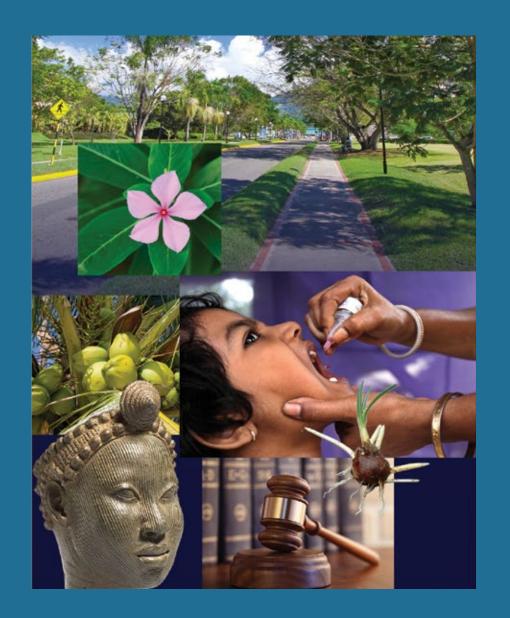


RESEARCH
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2017





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## FOREWORD

Our region's development imperative clamours for meaningful collaboration between the public and private sectors and academia. Among the various concerted efforts to advance this collaboration, the University of the West Indies, Mona Campus takes advantage of its annual Research Days, and with it, its publications, Research for Development and Best Research Awards, to expose some of the seminal research projects, undertaken during the year, that advance solutions to our nation and region's complex development needs.

This publication features the researchers' (including research students') examination of issues that directly impact economic growth - among them, underachievement in our educational system

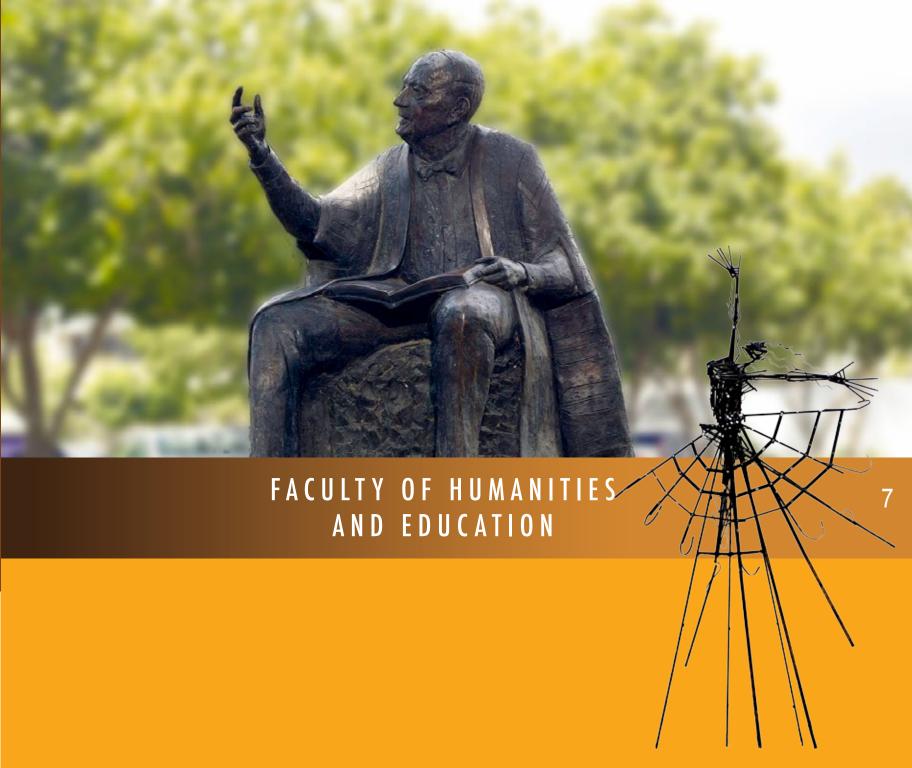
related to language, science and teacher education, the law and our institutions, community development, our population's health and wellness, ICT challenges in small businesses, environmental deterioration, and underdevelopment of local industries - and posits solutions that are transformative and solution-oriented.

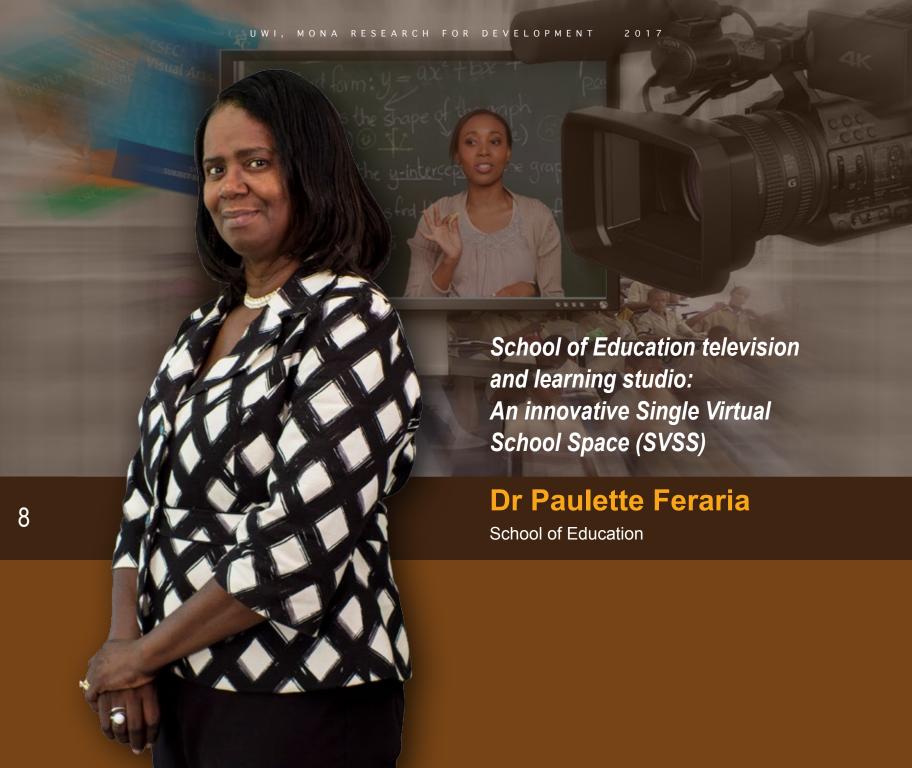
Of course, we are pleased to acknowledge the continued financial support of our public and private sector partners to our university's research, and its related Research Days' activities. We hope that more stakeholders will come on board to enable us to build our research capacity towards greater and more urgent national and regional development.

**Archibald McDonald** 

Professor of Surgery
Pro Vice-Chancellor and Principal







There has been much talk about studentcentred classrooms and the value of enabling students' control of their own learning. Such notions, even with good intentions, create tensions in classrooms as the power relations between teachers and students are never equal. Students expect teachers to take charge and to teach; teachers expect students to learn and to know who is in charge! Everyday classroom spaces are clearly not ideal for teachers to become learners and learners to be teachers in role reversals that lead to both learner and teacher empowerment. Teachers of English in training and teachers pursuing postgraduate degrees at The University of the West Indies, Mona Campus have carved out a new dialogic space in their dual roles as teachers and learners preparing to teach English Language and Literature in Creolespeaking environments.

This Single Virtual School Space (SVSS) in the form of a computer technology-enhanced television studio that links the School of Education with Caribbean classrooms was birthed out of a five-year intervention in which teachers, pursuing undergraduate courses that support the delivery of the CSEC English syllabus, planned, staged and filmed their assignments for assessment in the form of conferences, Readers Theatre, seminars and workshops before live audiences of 1550 students in selected schools. The films were usually edited into 30-minunte sessions and taken to local cable television operators in confined geographical spaces, for dissemination as examination revision sessions. There was need for a physical, but wall-less, space on the Mona Campus that merge teachers learning, students learning, syllabus inquiry, research and innovation. This search gave birth to the

appropriation of the television studio into a place with pedagogical significance for the professional development of teachers, and the improvement of student learning.

Today, the SVSS breaks away the walls of fixed classrooms and geographically confined cable television spaces, and transforms university classrooms into televised-theatre-settings which engage secondary school students preparing for CSEC and CAPE English and their teachers in syllabus inquiry, innovation and experiment. The SVSS now facilitates the dissemination of information and engagement with a larger audience through live streaming and the archive of films on the SVSS webpage.

## The television learning studio: Philosophy, pedagogy and practice

This new television pedagogical space is cognitive, professional and reflective in



nature, and synchronises teaching, learning and research in a university setting with teaching and learning in everyday classrooms. It is framed by the belief that the television is an arena for teaching and learning that promotes best quality practices and performances from teachers and students. The use of the camera in teachers' professional space places their practice under the microscope of self-scrutiny, and to be scrutinised by others. This is nurturing a teacher-in-built quality assurance mechanism in the search for new ways of knowing and doing. These new teacher-learner dispositions are providing new knowledge and insights for practice that map curriculum and syllabus goals and expectations with the closing of gaps in student learning and achievement .This synchronisation of curriculum experiences through film is nurturing a wall-less classroom practice that is pedalled and sustained by a pedagogy of enjoyment and engagement in real-life learning contexts.

# Building a performance rich environment that promote visual literacy in the study of literature

The concept of a performance rich-classroom environment has emerged out of teachers' and students' explorations with process drama in the staging of literature texts on the CSEC syllabus for filming. These explorations inject a performance quality in novels, plays, short stories and poetry to give students greater access to texts through listening, speaking and viewing. This has strengthened the need for building visual literacy in the study of literature in Creolespeaking environments where students are not motivated to read the texts selected for study. The television provides a space for reading into texts and seeing through texts. These new 'reading' dispositions are modelling and paving the way for greater learner empowerment and autonomy in regular classrooms. Schools participating in the televised events are given pre-conference, peer-teaching tasks that engage them in the stage productions alongside teachers.

## New ways of doing and new sites for teacher training and professional development

In 2012, the undergraduate course, The Teaching of Literature the Secondary School, which charted this innovation, was awarded The UWI Best Practice in Education Content and Quality for the Caribbean as part of the Vice Chancellor's initiative for institutional

excellence. The best-practice findings were applied to other undergraduate and postgraduate courses: exemplary in quality to produce superior results; efficient resources; engagement of internal and external stakeholders; documentation, utility and recognition beyond the practice site. This has exposed 1, 226 student teachers of English, as well as teachers beyond practice site, to the innovative pedagogy. This SVSS teaching-learning space now twins media education with language education. It is widening the scope of the service learning that is built into university undergraduate and postgraduate programmes in language education. All courses which engage teachers in the delivery of CSEC and CAPE English have assessment components that involve the use of the television studio as a platform for engaging students in skills development for syllabus mastery, or for sharing classroom research that inform teacher pedagogy in the teaching of English and teaching in English in other subjects. The new Bachelor in Language Education and Media Studies has emerged out of this innovative teacher assessment for learning space and student alternative learning space that close gaps in syllabus goals and expectations for teachers and students. This creative teacher-student learning space is forging new partnerships with the university radio for teacher and student education and development.



### School of Education and News Talk 93FM Collaboration

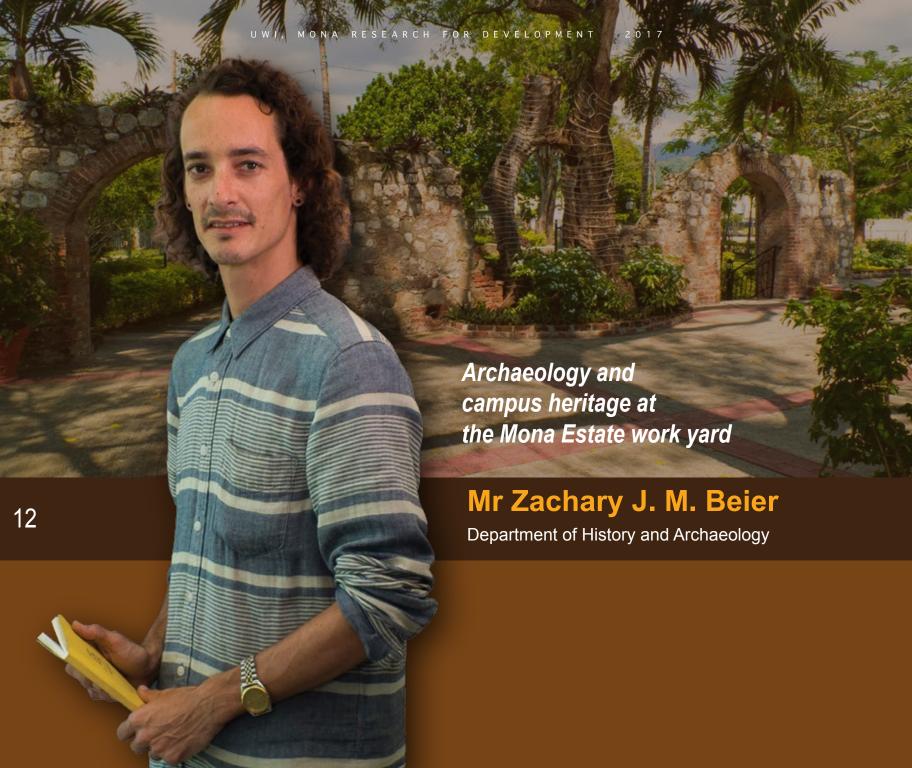
A university radio station is strategically positioned to sustain a break-away from four-walled classroom spaces into a single real as well as virtual space for teaching and learning. The School of Education has charted this transition through partnership with News Talk 93 FM. The Radio Active Classroom now being aired on News Talk 93 FM expands the SVSS modality to a radio-ineducation environment. The new partnership integrates radio as a new teaching-learning space, and a platform for modelling classroom pedagogy and School Based Assessment (SBA) as learning. The synchronisation of the School of Education physical classroom space with university radio studio space provides real and virtual learning solutions for improvement in the quality of secondary and tertiary education through research and innovation. This Single Virtual School Space has the potential to institutionalise media technologies as integral components of teacher education and training.



## Bio

**Dr Paulette Feraria** is a lecturer in Language, Literature and Literacy Education in the School of Education, The University of the West Indies, Mona Campus. Her classroom praxis and research are underpinned by critical thinking and critical pedagogies from 'outside the box', which result in alternative and new ways of doing and knowing.





The University of the West Indies, Mona Campus is composed of a series of cultural resources from the Jamaican past. Situated in the Liguanea Plain, this wide and gently sloping valley with fertile soils was ideal for settlement by early indigenous people of Jamaica, collectively known as the Taíno. Following European colonisation in the late sixteenth century, these same features made this area conducive to the plantation economies that would define the Caribbean. The UWI. Mona Campus includes above-ground and below-ground evidence associated with two eighteenth century sugar plantations, the Mona and Papine estates. Additionally, the campus was used as a large refugee camp in the Second World War for evacuees from Gibraltar and other Europeans, including Jews and interned enemy aliens. All of these historical features have left an indelible mark on the campus, creating one of the most unique educational settings in the world.

Over the years, Campus administrators have worked to preserve portions of this history despite development efforts necessary to cater to an ever increasing and modernising population. university Historical archaeological investigations carried out by the Department of History and Archaeology, as well as international collaborators, have better clarified the location of these campus resources and aided in their interpretation. including work by Dr Karl Watson (1981, 1987, 1989), Dr Suzanne Francis Brown (2004), and the Digital Archaeological Archive of Comparative Slavery (2008-2011). The 2016 UWI Mona Annual Field School in History and Archaeology builds on previous research that contributes to scholarship dealing with the everyday lives of individuals and communities impacted by the realities of slavery. The field crew included second year undergraduates, Stephanie Butterfield, Randy Davidson, Shoshana Dyer, Desiree

Edwards, Michelle Mais, Raveese Pinnock, Tonia Revers and Nathan Vickers, as well as two graduate students in Heritage Studies, Ashley Jones and Adrian Reid, who were under the supervision of Assistant Lecturer in Archaeology, Zachary J. M. Beier.







This year, field school participants investigated areas of significance at the Mona estate work yard, located between the University Chapel and the Visitors Lodge. The Mona estate was active between the mideighteenth century and the first decade of the twentieth century. The estate had a number of different owners and managers, along with an enslaved laborer population numbering just under 200 individuals. It was the last functioning sugar estate in the parish of St Andrew, which offers the opportunity to study long-term change in agroindustrial technology and the material and spatial practices of diverse inhabitants. The work yard is particularly well preserved, featuring massive cut limestone and brick sugar works, along with housing for the bookkeeper and overseer. This degree of preservation demonstrates the foresight of University administrators in the integration of this unique setting into contemporary campus development. In the recent past, the University has used this location to house some of its first students, as Oriental Gardens, and as a venue for performances. Today, it is commonly referred to as the "Secret Garden" and is a popular meeting place among students. This former plantation work yard has so far never been studied archaeologically.

Research efforts concentrated on above-ground features in this industrial quarter. This work encompassed the full range of archaeological field methods, including site survey and mapping using a Total Station Theodolite (TST), controlled surface collections, and examination of below-ground evidence, using shovel test pits (STPs) measuring 50 centimeters in diameter and test excavation units measuring 1 metre by 1 metre square. A total of 18 STPs and 1 excavation unit was completed during the 10 days of fieldwork.

Students also completed preliminary artefact analysis, including cleaning, classifying, and sorting recovered finds. One thousand, eight hundred and sixty-six (1,866) artefacts, dating between the eighteenth and nineteenth centuries, were recovered, including a mixture of domestic materials, such as ceramics imported from Europe or manufactured locally, bottle glass fragments, kaolin clay tobacco pipes, buttons, as well as architectural evidence like slate, cut stone, bricks, and different types of nails. While artefact analysis will be

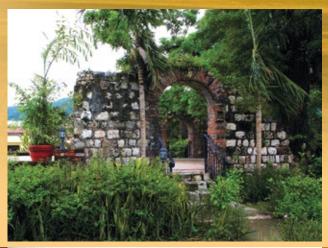
ongoing over the next year, this evidence aids in the reconstruction of this historic landscape, as well as in the interpretation of the everyday lives of people living and working in this industrial quarter. Initial findings suggest a great deal of activities took place in the Mona work yard beyond labour alone.

Particular emphasis was placed on excavations around what is believed to be the Overseer's House. While development at the site since the mid-twentieth century has transformed the original architectural outline of this dwelling, the recovered artefacts provide an interesting glimpse into the life of an overseer on a Jamaican sugar plantation. Some of the most significant finds in terms of dating the occupation of this structure and better understanding the way of life of its inhabitants include a mixture of imported and locally manufactured ceramic vessels, animal bones from meals, ceramic fragments modified into circular gaming pieces for betting games, as well as a dog's maxillary right third incisor that was perforated and polished, presumably to be worn by an individual.

This year's field school continued the tradition of research and training that has become synonymous with this annual offering from the Department of History and Archaeology. The collected evidence will

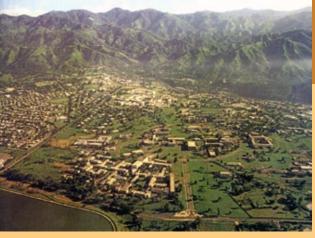


be used to inform future fieldwork at the work yard, as well as a variety of formal and informal presentations and publications offering insights into the lives of individuals and communities living and working at the Mona estate during a significant period in Jamaican history. Perhaps most importantly, this project provides students with accessible, hands-on experience that can serve as a foundation for future professional practice. Finally, campus archaeology enhances the visibility of applied techniques in the Humanities and Social Sciences that are particularly relevant in addressing issues in contemporary Jamaican society, including the preservation of cultural resources along with the process of development. This style of research is inherently interdisciplinary, and investigations at the Mona work yard were aided by collaboration with the UWI Campus Registrar, UWI Mona Museum, Jamaica National Heritage Trust (JNHT), Mona Geoinformatics Institute, and the Digital Archaeological Archive of Comparative Slavery (DAACS).



## Bio

**Mr Zachary J. M. Beier** is an assistant lecturer in the Department of History and Archaeology at the UWI, Mona and a PhD candidate in Anthropology at Syracuse University. His research and teaching deal with the historical archaeology of the modern world, with a particular focus on the diverse communities occupying colonial fortifications in the Caribbean. He can be reached via email at zachary.beier@uwimona.edu.jm





Dr Marcia Rainford | Dr Sharon Bramwell-Lalor | Mr Miguel Ison
School of Education

16

Enhancing science teacher development through authentic learning experiences

Areas of need satisfied by the research project

Teachers play a major role in educating children. Therefore, the teachers' own education must keep pace with best practices in teacher professional development. Educational research has alluded to the benefits of authentic assessment strategies for the development of students' critical thinking and problem solving skills (Carter, 2013). These are assessments that allow learners to use and apply their knowledge and skills in real-life settings, and solve reallife problems (Wiggins 1993). Teachers who have first-hand experiences of this type of assessment will likely be better able to prepare their students to fulfil workplace and societal needs that demand critical thinking and problem solving skills.

There is ongoing educational reform at the primary and secondary levels of the Jamaican education system. In many instances, policy decisions guiding these curricular reforms

are based on ideas, recommendations and practices implemented in contexts external to Jamaica and the Caribbean. In preparing teachers to implement these reforms, we acknowledge that, in addition to the theoretical knowledge generally acquired by way of formal delivery modes, there is also need for development of tacit knowledge that comes through experience. In relation to assessment strategies, we hold the view that tacit knowledge serves to build teacher interest, confidence and motivation, which is likely to promote sustained long-term changes in their practice. Providing our teachers with opportunities to utilise these assessments will not only give them the experience, but will also strengthen their ability to use these assessments.

