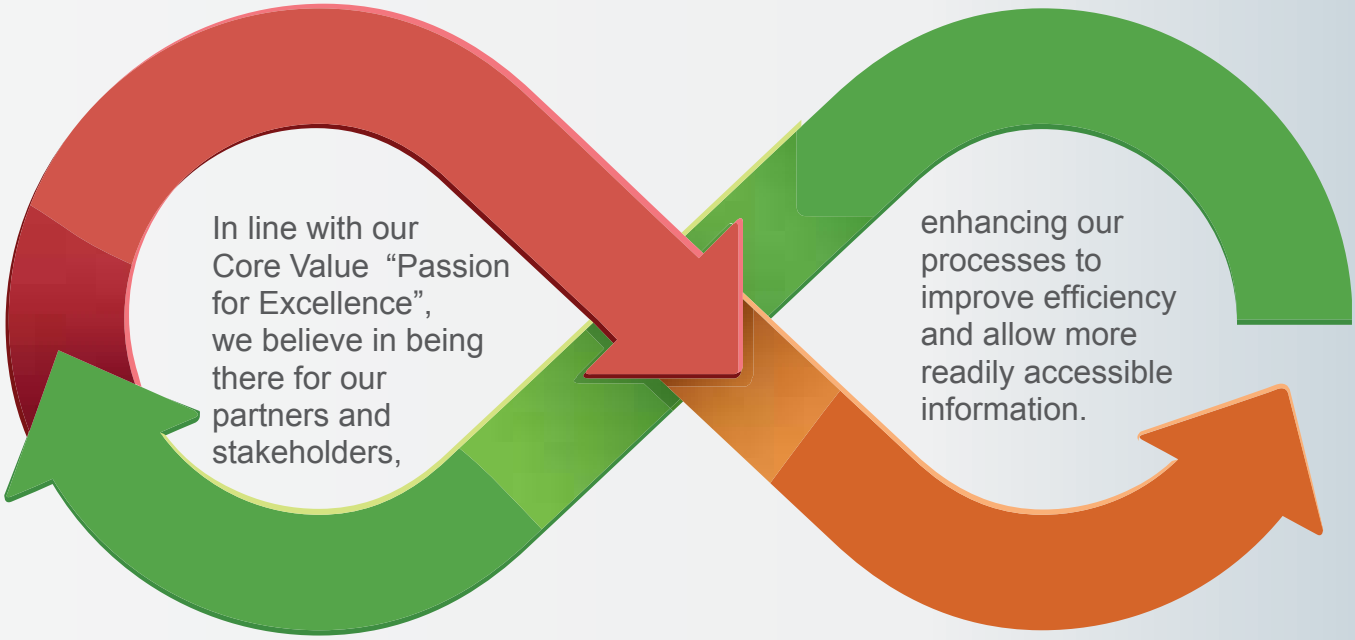
In recognition of our enforcement efforts in two multi-agency operations, our enforcement officers were awarded the Certificates of Appreciation for Operational Excellence from Mr Teo Chee Hean, Deputy Prime Minister, Coordinating Minister for National Security and Minister for Home Affairs.

In addition, 29 of our HPRG staff were also awarded the Service Excellence Award 2012, a national award that recognises individuals who have delivered quality service.

Awarded for ISO 9001:2008

The Tobacco Regulation Branch (TRB) was first awarded the Quality Management System - ISO 9001:2000 certification in March 2008. This was subsequently upgraded to the ISO 9001:2008 version in 2010. In January 2011, TRB successfully passed the re-certification audit.

CONNECTING WITH OUR PARTNERS



A Personal Touch with Hospital Liaison Officers

Established in October 2012, the appointment of Hospital Liaison Officers for Fortis Colorectal Hospital and Ng Teng Fong General Hospital is an initiative to increase knowledge sharing of our regulations and policies, and foster a relationship of trust between hospitals and regulator.

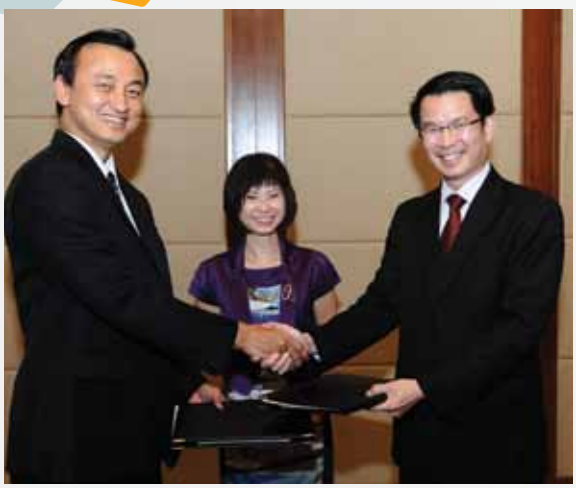
Senior management of both organisations met with HPRG to discuss ways to resolve challenges in medical device access and procurement issues faced by the new hospitals. This resulted in roadshows to share medical device regulatory requirements and encourage medical device adverse event reporting.

Side-by-side with our Stakeholders

To showcase our commitment in working together with our industry stakeholders, we launched our stakeholder engagement and service campaign "NEX2US – Connecting with Our Partners" in February 2012. The campaign kicked off with a NEX2US campaign video ad the first issue of our NEX2US newsletter. Published bi-annually, the newsletter showcases the latest regulatory developments, updates and events in the health product industry.

ENHANCING COLLABORATION AND COOPERATION

Working together with local and international agencies gives us immense opportunities to expand our knowledge and further our cause in protecting and advancing public health.



Inking Partnerships

In October 2012, HSA signed a Memorandum of Understanding (MOU) with the National University of Singapore's Saw Swee Hock School of Public Health, highlighting pharmacogenetics as a key area of cooperation.

We also signed an MOU with the Medicines Evaluation Board of the Netherlands on 28 January 2013 to facilitate information exchange and cooperation in the area of health product regulation.

A confidentiality agreement was signed with the European Directorate for Quality of Medicines and Healthcare of the Council of Europe with which we will cooperate and share information related to quality and manufacturing of substances for pharmaceutical use.

The second bilateral meeting between the Ministry of Health Malaysia's National Pharmaceutical Control Bureau and HSA was held on 31 January 2013. From the meeting, we have committed to enhance information sharing over border enforcement issues and will work towards further collaboration in the area of evaluation and audit for health products.

ENGAGING THE WORLD IN SINGAPORE

Working Towards Regulatory Convergence and Cooperation

Over 300 health and pharmaceutical experts from all over the world gathered at the second Drug Information Association (DIA) Asia Regulatory Conference, hosted in Singapore for the first time.

Held from 28 to 30 January 2013, the opening ceremony was graced by Dr Amy Khor, Minister of State for Health and Manpower. The conference themed “Towards Regulatory Convergence and Cooperation to Improve Access and Quality” served as a platform for delegates to exchange views and identify specific areas to enhance patient access to new and improved medicines. It also touched on ensuring the viability of global supply chains, the importance of post-market and active surveillance, and combating counterfeit health products. The Asia Regulatory Conference was co-organised by the DIA, the International Federation of Pharmaceutical Manufacturers Association and HSA.

As host to various regional and international events in Singapore, we seek to engage, share and learn from experts, regulators and industry stakeholders from around the world.

Meeting with the World's Pharmaceutical Experts

PIC/S Expert Circle Meeting on Human Blood, Tissues and Cells

Regulators and inspectors from 26 countries gathered in Singapore for the 19th Pharmaceutical Inspection Co-operation Scheme (PIC/S) Expert Circle Meeting on Human Blood, Tissues and Cells, hosted by HSA in October 2012. HSA accepted the invitation to join the PIC/S Steering Committee for the expert circle at the meeting.

WHO-HSA Inter-regional Pharmacovigilance Training Course

Over 40 participants, including more than 20 overseas delegates from ASEAN and the Asia-Pacific came to Singapore in October 2012 to attend a 3-day WHO-HSA Inter-regional Pharmacovigilance (PV) Training Course. Jointly organised by WHO and HSA, with participation from the Uppsala Monitoring Centre, this course focused on the advanced topics of pharmacoepidemiology and data mining.

Learning from Visiting Experts

Two visiting experts under the Health Manpower Development Programme imparted their valuable knowledge and resources to HSA and our stakeholders through training courses. They were:

- Professor Stephen Evans, Pharmacoepidemiology, London School of Hygiene & Tropical Medicine, December 2012
- Professor Joga Gobburu, School of Pharmacy, University of Maryland, 21 January to 7 February 2013

Attachment of Staff from the Health Enforcement Unit, Ministry of Health of Brunei Darussalam

In October 2012, our partners from the Health Enforcement Unit, Ministry of Health of Brunei Darussalam, were attached to our Tobacco Regulation Branch to study our enforcement best practices in curbing smoking by minors, and errant tobacco retailers, as well as the administration of the tobacco licensing system.

Attachment of Staff from the Ministry of Food and Drug Safety, Korea

We hosted a staff member from the Korean Ministry of Food and Drug Safety, for a period of 15 months from April 2012, to understand our regulatory frameworks and processes across the product life cycle.

Study Visit to the Malaysia National Pharmaceutical Control Bureau

The 1-day visit to the Malaysia National Pharmaceutical Control Bureau (NPCB) in November 2012 focused on NPCB's ISO 9001 certification process as well as the implementation of the quality systems in the seven regulatory centres of NPCB.

Working Together towards Common Goals

We have been actively involved in work-sharing efforts since the Head of Agencies Consortium comprising our international partners – Health Canada, Australia Therapeutics Goods Administration and SwissMedic – was established in 2007. The group's efforts on work-sharing for generic products applications are ongoing and there have been more streamlining in the regulatory processes.

It has initiated a plan of action that includes reviews sharing, staff exchanges and identifying opportunities for convergence. This is expected to serve as a "proof of concept" for broader international initiatives underway in this area. In addition, the consortium has joined hands with the Centre for Innovation in Regulatory Science (CIRS) to work on the CIRS Consortium on Benefit-Risk Assessment initiative.

In July 2012, we joined the Communications Working Group under the umbrella of the Head of Agencies Consortium to share best practices, challenges, approaches, outcomes and lessons learnt. Through the work group, we aim to develop more effective communication methods on therapeutic products regulation for external stakeholders.

Harmonising Frameworks

We have been actively involved in ASEAN harmonisation efforts for Traditional Medicines and Health Supplements aimed at reducing technical barriers to trade without compromising safety, including:

- Host for 17th Traditional Medicines and Health Supplements Product Working Group (TMHS PWG), June 2012
- Co-chair for 16th, 17th and 18th ASEAN TMHS Scientific Committee (ATSC) meetings, from September 2012 to March 2013
- Chair for 17th TMHS PWG meeting in Singapore, June 2012 and 18th TMHS PWG meeting in Brunei, November 2012

ASEAN Sectoral MRA on GMP Inspection

Following the 1st Joint Sectoral Committee Meeting that HSA chaired in Bangkok, the inspection services of Singapore (HSA), Malaysia (National Pharmaceutical Control Bureau) and Indonesia (National Agency for Food and Drug Control) were accepted as Listed Inspection Services under the ASEAN Sectoral Mutual Recognition Agreement (MRA).

With this, ASEAN Member States will recognise and accept GMP certificates and inspection reports issued by Listed Inspection Services without the need to conduct a separate audit.

Quality Medication First

The 19th ASEAN Pharmaceutical Product Working Group Meeting, chaired by HSA, saw the adoption of the guideline, including the annexes for Solid Oral Dosage Products and Quality by Design as an Alternative Approach to Process Validation. This guideline is used by the industry and regulators to ensure that drug manufacturers have in place processes that are capable of consistently producing finished products of the required quality.

GMP for Traditional Medicines and Health Supplements

The ASEAN Traditional Medicines and Health Supplements GMP (TMHS GMP) Taskforce has successfully completed the development of the ASEAN Guideline on GMP for TMHS which was endorsed in November 2012. The taskforce comprises HSA, other ASEAN National Drug Regulatory Authorities, and industry associations endorsed by the TMHS PWG.

The Science of Beauty

The cosmetics industry and its regulating authorities around the region convened at the 17th and 18th meetings of the ASEAN Cosmetic Committee and ASEAN Cosmetic Scientific Body. Held in July and November 2012 in Cambodia and Indonesia, topics of discussion included the review of safety of cosmetic ingredients and the regional efforts in post-market surveillance of cosmetic products.

