Department of Medical Research

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The objective of this Bulletin is to disseminate international news about health and medicine, developments, activities in medical and health research in DMR. The Bulletin is published monthly and delivered to township hospitals.

The Editorial Committee, therefore, invites contributions concerning information about research activities and findings in the field of medicine and health.

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Highlights on Useful Research Findings Applicable to Health

Phylogenetic Analysis of Myanmar Human Respiratory Syncytial Virus from under Five Children's with Acute Respiratory Infection Admitted to Yangon Children's Hospital

Human respiratory syncytial virus (RSV) is one of the most important respiratory viruses responsible for annual epidemic ARI outbreaks in infants and pre-school children worldwide and it is frequently causing bronchiolitis and pneumonia in infants less than six months old. RSV is a member of the family *Paramyxoviridae* that is differentiated into two groups (A and B) based on antigenic and genetic variability. To date, 11 genotypes for RSV group A and 23 for RSV group B have been described based on changes in the G gene coding for the attachment glycoprotein. In this study, nasopharyngeal swab samples were collected from hospitalized paediatric ARI cases at Yangon Children's Hospital from January to September 2014. Out of 160 cases, non-structural protein 1 (NS1) gene of RSV was detected in 16.25% (26/160) comprising RSV-A strains 52% (11/21) and RSV-B strains 48% (10/21). Furthermore, the 21 NS1 gene positive nasopharyngeal swab samples were processed for genotyping by reverse transcription-PCR and sequencing of C terminal of the G gene, second variable region. RSV-G gene was found in 61.9% (13/21) of samples. RSV-A was the larger group, accounting for 53.8% (7/13), followed by RSV-B, 38.5% (5/13) and one case (7.7%) was a mixed infection. The phylogenetic analysis revealed that all group A strains clustered as the ON1 genotype. This RSV ON1 genotype in subgroup A has a characteristic of a 72 nucleotide duplication in the second highly variable region of attachment G gene and it was first detected in Canada in 2010. Other studies reported ON1 genotype was associated with less severe cases such as bronchiolitis and the present study also showed the similar findings.

ရန်ကုန်ကလေးဆေးရုံကြီးတွင် အသက်ရှူလမ်းကြောင်းရောဂါဖြင့် တက်ရောက်နေသော အသက် ၅ နှစ်အောက် ကလေးများတွင် တွေ့ ရှိရသောအာရ်အက်စ်ဗွီဗိုင်းရပ်စ် (Respiratory Syncytial Virus) ပိုးမျိုးကွဲ၊ ပိုးမျိုးကွဲစိတ်များကို (Phylogenetic Analysis) နည်းဖြင့်လေ့လာခြင်း

အာရ်အက်စ်ဗွီဗိုင်းရပ်စ်ပိုးသည် ကမ္ဘာနှင့်အဝှမ်းရှိ (၁) နှစ်အောက် ကလေးများနှင့် မူကြိုအရွယ်ကလေးများတွင် နှစ်စဉ်ကပ်ရောဂါအသွင်ဖြင့်ဖြစ်ပွားသော အသက်ရှူလမ်းကြောင်းဆိုင်ရာဗိုင်းရပ်စ်ပိုးများအနက်မှ အရေးကြီးသော ဗိုင်းရပ်စ်ပိုးတစ်မျိုးဖြစ်ပါသည်။ ၎င်းဗိုင်းရပ်စ်ပိုးသည်အသက် (၆) လအောက်ကလေးငယ်များတွင်လေပြွန်

