



# 14<sup>TH</sup> INTERNATIONAL RESEARCH CONFERENCE

*“ Security, Stability and National Development in the New Normal ”*

09<sup>TH</sup> - 10<sup>TH</sup> SEPTEMBER 2021

MEDICINE

PROCEEDINGS



GENERAL SIR JOHN KOTELAWALA DEFENCE UNIVERSITY





**14<sup>TH</sup> INTERNATIONAL RESEARCH CONFERENCE**  
SECURITY, STABILITY AND NATIONAL DEVELOPMENT IN THE NEW NORMAL

**Medicine**

**PROCEEDINGS**



General Sir John Kotelawala Defence University  
Ratmalana, Sri Lanka

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## Welcome Address

Major General Milinda Peiris RWP RSP USP ndc psc

*Vice Chancellor, General Sir John Kotelawala Defence University*

Keynote Speaker, Mr. Lalith Weeratunga Principal Advisor to H.E. President Gotabaya Rajapaksa, Secretary to the Ministry of Defence, General (Retd.) Kamal Gunaratne, DVC Administration and Defense, Brigadier Wipula Chandrasiri, DVC Academic, Prof Sanath Dhammika, Deans of the respective faculties, Centre Directors, Academics, Senior Military Officers, Administrative Staff, Students and all distinguished guests who are connected with us in the cyber space.

Good Morning to you all!

It is indeed with a great sense of responsibility that I deliver the welcome address at this 14<sup>th</sup> consecutive international research conference of General Sir John Kotelawala Defence University held on the timely theme, ‘Security, Stability and National Development in the New Normal’, at one of the most crucial times of our history.

To begin with, let me very warmly welcome our chief guest and keynote speaker, Mr. Lalith Weeratunga, the principal advisor to HE the President Gotabhaya Rajapakse. Of course, Mr. Lalith Weeratunga is not at all a stranger to KDU. He is one of the great personalities who clearly understands the role played by KDU for the betterment of the nation and who has long been assisting us in numerous ways to develop this institution to what it is today. As I remember Mr. Lalith Weeratunga was the keynote speaker of our 6<sup>th</sup> research conference in 2013. Sir, your keynote on our theme, “Sri Lanka as a Hub in Asia: the Way Forward” still reverberate in our minds even after 8 long years.

And it is a remarkable coincidence that I welcome you once again to deliver the keynote address on our current theme, ‘Security,

Stability and National Development in the New Normal”, which highlights the importance of stability created by the development and security nexus in the context of emerging new threats to national, human, and global security. Sir, we are looking forward to listening to your words of wisdom today as well.

Mr Weeratunga, it is also remarkable that eight years ago, you were accompanied by the Secretary Defence during that time, who has been destined to be President of our country today, H.E. Gotabaya Rajapaksa, and today you are accompanied by the present Secretary Defence and the Chairman of our Board of Management, General (Retd.) Kamal Gunarathne, and I am indeed honoured to welcome General Kamal to this conference as the Guest of Honour because he has been a tower of strength for KDU at this crucial time of its history.

Let me also welcome all distinguished invitees including the Tri-Service Commanders and other BOM members including the Chairman of the UGC, distinguished members of the diplomatic corps, Vice Chancellors and academics from other universities, senior tri-service and police officers, and national and international participants joining this event on line.

Ladies and gentlemen, this year’s conference is significant to us at KDU on several accounts. First, 2021 is the year in which we mark the 40<sup>th</sup> year of KDU’s existence in the higher education landscape of Sri Lanka, and we are proud of the role we have been playing therein, whilst continuously growing in its stature as a national university doing its call of

duty towards the nation with fullest commitment and dedication.

Secondly, this year's conference is the one that we hold under the most trying circumstances in our history. Last year too, we conducted our research conference in a hybrid mode due to the first wave of the COVID 19 pandemic that took us all by surprise.

But we hoped that we would be able to conduct the 2021 conference freely and in the usual glamour. But this year, it turned out to be even a worse scenario with the third wave of the pandemic hitting us harder. So we consider that this is a more challenging test of our resilience as the nation's defence university.

Ladies and gentlemen, we always believe in the dictum that a quitter never wins and a winner never quits. So we were determined to challenge the challenges, how hard they may be. And we ensure the continuity of the conference adjusting and amending the circumstances, while taking the highest precautions against the pandemic scenario. We were able to slowly but steadily accept the prevailing danger, assess the situation realistically, and to see the best options for the best interest of our University. Therefore, we finally decided that this year's conference will be a hybrid one with a major virtual orientation.

Ladies and gentlemen, the reason why we conduct this conference somehow or the other is because of our belief that we need to set an example for the nation to stand on its feet at times of crises. We as a nation cannot afford to continue to play the waiting game for ever. As our theme highlights, we need to find ways to ensure security and national development in the new normal adjusting ourselves to the new normal conditions sooner than later.

And thirdly, we believe that this is the time in which a nation's intellectual community must come forward to engage in serious and meaningful research to help overcome

innumerable issues and problems that crop up in diverse fields such as defence and security, economics, science, technology and engineering, medicine and health services, management, social sciences and humanities, law and so on and so forth. It is the responsibility of a university to create the necessary environment and enabling grounds for important research outcomes, which the nation yearns for.

Ladies and gentlemen, we are glad that the intellectual community of the country has very positively responded to our initiative. Despite some adverse comments and criticisms of KDU and its role in higher education in Sri Lanka from certain quarters in recent times, the large majority of fair thinking academics, professionals and ordinary people are with us fully, and that is evident from the large number of research papers submitted by researchers from all over the country representing various higher educational institutions.

Despite the difficulties in adjusting to the online mode, the organizers of the KDU international research conference have done their best to maintain the quality of the conference in the highest level. They intend to set the tone to initiate more collaborative research to face new global challenges. As I always point out these types of research conferences are ideal platforms to make connections nationally and internationally for mutual benefit.

I hope that authors of KDU and various other local and international universities will take the opportunity to interact and develop friendly relationships, establish networks, and explore opportunities to embark on productive research collaborations.

While assuring our commitment to providing best opportunities for research collaborations, I wish all the very best for the presenters and hope you will enjoy every moment of this academic fusion. Thank you.

## Keynote Address

Mr Lalith Weeratunga

*Principal Advisor to His Excellency the President of Sri Lanka*

Secretary, Ministry of Defence, Chief of Defence Staff and Commander of the Army, Commander of the Air Force, Vice Chancellor of the KDU, Distinguished academics, Honoured guests, Friends, *Ayubowan!*

Once again, I am delighted to be with you this morning at this research conference. It gives me much pleasure to be at the KDU because it is one of the best universities we have in Sri Lanka. Since of late, there have been much attack on and criticism of the KDU. That's because the KDU is doing well and has brooked no nonsense. With a village background, my mind goes back to a famous Sinhala saying, which means "only those mango trees that have sweet fruits are attacked."

The entire world is undergoing a massive reorganization with the COVID-19 pandemic, and the traditional themes and arguments in security seems rather irrelevant in the present context. "Security, Stability, National Development in the New Normal" is a timely theme, giving us much food for thought in terms of the advancement of a country like Sri Lanka. If you take the first component, security, the bottom line of security is survival. *Survival*, is based on a number of factors. Barry Buzan, the veteran in international security rejected the practice of restricting security to just one sector and defined it as "a particular type of politics applicable to a wide range of issues."

As eminent representatives of the security sector, you are aware that the concept of security can somewhat vary from one country to another. When Mexico's major national security threat has remained to be organized crime for quite some time, Afghanistan's has been religious extremism. For a country like Somalia, it is the inbuilt corruption into their governance. For some countries, it might change abruptly. A few days ago, we all saw corruption and mismanagement which was the major security

threat of the African nation Guinea, getting substituted by another – an armed unrest. In spite of these differences, almost all countries in the world have developed a commonality during the past year, where the health insecurity assumed a major role over and above all others.

The COVID-19 pandemic has caused the entire world to assume a 'new normal' to fight this common insecurity that is caused by a tiny, microscopic virus. Even during the new normal, however, certain fundamental features of the modern-day security have not changed. Security in the 21<sup>st</sup> Century was, to a great extent, focused on internal factors of a country, rather than external ones. The organization of the threat factor has changed from state militaries to terrorist organizations to even pirates. The underlying motivation for creating insecurities has shifted from being political to one that is economic.

