Dear Reader,

Welcome to a peripatetic issue of Evidence+.

We’ll start our journey from a laboratory here at Kent Ridge, where experts are working on transforming cells into other, needed ones. It is an innovation that holds limb- and life-saving potential.

Moving from high science to everyday routines, we’ll call in at the heart centre to look at how doctors and nurses are monitoring patients’ vital signs remotely using Internet and Bluetooth technologies. The real-time readouts let care providers titrate medication where necessary, and also schedule hospital visits for further care.

Along the way, we’ll also learn how an NUH team responsible for finding beds for patients in the 1,200-bed facility copes with daily demand.

Next stop is a special clinic in bustling Clementi, where a team of GPs is partnering hospital specialists to care for discharged patients requiring outpatient follow-up. It is a private-public sector partnership that is winning patients over because of the convenience the service offers.

Then, read the reflections of an infectious diseases expert on his recent trips to Liberia to join other healthcare professionals in the fight against an outbreak of the Ebola virus.

The eclectic reading itinerary this issue offers has a locus. It is also the coda that rounds off a recent address by the visiting WHO Director-General, Dr Margaret Chan. Like the two other eminent experts in their respective fields who share their thoughts about the future wellbeing and security of the human race in a joint editorial within these pages, Dr Chan notes that it is still networks, collaboration, partnership, science and innovation that is the way forward for a world continuing to grapple with healthcare threats and challenges that, while often local, can sometimes turn global at very short notice.

The Editorial Committee
The ability to grow tissues and organs in the laboratory has moved far beyond the realm of science fiction.

Back in 1997, the world was amazed when researchers grew a human ear from cartilage cells on the back of a mouse. Since then, tissue engineering has continued to advance, but it still means manipulating cells, changing their behaviour and properties to potentially enormous impact.

Manipulating cells for specific purposes has been Associate Professor Michael Raghunath’s passion for a long time. He has even patented a method that changes a commonly available cell into another, desired cell type.

Recently, Assoc Prof Raghunath and his team—NGS PhD scholars Anna Blocki and Wang Yingting—together with Professor Kishore Bhakoo from the Singapore Bioimaging Consortium (A*STAR), used this method to change an ordinary white blood cell into a new type that promotes blood vessel growth in cell culture and in mice. The eventual goal is to use these blood-derived angiogenic cells to treat people with ischaemic diseases. Blood vessels in these people are blocked or narrowed because of plaque or hardening of the vessels themselves—current treatments use invasive methods that expand, unblock or bypass the blocked blood vessels. Assoc Prof Raghunath’s cells represent an alternative that could complement or even replace such methods. The work is funded by the Singapore-MIT Alliance for Research and Technology.

The engineered cells are a new type of pericyte, cells that wrap around blood vessels and stimulate their growth. What’s more, millions of these cells can be generated from a single blood donation of 400cc of blood, enough to constitute a useful treatment dose.

The engineered cells were able to stimulate blood vessel growth in mice with a condition called hind limb ischaemia. In these mice, blood flow was cut off in their hind legs. The engineered cells were mixed with saline solution and injected in seven of these mice, while saline solution alone was injected in six other mice (the control group). Within a week, the mice that were injected with the cells started to regrow blood vessels in their legs; within two weeks, they had fully regenerated their blood vessels (see Figure).

After two weeks, only one of the treated mice had a single black toe, a sign of necrosis, and the condition did not worsen. Among members of the control group, blood vessels in their legs took one to two weeks longer to regenerate than the cell-treated mice, and all had black, necrotic toes and paws. In addition, the musculature was much better preserved in the cell-treated mice.

“The study shows that we can harness the regenerative power from adult progenitor cells if you know how to induce them in culture. Furthermore, there’s hardly a more elegant and sustainable source of this kind of cells than blood. This opens up opportunities for autologous cell therapy, and we look forward to liaising with clinicians to move towards safety studies in human patients,” says Assoc Prof Raghunath.

