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We have contributed to the training of over 1,500 health workers to provide a high standard of hospital care for children.

Our anaesthetists have helped train health workers to use 10,000 low-cost machines to make surgery safer in our region. Our heart surgeons have trained surgeons in Vietnam who operate on around 600 children and adolescents each year.

We have been involved in screening over 15,000 children and adolescents for rheumatic heart disease in Fiji.

Our Emergency Department doctors and nurses have been part of Australia’s emergency response teams who treated over 2,500 people and performed 200 surgeries in the weeks following natural disasters in Samoa (2009) and the Philippines (2013).

We have trained the only childhood cancer specialist in any Pacific Island country.

We are working with countries in our region to show how vaccines could protect almost 6.5 million children each year.

The Royal Children’s Hospital (RCH), Melbourne is one of Australia’s biggest and busiest paediatric hospitals. With a proud 147-year history the RCH cares for children from across Victoria; and, through its nationally funded centres for complex cardiac surgery and transplantation, for Australia’s sickest children and adolescents.

But the RCH is more than just a great children’s hospital. With our campus partners, Murdoch Childrens Research Institute (MCRI) and the University of Melbourne Department of Paediatrics, we are Melbourne Children’s. And it is this integration of research, education and clinical care, on one site, that has positioned us as a global leader in child and adolescent health care delivery.

Melbourne Children’s has led developments in clinical care and research, including the discovery of the major worldwide causes of viral diarrhoea and bacterial pneumonia, that are now saving the lives of children across the world.

Our work with United Nations agencies, donors, governments and with doctors, nurses, allied health professionals in developing countries is a small part of the global effort that has seen child deaths reduce by half.

But just half a day’s flying time away, in Asia and the Pacific, children still die from preventable diseases. In some of these countries, children are 10 to 15 times more likely than Victorian children to die before their fifth birthday.

This report documents the contributions made by over 100 Melbourne Children’s staff on an effort to reduce this inequality in global health. Global health focuses on the needs of the poorest countries by working toward the prevention and treatment of common illnesses. Global health programs should be equitable, sustainable, affordable, based on best practice and evidence and driven by the priorities of our developing country partners. Our global health programs combine practical collaboration with research, training and advocacy.

The projects described in this report have collectively raised over $40 million to improve the health of children in low- and middle-income countries. Other stories told in this report acknowledge the galleries and dedication of our staff involved in volunteer work.

The contributions of our staff are amplified by the work of over 100 international medical graduates who train in clinical departments of the RCH annually, and over 30 partnerships with hospitals, universities, research institutes and ministries of health in low- and middle-income countries. Some of our international colleagues tell their own stories in this report.

It is inspiring.

Professor Christine Kriplari, Chief Executive Officer
The Royal Children’s Hospital

Professor Kathryn North AM, Director
Murdoch Childrens Research Institute

Professor Paul Monagle, Stevenson Chair, Head of Department of Paediatrics, The University of Melbourne
Survive beyond five

Preventing three common causes of child deaths: pneumonia, diarrhoea and newborn conditions

Each year throughout the world, six million children die before their fifth birthday. Almost half of these deaths are due to diseases such as pneumonia, diarrhoea or other infections that can be prevented or treated through simple and affordable healthcare measures.

Children are most vulnerable in their first month of life; and especially in the first 24 hours after birth. Forty percent of all deaths in children under the age of five occur in the first month of life. Pneumonia and diarrhoea account for a third of all child deaths, causing the loss each year of about two million children before their fifth birthday. Pneumonia, diarrhoea and newborn conditions can be prevented by vaccines as well as by improving breastfeeding and childhood nutrition, reducing exposure to indoor smoke and environmental pollution, improving hand hygiene and ensuring access to clean drinking water and toilets.

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How do we know this?

Staff from the Melbourne Children’s were part of an international team of 456 researchers from 50 countries who conducted estimates on global child mortality and disability and death in children and adolescents using surveys and available information from national and international health systems.

Essential care for newborns

A baby’s chance of surviving complications during birth increases significantly if they are delivered by a skilled birth attendant in a health facility. In countries where most births occur in hospitals or health centres, quality care in these facilities is essential for newborn survival.

In communities where there are still high levels of newborn deaths, the focus should be on improving community-based services for disadvantaged populations and increasing essential newborn care, which includes breastfeeding and keeping the baby warm.

Seven steps to identify very sick newborns

Seven steps to identify very sick newborns

A simple checklist to assist community health workers has been developed through the Young Infants Clinical Signs Study. Seven steps to identify very sick newborns: Sick newborns with any one of the following signs should be referred to hospital:

- Difficulty feeding;
- Temperature below 35.5°C or above 37.5°C;
- Movement only when stimulated;
- Rapid breathing;
- Difficulty breathing;
- Fever;
- Convulsions.

This simple checklist is an important tool to reduce disability and death in the first two months of life. It has also been used to update the World Health Organisation’s Integrated Management of Childhood Illness (IMCI), the standard checklist for first-line health workers.

RCH Global Report 2015
Early essential newborn care in the Solomon Islands

The Solomon Islands is one of 23 countries in the Western Pacific Region where out of every 1,000 babies born, more than ten newborns will die within their first month of life. A newborn dies every two minutes in this region. Access to care can be challenging in the Solomon Islands, where 80% of the population lives in rural or remote areas. To improve care during the first month of life, Melbourne Children’s is working with the Ministry of Health and Medical Services (MHMS), Solomon Islands, and UNICEF to upgrade equipment in special care nurseries, and train health workers at all levels in newborn care.

