ABSTRACTS

Updates in anticancer therapies with a focus on immunotherapies
Hari Deshpande

Cancer treatments have continued to advance over the last 20 years. New surgical, radiation and chemotherapy options have improved outcomes while reducing side effects, resulting in a better quality of life. One of the most exciting developments has evolved from a better understanding of the interaction of cancer with the immune system. New medications have been developed which appear to allow the host immune cells to control and sometimes eliminate cancers. Some of these have been approved by the Food and Drug Administration (FDA) for the treatment of patients with melanomas, non-small cell lung cancers and renal cell cancer. This talk will review some of the background and studies that have led to the use of these new agents.

The genetic basis for reading and language disorders
Jeffrey R Gruen

This talk will focus on the genetic influences effecting developmental disorders and specifically learning disabilities. Although the specific causes of learning disabilities have not fully been identified, recent advances in the fields of genetics and early intervention have provided new evidence into the neurobiological mechanisms that contribute to learning disabilities and other developmental disorders. Dr Gruen will address current genetic research and how science is informing understanding of learning disabilities and its relationship to other disorders.

Prospects for presymptomatic genetic screening and precision education
Jeffrey R Gruen

This talk will focus on the importance of early intervention for reading disability and approaches to improve response-to-intervention. Educational interventions vetted through randomized controlled trials are being deployed by many school systems, but tangible results remain elusive. Dr Gruen will discuss the feasibility of genetic screening for presymptomatic early diagnosis, population differences in allelic effects and the dawn of precision education whereby genetics can inform interventions tailored to the needs of individual students.

Autism and the effects of genes and the environment in Jamaican children
Maureen Samms-Vaughan

Autism is the most common developmental disorder in childhood, with a prevalence of 1 in 68 children; identifying the aetiological agent(s) is of public health importance. The genetic basis of autism is supported by high concordance rates among identical twins, increased risk among siblings and first degree relatives and association with known genetic conditions. The environment has been implicated because of higher risk among older parents, preterm and low birthweight babies and with drug use and infections in pregnancy, as well as exposure to toxins and pollutants. Environmental factors can produce genetic changes. Some studies have identified increased blood heavy metal concentrations as possible aetiological environmental factors, associated with oxidative stress. Glutathione genes can protect cells from oxidative stress. As Jamaica is known to have high levels of heavy metals in the soil, a case control study of 150 children with and 150 children without autism was undertaken to investigate the gene (glutathione) environment (heavy metals) interaction in Jamaica as a possible aetiological pathway. This paper reports on this work.

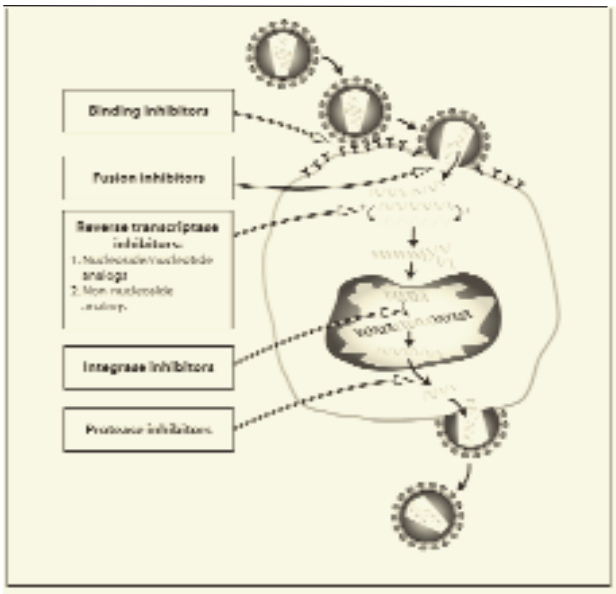
Update on management of paediatric HIV/AIDS
Russell Pierre

The scaling-up and uptake of antiretroviral therapy in resource-limited settings including Jamaica have been informed by evidenced-based guidelines developed by the World Health Organization (WHO), using the public health approach. In Jamaica, coordinated interventions for paediatric HIV/AIDS management comprising care, treatment, training, mentoring and outcomes-based research commenced toward the end of 2002, beginning first in Kingston and then throughout the rest of the island. The subsequent

significant impact of reduced morbidity, increased survival and improved quality of life among infected children, adolescents and youth is described. We are now faced with a maturing cohort of perinatally infected adolescents and youth who have challenges beyond antiretroviral therapy. Healthcare practitioners in resource-limited settings must therefore be cognizant of the management challenges in order to optimize the outcomes of this transitioning group.