Another component that is critical for teacher professional development is reflecting on one's practice (Schön, 1987). Reflection involves actions such as mental processing of issues,

elaborating on, or interrogating experiences ultimately to inform future practice (Wear et al, 2012). Authentic assessment experiences provide opportunities for teachers to reflect on their practice, and can provide us with information about the usefulness of these strategies as they are implemented in the Jamaican context.

Teacher preparation programmes such as the one offered at the School of Education (Mona) have been incorporating authentic assessment activities which create opportunities for developing teachers' knowledge within the context of their practice. These assessment tasks form a part of their course grades. In conducting the activities, both pre- and in-service teachers are required to use real-life contexts of their classrooms. schools or communities to implement and apply the skills and theoretical knowledge that they have mastered.





We used authentic assessment strategies in the teacher education courses: Environmental Education (pre- and in-service teachers at the graduate and undergraduate levels) and Measurement and Assessment in Science Education (in-service teachers at the graduate level). For the Environmental Education course, the teachers were asked to identify and develop an action plan to address an environmental issue at their school, community, homes or at a workplace. The graduate level teachers were further required to implement the project in a collaborative way, involving students, colleagues, administrators or community members. They were also required to reflect on the experience of implementing their project. Additionally, the teachers at the undergraduate level were required to make an artefact that could be used for teaching children in their communities about an environmental issue. The course on assessment at the graduate-level required teachers to conduct an action research project in which they implemented one Assessment for Learning (AfL) strategy, over a period of three to four weeks, in teaching one science topic. Assessment for learning (also called Formative Assessment) is an approach to assessment that has specific characteristics designed to give students feedback on their learning while learning is occurring, rather than at the end (Black et al; 2003). The teachers were required to reflect on the potential for using the AfL strategy in their classroom contexts.

The projects implemented to address environmental issues included: energy and water conservation, the launch of an Environmental Stewardship programme, recycling of plastics and paper recycling, and composting. The pre-service teachers' creativity skills were enhanced through the artefacts they produced, such as board games, a tote bag from repurposed fabric, a musical CD of environmental songs, videos and dramatic poetry.

## New knowledge gained

We gained first-hand information on the usefulness of authentic assessment strategies as they are implemented in our context. We learned that in-service teachers were able to balance their roles as teachers and learners through implementing authentic assessment

tasks in their schools, homes, workplaces and communities. The teachers experienced a rewarding feeling for having played a role in sensitising and educating others about the environment, and influencing their practices by first modelling it. They reported an increase in critical thinking skills which is one of the aims that we had hoped to accomplish. Teachers experienced feelings of gratification for collaborating with community members, colleagues and students in carrying out their assessment tasks. They reported that the activities were life-changing and transformational. One pre-service teacher even started a YouTube channel dedicated to poetry about various issues including the environment.

Most importantly, teachers expressed a desire to continue to incorporate what they had learned into their students' lessons (for example, project-based learning, reflective practice, whole-institution approach to problem solving, fostering positive values and attitudes, and AfL). This speaks to the value of the assessment exercise in their education and professional development.

### Benefits derived/potential impact on society

We benefitted from this experience by learning more about the context in which pre- and in-service teachers work, thereby making us better prepared to carry out our tasks as teacher educators. We also noted that authentic assessment tasks provided teachers with





the confidence to use the skills with their own students. The lesson plans created during the courses to display what had been learned included assessment tasks such as: creation of posters, poems/rap, song, drama, representing an initial attempt to rely only on traditional pencil and paper activities.

One teacher expressed, "In the past my teaching and learning strategies focused on knowledge about the environment ... students were not given opportunities in the lesson to participate in decisions, or to take action in order to solve an environmental problem. I will now apply what I have learned ... in a way that will ...create ...citizens that are able to take action." This in-service teachers' comments reflect the potential impact on the students who will benefit from her experiences.

## **New partnerships**

Activities carried out in schools, communities and workplaces relied on collaboration with citizens and partnerships with entities to implement and sustain the projects that were developed (for example, WYSINCO, JSPCA, NEPA, NSWMA).

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#### Bio

**Dr Sharon Bramwell-Lalor, Dr Marcia Rainford** and **Mr Miguel Ison** are science educators in the School of Education, UWI (Mona). They have an interest in the implementation of Alternative Assessment strategies in science classrooms.







#### Introduction

As a direct outcome of the inadequacies of the Jamaican education system, afterschool tutoring and academic lessons. described locally as extra lessons, continue to address the growing gap in achievement owing to inequities between schools and teaching standards (Spencer-Rowe, 2000). Extra lessons are, essentially, additional academic lessons, through private or public tutoring, outside of the regular school curriculum. Public tutoring refers to teachers providing additional tutoring at no charge. This occurs with the support of government subsidies, as well as through the altruism of teachers addressing a perceived need to provide additional tutoring to their students. Extra lessons in the Caribbean represents a response to inequitable teaching in the classroom, overcrowded classrooms and the inadequacy of preparing students for CXC exams (Brunton, 2000; Lochan & Barrow, 2008).

Against this background, this paper discusses the conditions underlying the current situation of extra lessons in Jamaica. In doing this, the paper presents findings on the role of education, the examinations-driven society and the conditions of schools from the perspective of secondary students preparing for the CSEC exams, their parents, teachers and key government officials. The paper derives from a larger mixed-methods study, which sought to quantitatively predict and qualitatively explore how extra lessons impact students' perceived academic achievement at the CSEC level (Stewart, 2013).

### Methodology

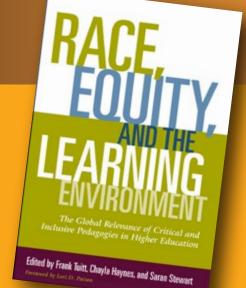
This article reports the selected qualitative findings from a larger, transformative mixed methods study (Stewart, 2013). The qualitative portion of the study employed a holistic multicase design (Yin, 2009) applied to a single unit of analysis: extra lessons. The transformative mixed methods design followed a sequential

order in which the researcher first collected and analysed the quantitative portion of the study. For the purposes of this article, the researcher reports on only a small portion of the descriptive statistics from the Stewart (2013) study to establish how the qualitative methods then followed. Data was collected from a total of 1,654 grade 11 students in 62 schools across 14 parishes.

## Findings and discussion

The continuing historical pattern of stratification found in the data represented much of the challenges mentioned more than a decade ago, in 2004, by the Ministry of Education: (a) access to full secondary education, (b) equity and quality of schools, (c) poor performance rates, and (d) increasing gender disparities in which girls are outperforming boys in schools (MoE, 2004). Arguably, this pattern can be attributed to what Hickling-Hudson (2011) termed "the hegemony of a social class-divided and unequally gendered model





of education" (p. 459). This hegemony has been in existence since colonial times and continues to stratify the society and the education system.

Extra lessons in this school system arguably perpetuates the division of Jamaicans by social class. Reliance on extra lessons can represent a false hope among poorer students for high quality education, as wealthier students can afford better quality extra lessons. This is likely to deepen the stratification of the social classes. This study found that students in Region A received a distinctly better quality of extra lessons than those in the other two regions studied.

As seen in the qualitative data, the case is made that the widespread occurrence of extra lessons in Jamaica can be explained by the colonial drivers of education. Examining the situation which in this study is referred to as 'coloniality', the researcher looked specifically at the inherited examination-driven society, the role of stratified education in determining upward social mobility, and the poor conditions of schooling in the less well-resourced schools. Extra lessons provide a space not only for remedial education but also for differentiated instruction in which gifted students can be challenged more than they would normally be during the regular school day. As a result, students from affluent backgrounds who attend high performing schools also attend extra lessons, as they reported being bored in class and not being challenged to learn more.

Stewart argues that extra lessons exist to provide remedial and/ or gifted education, and that this is due to a lack of capacity and inadequacy of factors that would drive educational decolonisation. From an anti-colonial discursive perspective, the prevalence of rote and lecture-style learning in many schools increases issues of inequity in teaching and learning practices. For those who can afford high-quality extra lessons, it is possible to purchase more critical and radical approaches to pedagogy that are inclusive and engaging, and more likely to help students achieve excellence in competitive examinations.

The issues of equity and quality of schools, as referred to by officials from the Ministry of Education as well as by some parents, are a continuing challenge in the education system. The researcher has argued in this study that they contribute to the prevalence of extra

lessons. In an interview, a member of the Ministry of Education said it well: "It is not the intention of the government to provide free tuition for parents to pay for private lessons so their children can pass the exams" (6th February, 2013). The relationship between socioeconomic class and cost of extra lessons is dynamic in that, in each of the regions studied, some extra lessons were paid for at cost, or provided at subsidised rates by teachers. However, there is a distinct difference in quality for extra lessons in which higher fees were charged. In those cases, parents reported paying more for extra lessons in one term than they paid for school fees for the entire year. These costs were defended by parents who wanted value for their money and control of the quality of lessons. This, in turn, exacerbates a stratified capitalist micro-economy within the education system. However, when it is acknowledged that "we 'graduate' close to 25,000 of our students each year unprepared to even enter the workforce" (CEO Interview, Ministry of Education, 6th February, 2013), one can understand a parent's rationale to pay for quality education in the form of extra lessons.

#### Conclusion

Essentially, extra lessons in Jamaica thrive because of two factors: a) unsatisfactory conditions of learning, especially in less-resourced schools; and b) the drive leading parents to provide an advantage for their children even in traditionally elite schools. Whereas this paper discussed the conditions that gave rise to extra lessons such as the



poor conditions of learning and the drive for increased upward social mobility, the data does not focus on the scope and prevalence of extra lessons. Although such material was collected in the larger study (Stewart, 2013), this article focuses on the conditions that explain and increase the demand and supply of extra lessons.

(Publication: Stewart, S. (2015). "Schooling and coloniality: Conditions underlying 'extra lessons' in Jamaica". Postcolonial Directions in Education Journal, 4(1), 25-52).

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#### Bio

**Dr Saran Stewart** is a lecturer in Comparative Higher Education in the School of Education. She is also the coordinator for the MA in Higher Educational Management programme and the chief editor for the Journal for Education and Development in the Caribbean.









The family home is usually the major asset that a couple acquires during their union. On the breakdown of the union, invariably, the interest of each party in the family home is hotly contested because both will have an obvious concern about the determination of their respective property rights in such a valuable asset. The court is faced with the difficult task of adjudicating on competing claims and ultimately giving due recognition to the rights of both parties. The document of title cannot be relied on to fully explain the ownership rights since it may be restricted to declaring the legal rights only. Many times other ownership rights can be alleged. The two tiers of ownership, legal and beneficial, a legacy of the English, could cause a determination of ownership to become a complex matter. Ownership rights, therefore, could be examined either under the relevant legislation or equity.

Jamaica's laws on the division of family home deemed unsatisfactory

In 1962, when Jamaica gained its independence from England, the laws governing the family home, the *Married Women's Property Act*, Jamaica, and the resulting trust, were not equitable and did not account for the Jamaican social context. However, no action was taken until 1975 when the Minister of Justice appointed the Family Law Committee, a composition of eminent members of the legal fraternity, to examine the relevant family laws and make recommendations for changes where necessary.

The Family Law Committee prepared its recommendations from which the *Property Rights of Spouses Act (PROSA)* was framed. The new legislation came into operation on the 1st of April, 2006. It was hailed as a 'major advance' which provided a new approach to

addressing the rights of spouses when the relationship broke down.

#### The advances of PROSA

- The definition of spouses was expanded.
   The term 'spouse' was no longer restricted to married persons, but embraced single persons who have lived together for five years.
- The introduction of the notion that, on the grant of a decree of dissolution of a marriage or the termination of cohabitation, each spouse was entitled to an equal share of the family home
- 3. An escape from the equal share rule was provided in the following circumstances;
  - (a) the family home was inherited by one spouse;
  - (b) the family home was already owned by one spouse at the time of the marriage or the beginning of cohabitation;
  - (c) the marriage is of short duration.





#### Justification of expanded definition of spouses

The dominant unions in Jamaica comprise: married heterosexual couples and unmarried heterosexual couples, the latter group, Senator Dwight Nelson observed, accounting for "a significant part of the statistics of man and woman relationships." Senator Nelson also observed that the statistics were showing an increase in the country's divorce rate. His statement is corroborated by data from the 2011 National Census. Supporting this position were renowned Family Counsellor, Dr Barry Davidson and Professor in Child Health, Maureen Samms-Vaughn, who in their paper 'Family Life in Jamaica: A Challenge for All of Us' reported that "Jamaican children have about a fifty-fifty chance of being born within a cohabiting union or within a visiting relationship between parents."

The data from STATIN and PIOJ allow us to calculate that 42% of Jamaican families are considered unions, which would be covered by *PROSA*. This group is listed under the Organisation of Economic Co-operation and Development (OECD) Family Social Policy Division (2012) as the couple family. The problem is that there is a 58% residual category of family forms from which several possible unions, not accounted for by PROSA, are likely to emerge.

#### How efficacious is PROSA?

Clearly, the parameters of *PROSA* do not cover all possible Jamaican unions. While these are critical, they fall under the second phase of evaluation of the Act. There is urgent need to assess the efficacy of the Act, which implies interviewing those it was designed to serve across gender, age, socio-economic backgrounds, geo-social zones, and marital status. It is also critical to identify if fear of losing property hinders the formation of long-term cohabiting unions. From this foundation we can launch a second phase of research to examine how it may impact those unions that were excluded.

The small sample of 236 utilised in this study suggests that the focus is on exploration, rather than deduction. As shown in Table 1, over a hundred of the respondents who owned property did not qualify for

the longer interview. The latter group comprises 134 respondents and forms the basis of the study's conclusions on *PROSA*. The core of 134 represents the smallest sample that could be useful in exploring the issues surrounding *PROSA*.

### **Findings**

- 1. Marriage is an indicator of socio-economic stability in the Jamaican culture; but geo-social factor also matters.
- 2. The longer couples live together after five years, the more valuable their family home.
- 3. Most family homes are acquired through the efforts of partnership.
- 4. Gender is a critical factor in house acquisition.
- 5. Marriage is the ultimate destination of unions in Jamaica but not for everyone.
- There was little excitement among the unmarried respondents about the benefits of *PROSA*. Fifty percent accepted that it was fair, while thirty-six percent thought it blatantly unfair. Six per cent thought it made women dependent and weak.
- 7. Strong support for *PROSA* across the categorical variables to treat unmarried unions and married unions similarly under the law in the distribution of the family home in cases of an irreparable termination or break down of the relationship.
- Weak support for PROSA 50/50 percentage share of property which one or both parties had acquired through his/her own efforts and to which the other party has not contributed to its acquisition or equally.
- The matter of whether or not people choose to get married is secondary to their input as a partner in the matter of the 50/50 rule.
- People do not want PROSA discarded. However they want it amended, as they believe that without legislation there could be violence and chaos.
- The escape clauses are welcomed but there are concerns and suggestions.

## Conclusion

The possible expansion of the reach of *PROSA* has to be examined by the lawmakers, given the large number of family forms which fall outside of the protection of the legislation.

Lawmakers must, in any amendment of PROSA, take into account the strong sentiments expressed by those whom it was designed to serve. For the couples to whom PROSA would apply, there was strong support for it. The study found a strong support for treating married and unmarried couples equally under the Act. It also found overwhelming support for the Act's three escape clauses. Nonetheless, the support for the Act diminished on the issue of 50/50 percentage share of property, which one or both parties had acquired through his/her own efforts and to which the other party has not contributed, partly or equally, to its acquisition. The modal position taken by respondents is that everyone who enters into a union must be prepared to make an economic contribution. This position ran across all categorical variables and was not restricted to the views of males. Respondents of every group expressed extreme fear of predation, and this was very obvious among those who owned property above the value of 20 million dollars.

Diverce Decree

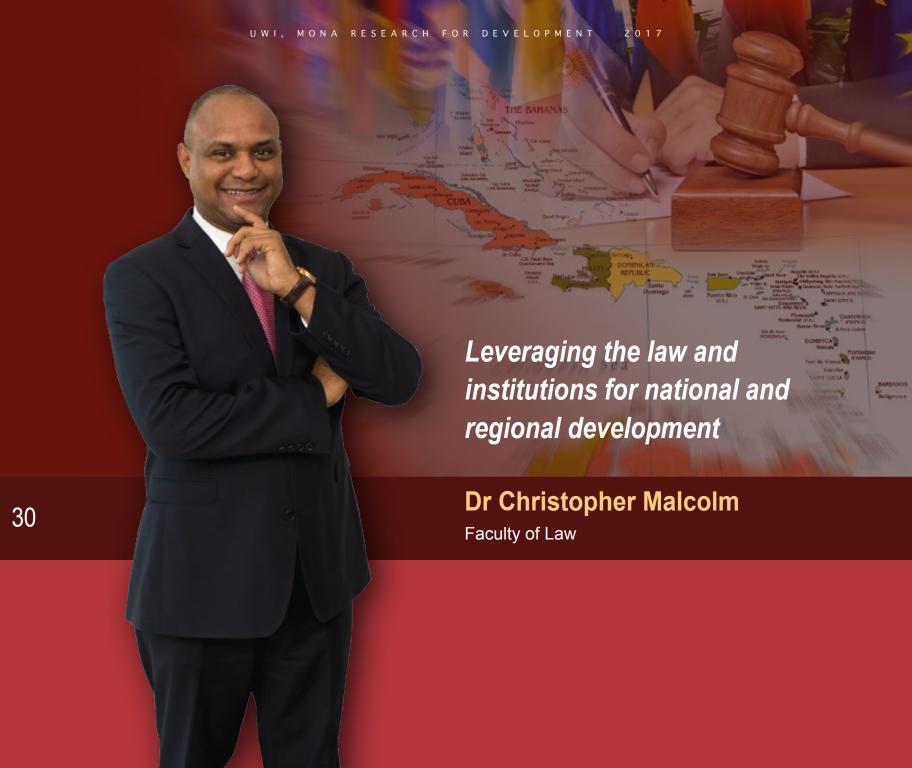
Women were very critical of PROSA. Their main criticism is that it is dated; that it would have been ideal in the 1970s. However, today, they argued, women have achieved enough to be respected as genuine partners with men economically, and this is not an assumption of PROSA.



## Bio

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The sustainable development of Jamaica and the wider Caribbean region is an imperative that must be considered very, if not most, important given the prevailing socioeconomic and vulnerability conditions across the region. Even without difficult conditions, however, the imperative requiring that silos

be collapsed and that all hands on deck work

in support of securing sustainable economic

development, is critical.

While there is general agreement that sustainable development is an imperative, there is divergence of opinion as to next required achievement steps. Whatever is considered, however, it must be clear that the law and how it operates is at the core of every development initiative. Furthermore, it must also be clear that where the law does not permit it, however productive the activity might be, it should not be undertaken. Moreover, even where the law permits an activity there will be implementation and

other constraints imposed by the law.

## Progress to date

On-going initiatives from within and without the Faculty of Law, Mona, including under functional cooperation arrangements between the public and private sectors, academia, and international institutions, have been geared to support sustainable development. From within the Faculty of Law, the Mona Law Institutes Unit (MLIU) was formally established on January 1, 2015. Street Law Caribbean, which is a not-for-profit sponsored by Street Law South Africa, and the Mona International Centre for Arbitration and Mediation (MICAM), which has been established with support from Kuala Lumpur Regional Centre for Arbitration (KLRCA), have been instrumental.

#### 1. Street Law

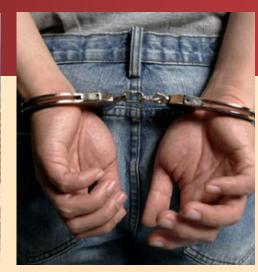
Street Law Caribbean was launched on June 6, 2016. Its community-based legal education

programmes take the law to the streets using interactive teaching and learning methods, such as role play, skits and debates, which allow anyone to participate and learn about the law, how it impacts, and how to best function under it.

Three areas of focus have been developed-Small Business Law. Entertainment Law. and Citizenship and the Law, and are being implemented. With Small Business Law, for example, the programme has stripped away the legalese, and taken the mystery out of how the legal system in Jamaica operates; how the law applying to contracts, torts, companies, taxation, and more general principles apply. The programme also demystifies how the mechanisms for settlement of disputes, including mediation, arbitration and national courts, apply, as well as how to leverage these mechanisms in their application so as to bring greater certainty to business activities. This leveraging will then allow the business







to better plan for disputes, to better manage provision for contingent liabilities and, then, better cash flow management, with beneficial implications for profitability for the business and, ultimately, national and regional development.

## 2. Arbitration and Alternative Dispute Resolution

Disputes are inevitable consequences of commercial activities and every other aspect of daily life. Hence, efficient management of disputes is essential and is a pre-requisite for both domestic and foreign investment.

Arbitration is the most important mechanism for the resolution of international commercial disputes, and is, as well, a very significant mechanism for resolving certain categories of domestic disputes, particularly in the construction industry. With this in mind, the Mona International Centre for Arbitration and Mediation (MICAM) was established, and while geared to serve the Caribbean region, it has a longer term global focus. Its advisory board includes prominent industry figures from Malaysia, Colombia, United States of America, St Lucia and Jamaica.

In his statement to the House of Representative on November 2, 2016, when introducing the new Arbitration Bill, Minster Chuck said:

The Mona International Centre for Arbitration and Mediation (MICAM) will be launching its operations on November 3, 2016. This will be followed by a conference on November 5, 2016 under the theme, "Capacity building for progress: Leveraging arbitration for national and regional development". These efforts will ensure that once the Bill is passed, there will already be an established and modernised venue to host arbitration disputes. Thereafter, MICAM will also be conducting several training programmes geared towards ensuring that Jamaica has a well-trained cadre of arbitrators who will join the illustrious panel of arbitrators that already exists worldwide.