ရောင်ရမ်းခြင်းနှင့် အဆုတ်ပွ၊ အဆုတ်ရောင်ခြင်းတို့ကို အများဆုံးဖြစ်စေသော ဗိုင်းရပ်စ်ပိုးလည်းဖြစ်ပါသည်။ အာရ်အက်စ်ဗွီ အသက်ရှူလမ်းကြောင်းဆိုင်ရာ ဗိုင်းရပ်စ်ပိုးသည် မျိုးရင်း *Paramyxoviridae* တို့၏ မျိုးနွယ်ဝင်တစ်ခုဖြစ်ပြီး ၎င်းဗိုင်းရပ်စ်ပိုးမျိုးကွဲများသည် ပဋိလုံ့ပစ္စည်းနှင့် မျိုးရိုးဗီဇပြောင်းလဲခြင်းပေါ်မူတည်၍ အုပ်စု အေ နှင့် ဘီ ခွဲခြားထားပါသည်။ ယခုအချိန်တွင် ချိတ်ဆက် (glycoprotein) (G) မျိုးရိုးဗီဇပြောင်းလဲခြင်းအချက်အလက်ကို အခြေခံ၍ အုပ်စုခွဲရာတွင် အာရ်အက်စ်ဗွီ ဗိုင်းရပ်စ်ပိုးမျိုးကွဲ အုပ်စု အေ ၁၁ မျိုးနှင့် အုပ်စု ဘီ ၂၃ မျိုးတို့ကို ရှာဖွေတွေ့ ရှိပြီးဖြစ်ပါသည်။

ယခုလေ့လာမှုတွင် ၂၀၁၄ ခုနှစ် ဇန်နဝါရီ လ မှ စက်တင်ဘာ လ အတွင်း ရန်ကုန်ကလေးဆေးရုံကြီး၌ အသက်ရှူလမ်းကြောင်းဆိုင်ရာရောဂါဖြစ်ပွားနေသော ကလေးများ၏ နှာခေါင်းအတွင်းမှ အရည်နမူနာများကိုရယူပါသည်။ ကလေး ၁၆၀ ဦး၏ နှာခေါင်းအတွင်းမှ အရည်နမူနာများကို အာရ်အက်စ်ဗွီဗိုင်းရပ်စ်ပိုး ရှိ၊ မရှိ NS_1 gene မျိုးရိုးဗီဇအချက်အလက်ကို အသုံးပြုခြင်းဖြင့်ရှာဖွေရာတွင် ၂၆ ဦး (၁၆.၂၅ ရာခိုင်နှုန်း) သည် ပိုးရှိကြောင်းတွေ့ရှိရပြီး ဗိုင်းရပ်စ်ပိုးမျိုးကွဲ အုပ်စု အေ ၁၁ ဦး (၅၂ ရာခိုင်နှုန်း) နှင့် မျိုးကွဲ အုပ်စု ဘီ ၁၀ ဦး (၄၈ ရာခိုင်နှုန်း) တို့ကို ထွေ့ ရှိရပါသည်။

NS_1 gene ဖြင့် အာရ်အက်စ်ဗွီဗိုင်းရပ်စ်ပိုးတွေ့ရှိပြီးဖြစ်သော အာရ်အင်အေအရည်နမူနာ ၂၁ ဦး၏ ပိုးမျိုးကွဲစိတ်များကိုအာရ်တီပီစီအာရ်နည်းဖြင့် ရှာဖွေပြီးနောက် (G) မျိုးရိုးဗီဇ၏ ပြောင်းလဲမှုများသော ဒုတိယအပိုင်း (C-terminal ဟုခေါ်သောအပိုင်း) ၏ Nucleotide အစီအစဉ်များကို ဆက်လက်ရှာဖွေလေ့လာခဲ့ခြင်းဖြစ်ပါသည်။

စီဒီအင်အေနမူနာ ၂၁ ဦးအနက် ၁၃ ဦး (၆၁.၉ ရာခိုင်နှုန်း) သည် အာရ်အက်စ်ဗွီဗိုင်းရပ်စ်ပိုးရှိကြောင်းတွေ့ ရပါသည်။အာရ်အက်စ်ဗွီအေ ၁၃ ဦးမှ ၇ ဦး (၅၃.၈ ရာခိုင်နှုန်း) သည် လွှမ်းမိုးသော အုပ်စုဖြစ်ပြီး အာရ်အက်စ်ဗွီ ဘီ ၁၃ ဦးမှ ၅ ဦး (၃၈.၅ ရာခိုင်နှုန်း) နှင့် ရောနှောအုပ်စု (အုပ်စု အေ နှင့် ဘီ) (၇.၇ ရာခိုင်နှုန်း) ဖြစ်ကြောင်းတွေ့ ရှိရပါသည်။ Phylogenetic Analysis နည်းဖြင့် မျိုးကွဲစိတ်များ လေ့လာရာတွင် ပိုးမျိုးကွဲ အုပ်စု အေ အားလုံးသည် ON1 မျိုးကွဲစိတ်အုပ်စုအဖြစ် တစ်စုတစ်ဝေးတည်းတည်ရှိနေကြောင်းတွေ့ ရှိရပြီးငင်းတွေ့ ရှိချက်သည်ကနေဒါနိုင်ငံတွင် ၂၀၁၀ ခုနှစ်က ပထမဦးဆုံးတွေ့ ရှိခဲ့ခြင်းဖြစ်ပါသည်။