Update on the expanding armamentarium of antiretroviral agents and new combination therapies
Elijah Paintsil

The first agent to demonstrate anti-HIV activity was zidovudine (AZT, a nucleoside reverse transcriptase inhibitor [NRTI]). Since the approval of AZT in 1987 by the Food and Drug Administration (FDA), over 26 agents have been approved for treatment of HIV. Current agents exploit differences between the structures and function of viral and human proteins to achieve selectivity of antiviral action. They mostly target HIV life cycle as illustrated in the Figure. The objectives of this lecture are that attendees will be: 1) familiar with HIV life cycle and the main target of available antiretroviral agents; 2) able to appreciate the mechanism of action of antiretroviral agents; 3) familiar with the main mechanisms of resistance to current agents; 4) able to appreciate why we cannot achieve cure for HIV infection with current agents and 5) familiar with the need to have optimal adherence to antiretroviral drugs and new user-friendly fixed-dose combination regimens aimed at improving efficacy and treatment compliance.



Adopted from: Paintsil E, Cheng YC. Antivirus agents. In: Schaechter M, ed. Encyclopedia of Microbiology. 3rd ed, Vol 4. San Diego and London: Elsevier: 2009: 223–57.

Transitioning HIV-infected children into adult care – Voices of Jamaican adolescents and their healthcare providers
Flavia De Souza

Successful public access to antiretroviral therapy in resource-limited settings (RLS) has resulted in survival of HIV perinatally-infected children into adulthood. However, there are few studies or guidelines on transition of care in RLS, where 90% of HIV-infected children reside. We aimed to characterize the current landscape of the transfer process of HIV-infected adolescents from the perspectives of both the adolescents and providers in one such RLS, Jamaica. We conducted in-depth semi-structured interviews of 18 HIV-infected adolescents in paediatric care at the University Hospital of the West Indies and 21 healthcare providers from various clinics across Jamaica. We audiotaped, transcribed verbatim then organized and coded transcripts using the software ATLASti. We analysed the data using the grounded theory approach. Five themes emerged: 1) Adolescent patients articulated psychosocial benefits associated with paediatric care. Paediatric clinics were like families who provided care-taking and developmental support in addition to HIV care. 2) Both adolescent patients and paediatric providers felt the quality of care adolescents received in the paediatric clinic was better than it would be in the adult setting. 3) Given the social significance of paediatric clinics in participants' lives, alongside the concerns regarding adult care, there was rootedness in the paediatric clinic and apprehension about transfer to the adult clinic. 4) In the face of the national policy of transfer to adult care at 13 years, no formalized national structures or services for adolescents, and the challenges HIV-infected adolescents experience, some physicians sought to bridge the gap between childhood and adulthood by providing adolescent-centred services for their HIV-infected clients. 5) Narratives speak to the transfer as a critical juncture in adolescents' care and a transition as a holistic and gradual process, an element of which is the transfer. A formal, culturally and developmentally appropriate process of transition is necessary to manage the fear and apprehension both providers and adolescent patients experience when confronted with the transfer from paediatric to adult care.

Antiretroviral therapy toxicity: Mitochondrion, conductor of the orchestra
Elijah Paintsil

The advent of antiretroviral therapy (ART) has reduced HIV-associated morbidity and mortality significantly. However, the therapeutic benefit of ART is often limited by delayed toxicity. The prevalence of ART-related toxicities is as high as 47% and 27% for clinical and laboratory manifestations, respectively. As ART use increases worldwide,

the prevalence of ART-related toxicities will increase. The main objectives of this lecture are 1) to help attendees to be familiar with the main manifestations of ART-induced toxicity: (i) 'traditional' mitochondrial toxicity, (ii) end organ disease and (iii) metabolic syndrome and 2) to discuss the challenges in the diagnosis and management of ART-induced toxicities.