Assoc Prof Raghunath is a trained clinician and holds joint appointments in the Department of Biochemistry at the Yong Loo Lin School of Medicine and in the Department of Biomedical Engineering within the Faculty of Engineering. He also has industrial R&D experience. He thus has a unique perspective on combining aspects of matrix biology, biophysics and biomechanics with the realities of translating innovations into the clinic.
A team of doctors from the National University Heart Centre, Singapore (NUHCS), and the Division of Endocrinology at the National University Hospital (NUH) is changing the way hypertension, heart failure and diabetes are being recorded, tracked and reviewed.
The relationship among hypertension, heart failure, and diabetes is more apparent than meets the eye. Aside from being common health conditions, the presence of one disease may lead to or worsen the state of the others.

In 2013, cardiovascular disease accounted for 29.3% of all deaths in Singapore, while one out of nine Singaporeans aged 18–69 is diabetic. That translates to about 400,000 people afflicted with either or both illnesses, according to the Diabetic Society of Singapore.

Fortunately, these conditions have indicators that can be picked up and monitored. For example, sudden fluctuations in weight may point to imminent heart failure in patients, while consistently high blood pressure or blood sugar levels may indicate the need for immediate medical intervention. Being able to record, track, and review these statistics doesn’t just make the disease more manageable, but it can also save lives.

However, the reliability of blood pressure, blood sugar, and weight readings has been problematic. That’s because the patients themselves are supposed to chart the numbers twice daily for up to a month. If the patient stops taking measurements halfway through, the results will be invalid.

Not any more.

Last year, a team from the NUHCS and the Division of Endocrinology at the NUH began using tele-health monitoring to obtain accurate and reliable data from patients.

**High-tech wizardry**

This began on Feb 2014, when the NUHCS partnered myHealth Sentinel, a healthcare technology firm, to field-test Singapore’s first integrated tele-health monitoring service, targeting patients with hypertension, heart failure, and diabetes.
Hypertension was chosen because, on top of being the Chief Medical Information Officer at the NUHS, Associate Professor James Yip is also a Senior Consultant Cardiologist at the NUHCS. “What better place [to begin] than with my own house and my own patients in cardiology?” he reasons. Heart failure and diabetes were included to broaden the scope of the project. And since the basic methodology was the same—patients chart their own vital statistics and send them to their respective doctors—integrating other medical departments was not a difficult task.

“We’ve been approached by many companies in the past, and they say, ‘Oh, you can use your smartphones, computers and apps and connect to these devices, but it’s all very complicated. Our elderly patients will not be able to cope with this kind of technology,’” Assoc Prof Yip reveals.

The team’s solution is fairly straightforward. Instead of computers, smartphones and other high-tech gadgets, patients with hypertension, heart failure or diabetes would be sent home with a Bluetooth-enabled blood pressure set, weighing scale or glucometer. These devices look no different from their mass-market counterparts.

The only addition to this set-up is a special Internet gateway, which acts like a router. But Assoc Prof Yip was quick to clarify that it is no more complicated than a common household appliance: just plug it into a wall socket and it will work seamlessly in the background. All the patient has to do is to obtain his readings and the information will be sent via the Internet gateway to the hospital, where nurses will keep track and ensure that the records are timely and reliable.

Ms Margaret Choong, a Cardiac Care Nurse who works closely with Assoc Prof Yip, adds, “With this system, we know when they [the patients] are not taking measurements, and we can monitor. So if they don’t send in the results within two days, we’ll call to remind them.”

But the nurses aren’t just there for follow-ups. In fact, by receiving data on a regular basis, they can actually perform titration over the phone, advising patients to adjust the dosage of certain medications they are already on. This is dramatically different from the current practice, where patients have to physically show up at the hospital for a prescription change. So a side benefit is that patients learn to monitor their own blood pressure and glucose readings.
PINPOINT ACCURACY

Another added benefit of the tele-health monitoring service is that it eliminates white coat hypertension, when patients exhibit elevated blood pressure in a clinical setting and not anywhere else. This may potentially skew the baseline result—the very first measurement taken by the doctor—and, in turn, throw off the accuracy of subsequent readings.