ယခင်သုတေသနစစ်တမ်းများအရ ON1 သည် အလွန်ပြင်းထန်ခြင်းမရှိသည့်ရောဂါအခြေအနေဖြစ်သော အဆုတ်လေပြွန်ရောင်ရမ်းသည့် လူနာများနှင့်ဆက်စပ်မှုရှိကြောင်းဖော်ပြထားရာ ယခုသုတေသန၏တွေ့ ရှိချက်နှင့်လည်းကိုက်ညီကြောင်းတွေ့ ရပါသည်။

Reference: Kay Thi Aye, Aung Zaw Latt, Theingi Win Myat, et al. The 45th Myanmar Health Research Congress Programme & Abstracts: 48. (Third Prize for Basic Research Paper)

Abstract of Research Paper Published or Read Abroad by DMR Scientists

Clinical and Molecular Surveillance of Artemisinin Resistant Falciparum Malaria in Myanmar (2009–2013)

Emergence of artemisinin-resistant malaria in Southeast Asian countries threatens the global control of malaria.

Although K13 kelch propeller has been assessed for artemisinin resistance molecular marker, most of the mutations need to be validated.

In this study, artemisinin resistance was assessed by clinical and molecular analysis, including K13 and recently reported markers, *pfarps10*, *pffd* and *pfmdr2*.

A prospective cohort study in 1160 uncomplicated falciparum patients was conducted after treatment with artemisinin-based combination therapy (ACT), in 6 sentinel sites in Myanmar from 2009 to 2013.

Therapeutic efficacy of ACT was assessed by longitudinal follow ups. Molecular markers analysis was done on all available day 0 samples. True recrudescence treatment failures cases and day 3 parasite positivity were detected at only the southern Myanmar sites.

Day 3 positive and K13 mutants with higher prevalence of underlying genetic foci predisposing to become K13 mutant were detected only in southern Myanmar since 2009 and comparatively fewer mutations of *pfarps10, pffd,* and *pfmdr2* were observed in western Myanmar.

K13 mutations, V127M of *pfarps10,* D193Y of *pffd,* and T448I of *pfmdr2* were significantly associated with day 3 positivity (OR: 6.48, 3.88, 2.88, and 2.52, respectively).

Apart from K13, *pfarps10, pffd* and *pfmdr2* are also useful for molecular surveillance of artemisinin resistance especially where K13 mutation has not been reported.

Appropriate action to eliminate the resistant parasites and surveillance on artemisinin resistance should be strengthened in Myanmar.

Reference: *Myat Htut Nyunt, Myat Thu Soe, Hla Win Myint, et al.* Malaria Journal 2017, 16: 333.

News about Medicine & Health

How Does the New 'Gene-Altering' Therapy Fight Cancer?

A new type of cancer treatment that involves altering a person's genes – and could save children's lives- passed a major hurdle this week, when a U.S. Food and Drug Administration (FDA) panel recommended that the agency approve the therapy, The New York Times reported. But how does the treatment work? The treatment is for an uncommon type of leukemia, called B-cell acute lymphoblastic leukemia, that affects mainly children and young adults, according to the Times. The success rate of the treatment that was seen in a recent clinical trial was "astonishing," said Lee Greenberger, chief scientific officer of the Leukemia and Lymphoma Society (LLS). Greenberger was not involved directly in the research of the new therapy, but the LLS has contributed significant funding toward the work.

Leukemia is cancer of white blood cells, and it starts in the bone marrow, the soft material found in the center of bones that produces blood cells. Simply put, the new treatment works by rewiring a person's own immune cells to fight cancer.