'Traditional' mitochondrial toxicity: During the era of zidovudine (AZT, a nucleoside reverse transcriptase inhibitor [NRTI]) monotherapy, some patients developed skeletal muscle myopathies. Histological examination of their muscle biopsies revealed mitochondrial pathologies. These patients had decreased amounts of mitochondrial DNA (mtDNA), RNA and proteins in their muscles. With widespread use of NRTIs, other clinical manifestations such as lactic acidosis, lipodystrophy, peripheral neuropathies, cardiomyopathies and pancytopenia were observed. These manifestations were attributed to the inhibition of polymerase gamma (Pol-γ) by NRTIs, leading to depletion of mtDNA and subsequent mitochondrial dysfunction.

End organ disease: Compared with HIV-uninfected individuals, HIV-infected patients are at increased risk for chronic conditions such as cardiovascular disease (CVD), renal disease, bone disease and diabetes mellitus. Cardiovascular disease is responsible for up to 15% of HIV-associated deaths. In the Strategies for Management of Antiretroviral Therapy (SMART) study, complete suppression of viraemia with ART did not eliminate the risk of CVD. Renal diseases: components of ART such as NRTIs, NNRTIs and protease inhibitors have been associated with renal dysfunction. Bone disease: compared with HIV-infected treatment-naïve individuals, HIV treatment-experienced individuals had a 2.5-fold greater risk of low bone mineral density (BMD). Diabetes mellitus: the prevalence of diabetes mellitus and insulin resistance is high among HIV-infected individuals.

Metabolic syndrome: Metabolic syndrome (MetS) is defined as having at least three out of five of the following components: elevated fasting glucose, hypertension, elevated waist circumference, elevated triglycerides, low high-density lipoprotein (HDL) cholesterol 40. The prevalence of MetS among HIV-infected patients globally ranges from 17.0% to 45.4%.

Survival of children with paediatric HIV infection in Jamaica

Shashikala Gowda

Antiretroviral therapy (ART) in HIV-infected children has resulted in significant reduction in HIV-attributable morbidity and mortality in affected children. We aimed to determine the survival pattern of ART-initiated perinatally HIV-infected children enrolled in Paediatric Infectious Diseases clinics, Kingston, Jamaica, over a decade (2003–2013). Data on children initiated on ART during January 2003 to December 2013 were collated from the cohort of vertically infected children consecutively enrolled in the Kingston Paediatric and Perinatal HIV/AIDS Programme. Demographic, clinical, immunological and virological characteristics and outcomes were identified. Multivariate analyses (Cox regression model) determined factors associated with survival. All tests were two-tailed and were considered statistically significant at a level of $p < 0.05$ (SPSS version 20).

Antiretroviral therapy was initiated in 289 vertically infected children during the period. Demographics, CDC class, laboratory studies, hospitalizations and duration on first-line, second-line and salvage therapy at the end of the period are reported. Mortality rates are reported and characteristics compared for those who survived *versus* who died. We conclude that ART has improved the survival of HIV-infected children in Jamaica (comparable to international cohorts), while enhancing immune recovery and by extension their quality of life. Infected children are now surviving into early adulthood and healthcare providers and caregivers must now focus on holistic therapy to assist their transition to independent adults.

Paediatric infectious diseases influencing public policy from USA to Jamaica – Pertussis, rotavirus and eliminating mother-to-child transmission of HIV/AIDS

Celia DC Christie

This paper highlights how the academic, in-hospital practice of paediatric infectious diseases has influenced public policy during each of the three decades since the speaker completed her paediatric infectious diseases fellowship with her mentors at Yale University. While at the Cincinnati Children's Hospital, the epidemic of pertussis (whooping cough) which was identified in highly immunized children in Greater Cincinnati is reported. The management of the pertussis outbreak in hospitalized children, employees and visitors to the hospital is summarized. Results of policies that were implemented to identify and prevent pertussis in Cincinnati schools and day care centres are presented. Results of an acellular pertussis vaccine trial (*vs* meningococcal vaccine) in hospital employees during the epidemic are outlined. The speaker concludes by showing that the molecular epidemiology of *Bordetella pertussis* strains circulating in the community preceding, during and after the outbreak confirmed that the outbreak was not related to a clonal expansion of a single *B pertussis* strain. While in Jamaica at The University of the West Indies (UWI), in the second decade, the speaker led the implementation of the Jamaican arm of the Merck-sponsored international pentavalent rotavirus vaccine trial in over 1800 infants, who received three doses of study vaccine, or placebo. The clinical trial showed that the vaccine was efficacious, without the development of attributable complications of acute