At a presentation for the media, Assoc Prof Yip demonstrates how stress, even the subconscious variety, can affect blood pressure readings. Although he appears calm to the journalists present, his blood pressure starts climbing rapidly. For some people, explains Assoc Prof Yip, the mere act of meeting a doctor can be stressful, even if they are not aware of it. “Allowing patients to perform their baseline measurement at home eliminates white coat hypertension, and that is very helpful for us,” he assures.

“We also have a test called the 24-hour blood pressure monitoring. It’s a machine you wear like a Walkman, and it takes your blood pressure every 15 minutes for 24 hours,” describes Ms Choong. “This is a bit different because you don’t wear it all the time. So instead of [an] intense [regimen] over one day, we spread it over a month, making the results more representative and accurate.”

POSITIVE RESULTS

Unlike tele-health services elsewhere, which tend to focus on smaller groups of patients, the NUHCS’ integrated tele-health monitoring service had already benefitted more than 800 patients by the end of 2014, and the results have been overwhelmingly positive.

In terms of hypertension diagnosis, the pick-up rate of true hypertension increased to 30%. And since the nurses are able to perform drug titration remotely, 85% of hypertension patients have had their blood pressure reduced to a healthy range within one month of using these protocols.

For diabetic patients, the results have been significant as well. Of the 19% who started the programme with a glucose count of over 20mmol/l—a highly unhealthy level—only half of them remained in the red by Week 4.

Weight fluctuation remained relatively stable for most patients, with a net weight decrease of 0.6kg. This is a good thing, since sudden and dramatic fluctuations in weight are considered indicators of possible heart failure. While the overall weight dipped a little, none of the patients was at risk of heart failure.

PROMOTING SELF-CARE

But hypertension, heart failure and diabetes do not have a monopoly over this technology. In fact, there are plans for the service to be scaled up to include video tele-health, activity tracking, ECG and even temperature sensing in the near future. Also, patients with Fitbit, an activity-tracking device, will be able to submit their own data to the same portal, and it is hoped that patients will be able to perform rudimentary drug titration on their own.

Adding more functions to the devices, according to the team, is only the tip of the iceberg. For the next phase of the service, promoting self-care among patients and encouraging functional ageing will be the main focus. Considering the ageing population in Singapore and the increasing burden on healthcare services, the next phase will be especially crucial for the team. “We’ve taught you how to do it for a month, so now you do it yourself and share your results with us,” Assoc Prof Yip quips. “That way, patients will be able to take care of themselves and live better for the rest of their lives.”
Professor Dale Fisher shares his firsthand experience in the heart of the Ebola outbreak in West Africa.

EBOLA: A DOCTOR’S VIEW FROM THE EPICENTRE

THE WAY OF THE VIRUS

Ebola outbreaks typically originate as a single animal-to-human transmission from either fruit bats or non-human primates. How often this occurs is not known, but an outbreak is identified every year or two in Central Africa. While outbreaks of just one case have been documented, most outbreaks are identified when there is some degree of human-to-human spread (a cluster), most notably at funerals (to family members) or in hospitals (to healthcare workers). Typical outbreaks last for months. They are contained locally and are eventually controlled by standard approaches rolled out largely by Doctors Without Borders (Médecins Sans Frontières).

There are many reasons to explain this latest outbreak and how it spread geographically and far beyond historical case numbers. They are almost all related to the setting in this part of Africa and human factors. The virus is no different in terms of transmissibility. The index case occurred on a border shared by three countries with different languages and (already stretched) health systems, making social mobilisation more complex.

Furthermore, overland travel in this area is not difficult, and as people become frightened, it is not surprising that they may choose to drive across the country to be with family despite advice to not...
travel if unwell. For all these reasons, the geographic spread of Ebola in this outbreak has been difficult to curtail. The fact that the disease has been limited (by and large) to three countries is actually a genuine success story.

**A GROWING CONCERN**
However, this outbreak did witness the first air travel-transmitted case of Ebola. When an infected Liberian arrived in Nigeria, the world’s seventh most populous nation at 180 million people, it caused local transmission in Lagos, a bustling city of 21 million. As a result, international efforts in collaboration with the Nigerian health authorities were under extreme pressure. Remarkably, the Nigerian outbreak was controlled. Likewise, cases in Senegal and Mali saw no further transmission. Even though local transmission occurred in Spain and the US, transmission was quickly curtailed in these more developed settings.