To do this, doctors first remove millions of the immune cells, called T cells, from a patient's blood, Greenberger told Live Science. Normally, T cells help destroy infected or cancerous cells. These T cells are sent to a lab to be purified, and then are genetically engineered, Greenberger said. Scientists mix the cells with a virus that works as "vector" to insert a bit of genetic material into the cells' DNA. (Viruses commonly insert their DNA into living cells.) In this case, the vector that's used is an inactive form of HIV. After 15 to 25 days, during which the cells have started to produce the new protein that is encoded by the DNA, as well as grow and multiply the "gene-altered" T cells are infused back into the patient. "It's basically a one-time therapy," Greenberger said.

The genetic material that the virus inserted into the T cells makes the cells do two things when they are put back into the patient's body, Greenberger said. First, the T cells produce an antibody that sits on the cell's surface, he said. This antibody enables the T cells to recognize the cancer cells. Also, the new genetic material activates the T cells so that, when they arrive at the tumor cells, they not only recognize them but also latch on and destroy them. Once in the body, these "hunt and destroy" T cells multiply, so the patient ends up with an "army" of them in the blood, Greenberger said. The entire process of the T cells killing the cancer cells lasts a couple of weeks, Greenberger said. But when the treatment is working, it can cause some serious side effects, he noted. The side effects include a condition called cytokine release syndrome, which can cause fevers, and another condition called neurotoxicity, which can cause symptoms such as disorientation and an inability to speak. These side effects start as the T cells begin to kill the tumor cells, and when the tumor cells are depleted, the symptoms calm down, Greenberger said. During the entire process, however, the patient stays in the hospital and is monitored very carefully. In some cases, patients need intensive care.

In addition, some normal, noncancerous cells also carry the protein that the T cells are engineered to recognize. That means that the T cells will also kill these healthy B cells. "But people will survive without those [B cells]," Greenberger said. They do, however, need to get regular infusions of "immune globulins," which help to boost the immune system. The FDA panel's recommendation was based on the results of a clinical trial run by the drug company Novartis, The New York Times reported. In the trial, 63 patients were given the new therapy, and 52 of them, or 83 percent, went into remission-meaning the cancer went away. The other 11 patients died. Greenberger noted that the treatment is being recommended for leukemia patients who have no other options left. And based on the results of the research, "it works," he said. The FDA panel recommended that it be approved specifically for patients whose cancer has not responded to other treatments or whose cancer returned after treatment.

So far, the patients who were successfully treated with the new therapy sometime between April 2015 and August 2016 haven't had their cancer return and haven't developed any serious side effects, Greenberger said. Still, they'll need to be monitored over the long term to see if anything changes. Novartis plans on monitoring the patients for 15 years.

Source: https://www.livescience.com.
Contributed by Blood Research Division

Diet Drinks Linked to Increased Stroke and Dementia Risk

New question marks over the safety of diet soda have arisen following a study linking intake of artificially sweetened beverages to both stroke and dementia. The study, published online in Stroke on April 20, showed that consumption of one can of diet soda or more each day was associated with a three times increased risk for stroke and dementia over a 10-year follow-up period compared with individuals who drank no

artificially sweetened beverages. "There are many studies now suggesting detrimental effects of sugary beverages, but I think we also need to consider the possibility that diet drinks may not be healthy alternatives," lead author, Matthew P. Pase, PhD, Boston University School of Medicine, Massachusetts, told Medscape Medical News. I believe we need to rethink the place of these drinks. It is possible that the observation could be due to reverse causality, he noted. "It is not clear whether the diet sodas are causing stroke and dementia or whether unhealthy people gravitate more towards these drinks than healthier people. "If you already have cardiovascular risk factors, you are likely to have been advised to lower your sugar intake and so may move away from sugary beverages to diet drinks," Dr Pase said. "We did find that a higher intake of diet soda was linked to diabetes at baseline, but again we don't know which came first. Did the diet drinks increase the risk of developing diabetes, or did diabetic patients choose diet drinks as they have to limit their sugar intake?" The link between diet drinks and dementia became non-significant when adjusted for vascular risk factors. Dr Pase suggested this could be because the association may be mediated through vascular risk factors – artificial sweeteners could be increasing vascular risk factors. "Or it could just be that people with vascular risk factors drink more diet sodas, which is perfectly possible as they could have been advised to cut down on sugar." "There are many other studies suggesting harmful effects of sugar-sweetened drinks, and we did not have large enough numbers of people consuming sugary drinks in our current study for reliable information on this," Dr Pase said. "We had much larger numbers of individuals reporting intake of artificially sweetened drinks." Another study by the same group, published online in Alzheimer's and Dementia on March 5, shows a link between consumption of both sugar-sweetened and artificially sweetened beverages and reduction in brain volume in a middle-aged cohort. In the cross-sectional study, the sugary drinks, which included both soda and fruit juice, were also associated with worse episodic memory.