For their part, the Jamaica Observer in their Sunday Editorial of November 6, 2016, said:

Many factors account for confidence in a country's business

environment. Above all, there must be predictability, which is a result of the combination of macroeconomic conditions, the stability of policies, the laws and administrative orders which govern the conduct of business, and the ability to resolve disputes promptly, efficiently and inexpensively.

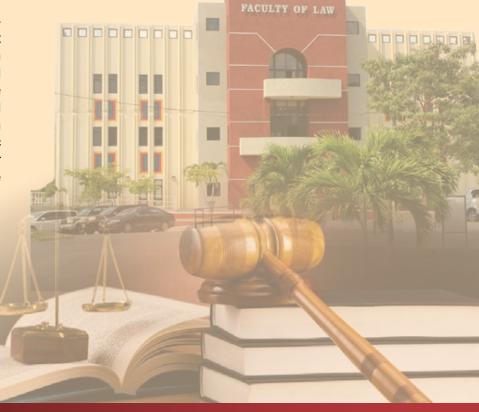
The establishment of the Mona International Centre for Arbitration and Mediation (MICAM) is timely and vitally important to the economic development of the Caribbean, and to developing countries, particularly small states.

The commentaries could have added that over the last six or so years the collaboration agenda being pursued, including, in particular, under an arrangement with the Chartered Institute of Arbitrators (CIArb), has trained over 300 judges, lawyers, and other professionals across the Caribbean region. This is already causing a significant culture shift, and there is growing acceptance that dispute management is a tool that should be leveraged for economic growth and stability. Court-connected arbitration is being pursued, and Belize will lead the pack when it is implemented there in January 2017. This facility will enable better management of judicial resources, with consequential reduction of backlogs in the court system.



## Way forward

Change is constant, and working in silos will ordinarily yield sub-optimal performance. In our region, there are still too many silos at work, and too few areas of functional cooperation being pursed. In the end, human and other resources are wastefully dispersed, and the parts so utilised do not benefit the whole as much as would have been otherwise possible. Going forward then, and bearing in mind that there are limited resources in what is a small Caribbean region with a small number of people and significant areas of economic and ecological vulnerabilities, it is imperative that further and deeper cooperation become the norm among the public sector, private sector and academia, in support of sustainable development.



## Bio

**Dr Christopher Phillip Malcolm** is Former Attorney General, British Virgin Islands; Director, Mona Law Institutes Unit, Deputy Dean for External Affairs, and Senior Lecturer, Faculty of Law at Mona, The University of the West Indies; Executive Director, Street Law Caribbean; Secretary General, Mona International Centre for Arbitration and Mediation; Member, Caribbean ADR Chambers; Fellow, Chartered Institute of Arbitrators; Chair, Chartered Institute of Arbitrators – Caribbean Branch; and Member, Technical Advisory Group, Improved Access to Justice in the Caribbean (IMPACT) Project.







Surgical quality in colorectal cancer

## **Dr Joseph Plummer**

Department of Surgery, Radiology, Anaesthesia & Intensive Care (SURRADIC)



#### Summary

The body of works seeks to describe the quality of surgical management offered to patients with a diagnosis of colorectal cancer, as measured by the adequacy of lymph node resections across the major hospitals in Jamaica.

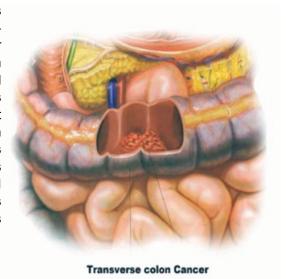
## Areas of need research seeks to satisfy

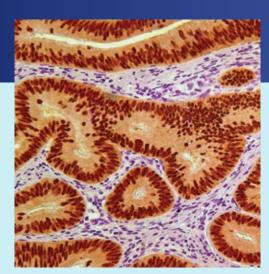
Colorectal cancer (CRC) is the third most common cancer affecting both men and women in Jamaica. The mainstay of its treatment is surgery to remove the part of the colon affected by this disease. The majority of patients can be cured if they present early, or if the cancer is detected by screening. However, currently they are no screening programmes in Jamaica for this cancer and, historically, our patients tend to present late. The only way they can be cured is with excellent surgery and chemotherapy. The number of lymph nodes removed at surgery

is a marker of the quality of the surgical (and pathology) service at the hospital. It also helps to determine the need for chemotherapy.

A recent study of survival from colorectal cancer in Jamaica revealed that patients were doing poorly, with only about one-third surviving up to five (5) years after their diagnosis. This poor outcome is less than expected when compared with developed countries. Given that the number of patients presenting with spread of the cancer at the time of diagnosis was not higher than expected, we wondered whether our patients were receiving adequate surgery. A previous study looking only at patients from the UHWI revealed that patients with left-sided cancers were having less than the expected 12 nodes resected.

The purpose of this study was to re-assess the adequacy of nodal resection at the UHWI, and to compare this CRC quality indicator with the other hospitals throughout the island.







# New knowledge created or knowledge gaps filled

The body of work has contributed to the overall literature on CRC in our population. The sample of patients studied was the largest number of patients reported from Jamaica, and included patients treated not only at the UHWI, but also from all the major treating hospitals in the various health regions. The results confirmed a previous report that the majority of patients with CRC presented with locally advanced disease, as evidenced by the spread of cancer to at least one nearby lymph node. However, it also revealed that in two of four health regions, the number of lymph nodes removed were not meeting acceptable surgical standards. This was especially true for cancer of the rectum and the descending colon.

# Specific benefits to be derived - Impact on society

The information gained from our study will allow surgeons and pathologists at the various hospitals to re-examine their processes in an attempt to improve the quality of care offered to CRC patients. In addition, by demonstrating that the majority of patients present with locally advanced disease, it will provide evidence for the need for a national screening programme for this disease. Plus, the need for expensive chemotherapy may force the government and health ministry to provide lost-cost chemotherapy to affected patients, in an attempt to improve disease outcome.

# Direct application of outcomes to industry

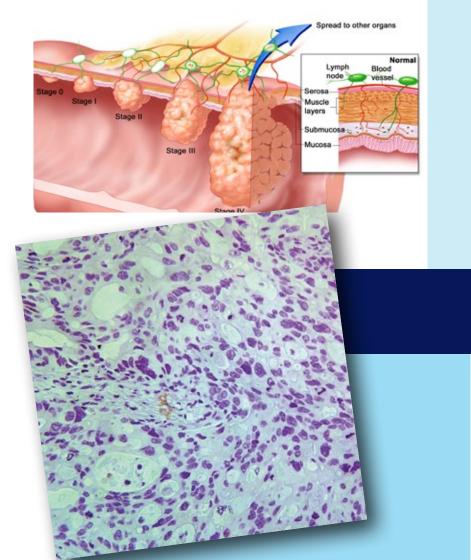
The long-term goal is to implement a series of preceptorship surgical workshops in selected Jamaican hospitals for the review of appropriate surgical techniques. The impact of such a programme can then be measured over time, by not just nodal harvesting, but also local recurrence and survivorship from CRC. These are similar to programmes that were implemented in Europe in the 1990's, and what is currently being done for rectal cancer in the United States.

# New partnerships developed

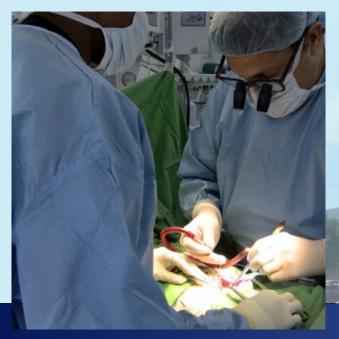
The researchers are currently forming partnership with the Ministry of Health regarding a programme of screening for CRC throughout Jamaica.

#### Bio

**Dr Joseph M. Plummer** is a general and colorectal surgeon the UHWI, and a senior lecturer in the Department of Surgery, UWI. He has an interest in disease of the colon and rectum, and endoscopic surgery.











#### **Background**

Research done in the Tropical Metabolism Research Unit has informed the WHO manual for treatment of severe malnutrition. Despite the significant success in reducing overall morbidity and mortality, there is still high case mortality especially in oedematous malnutrition (OEM). Severe malnutrition presents either as marasmus which is non-oedematous (NOEM) or as OEM (kwashiorkor and marasmickwashiorkor). OEM is characterised by abnormal accumulation of fluid, called oedema. This and other abnormalities, such as high prevalence of fatty liver, carry poorer prognosis in OEM. Furthermore, it is still not known why children develop different types of malnutrition. A substantial part of research carried out by Asha Badaloo and team (Terrence Forrester and Marvin Reid. TMRU; Farook Jahoor, Baylor college of Medicine) has focussed on further exploring

mechanisms and consequences of metabolic aberrations in fat, protein and amino acids metabolism in severe acute malnutrition that may inform further improvement in treatment.

## Methodology

Stable isotope tracer kinetic methodology was used. It is a safe, non-radioactive technique to trace in vivo pathways, and to make direct measurements such as rates of synthesis and catabolism, total production, pool size and turnover rate of various compounds

#### **Findings**

The work has produced new information on distinctive metabolic differences between OEM and NOEM, indicating new considerations for dietary treatment. The data have been published in several international journals. Some of the major findings are as follows:

#### Fat

Despite a tendency for higher fat breakdown in OEM than in NOEM, oxidation of the released fatty acids is less in OEM, indicating that the ability to oxidise and utilise fat as a source of energy when there is a shortage of food is blunted in OEM and may play a role in the aetiology of the syndrome. Also, synthesis of VLDL, which is the form in which fat is exported from the liver, is not low in





OEM. This does not support the long believed assumption that fatty liver in OEM is caused by low VLDL synthesis rate. Instead, the precipitating factors seem to be increased influx of fatty acids to the liver and their low oxidation. The difference in handling of fat by the body suggests that the same treatment diet might not be appropriate for both syndromes, and that further investigation is required to determine the amount of oil that may be used in preparation of the rehabilitation diets.

## Whole body protein turnover

Pioneer work in TMRU since the 1960s, has shown that protein turnover, which is a continuous process in the body, is generally reduced in malnutrition. We have now shown that protein turnover is slower in OEM than in NOEM. This indicates less availability of amino acids in OEM for synthesis of proteins and other biomolecules that are critical for survival because protein turnover contributes the majority of amino acids to the body's free amino acids pool.

#### Cysteine and Glutathione (GSH)

In a series of studies, we have shown that, for the same dietary intake, the supply of the amino acid, cysteine and its precursor (methionine) from protein turnover is much less in OEM than in NOEM; and that the insufficient cysteine contributes to a low GSH synthesis, accounting for reported lower GSH concentration in OEM. Cysteine is the rate limiting precursor for making GSH which is a major antioxidant in the body with many protective functions. Its low concentration has been associated with deteriorating clinical state in OEM. When we supplemented children with OEM with cysteine in the form of N-acetyl cysteine, there was quick restoration of GSH status and faster resolution of oedema, compared with controls. In separate studies, we found no difference in conversion of methionine to cysteine between OEM and NOEM, and no effect of methionine supplementation on GSH status, suggesting a higher dietary requirement for cysteine in OEM.

# Other demand for the sulphur $\alpha$ -amino acids: methionine and cysteine

The researchers found that as much as 45% of available cysteine is utilised by the splanchnic tissues (gastrointestinal tract, liver,

spleen, and pancreas) in both OEM and NOEM. In particular, high gut uptake in malnutrition is expected for repair of marked intestinal atrophy because proteins of the gut are rich in cysteine. Furthermore, cysteine deficiency may also result in gut atrophy and impaired function. After splanchnic uptake, only about half of cysteine supply is available to meet the requirements of other organs and tissues, such as for overall synthesis of whole body GSH and other proteins rich in cysteine such as the skin and hair keratin; and may explain why the skin lesions of OEM take about four weeks to heal. We are completing a study looking at supplementation with a mix of methionine and cysteine on gastrointestinal and skin functions and on GSH status. Preliminary result is showing a beneficial effect on protein synthesis in gastrointestinal mucosa and skin.

#### Main benefit

Overall, our data imply that cysteine supplementation would contribute to earlier re-establishment of metabolic capacities and, hence, earlier resolution of OEM. This would confer not only health benefits, but economic benefit to poor and developing countries by reducing hospitalisation and overall treatment cost.



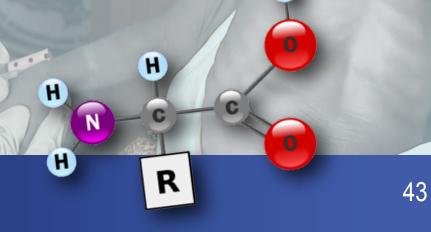


## Possible product development

The results provide strong evidence for extending the many, relatively small metabolic studies to a large clinical trial to gain more robust support for cysteine supplementation and dietary fat modulation. It is clear that the requirement for cysteine in OEM is not met by the quantity of protein provided during the acute phase of treatment. At this stage, recommended protein is restricted to meet the metabolic capacity of patients, and giving more protein can overwhelm the brittle metabolic state, with high risk of death. Consequently, feeds for the acute phase have to be specially prepared, and this is often not convenient in non-specialised treatment centres. Therefore, there is potential to form partnership to develop a ready- to- use cysteine enriched formula for the critical period of acute treatment. Although the prevalence of malnutrition in Jamaica has been significantly reduced, continuation of this work could have regional and global benefits, especially in Haiti where prevalence of malnutrition is high. Moreover, malnutrition is associated with about 2.5 million deaths in children under five (5) years, annually.

## **Acknowledgements:**

The researchers are grateful for NIH funding (R01 DK056689) and to all who contributed to carrying out the research: Hyacinth Gallimore, Lorraine Wilson, Bentley Chambers, Carolyn Taylor-Bryan, Jean Hsu, Diahann Turner and Curtis Green.



H

#### Bio

Asha Violet Badaloo is Professor of Nutritional Metabolism at the Tropical Metabolism Research Unit, UWI. Majority of her research has focussed on exploring underlying pathophysiology using stable isotope tracer techniques with an aim to inform intervention in malnutrition, sickle cell disease and pregnancy. Using similar research methodology, she has included assessment of body composition and energy expenditure in studies of risk factors for sarcopaenia in the elderly and for obesity

of males. The condition most commonly has an age of onset between 13-18 years. Typical episodes occur at 1-2am and may last for 1-2 hours (stuttering) or longer than 4 hours (major). The importance of priapism not only lies in its high prevalence and recurrent excruciating penile pain, but also in its consequence. If untreated, prolonged (major) episodes may lead to penile fibrosis and erectile dysfunction. This consequence is grave as it affects the sexual and reproductive life of young men. The mainstay of treatment is reactive and consists of drainage (aspiration) of the penis. There is no established guideline on prophylaxis of these episodes.

There are many gaps in the literature on priapism in sickle cell disease. These span from the pathophysiology, associated clinical conditions, triggers and effective prophylaxis. The body of work outlined seeks to fill these knowledge gaps by describing the disease in

Jamaican males with sickle cell disease and conducting observational research in areas of treatment.

# New knowledge created or knowledge gaps filled

The body of work has contributed novel ideas to the theory of testosterone and its role in the pathophysiology of priapism. The results have challenged the widespread dogma that testosterone induces priapism. Instead, the research has suggested that low testosterone levels in men with sickle cell disease may promote priapism. The research has also suggested that testosterone therapy does not induce priapism, but instead alleviate episodes. It has also sought to evaluate the use of hydroxyurea in a novel way, for prevention of priapism.

# Specific benefits to be derived-impact on society

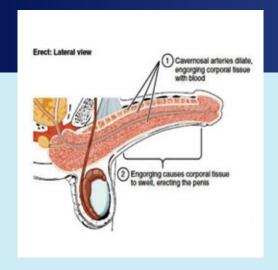
The information gained from our study will significantly improve quality of life and medical care of males with sickle cell disease. This will be of significant impact in Jamaica since sickle cell disease is seen in so many members of our population.

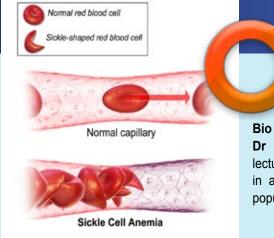
# Direct application of outcomes to industry

The long-term goal is to describe in greater detail the pathophysiology of priapism in sickle cell disease, and conduct randomised controlled trials investigating effective prophylactic agents. This would have significant commercial benefit in the pharmaceutical industry, providing new drugs, or new indications for older drugs.

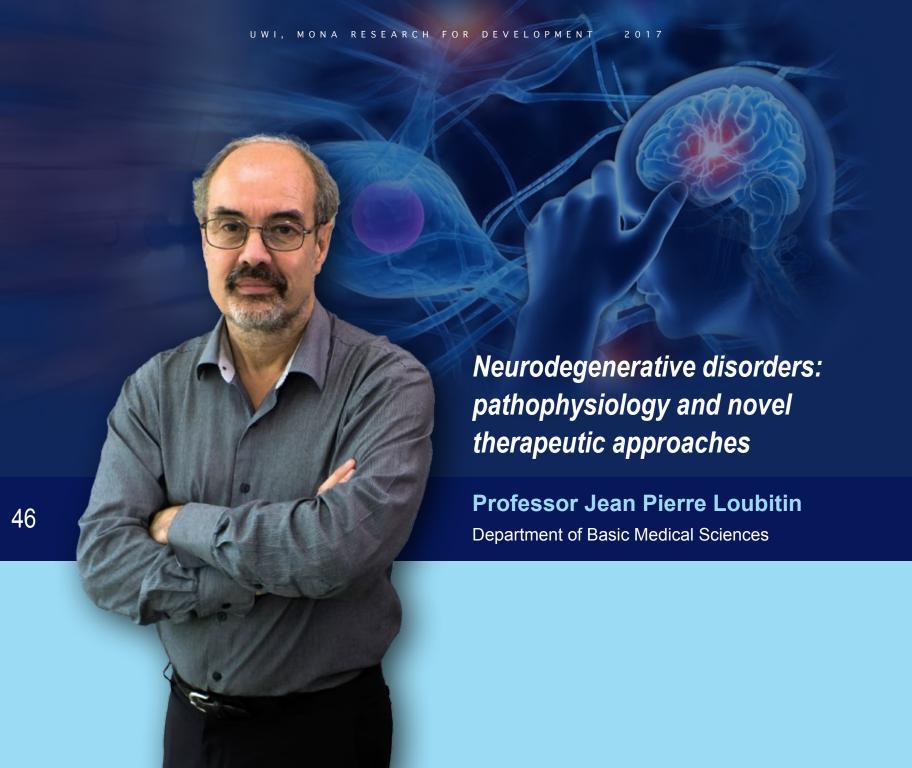
## New partnerships developed

Research in the area of priapism has forged relationships with a leading expert at Johns Hopkins University, leading to research collaborations.





Dr Belinda Morrison is a urologist and lecturer at the UWL She has an avid interest in andrology, specifically in the sickle cell population.



The research topics of Professor Louboutin's research team present several cross-cutting themes and numerous links with translational medicine in the domains of neurological disorders, gene- and cell therapies, inflammation and oxidative stress. A better understanding of the events occurring in the neurobiology of disease will lead to potential novel therapeutic options.

There is a steady increase in the number of disorders of the Central Nervous System (CNS) worldwide, with some important social and financial consequences. According to the World Health Organisation, patients with CNS, and the financial costs of treatment and rehabilitation in the next 10-15 years will move into first place, ahead of cardiovascular and oncologic pathology. This is due in part to an increase in the aging population.

Neurodegenerative disorders are among the most frequent disorders responsible for this increase in CNS cases. Many of these disorders, such as Parkinson's diseases, Alzheimer's disease, and Amyotrophic Lateral Sclerosis share many features in common, ranging from genetic mutations, to abnormalities in protein degradation pathways, from progressive loss of neurons to abnormal axonal transport. There is recent evidence that inflammation and oxidative stress play a causal role in many neurological diseases.

Neurons are particularly sensitive to oxidative damage because of their high levels of fatty acids which are susceptible to oxidation. In addition, brain is characterised by higher levels of iron and lower antioxidant activity, compared with other organs. Antioxidant therapeutic options include dietary natural antioxidants as upstream preventive measure, preventing neuroinflammation by limiting inflammatory cells infiltration, and free radical scavenging as downstream antioxidant therapy by using anti-inflammatory drugs.

As an example of neurodegenerative disorders, we developed different animal models of Human Immunodeficiency Virus type 1 (HIV-1) Associated Neurocognitive Disorder (HAND). HIV-1-related dementia is the most frequent dementia in patients less than 40 years old. The prevalence of HAND continues to rise, and less fulminant forms of HAND have become more common than their more severe predecessors. Incident cases of HAND are accelerating fastest among drug users, ethnic minorities, and women. Moreover, it is becoming clear that the brain is an important reservoir for the virus, and that neurodegenerative and neuroinflammatory changes may continue despite HAART. The injection of proteins of HIV-1 into the brain induces death of neurons, oxidative stress. neuroinflammation, and abnormalities of the blood-brain barrier. Using viral-based gene transfer of antioxidant enzymes into the blood circulation, brain or cerebrospinal fluid





of mice, rats and nonhuman primates, we were able to induce an overexpression of antioxidant enzymes in the brain, and to prevent the deleterious effects of the injection of HIV-1 proteins. The goal of the research team is to extend their current expertise in HAND to other models of neurodegenerative disorder sharing common mechanisms (i.e., Parkinson's diseases, Alzheimer's disease, ALS).