infant intussusception or death. In the second through third decades, the speaker has also been collaborating from The UWI with the Jamaican Ministry of Health to lead the implementation of a programme to prevent and then to eliminate mother-to-child transmission (pMTCT) of HIV/AIDS. Working collaboratively, pMTCT rates have trended downwards from 25–30% to about 2%.

The worm wars: Can mass drug administration control parasitic diseases?
Michael Cappello

Intestinal nematodes (*Ascaris lumbricoides*, *Trichuris trichiura* and hookworms) infect nearly two billion people worldwide, disproportionately impacting poor people from resource-limited countries who lack access to adequate sanitation. Over the past decade, substantial resources have been mobilized to reduce the global burden of disease caused by roundworms, most of which have been allocated to scale up mass drug administration (MDA) of benzimidazole drugs in high-risk populations. Despite the potential benefits, questions have been raised about the long-term impact of MDA, as well as the overall potential for chemotherapeutic interventions to control and/or eliminate these endemic infections. Follow-up analyses of data from a landmark deworming study suggest that the benefit of school-based deworming may not be as robust or reproducible as previously reported. In addition, the variable effectiveness of benzimidazole drugs against the most common intestinal nematodes, as well as growing concerns about the risk of emerging benzimidazole resistance with repeated exposure has led to concern about the value of MDA as an effective public health intervention. In Kintampo North Municipality, Ghana, albendazole exhibits poor effectiveness against hookworm, as measured by cure rate and fecal egg reduction rate. Studies have identified certain host factors associated with response to treatment, as well as revealed the presence of genetic markers of benzimidazole resistance in hookworms. This seminar will review the current challenges to global control of intestinal helminths, as well as present data from laboratory and field based studies on hookworm epidemiology and deworming treatment response in Ghana.

The menace of antibiotic resistance
Robert Baltimore

In 2014, the Centers for Disease Control and Prevention named the four greatest public health threats. They were: the emergence and spread of new microbes, the globalization of travel and food supplies, the rise of antibiotic-resistant infections, and inadvertent or intentional release of pathogens and bioterrorism. Since the rise of antibiotic-resistant infections can be related to travel and problems having to do with food supplies, as well as the emergence of new pathogens and inappropriate antibiotic use, this problem may actually be the number one public health threat worldwide. In my opinion, the degree to which you are concerned about inappropriate antibiotic use is determined by the degree of your concern regarding the development of antibiotic resistance.

Are we entering a post-antibiotic era? "*It appears that the moment we all have feared might have arrived even sooner than we had expected, and the world might already have entered the post-antibiotic era. According to recent news reports from New Zealand, that geographically isolated and tightly quarantined island country, in July it experienced its first case – and resulting death – of a patient infected with a bacterial pathogen resistant to every available antibiotic.*"

The major practices we believe are responsible for the development of antibiotic resistance include:

- Increased use of severely myelosuppressive regimens for cancer and inflammatory diseases.
- Increased adoption of transplantation of marrow and solid organs with immune suppression.
- Increased availability of broad spectrum antibiotics in developing countries.
- Use of antibiotics in animals and vegetables grown for foods and industry.
- Indiscriminate use of antibiotics for prophylaxis and minor illnesses.

However, there are proposed methods for reducing the risks for the development of antibiotic resistance and they include:

- Educate physicians and the public about the appropriate uses and misuses of antibiotics.
- Reduce unnecessary use for colds, simple sinusitis and chronic middle ear effusions.
- Limit non-prescription over-the counter sales of antibiotics.
- Reduce prophylactic uses of antibiotics.
- Reduce the use of antibiotics in animal feeds.

In the hospital:

- Limit use of prophylactic antibiotics to surgical procedures where impact is significant.
- Limit duration of surgical prophylaxis to strictly perioperative duration.
- Limit use of broad-spectrum antibiotics by establishing an appropriate approval process.
- Limit duration of antibiotic use, in hospital and out of hospital.