Targets have shifted from soldiers to civilians. The distinction between 'high profiles' of national security and 'low profiles' of economic and social interactions have softened. This has given rise to new sources of global insecurity in the 21<sup>st</sup> Century which are essentially 'soft' in nature.

The 21<sup>st</sup> Century has continued to witness these new sources throughout its first two decades. Donald Rumsfeld, the onetime Defence Secretary of the United States said at a key decision-making point in the history of his country, "there are known knowns; the things we know we know, we also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns—the ones we don't know we don't know." Although stated in relation to a completely different scenario, when recalling this statement, I see that it resonates with the pandemic that we are facing now. In 'security

terms', COVID-19 is a 'wild card', an 'unknown unknown'. It is a security threat without a passport. It caused the 'health security' to assume the prime position in the security landscape of the modern day, surpassing the food security, water security and all other soft securities.

When we view the modern-day threats, we see that none of these is of a purely military nature, as those perhaps were, during the cold-war period. As a result, they also cannot be tackled by purely military means. There is another factor that contributes to the restriction of military means as a response to insecurities. In today's security landscape, States do not have the monopoly that they used to enjoy. Human beings have assumed that role. When the individual is considered as the central point in security rather than the 'State' as before, it gives a new insight into all our security related concerns. This helps us to understand the present-day global vulnerabilities with a new eye.

When the centre of focus in security becomes the individual, it changes the state-centric understanding of national, regional as well as global security. When a pandemic, which cannot be controlled by military means is plaguing the world, the human-centric understanding of security becomes vital to address it in order to ensure development of any country. This is why the 'soft component' of security, or the 'human security' gains more prominence over the 'hard component' of security during this new normal, created by the worst health pandemic in the recent history of the world.

The pandemic has given rise to a number of human security threats. To mention a few, the threat to economic security through unemployment, to health security through the deadly infectious virus and to environmental security through the mass accumulation of the waste generated in the health sector. It has also given a signal on food security as well, which is precisely when the Government declared essential services and appointed an authority to manage the situation in Sri Lanka. So you see, security in the new normal is connected with the

stability of a country, but in a different way from how it did with conventional security under the normal conditions.

National development, as we all know, is an all-encompassing term. It includes both the individual and the nation. Therefore, national development can be considered as the process of development and reconstruction of all dimensions of the nation, along with the development of the individual. This concept is essentially linked with both the growth and the change where *change* can be socio-cultural or economic, tangible or intangible. National development involves activities through a planned national economy, application of modern technology in agriculture to enhance production, application of science and technology in the production sector, improving the human resource and providing education for all among many others.

During a disaster such as the COVID pandemic, it also includes providing facilities and assistance to the poorest segments of the society. In theory, addressing the security needs, especially those of soft security and implementing broad array of the previously mentioned key activities in national development ensures the stability of the country during the new normal. This theory is in practice in Sri Lanka today, in different sectors to different degrees.

Let us consider the vaccination drive for example. Two months ago, Sri Lanka was struggling with the inadequate human resource in the civilian component of the health sector to conduct the vaccination programme at its full length. Health sector employees were getting exhausted with the enhancing demand for services. At this point, the Government employed its military health professionals to assist their civilian component. That accelerated our vaccination drive to such an extent that Sri Lanka became the first country in the world to have the fastest vaccination drive to its population.

H.E. the President had first-hand supervision of this process, at times acting as a 'vaccination planner', which contributed to the success of the

whole programme. This measure addresses our health security, and at the same time contributes to our national development by making the workforce resistant to the pandemic. Together, the two outcomes contribute to enhancing the stability of the country during this new normal.

Now let us consider a few of the numerous initiatives that the Government has introduced to ensure food security. The Government recently decided to take a transition from inorganic agriculture to organic agriculture, in keeping with pledge given to our people by the President, H.E Gotabaya Rajapaksa, in his policy document, 'Vistas of Prosperity and Splendour.' The primary aim was to safeguard the public, and especially the future generations from non-communicable diseases including renal diseases, again ensuring the health security. This also gave an added advantage where the imports of chemical fertilizers became minimal and that saved a considerable amount of money to our Treasury. This also resulted in enhancing organic and bio fertilizer production within the country, opening up new employment opportunities.

Linked with these two activities, the Government also launched 'Wari Saubhagya', a programme to rehabilitate 1000 small tanks across the country. This was to provide water for both irrigation and drinking purposes. These projects ensured irrigation water to a greater area of paddy and other field crop cultivations and also created additional employment opportunities within the country. Overall, those made a noteworthy contribution to the national development as well as to the soft security of the country during the new normal.

National development not only involves the infrastructure development, but also the human development. A developed human resource is a shield against certain soft threats. The programme 'connect Sri Lanka' was launched during the new normal, initially providing four remote areas with 4G connectivity. We are planning to expand it into all 9 provinces.

The pandemic period where schools had to be closed was also used to plan education reforms

aiming at producing future generations that are better equipped with battling their way through the ever-changing global order. These enhance opportunities for the public, especially the children to gain access to knowledge that is amply available to children and citizens of many developed countries, and also to equip themselves better to assist with development initiatives of the Government.

Fruits of this labour will be reaped only in the future, where our country will continue to have a learned, open minded younger generations, and through them, smarter work forces. The activities that the Government has started today contribute to national development in the future on the one hand, security on the other, and to stability of the country, overall.

The last example that I wish to draw has a direct connection with all institutions in the public as well as the private sector, electricity. The Government spent over US\$ 2.3 Bln for oil imports in 2020. We all know that a considerable amount of this is spent for generating electricity. This is an unbearable amount for a developing country like Sri Lanka, to be spent notwithstanding the prevailing health pandemic. It is also a waste of funds considering the vast and untapped potential that Sri Lanka has for renewable energy.

The Government gave due consideration to both these when establishing 'Thambapawani' the first wind power station owned by the Government of Sri Lanka. Another similar plant has been launched in Pooneryn. Use of solar power has been introduced to households. A waste-to-power plant was also declared open at Kerawalapitiya. It is not an easy task for a developing country like Sri Lanka to manage this shift while battling with a pandemic, but amidst all, the Government plans to increase the renewable energy component to 70% of the total consumption of the country by 2030. It is an ambitious target, but it helps the country to reach a higher status in self-sufficiency and also prepares the country to face worse calamities than the present one that might arise in the future. The 'failure to prepare' as the old saying



goes, is 'preparation for failure'. We intend to avoid it.

Moving back to the concept of security with these examples, with special emphasis on human security, it is evident that the national development and security are inter-linked. These cannot be achieved separately. This is probably what caused the formerly known definition of security, 'freedom from fear', to be redefined as 'freedom from want', indicating the link between security and development. Human security, as we all know, is an integral part of State security, which in turn, has an equally strong connection with national development. This is why if you have a closer look at Sustainable Development Goals, you will see that all 17 goals are connected to human security.

In this context, I believe there is something vital that we all need to understand about security, development and the stability that those bring about. The new normal caused by the COVID-19 pandemic is calling us to re-think our actions, plans and concepts on security and development both.

Is it not high time for us to re-think our national security and national development?

Is this not the best time for us to redefine our development-security nexus?

Let me conclude by bringing back to your memory, extracts from a famous speech delivered by Robert F. Kennedy during his run for the Democratic nomination for the Presidency of the United States. Over 50 years later, his remarks about the measurements of

development resonate with something that we need to re-discover with experience we had during this new normal. He said, and I quote,

"... the gross national product does not allow for the health of our children, the quality of their education or the joy of their play. It does not include the beauty of our poetry or the strength of our marriages, the intelligence of our public debate or the integrity of our public officials. It measures neither our wit nor our courage, neither our wisdom nor our learning, neither our compassion nor our devotion to our country, it measures everything in short, except that which makes life worthwhile."

Distinguished scholars, ladies and gentlemen, let us try to fathom the lesson that this global pandemic and the new normal is trying to teach us. Let us acknowledge the all-encompassing nature of national development and pay attention to the vital fact that has evaded our comprehension thus far – the fact that the individual, the human has assumed the central focus in security as well as in national development. Let us use that understanding to re-define our development-security nexus and bring a lasting stability to our country during the new normal.