Numerous chronic diseases affecting the spinal cord belong to neurodegenerative disorders. They can be characterized by loss of motoneurons, neuroinflammation and oxidative stress. Among these diseases, some can be of genetic origin (i.e., spinal cord atrophy, SMA), of viral origin [i.e., HTLV-1-Associated Myelopathy (HAM)/Tropical Spastic Paraparesis (TSP)], or of unknown cause (i.e., Amyotrophic Lateral Sclerosis, ALS). HAM/TSP is a slowly progressive neurodegenerative disorder due to the first retrovirus isolated, HTLV-1, in which lesions of the CNS cause progressive weakness of the lower limbs associated with stiffness. Large cohorts of patients with HAM/TSP have been reported in Jamaica. There is no cure yet for HAM/TSP. Prevention is difficult in low-income patients. Thus, there is a need for new therapeutic avenues. Therapeutic approaches must be based on a better understanding, not only of clinical and clinicopathological data, but also of the pathophysiology of the affection. Exploring the role of oxidative stress and the related inflammatory events in HAM/TSP could open new perspectives for the understanding of this disease.

The research project is multidisciplinary, relying on morphological, biochemical, physiological and pharmacological methods. This study is funded by a grant (New Initiative Programme) from the University of the West Indies. We are also collaborating with the Gene Therapy Programme, University of Pennsylvania (UPENN), Philadelphia, on the treatment of SMA and ALS. The project is focused on different ways of gene delivery to the spinal cord. We hope that the knowledge obtained from the study on the methods of gene transfer developed in UPENN could be applied to our animal models of HAM/TSP.

Mucopolysaccharidosis (MPS) are lysosomal multisystemic diseases characterised by a mutation of a gene, resulting in lack of enzymes causing the accumulation of polysaccharides in different

tissues. In MPS, specific regions of the brain are vulnerable to neurodegeneration, and inflammation. An ongoing collaboration with the Gene Therapy Programme, University of Pennsylvania, Philadelphia, USA, aims to study several gene therapy avenues developed for delivering missing genes in the brain of large animal models of MPS (cats, dogs). Results show that this approach is able to correct the phenotype of the disease.

Epilepsy is a frequent neurological disorder. There is currently no known cure for epilepsy. Even if several drugs can efficiently control epilepsy in most patients, most of the drugs act by stopping the seizures from occurring. Moreover, there are frequent side effects encountered with the drugs used. Immune-mediated damage to the Central Nervous System is emerging as an important contributor to seizures, both directly through inflammation and indirectly by causing a leakage of the barrier between the vessels and the brain. Different inflammatory molecules may play a role in the migration of white blood cells (i.e., lymphocytes and macrophages) across the barrier between brain and vessels during inflammation of the CNS in several neurological processes, like epilepsy. The researchers demonstrated that one of the co-receptors for HIV-1 virus (named CCR5) is facilitating the binding of the lymphocytes and macrophages circulating in the blood to the walls of the brain vessels. Seizures increase the production of this co-receptor, leading to an accumulation of lymphocytes and macrophages in the brain vessels, before they cross the barrier between vessels and brain and enter the brain tissue, amplifying the inflammation process. Decreasing the production CCR5 in the bone marrow and in the circulating cells by gene therapy resulted in the protection against seizures and their harmful consequences (i.e., death of neurons, leakage of the barrier between vessels and brain, and inflammation) and facilitated regeneration of neurons. The research team is currently trying to extend our previous findings by using different drugs targeting the co-receptor CCR5. This novel therapeutic approach may allow control of injurious neuroinflammatory responses, and facilitate neurogenic repair in seizures, and might provide some insight in acquired epilepsies.



The researchers hope that by developing this translational approach, they will be able to foster new therapeutic avenues based on innovations in pharmacology and biotechnology that will be useful in the treatment of neurological disorders, and that they will decrease the burden associated with these diseases at the society level.

#### Bio

**Professor Jean-Pierre Louboutin**, MD, PhD, is a neurologist whose first interest was focused on neuromuscular disorders. His MD dissertation was aimed at the study of Multiple Sclerosis, and his PhD was dedicated to the morphological and physiological analysis of development and regeneration of the neuromuscular system. This led him to be involved in gene therapy/cell therapy, as well as neurovirology. After a postdoctoral fellowship in the Gene Therapy Programme, University of Pennsylvania, where he became familiar with methods involved in gene and cell therapy, he focused his work in Thomas Jefferson University, Philadelphia, on the role of oxidative stress in the neuropathogenesis of HIV-1. By developing different animal models of HIV-1 Associated Neurocognitive Disorder (HAND), he studied the deleterious effects of HIV-1 neurotoxic proteins in the brain. Gene delivery of antioxidant enzymes protected neurons against the harmful effects of these neurotoxins.

Another field of interest is spinal cord disorders of neurodegenerative origin, for example the pathogenesis of HTLV-1-associated myelopathy/ tropical spastic paraparesis (TSP/HAM), but also the treatment of spinal muscular atrophy and amyotrophic lateral sclerosis. Gene delivery to the spinal cord, either intravenously or intrathecally, resulted in long-term transgene expression in neurons of the spinal cord. The ongoing collaboration with the Gene Therapy Programme of the University of Pennsylvania is focused on gene therapy approach in different neurodegenerative disorders, (more particularly in lysosomal diseases, i.e., mucopolysaccharidosis, MPS). Concerning epilepsy, gene delivery of vectors downregulating chemokines in the bone marrow resulted in the reduction of excitotoxin-induced seizures and their harmful consequences. These results emphasize the role of chemokines in the immune-mediated process underlying some forms of epilepsy.

Finally, Dr Louboutin is involved in cell therapy, using stem cells in different tissues (i.e., bone marrow stem cells, skeletal muscle, Central Nervous System). This approach emphasises the interaction with regenerative medicine in a translational context. He is the author of more than 100 papers in peer-reviewed journals, and more than 18 book chapters.





Professor Horace Fletcher | Ms Elva Langott | Dr Christine Walters | Dr Harding-Goldson | Dr Jasneth Mullings Dr Kelvin Metalor | Dr Blondel Crosdale | Dr Tiffany Hunter-Greaves | Professor Minerva Thame

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**FACULTY OF MEDICAL SCIENCES** 

The programme for the reduction of maternal and child mortality for Jamaica (PROMAC)

# New knowledge created/knowledge gaps filled

Reproductive health is a direct measure of a country's development. It is an important marker of social and economic development, and is central to population and development policy. Reproductive health issues are among the leading causes of morbidity and mortality among women globally. Like its many partners around the globe, Jamaica has lagged behind its commitment to achieve the Millennium Development Goals 4 (Reduce Child Mortality) and 5 (Improve Maternal Health). Existing data from a 2008 death evaluation study (Delaware Group Consultario. 2011. Jamaica Civil Registration and Vital Statistics Modernisation Programme - Evaluation of the quality and completeness of death registration in Jamaica. Inter-American Development Bank grant to the Planning Institute of Jamaica (Consultant: Professor Affette McCaw-Binns) indicated

that the leading cause (91%) of underfive mortality was infant mortality, with the majority (80%) of infant deaths occurring during the neonatal period (the first month of life). Prematurity and other complications of the perinatal period accounted for 87% of neonatal deaths. Locally, the impact of noncommunicable diseases (NCDs) has slowed the rate of reduction in maternal mortality. Deaths from direct obstetric causes declined by 49% between 1987 and 2006 owing to improved health management and improved access to obstetric care. However, over the corresponding period, there was an 83% increase in deaths from indirect causes, negating these gains.

## Programme goal and description

Through funding from the European Union, the University of the West Indies was contracted by the Ministry of Health, under the direction of the Planning Institute of Jamaica, to deliver training and research in support

of maternal and child health. The PROMAC project will produce trained clinicians to support the operations of High Dependency Units which will be established in selected hospitals island-wide by the Ministry of Health. These Units are expected to provide critical care for mothers and neonates, with the aim of reducing morbidity and mortality among both groups. The project will also undertake research to identity risk factors for prematurity in Jamaica, and will build on previous work done in this area.

**Training:** Development and delivery of curricula for new postgraduate specialists in neonatology, maternal/foetal medicine and critical care. The project provides 86 scholarships for the new postgraduate programmes; DM programmes in Paediatrics, Anaesthesia, and Obstetrics and Gynaecology; MScN Nursing Education, and a course in Obstetric Ultrasound.





Research: Incidence, Risk Factors and Outcome of Prematurity in the Jamaican Population: PROMAC.

This study aims to identify risk factors for prematurity, such as socioeconomic status, lifestyle, clinical, oral health and environmental exposures, in a national sample of 3000 Jamaican women, 24-36 weeks of gestation. Data will also be collected on the health status of neonates.

# Specific benefits to be derived - potential impact on society

The trained specialists will provide care for the vulnerable populations of critically ill mothers and neonates. The research findings will inform government policies and programmes for the development of appropriate interventions to judiciously monitor and treat highrisk pregnancies, and strategies to decrease the incidence of pathologies which may contribute to prematurity. Findings may also have implications for the management of these risk factors in other developing world settings, including the Caribbean.

## Potential impact, applications and partnerships

The programme is expected to have a significant impact on health care delivery by supporting the reduction of maternal and neonatal morbidity and mortality in Jamaica. With a multi-sectoral reach, programme applications will inform and strengthen the following aspects of policy, service, planning and partnerships:

- 1. Policy reproductive health, social and development policy
- 2. Service delivery trained specialists and protocols for clinical management of at-risk mothers and neonates
- 3. Curriculum development nursing, midwifery and medical training programmes
- 4. Health systems management– assessment of documentation and other protocols
- National statistics provide information for reporting to local and international development partners [e.g., Planning Institute of Jamaica (PIOJ), National Family Planning Board, United Nations Population Fund (UNFPA), Pan American Health Organisation (PAHO) and United Nations Children's Fund (UNICEF)]
- 6. Health status of individuals and families through the scale up

- of health care services to vulnerable women and babies, as well as through direct health care referrals during data collection
- Academic development and institutional recognition via publications, reports and conference presentations
- Partnership development and expansion with the Ministry of Health, European Union, Pan American Health Organisation (PAHO) and the PIOJ National Family Planning Board, United Nations Population Fund (UNFPA), Pan American Health Organisation (PAHO) and United Nations Children's Fund (UNICEF)



**Project Implementation:** 

Project Funding: European Union - €1,100,000.00



Project Administrators: The Planning Institute of Jamaica and the Ministry of Health, Jamaica





**Duration: 2014 - 2020** 



# Project lead team

Principal Investigator: **Professor Minerva Thame**, Head, Department of Child and Adolescent Health Project Lead: **Professor Horace Fletcher**, Dean, Faculty of Medical Sciences (FMS)

Project Coordinator: **Dr Jasneth Mullings**, Lecturer, Office of the Dean, Faculty of Medical Sciences.

# Acknowledgements

## **Training Collaborators**

Dr Steve Weaver, Head, UWI School of Nursing (UWISON), Dr Carole Rattray, Head, Department of Obstetrics and Gynaecology, Dr Hyacinth Harding-Goldson, Head of Section, Anesthesia, Department of Surgery, Radiology, Anaesthesia and Intensive Care, Dr Tiffany Hunter, Lecturer, Department of Obstetrics & Gynaecology.

#### **Research Collaborators**

Dr Carole Rattray, FMS, Dr Tiffany Hunter, FMS, Dr Donnette Simms-Stewart, FMS, Dr Helen Trotman-Edwards, FMS, Dr Christine Walters, FMS, Dr Arvind Babu Santosh, FMS,

Mrs Zada Mulrain, UWISON, Mrs Valerie Noble-Myrie, UWISON, Dr Cathy Maddan, FMS, Dr

Sandra Chambers, Ministry of Health, Jamaica, Mrs Lola Fenton Falconer, Ministry of Health, Jamaica.



# **Technical Advisory Group (Research)**

Professor Affette McCaw-Binns, Reproductive Health Epidemiologist & Head, Department of Community Health & Psychiatry, Professor Rainford Wilks, Clinical Epidemiologist, Epidemiology Research Unit, Tropical Medicine Research Unit.



The lack of research capacity building among nurses in low and middle income countries has been well documented, and has implications for evidence-based practice among nurses in the region (Edwards et al 2012).

Historically, nursing has transitioned from the apprentice model to that where legislated regulations require registered nurses to enter the profession at the baccalaureate level. Faculty in the Caribbean region, though excellent practitioners, lag in generating new evidence which is relevant to our practice setting. Furthermore, nursing faculty often fall behind their academic peers in education and other disciplines because of their inability to write and publish scholarly papers.

Factors such as inadequate training, mentoring, low self-efficacy and a negative attitude towards research have been cited as contributing to the nurse's failure to reach the full potential in scholarly problem-solving.

This body of work sought to strengthen the research capacity of faculty and students at both the undergraduate and graduate levels.

We sought to improve the attitudes and learning experience of faculty and post graduate students, thereby ensuring an increase in conference presentations and peer-reviewed publications at the UWISON. This work is described in the publication: Lindo, J. L. M., Holder-Nevins, D., Roberts, D. D., Dawkins, P., & Bennett, J. (2013). "Shaping the research experiences of graduate students using action research". Nurse Education Today, 33(12), 1557-1562. The article shows that students registered in the Research Methods course of the MScN at a nursing school for the academic year 2010/2011 were exposed to a supportive learning environment with a minimum of two supervisors, workshops and exposure to experts in the field.

Students studied identified four clear enabling factors that reduced fears and improved attitudes towards research (the quality of course leadership, faculty members' interest in students' welfare, the affirmation of students, the level of respect for, and understanding of students' needs, and the direction of students to additional resources). Findings have been disseminated with the goal of raising the level of awareness among nurse educators.

Recommendations from the postgraduate students studied included strengthening of the research component during undergraduate training. This was supported by the Nursing Council of Jamaica, which endorsed a curriculum with six credit hours of research methods.

## Benefit to faculty and students

Additionally, from the group of 40 students, 20 projects were presented (oral and poster)



at the FMSARC 2012, and 10 papers have since been published in peer reviewed journals (see appendix below). This strategy, while successful, brought to the fore a discussion about authorship of work done by postgraduate students in partial fulfilment of degrees. This led to the following publication: Lindo JLM, LePage C., & Beason, F (2016). "Should faculty be allowed to assume first authorship on papers in cases where postgraduate students have failed to draft papers from work they conducted during their training?" [Letter to the editor]. Nursing Research 65 (2), 95. doi: 10.1097/NNR.00000000000000148

## Gaps identified

- I. The study highlighted the need to better understand how postgraduate nursing students' experience research methods at the UWI School of Nursing. This information may assist faculty to develop appropriate teaching strategies. A qualitative phenomenological study was conducted to answer questions about the lived research-course experiences at the UWISON, and the preparedness of course registrants. Figure 1. Describes a proposed framework for addressing issues relating to the challenges experienced by research methods course registrants.
- II. The lack of adequate mentorship to support improved research capacity among nursing faculty remains problematic with far reaching consequences in the nursing profession.
- III. Low levels of self-efficacy in research was an antecedent to the formation of negative attitudes toward research methods courses. Learning is an active process and learners seek to make sense of their surroundings by integrating new knowledge with that which they have already learned (Ausubel, 2012).

## **Application of outcomes**

A collaborative approach was used to develop a proposal which facilitated the learning experience of undergraduate nursing students in a research course, and the mentoring of junior nursing faculty in the conduct of research while determining the quality of nursing documentation at three Jamaican hospitals. Pairing students with principal nurse researchers to assist with activities such as literature review, data collection, patient assessment, analysing research

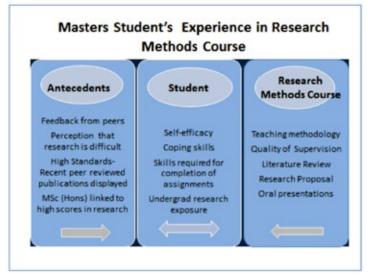


Figure 1. Concept Map of participants research experience

results, making poster presentations, has been recommended to address student's confidence (Kennel, Burns & Horn, 2009). This work resulted in the following publications:

i. Lindo, J.L., Stennett, R., Wilson, K., Barrett, K.A., Bunaman, D., Anderson-Johnson, P., Waugh-Brown, V., Wint, Y. "Killing three birds





with one stone: Implementing a Nursing Research, Education and Practice Program". Poster Presentation, AACN's Doctoral Education Conference, January 20-21, 2016, Naples, Florida USA

II. Lindo, J.L, Stennett, R., Stephenson-Wilson, K., Barrett, K. A., Bunnaman, D., Anderson-Johnson, P., & Wint, Y. (2016)." An Audit of Nursing Documentation at Three Public Hospitals in Jamaica". Journal of Nursing Scholarship, 48(5), 499-507.

III. Lindo, J. L. (2016, July). "Using Nursing Documentation as a Proxy for Quality of Care at Public Hospitals in Jamaica". In Sigma Theta Tau International's 27th International Nursing Research Congress. STTI. Cape Town South Africa

# Specific benefits to be derived from the research

Specific benefits to the society include:

Developing nurse researchers is an important element for generating new evidence, which is highly relevant for evidence based practice in the region.

An assessment of the quality of care, since documentation, can be used to gauge the level of care being delivered by nurses, and drive the process of strengthening the healthcare delivery.

Through this body of work, new partnerships have been forged as

we engaged nursing administrators in hospitals across the island and at the MOH, Jamaica. We have since partnered to explore problems relating to preceptorship of nursing students at the University of the West Indies

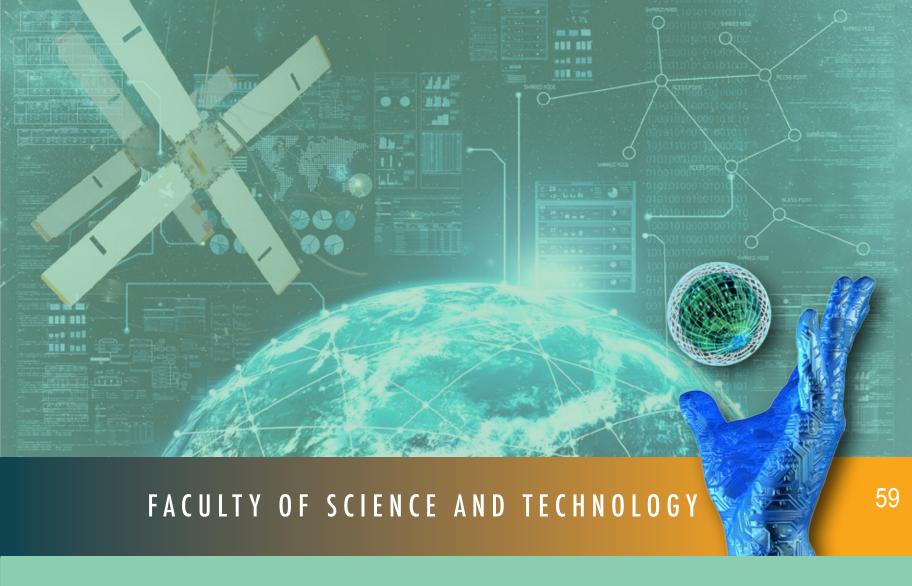
Finally, creating positive learning environments has the potential to improve the universities brand.



#### Bio

**Dr Jascinth Lindo** is a registered nurse with a Master's Degree in Nursing Education and a PhD in Public Health. She has extensive experience in the pedagogy of epidemiology, public health, health promotion and research methods, having taught at both the undergraduate and postgraduate levels since 2005. A strong advocate for evidence-based practice, Dr Lindo has published 24 peer-reviewed articles, and co-authored more than 60 abstracts and conference presentations (regional and international).









Bamboo has been a much maligned and misunderstood plant in Jamaica. Brought in for river training many eons ago, it has been mainly used for fence posts and yam sticks, and thus we inadvertently spread it throughout the country. There are now ~65,000 hectares of under-utilised bamboo stands in Jamaica. However, in many countries, bamboo feeds multi-billion dollar industries - including furniture, household appliances, construction, food, medicine, agriculture, feed and energy. Jamaica has woken up to the possibilities. Spear-heading this charge is the Bureau of Standards who initiated The Bamboo Project in May 2014; this is supported by public and private sector involvement through the Bamboo and Indigenous Materials Advisory Council (BIMAC) and the Bamboo Industry Association of Jamaica (BIAJ). This Bamboo Project is standards-led and market-driven.

The market opportunities are currently bigger than the supply, but foresighting has shown the real possibility for the need to cultivate bamboo in the future. For example, an outcome of the Bamboo Project has been the export of 70,000 lbs of Organic Bamboo Charcoal to the USA. The identified market for this industry is 12 million lbs per annum. Another market being eyed is the trade in bamboo shoots, which in 2012 was worth 275 mill USD - samples of locally-made sweetn-sour, jerk and curry bamboo shoots were available at Denbigh 2016. Also, a 260-square foot bamboo-framed house was constructed at Denbigh, while Jamaican-made prototypes were displayed (bamboo board, plywood, tile, school furniture, baking spoon, cutlery, pens, etc.). Indeed, the following products are already on the market - bamboo ketchup, bamboo organic charcoal, bamboo charcoal powder – in addition to the usual craft pieces.