Sepsis and sepsis response syndrome in Jamaican children
Kathryn Swaby

Infectious diseases, sepsis and the spectrum of illness beyond this account for a significant portion of paediatric hospitalizations, morbidity and mortality globally. Though generally under-reported, the current global prevalence of severe sepsis is estimated to be 8% with an in-hospital mortality rate of 25%. Respiratory illnesses are the most common cause of sepsis globally and mortality is highest in neonates and infants. While more research has been done in this area since the advent of the Surviving Sepsis campaign, information from developing countries, and in particular Jamaica, has been limited. The prevalence of sepsis, severe sepsis and septic shock in Jamaican children is not known.

This study is a descriptive study of patients with infectious diseases admitted to the paediatric wards between 1 month and 16 years of age. It will review charts for subset of patients with presumed and confirmed infections and will identify the proportion of patients who have sepsis, severe sepsis and septic shock by both physician diagnosis and the consensus criteria. It will describe characteristics of patients with infectious diseases and the spectrum of sepsis in the paediatric population at the University Hospital of the West Indies (UHWI). This is a minimal risk study with data safeguards and ethical approval will be requested from the UHWI ethics committee.

Febrile neutropenia in Jamaican children
Raja Dandamundi

This is a descriptive retrospective cohort study of epidemiologic data in Paediatric Oncology patients with febrile neutropenia treated at the University Hospital of the West Indies between January 2012 and December 2015. We will be evaluating each febrile neutropenic episode in terms of duration, clinical and microbiological characteristics, investigations done and outcome. We also wish to identify which malignancies are at high risk for febrile neutropenia and implement appropriate strategies accordingly. We would like to document the extent of filgrastim use with these episodes and assess its impact. While vancomycin and methicillin resistance are relatively uncommon in the local setting, we aim to determine the prevalent local pathogens and antibiotic sensitivities of these isolates. This study will be used as a platform for improving care of these patients.

Neonatal sepsis at Yale: Eight decades and counting
Matthew Bizzarro

Yale-New Haven Hospital has maintained the longest continuous-running, single-centre database of neonatal blood stream infections (BSI) in the United States of America, beginning with Ethel Dunham's case series from 1928–1933. The documentation and analyses of evolving centre-specific data through publication of seven separate case series has greatly assisted in the formulation of strategies to treat and prevent sepsis in the neonatal intensive care unit (NICU) population, and has allowed tracking of the emergence and disappearance of certain pathogenic organisms from the NICU landscape.

This presentation will provide an overview of the history of neonatal BSI at a single institution from 1928–2015, and will describe major changes in the epidemiology, causal organisms and population at risk. These data will be compared and contrasted with regional epidemiologic data and, based on this information, continued efforts to improve the evaluation, treatment and prevention of infections in the newborn population will be described.

Investigating congenital diarrhoeal diseases: Bench to bedside
Nadia Ameen

Microvillus inclusion disease (MVID) is a rare but life-threatening inherited disease that was first recognized by Davidson in 1978. Affected newborns succumb to rapid death due to severe secretory diarrhoea within hours of birth. Microvillus inclusion disease clusters in the Middle East and Navajo Indian populations in the United States of America (USA) and is associated with consanguinity. Stool volumes are greater than 125 mL/kg/day with elevated levels of chloride (Cl^-) and sodium (Na^+), resulting in diarrhoea that is often worse than cholera. Death is inevitable unless patients receive continuous support with parenteral nutrition for life or undergo bowel transplantation. There is no specific therapy to treat MVID. Secretory diarrhoea in MVID is associated with specific pathologic features in the intestine including villus atrophy, disordered brush border and microvillus-containing inclusions (MVIs) that are characteristically found within the apical cytoplasm of mature enterocytes. In 2008, loss of function mutations in Myosin Vb (Myo5b), an actin binding motor, was found to be responsible for MVID. Myosin Vb regulates the targeting of apical membrane proteins in epithelial cells and the enterocyte brush border. How loss of Myo5b leads to secretory diarrhoea is unknown. We developed crypt and villus enterocyte cellular models of MVID using shRNA silencing of Myo5b and, in conjunction with MVID human intestine, we examined the localization and function of the

major transporters responsible for salt and water transport. We found that Na^+ absorption (NHE3) and Cl^- absorption (DRA) were down-regulated, while Cl^- secretion (CFTR) was unopposed, a profile that completely accounts for the secretory diarrhoea in patients with MVID. Pharmacologic inhibition of CFTR reduced fluid secretion in MVID models, supporting the first potential pharmacologic treatment for this life-threatening disease.