The outbreak in the three West African countries rumbled from Dec 2013 to Jul 2014. By September, case numbers had risen to heights never before seen or anticipated, with hundreds of cases per week being identified. The outbreak had evolved into dozens of smaller outbreaks, involving almost every district and province of Guinea, Liberia and Sierra Leone. Novel responses such as community care had to be considered as the usual isolation case management facilities (Ebola Treatment Units) struggled to get ahead of the outbreak. In fact, this and other policy initiatives, together with the scaling up of the necessary training, was a focus of my work in Liberia.

**THE WAY FORWARD**
Writing in Feb 2015, after having just arrived in Liberia for my third mission, I reflected on what we have learnt about outbreak response. Of course, there are lessons to be learnt, but the principles remain unchanged. The key components of social mobilisation, infection prevention and control interventions, case management, logistics, case finding and epidemiologic tracking are fundamental, irrespective of the scale of the outbreak and the setting. Then it comes down to the skills of an outbreak response team to adapt to the particular moment. Whether it’s Ebola in Africa or MRSA in a ward, the outbreak containment and management principles are the same.

In Africa for Ebola, adaptation is critical and continuous. We have now moved from mitigation to “getting to zero,” quite a different focus and strategy. There is belief that zero cases can be achieved, and that Ebola will not become endemic. However, there are no guarantees, and efforts are ongoing to adapt to circumstances in the months to come. International complacency is a concern as Ebola leaves the headlines and the focus changes, but further waves are possible while transmission continues to smoulder.

**A PERSONAL NOTE**
On each of my three missions to Liberia, I have not travelled alone. A colleague, Assistant Director of Nursing Sharon Salmon, feels equally committed to this cause. For us, there is no greater honour than being asked by the World Health Organization to play a role in the modern world’s most significant infectious disease outbreak. It is a privilege to have the skills to save lives and contribute to the control of this most devastating event on the other side of the world. There are also reasons to finish the job we started. The Ebola outbreak in West Africa has tested everyone and, returning for our third mission, I see colleagues happy that we have returned to help. I know I have made a difference, especially when I see our training materials, posters and policies still being used effectively.

On the other hand, some reasons for returning are deeply personal. The medical director of Monrovia’s largest referral hospital, with whom we worked on case definition documents and clinical management guidelines, fell victim to Ebola some months back.

Currently we are working hard to restore normal healthcare system function and ensuring that staff are safe from Ebola at work. At the same time, we need to get to zero Ebola cases in West Africa, unless we wish to accept the further threat of more waves of high numbers, with cases exported beyond Africa. Accepting low level endemicity is not an option.

“I KNOW I HAVE MADE A DIFFERENCE, ESPECIALLY WHEN I SEE OUR TRAINING MATERIALS, POSTERS AND POLICIES STILL BEING USED EFFECTIVELY.”
21ST-CENTURY PUBLIC HEALTH MANAGEMENT

World Health Organization (WHO) Director-General Dr Margaret Chan visited the NUS on 12 Feb to attend the official opening of the Saw Swee Hock School of Public Health’s new premises in the Tahir Foundation Building. An alumna of the School, Dr Chan delivered a wide-ranging lecture entitled ‘Facing Public Health Challenges in the post-2015 Era: Need for a new Paradigm.’

Speaking to an audience of public health and medical professionals and students, Dr Chan touched on the WHO’s progress in combating diseases worldwide, and noted how ageing populations, rapid urbanisation and the globalised marketing of unhealthy products have led to non-communicable diseases, such as stroke, cancer and diabetes, replacing infectious diseases as the leading cause of mortality worldwide. This shift holds profound implications for all countries, which must adopt a whole-of-government approach in addressing these challenges.