Countering Counterfeits with Technology

At the APEC Patient Safety and Detection Technology Workshop in September 2012, we presented "Product Quality Surveillance in Detecting Substandard and Spurious Medicines", which covered the appropriate use of detection and prevention technologies for drug safety. We also discussed future global cooperation related to the use of detection technologies to promote drug safety.

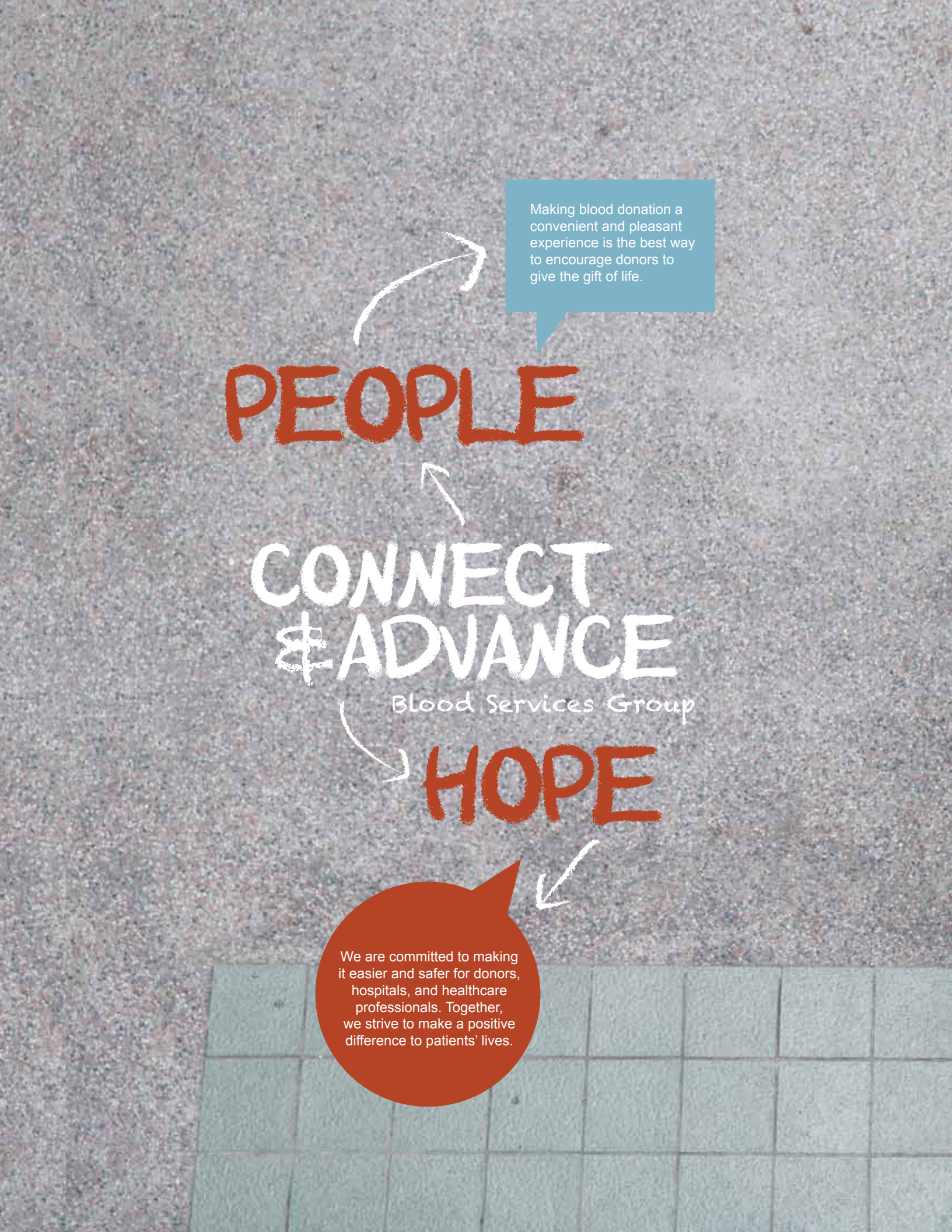
Learning from Our Hong Kong Counterparts

In November 2012, we visited Hong Kong's Tobacco Control Office to study its experience in handling tobacco control challenges and establish useful networks for future cooperation and collaboration.

Stamping Out Pharmaceutical Crimes

Enforcement officers from across Asia learnt how to effectively detect and combat pharmaceutical crimes at various enforcement training programmes hosted by HSA over the year, including:

- Storm Enforcement Network, "Train-the-Trainer", April 2012
- Singapore-United States Third Country Training Programme, "Combating Counterfeit Health Products", August 2012
- Training on Pharmaceutical Crime, February 2013


Making blood donation a convenient and pleasant experience is the best way to encourage donors to give the gift of life.
PEOPLE
CONNECT & ADVANCE
Blood Services Group
HOPE
We are committed to making it easier and safer for donors, hospitals, and healthcare professionals. Together, we strive to make a positive difference to patients' lives.

KEEPING IT SAFE AND SUSTAINABLE

The Blood Services Group (BSG) has made key advances during the year to ensure that the national blood supply to patients continues to be safe and adequate. The following section showcases practical applications of new knowledge, as well as systemic enhancements made in our efforts to advance transfusion medicine and maintain a ready supply of safe blood products for hospitals, healthcare professionals and patients.

Screening for Malaria

Keeping Singapore's blood supply free from existing and emerging threats to transfusion medicine is a priority of the Blood Supply Management at BSG. In April 2012, we implemented the Malaria Antibody Screening for blood donations from people who have been to malaria-endemic areas. Through this new screening protocol, BSG aims to safeguard blood supply coming from these donors who are considered at-risk of malaria infection.

Better Way of Preparing Platelets

BSG recognises the importance of maximising the use of each whole blood donation by processing the blood into its various components. In 2012, we implemented the buffy-coat (BC) method as part of our routine process. This new platelet preparation method allows blood components to be produced from whole blood donations, enabling white cell filtration and pre-storage pooling of platelets for easier administration. The BC method also allows platelets to be prepared more efficiently up to 24 hours after the blood is collected. That is a four-fold improvement on the conventional limit of six hours.

Improving Flow

In September 2012, BSG provided hospitals a stockpile of pre-pooled cryoprecipitate, a concentrated component rich in a blood-clotting protein obtained from the thawing of frozen blood plasma. Used in the treatment of patients whose blood have a reduced or dysfunctional ability to clot naturally, this ready inventory ensures that these patients can now receive cryoprecipitate transfusions in a more timely manner.

Enhancing the Success of Transfusions

Blood transfusions are sometimes ineffective because patients are unable to achieve the desired level of blood platelets after receiving blood due to immunity. In a majority of these cases, antibodies against Human Leucocytes Class I Antigen (HLA) in the patient's blood are the primary cause. To support patients with such needs, BSG's Transplant Support Laboratory has embarked on a project to screen for HLA in donors who undergo apheresis to supply blood components to patients with specific needs. The tests are performed using the Polymerase Chain Reaction – Sequence Specific Primer (PCR-SSP) methodology where HLA-A, B and C can be accurately typed for enhanced matching, thereby enhancing the probability of transfusion success.

Speedier Outcomes, Lower Costs

BSG regularly reviews processes and leverages newer and more efficient testing technologies for speedier outcomes. Among the new capabilities introduced is a new processing methodology for classifying HLA alleles — Polymerase Chain Reaction based on Reverse Sequence Specific Oligonucleotide (PCR-RSSO). This highly efficient new technique has significantly reduced processing time and costs, allowing the processing of up to 96 platelet donor samples at any one time.

Explaining Blood Transfusions

Helping patients understand what blood transfusion is all about – the process and its possible risks – enables them to make informed decisions. To this end, BSG worked with the Corporate Communications department to produce a patient information leaflet, developed in the four official languages, for distribution to all hospitals. Introduced in October 2012, this informative campaign is designed to help doctors explain the procedure to patients when seeking consent for blood transfusion.

HAPPY AND ENGAGED DONORS

KEY TO CONSTANT BLOOD SUPPLY

BSG depends on the generosity of volunteer blood donors to ensure that the transfusion needs of patients continue to be met. Hence, making the blood donation process as convenient and pleasant as possible is instrumental to our mission's success. Here are some key advancements we made in the year.

Donating Blood in the City

Youths and the young at heart can now donate blood in the heart of the city. Following the success of Bloodbank@Woodlands, a second satellite collection site was established at Dhoby Ghaut Xchange on 28 September 2012. The launch was officiated by Minister for Health, Mr Gan Kim Yong. Bloodbank@Dhoby Ghaut achieved 3.5% of the total blood collection for 2012 within the first three months of operation.

The location, chosen for its accessibility and healthy youth demographic has attracted more youth donors compared to our other collection sites. At Bloodbank@Dhoby Ghaut, youth donors make up 40.7% of the total donor pool. We will continue to build on Bloodbank@Dhoby Ghaut's success in driving BSG's strategy to decentralise our network of fixed donation centres for the convenience of donors across the country.

Donors Park Free at Woodlands

BSG has made arrangements for complimentary parking whenever donors donate at Bloodbank@Woodlands, Woodlands Civic Centre. Implemented in May 2012, this gesture is just one of the many ways we hope to continue enhancing the overall experience of donors, and to show them our appreciation for their support.

A New Identity

Over the years, blood donors have carried paper-based donation cards that required their personal details and appointments to be recorded manually.

In April 2012, Bloodbank@HSA began issuing new plastic donor cards to replace the paper version. The new plastic cards were also implemented at Bloodbank@Woodlands in July 2012. With this enhancement, the new cards capture essential information such as the donor's name, NRIC and blood type, speeding up processing, and cutting down waiting times. Besides using the card to book their next donation appointment, donors can also locate the nearest blood bank simply by scanning the QR code on the card.

A Cost-Saving Design

An innovative, yet simple design of a movable stainless steel tray has effectively saved us up to 50% in costs. This newly installed tray eliminates the need to cater two blood mixer machines per chair, along with their routine calibration and preventive maintenance.

ALL PACKED AND GOOD TO GO

During emergencies, the time taken to retrieve blood and platelets is vital in saving lives. As such, BSG has taken steps to support hospitals and patients with new ways to access blood and blood products whenever the need arises.