Out of this relationship between BSJ, BIMAC and BIAJ, the following standards have also emerged:

- 1. Jamaican Standard for Bambo charcoal for air purification (JS 333\_2015)
- 2. Jamaican Standard for Canned/ packaged bamboo shoots (JS 334\_2015)
- 3. Jamaican Standard Specification for Furniture Part 2: Bamboo and Indigenous furniture (JS 106-Part 2: 2014)
- Bamboo Determination of physical and mechanical properties - Part 1: Requirements(JS ISO 22157-1: 2004), Adopted 2015
- Bamboo Determination of physical and mechanical properties - Part 2: Laboratory manual (JS ISO 22157-2: 2004), Adopted 2015
- 6. Bamboo Structural design (JS ISO 22156:2004), Adopted 2015



We have come a long way. In January 2012, Jamaica became the 38th member of the International Network for Bamboo and Rattan – INBAR. Bamboo charcoal from the local variety (Bambusa vulgaris) was produced for the first time in Jamaica on 06 October 2012 followed by the first ever sale of Jamaican Bamboo Charcoal on 08 February 2013 at a local supermarket. On 04 November 2014, Jamaica was elected Chair of the governing INBAR Council, now consisting of 42 Governments committed to using bamboo for the Alleviation of Poverty, through training and technical assistance.

Dr Mitchell was invited to join BIMAC by a colleague, Dr David Lee, and on joining realised that judicious application of research could help support the process. There is too often a clear disconnect between research and industry in Jamaica. Research is thought to finish with the post-graduate degree or after the formulation of a business idea. Thereafter, the researched product is said to be in the realm of business, and there is no more need for R&D. In fact, anyone who mentions the word "research" might be thought of as trying to hold back the process. There is need, however, to apply the principle of scientific data to new industries.

This idea of using research to help establish standards for this new industry resonated with the Bureau of Standards (BSJ) and an MOU was signed in 2015 between UWI (through the Biotechnology Centre) and the BSJ to make this link a reality. The goal to establish relevant standards and regulations for the young bamboo industry will guide its sustainable development in an environmentallyfriendly way. In furtherance of this objective, funding was sought and obtained as part of the OAS Peckham Bamboo Pre-processing Project: (Bamboo) 'Productive Employment'. This OAS project is coordinated by the PIOJ and links several organisations, including UWI, BSJ, NHT, SDC and local government. UWI, specifically the Biotechnology Centre, is producing tissue cultured bamboo plantlets to kick-start planned cultivation of bamboo. Also written into this project is a research component for nursery and field data collection. The data collected on the local growth of bamboo and otherwise, will help create standards, a few of which are:

- 1. Bamboo Nursery Standards
- 2. Bamboo Plantation Standards
- 3. Bamboo Removal and Land Restoration Standards
- 4. Bamboo Paper Standards
- Bamboo Activated Charcoal Standards

Jamaica is now a p-member of the new ISO Standards Committee on Bamboo and Rattan. Dr Mitchell attended the first meeting of this Committee in Beijing China, and took part in a three-week Bamboo Standardisation course between 20th April and 10th May, 2016. Locally, Dr Mitchell was elected the technical secretary of the Bamboo Products Standard Technical Committee. Internationally, she was elected to represent Jamaica as the convenor of the Bamboo Charcoal Working Group 3 of the Technical Committee 296 in the ISO system.

The agricultural value-chain is only as strong as its weakest link. The lack of good quality planting material and knowledge of growing of bamboo in Jamaica are weak links. Bamboo can be made into many products, suitable for multiplex national and international markets. However, this industry presently is resting on bamboo species neither purposefully chosen nor in in suitable areas. The value-added market is increasingly asking for traceability all the way back to the planting material used, and there is a need to ensure that the value-chains start from the best planting material possible.

As part of this process, the Biotechnology Centre has initiated *Bambusa vulgaris* and *Dendrocalamus asper* into tissue culture for the very first time in Jamaica (Fig 1a).

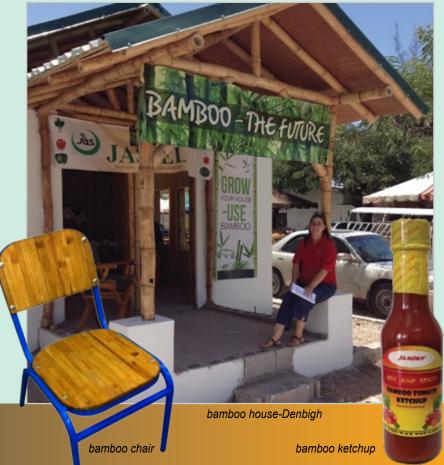
The field growth of this high quality planting material is being compared with traditionally planted material (as reported in other countries, for Jamaica has never grown bamboo as a crop before). Mined-out bauxite lands in Clapham are earmarked for the wide-scale planting of bamboo, including new varieties suitable for edible bamboo shoot production. A long-held desire of Dr Mitchell is to train farmers to take data on their farm, and then send it in for analysis. In this current bamboo project, data is coming into the University from



farmers in Peckham, Clarendon who are planting bamboo for the very first time. And more farmers are projected to join the movement.

This field data will be used to develop nursery and plantation standards. The nursery standards will cover both traditional and tissue culture produced planting material. Since this is the beginning of the value-chains of the bamboo industry of Jamaica, these standards are very important. The general objectives of these standards are to help stream-line the process of producing high quality bamboo planting material, and the establishment of sustainable and environmentally-friendly bamboo plantations in Jamaica.

There are several plants in Jamaica that are not purposefully planted, but are still being wild gathered, including turmeric (planted only in the last 10 years), ackee, breadfruit and bamboo. Indeed, most of the bamboo found growing all over Jamaica had been 'planted' inadvertently as yam sticks while still green, and they subsequently rooted and shooted and could not be removed at the end of the yam season, leading to the plot being abandoned. This has given rise to bamboo being considered as invasive, although its spread was not of its own making. Also, underutilised bamboo clumps are firehazards, so usage of these clumps will decrease the chance of fire as well.



Agricultural research in Jamaica is still too sparse. This project aims to help to correct this situation and to produce a methodology that will encourage other academic-public-private partnerships. Through this MOU with the Bureau of Standards, Dr Mitchell is helping to bridge the gap between research and Industry.

#### BIO

**Dr Sylvia Mitchell** is a senior lecturer at the Biotechnology Centre. At the Centre, she is in charge of the Medicinal Plant/Tissue Culture Research Group. The group is working towards 'Harnessing the potential of Jamaican-grown plants for health and wealth through biotechnology'.



Coral reefs have been considered among the most productive biological ecosystem, providing valuable resources, especially for the peoples of small island states such as Jamaica. The net benefit of coral reefs to the Caribbean has been estimated at between US\$3.1-4.6 billion through dive tourism, shoreline protection and fisheries (Burke and Maiden 2014). However, there has been a regional decline in coral reef health over the past four to five decades owing to overfishing, coastal development, agricultural run-off and other land-based sources of pollution. In addition, coral reefs are now under threat from increased sea surface temperature and ocean acidification, as a result of climate change. Countries of the Caribbean, including Jamaica, are now looking to coral reef restoration as a means of reducing and possibly reversing this decline.

The UWI's Centre for Marine Sciences was contracted by the Inter-American

Development Bank (IDB) to undertake research aimed at conducting effective coral reef restoration by selecting and propagating climate-change resilient corals. One component of the consultancy involved an island-wide survey and evaluation of the success of the existing coral reef restoration initiatives.

Coral restoration initiatives have been implemented to assist in the recovery of degraded and damaged coral reefs and, thus, restore their productivity. However, a survey of these activities had never been done. The island—wide survey revealed that coral restoration activities were concentrated mainly along the north coast, and almost all were located in some form of marine protected area. A total of 28 restoration activities were identified at 12 localities (Negril, Montego Bay, Falmouth, Discovery Bay, Boscobel, Oracabessa, Alligator Head, Rackhams Cay, Three Bays, Burial Ground Point, Malcolm's

Bay and Bluefield's Bay) around the island. [Figure 1: Location of coral restoration sites around Jamaica.]

The methods employed at these locations were approximately equally divided between physical (artificial reefs and coral relocation) and biological techniques (coral nurseries). [Figure 2: Summary of the different physical and biological restoration techniques implemented in Jamaica.]

The physical restoration techniques were primarily artificial reefs, which comprise man-made structures placed on the sea floor in order to improve fish habitat and create substrate for the attachment of corals. Coral relocation was conducted at Rackham's Cay (outside of Kingston Harbour) as well as Falmouth Harbour and Discovery Bay in to order to save coral colonies from the destruction that would have otherwise resulted from dredging.



## [Figure 3: Artificial reef structures and coral relocation sites]

By far the most common type of restoration techniques involved the growing of corals in underwater nurseries. The aim of these biological nurseries was to keep the young corals off the sea floor and away from competition from other organisms such as algae and sponges, and also to reduce the possibility of predation and diseases. Most of the nurseries were focused on growing the endangered Acropora cervicornis and Acropora palmata species. However 11 other species were also identified. Several coral nursery designs were used, however, the line/rope and the coral tree nurseries proved to be the most successful and cost effective. Larval seeding and DNA gene expression analysis has also been attempted, but with limited success.



[Figure 4: Endangered coral species used in coral nurseries] [Figure 5: Examples of the different type of coral nurseries]

The ultimate goal of coral restoration activities is to increase coral coverage in the target area, the success of which is evaluated though measuring growth rates, survival rates, the survival of outplants and, finally, the area of reef actually restored. The Jamaica initiatives faced the challenges of suitability of the locations, poor water quality and the lack of adequate human and financial resources. Documentation on the local restoration activities is limited because

coral reef restoration is a new and evolving scientific field; however, there is now a movement towards sharing experiences which will contribute to future successes.

[Figure 6: reef habitat created as a result of restoration activities.]

The IDB consultancy team includes staff from the Centre for Marine Sciences (CMS), the Discovery Bay Marine Lab (DBML), Alligator Head Marine Lab (AHML) and the Department of Life Sciences (DLS) as follows: Mona Webber (CMS-Project lead), Suzanne Palmer (DLS), Peter Gayle (DBML), Dayne Buddo (DBML/AHML), Marcia Creary (CMS), Patrice Francis (CMS), Gina-Marie Maddix (CMS), Deana-Lee Douglas (DBML), Denise Henry (AHML) Camilo Trench (DBML), Dalelan Anderson (DBML), Shanna Lee Thomas (DBML).

#### Bio

Marcia Creary Ford is the environmental data manager of the Caribbean Coastal Data Centre located in the Centre for Marine Sciences (FST). Her primary areas of interest/research include data management and archiving, coral reef monitoring, coral reef ecosystem restoration and the impacts of global climate change on coral reefs.

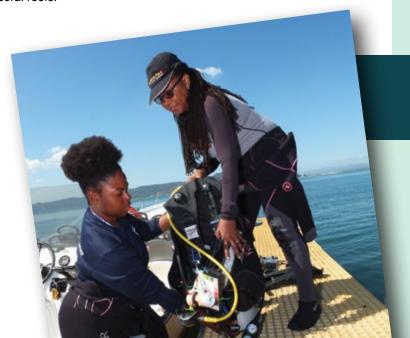


Figure 3



Figure 4a

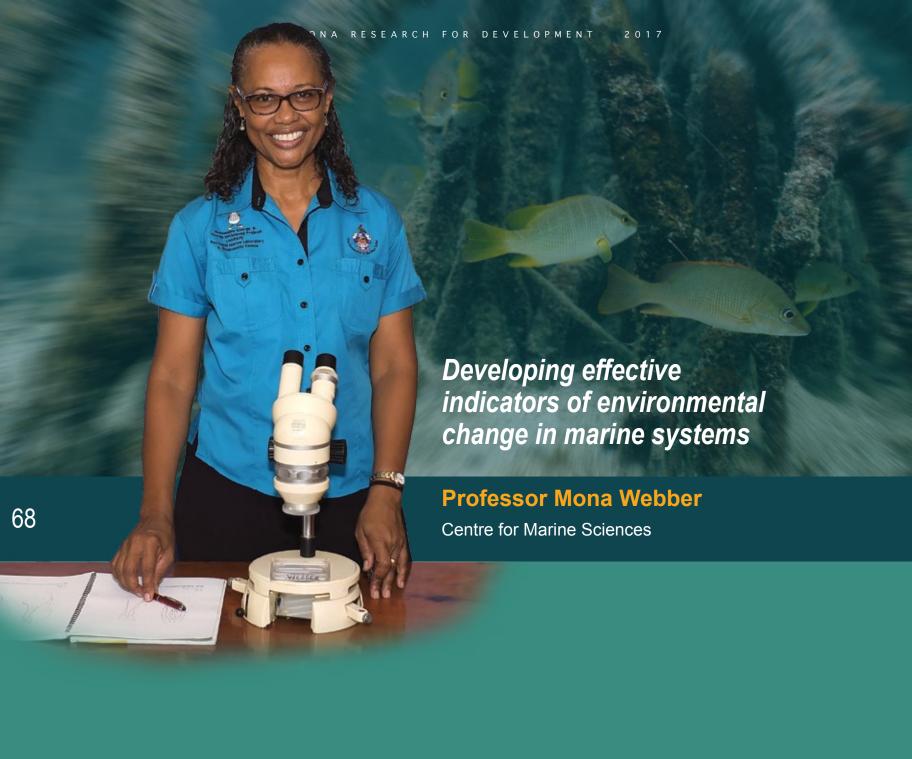


Figure 5



Figure 6

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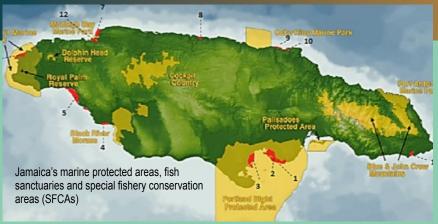
#### Introduction

Environmental changes in marine systems can be positive or negative. Systems undergo measurable change, either in response to natural or anthropogenic factors. Negative changes in the marine environment can be in response to pollution, or from natural disasters. Changes can also be positive as a result of conservation interventions like the establishment of protected areas and fish sanctuaries. Marine systems are very complex, with organisms interacting with the physical and chemical environment on many different levels. How do we effectively and accurately indicate real changes that inform about the effects of positive or negative action?

Environmental change in Kingston Harbour The need to develop effective indicators of change in the Jamaican marine environment was driven by negative effects of nutrient

pollution (eutrophication) on coastal water bodies like Kingston Harbour. Kingston Harbour and other commercially important bays around the island have been receiving mostly large quantities of nutrients from untreated sewage since the early 1970's. These pollutants were either from point or non-point sources, but were driven by excessive development (for housing, e.g., Hellshire, or recreation, e.g., hotels) in the coastal zone. There was, therefore, great need to identify the source of pollutants as well the effect of these pollutants on marine systems so there could be mitigation. On the positive side, as Jamaica began to realise the need to protect important areas of its coast, which included sensitive habitats and important fish stocks, marine-protected areas and fish sanctuaries were developed. How do we accurately indicate that sanctuaries are effective at preserving fish stocks?

For indication of nutrient pollution, biological indicators were found to be most effective, as they would immediately absorb nutrients and increase in numbers. Research showed that unless we were lucky enough to sample at the exact time of the nutrient inputs, it was impossible to accurately quantify or identify the source of the inputs. Certain planktonic plants and animals were observed to multiply in response to nutrient inputs, while others disappeared from the waters. Thus, the changes in species composition, diversity, as well as abundance of individual planktonic species were developed as effective indicators. In extreme cases, in Kingston Harbour planktonic plants would bloom in such numbers that the waters were coloured red (red tide). Also, animals like Lucifer faxoni and Penilia avirostris were found to multiply in the harbour, thus characterising its waters and allowing us to track the movement of





these waters along the Hellshire coast. Therefore, waters polluted by excess nutrients have been effectively characterised by low diversity and dominance of one or few species which usually increase in numbers and come to characterise the polluted waters.

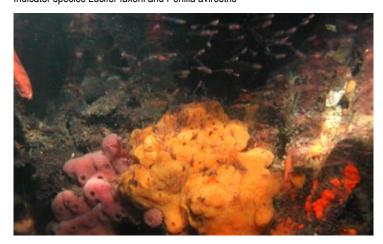
# Environmental change in mangrove lagoons

Mangroves lagoons are characterised by dark coloured waters, often stained red by the tannins leached from the bark of the red mangrove tree. Were all mangrove lagoons polluted because of these dark coloured low oxygen waters? There was need to develop unique indicators of pollution for mangrove lagoons which, again, resulted in the use of the microscopic plants and animals in the water column. Indicators were developed by sampling a range of mangrove lagoons across Jamaica experiencing different levels of pollution. These





Indicator species Lucifer faxoni and Penilia avirostris



Juvenile fish in the mangrove root area of the Port Royal Mangrove lagoon.

studies indicated the importance of mangrove waters in providing food and shelter for juvenile fish, shrimp and lobsters. However, the animals and plants living on the mangrove roots hanging into the water (the prop root community) were also found to be effective indicators of stress in the mangrove lagoon.

# Environmental change in polluted sediments

Using the microscopic plants and animals in the water column is effective as long as inputs continue. When Soapberry sewage treatment system was developed in 2012 to take the large quantities of untreated sewage that used to enter into the Harbour, there was immediate improvement in the Harbour waters. But what of the sediments that were exposed to a constant 'rain' of nutrients for decades? There was need to develop effective indicators to show the changes in the pollution in the sediments, and how this changed over ensuing years. The microscopic animals living in the sediments (termed meiofauna) were sampled throughout Kingston Harbour and these clearly showed the most polluted areas dominated by one group of animals; nematodes. Clean sediments had a greater diversity and included a variety of animals, but only nematodes currently live in most areas of the Kingston harbour bottom. Developing these bioindicators, using the meiofauna, will allow us to indicate when the sediments of the harbour begin to show improvement.



#### **Environmental change in water column with microplastics**

So what about the new global threat of micro-plastics in marine waters? These contaminants are being eaten by fish. Studies in other parts of the world suggest that the micro-plastics are being "favoured over more natural fish food". The plastics leach toxic chemicals and effectively poison the fish. Are Jamaican fish consuming micro-plastics in large enough quantities for this to have a negative impact on them and, in turn, on us? Kingston Harbour receives large quantities of plastics from the 21 gullies that bring storm water (among other things) into the sea. When exposed to sunlight and wave action these plastics break into small fragments. Those less than 5 mm are referred to as micro-plastics, and can be eaten by marine organisms. The next stage of developing effective indicators of pollution will involve effective sampling to identify quantities of micro-plastics in Jamaica's coastal waters and in our fish.

#### Environmental change in marine protected areas

On the positive side, effective indicators are being developed, using fish larvae that live in the plankton (ichthyoplankton) which help to show the effectiveness of fish sanctuaries, or help to validate the positioning of these areas. Marine protected areas, fish sanctuaries or special fishery conservation areas (SFCAs) must protect juvenile stocks. To be effective, a sanctuary must provide a nursery (food and shelter) for young fish so they can grow larger and effectively replenish

the sanctuary and adjacent areas. By sampling and quantifying the fish larvae across SFCAs, we can see whether these areas are being effective and which ones are best so new sanctuaries can be strategically placed.

#### Conclusion

We have been conducting research into developing effective indicators for marine systems since the early 1980's, working in Kingston Harbour, along the Hellshire coast, in Portland Bight, in Galleon Harbour (St. Elizabeth), along the St Thomas coast, in Discovery Bay and, most recently, along the Portland coast. The work in Portland has contributed to the establishment of the newest and largest fish sanctuary in eastern Portland. Throughout the years of research, over 35 graduate students have been trained and these continue to work at effectively indicating change (positive or negative) in our marine environment upon which we depend for food, recreation and numerous goods and services.



Bio

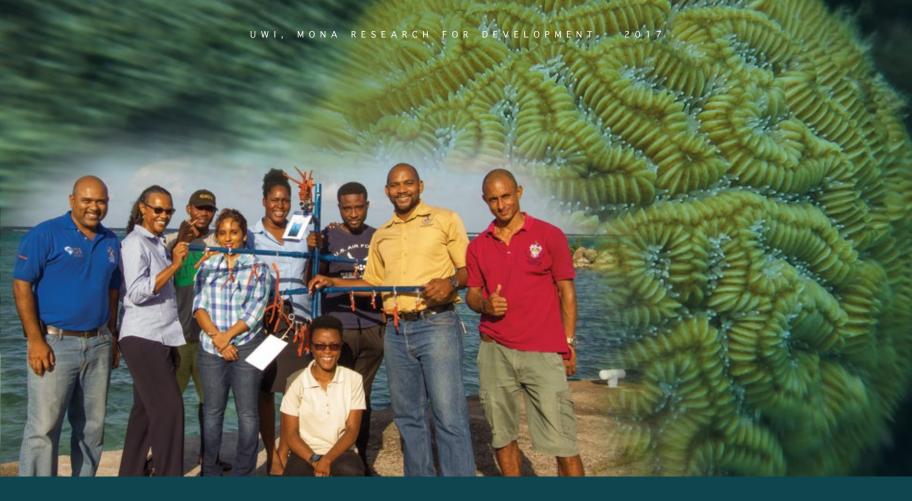
**Professor Mona Webber** is a professor of Marine Biology and is Director of the Centre for Marine Sciences, Department of Life Sciences, UWI (Mona).