Dr Shidan Tosif will implement training in neonatal resuscitation, standard clinical guidelines for managing sick newborns and other strategies as part of WHO and UNICEF’s Action Plan for Healthy Newborn Infants in the Western Pacific Region. This features the Early Essential Newborn Care (EENC) program, a package of interventions aimed at improving care at birth and in the first few days of life. Essential care includes interventions for babies born too soon or too small and the ‘first embrace’.

Training will be run at a national and provincial level for health care workers, nurses and doctors. The aim is to eventually train all health workers in the country. Support will be given to include essential newborn care in the Bachelor of Child Health Nursing, which has been developed by MHMS and Solomon Islands National University.

Alongside this, UNICEF will support new equipment and improved infrastructure for special care nurseries at health centres and hospitals.

As part of a comprehensive approach, these infrastructure upgrades and training will be guided by an assessment of available health care for newborns, strengthened health information and updated national policy. By improving access to essential newborn care, this project aims to contribute to reach the Solomon Islands’ national goal of reducing newborn deaths.

Dr Hoang Tran completed these studies as part of a Doctor of Philosophy at the Melbourne Children’s, supervised by Professor Steve Graham.
How do we know this?

- Professor Frank Stank conducted some of the earliest research to identify the causes of childhood pneumonia.
- Professor Kim Mulholland conducted the first trials to demonstrate that bacterial pneumonia can be prevented by vaccines, as well as a range of studies on the causes and treatment of pneumonia.
- Professor David Graham showed the value of preventative antibiotics for pneumonia in HIV-positive children in Africa.
- Professor Trevor Duke and colleagues in PNG conducted the largest field trial of oxygen concentrators and pulse oximeters, which showed that deaths from pneumonia could reduce by up to 39%.

Life saving vaccines for pneumonia

At least one third of pneumonia deaths are attributable to Streptococcus pneumoniae. The pneumococcal conjugate vaccine (PCV) is a life-saving vaccine that can prevent infections and young children against pneumonia, meningitis and middle ear infections. Several doses starting at six weeks and a booster dose between nine and 12 months is recommended to prevent infections.
Diarrhoea can be a cause of a variety of viruses, bacteria (and their toxins) and parasites. The Melbourne Children’s is targeting rotavirus, the most common cause of diarrhoea in children, with vaccines.

How do we know this?

Professor Roy Robins-Browne was part of a team that studied around 15,000 children with diarrhoea in seven countries in sub-Saharan Africa and South Asia. They identified the four most common causes of diarrhoea in these children as rotavirus, Escherichia coli, Cryptosporidium and Giardia. Their results confirmed the existing vaccines and prevention with zinc, but also suggested supplements should be made more widely available and that new methods had to be developed to diagnose, treat and prevent other infections.

Life saving vaccines for rotavirus

In Indonesia, rotavirus remains a leading cause of death in children under five years age and is a significant cause of childhood hospitalisation. A recent survey showed that 60% of diarrhoea-related hospitalisations in children across Indonesian provinces were due to rotavirus.

As part of the clinical trials of the RV3-BB vaccine, Professor Julie Bines, Associate Professor Carl Kelkwood and their team are working with the Universitas Gadjah Mada and the Indonesian vaccine manufacturer Bio Farma. Two hospitals, 23 primary healthcare clinics and more than 35 doctors and 400 midwives are participating in the trial. Through the trial, primary health workers, including midwives and nurses, have been trained to strengthen care for common childhood illnesses. The health care workers administering the vaccine are proud of the part they are playing in the trial. Indonesian health care worker Binti Fatimah says, “We are ready to share this research in order to be successful and potentially save lives of children and toddlers.”

RV3-BB is an oral vaccine. There are two other commercial rotavirus vaccines globally available, but RV3-BB would provide earlier protection as it is administered soon after a baby's birth. Additionally, administering the first vaccine dose shortly after birth when a woman and her baby may already be in a healthcare setting, could help much of the infant whose formula does not have easy access to healthcare.

So far, over 1,000 infants in Indonesia have received the vaccine. With 6-7 million babies born each year in Indonesia, if RV3-BB is included in the national immunisation schedule an estimated 50,000 deaths could be prevented each year.

How do we know this?

Rotavirus was discovered by the Swedish Children’s Hospital, led by Professor Harry Blichfeldt. This virus has subsequently been shown to cause 40% of all cases of diarrhoea worldwide. A strain of rotavirus that specifically infects newborns but does not cause disease was discovered at Melbourne’s Royal Women’s Hospital. This unique strain of rotavirus (RV3) is the basis of the RV3-BB vaccine developed at the Melbourne Children’s, Professor Neville Ramadorai’s family and early efficacy trial (RV3-BE) in Melbourne. The next generation of the vaccine, RV3-BB, has completed phase I and safety trials in Australia and phase II trials in China. Phase III trials are currently being undertaken in Indonesia.

The Melbourne Children’s has collaborated with the Universitas Gadjah Mada and Sanghi Hospital in Indonesia over the past 40 years.