Source: http://www.medscape.com.
Contributed by Pathology Research Division

Protein may be Key to Ageing

British researchers say they have found an "ageing" protein within mitochondrial cells and tackling the protein might help to slow the effects of ageing on the body. Other recent studies have suggested that the accumulation of DNA mutations puts a limit on human life-span. But the researchers have conducted laboratory studies suggesting that growing levels of the protein, carbonic anhydrase, is linked to ageing. They believe that slowing its effects could slow the onset of degenerative diseases of the brain and the loss of muscle mass linked to age. They pin-pointed the protein by using 2D gel electrophoresis to separate out proteins found in the mitochondria. They then compared these in samples from young and middle-aged brains. They found that carbonic anhydrase was found in increased quantities in middle-aged brains. They tested this in laboratory conditions on nematode worms – finding that increased levels of the protein reduced life span. Researchers said what is really exciting about this development is that we have been able to surmise that the function of this protein is playing a role in the aging process within the cell.

This gives us a very promising start in working out how we can best target this protein within the mitochondria to slow the effects of aging in the body while limiting other unwanted side effects on the body. It could potentially offer a significant new avenue in both tackling degenerative illnesses and the general effects of aging on the body.

Source: www.englemed.co.uk.
Contributed by Blood Programming Division

Hepatitis B Vaccine Works well for People with Hepatitis C

People with hepatitis C are as likely as people without the virus to produce protective antibodies after receiving the hepatitis B vaccine, according to research published in The Journal of Infectious Diseases. Hepatitis B virus (HBV) infection can be prevented with an effective vaccine. Indeed, routine infant vaccination has reduced hepatitis B rates. The Centers for Disease Control and Prevention recommends the hepatitis B vaccine for people at risk who were not vaccinated as children. These include people with multiple sex partners, gay and bisexual men, people who inject drugs and medical providers and others who could be exposed on the job. Hepatitis B vaccination is also recommended for people living with HIV and those with chronic liver diseases, such as hepatitis C. This is important because people who already have another liver disease are at risk for more severe liver injury if they get hepatitis B. (There is currently no vaccine for hepatitis C.) Jiaye Liu, MD, of Shandong University in China, where hepatitis B is endemic (very common), and colleagues conducted a study to determine how well people with chronic hepatitis C would respond to the hepatitis B vaccine. This is a concern because some research suggests that having hepatitis C virus (HCV) might reduce immune function, including the ability to produce antibodies.

In this study, 79 people with untreated chronic HCV infection were each matched by age and sex with two community members without HCV.

All participants were given the standard schedule of three injections of the hepatitis B vaccine. One month after the last dose, participants' blood samples were tested for antibodies against hepatitis B surface antigen and various cytokines, which are chemical messengers that play a role in immune response.

People with and without hepatitis C had a similar likelihood of developing protective levels of antibodies against hepatitis B, and average antibody levels did not differ significantly between the two groups. Overall, about 96 percent of people with hepatitis C and about 99 percent of people without hepatitis C achieved some level of protection from the vaccine.

Among people with hepatitis C, about 46 percent showed normal or expected levels and 41 percent had high levels of HBV antibodies, while 10 percent had low levels and just under 4 percent had no detectable antibodies. Among people without hepatitis C, 39 percent and 49 percent had normal and high levels, respectively, while 10 percent had low levels and only about 1 percent had undetectable antibodies. None of these differences were statistically significant. There were also no significant differences in levels of the cytokines interferon-gamma and interleukin 2, IL-4, IL-5 or IL-6. Hepatitis B vaccination was generally safe and well tolerated, with no notable differences in adverse events observed between people with and without hepatitis C.