Management of Hepatitis C infection: Today and tomorrow
Joseph K Lim

Chronic hepatitis C virus (HCV) infection is well-recognized as a common blood borne infection with global public health impact, and is associated with significant morbidity and mortality. An estimated 170 million people are chronically infected with HCV worldwide. The prevalence of chronic HCV is approximately 1.8% in the United States of America (USA) and between 0.3% and 1.7% in Jamaica. Chronic HCV represents an indolent infection which is associated with chronic inflammation and progressive liver fibrosis which may lead to the development of liver cirrhosis and its complications, including liver failure (ascites, encephalopathy, variceal bleeding), liver cancer, need for liver transplantation and liver-related mortality. Screening for Hepatitis C is recommended in individuals with risk factors such as prior injection or intranasal drug use, blood transfusions before 1992, organ or tissue transplantation, haemodialysis, tattoos or body piercings, high-risk sexual contact or accidental needlestick exposures. In the USA, over 75% of all individuals with chronic HCV were born between 1945 and 1965, known as the Baby Boomer cohort. On this basis, since 2013, the Centers for Disease Control and Prevention (CDC) and the US Preventive Services Task Force (USPSTF) recommend that all individuals born within these years undergo a one-time HCV antibody test to screen for HCV. All patients with chronic HCV should undergo laboratory testing to characterize their infection, including HCV genotype, HCV viral load (RNA), HIV antibody, assessment of immunity to HAV and HBV, as well as assessment of liver fibrosis through a liver biopsy or non-invasive fibrosis assessment tools. In contrast to prior treatment strategies which incorporated a chemotherapy-like combination of interferon injections and oral ribavirin for one year, which were associated with severe adverse effects and low efficacy, current HCV treatment is based on all-oral, interferon-free combinations of directly acting antiviral agents (DAAs) of two to six months duration which are associated with improved tolerability and high rates of viral eradication, also known as sustained virologic response (SVR). In this lecture, we will discuss current and future treatment strategies with all-oral DAA regimens aimed at optimizing rates of SVR, which in turn is associated with a reduced risk of liver cirrhosis, hepatic decompensation, need for liver transplantation and liver-related and all-cause mortality.

Amino acid metabolism, childhood growth and the risk of cardiovascular abnormalities
Marvin Reid

This presentation will examine the limits of adaptation of children to the twin burden of inflammation and malnutrition, focussing on amino acid metabolism. It will also explore how these adaptive responses increase susceptibility to cardiovascular diseases.

Comparison of pregnancy in the adolescent and mature woman
Minerva Thame

Adolescent pregnancy still remains a major health concern worldwide. It is associated with a high prevalence of low birthweight infants and premature births which are significant contributors to an increased perinatal mortality rate.

Although a pregnant adolescent may look the same physically as an adult pregnant woman, their pregnancies are very different in many aspects. These differences may have long-term consequences. In a prospective study conducted on 425 pregnant women including 200 adolescent girls and 225 mature women, the anthropometric measurements of weight, height, triceps, biceps, subscapular and suprailiac skinfolds as well as blood pressure and urinalysis were performed at the first antenatal visit (approximately 10–12 weeks gestation) and repeated at 15, 25 and 35 weeks gestation. Anthropometric measurements of the newborn were performed at birth.

This study showed significant difference between anthropometry and skinfold thickness at the first antenatal visit, 15, 25 and 35 weeks gestation between the adolescents and the mature women. Percentage fat, fat mass and lean body mass calculated using the skinfold thickness were significantly lower in the adolescents compared to the mature women ($p < 0.0001$). However, a greater gain was seen in these measurements throughout the pregnancy in the adolescents compared to the mature women ($p < 0.0001$). Regression analyses showed that the gain in lean body mass in the adolescent was the most important predictor of birth anthropometry.