Collaborating with Indonesian government vaccine manufacturer, Bio Farma, to produce RV3 allows for technology transfer to an emerging vaccine manufacturer and is hoped will result in the manufacture of an affordable rotavirus vaccine for developing countries.
Getting the benefits of breastfeeding and vaccines

Rotavirus vaccines are highly effective in countries like Australia, where studies show evidence of protection from severe rotavirus disease in 90-100% of infants. These vaccines are proving less effective when they are most needed, with variation in severe disease in excess of 50% of infants in Bangladesh, Vietnam and Malawi. These are a number of factors that could explain why and why vaccines are less effective in these settings, including the high load of microorganisms within the environment, malnutrition or high levels of material and immunization.

A team from University of Gadjah Mada and another in Malawi is examining the role of maternal antibodies, the antibodies that are passed to newborns through breast milk and breastfeeding. Maternal IgG and IgM antibodies are expected to provide rotavirus disease and develop higher levels of antibodies. These antibodies are concentrated early in breast milk and colostrum and are the potential sources of high protection from natural rotavirus disease. These vaccines are also able to be administered in the immune response to rotavirus vaccines.

A rotavirus vaccine for neonates developed by MRC, RCHBB, is being trialled in Malawi (as described above) with the first of three doses given at birth. To examine the effect of maternal antibodies on oral vaccines, Dr Victra DeSire and Dr Margaret Bruce will look at rotavirus antibodies in cord blood, colostrum and breast milk.

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Rotavirus surveillance

The safety and efficacy of the current rotavirus vaccine has been proven in extensive clinical trials. When the rotavirus vaccine is introduced into national immunisation schedules, vaccine effectiveness and adverse events can be monitored through national health information systems or disease surveillance programs. However, many low and middle-income countries do not have adequate systems or laboratory capacity to monitor disease trends, vaccine safety or effectiveness.

As part of the WHO Global Rotavirus Surveillance Network, Carl Kirkwood leads the Regional Reference Laboratory based at the Melbourne Children’s. The Regional Reference Laboratory provides an infrastructure to detect and sequence rotavirus and supports laboratories in developing countries to introduce standardised procedures. The Regional Reference Laboratory has provided training to laboratories in Vietnam, Mongolia, Fiji, Bangladesh, Laos, PDR, Myanmar and Cambodia.

Lifesaving vaccines for Escherichia coli

Most strains of E. coli are harmless, but some can cause diarrhoea and other diseases. Roy Robins-Browne and a team at the Melbourne Children’s and the University of Melbourne are developing new tools to distinguish the disease-causing varieties of E. coli and developing a vaccine to target these varieties. There is currently no effective vaccine for E. coli.

The Melbourne Children’s and the University of Melbourne are in the early stages of developing a vaccine based on InVivoStat, a protein from the bacteria. This vaccine is robust, can stimulate immune cells directly and should generate a comprehensive immune response without the need to use toxic adjuvants such as aluminium.

How do we know this?

Safety evaluations showed that the first rotavirus vaccine was associated with a small increase in the risk of intussusception, the most common cause of obstruction in infants and young children. This vaccine was withdrawn and subsequent vaccines have been rigorously evaluated for risk of intussusception.

Professor Julie Bines compiled data from 70 countries on intussusception for the Steering Committee on Diarrhoeal Disease Vaccines, Vaccine Development and Biologicals, World Health Organization, to contribute to vaccine safety guidelines and developed the Brighton Collaboration Clinical Case Definition for intussusception and the WHO generic protocol for post-licensure surveillance for rotavirus vaccines.

In 2012, Fip introduced the rotavirus vaccine for infants into the national immunisation schedule. To show how effective the vaccine is, a team from the Melbourne Children’s is working with the Fip Centre for Communicable Disease Control (FICDCC), Ministry of Health, the Colonial War Memorial Hospital and Savusavu Hospital to build disease surveillance capacity in the WHO Global Rotavirus Surveillance Network and in the WHO Regional Reference Laboratory for the Pacific.

Vaccine safety monitoring was also introduced through this project.
Nutrition and common childhood illness

Globally, more than one third of children do not receive adequate nutrition. This has serious consequences for their health, development and learning.

Poor nutrition is a factor in almost half of all deaths of children under five years of age.

An essential micronutrient to reduce diarrhoea

Zinc sulphate, when given with an intravenous solution (IV), reduces the severity and duration of diarrhoea. It is highly cost-effective, even where supply of zinc and ORS costs less than 30 cents. However, in many developing countries, zinc and ORS are not yet readily given to children with diarrhoea. This is often due to issues with the supply and distribution of essential medicines or the promotion of new treatments.

Pharmacist Michael Nunan is working with the Pharmacy Services Division in the Solomon Islands to improve the availability of zinc by introducing electronic management and simplifying the supply system for over 300 clinics, health centres and provincial hospitals. This project has also developed educational tools and patient information cards to improve health worker and community knowledge of the effectiveness of zinc.

Can vitamin D prevent severe pneumonia?

Despite being close to the equator, vitamin D deficiency is still common in South-East Asia. Vitamin D plays a role in ensuring healthy immune function and there is evidence to suggest that deficiency can contribute to the severity of lower respiratory tract illness, particularly pneumonia, in young children.

To examine the relation between vitamin D deficiency and the severity of pneumonia in Indonesian children, Vicka Oktaria, Sardjito Hospital, Yogyakarta, and Gadjah Mada University, Indonesia, and a team of local health care providers are working with Steve Graham and Margie Danchin, at the Melbourne Children’s Hospital.