Source: https://www.hepmag.com.
Contributed by Technology Development Divisoin

Exercise in Early Life Affects Gut Flora, Promoting Better Health

Researchers from the University of Colorado-Boulder say they have discovered that exercising early in life changes the gut's microbial community so that it sets us up for better brain and metabolic activity during our lifetime. Their study is published in the journal *Immunology and Cell Biology* and is led by Prof. Monika Fleshner, of Boulder's Department of Integrative Physiology. She and her colleagues explain that our guts contain over 100 trillion microorganisms, many of which colonize our intestines shortly after birth. They are critical for our immune system's development and can add as many as 5 million genes to our overall genetic profile. As such, our gut flora has great power in influencing different aspects of our physiology. Gut bacteria form a natural protective barrier, making us less susceptible to infection and promoting better digestive enzyme activity. Additionally, some types of gut bacteria affect the expression of certain host genes that affect nutrient uptake, metabolism and the development of the enteric nervous system. Previous studies have suggested that the composition of our gut flora influences individual differences in immunity.

The gut is the 'second brain'

The human gut has often been referred to as the second brain, because of the enteric nervous system, which communicates back and forth with our actual brain and even triggers emotional shifts.

Fast facts about the gut

- Our gut contains at least 1,000 different species of known bacteria
- In total, our gut flora can weigh up to 2 kg (4.4 lbs)
- One third of our gut flora is similar among most people, but two thirds are specific to each of us, making our gut bacteria "like an individual identity card."

This latest study examines the effect of exercise on our gut flora and reveals that the earlier we engage in physical activity, the better. "Exercise affects many aspects of health, both metabolic and mental, and people are only now starting to look at the plasticity of these gut microbes," says Prof. Fleshner. "That is one of the novel aspects of this research." She and her team note that although the diverse microbial community that resides in our gut is fairly pliable throughout adult life – being influenced by diet and sleep patterns – our gut microorganisms are particularly malleable when we are young.

Source: http://www.medicalnewstoday.com.
Contributed by Nuclear Medicine Research Division

New Method Helps Fighting Future Pandemics

By developing a new technique for labeling the gene segments of influenza viruses, researchers now know more about how influenza viruses enter the cell and establish cell co-infections-a major contributing factor to potential pandemic development. Seasonal influenza viruses are estimated to cause 3-5 million cases of severe illness each year. Since the most severe infections are caused by influenza type A and type B viruses, the available vaccines provide coverage against these two types. However, influenza viruses are constantly evolving, which requires that vaccines are designed to match the circulating variants of the virus each year. Influenza viruses evolve by acquiring mutations in the viral genome or by a process called reassortment. Reassortment, which was responsible for the 2009 pandemic virus, occurs when one or more of the eight genome segments are exchanged between two different influenza viruses.

With current techniques it is not easy to make comparative analysis of influenza viruses with single mutations in their genomes, and it is extremely difficult to identify factors that limit the reassortment process between two influenza genomes that have infected the same cell. It was a procedure to analyze influenza virus infections in cells and lung tissue by labeling and visualizing the viral genome.

The specificity of the approach enabled the researchers to visualize the delivery of the eight influenza genome segments to the cell nucleus where the virus replicates, and to analyze co-infections by two influenza viruses that differed by single mutations. Using this technique, the researchers concluded that productive cell co-infections, which are necessary for reassortment, only occur when both viruses enter the same cell within two hours. This unique approach will make it easier to evaluate how new mutations affect influenza pathogenicity and help to identify the underlying properties that enable or restrict influenza gene segment reassortment. This can help the community predict the possibility of two strains reasserting into a potential pandemic virus. While further research is needed to achieve these goals, the current approach can already help to characterize and assess treatments aimed at inhibiting influenza entry into cells.

Through additional improvements the technique also has potential diagnostic applications for identifying influenza virus infections as well as many other pathogens.