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**Centre for Marine Sciences** 

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Coral reef restoration using climate change resilient species by identifying the genes involved in coral resilience



Coral reefs are unique tropical systems that provide numerous ecosystem functions, including protecting shorelines, producing sand, and supporting fish and other biodiversity. Their global decline in the face of anthropogenic stresses (overfishing and pollution) has been extensively documented. Now, issues related to climate change (coral bleaching and disease) have led to heightened activity around how to effectively restore degraded and damaged reefs. Several local and international organisations have been conducting coral reef restoration using nursery grown corals for the past decade, with varying levels of success. Awareness is growing that the propagation of resilient corals is critical to the survival of coral reefs in the face of climate change effects. The UWI's Centre for Marine Sciences was. therefore, contracted by the Inter-American Development Bank (IDB) to carry out novel

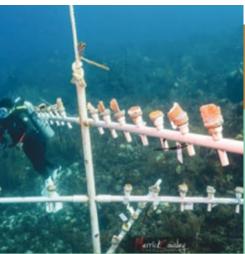
research aimed at conducting effective coral reef restoration by selecting and propagating climate-change resilient corals.

Part of the consultancy involved identifying the genetic structure of coral species that are showing natural resilience in Jamaica's marine environment. We recognise that corals that are continually under pressure from natural and anthropogenic stressors must adapt to their changing environment to avoid local extinction. Defining genetic diversity and structure, as well as identifying genes involved in coral resilience, can improve coral conservation and restoration efforts.

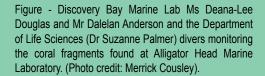
Identifying resilience at the genetic level involved first making collections in Discovery Bay and Alligator Head of coral species that were surviving and thriving under poor

conditions while adjacent corals of the same species were succumbing to those very conditions.. Understanding the genetic structure of resilient corals compared with that of those less resilient can potentially identify changes in allele frequencies that identify resilience, which can be used as a guide for restoration efforts. The Centre for Marine Sciences received assistance from Mote Marine Laboratory, Sarasota Florida with the genetic analysis, as well as in the training of staff who travelled to Mote to conduct the analysis.

Species specific microsatellite markers were used to genotype Acropora palmata and Orbicella faveolata corals. When comparing the gene expression of the healthy corals with that of the unhealthy corals, "frontloading" (a proposed mechanism for resilience) of some of the gene transcripts can be observed. The







"frontloading" of the O. faveolata gene transcripts was much higher in the Discovery Bay samples than in the Alligator Head samples, suggesting that the Discovery Bay corals are more resilient than the Alligator Head corals.

Re-propagating depleted reefs with resilient corals greatly increases the chance of successful restoration. Genetic diversity and structure vary significantly between coral species, but the use of microsatellite markers has been successful in detecting genetic structure in the same coral species.

Our results of the Discovery Bay unhealthy coral gene expression suggest that these corals may be under some form of heat stress, whereas A. palmata samples from Alligator Head seem to be under high microbial (disease) pressure.

Figure - Gina-Marie Maddix doing genetic analysis at Mote Marine Laboratory, Sarasota Florida. (Photo Credit: Tracy Sherwood).

The data presented here of the coral gene expression comparing the unhealthy (presumed less resilient) with healthy (presumed resilient) corals is a useful strategy in discovering key biomarkers that can be related to disease, infection and environmental stress. While these results represent two species of coral from two bays on the North coast of Jamaica, the indications are very valuable and could have far-reaching implications for successful propagation and restoration of coral species in Jamaica and the Caribbean. Restoration efforts need to make every attempt to select for resilient corals through the investigation of biomarkers related to internal and external factors. There is need for funding to conduct additional genetic analysis using micro-satellites, and a larger number of replicates is recommended for this, as this could better elucidate differences between and within locations.





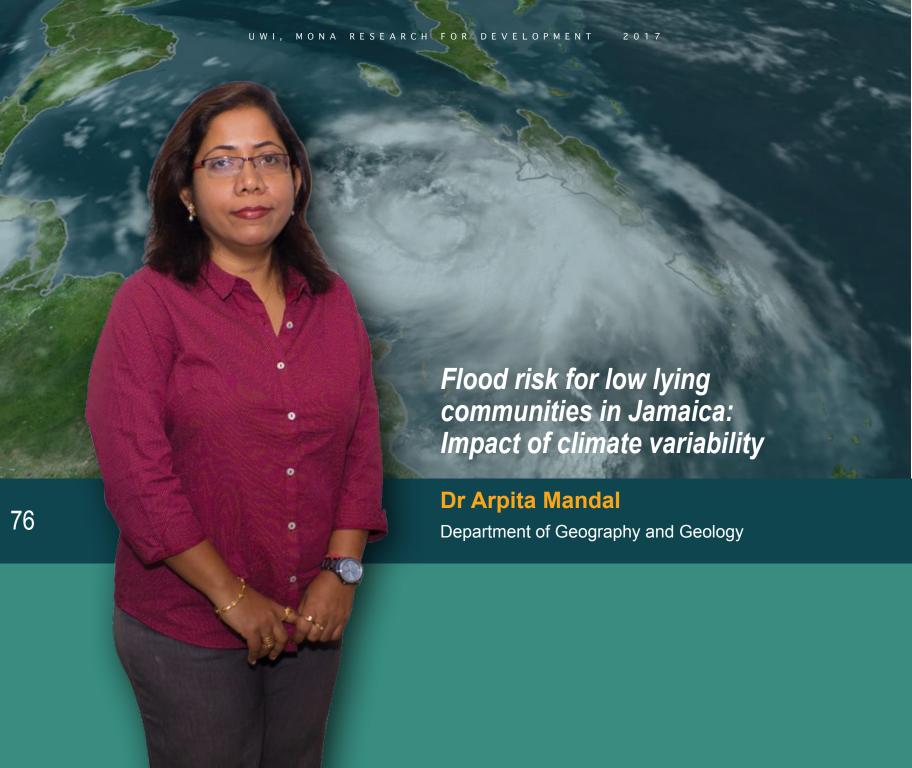






# BIO

The IDB consultancy team includes staff from the Centre for Marine Sciences (CMS), the Discovery Bay Marine Lab (DBML), Alligator Head Marine Lab (AHML) and the Department of Life Sciences (DLS) as follows: Mona Webber (CMS-Project lead), Suzanne Palmer (DLS), Peter Gayle (DBML), Dayne Buddo (DBML/AHML), Marcia Creary (CMS), Patrice Francis (CMS), Gina-Marie Maddix (CMS), Deana-Lee Douglas (DBML), Denise Henry (AHML) Camilo Trench (DBML), Dalelan Anderson (DBML), Shanna Lee Thomas (DBML). The team from Mote Marine Laboratory who hosted CMS Scientific Officer, Ms Gina-Marie Maddix and facilitated/reported on the genetic analysis included Tracy Sherwood and Dana Wetzel.





### Abstract

Jamaica is frequently impacted by floods, with 20% of the island subject to a high or very high flood hazard. These negatively impact livelihoods, with high levels of damage to private property, civil infrastructure, agriculture, and also loss of life. Several factors influence flooding, inclusive of geology, geomorphology, topography, hydrology, landuse and high rainfall. In Jamaica, much of the high rainfall occurs in the second half of the year, and is associated with tropical cyclones. Consequently, flooding in Jamaica is often associated with tropical storms and hurricanes. Flood frequencies increased during the last half of the 20th century and start of the 21st century, and the increase in the frequency of tropical cyclones affecting the island correlates with an increase in floods. Climate change models predict that within the Caribbean basin, the intensity of

tropical cyclones and the rainfall associated with them will increase. This may affect the frequency and severity of floods in Jamaica as well as other Small Island Developing States (SIDS) of the Caribbean.

The researcher's work on flood risk primarily focusses on the low-lying communities which reside on the floodplains of major river systems such as Hope, Yallahs, Anotto and Outram River. Of the watersheds in Eastern Jamaica, the Hope and Yallahs River watersheds located in the parishes of Kingston and St Andrew and St Thomas have shown major evidence of damage from past flooding and storm surges. Of particular significance is the collapse of the fording at Kintyre and the bridge at the mouth of Hope river from heavy rains associated with hurricanes Ivan (2004), tropical storm Gustav (2008), tropical storm Nicole (2010) and hurricane Sandy (2012) in

recent years. Damage to infrastructures also accounts for the majority of flood damages from past extreme events. The collapse of the bridge at Harbour View at the mouth of the Hope River from the above events led to challenges in commuting between the two parishes (Kingston and St Andrew and St Thomas). The watershed of Yallahs River has also shown signs of damage from flooding, leading to the collapse of the fording between Albion and Poorman's Corner from rains associated with hurricane Lili and Isidore in October 2002. A temporary bailey bridge was constructed post this event, which was eventually washed away in May 2003, post which a permanent bridge was constructed in 2008. Aside from this, flooding has also been reported from the community of Poorman's Corner (Yallahs) at the mouth of the river, with flood levels reaching as high as 4ft, as well as recurrent flooding in Port Maria, the





capital of St Mary (2006, 2010 and 2012) from rainfall associated with and without extreme events (tropical storms, hurricanes). Aside from this, work is also ongoing on damage and risk assessments from past flooding events on the above mentioned study areas, using a combination of fieldwork, data collection on building types, damages from past event, and cost analysis for different types of infrastructures.

Research on flood risk also includes rainfall data from past events, and future climate projections. Regional Climate Models for Jamaica, based on the PRECIS RCM 50km model runs, were used to date hydrological models for past events as well as for rainfall of different probabilities of exceedances (return periods) developed for the watersheds of Hope, Yallahs, Port Maria and South-Negril Orange River. These models isolate areas vulnerable to damage from discharges which exceeded the modelled lifetime for bridges (return periods) that collapsed from past events. Models also included future rainfall data for 5, 10, 25, 50 and 100-year events as derived from the PRECIS RCM which were conditioned over the hydrological and hydraulic (flood inundation models) to predict flood depths for above return periods and, thus, show the extent of areas (buildings and other infrastructures) which are, and will be at risk from flooding. In all the watersheds studied as well as other areas in Jamaica, there are developments which are directly on the river bed or in flood prone areas. Poor planning and land use practices as well as poor maintenance of drains (in urban areas) have all aggravated increased flood risk causing damage to life and property. These flood hazard maps showing present and future flood risk for vulnerable communities at national and sub-national levels are vital for disaster management and planning climate-compatible development in floodprone areas.

Research has also led to creation of an island wide riverine flood hazard map using Geographic Information System, Logistic Regression and Principal Component analysis using the various climatic (rainfall) and non-climatic (soil, land use, topography) causative factors responsible for flooding in any areas. The map

shows areas of high likelihood of flooding. These are the floodplains of major river systems and sites for major towns and cities. This, when overlaid with road network map, clearly shows that the major roadways are located in, or pass through areas with high flood likelihood, thus laying emphasis on building flood resistant infrastructure for present and future climate conditions.

Aside from the above research activities, the research projects also involved community meetings and workshops conducted in the watersheds of Yallahs and South Negril Orange River. These involved distribution of fliers and booklets on climate change and flooding in Jamaica, followed by presentation of result. The researcher also conducted training of stakeholders from different Government agencies in Jamaica (e.g., WRA, NEPA, PIOJ, ODPEM, NWA) on hydrological and hydraulic models used in the research, as well as use of mobile data collection using ODK app for disaster risk reduction. This forms a significant part of capacity building and knowledge sharing, which can lead to proper planning and policy design for development based on science-based solutions.





### Bio

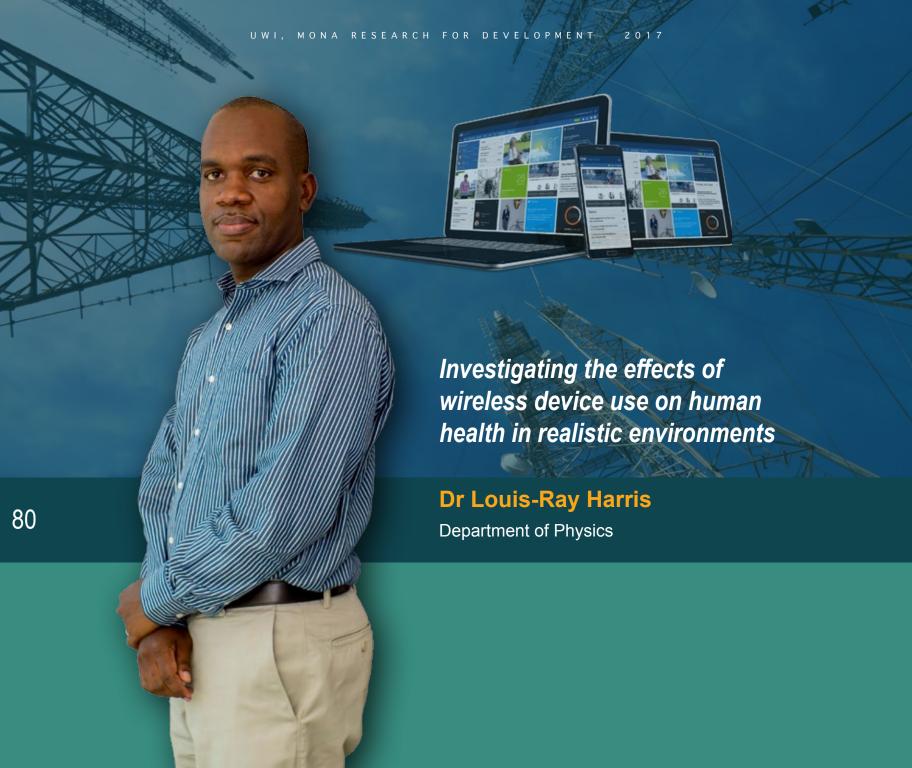
**Dr Arpita Manda**l is a senior lecturer in the Department of Geography and Geology. Her p primary areas of interest/research are hydrology, flood risk under impact of climate variability, groundwater resources for Jamaica and aqueous geochemistry.

The projects had several collaborators, both in the Caribbean and international. These include Prof Michael Taylor and Dr Tanneica Stephenson and colleagues from the Climate Studies Group Mona, Dr David Smith from the Institute of Sustainable Development, UWI Mona, Dr Matthew Wilson, Department of Geography, UWI St Augustine, Trinidad and Tobago, Dr Adrian Cashman, Director CERMES, UWI Cave Hill and Dr Sherene James Williamson from Dept of Geography and Geology, UWI Mona. International collaborators include Drs Phillippe De Meyer and Greet Deruyter, Ghent University, Belgium and Dr A Nandi from East Tennessee State University, USA.





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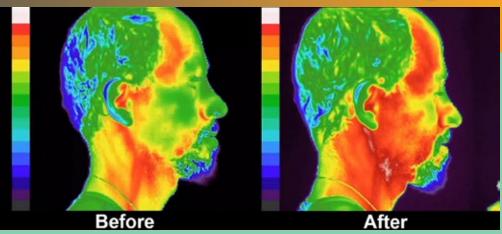
The World Health Organisation (WHO) recognises radiofrequency (RF) exposure as a health-related issue, and has published health-risk assessments for different types of electromagnetic (EM) fields that are generated by wireless transmitters. Research in the area of electromagnetism generally includes determining the relationship between EM fields in free space and fields which are induced in human body tissues. In this specific study, the research has focussed on the use of cellular phones and other wireless devices, which have become increasingly popular in recent times, and which are used by people in all walks of life.

Wireless devices are the primary sources of EM fields, and include mobile phones, laptops, tablets and cellular base stations. During normal everyday use, the exposure levels due to mobile phones, which usually transmit at powers less than 10 Watts (W),

exceed the exposure levels due to cellular base stations, which transmit at higher power levels. This is primarily because of the relative proximity of mobile phone antennas to people's vital organs, e.g. the brain and reproductive organs. Other sources of EM fields include wireless body area network (WBAN) sensors which are wirelessly connected in, on and away from the human body to form networks that unobtrusively monitor an individual's physiological or environmental signals. This technology has been increasingly applied in medical, military, lifestyle and entertainment applications such as the in-hospital monitoring of patients' vitals, smart watches and smart glasses. A key reason for this increased application is the development of wireless sensors which can be ingested as capsules, embedded under the skin or incorporated into clothing materials (textile antennas).

Many countries in the Caribbean region have set targets for realising increased broadband penetration in order to improve the connectivity and productivity of their citizens. To accomplish this goal, several steps have been taken to increase access to wireless devices and broadband Internet services. One example is the recent large-scale introduction of tablet devices in primary schools in Jamaica. In addition, in many countries, people own multiple wireless





devices which enable them to communicate with friends and family who are subscribers on different networks. These devices are usually placed in pockets, bags, clipped onto belts, or are held in hands, and are commonly used in vehicles, whether they are drivers or passengers.

All of these devices used should comply with human exposure guidelines for basic limits with respect to the specific absorption rate (SAR), which indicates the rate of absorption of EM radiation by the human body. The International Commission for Non-lonizing Radiation Protection (ICNIRP) has issued guidelines for the maximum allowable SAR values for wireless devices in order to prevent excessive localised heating of human tissues. However, many people do not usually use this information to guide their purchase of mobile phones or other wireless devices.

The SAR depends on a device's frequency, position, transmission power and the anatomy of the individual. Under different conditions, there are varying degrees of interactions between the EM field from wireless devices and the human body, which comprises water, electrolytes and molecules. These interactions result in induced electric currents and the absorption of EM energy by the body, mainly by its ionic activity. The absorption of the EM field by tissues results in energy being converted to heat, thus increasing the tissue temperature. Several models have been developed which incorporate thermal migration, blood perfusion and convection, and in these models, the thermal properties of different tissues and organs vary because of their different composition and water content. The determination of these EM field levels at a given location in the human body is important in establishing the risk to humans. In addition, it is widely accepted that the absorption of EM radiation by the tissues of children is greater than that for adults because children's tissues are not yet fully developed. In some countries, this has led to the issuing of specific guidelines regarding the amount of time that children (up to the mid-teens) should spend using wireless devices because of the absence of data on the long-term effects of the use of these wireless devices.

In this study, to determine the SAR values caused by the placement of wireless devices around the human body, specialised software and hardware are used to model wireless devices which are in close proximity to real-sized humans as well as other objects present in the environment. The EM field values throughout the environment are calculated, incorporating the electrical properties of the humans and objects. These field values are used to generate the SAR, which is then compared to the ICNIRP guidelines for both general use and occupational use. The inclusion of nearby objects in the simulations has several advantages in that metallic objects, such as the frames of vehicles and surfaces of elevators, reflect RF signals, and may lead to an accumulation of EM energy in a given environment. Several scenarios are being modelled involving different types of devices in a variety of environments. For some configurations of wearable antennas placed on the chest, back and hip, the SAR due to the combined effect of these devices were within the ICNIRP guidelines. Further, because of the relatively low-power transmission, the SAR values for Bluetooth devices are shown to be very low. However, with the continued development of devices for use on newer mobile



networks such as Long-Term Evolution (LTE), LTE-Advanced and 5G (expected around 2020), the analysis of the EM fields generated by these devices and mobile base station antennas is, therefore, important in order to ensure that SAR threshold values are not exceeded.

In 2010, the 'Edumed Institute for Education in Medicine and Health Independent Research Group on the Impacts of Mobile Technologies on Health' published a report that reviewed the standards and policies of RF radiation protection in Latin America. It was noted that 13 countries in the Latin American and Caribbean region had completed, or were in the process of developing non-ionizing radiation standards for telecommunication systems. However, no English-speaking Caribbean countries were included. Therefore, there is the need for English-speaking countries in the Caribbean region to focus on developing their own policies and regulations regarding RF exposure limits.

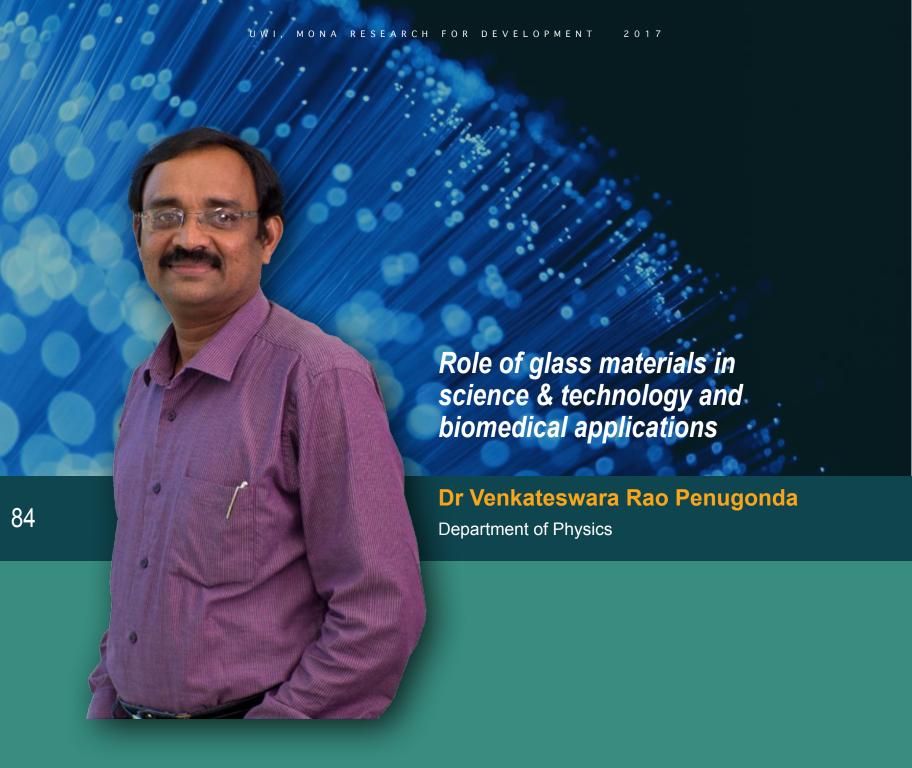




## Bio

Dr Louis-Ray Harris is a lecturer in the Department of Physics. His research includes investigating the effects of wireless devices on human health and the application of the finite-difference timedomain (FDTD) estimation method to various wireless environments. He is a recipient of the Government of Japan's Monbukagakusho Scholarship, and holds a PhD in Wireless Communications from Hokkaido University, Japan.