The team will test newborns for vitamin D deficiency at birth and at other time points during the first two years of life to record vitamin D levels and incidence of respiratory infections in the community. The team will also test the vitamin D levels of children with pneumonia admitted to Sardjito Hospital over one year to look for an association with more severe respiratory illness.

The number of children globally who do not receive adequate nutrition

Treating malnutrition and common childhood illness in hospital

Hospital based nutritionists are a key part of a health care team working to reduce complications and promote faster recovery from disease through improved nutrition. Judith Myers is working with the Ministry of Health, Timor Leste to define the role of hospital based nutritionists and to write the Hospital Nutrition Manual for Timor Leste. She is also working to ensure that the skills needed in a hospital setting are incorporated into local nutrition training. Over 50% of children in Timor Leste are chronically undernourished.

This program has received support from the Royal Darwin Hospital, Alice Springs Hospital, Menzies School of Health Research, the Australian Government and the WHO South East Asian Regional Office (SEARO).

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one third
Child tuberculosis

The WHO estimates that there are around 500,000 cases of tuberculosis in children and up to 74,000 deaths annually. The actual numbers could be much higher. The impact of this neglected disease in children has gained recognition since the launch of the global plan to eliminate child tuberculosis in 2013.

Steve Graham led the development of the global plan Roadmap for childhood tuberculosis towards zero deaths with WHO, Stop TB Partnership, US Centers for Disease Control and Prevention (CDC), International Union Against Tuberculosis and Lung Disease and the US Agency for International Development.

The Roadmap outlines critical research to end child tuberculosis, including research to develop child-friendly diagnostic tests, that already exist. The Melbourne Children’s works on developing new diagnostic tests, including a pilot study in children in Lima, Peru.

Steve Graham and Nigel Curtis are investigators on the National Health and Medical Research Council (NHMRC) Centre of Research Excellence in Tuberculosis Control, which also has a focus in Africa and Australia found that new tests developed for use in adults do not perform as well in children. This has led doctors worldwide to review how these tests are used in children. Nigel Curtis’ team has gone on to investigate other new methods for obtaining more accurate results. They are involved in ongoing studies of potential new diagnostic indicators of tuberculosis, including protein targets in sputum.

Testing for tuberculosis in children

The lack of an accurate test for tuberculosis in children is a major challenge. Professor Nigel Curtis and Tom Connell have considered some of the available tests. Tuberculin skin testing (QuantiFERON-TB and T-Spot OT) is used in South Africa and Australia to confirm that new tests developed for use in adults do not perform as well in children. This has led doctors worldwide to review how these tests are used in children. Nigel Curtis’ team has gone on to investigate other new methods for obtaining more accurate results. They are involved in ongoing studies of potential new diagnostic indicators of tuberculosis, including protein targets in sputum.

Community care of children and families with tuberculosis

The idea of Mavuto, a nine month old Malawian infant whose name means ‘trouble’ in the local language, shows what community initiated care of children with tuberculosis could achieve. When Mavuto’s father was diagnosed with tuberculosis, Mavuto was only three months old. Young children living with a family member who has tuberculosis are at high risk of infection. However, if an adult is diagnosed there is often a attempt to test children in the household for tuberculosis. Mavuto wasn’t tested.

Six months later Mavuto was hospitalised with symptoms from tuberculosis meningitis. If screening of family members was routine, Mavuto could have taken preventative medicine or been treated earlier, before he developed symptoms. Mavuto survived hospital to return home, sadly, many children with tuberculosis meningitis do not.

Preventive medicines are safe and cost effective for children under five years old who have family members with tuberculosis. Prevention requires daily medication for six months. While adhere to preventive therapy is difficult for parents that without symptoms should take daily medication, community health workers can help educate and encourage parents to continue preventive medicines for their children.

Many countries are now adopting this type of screening for children.

How do we know this?

Professor Nigel Curtis has been investigating the broader heterologous effects of BCG vaccine since tuberculosis is common in Africa and BCG vaccine is not routinely recommended. As children’s doctors in a study to determine BCG vaccination reduced the incidence of other than tuberculosis, including other infections and allergies. Nigel Curtis’ team is investigating these broader heterologous effects of BCG vaccine. Because tuberculosis is uncommon in Australia and BCG vaccine is not routinely recommended, a Melbourne Children’s team is conducting a study to determine BCG vaccination reduces the incidence of other than tuberculosis, including other infections and allergies. Nigel Curtis’ team is investigating these broader heterologous effects of BCG vaccine.

A team led by Nigel Curtis at the Melbourne Children's compared the immune responses to BCG vaccines made from three different strains to determine which provides the most effective protection.

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Life saving vaccines for tuberculosis

The Bacille Calmette-Guérin (BCG) vaccine is given to over 120 million infants born each year worldwide to prevent tuberculosis. The BCG vaccine offers protection against some forms of tuberculosis, but we don’t yet fully understand the immune response to the vaccine. Understanding the immune response to BCG vaccine can help to develop other tuberculosis vaccines.

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In recognition of the challenges and possibilities in places like Guinea-Bissau, to explore whether BCG vaccination affects childhood morbidity and mortality worldwide, and have implications for the design of new vaccines and global BCG vaccine policy.