Stay safe and take care of yourselves.

Thank you.

## Address by Secretary, Ministry of Defence, Sri Lanka

General Kamal Gunaratne (Retd) WWV RWP RSP USP ndc psc MPhil

*Secretary, Ministry of Defence, Sri Lanka*

Chief Guest and Keynote Speaker of the 14<sup>th</sup> International Research Conference of KDU, Principal Advisor to the President Mr. Lalith Weerathunga, Ambassadors and High Commissioners, Foreign Secretary Professor Jayanath Kolombage, Chancellor of KDU General Jerry De Silva (Retd), Chief of Defence Staff and Commander of Army General Shavendra Silva, Commander of the Navy Vice Admiral Nishantha Ulugetenne, Chairman of University Grants Commission Professor Sampath Amarathunga, Vice Chancellors of other Universities, Vice Chancellor of KDU, Chief of Staff of Air Force, Director General at Institute of National Security Studies Professor Rohan Gunarathna, Deputy Vice chancellors, All Deans and Directors, former Chancellors and Commanders at KDU, Eminent Scholars, Senior Officers of the Armed forces and Police, distinguished guests joining us virtually from Sri Lanka and Overseas, Ladies and Gentlemen;

I consider it as a great pleasure and a privilege to be present here today at the inauguration ceremony of General Sir John Kotelawala Defense University's International Research Conference which is taking place for the 14<sup>th</sup> consecutive year and I would like to thank the Vice Chancellor and the conference organizers for the invitation extended for me to be present here to participate in this event. The International Research Conference of KDU is providing the opportunity for academics, professional researchers and practitioners to share their research findings and expertise addressing the mutual challenges in their fields. Therefore, this event has gained tremendous recognition among all interested parties around the world. Further, the provision of a wider interaction and

networking with national and international scholars in respective fields would be absolutely beneficial for all the participants to broaden their horizons of knowledge through intellectual discussions. However, due to the global pandemic situation in effect, most participants may join the event through a virtual platform for this conference as same as the last year. Yet, I'm sure we will be able to achieve the desired objectives in a state amidst this pandemic situation.

Furthermore, I'm extremely pleased that the theme selected by the KDU for the conference this year security, stability, and the national development in the new normal is a timely theme capable of augmenting the significance and focus of the subject of strategic national importance. Further, I firmly believe that the endeavor towards warranting the national development and ensuring national security becomes further from achievement by undermining the routine activities due to the ill effects of the pandemic but becomes attainable by ensuring the adaptability to the new normal as widely accepted by all the countries in the world, today which is implied by the theme that you have selected. In fact, as comprehensively illustrated by the keynote speaker Mr. Lalith Weerathunga it is quite imperative that all of us understand and pursue the ways and means of adopting the circumstances embedded with the new normal. In order to coexist with the Covid 19 pandemic which has not shown any expiry date as of yet.

Ladies and Gentlemen in a context of globalization and further economic integration, in recent decades the relationship between national development and national security of a country has become increasingly



interlinked for Sri Lanka. These connections represent both opportunities and potential threats to the country's national security. The open and interconnected Sri Lankan economy creates vulnerabilities from potential international and external threats. Against this backdrop, national development has emerged as an important strategic priority for the Sri Lankan government with the connection between development and national security which will be orchestrated upon the vistas of prosperity and splendor, the national policy framework of our government headed by his excellency the president Gotabhaya Rajapaksha.

Ladies and gentlemen, the development generally depend on the stability of a country which should be achieved by ensuring national security. Sri Lanka being a country endangered by ruthless terrorism for almost three decades has experienced a lot of hardships during the past and was in the stage of eyeing its development in the last decade. Even though we were able to relieve the country from the menace of terrorism we have found another security threat in the form of a pandemic which has posed a greater threat to the entire world. The threat that we face today is progressing in its second continuous year without any indication of a possible termination we are yet to find a permanent solution for the same. However, we must always work towards reaching our development goals without letting our country at peril. In such a context our endeavor here as Sri Lankans should be to seek possibilities to find ways and means to steer the country towards development goals amidst said difficulties. Sri Lankan government is at the threshold of trying all possible methods to meet its economic growth and objectives yet with lots of empidements while ensuring human security. When the domestic affairs of a country are affected it is extremely difficult for a country to reach its desired end state. Sri Lanka is no exception in

this, regard being a developing country Sri Lanka cannot accept any economic standstills for a protacted time frame. However, any plans to expedite the economic gains should never be at the expense of human lives. Therefore, his excellency the president himself has expressed his keenness on this aspect to see and inspire all possibilities available to ensure the maintenance of momentum in the economic sphere.

On the contrary, we should also note the other contemporary security concerns such as violent extremism, terrorism, piracy, drug, and human trafficking, smuggling, cybercrimes, and other organized crimes and natural disasters pose a grave threat to the stability of a country. Sri Lanka's geostrategic location is susceptible to such threats as it is located in the main sea routes in the Indian ocean. The same geopolitical significance has given a greater recognition to the country, thus it has gained greater demand from the rest of the world. In such an instance, the possibility of Sri Lanka becoming susceptible to threats posed from violent extremism and organized crimes is very high and present the government has initiated several steps to curtail such illegal activities and such measures taken such as the demarcation of maximum security prisons concept and highly effective maritime domination programs launched by the Sri Lankan Navy which have become very effective in restricting such threats. However, the effects of such activities pose a moderate level threat to the stability of our country.

Ladies and gentlemen, a government alone cannot afford to force all these threats that are in concert ruining the stability of a country. Therefore, as responsible citizens, it is our bounded duty to provide novel ideas, suggestions, and proposals to consider in regaining our country's stability and development. I hope the academic events of this nature will undoubtedly serve this national requirement. Such efforts are

arranged to address emerging challenges. Promoting more research and development becomes a task of topmost priority for all of us.

Fortunately, as the Secretary of Defense, I feel tremendously proud and content to say that the Kotelawala Defence University is at the forefront of researching the development of security-related problems in the new normal. The approach adopted by the Kotelawala Defense University to understand the contemporary complex situations concerning the bigger picture rather than dwelling on the narrow passages will become far more effective in resolving the emerging complexity of future challenges. Therefore, I'm well certain that the faculties of General Sir John Kotelawela Defence University with their interest, commitment, dedication, and knowledge in diverse academic disciplines

and outside rich researches inputs would contribute immensely to this year's conference theme. The knowledge that you are going to unearth and share during this conference would be of immense benefit not only to the academic community but to the entire humankind to make their lives better.

In conclusion ladies and gentlemen, I should express my most sincere appreciation to the Vice Chancellor and the organizers of the General Sir John Kotelawala Defense University's 14<sup>th</sup> International Research Conference 2021 for organizing this timely important event amidst the covid 19 pandemic concerns and I wish this event be successful in all way imaginable. Ladies and Gentlemen thank you very much for your patience, thank you.

## Vote of Thanks

Dr Harinda Vidanage

*Conference Chair, 14<sup>th</sup> International Research Conference, General Sir John Kotelawala Defence University*

Mr Lalith Weeratunga, Principal Advisor to HE the President of Sri Lanka, Secretary to the Ministry of Defence, General Kamal Gunaratne, Vice Chancellor – Maj Gen Milind Peiris, Deputy Vice Chancellor (Defence & Administration), Deputy Vice Chancellor (Academics), Rector – Southern Campus, Senior Professors, Deans and Directors, Senior officers representing Tri Forces and Police, Distinguished guests, colleagues, Ladies & Gentlemen, Good morning!

In its 40<sup>th</sup> Anniversary since its inception the flagship academic conference of the KDU, the international research conference progresses to 14 years of continuity. I stand here to reflect and provide my gratitude to a team of individuals who despite every challenge in the form of material and the forces of nature has confronted us with, have managed to successfully bring us to where we are today.

Since 2019, the country has witnessed unprecedented upheavals from violent extremism to microbial threats that have forced a drastic rethinking of every aspect of social life. These challenges have made all of us believe in a reality that long established norms, traditions, beliefs do have their limits and if we are to survive and thrive in the new normal, we must adapt, adopt and innovate. The core fundamentals driving this year's IRC is based on this conviction and that the KDU as a leading force of defiance and a beacon of hope amidst such calamities.