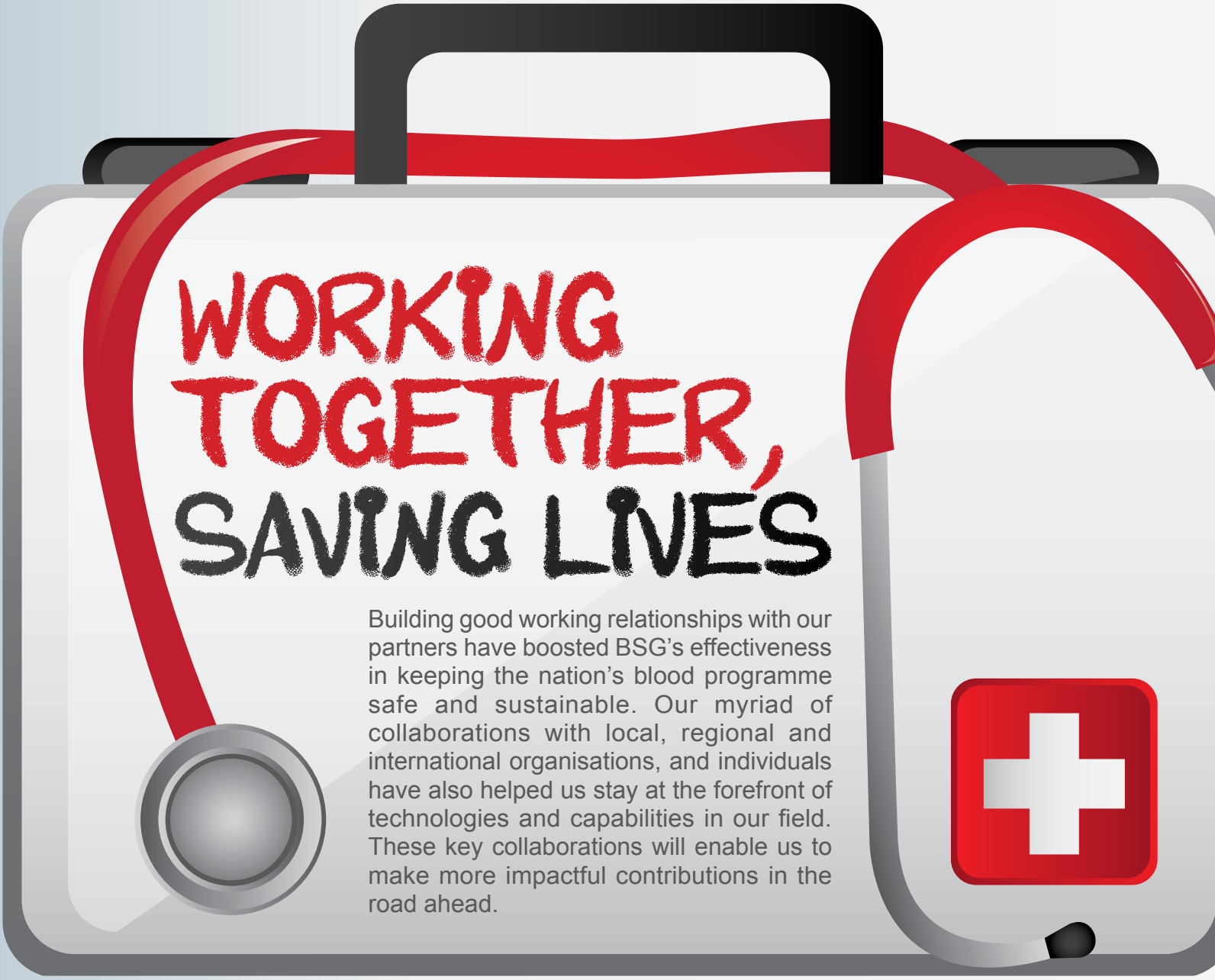
Faster Access to Platelets

Patients now have quicker access to platelets. A new workflow with the Restructured Hospitals, implemented in the year, now allows the direct collection and issue of platelets for patients with low platelet counts, cutting down on consultation with BSG's on-call physician. This decentralisation of platelet storage has seen tremendous benefits with decreased workload for hospital blood bank staff and clinicians, leading to a productivity boost that enhances patient care.

Special Blood Packs for Emergency Paediatrics

Time is of the essence, especially in life-threatening situations such as the case of young patients with heart or lung issues in the intensive care unit (ICU).

To better support paediatric patients at the KKH (KK Women's and Children's Hospital) Neonatal ICU, we began supplying standard packs of blood products that can be readily used for Emergency Extra-Corporeal Membrane Oxygenation (ECMO). These special blood products, now promptly available, are used to prime the ECMO device at the onset for neonatal patients requiring urgent ECMO support for failing heart or lung functions.



WORKING TOGETHER, SAVING LIVES

Building good working relationships with our partners have boosted BSG's effectiveness in keeping the nation's blood programme safe and sustainable. Our myriad of collaborations with local, regional and international organisations, and individuals have also helped us stay at the forefront of technologies and capabilities in our field. These key collaborations will enable us to make more impactful contributions in the road ahead.

Strengthening Ties with the Singapore Red Cross

Over the past 11 years, BSG and the Singapore Red Cross (SRC) have been working hand in hand, through voluntary blood donation programmes, to ensure an adequate supply of safe blood and blood products for patients in Singapore. A strategic retreat was conducted in August 2012 to review how the partnership will meet new challenges for the years to come. A key outcome of the retreat was the formation of the HSA-SRC steering committee which meets twice a year to discuss the strategic direction for the National Blood Programme.

A joint action plan was also developed for the National Blood Programme to deepen engagement with our multiple stakeholders, across public, private, civic and media organisations, to enhance our efforts towards maintaining a safe and sustainable national blood supply.

Fighting Blood Diseases with Cell Therapy

Clinical researches help physicians narrow down and find the most effective form of care for their patients. Collaborating with other institutions, the Cell Therapy Facility (CTF) has embarked on several projects in its continuous effort to develop new cellular therapies to counter blood diseases.

One such successful research initiative is the culture of Cytokine-Induced Killer (CIK) cells for patients with haematological malignancies. Working with the Singapore General Hospital, the initiative has been introduced as a routine service available to patients.

Moving forward, CTF will also be involved in other projects which are currently in the translational and validation phases. These include the cord blood expansion project with Duke-NUS, and the T-regulatory cell isolation project with the Singapore Immunology Network.

Solving Problems with Lean Six Sigma

In the year, BSG adopted the Lean Six Sigma methodology to enable our staff to apply a simple structured approach to problem solving. The methodology also facilitates better communication and teamwork between cross-functional personnel in BSG.

By employing Lean Six Sigma, seven projects were completed in 2012. Of these, three of the best projects were submitted for poster presentations at the International Society in Blood Transfusion Conference in Amsterdam. Over the next two years, we plan to develop a core group of black belt Lean Six Sigma practitioners who can take the lead to further improve our processes.

RECOGNITION OF EXCELLENCE

BSG has a strong reputation for its high standards in the processes and delivery of its services. Our long-standing accreditations with the world's most respected standards bodies in our field attest to the quality benchmarks we set for ourselves.

AABB Accreditation Renewed

AABB has remained a symbol of authority and distinction in advancing the practice and standards of transfusion medicine and cellular therapies worldwide. In April 2012, we successfully renewed our accreditation with AABB after having completed the requisite assessment which we have been doing every two years since we first attained accreditation in 2006. This is testament to our strong commitment to quality and continuous improvement in the field of transfusion medicine.

CTF Accreditation Update

We work hard to ensure that we can offer world-class healthcare to our patients. In doing so, we benchmark processes and procedures in our Cell Therapy Facility (CTF) to international standards. By implementing a quality management system, our high standards have been acknowledged with accreditations by international organisations.

The first Good Manufacturing Practices (GMP) audit was conducted by the Health Products Regulation Group (HPRG) in collaboration with Swissmedic for our cell therapy products in October 2012.

In January 2013, the CTF was also assessed by the Joint Accreditation Committee – International Society for Cell Therapy and European Blood & Marrow Transplantation (JACIE). We were awarded the accreditation in July 2013.

New Test Method Validated by ASHI

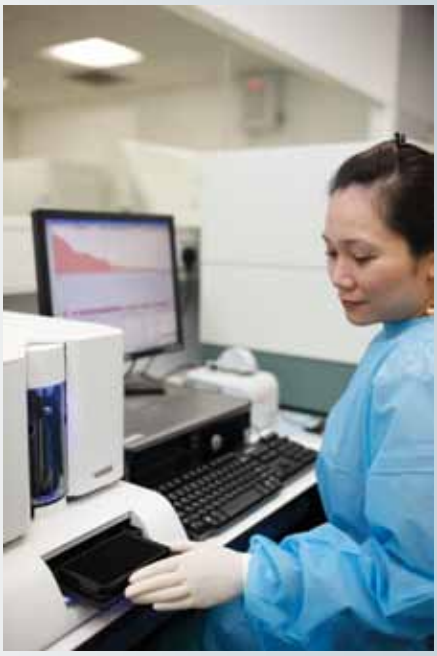
BSG stakeholders have more reason to be assured of our high standards in the testing services we provide through our transplant programmes. This is because our Transplant Support Laboratory has once again passed the American Society for Histocompatibility (ASHI) 2012 inspection and remains accredited by ASHI. We are happy to report that in addition to renewed accreditation, our new test methodology (rSSOP) for typing plateletpheresis donors has also been validated and accredited by ASHI.

Doing More as a WHO Collaborating Centre

BSG remains a designated World Health Organization (WHO) Collaborating Centre for Transfusion Medicine for another four years from 28 April 2012.

As a WHO Collaborating Centre, we embarked on several activities. These included a joint project with Tan Tock Seng Hospital to develop a generic standard, competency framework and curriculum, and materials for nurses and midwives on safe transfusion practices based on experiences in Singapore and other countries. The Global Network for Blood Safety will be reviewing the document before it is finalised as a best practice guideline by WHO.

In May 2012, we signed an Agreement for Performance of Work with the WHO to provide consultancy assistance for the Red Cell Reference Laboratory at Mongolia's National Centre for Transfusion (NCT). Training was conducted for the NCT staff in May 2012.



LEARNING FROM ONE ANOTHER

Constant learning is not the only thing that keeps us growing and excelling. By forming and nurturing collaborative alliances with our wide network of local and international partners, we are finding newer and better ways to keep Singapore's blood supply safe and adequate.

Welcoming Foreign Friends

While we learn from others, we are also happy to share our best practices with others. In 2012, we hosted delegates from various organisations including:

- The Red Cross Blood Centre from the Xuzhou city of Jiangsu, China
- The Indonesia Red Cross from East and Central Java
- The Shanghai and Dalian Blood Centres
- The Beijing Blood Centre

Sharing Concepts on Blood Safety

In collaboration with the HSA Academy, and with the support of the Ministry of Health, we organised the Risk-Based Decision Making in Blood Safety symposium to share the concepts of the topic as well as the perspectives from three international blood services in managing blood safety risks.

With blood safety decision-making becoming increasingly complex, a half-day workshop was held in February 2013 to discuss the introduction of a framework that can guide decision-making for blood safety in Singapore. The event saw representatives from key stakeholders such as Hospital Transfusion Committees, regulatory agencies, legal and policy planning departments.

Overseas Visits and Ideas Exchange

To better understand how our overseas counterparts work, we visited blood centres in Beijing and Hong Kong in April 2012. We learnt the best practices of Beijing's efficient process management during disasters, as well as aspects of emergency planning in the capital's largest blood centre. In Hong Kong, we gained insights into how blood products inventory is managed to minimise outdating and to ensure adequate supply to meet hospital demands. On top of the opportunity to establish relationships with the blood banks overseas, these visits were also fruitful with the sharing and exchanging of ideas.

LOOKING FORWARD, DOING MORE

We devote time to looking at the future needs of the Singapore blood services system and its many stakeholders and beneficiaries. From how to improve the donor experience, to enhancing our research capabilities, and finding ways to apply new knowledge to meet and further our goals, BSG is committed to delivering a brighter and safer future by being exceptional in all we do.

Health Assessments, the E-fficient Way

In our constant drive to enhance our donors' experience, we introduced a prototype e-questionnaire system for donor health assessments in February 2013. Donors were invited to try it and with their feedback, we aim to improve the system before its full implementation targeted for the third quarter of 2013.

Supporting Ethics-based Research

Together with HSA Academy, we have developed a research framework with clear guidelines on the use of donor samples in relevant research work. Implemented in June 2013, we support and advance healthcare and medical treatment relevant research based on ethical principles.

A Better Match for Rare Blood Types

While most people have blood types from one of the major blood groups, there are patients who have rare blood types. To best meet the needs of patients in our community who belong to rare blood types, a Rare Blood Donor Inventory will be set up, ensuring safe and adequate blood supply to all who need them.

Archiving Blood Samples for Future Tests

A National Blood Donation Sample Repository System will be implemented for look-back investigations. This sample archive repository with a 12-month holding period will be beneficial in supporting and resolving investigations of potential transfusion-transmitted infections or other adverse events like transfusion-related lung injuries.

New Process for Frozen Plasma

We will be phasing in the new process of using plasma frozen within 24 hours (PF24). The new process will enable us to adopt safer approaches of using male-only donor plasma for transfusion purposes, and preventing transfusion associated acute lung injury.

RFID Tracking to Ensure Blood Safety

Following our successful pilot project with Tan Tock Seng Hospital of implementing RFID (radio frequency identification) technology in tracking blood units from collection to transfusion, we are planning to expand this initiative across more hospitals. With this system, we look forward to enhanced safety and more efficient healthcare delivery, minimising the risk of patients receiving the wrong type of blood.

Expanding Our Cell Processing and Therapy Programme

We recognise the many benefits that cell therapy has to offer and will continue to develop this programme. Our efforts include significantly expanding collaboration with national and international organisations in translational clinical projects, and provision of safe cell therapy products for specific disease treatments.

We partner law enforcement agencies, regulators and the judiciary, and draw on the expertise of our scientists to serve the administration of justice and safeguard public health.

INSIGHTS

CONNECT & ADVANCE

Applied Sciences Group

CAPABILITIES

With a focus on continuous innovation and leveraging the best minds, we push the frontiers of knowledge and expertise, actively contributing to the scientific community and seeking to be the leader in our fields.

BREAKTHROUGHS IN RESEARCH

As the national authority in forensic medicine and science, and chemistry testing, we provide specialised scientific and investigative services to support health products and food safety regulation, as well as hospital and law enforcement needs.