Professor Katie Allen has worked with the Indepth Network, Guinean-BSO to explore whether BCG vaccination affects childhood morbidity and mortality worldwide, and have implications for the design of new vaccines and global BCG vaccine policy.
Take heart

The Melbourne Children's is working to understand rheumatic heart disease, which typically begins with a persistent fever in early childhood. Rheumatic fever, caused by the common infection Group A Streptococcus, affects 15 million children in developing regions of the world, including the Pacific, and in Indigenous communities in Australia. If rheumatic fever is prevented or treated early, we can prevent heart inflammation and the need for surgery during later childhood or adolescence.

Step by Step to understand rheumatic heart disease

Associate Professor Andrew Steer and Professor Pierre Smeesters are working to understand how various types of Group A Streptococcus bacteria cause acute rheumatic fever and heart disease. Group A streptococcus is a common infection that also causes sore throats, scarlet fever and impetigo (a skin infection). Understanding how infection occurs will contribute to the development of an effective vaccine for the spectrum of diseases caused by the bacterium.

There are several potential vaccines currently being tested by groups worldwide.

Echo every heart beat

Rheumatic heart disease is difficult to detect early. The stethoscope has long been the primary tool available for doctors in low-income countries to detect heart murmurs that could indicate damage to heart valves. Now, ultrasound of the heart – echocardiography, or ‘echo’ – is becoming more widely available and more portable. Echo can be ten times more effective at detecting heart valve problems than a doctor listening with a stethoscope.

Dr Daniel Engelman is working with Dr Joseph Kado from the Ministry of Health in Fiji to train school health nurses to use echo. Portable echo machines make it possible to test children in remote villages. Children can then be referred to the Fiji rheumatic heart disease control program. The program provides antibiotics to prevent the recurrence of rheumatic fever and further damage to the heart. Children are followed up in the Divisional Hospitals, such as the Colonial War Memorial Hospital, Suva.

Over 15,000 children have been screened so far in Fiji. At least 800 children who would have gone undiagnosed have received treatment through this program.

Continuing work will follow up many of these children to understand their health care needs, and inform policy regarding screening and prevention in Fiji and other Pacific Island nations.

Understanding Kawasaki disease in developing countries

In developing countries where fever is a common symptom, less common causes of fever such as Kawasaki disease may go undiagnosed. In many resource limited settings, Kawasaki disease is increasingly recognised as an important cause of heart disease in children.

Professor David Burgner is working to understand the causes of and changes that occur in Kawasaki disease to improve diagnosis and treatment worldwide. There is no simple test for Kawasaki disease but it is effectively treated with immunoglobulin, the antibodies used in the immune system to neutralise bacteria and viruses. If Kawasaki disease goes undetected in childhood, it can lead to ongoing inflammation of the arteries in a child’s heart and heart disease in adulthood.

If rheumatic fever is prevented or treated early, we can prevent heart inflammation and the need for surgery during later childhood or adolescence.

The number of children screened so far in Fiji for rheumatic heart disease. Globally 15 million children are affected by rheumatic fever.
Each year around the world, 175,000 children and adolescents are diagnosed with cancer. The majority live in developing countries where survival rates can be as low as one in ten. If a child develops cancer in Australia, their chances of survival are usually in excess of 95%. To give children and adolescents with cancer the best chance of survival, the Melbourne Children’s in collaboration with specialists in China in the diagnosis of childhood cancers and other diseases also has adapted treatment regimens to improve prevention, early detection, specialist cancer care and the availability of cancer medicines and treatment.

Putting children’s cancer under the microscope

Cancer causes cells in a growth uncontrolled way. Some tumours grow and spread quickly, some slowly and in other cases tumours simply disappear. Accurate diagnosis, including identifying the type of cancer and severity of the disease, in conjunction with the use of accessory investigations such as molecular genetics, is important in low-income countries, where access to testing and treatment for cervical cancer is limited. The Melbourne Children’s is also working with the National Institute of Hygiene and Epidemiology and the Florian Institute in Vietnam on a national HPV research program before the vaccine is introduced.

Putting children’s cancer under the microscope

Cancer care in PNG is very basic, from the diagnosis to the services available. The current standard of care is overwhelmed by more common diseases. When I first came here, Cervical cancer was the second leading cause of death in women, accounting for 10% of deaths in the western Pacific each year. HPV vaccine is especially important in low-income countries, where access to screening and treatment for cervical cancer is limited.

Life saving vaccines for cervical cancer

Human papillomavirus (HPV) vaccine, recommended for children and young adolescents aged nine to 13 years, is highly effective in preventing cervical cancer. Cervical cancer is one of the leading causes of death for women, causing over 500,000 deaths a year worldwide. HPV vaccine has already vaccinated more than 17,000 girls in Fiji, following the introduction of the vaccine. The Ministry of Health and treatment for cervical cancer is limited. The Melbourne Children’s is working to support the Ministry of Health, Fiji to evaluate the value of receiving less than the recommended three doses of HPV vaccine and measure HPV infection rates following the introduction of the vaccine. The Ministry of Health has already vaccinated more than 10,000 girls.

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Simple tools to make surgery safer

We picture operating rooms filled with steady beeps, screens and specialist monitoring equipment to make anaesthesia and surgery safer. Without adequate monitoring a routine operation poses huge risks.