On behalf of KDU, I would first and foremost like to extend a heartfelt appreciation to our Chief Guest and Keynote Speaker, Mr Lalith Weeratunga the Principal advisor to H E President Gotabaya Rajapaksa. Your presence today is a blessing to us as an institution and to the IRC as a process and your observations made at the keynote enriched us with

knowledge and perspective. Your wise words of wisdom will have a bearing on the deliberations of all academic communities within and well beyond this conference. I also would like to thank Secretary to the Ministry of Defence, General Kamal Gunaratne for his presence, his insights and his towering leadership that has seen KDU through fair weather and through some rough storms.

I would like to highlight and appreciate the visionary leadership of the Vice Chancellor, Maj Gen Milinda Peiris and his belief in maintaining continuity of this apex academic event of the KDU. I must then appreciate the critical roles played by Deputy Vice Chancellor (Defence & Administration) Brigadier Wipula Chandrasiri in ensuring that the IRC will take place and in providing the administrative leadership towards the materializing of the conference. The support and blessing of the Deputy Vice Chancellor (Academic) Professor KAS Dhammika is highly appreciated, along with the support of all Deans of faculties who came together to make this event a success.

Even at a time when every institution is careful about its purse, our sponsors have stood by us, let me profoundly thank and appreciate the generosity of our Gold Sponsors, the Bank of Ceylon and the People's Bank and with Huawei Sri Lanka and National lotteries board being our silver partners. There are many more who have chipped in and do not want their names mentioned and a big thank you for all.

I must mention that this year it is the first time the faculty of Defense and Strategic Studies have been tasked with the overall IRC and holds the chair. I must with gratitude mention the hard work of my colleagues in both departments of Defense and Strategic Studies under the leadership of Col Enoj Herath the Dean of the faculty. The FDSS represents the tip of the Spear of the KDU and bears

testimony to the perfect convergence of civic-military relations.

Towards the buildup to the conference the shutdowns became lockdowns and lockdowns became enforced quarantined curfews, yet the main committee of the IRC 2021 managed to work tirelessly around the clock. We knew it was all for a greater cause and I must appreciate the gargantuan task that was handled by the secretary of the IRC committee Ms Lihini De Silva who virtually was my prime buffer and the tremendous work done by the three co secretaries, Maj Ranushka Ferdinandesz, Ms Isuri Uwanthika and Captain Abeetha Athukorala. We were all supported by the dynamic team of faculty coordinators who labored hard and were endowed with patience.

It is with sincere gratitude I appreciate the services of Mr Kithsiri Amaratunga the president of the Editorial committee and Dr Faiz Marikar the deputy editor. I also want to mention the prudent actions taken by Commander Bogahawatte, the president of the

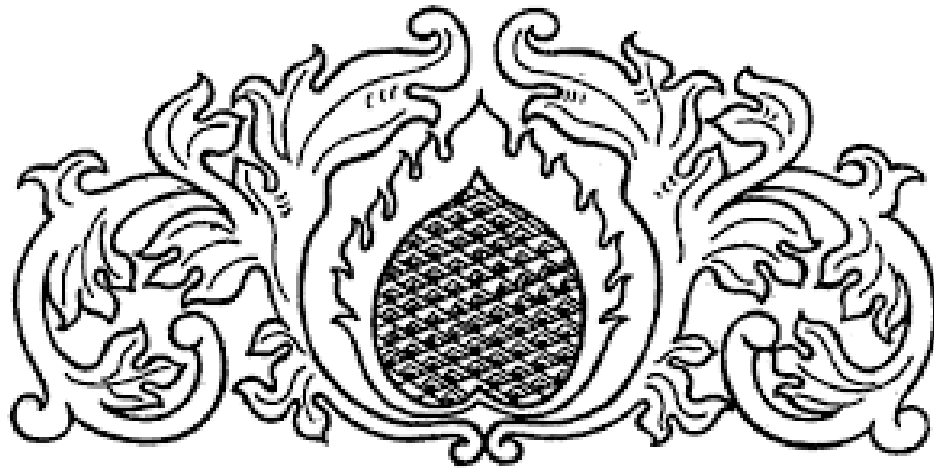
publication committee. I would like to thank all committee presidents, committee members, faculty committees, the office of Bursar, Registrar, Adjutant and C/O Admin and the staff at the Vice Chancellor's office.

New normal pushed us to the limits, yet we managed to overcome as we functioned as a collective team. Yet, finally the work would be incomplete if not for the researchers who had put faith in us and submitted papers and reviewers who filtered them. This year's IRC is the most decentralized event out of all IRCs, facilitating intellectual deliberations of this scale is no easy task. To keep this grid alive and robust the contributions made by Director IT and his team needs a special word.

We have truly embraced the new normal. We have not run away from it, instead we have transcended it. Thank you all for accepting and believing in us. We shall prevail and we shall overcome.

Thank you very much!

# MEDICINE



## **PLENARY SESSION**

## Current Understanding of Mechanisms of Vaccine-induced Protection in COVID-19

Dr Chandima Jeewandara

*Director, Allergy, Immunology and Cell Biology Unit, Faculty of Medicine, University of Sri Jayewardenepura*

The dawn of the year 2020 was a turning point in our modern era and global health. We have learned a hard lesson about the intrinsic vulnerability of our societies to a single pathogen. It has crippled economies and disrupted the lives, livelihoods, and social life of people. As a result, the quest for a vaccine soon began.

The knowledge gained through past research on coronavirus vaccines helped accelerate the initial development of the current COVID-19 vaccines. By the end of December 2020, several COVID-19 vaccines completed phase 1/11 clinical trials, which effectively prevented severe disease.

In developing these vaccines, all candidates taking part in the clinical trials are designed to elicit an immune response to the spike protein of SARS-CoV-2. However, other viral proteins such as membrane and nucleoproteins are also being used. The main focus has been on the induction of neutralizing antibodies, especially various T cell subsets that are important in controlling the disease progression rather than preventing infection. Vaccine-induced immunity provides systemic immunity whereas, infection-induced immunity is systemic and mucosal. Monoclonal antibody prophylaxis and therapeutics work due to their ability to neutralize the virus through Fc-dependent effector functions.

At present, several vaccines are administered in Sri Lanka. Covishield, Sinopharm, Pfizer, Moderna, and Sputnik V. When focusing on the immunity offered by vaccines, they induce a strong CD4<sup>+</sup> and somewhat lower CD8<sup>+</sup> T cell response. Regarding Covishield, a single dose of the AZD1222 vaccine induced high levels of antibodies to the RBD and

ACE2-blocking antibodies in previously naïve individuals, which was greater than immune responses in those who experience a mild or asymptomatic natural infection. The T cell responses were comparable to those following natural infection; in those who previously had COVID-19, a single dose induced very high levels of ACE2-blocking antibodies and antibodies to RBDs of SARS-CoV-2 variants of concern.

Another vaccine introduced in Sri Lanka, Sinopharm, has a 95% seroconversion following both doses, especially at six weeks, similar to the seroconversion seen in natural infections. It also shows good efficacy against alpha, beta, gamma, and delta variants.

The third vaccine Sputnik V also has a good antibody response. However, compared to Covishield and Sinopharm; its seroconversion rate is lower.

Despite the rapid development of effective vaccines, there is still a worldwide crisis with the highly transmissible Delta and Mu variants, hindering the process of eliminating COVID-19.

He also summarised the work being carried out at the Allergy Immunology and Cell Biology Unit of the University of Sri Jayewardenepura on vaccine immunogenicity studies in Sri Lanka. Finally, he highlighted that Mass vaccination has not successfully prevented outbreaks worldwide, and there is a global need to evaluate vaccine immunogenicity and effectiveness. He highlighted the necessity of data on developing the immune response to candidate vaccines currently used in Sri Lanka.