Dr Penugonda's general research interests are in dielectric, thermo luminescence, non-linear optics, specifically in bismuth borate, tellurite and bioactive glasses. My current research is the calcium phosphate-based bioactive glasses for bio-medical applications, and tellurite-based glasses for the electro-optical fibre devices.

Glass is an inorganic amorphous disordered solid material that is usually clear or translucent with different colors. It is hard, brittle and stands up to the effects of wind, rain or sun. The nature of the glass formation depends on the mixture of the different chemical powders known as glass composition. Glass composition mainly contains three types of components, network/glass formers, intermediates and modifiers. Glass formers, form the network by means of the cations that bond to bridging oxygens. Network formers are two types, chalcogenide

and oxide network formers. Network modifiers disrupt the network and produce non-bridging oxygens. Intermediates can act as both network formers and modifiers, depending on the glass composition. Glass formation of glass composition follows the W.H. Zachariasen rules.

Different techniques have been used to prepare glassy materials in various forms like bulk, sheet, powder, thin films, etc. The techniques include: thermal evaporation, sputtering, glow discharge decomposition, chemical vapor deposition, electrolytic decomposition, chemical reaction, reaction amorphisation, irradiation, melt quenching, and sol gel technique. Among these, melt quench technique is the oldest established widely used method for the preparation of glassy materials because glass preparation and handling are relatively easy. The distinguishing feature of the melt-quenching

process of producing amorphous material is that the amorphous solid is formed by the continuous hardening (i.e., increase in viscosity) of the melt.

According to P.W. Anderson, "The deepest and most interesting unsolved problem in solid state theory is probably the theory of the nature of glass and the glass transition." X-ray diffraction patterns confirm the amorphous nature of the glassy materials. Physical/chemical/mechanical/optical properties heavily depend on the composition. Various spectroscopic techniques namely, optical absorption, photoluminescence, electron spin resonance, Raman, IR and NMR are useful to probe the structure and connectivity of the materials.





Bio Active Glass samples

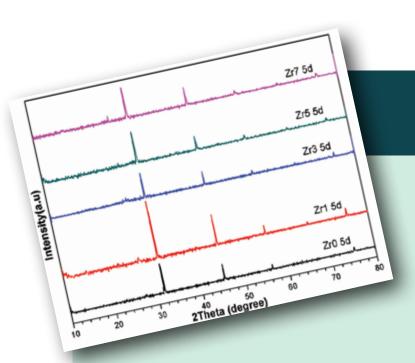
Glass materials play an essential role in our daily life and in modern scientific technology. Naturally formed glasses are obsidian (occurring from volcanic) and moldavite (formed by a meteorite impact). Obsidian is used for ornamental purposes and as a gemstone, and used by some surgeons for scalpel blades. Moldavite is used for ornamental purposes. Soda-lime-silica glass is used for windows, containers, light bulbs, tableware. Borosilicate glass is used for chemical glassware, cooking glass, car headlamps, reagent bottles, optical components, etc. Lead-oxide glass has a high refractive index, making the look of glassware more brilliant (crystal glass). Some types of aluminosilicate glass have been used in space shuttle windows, gauges, high quality fiberglass and thermometers. Bismuth-based glasses have potential applications in optical and optoelectronic devices such as ultrafast switches and optical Isolators.

The researcher is currently working on two research projects. The first one is calcium phosphate-based bioactive glasses. The bone-bonding capability of a bio-material to host bone is associated with the formation of a carbonated hydroxyapatite (HA) layer on the surface of the material, either when implanted or placed in contact with biological fluids. The ability to bond with bone can be preliminarily assessed in vitro in simulated body fluid (SBF) by monitoring the formation of HA on its surface. With the increase of immersion time in SBF, the quantity and size of the apatite particles increase gradually. X- ray diffraction (XRD)studies and scanning electron microscope (SEM) morphologies confirm the presence of a crystalline HA layer on the surface of glass. Calcium phosphate glasses are widely used as a bone substitute in the field of dentistry, orthopedic and reconstructive surgery.

The second research project is on tellurite glasses. The research on tellurite-based glasses is significant owing to their potential applications in designing materials for optical communication systems, lasers, and nonlinear optical and optoelectronic devices. Several telecommunication companies such as Bell Communications Research Inc., Corning Incorporated, Nippon Telegraph and Telephone Corporation have used tellurite glasses in different

applications like optical amplifier, fiber amplifier and light source. The possibility exists for our Caribbean regional telecommunication providers do this same with this newly synthesized material.

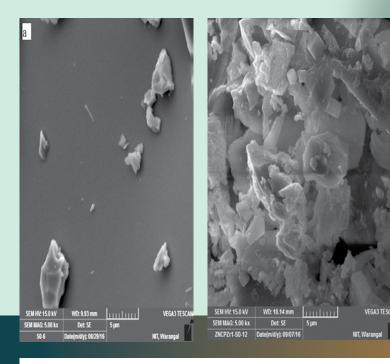
Glass has become an essential material in human life. Most of the glasses are eco-friendly. Future work towards the nuclear waste includes both low-level waste (LLW) generated from the dismantling of nuclear weapons, and high-level waste (HLW) Borosilicate glass has been the most widely adopted material for the immobilisation of both HLW and LLW. The number of possible compositions is practically infinite, so there is a huge space for research on new glasses. UWI, Physics Department has the collaborative glass science research with the: Rutgers University -USA, University of Trenčín-Slovakia, University Putra- Malaysia, Université Mohamed Khider Biskra, -Algeria, The university of the Dodoma-Tanzania, National Institute of Technology, Warangal- India, and Acharya Nagarjuna University, India.

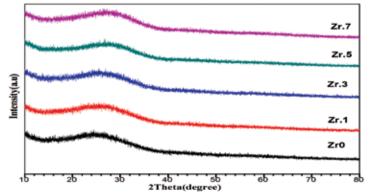




# Bio

**Dr Venkateswara Rao Penugonda**, is a lecturer in the Physics department, working in the field of Glass Science since 2000. He has several publications in reputed international journals and conference proceedings, and is a reviewer of more than 10 international journals.













FACULTY OF SOCIAL SCIENCES

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### Introduction

In an effort to achieve sustainable progress, economies of Latin American and the Caribbean need to improve and enhance their tourism capabilities (Peterson, Cardenas and Harrill, 2014). The hotel industry can take advantage of the pervasiveness of ICTs to advance some of their operations (Ansah and Blankson, 2012). ICT enables individuals to access the tourism products and services from anywhere at any time. It also enables hotel managers to reach targeted customers across the globe in a single click on the keyboard since the emergence of mobile computers and web technologies (Bethapudi, 2013). Hotels are currently using ICT to forecast the demand for reservation, assist with reservation management, online accounting system for guests, yield management, data management and management of guest services (Ansah and Blankson, 2012). These services create a win/ win situation for the key stakeholders in the

hotel industry. The benefits include enhanced guest services, productivity improvement, cost reduction, revenue generation, improved decision making, competitive advantage, and customer satisfaction (Aziz, Bakhtiar, Syaquif, Kamaruddin and Ahmad, 2012).

Hotels in developed countries have increasingly been adopting ICT and successfully integrated systems, like customer reservation system, supply chain management, enterprise resource planning, customer relation management, knowledge management and office automation systems, to realise the intended benefits (Li, 2012). But hotels in developing countries might be utilising ICT at the transactional level of the value chain owing to resource constraints, and, as such, might not be reaping the potential benefits. This assumption is made because effective adoption of ICT applications usually requires substantial investment of resources (Hoontrakul and Sunil, 2007). And Jamaica, like many other countries in the Caribbean, is experiencing both human and financial constraints (Chevers, 2015).

However, hotel decision makers are now realising that brand by itself is not enough (Knowles, 1998). This is the case in Jamaica with its excellent beaches, fantastic attractions, warm sunshine and competitive rates. Yet, Jamaica is ranked seventy-sixth among one hundred and forty one countries in the world in the Travel and Tourism Competitiveness Report (Crotti & Misrahi, 2015). Based on the country's raking, a concerted effort is needed to improve Jamaica's Travel and Tourism Competitiveness ranking in the Caribbean, especially in light of the eminent entry of Cuba. One solution to increase Jamaica's ranking is through the adoption and use of ICT which, by extension, can lead to improved tourist offerings and improved customer satisfaction.

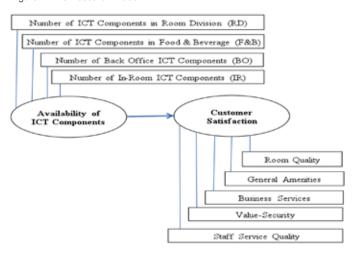


The motivation to conduct this study is based on an appeal in the literature (Sirirak, Islam and Khang, 2011) for more studies to investigate the impact of ICT on hotel performance, especially in developing countries. This preliminary study seeks to answer the research question, "What is the impact of ICT adoption on customer satisfaction in Jamaican hotels?" It is hoped that this study can inform hotel managers about the ICT components with the greatest impact on customer satisfaction. These insights should be helpful in the pursuit towards improved hotel performance and competitiveness.

### Methodology

This was a preliminary study in which the unit of analysis was the firm, i.e. hotels. The ICT components were classified as room division (RD), food and beverage (F&B), back office (BO), and in-room (IR). An online approach was taken. Responses were sought from hotel guests who recently stayed or were staying at a Jamaican hotel for business, vacation or any other reason. Referrals were used to identify the survey respondents. Seven hundred and five emails were sent out. However, only one hundred and thirty-two were completed and analysed. This gave an 18.7% response rate. The survey items were anchored on a 5-point Likert-type scale, ranging from 1 being "strongly disagree" and 5 being "strongly agree". Statistical package for the social sciences (SPSS) was used to do the data analysis.

Figure 1: The Research Model



## **Findings and Discussion**

The reliability test results in Table 1 show that the 'Availability of ICT components' and 'Customer Satisfaction' constructs were internally reliable, i.e., above 0.70 threshold (Chin, 2010).

Table 1: Reliability Results

Element	Cronbach's Alpha	Number of Items
Availability of ICT components	0.887	14
Customer Satisfaction	0.880	14

Table 2: Regression Results with ICT components and customer satisfaction

Number of sample points	Adjusted R Square	F-Statistics	Significance
132	0.606	12.734	0.000

Note: The Independent variables are ICT Components and the Dependent variable is Customer Satisfaction

Table 2 shows the result of the F-test being 12.734, with an associated significance value of zero that is significant at the 1, 5 and 10 percent level of significance. Hence, it can be concluded that there is a significant linear relationship between the total ICT component construct and customer satisfaction at the 1 percent level of significance.

Based on the R2 value in Table 2, the model specifies that 60.6% of the variation in customer satisfaction is explained by the variation in the ICT component scales. Most of the ICT component variables did not add much value when looked at singularly, as shown in Table 3. This conclusion is drawn because the majority of the components proved to be insignificant based on the associated t-test and significance value. As a result, other factors like the hotel ranking, level of hotel maturity or culture could be considered and incorporated in future research in an effort to provide richer insights.

Table 3: Coefficient Results with ICT components and customer satisfaction

Variable	Operational	Coeff.	T-Stats	Sig.	Remarks
variable	Domain		1-Stats	big.	Kemarks
	20 0 10111111	(β)			
Wireless Internet service	IR	0.125	1.664	0.100	Supported**
Telephone service	IR	0.165	2.208	0.030	Supported**
Online check-in system	RD	0.136	1.305	0.195	Not Supported
Online checkout system	RD	-0.127	-1.172	0.244	Not Supported
Dining table reservation	F&B	0.137	1.443	0.152	Not Supported
Electronic point of sale	F&B	0.123	1.477	0.143	Not Supported
Online hotel reservation	RD	0.100	1.284	0.202	Not Supported
Business Center for	BO	0.061	0.636	0.526	Not Supported
printing/copying					
Teleconferencing/Skyping	BO	0.130	1.258	0.212	Not Supported
ATM in the hotel	BO	0.097	1.156	0.251	Not Supported
Check daily expenditure	BO	-0.052	-0.596	0.553	Not Supported
online					
Security system in room	ВО	0.183	2.179	0.032	Supported**
Automated wake-up	IR	0.025	0.309	0.758	Not Supported
system					- *
In-room	IR	0.112	1.343	0.183	Not Supported
television/entertainment					

Key: IR = In-room; RD = Room division; F&B = Food and Beverage; BO = Back office

Note: \*\* p < 0.05

Only three out of fourteen ICT components were found to be significant at the 5% level of significance vis-a-vie customer satisfaction. These are:

- Wireless Internet in the room
- Telephone service in the room
- Security system in the room

Based on these findings, it is obvious that hotel guests are most concerned with in-room ICT components; their next greatest concern is with computer connectivity, followed by personal security concerns.

A likely explanation is the notion in the community that ICT does not change anything in the hotel industry in relation to customer satisfaction because hospitality requires the interaction of hotel staff and hotel guest to drive guest satisfaction (Yousaf, 2011). However, the two connectivity components could be considered important because while being on vacation, hotel guests still want to be connected with family and friends.

### Conclusion

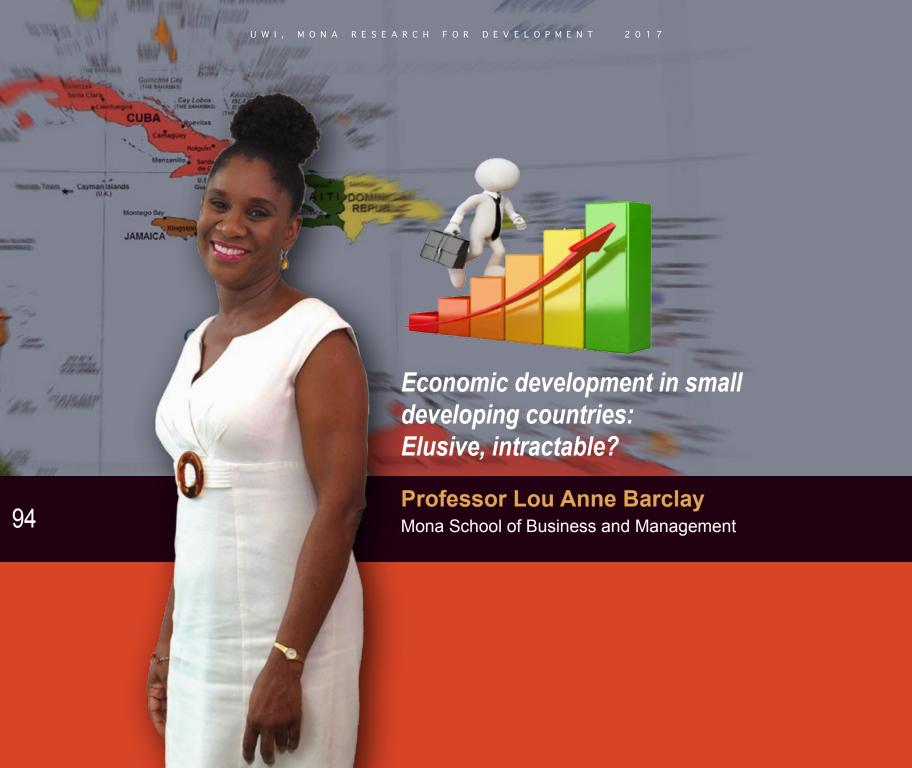
Intense rivalry among hotels and high customer expectation have led many hotels to explore innovative means to achieve competitive advantage. This study demonstrates the notion that the availability and adoption of ICT components can have a positive impact on customer satisfaction in Jamaican hotels. This finding is important to both practice and research because it is widely accepted that ICT adoption can lead to economic development of nations. Hence, the study provides the impetus for further studies to examine other factors that may influence customer satisfaction in Jamaican hotels, and hotels in the wider Caribbean.



### Bio

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Lou Anne Barclay graduated from The University of the West Indies, St Augustine in 1990 with undergraduate and graduate degrees in Economics. The decade of the 1980s and 1990s were defining periods in the economic history of Trinidad and Tobago; the once prosperous and dynamic country was in the throes of an economic crisis from which it eventually emerged in the late 1990s. Acutely aware of, and even awed by the challenges confronting policy makers in her home country. she followed the tradition of Caribbean-born economists, such as Arthur Lewis, Lloyd Best, Norman Girvan and Trevor Farrell, in finding answers to that perennial question: What factors influence the sustained economic development of developing countries. notably the small island states of CARICOM? However, unlike her predecessors, she has gone beyond the discipline of Economics to Management/Business Studies in her guest for answers. Thus, her research focusses on five areas: Economic Development, Foreign Direct Investment, Resource-based Development, Competitive Strategy and Entrepreneurship.

# Economic development and foreign direct investment in the Caribbean: The continuing mystique

Her second book, entitled Foreign Direct Investment in Emerging Economies: Corporate Strategy and Investment Behaviour in the Caribbean, was drawn from her PhD thesis, defended at Warwick Business School. This book examined the investment behaviour and corporate strategies of multinationals operating in three Caribbean countries -Jamaica, Barbados and Trinidad and Tobago. It assessed the factors that influenced the motivations, location choices and market entry mode of multinationals making investment in these countries. The degree to which these investments were influenced by the timing of the investment decision, the type of foreign direct investment (FDI) and the country of origin of the investor was also explored.

Recommendations drawn from this research remain relevant to policy makers, managers and academics. The book concluded that the governments of the focus countries need to adopt a more proactive approach to the creation of a business environment that is supportive of the foreign investors. Similarly, the multinationals need to be more integrally involved in their host environment. This study also called for more academic studies to be conducted on 'forgotten locations' like Caribbean countries in research in the field of International Business.

After the publication of her second book, Lou Anne Barclay's research explicitly focused on the manner in which FDI facilitates the economic development of small, developing economies; a concern which dates back to the early work of the Nobel Prize laureate, Arthur Lewis. Building on his work and those of International Business scholars, she sought to advance an understanding of this issue





in a series of papers. Her analysis led her to coin the phrase, 'FDI-facilitated development' to describe this phenomenon. She argues that FDI-facilitated development occurs when a developing country assimilates, adapts and diffuses the positive externalities or spill-overs that arise from the interaction of the multinational's ownership advantages (for example, the possession of superior production technology) with its locational attributes (for example, a low-cost, skilled labour force).

Lou Anne Barclay first implemented the concept of FDI-facilitated development in an examination of the apparel assembly industry of Jamaica and the information technology industry of Barbados. She subsequently linked this concept to that of national innovation system in two co-authored papers, which analysed the information technology industry of Costa Rica and the natural gas industry of Trinidad and Tobago. She later fully applied the concept of FDI-facilitated development to an analysis of Trinidad and Tobago's strategic, natural gas industry.

Her country and industry studies on FDI-facilitated development conclude that the Caribbean region, specifically Jamaica, Barbados and Trinidad and Tobago are yet to receive the full benefits of FDI-facilitated development.

# Resource-based development and FDI-facilitated development: Applying new concepts and frameworks to an intractable problem.

Building on her earlier work on FDI-facilitated development, Lou Anne Barclay sought to gain a greater understanding of the manner in which FDI enhances the economic development of countries. To this end, she analysed the role that embedded autonomy plays in the resource-driven, FDI-facilitated development of bauxite-rich CARICOM countries. Embedded autonomy describes the strategic collaborative relationship that exists between an autonomous state and the private sector. She applied this concept to the bauxite industry of selected CARICOM countries -Jamaica, Guyana and Suriname and the proposed aluminium investments in Trinidad and Tobago. In so doing, she made three distinct contributions to the extant International Business literature.

Firstly, she is the first researcher to apply use the concept of embedded autonomy to analyse the resource sector. Previous studies examined this relationship for Japan and the South East Asian Newly Industrialised countries and focussed on the manufacturing sector. Secondly, her work is the first to emphasise the creation of efficient and autonomous bifurcated bureaucracy to enhance FDI-facilitated development. Thirdly, in her research on the proposed aluminium investments in Trinidad and Tobago, she encountered the effect that dynamic civil society organisations can have on the industrial policy process. She thus sought to examine two issues —accountability and transparency - that are salient to industrial policy process in the twenty-first century. Her work on the proposed aluminium investments in Trinidad and Tobago is the first study of its kind to examine the role that accountability and transparency play in the resource-driven, FDI-facilitated development of a small developing country.

This body of work appears in her third and latest book. This ten-chapter book consists of four case studies on the bauxite industry of Jamaica, Guyana and Suriname, and the proposed aluminium investment of Trinidad and Tobago. It uses the value chain framework, which was first introduced by Norman Girvan in the late 1960s in his examination of the Caribbean bauxite industry, to assess the success of resource-driven, FDI-facilitated development in the four focus countries.



# Entrepreneurship and competitive strategy: Understanding the private sector in the Caribbean

Lou Anne Barclay's preoccupation with the issue of economic development in developing countries has also allowed her to move beyond her research on foreign direct investment. She is especially interested in the role that the private sector plays in facilitating the economic development of developing countries, notably those of the Caribbean. Her research on this issue has taken two distinct emphases. Drawing on the business literature, she has examined, in a series of papers, the competitive strategies that locally-owned firms in small, developing countries implement in the current increasingly liberalised trading environment.

Her concerns with the competitiveness of locally-owned firms have also been examined through the lens of the sociology of entrepreneurship. This research has emphasised the factors that influence the entrepreneurial success of certain ethnic groups in the plural societies of the Caribbean. This topic is the subject of her first co-authored book, and was the theme of later research conducted on the Syrian-Lebanese and African communities in Trinidad and Tobago. Lou Anne Barclay has engaged in research that is highly relevant to the small developing countries, including those of the Caribbean. Her research, which has made a significant impact on academia, also has tremendous policy implications.