This study therefore showed that body composition differs in pregnancy between adolescents and mature women and if adequate weight and lean body mass are attained, it impacts positively on birth size irrespective of age.

The adolescent pregnancy has its consequences and in a continuation of the study to six weeks postpartum, adolescent girls, although having significantly lower measurements of weight and skinfold thickness at six weeks post-

partum, retained more weight ($p = 0.0003$) and a greater percentage body fat ($p < 0.002$) than the other women. In multiple regression analyses, 0.982 kg more fat was retained postpartum in the adolescents compared with the other women, while there was no significant difference in lean body mass retained between the two groups. These findings suggest that the adolescent may be at greater risk for the development of obesity in later life, as with each pregnancy, weight is usually retained and the adolescent would have the potential for a longer reproductive life.

Memories of Ebola preparedness in a resource-limited setting – Jamaica
Tamara Thompson

In the latter part of 2014, the world witnessed the unfolding of an unprecedented Ebola outbreak which spanned several continents. Ebola virus disease thus moved from a place of relative obscurity to one of prominence in the minds of many, prompting many countries to go into a heightened mode of preparation to prevent possible introduction of the infection and to manage any suspected or confirmed cases. The Caribbean, a tourist haven, was vulnerable to the threat of Ebola. The Jamaican Government, like many others in the Caribbean, heightened efforts to protect its borders, improve national awareness and strengthen the capacity of the existing medical infrastructure. All of these developments took place on the background of severe resource constraints.

This talk gives an insight into the significant collaborative efforts of an elected multidisciplinary healthcare team (the Ebola Preparedness Committee) which, under the mandate of the Ministry of Health of Jamaica and the University Hospital of the West Indies (UHWI), worked tirelessly to address the response of the UHWI as a potential point of care and treatment site for suspected and confirmed Ebola cases. The challenges faced by the team and how these were circumvented are also highlighted.

Severe acute respiratory infections in hospitalized children during Influenza A H1N1 circulation in the community
Sukiena Anderson-Gabriel

During the year 2016, between January and March, an increase in influenza activity was noted in North America, with Influenza A (H1N1) predominating. In the Caribbean, however, low influenza and other respiratory virus activity were reported in most countries, with Jamaica and Puerto Rico being the exceptions. In this study, an audit was done assessing the number of admissions with severe acute respiratory infections (SARI) to the Paediatric wards at the University Hospital of the West Indies between February and March 2016 during an influenza outbreak in the community. Hospitalized children with SARI and their parents/guardians were cohorted on one ward during the height of the SARI outbreak. The increase in SARI paediatric hospitalizations was likely due to the increased circulation of Influenza A (H1N1) in the community. This audit reports on the underlying illnesses and possible risk factors, clinical presentation, duration of hospitalization, management, complications related to the illness in these children and also the limitations faced in achieving a timely diagnosis. Annual influenza vaccinations would likely reduce influenza-attributable illnesses in the community, in the future.

Dengue fever epidemic in Jamaican children – Clinical outcomes
Tarik Davidson

Dengue fever is endemic to Jamaica, with exponential rates of infection in successive outbreaks. The absence of local data and the potential for massive outbreaks in a country where one-third of the population are children formed the basis for this study. In this retrospective study, we evaluated the outcome of dengue infection in paediatric patients (< 15 years) admitted to the University Hospital of the West Indies (UHWI), Kingston, Jamaica, during the islandwide dengue fever outbreak of 2012. Of 134 hospitalized children with physician-diagnosed dengue who were included in this study, 88% had a confirmatory laboratory test. The majority of the cases were uncomplicated and 10% had severe dengue. Risk factors, associations, co-morbidities, duration of hospitalization, dengue-attributable morbidity and mortality are compared for those with uncomplicated *vs* severe dengue cases. The implementation of efficacious and safe dengue vaccines, when approved by the international regulatory agencies, will likely mitigate dengue-attributable morbidity and mortality in children in the future.

Chikungunya virus epidemic in Jamaican children – Clinical features and public health effects
Roxanne Melbourne-Chambers

Jamaica experienced the Chikungunya virus (CHIK V) epidemic with the first autochthonous case reported on August 5, 2014. Within a few months, as the epidemic started in the eastern parishes of Portland and St Thomas and spread westward across the island, there was an explosive increase in the numbers of persons experiencing fever, joint pains and skin rash which overwhelmed clinical services, shut down schools and paralysed the labour force.