# The Utility of SARS-CoV-2 Sequencing in the COVID -19 Pandemic Response

Dr Thushan de Silva

*Senior Clinical Lecturer in Infectious Diseases, University of Sheffield, UK;  
Honorary Consultant Physician, South Yorkshire Regional Department of Infection and Tropical Medicine  
in Sheffield, UK*

In December 2019, the first COVID 19 case was discovered in Wuhan, China which culminated into a Global Pandemic. Now more than one a half years later, with the emergence of newer virulent and more transmissible strains, we are still in the process of subduing the SARS CoV -2 virus and winning the war against COVID 19.

Despite the worldwide devastation and suffering that the COVID-19 pandemic has undoubtedly caused, it has also shown the pace and extent to which science can respond when faced with a public health challenge of this nature. Along with the speed of highly effective SARS-CoV-2 vaccine development and large-scale pragmatic clinical trials, the use of rapid viral genome sequencing in tracking and monitoring the pandemic has been unprecedented.

SARS- CoV -2 is the most sequenced pathogen in history. Genome sequencing is currently being used for two main areas outbreak investigation and public health surveillance. Sequencing of the

genome is helpful in outbreak investigation as it will help identify if the outbreak is due to a breach in transmission or a result of independent infections from multiple sources, ultimately helping control the pandemic, as well as information obtained from genome sequencing, can help make decisions regarding public health.

Genome sequencing is unique in that it tracks the evolution of the pathogen from its emersion, enabling us to predict mutations and newer variants, giving us the upper hand in controlling this pandemic.

In his speech, Dr. De Silva summarised the different ways in which viral sequencing has helped the COVID-19 response and discussed the need for ongoing genomic surveillance in the subsequent phases of the pandemic, including the importance of expansion of sequencing capacity globally.

## Dissecting the Challenges Posted by COVID-19 to Pharmaceutical Regulations in Sri Lanka

Senior Professor Rohini Fernandopulle

*WHO National Consultant on Regulatory Functions to NMRA Sri Lanka;  
Senior Professor in Clinical Pharmacology and Therapeutics, General Sir John Kotelawala Defence  
University*

The ongoing outbreak of the respiratory disease that was given the name Coronavirus Disease 2019 (Covid-19), first recognized in Wuhan China in December 2019, rapidly spread to a global pandemic including Sri Lanka claiming lives and damaging the economic and social fabric of society. As a consequence, the balance between the social and political pressure for rapid drug and vaccine development and the time-consuming scientific evaluation of clinical trials became a major social issue globally and in particular to resource limited National Medicines Regulatory Authorities (NMRA) in countries such as Sri Lanka.

The NMRA utilized clause 109 of the National Medicines Regulatory Authority Act, No. 5 of 2015 for emergency use permission (EUP) and appointed several advisory committees with relevant expertise to expedite the regulatory review of COVID-19 health products without compromising safety, efficacy and quality standards. The challenges faced by the NMRA will be illustrated through case studies on the first two vaccines (Astra Zeneca – Covishield, Sino pharm COVID-19 vaccine) and the medicine, ivermectin. The Astra Zeneca vaccine was submitted to the NMRA and the WHO at the same time for emergency approvals.

The NMRA advisory committee reviewed the data though the WHO recommended reliance pathway and granted EUP within a week after reviewing the clinical trial data of phase 1,2 and 3 which was infact before that of the WHO. However in the case of the sinopharm vaccine it took longer (3months) and was approved after the WHO Emergency use authorization. This was due to scientific reasons as

efficacy in the over 60year old age group and in patients with co morbidities was not well documented. Interestingly the WHO EUA report identified the same deficiencies but the main difference was that the WHO risk benefit analysis was from a global perspective where a vaccine fulfilling some parameters of efficacy was better than “No Vaccine” given the seriousness of the pandemic. A lesson learnt for the future. The next lesson learnt was that in times of a pandemic there is an unregulated channel of both registered and unregistered medicines coming into the country which is sold at an unbelievably high price to consumers. Hence a new mechanism which was previously recommended by the WHO during the Ebola crisis named “Monitored Emergency Use of Unregistered and Investigational Interventions(MEURI) was implemented by NMRA. This drastically brought down the prices of medicines such as ivermectin, tocilizumab and remdesivir. The price of ivermectin which ranged from SLR 250 – 4500 was available at prices below SLR 50/=.

In conclusion, Sri Lanka has experts of high scientific caliber to make independent decisions on new vaccines and medicines in times of emergencies, however we should be proactive in securing strategic stocks of vaccines, medicines, medical devices early, conducting identified clinical trials, preventing the influx of unregulated medicines and medicines shortfalls by engaging with all stake holders very early during emergency situations.

# Emerging from COVID-19 with a More Resilient Public Health System

Palitha Abeykoon

*WHO Director General's Special Envoy for COVID-19 for South East Asia, Advisor to the WHO Country Office and to the Regional Director of the WHO South East Asia Region*

The COVID-19 pandemic is an unprecedented challenge for our society and reminds us of the value of public health. Public health has already been improved, and the prevention measures like social distancing, contact tracing, and isolation used for epidemic control have become household words. The significance of public health and epidemiology are now more recognized by the general public and policymakers than ever before.

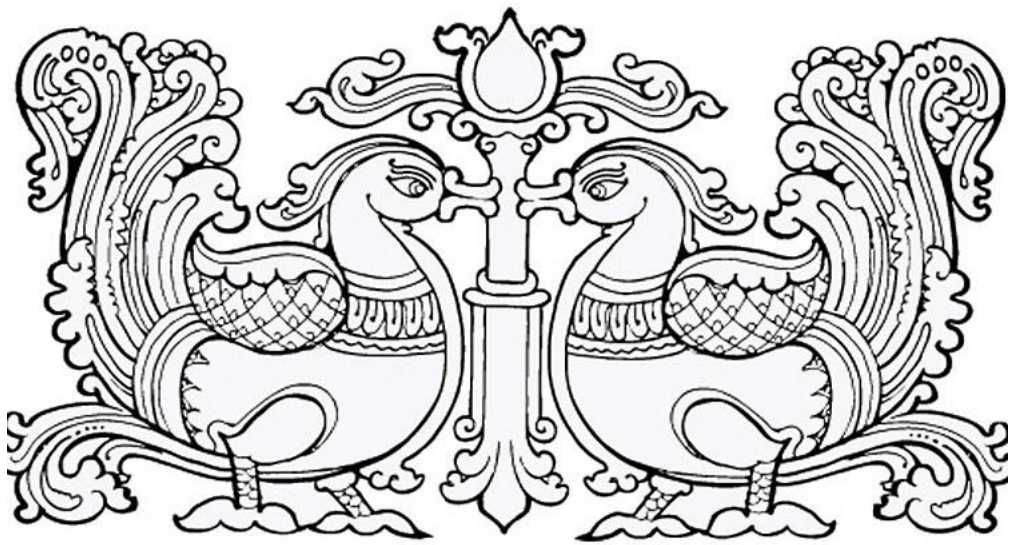
In the context of an era that will be shaped by COVID-19 and similar health emergencies, we will face a series of challenges to strengthen our public health system, particularly our emergency preparedness and response. Some facets of the inadequacies in our public health system became evident during the pandemic, including coordination, surveillance, data management, health system capacity issues complicated by concurrent health inequalities, and the spread of misinformation.

The presentation will examine the past and present responses to the pandemic, the stringency

of the public health and social measures on disease progression and some socio-economic aspects, the key lessons, and the challenges in further strengthening the public health system.

For Sri Lanka, there are possibly 3 phases for public health over the next five years: (1) proactive and reactive crisis management, (2) efforts to maintain the gains from the current efforts and experiences, and (3) plans to use the pandemic as a springboard to build a stronger public health system.