Benchmarking of Measurement Capabilities

We completed five regional and international comparisons over the year, examining trace elements in wine, pesticides in tea, essential elements in seafood and the purity of amino acids. We also completed a second collaborative project with Brazil's National Institute of Metrology, Quality and Technology on the determination of inorganic contaminants in Cachaça, a distilled alcoholic beverage made from sugarcane.

Tracing Hit-and-run Culprits by Paints

The success rate of the vehicle paint database (VPD) using blind test samples for hit-and-run incidents was shared with the Singapore Police Force (SPF). The Traffic Police from SPF has started to submit evidence to screen for vehicle paint smears and fragments, which were searched against the VPD for vehicle identification and comparisons. We have also increased the population of the paint samples in the VPD and used various statistical and database management software to enhance the search process of the database.

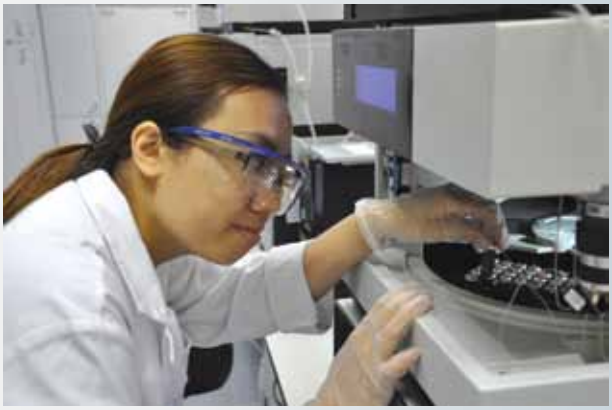
Drug Testing through Hair

Hair testing has recently been legislated in the Misuse of Drugs Act as an additional tool to detect drug abuse. This empowers drug enforcement officers from the Central Narcotics Bureau to procure hair samples from suspected drug abusers for analysis. Hair testing can detect drugs in a person's body even months after consumption, compared to urine tests which can only detect drug consumption a few days following usage.

With this new initiative, we are developing the necessary capabilities and services in hair testing to detect drug abuse.

Innovative Screening for Drugs

We successfully developed the Ultra Fast Liquid Chromatography (UFLC) Screening System – the most comprehensive of its kind in the region. Allowing the screening of more than 707 common western drug substances in complementary health products, this system offers better resolution and capacity than the conventional LC Screening System.



Faster, Better Cosmetics Analysis

Colour additives, or colourants in cosmetics must be ensured safe to be allowed in cosmetic products. Employing a new chromatographic technique has allowed us to screen colourants faster. A total of 26 prohibited colourants can be analysed in a single run, allowing faster turnaround for cosmetics analysis. We also introduced a new testing service to determine the presence of the carcinogenic compound, N-nitrosodiethanolamine, in cosmetic products.

We are looking to develop new acid testing methods for Alpha-Hydroxy-Acid in skincare products and Thioglycolic Acid in haircare products to increase the safety of cosmetics sold in Singapore by February 2014.

Enhancing Metrology Services

To assist laboratories in improving the accuracy and comparability of their test results, we expanded our External Quality Assessment Programme in Clinical Chemistry to include additional analytes and organised a proficiency testing scheme on the determination of toxic and essential elements in mushroom powder.

We also produced two certified reference materials (CRMs) – toxic and essential elements in mushroom powder and toxic elements in cosmetic creams. These CRMs were sold to local testing laboratories as quality control and method validation samples.

The Cutting Edge in Food Safety

With state-of-the-art hybrid instrumentation, we are actively working on increasing the robustness of methods to enhance the accuracy and reliability of food safety tests. Some of the instrumentations used include Gas Chromatography-Tandem Mass Spectrometry (GC-MS-MS) and High Pressure Liquid Chromatography-Inductively Coupled Plasma-Mass Spectrometry (HPLC-ICP-MS).

During the year, we offered 20 new testing services to the Agri-Food and Veterinary Authority of Singapore. These new tests, such as 4-methylimidazole in beverages by Liquid Chromatography-Tandem Mass Spectrometry (LC-MS-MS) and 3-monochloropropane-1,2-diol and glycidyl esters in oils and flour by GC-MS-MS, were developed to support new regulations on food additives and food contaminants. These will also be used for research on emerging areas such as food contact materials and process technologies, or environmental contaminants.

Taking Down New Psychoactive Substances

New technologies have been developed to counter new psychoactive substances (NPS) in seized drugs. NPS are drugs that have been designed to evade legislative control, but provide psychoactive effects similar to controlled drugs such as Ecstasy. To better detect NPS in seized drugs, we developed a fast Liquid Chromatography-Tandem Mass Spectrometry (LC-MS-MS) method to target the screening of synthetic cannabinoids, synthetic cathinones and common controlled drugs.

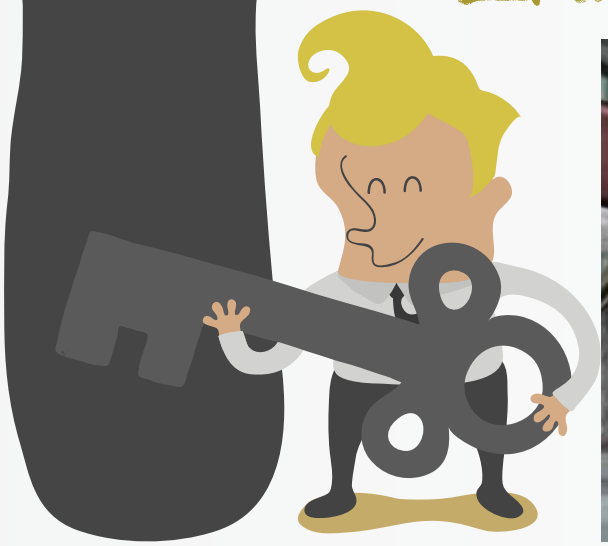
New Alkaloids Testing Capability

Our testing capability in natural occurrence alkaloids was expanded to support the pre and post-market evaluation of complementary health products. We can now provide comprehensive screening of 34 toxic alkaloids from their 12 respective families of herbs. This capability enhances our investigation of adverse drug reactions associated with natural health products containing toxic alkaloids.

We will also be developing a 2-Dimensional Gas Chromatography-Mass Spectrometry Time-of-Flight (2D GC/MS-TOF) analytical technique to enhance our capability in the analysis of chiral drugs and provide unambiguous identification of specific toxic natural alkaloids from structurally similar members of the alkaloid families, present in natural health products.

OPENING OUR DOORS TO INTERNATIONAL EXPERTS

In seeking to further advance our capabilities in the arena of forensic science, we create opportunities to host the world's leading experts in related fields.



Getting the Lowdown from INTERPOL & US DEA

In September 2012, we hosted Mr Noboru Nakatani, Executive Director of INTERPOL Global Complex for Innovation (IGCI) who visited us for a discussion on pharmaceutical crime, digital technology and forensics. At the meeting, we presented our holistic approach for counterfeit drugs analysis.

We also hosted Mr Scott Oulton, Associate Deputy Assistant Administrator of the United States Drug Enforcement Administration (DEA) in December 2012. He gave a seminar on the drug scene in the USA, the changing roles of the DEA, as well as technical areas such as drug profiling and investigating clandestine laboratories. He also led a roundtable discussion which was attended by Central Narcotics Bureau officers.

Expert Exchange on Forensics

A 3-day Forensic Science Seminar held in March 2013 brought together three international experts - Dr Dwight Adams, Forensic Science Institute, University of Central Oklahoma, USA; Dr Tony Raymond, New South Wales Police Force, Australia and Mr Wim van Geloven, Netherlands Forensic Institute Academy, Netherlands, as well as Mr David Khoo and Mr Anandan Bala, Senior State Counsels from the Attorney-General's Chambers, Singapore, who shared their experience on forensic science services.

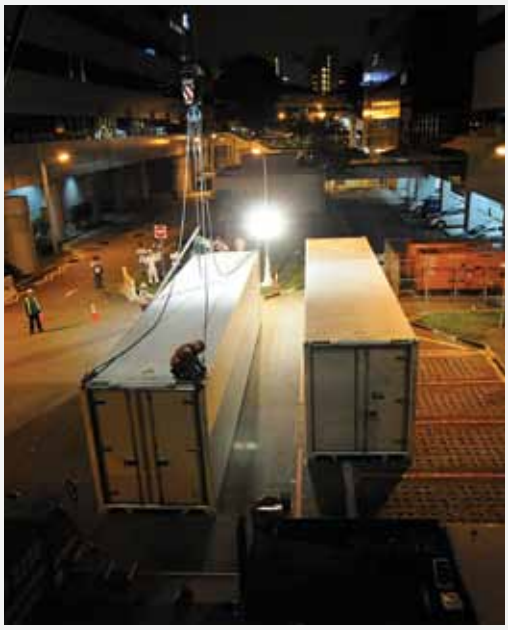
Recognising the value that international experts can offer, we are setting up International Expert Committees for 3-year term, to provide professional and technical advice on the critical scientific aspects of the different disciplines in the forensic laboratories. This will ensure that we stay aligned with international best practices and that our staff are kept abreast of the latest advances.

BOOSTING CAPABILITIES, BOLSTERING OUR STRENGTHS

During the year, we continued to enhance our facilities and capabilities, with new and strengthened internal controls for greater accuracy and reliability in our processes.

New DNA Lab at Biopolis

Arising from our service level agreement with the Ministry of Home Affairs in 2011, we have strengthened our capability and enhanced the scientific scope of our forensic laboratories' services to support the operational requirements of the Home Team departments. This includes increased manpower and developing faster tests to deliver timely results. A second DNA laboratory was established at Biopolis and commenced operations in April 2012. The new laboratory incorporates negative air-pressure examination rooms and advanced wastewater monitoring systems in compliance to new biosafety and environmental standards. Additionally, custom-designed chambers have been built to cater to low-level touch DNA evidence. Our DNA laboratories are now identifying twice as many possible perpetrators to unsolved cases through matches to persons in the Singapore Police Force DNA Database.



Containing an Outbreak

In collaboration with ACRE Engineering, we initiated a BB2 (Mobile Containerised BSL-4 Autopsy Suite, also known as Blue Box 2) receptor deployment exercise known as Ex-Andromeda III in March 2013. This exercise comprised a mobile containerised autopsy facility that provides a high-level containment space to enable the autopsy of suspicious and highly infectious cases. In an outbreak situation, this facility will allow the recovery of biological materials for further investigation, with maximum containment at the national level while protecting the staff involved. The facility will also allow the investigation of homicidal deaths arising from acts of bioterrorism, to support law enforcement investigations.

Our third exercise of its kind, the biennial event is aimed at testing the operational readiness of the BB2, processes and the people. Unlike the past two exercises, Ex-Andromeda III showcased its capability for night deployment.

Automated Alerts for Instrument Maintenance

To effectively control and maintain our laboratory instruments, we developed and implemented an Instrument Maintenance and Calibration Alert System for the Pharmaceutical Division's laboratories. This system is capable of providing real-time maintenance status of instruments and sending auto reminders to owners through emails when their instruments are due for calibration and maintenance. With the successful implementation, we plan to expand the project to include the other laboratories.

Renewing Our Commitment to Quality

Our laboratories successfully achieved the Singapore Laboratory Accreditation Scheme (SAC-SINGLAS) annual re-accreditation in the Chemical, Biological, and Environmental fields in May 2012. The assessment passed without any major non-compliances, reaffirming the international quality standards of our labs.

The Cosmetics Laboratory expanded its accredited list of prohibited colourants in the colourants screening test for cosmetics products, while the Food Safety Laboratory expanded its scope by 10 new tests. With the successful accreditation of the new methods, we can now offer our customers greater assurance of quality.

Our Pharmaceutical Laboratories also took part in the External Quality Assurance Assessment Scheme, a proficiency test programme, organised by the European Directorate for Quality Medicines & Healthcare for the WHO. The scheme benchmarks the performance of our laboratories with our European counterparts, and the results validated our good standing.

In addition, to ensure that excellence is inherent in every step of what we do, we established an independent Quality Team for our laboratories in October 2012. This unit, which is dedicated to quality assurance activities, comprises one director and six quality managers for the forensic and analytical laboratories.

PROTECTING HEALTH PRODUCTS

International collaboration has enabled us to remain alert to new developments for adulterated drugs that are on sale in the market. Through supporting this effort of post-market surveillance, we reinforce HSA's ability to take targeted action to avert the sale of contaminated and counterfeit health products in Singapore.