“The Ministry of Health has no control whatsoever, because these are linked to trade and many other issues that the Minister of Health has no role in policy setting,” she revealed. “Policy formulation in other ministries has a huge impact on health, which is always on the receiving end of failures of prevention in other ministries. And that’s why, I say, every minister is a health minister; they must wear the health lens in formulating public policies.”

TOBACCO CONTROL

This mindset would need to be translated into coherent government policy-making, Dr Chan said, noting wryly the one-step-forward-one-step-back dilemma that exists.

“The framework convention for tobacco control is perhaps the single, most-endorsed international treaty. Australia bravely introduced the ‘plain packaging’ laws, which are very good for tobacco control,” she explained. “But a few countries are now taking this to the World Trade Organization (WTO) for trade dispute. The Minister of Health signed up to the framework, yet the Minister of Trade of the same government takes Australia to the WTO for trade dispute!”

When collaboration between government and private sectors and civil society exists, there is progress. One example is the reduction in the price of HIV/AIDS antiretroviral medicine by more than a hundredfold in the past few years, she added.

EBOLA CRISIS

Turning to the recent Ebola outbreak in West Africa, Dr Chan said it revealed that the world is ill-prepared for epidemics that are severe and sustained. “The world went to battle against this deadly disease with no control tools,” she said, and wondered how, after 40 years, drug companies have yet to come up with a solution for this bug. The implication was that pharmaceutical companies are not willing to develop drugs against diseases that only affected impoverished countries, since the returns on their R&D investment would be minimal.

Thus, government involvement is vital. “We need to thank the US and the Canadian governments, as we now have two potential vaccine candidates to fast-forward to the clinical-trial stage,” she disclosed, although she acknowledged that these two nations invested in their respective vaccines as protection against bioterrorism threats, not necessarily as health measures.

SOCIAL MEDIA

The popularity of social media is a phenomenon that is both boon and bane for healthcare, Dr Chan noted.

“Personal views on scientific issues get taken as fact and are widely propagated, while traditional safeguards like peer review and precise scientific and statistical methodologies fly out of the window; anecdotes have more clout than evidence,” she described. “The public needs to understand that science is not a democracy in which the most popular websites, the most articulate bloggers or the loudest politicians get to decide what is best for health.”

And while the title of her address suggested a new paradigm may be needed for public healthcare in the 21st century, the tried-and-trusted pathways are just as valid today.

“Network, collaboration, partnership, science and innovation is still the way going forward. Many of them are very important for the health and wellbeing, and for the education of people so that we have educated, healthy human capital to sustain economic growth,” she insisted. “Without growth, you cannot begin to talk about poverty elimination or eradication. Without growth and jobs, you cannot begin to talk about inclusiveness. No one should be left behind because they are a woman, because they are marginalised groups, or because they are poor.”
aximising bed occupancy and shortening waiting times for patients is a challenge for hospitals in Singapore. With more than 1,200 beds to handle in the NUH’s 44 wards, good bed management is key to the hospital’s overall efficiency and patient safety.

ROUND-THE-CLOCK DUTY
Mr Richard Tan is an Executive Assistant at the NUH’s Bed Management Unit (BMU), the nerve centre of the hospital. Phone calls and bed requests come every minute, and two large LCD screens hang down from the ceiling to keep everyone apprised of the current bed situation. And since operations at the BMU run around the clock, on a typical working day, Mr Tan’s job as team leader is to lead BMU ground staff on duty and provide assistance to them. BMU has two overlapping day shifts and one night shift that work 365 days a year to get the right bed to the right patient. Up to five people from the BMU handle the 1,200 beds at any one time during the day, and together with his supervisor, Mr Tan’s bird’s eye view of the hospital’s bed situation holds the entire operation together.

PRIORITISING PATIENTS
The BMU first looks at patients who need to be decanted out from the Intensive Care Unit to ensure there are enough ICU beds on standby for more needy patients. The unit will then look at the Emergency Department and allocate beds to patients based on their bed-waiting time. The team will also have to take into consideration patients who are coming to the NUH for surgeries, as well as emergency admissions from Specialist Outpatient Clinics.