A stronger public health system will depend on leadership, how we address population-level risk, the capacity of the key public health institutions, employing 21st-century data sciences, and applying new communication skills. This presentation will address a few of these topics and propose how Sri Lanka can convert the challenges into opportunities to emerge stronger from the Covid -19 tunnel to meet future health emergencies



## **TECHNICAL SESSIONS**

# Explanatory Models of Cancer among Sri Lankans: An Interim Analysis

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**Abstract** - Current research shows that health-related beliefs are important in predicting adherence to treatment, the psychological impact of the condition, and the subsequent quality of life. The personal etiological framework of an individual regarding his/ her health condition is referred to as an explanatory model. Explanatory models have been researched in relation to many diseases. The current research literature shows that in Asian countries, individuals have two parallel sets of explanatory models. One is based on the western medical models, while the other is based on cultural and religious beliefs. Thus, it is very important to understand both belief-systems in providing health care. This appears to be even more important in chronic conditions such as cancer, where treatment toxicity and treatment tolerance may have a continued impact on quality of life. The current study explores the explanatory models related to cancer in a convenient sample of 140 adults in Sri Lanka. The study was conducted as an online survey. The study indicates that the biological explanatory models for cancer are strongly believed. The most strongly believed religious-cultural reason for cancer is "Karma". Most participants believed they would choose both Western medical treatments and religious and culture-specific treatments if they or their family members received a cancer diagnosis. The majority believed Western medical treatment to be the most important treatment modality. Thus, it will be important for clinicians to acknowledge the patient's desire to incorporate alternative treatment methods and non-medical explanatory models in providing cancer treatment.

**Keywords:** *Explanatory models, Cancer, Karma*

## I. INTRODUCTION

Cancer is a leading cause of death worldwide. According to the cancer fact sheet issued by the WHO (World Health Organization) in January 2014, the incidence of cancer in 2012 was 14.1 million. According to Globocan 2020, the number of new cases of cancer in the world is 19, 292,789. Cancer incidence has been rising in significant numbers. The stated prevalence estimate is 50.5 million. Further, the WHO states "approximately 44% of cancer cases and 53% of cancer deaths occur in countries at a low or medium level of the Human Development Index" (World Health Organization, 2014). This has important implications for Sri Lanka as, Sri Lanka is categorized as a country in the middle-income category, and the incidence of cancer has been in the increase in the country.

Researches further point out that with increased "Westernization" of low and middle-income countries due to globalization, cancer rates and patterns in low and middle-income countries are expected to follow those that are observed in the countries with high HDI (Human Development Index) values. Therefore, it is expected that there will be a decline in infection-related cancers, while there would be an increase in cancers related to reproductive, dietary, and hormonal risk factors.

According to currently available data on Sri Lanka, the crude incidence rate of cancer is 82.5 per 100,000. One out of every ten people has a lifetime risk of developing cancer. (National Cancer Control Program, 2015). Further, the statistics show an increase in incidence rates. This increase has been observed in the overall Asian rates of cancer as well (Pfizer Medical Division, 2008).

At present, there is increased attention to holistic care for many physical illnesses in general and cancer in particular. In providing holistic care paying attention to the patient's psychological aspects is of paramount importance. Especially, the patient's personal belief system has a strong impact on the psychological response to a disease. Recent research indicates that psychological aspects such as personality type are highly influential as etiological factors as well. (Kupper & Denollet, 2018)

A well-established tenet in Health Psychology is that health beliefs play a major role in all stages of any disease or illness. They are important in preventive measures, the course of illness, prognosis, and the outcome and subsequent quality of life in any health condition (Hoffman, et al., 2013)(Daher, 2012). The health belief model is frequently used to indicate the relationship between health beliefs and health behaviours. The importance of health beliefs in the etiology, course, prognosis, and outcome in cancer patients has also been well established in the research literature.

One important type of health belief which is believed to have an impact in the course of illness and outcome is the explanatory models of illnesses. Explanatory models (EM) refer to the personal etiological framework of the individual in explaining diseases and illnesses. This set of beliefs has a strong impact on treatment-seeking, the type of treatment sought, adherence to treatment, prognosis, and other illness-related outcomes. (Mamara, et al., 2017). Explanatory models are believed to be important in both mental and physical illnesses. (Jacob & Kuruvilla, 2018)(Gunn, et al., 2019). These beliefs can be highly influential for cancer patients, given the chronic nature of the disease and the common adverse reactions experienced by patients during treatment. Thus, gaining an understanding of the nature of the explanatory models of cancer can be important in providing cancer care.

Research on explanatory models in Asian populations has shown that people hold two categories of EMs simultaneously. One which is informed by the Western medical models and another informed by the religious-cultural practice. (Mathews, et al., 2019) This could be, because most Asian countries have adopted the Western medical model, while also retaining their

traditional religious-cultural belief systems and treatment modalities.

Thus, obtaining an understanding of both these systems in cancer care may be important as they may impact the treatment outcomes. The current research expects to explore the impact of these EMs on wellbeing. The current paper is based on an online survey of a convenient sample of adults as the first step of the study.

## II. METHODOLOGY

An online survey was conducted using the free google forms facility using the author's Gmail contacts and by posting the information on Facebook. A self-developed questionnaire which was developed after 05 mini-interviews and pre-tested was used for data collection. The questionnaire was available in English, Sinhala, and Tamil. The consent form was incorporated into the same google form. The responses received were analysed using IBM SPSS software.

### *Sample*

72 participants responded in English, 29 responded in Tamil, and 39 responded in Sinhala. Only 05% of the sample had a current or a past diagnosis of cancer, while 20.7 % had a first-degree family member with a diagnosis of cancer. The mean age of the sample was 36 years. 35% of the sample was males while 65% were female. 33.6% of the sample had a postgraduate qualification. 29.3% had a degree and 15.7% had G.C.E A/L qualification.

## III. RESULTS

### *A. Outcomes during the Development of the questionnaire*

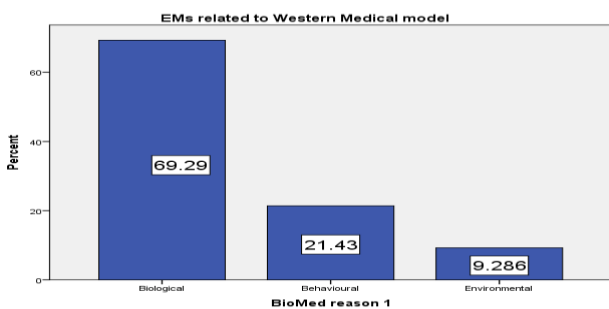
During the development of the questionnaire, when participants were asked regarding their EMs related to cancer, most participants mentioned only the EMs related to the Western medical model. When further probed, participants expressed strongly held religious-cultural EMs. During the mini-interviews, the participants revealed that for research they believed the medically related EMs were expected as responses, and providing cultural explanations would make them appear less knowledgeable. Therefore, unless specifically asked, people may not reveal their religious-cultural beliefs related to health conditions. Therefore, the questionnaire was



developed to acknowledge the presence of both Western medical model-related EMs and religious and cultural EMs.

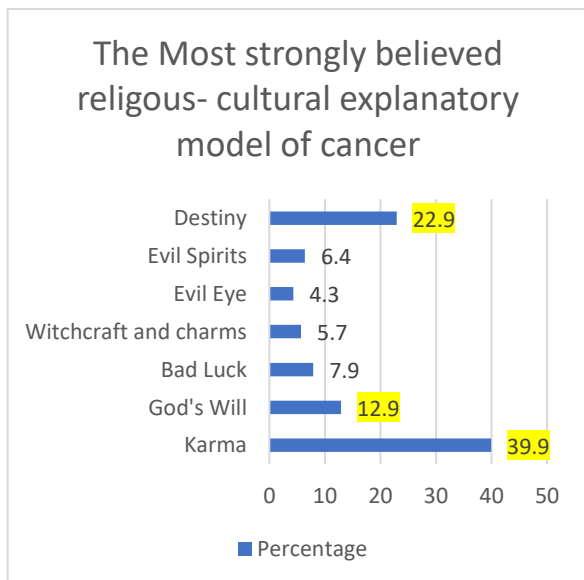
### B. Outcomes of the Survey

According to the results of the survey the most strongly believed EM of cancer which is related to the Western medical model was the biological reasons (genes, infections, and abnormal metabolic processes), the second most believed the EM was behavioural factors (Unhealthy diet, lack of exercise, etc) while the least believed EM being environmental factors (Toxins, climatic changes, etc)



Graph - 01- EMs related to the Western medical model.

Outcomes related to the cultural and religious EMs are shown in the below graphs.



Graph 02- The Most strongly believed religious-cultural explanatory model of cancer

As shown in the above graph, from the seven EMs listed in the questionnaire, the most strongly believed religious-cultural EM is "Karma". The other six EMs that were listed were God's Will,

Destiny, Bad luck, Evil Eye, Evil Spirits, and Witchcraft and charms.