We reviewed the clinical features in over 200 children diagnosed with CHIK V at the Bustamante Hospital for Children (BHC) and the University Hospital of the West Indies (UHWI) in Kingston, Jamaica, over a two-month

period during the epidemic. We found that there was an exponential increase in Emergency Room visits and hospital admissions of children with fever and rash or joint pain. Newborns (infected perinatally) and neonates were disproportionately affected and, along with others aged less than six months, were most likely to be hospitalized. They presented primarily with sudden onset of high fever, rash, irritability and loud groaning. Those aged six months to six years presented with fever and seizures, maculopapular rash, arthralgia and arthritis. Those aged greater than six years presented with fever, headache, joint pains and maculopapular rash. There were a few cases of encephalitis and Guillain-Barré syndrome. Although the media reported deaths in children attributable to CHIK V, none occurred within the population reviewed. The increased numbers of children presenting with CHIK V quickly overwhelmed laboratory services, clinical staff and physical space at these two institutions.

In summary, CHIK V had a significant economic and public health impact on Jamaica with significant morbidity, school absenteeism, man hours lost from the labour force and increased demand for pharmaceuticals, laboratory services, clinical staff and physical space. This experience has shown that Jamaica must allocate adequate resources in order to appropriately manage new and emerging epidemics.

Zika virus emerging epidemic in Latin America and the Caribbean – Epidemiology, clinical features and preparedness

Celia DC Christie

Zika virus (ZIK V), an arbovirus of the Flavivirus family, is spread by the bite of the *Aedes aegypti* mosquito, and has spread explosively through the Americas since it was identified in Brazil in early 2015. As of April 14, 2016, some 43 countries worldwide are reporting local transmission and 35 of these countries are in the Americas and the Caribbean. Over four million cases of Zika infection are projected to occur in the Americas this year. A "public health emergency of international concern" was declared by the World Health Organization on 1st February 2016 to elucidate the links between ZIK V and congenital microcephaly and Guillain-Barré syndrome.

Most ZIK V infections are asymptomatic or mild, with the presentations of generalized maculopapular rash, joint and muscle pain, headache, non-purulent conjunctivitis and low grade or no fever. However, prenatal ZIK V infection has now been conclusively linked as a cause of adverse pregnancy outcomes, including severe microcephaly and other brain lesions. Case reports, case series and epidemiologic studies of microcephaly associated with laboratory confirmed ZIK V infections confirm that the timing of ZIK V infections and severe microcephaly occurs in the first or second trimester of pregnancy. The congenital ZIK V syndrome appears consistent with the fetal brain disruption sequence with microcephaly, redundant scalp skin, eye findings, arthrogryposis and clubfoot. The rare exposure to the rare outcome of microcephaly has been confirmed in travellers who spent limited time in areas with active ZIK V transmission. Zika virus has also been isolated from glial cells and neurons of newborns with microcephaly. Zika virus infection is also conclusively linked to Guillain-Barré syndrome using case-control methodologies. These patients present with acute motor axonal neuropathy and rapid evolution of their disease. Clinical features include generalized muscle weakness, inability to walk, facial nerve palsy and increased cerebrospinal fluid proteins.

Countries are preparing by educating their populations about ZIK V and vector control, stopping the breeding of mosquitoes in stagnant water, while others are releasing the *Wolbachia*-infected *Aedes aegypti* mosquito as a research initiative to eradicate the mosquito. Other countries are increasing intensive care bed capacity to better manage patients with Guillain-Barré syndrome. Important research questions to be answered include understanding the full spectrum of birth defects caused by congenital ZIK V infections, clarifying the risks to infants who are born to women who are exposed to ZIK V at different time points during pregnancy and identifying the factors that may modify pregnancy outcomes (including previous infection with dengue, or chikungunya fever). These questions could be answered through large multi-country research consortia, like those being funded by the European Union and the United States National Institutes of Child Health and Human Development. Finally, a ZIK V vaccine is urgently needed to deflect the development of future generations of children, worldwide, with significantly diminished neurodevelopmental potential.