However, Mr Tan and his team must also be flexible, because every case is different. “For example, patients who have Methicillin-Resistant Staphylococcus Aureus (MRSA) should not be allocated a bed next to a non-MRSA patient in the same cubicle, because we don’t want it to spread to other patients,” he emphasises.

A SCRAMBLE TO LEARN
When the NUH took over bed management from an external vendor three years ago, Mr Tan and his colleagues had to scramble to get things going. “We had to start from scratch. It was stressful, because every mistake we made meant that someone was waiting out there without a bed,” he recalls. “Also, because it is a 24-hour operation, we couldn’t stop for three days to figure out the workflow. We were thrown into the deep end and had to hit the ground running.”

Fortunately, Mr Tan and his colleagues emerged from the deep end and, within three months, established standard operating procedures that keep the NUH running to this day.

For example, instead of just slotting patients into the next available bed, the team tries to place patients with similar ailments together in the same ward. That way, doctors spend less time going from ward to ward, allowing them to see patients more efficiently.

Even with a solid system in place at the BMU, Mr Tan is still learning how to make the most of it: “We are always learning, and we have developed a system that works well for us. But we will continue to fine-tune our workflow, and make sure we provide patients with the best care possible.” And that starts with a bed, available when it is needed.
In the health sector, each country must complement local responses with global collaboration. Fortunately, Singapore has been a responsible global citizen on this front.

BY PROFESSOR KISHORE MAHBUBANI & ASSOCIATE PROFESSOR YEOH KHAY GUAN

**E pluribus unum** (out of many, one) is a phrase on the seal of the United States of America. It is an apt summary of the potential benefits that can be reaped when communities and nations unite in the fight against common global threats. The ability to counter them truly lies in international cooperation and strong national and multinational institutions.

The recent Ebola outbreak has just reminded us that we live in a small, ever-shrinking global village. Even if we keep our homes spotless, new viruses and bacteria can literally fly in at a moment’s notice, sometimes from other parts of the world. That is why it is important that we combine both local and global efforts in the field of health.

This is also why the inaugural Raffles Dialogue will take place in Singapore in February. A stellar cast of international speakers, including Pascal Lamy, Mari Pangetsu and the editor of The Lancet, Richard Horton, will be coming to address the broad theme of the Future of Human Wellbeing and Security.

Similarly, the Ministry of Health will also be organising a Ministerial Health Summit in mid-February, demonstrating that Singapore has become one of the key centres for global coordination on global health challenges.

One little known fact to many Singaporeans is that the World Health Organization (WHO) has established 10 collaborating centres in Singapore alone, covering key areas such as health promotion and disease prevention, water and food safety, and bioethics. In short, the Little Red Dot has become a global hotspot in the field of health.

It all began in 1905, when the unstinting fundraising efforts of the visionary Mr Tan Jiak Kim and likeminded community and business leaders of the day led to the establishment of the country’s medical school, which has produced generations of medical doctors who have gone on to staff the country’s hospitals and clinics. Over time, the school became a university, which is today’s NUS. And thanks to the philanthropic support of the Yong Loo Lin Trust and other committed donors, the country’s first medical school continues to flourish today and, together with the University, marks its 110th year in July.

The growth and development of this medical capacity enabled Singapore to respond positively to the 2004 call of the Mexico Ministerial Summit on Health Research for greater investment in health research and international research collaboration in order to improve national healthcare systems.

The range of medical research in Singapore is truly remarkable. We have invested in research in diseases from myopia and heart failure to cancer and dementia, to deliver better health outcomes for Singaporeans.

In short, the Little Red Dot has become a global hotspot in the field of health.
risks of these diseases.

Singapore’s track record in healthcare and medical research was one key reason why the World Health Summit decided to hold a meeting here in 2013. At this meeting, the M8 Alliance, a group of leading universities that includes the NUS, identified several issues that needed to be addressed to ensure sustained health and development. These included promoting and protecting health, ensuring healthcare that is sustainable and accessible to all citizens, reducing non-communicable diseases such as cancer and metabolic diseases, maintaining good maternal and early childhood health, and continued surveillance for emerging infectious diseases and antimicrobial resistance.