The essential piece of equipment is a pulse oximeter, a small box that clips to a child’s finger to monitor the level of oxygen in their blood. The World Federation of Societies of Anaesthesiologists (WFSA) and WHO’s Safe Surgery Checklist recommended that every patient undergoing surgery should have a pulse oximeter. The Pulse Oximeter Audit is a simple tool to calibrate rates before and after surgery. Together, the checklist and pulse oximeters could have saved half the lives lost during surgery in developing countries.

However, pulse oximeters are still not available in over 70,000 operating rooms throughout the world. Since 2011, Dr Rob McDougall from the Melbourne Children’s has worked with UK charity Lifebox, supported by the Australian Society of Anaesthetists, to deliver 10,000 low cost oximeters and training to anaesthetists, surgeons and nurses in South East Asia and Pacific Island countries. Now nearly every caring hospital and emergency room in the Pacific has access to this same monitor. More recently, Utkin has been working in Cambodia, Laos, Mongolia, Timor Leste, Indonesia and Myanmar.

Safe Surgery Checklist

is a simple tool to eliminate errors before surgery.

Learning by heart in Vietnam

Almost one in 100 children are born with some form of heart disease. In Vietnam, there are currently around 16,000 children on the waiting list for heart surgery. An estimated 400 paediatric surgeries are performed each year at Hu Hope Central Hospital. In Vietnam, there are currently around 16,000 children on the waiting list for heart surgery. An estimated 400 paediatric surgeries are performed each year at Hu Hope Central Hospital. In Vietnam, there are currently around 16,000 children on the waiting list for heart surgery. An estimated 400 paediatric surgeries are performed each year at Hu Hope Central Hospital.

Professor Christian Brizard, Associate Professor Michael Cheung and the previous Director of Cardiology, Professor Dan Penny.

In addition, the PTCF supports local instructors to develop training skills. This has been remarkably successful in China where 30,000 doctors have been trained in PTC. The Melbourne Children’s has provided technical advice to the Ministry of Health in China on the establishment of trauma centres that can provide comprehensive emergency medical services.

Supporting life-saving surgery for children from Pacific Island countries

When a particular life-saving or life-changing surgery is not yet accessible for children in Pacific Island countries, Rotary Oceania Medical Aid for Children (ROMAC) facilitates surgery in Australia. In addition, the PTCF supports local instructors to develop training skills. This has been remarkably successful in China where 30,000 doctors have been trained in PTC. The Melbourne Children’s has provided technical advice to the Ministry of Health in China on the establishment of trauma centres that can provide comprehensive emergency medical services.

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In 2016, Dr Rob McDougall from the Melbourne Children’s has worked with the Primary Trauma Care Foundation (PTCF) to train doctors, nurses and ambulance officers to assess and treat serious injuries in a systematic way by using a more complex version of the airway-breathing-circulation (ABC) acronym. This has been remarkably successful in China where 30,000 doctors have been trained in PTC. The Melbourne Children’s has provided technical advice to the Ministry of Health in China on the establishment of trauma centres that can provide comprehensive emergency medical services.

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As a clinical nurse consultant, I aim for the highest possible standard of care for children in the Rosella – Paediatric Intensive Care Unit at The Royal Children’s Hospital Melbourne. Over the last twelve months I have worked in Libya where I coordinated nurse education programs for the International Children’s Heart Foundation (ICHF). A specialist team from the ICHF has started training local staff in simple surgery for children with congenital heart disease and over several years will train staff to perform more complex surgery independently.

I started volunteering in Libya a few months after the Libyan Revolution in 2011, and I have developed good relationships with the staff because I keep coming back. It’s been a privilege to get to know these nurses and whilst life is very different in Libya the same things are important – it’s about children and their families.

In Libya, about 2,000 children each year are born with congenital heart disease. For most of these children, one simple surgery can mean a long and healthy life.

Janine Evans, Clinical Nurse Consultant, Rosella Ward – Paediatric Intensive Care Unit, The Royal Children’s Hospital Melbourne
Making medicine child sized

A pocket-sized book to improve paediatric hospital care

Hospitals play an essential role in reducing child deaths, disability and disease. It is estimated that better-quality hospital care could improve child survival by up to 40% in low-income countries. The Melbourne Children’s is working with the WHO, national ministries of health and paediatric professional associations to improve the quality of care for children.

A pocket-sized book is changing how doctors in low-income countries diagnose and treat patients. The WHO Pocket Book of Hospital Care for Children: Guidelines for the Management of Common Illnesses with Limited Resources was first published in 2005 and revised in 2013. The book includes contributions from over 100 paediatricians worldwide, and constitutes a set of clinical guidelines for common causes of child deaths and ill health including pneumonia, diarrhoea, newborn health problems, tuberculosis, HIV and malnutrition.

The Melbourne Children’s have supported the training of over 1,500 health care workers in the Solomon Islands, Lao PDR, Papua New Guinea, Fiji, Samoa, Tonga, Vanuatu, Indonesia, Kazakhstan and Uzbekistan. The book has been translated into more than 16 languages and used in more than 40% of low- and middle-income countries.

Making medicines for children

Children need specific medicines in dose, size and taste. Professor Noel Cranswick is part of the team who initiated the WHO Essential Medicines List for children. The children’s list currently includes over 300 medicines for priority conditions including malaria, tuberculosis and HIV. To inform the committee as to what medicines should be recommended for the list, Professor Cranswick and a team from the Melbourne Children’s have conducted reviews of the growing evidence available.