Source: http://www.medicalnewstoday.com.
Contributed by Virology Research Division

Recent Arrivals at Central Biomedical Library (http://www.dmrlibrary.org)

1. ACP Annals of Coloproctology 33(3): June, 2017.
2. Consumer Health A Guide to Intelligent Decisions. Stephen B. 9th ed. New York: McGraw-Hill, 2013.
3. Circulation Journal 81(8): August, 2017.
4. Human Motor Development A Lifespan Approach. Payne V, Isaacs G, Larry D. 8th ed. New York: McGraw-Hill, 2012.
5. Physical Examination and Health Assessment. Jarvis. 7thed. Illinois: Elsevier, 2016.
6. WHO Bulletin 95(7): July, 2017.
7. WHO Newsletter August, 2017.
8. WHO Technical Reports Series 1005, 2017.

(၄၆) ကြိမ်မြောက် မြန်မာနိုင်ငံကျန်းမာရေးဆိုင်ရာသုတေသနညီလာခံ ဆေးသုတေသနဦးစီးဌာန

ကျန်းမာရေးနှင့်အားကစားဝန်ကြီးဌာနမှ ကြီးမှူးကျင်းပသည့် (၄၆) ကြိမ်မြောက် မြန်မာနိုင်ငံကျန်းမာရေးဆိုင်ရာသုတေသနညီလာခံကို ၂၀၁၈ ခုနှစ် ဧန်နဝါရီ လ (၈) ရက်မှ (၁၂) ရက်အထိ ဆေးသုတေသနဦးစီးဌာန၊ အမှတ် (၅)၊ ဇီဝကလမ်း၊ ဒဂုံမြို့နယ်ရန်ကုန်မြို့တွင် ကျင်းပရန် စီစဉ်ထားပါသည်။

ညီလာခံတွင် ကျန်းမာရေးသုတေသနစာတမ်းဖတ်ပွဲ၊ ကျန်းမာရေးသုတေသနပိုစတာပြပွဲနှင့် ကျန်းမာရေးပညာရပ်ဆိုင်ရာနှီးနှောဖလှယ်ပွဲနှင့် ဟောပြောပွဲများပါဝင်မည်ဖြစ်ရာ စိတ်ပါဝင်စားသူ ပြည်တွင်းပြည်ပမှပညာရှင်များအား ဖိတ်ခေါ်အပ်ပါသည်။ သုတေသနစာတမ်းတင်သွင်းရန်အတွက် စာတမ်းအကျဉ်းကို (၃၁-၁၀-၂၀၁၇) ရက် နောက်ဆုံးထား၍လည်းကောင်း၊ စာတမ်းအပြည့်အစုံကို (၃၀-၁၁-၂၀၁၇) ရက် နောက်ဆုံးထား၍လည်းကောင်း ဆေးသုတေသနဦးစီးဌာနသို့ ပေးပို့နိုင်ပါသည်။

ပြည်တွင်း၊ ပြည်ပ NGO အဖွဲ့အစည်းများ၊ ဆေးဝါးကုမ္ပဏီများ၊ ဓာတ်ခွဲခန်းကိရိယာ၊ ဓာတုပစ္စည်းတင်သွင်းသည့် ကုမ္ပဏီများနှင့် ပြည်တွင်း၊ ပြည်ပပုဂ္ဂလိက ဓာတ်ခွဲခန်းများ၊ ဆေးရုံများ၊ ဆေးခန်းများအားလည်း ဆေးပစ္စည်းကိရိယာပြခန်းများ၊ ပိုစတာပြခန်းများနှင့် ပညာရပ်ဆိုင်ရာဟောပြောပွဲများတွင် ပါဝင်ဆင်နွှဲနိုင်ပါရန် ဖိတ်ခေါ်ပါသည်။ အသေးစိတ်သိလိုပါက စာတမ်းတင်သွင်းမှုများအတွက် Email: sawsawsu@gmail.com နှင့် ဆေးပစ္စည်းကိရိယာပြခန်းများ၊ ပိုစတာပြခန်းများအတွက် Email: publicationdmr@gmail.com သို့ ဆက်သွယ်နိုင်ပါသည်။

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သို့

ကျန်းမာရေးနှင့်အားကစားဝန်ကြီးဌာနမှဝန်ထမ်းများအားဖြန့် ဝေပေးပါရန်မေတ္တာရပ်ခံအပ်ပါသည်။