By most global standards, Singapore is doing well in the battle on many of these fronts: we have the second lowest infant mortality rate in the world and one of the highest life expectancies at birth. The merits of our healthcare system are internationally recognised: a 2000 WHO ranking of 191 member states’ health systems placed Singapore’s at sixth in the world for efficiency. In 2014, Bloomberg rated Singapore’s healthcare system as the most efficient out of 51 countries.

However, in the field of health, each country must complement local responses with global collaboration. Fortunately, Singapore has been a responsible global citizen. It plays a modest yet meaningful role in the fight against the threat of global diseases and epidemics. For example, in specific areas such as bio-surveillance and control of infectious diseases, Singapore is an active collaborator and participant. The recent emergence of the H7N9 influenza virus and the Middle East Respiratory Syndrome (MERS) coronavirus underscores infectious disease as a serious global threat.

But despite improved technologies and knowledge, dangerous gaps remain in the bio-surveillance, prevention of and response to infectious agents. Improving early detection, promoting preventive measures such as vaccination, and strengthening response networks are crucial to protect against the spread of infectious disease. Besides technology, capacity and resources that already exist, focused leadership and political will are required to make measurable progress. This recent Ebola outbreak shows how crucial this is.

Given these multiple and inter-related global health challenges, it is timely that two major health conferences will be held in Singapore in February. Our colleague, Professor Tikki Pang, of the Lee Kuan Yew School of Public Policy, has called for a robust, “whole-of-planet and whole-of-society approach involving the media, academia, policy makers, industry and civic society working together at global and national levels to achieve a common vision of sustainable human existence.” We all have a role to play in ensuring human health and wellbeing in the 21st century.

This commentary was first published in The Business Times on 30 Jan 2015.
The idea behind the Frontier Family Medicine Clinic was simple: instead of getting patients whose illnesses were stabilised to return to outpatient clinics at the National University Hospital (NUH) for follow-up consultation, have them seen by general practitioners in the neighbourhood. This would minimise inconvenience to the patients and allow hospital clinics to see more new cases.

In caring for patients referred by the NUH, the Frontier FMC family physicians refer to their charges’ files stored on the hospital’s Electronic Medical Record (EMR) system. They share the care of these patients with their hospital colleagues, and collectively review their patients’ care plans when necessary.

It is a public-private partnership that has worked to benefit patients who no longer need to attend NUH outpatient clinics.

“In this model of integrated care, family physicians with the primary care team take ownership of the holistic care of their patients to work closely with the patients’ various hospital specialists to manage and keep the patients healthy in the community,” says Dr Koh Thuan Wee, Director of Frontier FMC. Integrated care means that the patients can now move seamlessly between primary care provided by the FMC and hospital care at the NUH. Complex cases, such as rheumatology, liver cirrhosis, post-stroke stabilisation of blood pressure and anticoagulation cases, now get the best of both places of care with greater access provided by the FMC without loss of continuity.

Adds Dr Koh, “The case manager, nurses, pharmacists, care coordinators, patient service associates and administrators all work under the leadership of the family physician, who leverages on the strength of each team member to deliver the best care to the patients.”

Two hundred and sixty-six patients have had at least 12 months of follow-up visits at the clinic, and their results speak for themselves. Overall hospital utilisation among this group of patients fell dramatically. Both inpatient admission and emergency visits were reduced by about 40%, while the total number of visits to hospital Specialist Outpatient Clinics (SOC) fell by 41%.

“Both inpatient admission and emergency visits were reduced by about 40%, while the total number of visits to hospital specialist outpatient clinics (SOC) fell by 41%.”
CASE IN POINT
Among the 2,000 or so referrals who have visited the Frontier FMC is Mr Sung Chu, 64, a businessman with chronic conditions such as heart failure, diabetes, high blood pressure, high cholesterol and kidney failure. Before the Frontier FMC was established, Mr Sung had to visit different hospital specialists numerous times a year for each of his chronic conditions. In the year before he started visiting the FMC, Mr Sung had to make 17 separate specialist appointments at the NUH. He also made three visits to the A&E department, and experienced four hospital admissions that came up to a total of 26 inpatient bed days. “It was very expensive,” Mr Sung recalls. “And the different sets of instructions offered by each doctor were very confusing.”