Swift Action on Chromium-Contaminated Drug Capsules

Following the alert issued by the China Food and Drug Administration on chromium-contaminated drug capsules, we beefed up our post-market surveillance checks, especially on Chinese products likely to be affected by the incident. To support this urgent market investigation, our laboratory developed a method to analyse chromium contamination in capsule shells. A total of 317 pharmaceutical products were screened, and two products were found to contain more than 10 ppm of chromium. This swift response enabled HSA to take appropriate action on the contaminated products, safeguarding public health.

Zeroing In on Zidolam-N Tablets

Together with the WHO, we investigated three batches of Zidolam-N tablets that were suspected to be falsified anti-HIV medicines discovered in Kenya. Investigations showed that these suspected medicines were original products, but were diverted from the destination they were intended, and subsequently repackaged and sold illegally. Our results from the analysis supported the investigation - while the packaging of these products were counterfeit, the dosage form of the medicine was likely to be authentic although they were not similar to the batch indicated. WHO subsequently issued a warning against these falsified anti-HIV medicines in Kenya.

ACCELERATING PROGRESS THROUGH THE ACADEMIC NETWORK

Our collaborations with academic institutions enable us to accelerate new developments in the areas of research in Singapore, around the region and the world.

Tie-ups with Tertiary Institutes

We continue to collaborate with the National University of Singapore's Pharmacy Department and Temasek Polytechnic in herbal medicines research, as well as the University of Maastricht in the field of tobacco research together with the National Institute of Public Health of the Netherlands. In addition, we are exploring opportunities for collaboration in cosmetics analysis with local polytechnics.

Silver Award for a Sticky Collaboration

We worked with the Raffles Institution (RI) on a project on the computer-assisted recognition of the textural surfaces of adhesive tapes. The poster prepared by RI won the silver award at the latest Singapore Science and Engineering Fair. The project was also accepted for a poster presentation at the Asia Pacific Conference of Young Scientists 2012.

REACHING OUT TO THE WORLD

Our participation in global and regional workgroups and meetings brings immense benefits, not just to Singapore, but also across the region. As we delve deeper and develop our capabilities, we are poised to better share our knowledge and expertise with our partners around the world.

MOU with the Netherlands Forensic Institute

On 30 October 2012, we signed a Memorandum of Understanding with the Netherlands Forensic Institute to increase our collaboration in research and development, sharing of information, knowledge, expertise and experience, as well as the setting up of forensic science and management training and consultancy facilities in Singapore.

Combating Pharmaceutical Counterfeiting

Our development of analytical techniques to detect and differentiate various sources and batches of the same active pharmaceutical ingredients (API) and drug dosage form has put HSA at the global forefront of combating pharmaceutical counterfeiting.

The results were presented at the Drug Information Association Workshop on API and AmCham Shanghai Healthcare Committee & US Department of Commerce (DOC) Anti-counterfeit Medicines Roundtable Discussion in Beijing, China, and at the European Academy of Forensic Science Conference 2012 in The Hague, Netherlands. We also presented at the Patient Safety and Drug Detection Technology Workshop, jointly organised by the US DOC and the India Office of the Partnership for Safe Medicines, in New Delhi, India.

Advancing Forensics in the Region

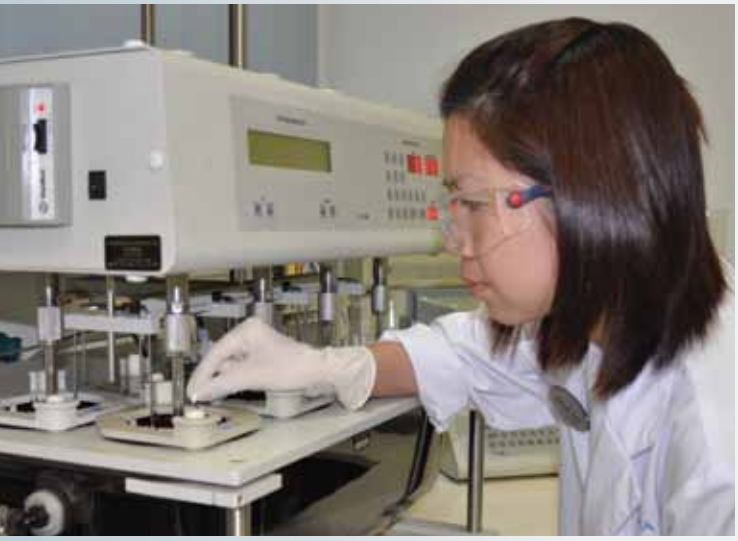
Our involvement in the Asian Forensic Sciences Network (AFSN) remains strong as we led the fourth publication of its annual newsletter, ForensicAsia. We also actively represent the AFSN in the International Forensic Strategic Alliance. The various positions held by HSA, include:

- AFSN Board Member and International Liaison Officer
- Chair of Trace Evidence Workgroup
- Chair of Illicit Drugs Workgroup
- Chair of Quality Assurance & Standards Committee
- Vice-Chair of Crime Scene Workgroup

A Leading Influence in ASEAN

Over the year, we have been part of the ASEAN Reference Substance Workgroup in the establishment of the ASEAN secondary drug reference standards. As part of this workgroup, we have completed the re-testing of a steroid, Prednisone, for the ASEAN Reference Standard. We are also the co-chair for the 1st ASEAN Cosmetic Testing Laboratory Committee covering analytical methodologies cooperation in the emerging complex cosmetics matrix.

As the European Commission-ASEAN reference laboratory for mycotoxin analysis, we attended the first and second ASEAN Food Testing Laboratory Committee meetings to raise the standard of testing in ASEAN countries.



Taking the Lead in Applied Sciences

We are committed to contributing to the global advancement of applied sciences by helping laboratories around the world raise and sustain their service quality. To this end, we actively participate in many international working groups such as the Scientific Working Group, Joint International Atomic Energy Agency / Food and Agriculture Organisation, Forensic Isotope Ratio Mass Spectrometry Network and the European Network of Forensic Science Institutes.

We are the first non-European agency to participate in the network group meeting of Official Cosmetics Control Laboratories, organised by the European Directorate for the Quality of Medicines and HealthCare. We are also part of the assessment teams for the American Society of Crime Laboratory Directors/ Laboratory Accreditation Board International assessment of two overseas laboratories.

We also participated in a collaborative study with the United States Pharmacopeia (USP) to establish an acceptance range for USP Proposed LOT Q2 USP Prednisone Tablet to be used as the international USP standard calibrator for the Dissolution Apparatus Suitability Test. The inter-laboratory collaboration study involved more than 30 international government and industry laboratories.

Making a Difference with WHO

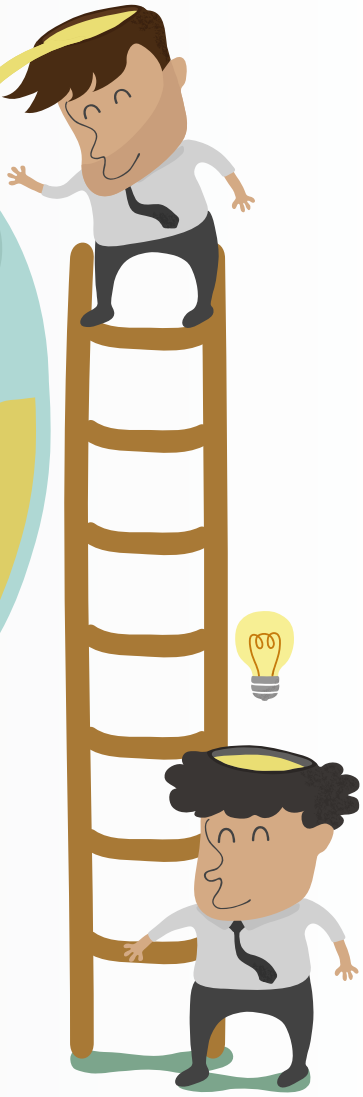
In the past year, we remained a key contributor to several WHO initiatives, including the following:

- Chair of Workshop on Impurities and Residues, International Pharmaceutical Federation Congress in the Netherlands, October 2012
- WHO Temporary Advisor to 47th Meeting of the WHO Expert Committee on Specifications for Pharmaceutical Preparations in the Netherlands, October 2012
- Chair of Working Group Meeting for the WHO Tobacco Laboratory Network on Volatile Organics in National Institute of Public Health, Japan, November 2012

Our Food Safety Laboratory has been re-designated as a WHO Collaborating Centre for Food Contamination Monitoring for a period of four years from 29 September 2012. As a collaborating centre, we provide monitoring information on the levels of contaminants in food to the Global Environmental Contamination Monitoring and Assessment Program. This helps to strengthen capabilities in contaminant monitoring and health impact.

DRIVING SCIENCE FORWARD WITH LEAN SIX SIGMA

Improving our processes and performance is something that we constantly seek. By applying Lean Six Sigma into our operations, we have been able to make excellent headway in delivering more and faster service for our partners and stakeholders.



Finding New Efficiency Gains

Through better arrangement of duty rosters to rationalise manpower and resources utility, and also refining testing processes and system workflow, the Analytical Toxicology Laboratory - Drug Abuse Testing Unit was able to increase the number of non-urgent routine cases meeting the target turnaround time (TAT).

Faster Paint Analysis

Restructuring and training of staff at the Forensic Chemistry & Physics Laboratory has improved the number of cases meeting the TAT of their forensic paint analysis service for traffic accidents. They increased the number of trained staff at the critical stages of casework. Regrouping the team allowed for better case allocation and parallel processing of exhibits, which resulted in faster processing time.

Absent: Maggie Tiang Su Su, Koh Hui Huang

Streamlined Processes, Better Output

The Analytical Toxicology Laboratory - Clinical and Forensic Toxicology Unit aimed to improve the percentage of clinical toxicology cases meeting the TAT. The solutions implemented included stepping up the training of junior scientists to enable them to handle more complex cases, streamlining workflows to reduce waiting time and unnecessary reworking. For example, scientists were required to review each case and send for further analysis if necessary, once the cases were submitted to them. Clearer guidelines and instructions were also provided to the laboratory staff to assist them to make better decisions and produce higher quality reports that did not need reworking. Cases were also prioritised according to the expected date of completion. With these processes in place, the number of cases meeting the TAT increased to 95%.

Solving Crime Faster with Better Processes

The DNA Profiling Laboratory aimed to reduce the TAT for Police Division crime cases with less than ten exhibits, from an average of 31 weeks to 13 weeks. The laboratory went through a process overhaul and increased staffing. New process schedules were developed and designated officers were rostered for the various processes. An optimal sample batch size was also determined so that the assigned officers could complete each test within the scheduled time. These changes enabled a consistent assignment of cases and reduced waiting time between processing steps. Eventually, the original target was surpassed and the average TAT was successfully reduced to 11 weeks. Staff morale also improved as the results helped in the speedy arrest of the perpetrators.

Absent: Joyce Low Hui Koon, Noorshahira binte Mohamad

Absent: Jean Chen Xiu Xiu

Analysing Unknowns More Efficiently

Analyses of unknown chemicals and materials are generally non-routine cases that follow some basic methodologies, requiring the examiner in the Forensic Chemistry and Physics Laboratory to select or modify the techniques according to the nature, quality and quantity of the evidence. To reduce the time required for method development, they re-delegated administrative work, created a searchable index for cases, compiled reference sources and literature searches, and trained more officers for competency in complex cases. Technical experts were trained to take charge of the analysis and to act as “knowledge centres”. As a result, the number of cases meeting the TAT improved to 83%.

Speeding Up Illicit Drug Tests

The Illicit Drugs Laboratory was focused to meet its target TAT for testing of controlled drugs in possession cases. To achieve this, they allocated officers according to the drug type that they were most efficient in. These officers were also responsible for monitoring the progress. The team was also able to identify the optimum size and drug types that could be batched together for analysis. This has significantly improved the percentage of exhibits meeting the TAT.