Many developing countries rely on the WHO children’s list to guide national procurement of medicines. To support pharmacists, doctors, nurses and community health workers to use medicines on the children’s list, a team from WHO and the Melbourne Children’s has produced a more detailed guide, the WHO Model Formulary for Children, which provides information on prescribing and the different dosages that are needed for children as they grow.

A pocket-sized book improving care in Lao Peoples Democratic Republic

To improve the quality of care for children in Lao PDR, local paediatricians worked with Dr Amy Gray to translate the Pocket Book and train staff to use the clinical guideline it contains. It is the first comprehensive Lao language resource for children’s hospital care. Previously, hospitals owned a medical textbook in Thai, English or French, it was kept under lock and key. Now there is a copy of the WHO Pocket Book in the hands of 2,000 paediatricians, nurses and health workers.
Education and training in child health

Global estimates suggest that 10.3 million more doctors, nurses, midwives and other health professionals are urgently needed. However, it’s not simply a matter of numbers. The skills, clinical experience and approach of health care workers must keep up with increasingly complex developments in technology, services and procedures.

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To reach their full potential, children need opportunities to play and learn in early childhood. Parents and other caregivers want to provide these opportunities but need support from community and governments to do so. Health care systems can provide some early childhood services and also act as a point of contact between parents and other services. It is estimated that at least 200 million children in developing countries are not realising their full potential.

Coordinated care for cerebral palsy
Cerebral palsy affects a child’s ability to move. It can affect muscle control, coordination, reflexes, balance and posture. Although cerebral palsy is a lifelong condition, coordinated care including physiotherapy, medication and surgery can greatly assist these children and adolescents in their day-to-day activities and other abilities to fully participate in community activities. Teams from the Melbourne Children’s, including Dr Adam Scheinberg, Afshin Chizari, Associate Professor Barry Reams, Rod Lawlor, Nicole Galea, Anjalee Schrieber, Ivan Gold and Associate Professor Adrienne Harvey, has trained teams of physiotherapists, orthotists, occupational therapists, psychologists and ENT surgeons to work with children and adolescents in cereals palsy in Indonesia and Cambodia. In Indonesia, it is estimated that nearly 150,000 people are affected by cerebral palsy; in Cambodia the number is unknown.

Giving pre-term newborn babies the best chance
Fifteen million babies are born too soon every year but this is known about the long-term health and development of preterm and other seriously ill babies in low-or middle-income countries. The best estimates suggest that almost 40% of these children will suffer from cerebral palsy; in Cambodia the number is unknown. Fifteen million babies are born too soon every year but little is known about the long-term health and development of preterm and other seriously ill babies in low-or middle-income countries. The best estimates suggest that almost 40% of these children will suffer from cerebral palsy; in Cambodia the number is unknown.

Listening and learning for children’s hearing
In many Pacific Island countries, children are not routinely screened for hearing loss, so long-term outcomes do not affect children or families. The Royal Australasian College of Surgeons Global Health Program has been working with the Royal Children’s, along with Carina Law and Sowmya Rao from Australian Hearing, developed a program with the Melbourne Children’s, including Dr Adam Scheinberg, Abhay Khot, Dr Mary Dahm and Dr Elizabeth Rose on hearing, begun through The Royal Children’s Hospital International (RCHI). These visits continue the Melbourne Children’s commitment to的好 health working to improve children’s hearing, began through The Royal Children’s Hospital International (RCHI). Elizabeth Rose and Sowmya Rao from the Melbourne Children’s, along with Carina Law from Australian Hearing, developed a program with doctors and nurses in Vanuatu in the Cook Islands, Fiji, Kiribati, Micronesia, the Marshall Islands, Nauru, Samoa, the Solomon Islands, Tuvalu and Vanuatu.

Making links to protect children
All children have the right to grow up in a safe, healthy and positive environment. These rights are assured through the United Nations Convention on the Rights of the Child (CRC). Anne Smith continues to provide advice and support for Pacific Island countries to develop legislation and policies to protect children’s rights under the CRC. These visits continue the Melbourne Children’s commitment to help children in developing countries are not realising their full potential.

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Healthy adolescence is a path to a better future

Adolescents are central to major health challenges, because risky behaviours such as tobacco and alcohol use, poor diet and physical inactivity commonly start or intensify during adolescence.

Most mental disorders begin before age 25 years.

Injuries account for a higher proportion of death in adolescents than in any other age group.

Unintended pregnancy, unsafe abortions, HIV infection and other sexually transmitted infections continue to present challenges. There is growing recognition of the potential to promote a healthy start to life for the following generation by addressing health and nutritional risks in adolescents before pregnancy and parenthood.

Adult cancer and cardiovascular disease can be prevented by healthy choices made during adolescence.

And adolescents are at the centre of emerging global unemployment, civic unrest and conflict, urbanisation, and migration, each of which pose threats to health and wellbeing.

How do we know this?

Two decades of calls to action have brought attention to adolescent health. The Melbourne Children’s has led international teams that have compiled the first systematic studies of disease, disability and death among adolescents throughout the world. Building on these first systematic studies, Professor George Patton is the Chair of the Lancet Commission on Adolescent Health and Wellbeing, which brings together academics and clinicians from across the globe to determine the most important investments to be made in the health of adolescents around the world.