However, in Sep 2013, Mr Sung’s doctor referred him to Frontier FMC, which had then been in operation for six months. There, doctors were able to provide pro-active blood pressure reporting and medication adjustments. “My family doctor communicates and works with my specialists at the NUH to give me a final prescription,” Mr Sung says. “This saves me the cost and trouble of visiting different specialists each time I feel unwell.”

After he started visiting the Frontier FMC, Mr Sung’s specialist appointments at the NUH dropped from 17 in a year to a mere five; he neither had to visit the A&E nor was he admitted. Some of his queries were resolved over the phone or via e-mail with doctors at Frontier FMC.

A MODEL OF CARE THAT WORKS
Mr Sung’s story is further evidence that, when it comes to providing quality healthcare, a private-public collaboration is effective in meeting the needs of patients. It also benefits the partners.

As more of such public-private medical partnerships are established, primary care in the community is enhanced, while GPs are able to broaden their skill sets and take on more complex cases. Public hospitals will be able to increase their patient capacity, thus allowing specialist clinics to better care for those who require secondary and tertiary care.

It is a care model that places the patient at the centre of all care arrangements, notes Dr Koh. With primary care doctors, specialists and allied health staff all working together, patients will receive more affordable healthcare and—most importantly—experience better outcomes.

The NUHS plans to open a new FMC in Choa Chu Kang by the second quarter of FY2016.
NUS TURNS 110!

To mark this milestone, a series of celebrations has been organised, starting on 1 Feb 2015 with a community event at Taman Jurong Community Club. More than 1,000 people participated in health talks, games and children’s activities; visitors could also tour an exhibition called ‘Because We Care,’ which featured community projects spearheaded by NUS students.

“NUS110 is a very timely opportunity for us to reflect, share and celebrate service to the community, and we felt that it would be most meaningful for us to do this in the community rather than on the NUS campus,” noted Professor Tan Chorh Chuan, President of the NUS. He also announced the launch of NUS Community Advancement with Research and Education Synergies (NUS CARES). “We... will pilot practical solutions and, if successful, disseminate the key learning points that would allow scaling up of effective practices,” Prof Tan explained the initiative.

SCHOOL OF PUBLIC HEALTH’S NEW HOME

On 12 Feb 2015, NUS Saw Swee Hock School of Public Health officially relocated to its new home at Tahir Foundation Building. Among those who graced the opening ceremony was Guest-of-Honour Dr Margaret Chan, Director-General of the World Health Organization, who gave a lecture on world healthcare trends. Turn to p8 for a round-up of key points in her speech.

NEW BURSARY AWARD

Needy students from the NUS Yong Loo Lin School of Medicine will have another avenue to obtain funds when the new academic year begins in Aug 2015: the OncoCare Medical Bursary has pledged $750,000 to be disbursed over five years. It was set up by OncoCare Cancer Centre, whose founder, Dr Tay Miah Hiang, is an alumnus who benefitted from a bursary as an undergraduate.

CONFERENCE CONFLUENCE

For the first time, the International Conference on Faculty Development in the Health Professions (ICFDHP) was held in Asia, and the NUS won the right to host it. The 3rd ICFDHP took place from 4–8 Feb 2015, simultaneously with the 12th Asia Pacific Medical Education Conference (APMEC), which saw participants not only from the Asia Pacific region, but also from the rest of the world. The twin conferences even had a mobile app, which gave users easy access to all sorts of useful information.

NUHS STAFF WINS PRESTIGIOUS AWARD

Associate Professor Lee Pyng, from the NUS Yong Loo Lin School of Medicine, was conferred the 2014 Geoffrey McLennan Memorial Award for Advances in Interventional Pulmonology, administered by the American Association of Bronchology and Interventional Pulmonology (AABIP). She is the first Asian to be given this esteemed award. As part of her prize, she was invited to America last October to deliver the McLennan Memorial Lecture at the AABIP’s 22nd Annual Assembly.