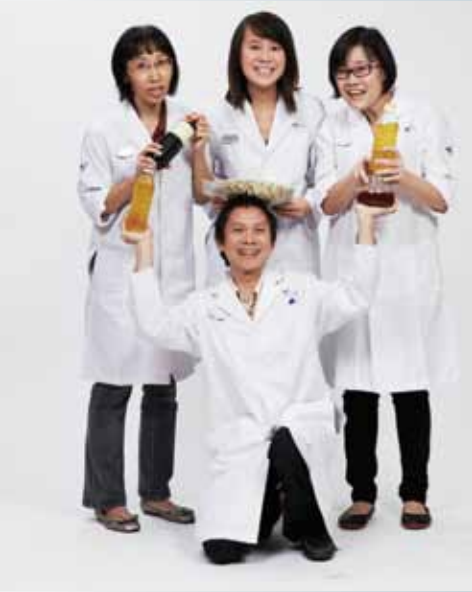
Absent: Nio Sok Hong

A 96% Success Rate

The Pharmaceutical Laboratory aimed to increase the number of routine Product Quality Surveillance screening for western medicine cases completed within the targeted TAT to 96%. To do so, they collaborated with the Generics and Biosimilars Branch and the Enforcement Branch from Health Products Regulation Group to revise the workflow. Company testing methods were retrieved and standards of concerned pharmaceutical products were purchased at least two months in advance, based on the yearly operational list before the samples were sent in for testing. This enabled the laboratory to work on the cases immediately to achieve the target.

Faster Submission, Better Customer Satisfaction

It now only takes half an hour to complete the full registration of food sample at the Food Safety Laboratory. This was achieved through relocating the customer service counter and further streamlining the process. A dedicated customer service officer has also been assigned to the laboratory to facilitate registration of samples and documentation. This has greatly enhanced work efficiency and improved audit traceability. The team also worked with the Agri-Food and Veterinary Authority of Singapore to batch samples for submission at designated timings, to allow for better work allocation. The improvement has resulted in better overall internal and external customer satisfaction.



In collaboration with our Professional Groups and external stakeholders, we align strategies and resources to develop solutions that enable HSA to successfully achieve its public health and safety mission.

STRATEGIES

CONNECT & ADVANCE

Corporate Headquarters

LEADERSHIP

By developing a culture focused on excellence, and by creating opportunities to gather, learn and share, we champion an HSA that is stronger than the sum of its parts, and ready for the future.

ONE FOR ALL, AND ALL FOR EXCELLENCE

At HSA, we are professionals driven by a shared passion to make a difference in people's lives every day – be it patients, consumers, industry partners, staff or members of the community. As an organisation, we are focused on sustaining and advancing our effectiveness and capabilities so that we can realise our vision, and deliver ever-improving value to all whom we partner and serve.

Sustaining Our Success

To be a truly future-ready organisation, we continue our pursuit of excellence through continuous learning and managing change. We are constantly reviewing and updating our corporate strategies and departmental operational plans. Sharing and discussion sessions are held regularly with the Professional Groups to ensure effective and timely implementation of plans. By taking an active approach in leading process improvement, we aim to excel in our 4-in-1 organisational excellence certification at the end of 2013.

Enjoy, Exchange, Excite

HSA believes in having our people gather often, to grow, bond, and learn in our journey as a family. In the past year, we continued the tradition of organisation-wide events such as our annual New Year gathering and Dinner & Dance, where everyone had the opportunity to relax and celebrate with fellow colleagues from across the different groups and departments.

Strengthening Our Core

HSA is a values-driven agency. The success we have enjoyed thus far is anchored by our Core Values which defines how we do everything – from retaining and attracting the best talents, to servicing both our internal and external customers. To enhance synergy across the organisation and promote a better understanding of our Core Values, the HSA-wide team building programme, that complements the regular orientation sessions, has continued to emphasise our Core Values.

To refresh our HSA identity, we updated the visual icons that represent each of our five Core Values. All new HSA notebooks have the refreshed icons printed on them. To further reinforce our branding and reputation as a progressive employer, we have enhanced the layout and design of our recruitment advertisements and HSA career webpage, offering meaningful work and career progression with competitive compensation packages.

Extra SPICE

HSAians can now share their ideas and suggestions easily on the Shared Portal for Information, Collaboration & Engagement (SPICE). The new staff suggestion portal also simplifies the processes of reviewing suggestions, tracking the implementation stages and providing in-depth reporting for planning and tracking purposes. This ensures that no suggestion is left out and entrusts HSAians with greater ownership of their workplace environment.

Empowering Our People

Our people are the active force behind the long-term success of HSA as a trusted authority. We continue to support our staff by providing developmental programmes and activities that bring out the best in their work performance and overall well-being.

One of our key platforms to promote a learning culture and to spread knowledge, ideas and growth-driving organisational excellence was the HSA Organisational Excellence Forum, held on 15 August 2012. Mr Ang Hak Seng, then-CEO of Health Promotion Board, was invited to share his experience on the pursuit of organisational excellence in the Public Service.

We continued to conduct regular roadshows aimed at keeping our staff informed and updated on our latest policies and processes. Work-life balance talks were also conducted to help our staff enhance their personal productivity and discover more ways to find balance between work and personal life.

A Showcase of Excellence

In the spirit of innovation, learning and sharing, we took part in the PS21 ExCEL Convention in November 2012. We showcased HSA's excellence by hosting a learning journey for 80 public officers at the Bloodbank@HSA, and shared with them how blood is collected and processed. At the convention, we conducted a public talk entitled "Real or Counterfeit Medicine… Can You Tell?", and showcased three projects by the Blood Services Group and Applied Sciences Group with live demonstrations within the exhibitors' booths.

Frozen Blood Inventory Electronic System (FRIES)

FRIES is an enhanced blood storage management system that provides real-time inventory information on frozen blood units. Using a barcode scanner, the status on the location of each frozen blood unit is updated in real-time at each station during storage and retrieval without compromising cold chain storage. Now, frozen blood units can be easily retrieved in a shorter time, meeting the needs of patients more effectively. FRIES has also allowed timely tracking of storage locations, improved storage space planning and raised overall efficiency.

Forensic Examination of Counterfeit Medicines

In the past, laboratory analyses of counterfeit medicines relied solely on the identification and quantification of its active pharmaceutical ingredients (API). Now, the Forensic Chemistry and Physics Laboratory (FCPL) has developed a multidisciplinary method to examine both medicine and packaging. Optical microscopy methods are employed to examine the printing and security features of packaging materials. At the same time, an array of analytical techniques is applied to retrieve information on any excipient and adulterant content. This integrated technique also characterises medicines to determine their source of origin and offers a rapid, comprehensive and reliable way to differentiate counterfeit from authentic medicines.

Forensic Examination of Drug Packaging Material

Collaborating with the Central Narcotics Bureau, FCPL applies its forensic expertise in the investigation and prosecution of drug related offences. Through the use of advanced instrumentation and technologies, the analyses of drug packaging materials such as plastic bags, straws and tapes, can provide useful evidence to link a suspected trafficker or an abuser to a case or syndicate operation. To further complement drug enforcement work, forensic databases comprising information on various packaging materials are being developed to provide invaluable investigative leads to aid in the administration of justice.

Perfecting Our Work

We have completed a trial implementation of the Near-Miss Reporting Framework that helps to identify, analyse and share problems before they escalate into more serious issues. This has been found to be particularly useful for trending and early detection of systemic errors. Reporting such incidents provides opportunity for early rectification to enhance the quality of HSA's work. We are in the midst of streamlining the process so that it can be implemented across the entire organisation.

CARING FOR THE COMMUNITY

HSA is committed to being a socially responsible organisation. Through our Corporate Social Responsibility framework, CARE (Community Action, Responsible for our Environment), we encourage our employees to contribute their time, talents and resources in three main areas of need: social volunteerism, preservation of environment, and cultivating a community-caring culture.

For the Young

During the year, we organised an English Learning Journey for the students of APSN Katong School through a play based on popular children's author Eric Carle's books. To give them the opportunity to build their entrepreneurial spirit, we invited the students to set up a booth during our Public Service Observance & Learning Day where they sold their handmade items.

For the Elderly

Our project, "HSA Care-in-Action through Sponsoring, Packing and Distributing", saw 100 bags of household items given to the elderly. In addition, a charity bazaar held in conjunction with our National Day Observance Ceremony raised $3,470 worth of proceeds for the Lions Befrienders Service Association (Singapore).

For Our Staff

Our employees are our best assets, and having healthy employees makes us an even stronger organisation. As such, it is with great pride that HSA achieved the Platinum Award for the Singapore Health Awards 2012, with a score of 91.45%, up from 83.21% in 2010.

Smooth Experiences

A customer relationship management system was completed in end 2012. This system, complete with automated analytics and reporting, helps us manage feedback, enquiries and engage our industry partners more effectively and efficiently.

A new email management system has been rolled out to ease the access to filed emails from a centralised electronic repository. This repository enables employees to search and retrieve valuable information and institutional knowledge that are contained in email exchanges.

Plugged In

To counter any potential malicious activity, we have implemented the Next Generation Firewalls in mid 2013. In addition, we have upgraded our security services with the Government's Cyber Watch Centre to the Intrusion Prevention System (IPS) to ensure that our Internet-linked networks are properly guarded against unknown threats from viruses and malware.

We also began converting our Internet protocol version to IPv6 for our public facing systems and electronic systems. This communication protocol not only helps to increase the number of our IT addresses, but also has other advantages such as helping to save network bandwidth. In 2012, we achieved 75% of our rollout, with a 100% target by early 2013.

SMART CONSUMERS

Our elderly can be vulnerable to unscrupulous sellers who promise miracle cures and treatments through well-packaged but illegal health products. Not only are they cheated of their hard-earned money, such products may harm their health and lead them to inadvertently forgo proper and necessary medical treatment.

"Guaranteed" Cures

Following the successful nation-wide campaign to curb illegal health products, which won a Bronze Award at the Singapore Press Holdings iink Awards 2012, a new public education campaign was launched in November 2012. With the aim of helping the elderly purchase health products smartly and safely, the new campaign focused on the dangers of illegal health products passing off as natural or traditional cures and obtained from dubious sources such as makeshift stalls or via word-of-mouth.These sellers entice buyers through false promises of guaranteed results, as well as exaggerated testimonials from "past users".

Some of these common illegal medicines include painkillers for rheumatism and other 'cures' for chronic illnesses such as diabetes and high blood pressure. HSA's testing has established that such products are at high risk of being adulterated with unknown and harmful substances.

To counter this, a comprehensive advertising campaign and micro-site (www.healthdangers.sg) reminded users that while it may be cheaper and convenient to purchase health products online or from unknown sources or even from friends; it is difficult for them to be sure of the safety and authenticity of the products. The advertisements also warned about possible fatal or serious health consequences.

This campaign reached an estimated 2.2 million people through mainstream advertising and secured over 11 million online impressions.

OUR PROMISE, YOUR SATISFACTION

Our business excellence certifications of the Singapore Quality Class, People Developer and Singapore Innovation Class agency, are testaments to our commitment to organisational excellence. We strive to build on this progress and continue to improve as our transformation gains momentum.

Honouring Our Ambassadors

HSA held its fourth Customer Service Day on 1 March 2013. Themed "Touch Hearts, Win Hearts", Mr Manoj Sharma from the Singapore Service Academy was invited as our guest speaker. In recognition for their contribution to service excellence, 36 officers and four teams were presented with the HSA Outstanding Service to Customers Awards.

The Customer Service Day also saw the presentation of the 2012 Excellent Service Award to 53 winners from HSA. This national award recognises individuals who have delivered outstanding service, and seeks to develop service role models for staff and create service champions. The number of HSA winners in 2012 surpassed that of 44 winners in 2011.

LEADING THE WAY FOR PUBLIC HEALTH

Global Partnerships, Greater Possibilities

As public health issues become more complex and multi-dimensional, the need for effective strategic partnerships has never been greater. And the benefits continue to be tremendous. By pulling together, we accomplish more than what a single organisation can do, through optimising resources and multiplying our strengths. Our achievements continue to push the boundaries of our knowledge, understanding and capabilities, to deliver limitless possibilities for public health and medical professionals, businesses, consumers, and patients everywhere.

More Ways to Connect and Impact

A key role of the HSA Academy is to bring experts together to share ideas and spark collaborations that inspire new ways to tackle current and emerging challenges in our various fields of focus. Throughout the year, the Academy continued to facilitate impactful scientific connections for our Professional Groups by hosting events and engagements on both national and international levels.

Since its establishment in 2010, the HSA Academy has been the driving force for our organisation to pursue international scientific and professional excellence in thought leadership. By creating opportunities for convergence of priorities and practices amongst HSA's myriad of stakeholders, the Academy continues to advance the organisation and Singapore's role in shaping innovative and cutting-edge approaches in health products regulation, transfusion medicine, forensics and analytical sciences globally.