The majority of the sample (73%) had stated that they would choose both Western medical treatments and the religious-cultural treatment methods if they or a first-degree family member of theirs is diagnosed with cancer. 66% had stated that they would choose only Western medical treatments while only 0.7% had stated that they would opt for only religious and cultural treatments.

When asked about their beliefs about the most important treatment modality according to their opinion 52.9% stated that the Western medical treatment to be the most important, while 45.7% stated both treatment modalities are important. Only 1.4 % stated that only religious and cultural treatments are important.

## IV. DISCUSSION

According to the current study, it is clear that there are strongly held parallel EMs regarding cancer among the participants. This confirms previous studies which had pointed out multiple EMs of diseases. "Karma" appears to be the most strongly believed religious-cultural EM among the participants. While it appears that EMs of destiny and God's will are still strong, EMs of evil eye, evil spirits, witchcraft, and charms appear to be very insignificant among the participants. This may be an indication that the beliefs regarding witchcraft and charms and evil eye and evil spirits are reducing in the larger society. With the recent revival of many religious movements in the country, it could be that beliefs regarding Karma and God have been strengthened.

An EM of "Karma" for cancer may produce negative or positive effects. It can lead to acceptance of the situation in some, while some may blame themselves for having been responsible for the karma that brought upon the cancer. On the other hand, this EM can also affect the patient's social support system. If the close family members interpret the cancer as a result of the person's karma, it may result in blame and stigma or more acceptance and support to increase one's good karma. The impact this EM would have on the patient and the family will be decided by the individual understanding of the concept of karma itself and other personality variables. Therefore, it



would be of value to conduct further research on the concept of Karma as an EM on cancer.

Further, as evident by the observations made during the development of the questionnaire, unless specifically asked, people, do not disclose their EMs related to their religion or culture. Rather, they choose to discuss the biomedical EMs only, due to social desirability of appearing knowledgeable, or maybe they are unsure of the societal response to these. Therefore, unless a clinician providing western medical treatments demonstrate they are open to discuss such beliefs, a patient would rarely discuss these with them.

The majority of participants appear to opt for both the Western medical treatments and religious-cultural treatments. Still, the majority thinks the most important treatment modality to be the Western medical treatments. It may be an indication that individuals while pursuing Western medical treatments as the most important treatment modality, would also like to supplement this with other more religious-cultural treatment modalities. Therefore, it would be of value to acknowledge the patient's desire to incorporate alternative treatment modalities when it does not affect the medical treatment provided. Accepting and acknowledging this desire of the patient would greatly strengthen his/ her acceptance in medical treatments as the study has already demonstrated that the majority of the individuals already believe the Western medical treatments to be the most important treatment modality for cancer.

## V. CONCLUSIONS AND FURTHER RESEARCH

The current study demonstrates that religious and culture-specific EMs such as Karma, God's will, Destiny to be the strongest non-medical EMs, when people try to understand why they developed cancer. These EMs would strongly interact with the individual personality variables of the patient and the societal variables of the micro-social circle of the patient to create positive or negative effects on treatment outcomes and the overall wellbeing of the patient. Therefore, it would be of value for clinicians providing care for cancer patients to explore these beliefs in their encounters with patients and support them in incorporating these beliefs in a way that would be supportive to the treatment outcomes and overall wellbeing of the patient as well as the close family members. While further research on the impact of these EMs is

indicated, obtaining a basic understanding of these belief systems would help clinicians provide more holistic care to cancer patients.

Further, it is clear that according to the current data, the Western medical treatments for cancer are accepted as the main treatment modality for cancer.

The salience of these EMs can be different in individuals who are obtaining treatment for cancer at present, and the subsequent stages of the research expect to explore this aspect. In the subsequent stages, the study expects to explore the impact of these beliefs on psychological well-being among cancer patients and their family members.

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# Prevalence of Home Accidents among Children Aged 1-4 and Its Association of Knowledge, Attitude and First Aid Practices of Mothers in Sri Lanka

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**Abstract**— Injuries are a leading cause of morbidity and mortality among children worldwide and in Sri Lanka. The objective of this study was to assess the prevalence of home accidents among children aged 1-4 years and its association with knowledge, attitude, and first-aid practices of their mothers in the Medical Officer of Health (MOH) area, Bulathsinhala, Sri Lanka. A community-based descriptive cross-sectional study was carried out among 309 mothers using cluster sampling. Data collected by interviewers using questionnaires were analysed in SPSS version 20. A majority (172, 55.7%) of the children were female. The prevalence of home accidents was 53.7% for three months (95% CI 47.6-59.3). One hundred and ten falls (35.6%, 95% CI 29.9-41.2), 32 (10.4%) cuts, 16 (5.2%) burns, 4 (1.3%) poisonings, 9 (2.9%) chokings, 11 (3.6%) cat/ dog bites, 15 (4.9%) scorpion/ centipede bites and 5 (1.6%) insect bites were reported. First-aid knowledge was good among 40.3% (95% CI=34.3-45.0) mothers, and the attitudes and practices were satisfactory. History of any type of home accident was not associated with overall first aid knowledge ( $\chi^2=0.045$ ,  $p=.907$ ). There was a significant association of a history of animal bites with overall first aid knowledge ( $\chi^2=4.456$ ,  $p=.046$ ) and with specific knowledge on animal bites ( $\chi^2=8.762$ ,  $p=.003$ ). Educating mothers and caregivers about first-aid and further research on risk factors for home accidents and factors affecting the first-aid competency of mothers is recommended.

**Keywords:** *injury, children, knowledge, attitude, practice*

## I. INTRODUCTION

First aid is “immediate help provided to a sick or injured person until professional help arrives”. It is concerned not only with physical injury or illness but

also with other initial care, including psychosocial support for people suffering from emotional distress from experiencing or witnessing traumatic events (IFRC, 2016). Early administration of suitable life saving measures and stabilizing measures in injuries save lives, prevent disabilities and reduce suffering.

Injury is defined as “a body lesion at organic level, resulting from an acute exposure to energy (mechanical, thermal, electrical, chemical or radiant) in amounts that exceed the threshold of physiological tolerance. In some cases (e.g. drowning, strangulation, freezing) the injury results from an insufficiency of a vital element” (Baker, 1984).

Injuries can be categorized in a number of ways. Intentional injuries are those due to violence and due to self-inflicted injuries. Unintentional injuries are categorized according to mechanism of injury (drowning, burns, falls, poisoning) and place of injury (road traffic accident, home injury, occupational injury, leisure injury).

According to Backet (1965) home accidents are “accidents that take place in and around the house. The home includes the dwelling unit itself, the garden, the yard, the garage and all that is personal to the household”.

Even though injuries can take place in a wide variety of environments, home is the most likely location for accidents involving children less than five years. Domestic accidents reflect more clearly than any other, the character and lifestyle of people (Lafta et al., 2013).

Injuries are a leading cause of death, hospitalization and disability throughout the world accounting for nine percent of all deaths and 16% of all disability annually. Over 875,000 children less than 18 years



An Interviewer Administered Questionnaire with close-ended questions constructed according to the objectives was used to collect data after pretesting. Four pre-intern doctors were recruited and trained as data collectors. Permission was obtained from relevant authorities. Proper research ethics was followed including obtaining written informed voluntary consent. Ethical clearance to conduct this study was granted by Ethics Review Committee, Faculty of Medicine, University of Colombo.

After the basic data of the child, the mothers were asked if the index child had each of the home accidents during the previous three months. In the affirmative only, they were asked about the action that was taken. Next, the knowledge about each home accident was assessed. The knowledge question was asked after their practice so that their answer would not be affected by the knowledge question. They were asked about falls, cut injuries, burns and scalds, animal, snake and centipede/scorpion bites, bee/ wasp stings, poisoning, choking and drowning.

Each knowledge question had “yes”, “no” and “don’t know” as responses. Each correct answer was given +1 mark, each incorrect answer was given -1 mark and “do not know” answer was given zero mark. Final mark for each question was the algebraic sum of marks of its statements. Negative marks were not carried over. Final score was converted into hundred. Seventy or more out of hundred marks were considered good knowledge. Attitudes were measured according to a Likert Scale. “Strongly agree” was given +2, “agree” +1, and “do not agree” zero marks. Then total marks were converted into hundred. Seventy or more marks were considered as having good attitude. Practices of first aid were analysed as correct or incorrect. The correct and incorrect first aid practices were summarized with numbers and percentages.