The estimated number of adolescents globally in 2012

2 billion

Conor Ashleigh © 2012

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Lucey Photography © 2012
Young people want substantial opportunities to engage longer-term…

Kikelomo Taiwo and Dakshitha Wickremarathne

The Lancet Commission on Adolescent Health and Wellbeing

For many years, we have heard about the health issues that young people face, including injury, violence, and non-communicable diseases. Health programs for adolescents have typically focused on sexual health and sexual and reproductive health. However, the Lancet Commission on Adolescent Health and Wellbeing, which was recently launched, is focusing on the broader health needs of adolescents and young adults, including mental health, substance abuse, and the prevention of non-communicable diseases.

The Lancet has partnered with Professor George Patton and Professor Susan Sawyer at the Melbourne Children’s Hospital to launch the Commission. The Lancet Commission on Adolescent Health and Wellbeing is a multi-disciplinary group of experts from leading universities to undertake a global commission on adolescent health and wellbeing. It will involve young people in the commission’s work and gather evidence from around the world to develop recommendations for improving adolescent health and wellbeing.

The Commission aims to address the needs of adolescents and young adults, who are often not given a place in discussions about their own health. The desire for young people to contribute meaningfully is about their health and wellbeing, and the development of programs to improve the health of women, children, and adolescents has been recognised as a global priority.

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The Commission will work with young people to gather evidence and develop recommendations for improving adolescent health and wellbeing. It will also engage longer-term, but there is a need for effective systems and mechanisms to support their participation.

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Responding to emergencies

Caring for children after Typhoon Haiyan, the Philippines

Almost 400,000 children were affected by the catastrophic damage of Typhoon Haiyan in November 2013. The city of Tacloban in the Philippines was one of the worst hit areas. All of the hospitals in Tacloban were damaged. At Tacloban City Hospital, although three quarters of the doctors, nurses and other staff were directly affected by the typhoon, the majority continued to work to provide care for over 25,000 people injured and impacted. To support the staff at Tacloban City Hospital and other local medical facilities, Dr Joanne Grindlay, Dr Peter Archer, Dianne Crellin and Cindy Sheers were part of an Australian Medical Assistance Team (AusMAT), providing acute surgical and emergency care in a temporary field hospital.

In just under a month, Australian teams assisted by Filipino nurses performed 200 surgeries and treated around 2,500 patients with serious injury and trauma. After the devastation of the typhoon, immediate concerns included food, shelter and the whereabouts of family members. People were presenting at the field hospital with serious injuries weeks after the typhoon. This meant those injured often had infections and other complications. The Australian team worked with local hospitals and Médicins Sans Frontières (MSF) to support those people with other acute or chronic illnesses.

Re prepared: training to assist in an emergency

Working as part of an AusMAT is a commitment that involves advanced training to provide care for mass casualties in some of the most challenging situations. Around twenty staff at Melbourne Children’s are trained to work as part of an Australian team and many of these staff were part of the teams that responded in Samoa (2009) and the Philippines (2013).

At the Melbourne Children’s the RCH Emergency Department liaises with the National Critical Care and Trauma Response Centre (NCCTRC) who coordinate teams of Australian doctors, nurses, paramedics and other emergency services to provide medical care after overseas disasters and emergencies.

‘I use my paediatric nursing experience in different ways, whether it’s planning, educating and implementing protocols or caring for patients.’

Monica Burns, Médicins Sans Frontières and The Royal Children’s Hospital Melbourne

Mathew Li, Courtesy of Photoshare© 2008

National Critical Care and Trauma Response Centre© 2013

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The Australian team was assisted by Filipino nurses in providing acute surgical and emergency care in a temporary field hospital. In just under a month, 200 surgeries were performed and around 2,500 patients were treated with serious injury and trauma. The immediate concerns included food, shelter and the whereabouts of family members. People were presenting at the field hospital with serious injuries weeks after the typhoon. This meant those injured often had infections and other complications. The Australian team worked with local hospitals and Médicins Sans Frontières (MSF) to support those people with other acute or chronic illnesses. The team was assisted by Filipino nurses in providing care. In just under a month, 200 surgeries were performed and around 2,500 patients were treated with serious injury and trauma. The immediate concerns included food, shelter and the whereabouts of family members. People were presenting at the field hospital with serious injuries weeks after the typhoon. This meant those injured often had infections and other complications. The Australian team worked with local hospitals and Médicins Sans Frontières (MSF) to support those people with other acute or chronic illnesses.

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Survive beyond five
Providing common causes of death in childbirth and pneumonia, data have been collected for children under the age of five (Ann Hum Biol. 2010 Mar;37(2):225-35).

Promising new solutions for child health
The microbiome is the world’s fastest-growing field, with great promise for the prevention and treatment of disease (Nature. 2013 Dec 19;505(7484):353-85).

For more information
Learn more:
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The Melbourne Children's Research Institute
Victorian Comprehensive Cancer Research Centre
This study was supported by the Melbourne Children’s Research Institute and the Victorian Comprehensive Cancer Research Centre.

Child tuberculosis
How do we know this?
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Victorian Comprehensive Cancer Research Centre
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Life saving vaccines for tuberculosis
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