Our MOU Partners

In 2012, we strengthened our partnerships with two agencies in the Netherlands by signing the following Memorandum of Understanding (MOU):

- National Forensic Institute of the Netherlands (NFI)
- The Medicines Evaluation Board of the Netherlands (MEB)

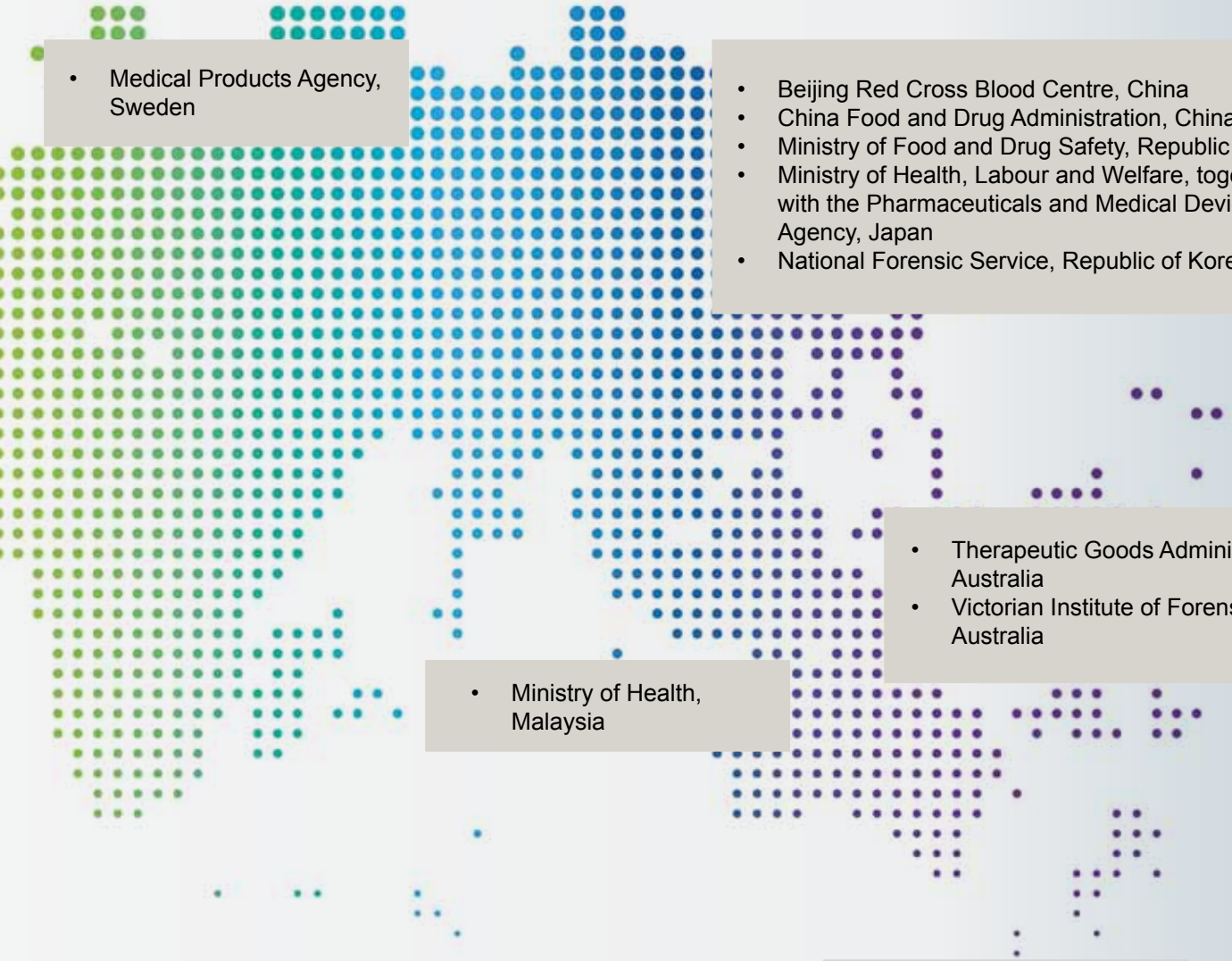
Locally, we also signed an MOU with the National University of Singapore's Saw Swee Hock School of Public Health for greater cooperation in the public health domains of epidemiology, biostatistics, health promotion/education, and health systems and policy.

- Irish Medicines Board, Ireland
- Medicines and Healthcare Products Regulatory Agency, United Kingdom
- Medicines Evaluation Board, the Netherlands
- Netherlands Forensic Institute, the Netherlands
- Paul-Erhlich-Institute, Germany
- Swissmedic, Switzerland

- Health Canada, Canada

- United States Food and Drug Administration, United States
- United States Pharmacopoeia, United States
- International Criminal Police Organization - INTERPOL

- The National Institute of Metrology, Standardization and Industrial Quality, Brazil



- Medical Products Agency, Sweden

- Beijing Red Cross Blood Centre, China
- China Food and Drug Administration, China
- Ministry of Food and Drug Safety, Republic of Korea
- Ministry of Health, Labour and Welfare, together with the Pharmaceuticals and Medical Devices Agency, Japan
- National Forensic Service, Republic of Korea

- Therapeutic Goods Administration, Australia
- Victorian Institute of Forensic Medicine, Australia

- Ministry of Health, Malaysia

- Medsafe, New Zealand

OUR ACHIEVEMENTS IN FIGURES

Whole Blood Donations
108,593

Apheresis Donations
9,980

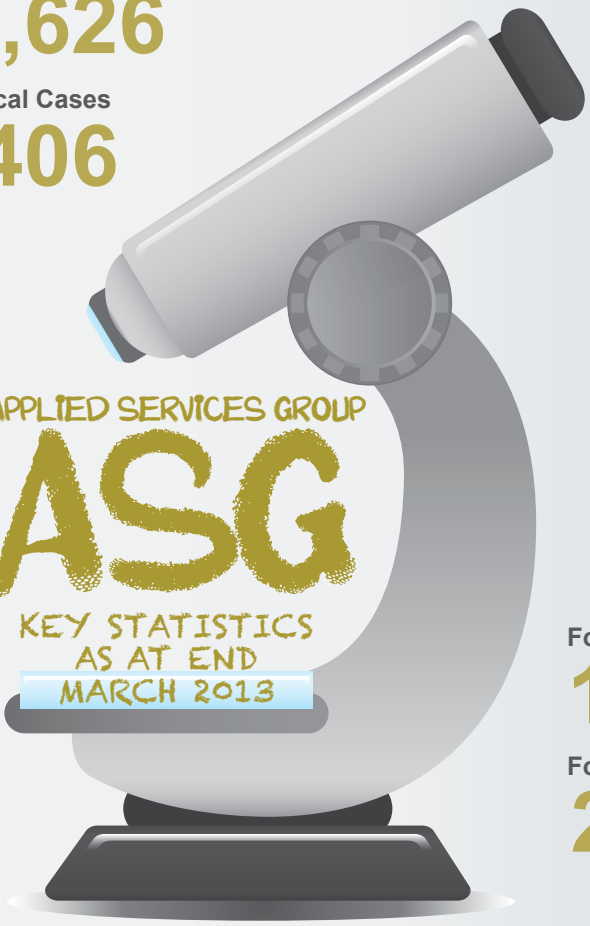
Blood Components Processed
357,076

Blood Donors
70,855

Laboratory Tests Conducted
984,099

APPLIED SERVICES GROUP ASG

KEY STATISTICS AS AT END MARCH 2013



FOOD SAFETY DIVISION

Analytical Tests for Laboratory Samples
33,626

Analytical Cases
5,406

PHARMACEUTICAL DIVISION

Analytical Tests for Laboratory Samples
20,602

Analytical Cases
4,143

ILLICIT DRUGS DIVISION

Forensic Cases
2,617

Forensic Exhibits
7,186

FORENSIC MEDICINE DIVISION

Coroner's Cases
4,144

Coroner's Autopsies
2,108

BIOLOGY DIVISION

Forensic Cases
18,162

Forensic Exhibits
26,891

FORENSIC SCIENCE DIVISION

Forensic Cases
341

Forensic Exhibits
1,332

ANALYTICAL TOXICOLOGY DIVISION*

Forensic Cases
28,453

Forensic Exhibits
46,463

*Statistics include clinical and forensic cases

New Product Licences Issued
203

Registered Medicinal Products
5,388

Medical Device Product Registration Applications (Class A, B, C & D)
972

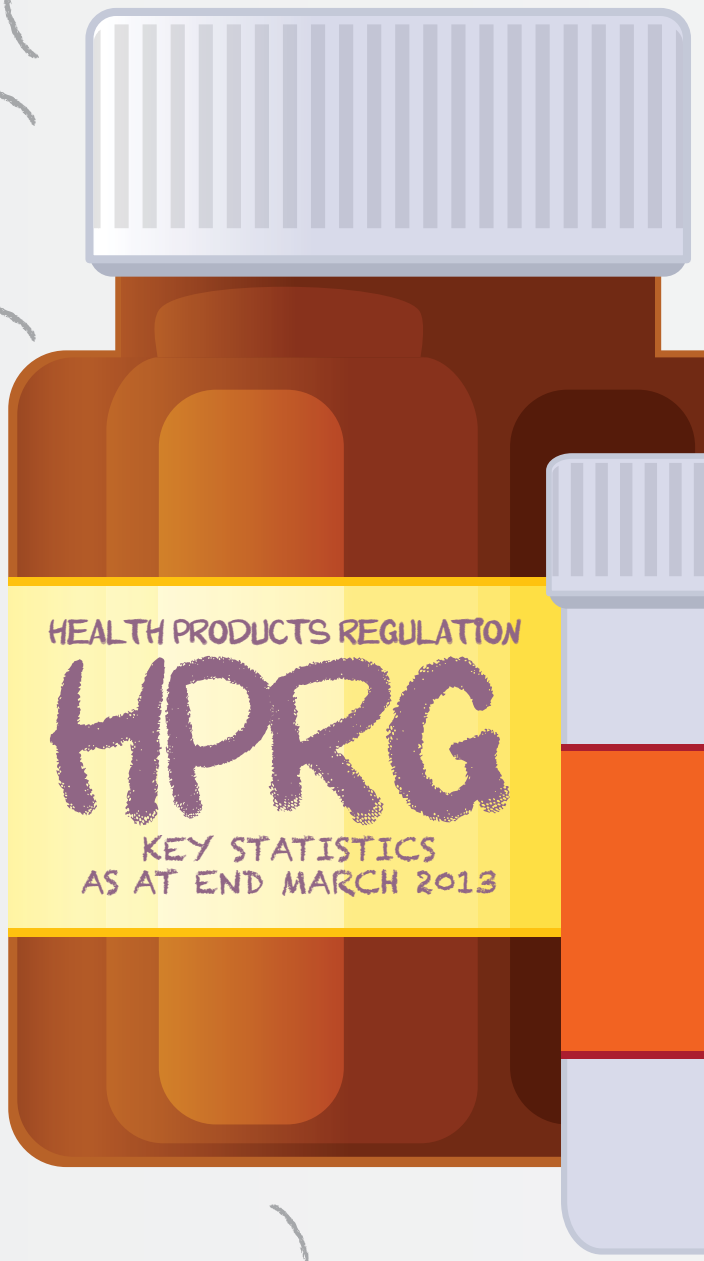
Medical Device Product Registration Applications by Product Listing (Class A, B, C & D)
1,116