### III. RESULTS

Although the calculated sample size was 340, only 309 mothers participated making the response rate 90.1%. Majority (172, 55.7%) of the children were female.

The prevalence of home accidents in the studied sample was 53.7% with 95% Confidence Interval (CI) being 47.6%-59.3% (Table 1). Commonest injuries were falls (35.6%) followed by cuts (10.4%) and burns (5.2%). There were no snake bites in the

studied population. The least prevalent home accident was drowning (0.3%).

Table 1: Prevalence of home accidents by type

Type of home accident	No. (%)	95% CI
Falls	110 (35.6)	29.9-41.2
Cut injury	32 (10.4)	7.5-13.7
Burns	16 (5.2)	2.9-7.8
Poisoning	4 (1.3)	0.0-2.7
Choking	9 (2.9)	1.3-4.6
Drowning	1 (0.3)	0.0-1.0
Dog/ cat bites	11 (3.6)	1.6-5.9
Snake bites	0 (0)	
Scorpion/ centipede sting	15 (4.9)	2.6-7.6
Insect bites	5 (1.6)	0.3-3.2
Any home accident	166 (53.7)	47.6-59.3

All the participated mothers of children aged 1-4 years had good attitudes towards first aid for home accidents.

Knowledge of all the mothers, irrespective of recent history of home accident, was assessed. Majority of the mothers knew the correct first aid measures for falls (97.4%), drowning (71.8%) and for choking (64.1%). But, only a minority of mothers had good knowledge on first aid measures for cuts (27.5%), burns (22.3%), insect stings (10.3%), snake bites (11.7%), dog/ cat bites (10%) and scorpion stings (7.7%). Overall level of first aid knowledge (minimum of 70% of knowledge level) was 40.3% (95% CI 34.3-45.0) [Table 2].

Table 2: Level of first-aid knowledge on home accidents among the mothers

Type of home accident	Good knowledge	95% CI
Falls	301 (97.4)	95.1-99.0
Cut injuries	85 (27.5)	22.6-31.6
Burns	69 (22.3)	17.3-26.6
Dog/ cat bites	31 (10)	6.9-13.6
Snake bites	36 (11.7)	7.9-14.9
Scorpion stings	24 (7.7)	4.9-10.9
Insect stings	32 (10.3)	6.9-14.2
Choking	198 (64.1)	58.7-69.2



Drowning	222 (71.8)	65.8-77.0
Overall knowledge	123 (40.3)	34.3-45.0

Out of those who reported recent home accidents, commonly practiced first aid measure by mothers following a fall was talk to the child (87 of 110, 79.1%). For burns, commonly practiced first aid measure was rinsing burn site with tap water (15 of 16, 93.8%). Only 2 out of 16 (12.5%) punctured blisters following burns, which is a wrong practice. Regarding burns, the majority applied ointment to the site (14, 87.5%). All the participated mothers, whose child got a cut, washed wound as a first aid measure (100%), while a majority also dressed the wound (31 of 32, 96.9%).

All the participants who had experienced poisoning of the child took the bottle of poison to the hospital and all of them induced vomiting. All the mothers who experienced drowning of the child called for help, talked to the child and checked for breathing. None of them practiced chest compression or rescue breathing. All the mothers of children who experienced animal bites rinsed the wound with soap and water and avoided dressing it, which is desirable. Only 9 out of 11 (81.8%) identified and observed the animal.

Table 3: Association of first-aid knowledge with a history of home accident

History of ...		Knowledge		Total	$\chi^2, p$
		Poor	Good		
any home accident	Yes	67	96	163	0.767, 0.815
	No	56	86	142	
falls	Yes	58	50	108	0.116, 0.143
	No	124	73	197	
cuts	Yes	18	12	30	0.969, 1.000
	No	164	111	275	
burns	Yes	11	5	16	0.578, 0.447
	No	171	118	289	
any animal attack (dog, scorpion, insect)	Yes	12	17	29	4.456, 0.045
	No	170	106	276	

Recent history of none of the home accidents was associated significantly with knowledge on first aid practices of their mothers except for the children

who had a history of animal attacks. Over half (58.6%) who had recent animal attacks had good knowledge while only about one-third (38.4%) who did not have a recent animal attack had good knowledge ( $\chi^2 = 4.456, d.f= 1, p= .046$ ).

#### IV. DISCUSSION

The prevalence of home accidents among children aged 1-4 years was 53.7% for three months (95% CI 47.6%-59.3%). In rural Egypt, El-Sabely and others (2014) reported a point prevalence of 84.7% home accidents among preschool children. A more recent study in Saudi Arabia reported a 56.1% past history of drowning, choking or burn injuries (Habeeb & Alarfaj, 2020). In Sri Lanka, the incidence of unintentional injuries was 28.1% in MOH area, Kolonnawa, in the same age group (Punyadasa, 2012). This high value in present study may be due to the differences in two study settings where Kolonnawa is an urban area and Bulathsinhala a rural area.

The most prevalent home accident in the present study was falls (35.6%) followed by cuts (10.4%). But, this differs from Kamel and others' study (2014) where the most prevalent home accident was cuts (48%) followed by falls (36%). This difference is due to difference in working definition of variables. For example, in our study, fall is considered as an event which caused injury by falling from a height and from slipping.

Overall first aid knowledge in the current study was 40.3% (95% CI 34.3%-45.0%) which is not satisfactory. A study in rural Egypt also described poor first aid knowledge among mothers regarding home accidents (Eldosoky, 2012). This may be due to low socioeconomic status in rural areas. Also, the rural mothers have limited access to rapid resources of new knowledge such as internet. Sometimes grassroots level healthcare personnel who deliver health massages to door steps are vacant in rural areas. A study in a metropolitan area in Thailand indicated good knowledge of first aid among parents, as 72% (Wei et al., 2013). In a study regarding first aid knowledge on choking, burns and drowning, the knowledge was high in only 6% and moderate in 55% and was significantly high in fathers than mothers, among the higher educated and salaried and employed mothers (Habeeb & Alarfaj, 2020). In a hospital based study on first aid knowledge on burns in Lahore, Pakistan, only 4.5% had good knowledge which was significantly associated with their past experience, educational and economic

level (Naumeri et al, 2019). First aid training in the past year was significantly (OR=3.32) associated with knowledge on burn injuries in Australia (Burgess et al, 2019). In our study, 40.3% had good knowledge while association with socio-demographic factors were not assessed.

In our study, all the mothers had good attitude towards first aid as in another study (Goniewicz et al., 2002). Practices following different injuries were satisfactory. In the study of Naumeri and others (2019), only 13.2% had irrigated the burn area with tap water. In our study, 15 out of 16 mothers who reported a burn injury had done so. This figure as 94% in Australia (Burgess et al, 2019).

This research provides baseline information to policy makers in planning and implementing services to reduce the burden of child injuries. This can be achieved through reducing home accidents and conducting first aid training for first contact persons; parents, in home accidents.

The low level of first aid knowledge among mothers indicates the need to improve knowledge. Therefore, programmes should be implemented to improve mothers' knowledge on first aid.

All the studied mothers have good attitudes towards first aid. This is important in implementing first aid training programmes to mothers. Good attitudes enhance their participation in training programmes and practicing first aid not only at home, even outside home and not only to their children but also to others' children as well.

As there is no association between exposure to any type of home accident and first aid knowledge, it is important to improve knowledge through routine measures such as workshops and seminars.

## V. CONCLUSION

Over half (53.7%, 95% CI=47.6-59.5) of children aged 1-4 years in Bulathsinhala area had experienced home accidents during a period of three months. The knowledge of their mothers on first aid for home accidents was low, while attitudes were good.

As there was only one significant association between prevalence of any type of home accident and first aid knowledge, first aid training programmes are recommended to be carried out to mothers in general. Further research is recommended to find out risk factors for home accidents and socio-demographic factors

associated with first aid knowledge, attitude and practices among mothers.

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