Medical Device Product Listing Approved
4,364

Approved Products on the Singapore Medical Device Register
12,090

Chinese Proprietary Medicines Listed
9,827

New Chinese Proprietary Medicines Listed
690



Cosmetic Products Notified under ACD
138,745

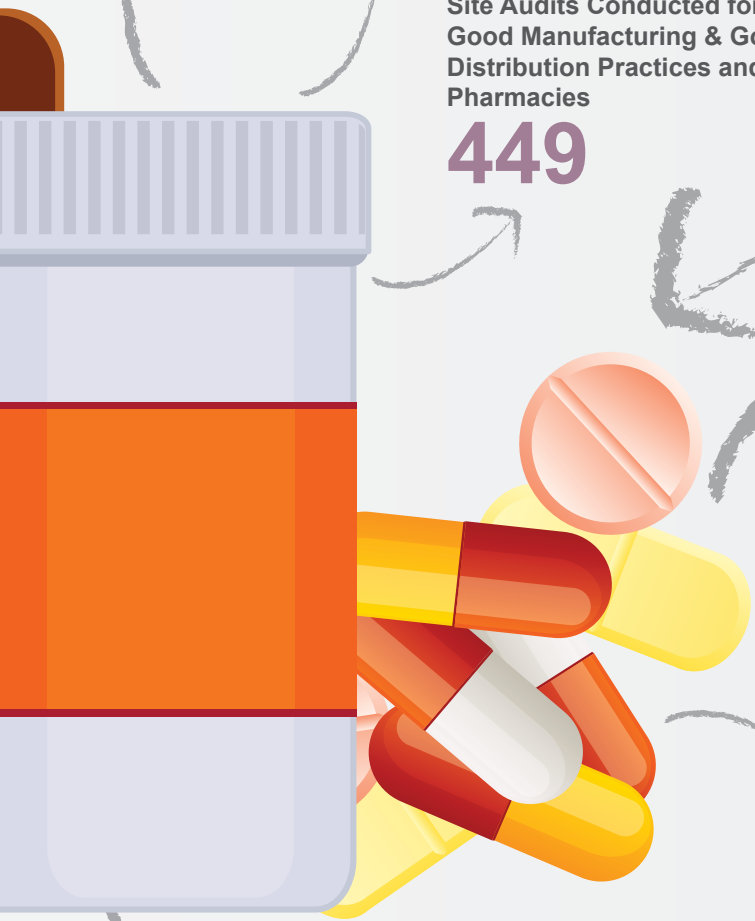
New Cosmetic Product Notifications under ACD
35,943

Clinical Trial Certificates Granted
253

Medical Advertisement Permits Approved
2,938

Premises, Dealers and Importers & Exporters of Health Products Licensed/ Certified/Approved
5,479

Site Audits Conducted for Good Manufacturing & Good Distribution Practices and Pharmacies
449



Applications Processed for Travellers Bringing Personal Medication into Singapore
1,800

Spontaneous Adverse Drug Reaction Reports Received
29,963

Spontaneous Adverse Drug Reaction Reports Captured
23,708

Tobacco Retail Outlets Licensed
5,330

Tobacco Retail Licences Approved
327

Underage Youth Smokers Caught
5,711

Post-Market Feedback Received
2,564

FINANCIAL HIGHLIGHTS

BALANCE SHEET

	FY12/13 $'000	FY11/12 $'000	Increase / (Decrease) $'000	%
Property, Plant & Equipment	96,464	101,967	(5,503)	(5)
Intangibles	4,577	5,782	(1,205)	(21)
Current Assets	108,846	91,901	16,945	18
Total Assets	**209,887**	**199,650**	**10,237**	**5**
Equity	114,646	103,601	11,045	11
Long-term Loans	22,021	24,932	(2,911)	(12)
Other Non-Current Liabilities	11,016	12,748	(1,732)	(14)
Current Liabilities	62,204	58,369	3,835	7
Total Equity and Liabilities	**209,887**	**199,650**	**10,237**	**5**

INCOME & EXPENDITURE STATEMENT

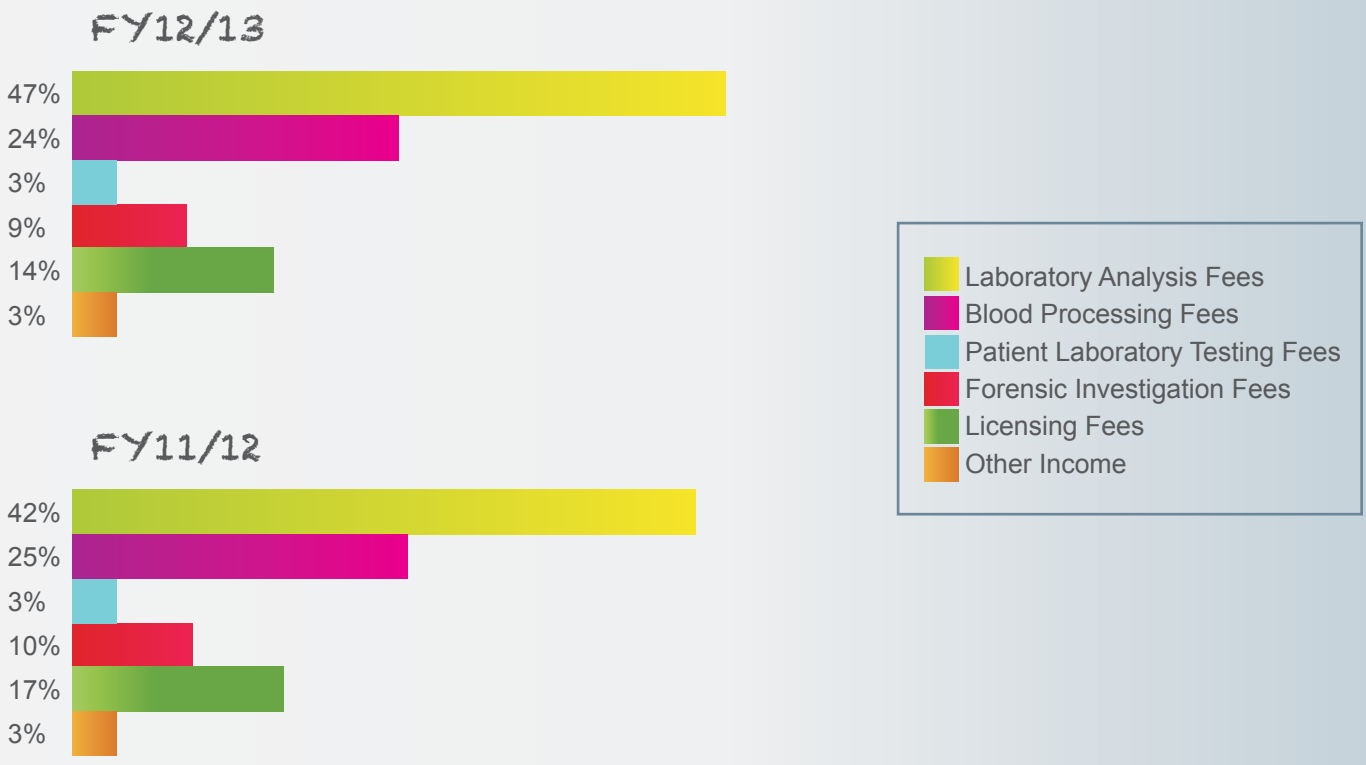
The Authority has achieved an overall net surplus of $9.5m for FY12/13.

	FY12/13 $'000	FY11/12 $'000	Increase / (Decrease) $'000	%
Operating Income	118,443	95,214	23,229	24
Operating Expenditure	(177,414)	(165,835)	11,579	7
Deficit before Government Grants	**(58,971)**	**(70,621)**	**(11,650)**	**(16)**
Government Grants	70,448	78,023	(7,575)	(10)
Surplus before Contribution to Consolidated Fund	**11,477**	**7,402**	**4,075**	**55**
Contribution to Consolidated Fund	(1,951)	(1,258)	693	55
Net Surplus	**9,526**	**6,144**	**3,382**	**55**

OPERATING INCOME

The Authority earned a total operating income of $118.4m in FY12/13, an increase of $23.2m (24%) over FY11/12's revenue of $95.2m.

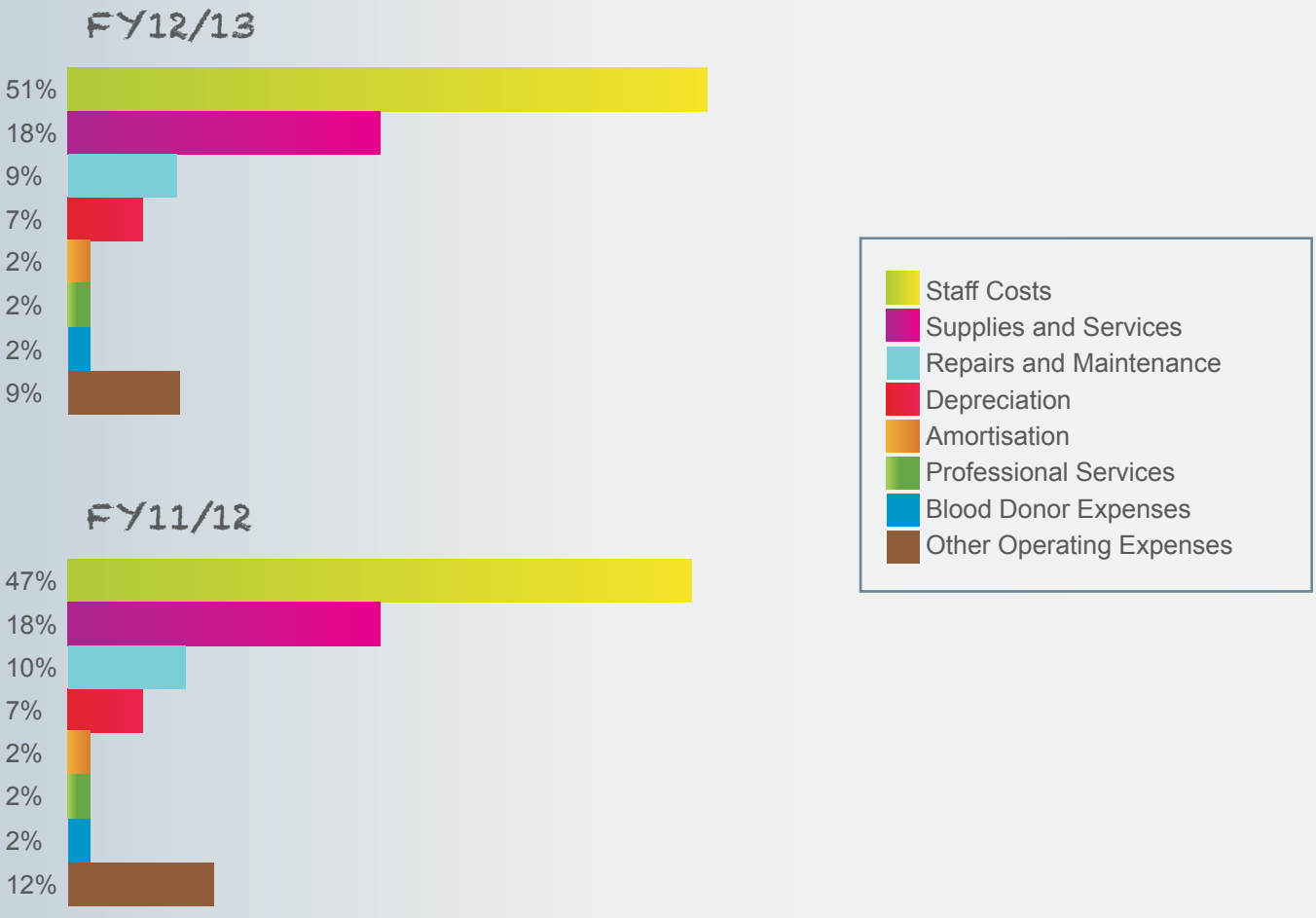
	FY12/13 $'000	FY11/12 $'000	Increase / (Decrease) $'000	%
Laboratory Analysis Fees	56,259	38,793	17,466	45
Blood Processing Fees	28,930	23,792	5,138	22
Patient Laboratory Testing Fees	3,117	3,128	(11)	(0)
Forensic Investigation Fees	10,237	9,984	253	3
Licensing Fees	16,072	16,424	(352)	(2)
Other Income	3,828	3,093	735	24
Total Operating Income	**118,443**	**95,214**	**23,229**	**24**



OPERATING EXPENDITURE

The Authority incurred a total operating expenditure of $177.4m in FY12/13, an increase of $11.6m (7%) over FY11/12's expenditure of $165.8m.

	FY12/13 $'000	FY11/12 $'000	Increase / (Decrease) $'000	%
Staff Costs	90,652	76,669	13,983	18
Supplies and Services	32,058	28,519	3,539	12
Repairs and Maintenance	15,959	17,157	(1,198)	(7)
Depreciation	13,160	12,388	772	6
Amortisation	3,006	3,654	(648)	(18)
Professional Services	2,676	3,753	(1,077)	(29)
Blood Donor Expenses	3,285	3,380	(95)	(3)
Other Operating Expenses	16,618	20,315	(3,697)	(18)
Total Operating Expenses	**177,414**	**165,835**	**11,579**	**7**



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