DEPARTMENT OF SOCIOLOGY, PSYCHOLOGY AND SOCIAL WORK

Factors that impact school engagement/disengagement

Secondary education is indispensable in molding the future for individuals, and while many improvements have been made, especially within the levels of early childhood and primary education, a considerable amount of weaknesses remain in secondarylevel schooling in Jamaica. Within the adolescent population, there are many social and economic reasons for poor academic achievement and school dropout, both of which are highly influenced by what is known as school or academic engagement - defined as a general three-part construct (Fredricks et.al, 2004; Jimerson, Campos & Grief, 2003; Li & Lerner, 2013) involving the behavioural effort, emotional involvement, and cognitive investment directly related to, and involved in the learning process. It is believed that the lack of academic engagement results in an increased risk for drop-out, teenage pregnancy, involvement in criminal activity and drug use among adolescents.

A review of the engagement literature reveals a significant proportion of research is dedicated

to the consequences of engagement or disengagement, meanwhile few have taken a look at the antecedents—especially non-school factors. This gap in the research is an interesting one given the many theories that indicate that individuals are agents of their social world (Bandura & McDonald, 1963; Bronfenbrenner, 1974). The dynamics and relationships developed within the most immediate social environment (the family, school and peer groups) are believed to greatly impact the future development of the individual, as well as how they progress in school (Bronfenbrenner, 1986; Lam et al., 2012).

In order to understand what factors affect school engagement, the current study sought to investigate eight factors that are believed to be antecedents to, and facilitators of engagement: attachment, family type, parenting style, violence exposure, externalising behaviours, social media, body image and happiness.

The sample consisted of 400 students (52% were male) with ages ranging from 11-19 years (M=14.83) and from grades 7 to 13.

Approximately 62.3% of students sampled had overall school engagement. Over half of the sample were both cognitively engaged (83.5%) and had extrinsic motivation (79.0%). However, only 46.5% were psychologically engaged. Of the students who had overall school engagement, 16 year-olds (19.7%), 14 year-olds (19.3%) and 15 year-olds (16.1%) accounted for the majority. However, of disengaged students, these three age groups also constituted the highest levels of disengagement, with 15 yearolds being the most disengaged of the groups (24.5%). When analysed by grade, those in grades 9 and 8 (25.3% and 16.9% respectively) were most engaged, while grades 9 and 11 had the highest number of disengaged students (27.2% and 25.8%, respectively). An independent samples t-test revealed a small, yet significant, gender difference in the levels of overall school engagement (t (396) = -2.64, p= .008, d= -0.265, 95% CI [-.17, -.03]), with females having greater engagement (M= 3.09, SD= 0.36) than males (M= 3, SD= 0.35). There was a small significant difference in genders for cognitive engagement (t (396) = -3.73, p<



.001, d= -0.37, 95% CI [-.23, -.07]) with females having greater cognitive engagement (M= 3.47, SD= 0.39). Meanwhile, there was no significant difference for psychological engagement or extrinsic motivation.

Chi-square analyses of the association between attachment style and engagement indicated a significant relationship between the two variables, with X2 (3, N= 400) = 47.45, p< .001. Cramer's V= 0.34 suggests that this is a moderate association. Overall, violence exposure was small for the sample, with only 1% reporting extremely high violence exposure. There was a very small, significant relationship between violence exposure and school engagement, with X2 (4, N=400) = 10.49, p= .03 (two-tailed Fisher's exact test), V=0.16. Of the externalising behaviours endorsed, there were significant associations found for those who, within the past year, had stolen something worth more than \$500, X2(3, N=400) = 11.25, p= .01, V=0.17; had been arrested or picked up by the police, X2(3, N=400) = 8.85, p= .03 (two-tailed Fisher's exact test), V=0.15; used cocaine, heroin or crack, X2(3, N=400) = 10.38, p= .009 (two-tailed Fisher's exact test), V=0.16; or committed a crime with a weapon, X2(3, N=400) = 20.45, p< .001 (two-tailed Fisher's exact test), V=0.23.

Forty-six percent (46%) of the sample reported feeling 'Very Satisfied' with their body image, and a small (V= 0.29) but statistically significant relationship was found between appearance and school engagement with, X2 (5, N=400) = 34.73, p< .001 (two-tailed Fisher's exact test). A chi-square analysis was done to test that those who had life engagement (a category of happiness) would have higher levels of overall school engagement. A very weak (V=0.17) significant association was found between these two variables, X2 (5, N=400) =12.03, p= .03. No significant associations were found for family type, parenting style, or social media use and engagement.

A multiple regression model examining these factors as predictors of engagement showed that these factors combined, explained approximately 24.7% of the variance in overall school engagement. Although the model was significant, F (16, 382) = 7.82, p< .001, R2= .24, only attachment, happiness as a life meaning, happiness as a life of pleasure, committing a crime with a weapon in the past year, had significant effects on the full model.

The findings of this study have identified some of the non-school antecedents that play a critical role in student academic engagement in Jamaica. Considering that they predict less than half of the variance in engagement, this study has opened the opportunity for further research

to investigate other possible factors that contribute to the overall school engagement of Jamaican adolescents. The factors identified, so far, are still crucial in helping to understand how best to increase school engagement in this population - namely increasing psychological engagement and increasing intrinsic motivation.

Being able to better identify these specific factors, especially in a Caribbean context, is a considerable benefit of a study of this nature. As a malleable concept, the study of engagement suggests that interventions can be specifically formulated and expected to be impactful in re-engaging students, and increasing engagement intensity.

It is important to recall that high school drop-out is invariably seen as the final result of cumulative disengagement, which normally begins in earlier grades (Blondal & Adalbjardottir, 2012; Rumberger, 2001). This new information can have a potentially far-reaching impact on the wider society by targeting high schools with "at-risk" students and seeking to both prevent and address the various factors that were found to have a significant impact on engagement. By exploring and identifying these factors, there is greater hope for developing programmes to reduce high school drop-out, delinquency and poor academic achievement and, on the other hand, increase high school graduation (Blondal & Adalbjarnardottir, 2012; Dotter & Lowe, 2011; Finn & Rock, 1997; Wang et.al, 2011), the employability of students with a greater productive capacity, and to provide them with a means for social and economic advancement. This may further lend itself to widespread governmental consideration of further research, creating programmes and utilising more targeted interventions to address the needs of students who have high levels of disengagement.

Owing to the critical role of school engagement in academic success, preventing school dropout and increasing the likelihood of future employment for youths, the results of this study can be made available to local governmental bodies and private sector institutions and other interested stakeholders (churches, teacher associations, community based organisations and school boards) as needed, in an effort to directly apply the information and, in the future, implement interventions. This will be particularly important to the Ministry of Education, Youth and Information and important stakeholders in education—possibly allowing new partnerships to be developed between mental health practitioners and these bodies, with the prospect of improving the secondary education system.



### Bios

**Dr Brodie Walker** is the former head of the Psychology Unit and the principal investigator on this unit research project. She initiated this project to advance the Unit's research agenda, as well as unify the members of the Unit; each variable studied represents an area of interest of the various members of the Unit. Dr Brodie Walker's population and area of research focus is at-risk youths, specifically her research attempts to identify the factors that impact at-risk behavior (i.e. exposure to violence, parent-child relationship).

Sophia Morgan is the co-investigator on this unit project. Ms Morgan is a lecturer at the University of the West Indies, Mona Campus within the Department of Sociology, Psychology and Social Work, Psychology Unit, and the coordinator of the Applied Psychology Programme. Ms Morgan's research interests are organisational identity, school engagement and positive psychology.

Djavila Ho is a licensed Associate Clinical Psychologist who graduated from the Clinical Psychology Programme at the University of West Indies, Mona Campus within the Department of Sociology, Psychology and Social Work, Psychology Unit. Ms Ho currently works independently, collaborating on research projects and providing research supervision for undergraduate students at the International University of the Caribbean. Her research interests include issues of adolescent and adult mental health care, public mental health, grief counselling, psychological first-aid, neuropsychology and depressive disorders.

Doneisha Burke is a lecturer at the University of the West Indies Mona campus within the Department of Sociology, Psychology and Social Work, Psychology Unit. She has responsibility for teaching in their undergraduate and graduate programmes of which she is a past student majoring in Psychology and Human Resource Management; and Clinical Psychology respectively. She is an associate clinical psychologist with research interests in body image and social media as it relates to its impact on adolescents and young adults with special emphasis on females.

Dr Tracy McFarlane is currently a tenured lecturer at the University of the West Indies, Mona Campus within in the Department of Sociology, Psychology and Social Work, Psychology Unit. In addition, she works as an independent consultant with local and regional organizations and community groups to improve well-being, interpersonal/intergroup processes, and social outcomes among their members. Dr McFarlane's research interests are in the areas of higher education, women's health, social identity, immigrant adjustment, and stigma.

Arnella Myers is a graduate of the Clinical Psychology Master's programme at the University of the West Indies Mona Campus within the Department of Sociology, Psychology and Social Work, Psychology Unit. Ms Myers is an Associate Clinical Psychologists who works with the Ministry of Health conducting psychotherapy sessions for at-risk and disengaged adolescents. Ms Myers's research interest includes youth empowerment and identifying factors that are associated with at-risks behaviours within adolescents.

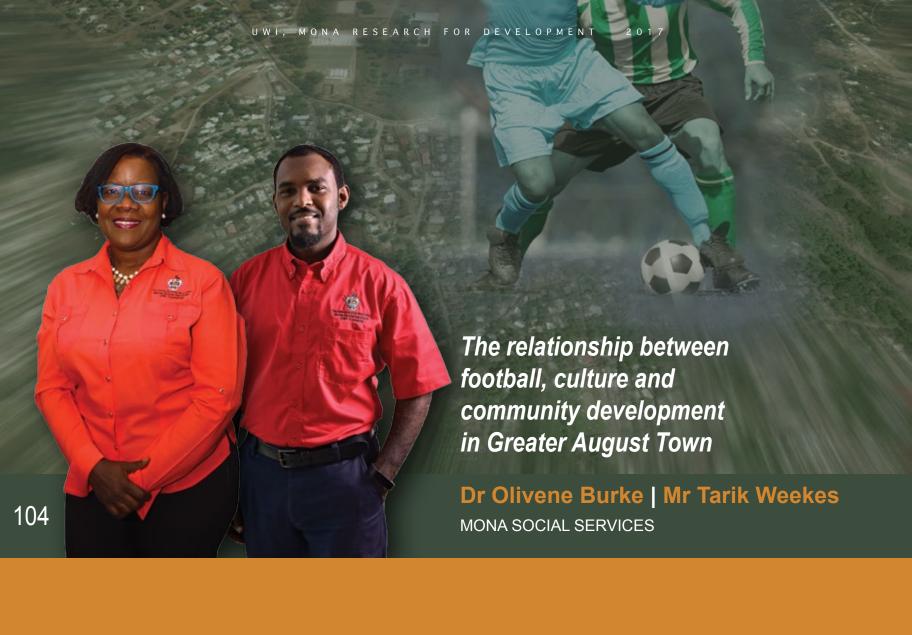






MONA SOCIAL SERVICES

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### Introduction and background

Greater August Town (GAT) is one of several communities in Eastern St Andrew, Jamaica. It is home to approximately 16,000 residents. Five districts make up GAT. The community is characterised by very hilly terrain in some parts, a river which divides one district from four others and what appears to be an abandoned quarry in the north east of the community.

The study explored the relationship between culture and the playing of football in Greater August Town because of a need to understand what assets the people and the community have that can be strengthened for community development.

Between 1980 and 2005, GAT was plagued by intersecting gang and political violence. During the early 1970s people moved freely and lived harmoniously within the community, but in the early 1980's this changed and sporting activities which once brought the community closer were discontinued. This turmoil repeated in the

1990s, and between 1999 through to 2005, it was clear that the way of life of residents had been affected by violence. The collective violence divided individuals. Residents' inability to cross borders and the fear of consequences restricted their interaction with family and friends. Community involvement in sporting activities returned in the 2000's, but this was far from the integration remembered on cultural days such as Emancipation and Independence that featured athletic competitions.

### Theoretical underpinnings

Playing football is structured and happens across different socio-cultural contexts. It has rules, power brokers and power wielders. Players exercise agency but, similar to the body operating as a living organism, act within particular roles for fulfilment of the greater good of the team. Players are interdependent but accountable for effort and output necessary for the team to achieve collective results.

General Systems Theory (GST), in works of Ludwig von Bertalannfy was utilised for informing the analysis and conclusions in this article. Systems theory in a community setting is about "community participants shift from being reactors, to viewing themselves as shaping their reality and the future" (Spruill, Kenney, Kaplan 2001 p.108). GST is useful because it recognises co-dependence between living things, their interacting with matters of different make-up and the outcomes from interaction.

### Methodology

This qualitative study employed qualitative employed tools that would gather shared experiences of playing football in GAT. Eight indepth interviews, two focus groups, communitywide data mapping and collection and participant observations were used alongside secondary data collection to achieve this.

The main research questions to be answered were:



- (1) What has been the experience of playing football in GAT?
- (2) How has the experience of playing football in GAT changed?
- (3) How has the playing of football brought about development?

### **Data Analysis**

The Atlas-ti research software was used for coding the data. The major codes formed the themed information for the write-up.

#### Issues and discussion

"People will support their own"

Perspectives of people supporting their own was an interesting element in the analysis. Focus group discussions with males from an under-17 team, revealed that there is much anxiety associated with the senior team of the community. In 2006, the senior team made it to the Premier League, one of the highest levels of national football championships. This brought great pride for the community and esteem to residents, and some residents travelled with the team wherever they went to play local matches. The sense of pride, esteem and loyalty of being associated with the football team, is not an uncommon experience in other parts of the world. Long and Sanderson (2001) cited by Bob, Swart and Knott (2011) argue that "the most common derived social benefits of sport for community are enhanced confidence, self-esteem, empowerment, capacity building, employment gains and health and environment improvements.

### "Transference"

As Fig 1.1 illustrates, several themes emerge in conversations about the playing of football in GAT. When there is talk about reducing violence in GAT and unity, football is included in the conversation. Football has historical significance for residents. This was reflected in the responses of males recalling how they started playing. Their responses included:

- · Being introduced to it by their mother
- Their father being a footballer
- · "My grandfather was a footballer"
- · Exposure to the game by older siblings
- Seeing it on television in their homes.

While the research did not quantify the psycho-social personal outcomes from the playing of football, it was derived that the playing of football fostered unity even off the field. Young males spoke about observable attitude changes in their behaviour since joining a football team. One young male said it instilled qualities he needed for achieving an educational scholarship. Playing football could bring social mobility, and earning income from it could assist family members in opening a business.

A fair amount of literature and practice supporting the teaching of lifeskills to youth through the playing of football exists. Moore (2012) notes that researchers agree on the impact sport can have on social cohesion, but sport alone will not solve the challenges faced by a community.

The transference theme is problematic for examining playing football, way of life and community development in GAT. There is a small spill-over of the values associated with football impacting the actions and organisation of certain practices in the community. Among the complexities which the researchers encountered while examining 'transference" included how playing football empowered players and those deeply involved. However, more than 80% of the senior players are not from the community, so the skills, knowledge, money that could contribute to the community leak out.



### **Concluding thoughts**

The point at which the playing of football and the community working as a single unit intersects can be a catalyst for people helping improve the lives of people. The community has a history where the playing of football is concerned, and it is part of their way of life. But there are some readiness issues which can only be solved by the community members. These readiness issues, such as each district operating in isolation of each other, are barriers to progress on value added of their sporting and economic capital.

### Bio

**Dr Olivene Burke** is Executive Director of Mona Social Services, UWI. She has a distinguished career as an educator, administrator, planner and community development professional. She also lectures in transformational leadership and management, as well as facilitates executive development workshops up to the senior management level. Dr Burke has co-edited one book, authored and co-authored peerreviewed journal articles and book chapters, as well as presented several papers at local and international conferences.

**Mr Tarik Weekes**, researcher, has a career in peacebuilding and gang reduction approaches. He is currently pursuing a PhD in the Department of Sociology, Psychology and Social Work. Mr Weekes is also an assistant lecturer in social policy. He has also co-authored a number of peer-reviewed articles and book chapters as well as presented at local and international conferences.







GRADUATE STUDENTS

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Ringo: Now listen; you hear how I talk to

you round the back – Jamaican?

Busboy: Yes, sir.

Ringo: Well round the front it is different

business.

(Smile Orange-Trevor Rhone 1976)

The view that Jamaican (Creole) is not good enough for the 'front' reflects the polarised functions of Jamaican and English in the society. In the excerpt above, from the award winning movie Smile Orange, Ringo, a seasoned waiter, advises the new busboy on what he deems appropriate language use in order to get tips. Though they are the two major languages in Jamaica, they do not perform the same functions. English is the language used in the 'front', that is, in public formal domains such as the education system and the media, while Jamaican is traditionally known to be used in the 'back' in informal settings such as the home. This paper focuses on what happens when Jamaican is used in the 'front' by investigating Linguistic Discrimination in public agencies.

When we approach a government department or office, those who provide us with service are expected to serve every member of the public in a fair and humane manner. Every citizen is entitled to reasonable and decent service by public servants. This study seeks to find out if that is indeed so. And it does so by testing whether public servants treat the same person differently when they telephone a public agency, they speak English as compared with when they use Jamaican.

# Methodology

The data includes 192 recorded telephone interactions with preselected service representatives (SRs) in entities from the three main geographical regions of Jamaica. The methodology uses a modified Matched-Guise technique to collect subjective reactions of a male and a female bilingual caller.

Essentially, the same person called the same SR on different days, asking for information about the agency. On each day, a different language is used and the same information is asked for on each occasion. For instance, the callers telephoned the National Housing Trust requesting information:

'Good afternoon, I am self-employed and I'd like to know how do I become a contributor with the NHT'

'Aftanuun, mi a wok fi miself and mi waahn nuo ou mi kyan staat chuo moni ina di NHT'

The study applies Conversation Analysis to examine the SRs' conversational practices while providing favourable and unfavourable service to these callers.

# **Findings**

The results indicate that linguistic discrimination does exist in Jamaica's public agencies:











- Callers rated most of the calls as polite irrespective of language.
   They rated the SRs as being polite in 87% of the calls made.
- Nearly all of the calls rated by the callers as impolite are the ones done in Jamaican. Callers reported that SRs were impolite in 7.5% of the English calls and in 19% of the calls made in Jamaican.
- Callers reported that SRs were more unwilling to assist when they used Jamaican. They reported that the SRs were unwilling to assist in 6% of the English calls and in 20% of the calls made in Jamaican.
- 4) Callers reported that they did not want 8.75% of the SRs to assist them in the future when they made the calls in English and they did not want 22.5% of the SRs to assist them in the future when they made the calls in Jamaican.
- 5) While using Jamaican, callers felt the SRs talked-down to them in a condescending manner in 13.75% of the calls. There were no such reported cases when callers used English.

Results show that linguistic discrimination does indeed exist within Jamaica's public agencies. Though most people receive good treatment irrespective of language, many do not. Callers reported receiving more negative treatment when they used Jamaican during service encounters with public agencies. This suggests that speakers of Jamaican with limited English language proficiency may experience linguistic discrimination when accessing services from public agencies.

# What is it like to experience linguistic discrimination

Callers reported being made to feel bad when they used Jamaican regardless of the rating they gave the SR. They reported feeling belittled and disrespected. Though they received adequate information, they were made to feel bad during the process. These negative feelings were experienced by persons who were conducting an experiment and, therefore, imagine how an actual person in that situation might feel. All of these negative feelings were produced by calls made in Jamaican, from SRs who were able to be polite, since they were polite when called in English.

# How were Jamaican Language callers made to feel bad?

- Callers were put on speaker phone when they used Jamaican, and were ridiculed.
- SRs tried to correct the language choice of the callers since they see their role as one to instruct the caller in the English Language, in addition to providing service.
- 3) SRs interrogated callers before assisting them. They asked questions like, 'who are you?' and 'why are you calling the office?'

#### **Conclusions**

In the United States, linguistic discrimination typically produces denial of service. A caller sounding Black or Hispanic will be told the apartment is gone, but one sounding White is invited for a viewing. In Jamaica, the callers all report that they got the information they sought. However, to get that information, when calling using Jamaican, is a struggle. The caller using that language is made to feel bad, in the process of getting the information. This passes as emotional abuse from public servants who are employed to serve the public, not punish them for the fact that they cannot or have chosen not to use English in a phone call to a public agency.



# **Implications**

Hardly anyone who lives in Jamaica and who can speak English is likely to phone a public agency and use Jamaican in the first instance. Those who do so are generally people of lower socio-economic status and of limited education. These are the least privileged and the ones who, if special treatment is given, should receive it. Instead, they are singled out for especially bad treatment, reinforcing the social and economic divide between the haves and the have-nots, or put in linguistic terms, the English-speaking haves and the non-English-speaking have-nots.

This strengthens the call for freedom from discrimination on the ground of language to be included in the Constitutional amendment of the Charter of Rights. This, of course, should be backed up by the training of public servants to interact respectfully in Jamaican, and supervising the implementation of non-discrimination on the ground of language.



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#### Bio

**Dr Kadian Walters** lectures in courses in Applied Linguistics in the Department of Language, Linguistics and Philosophy. Her research interests include the study of linguistic discrimination in public formal domains, discourse analysis, and forensic linguistics. For her dissertation, Dr Walters investigated linguistic discrimination in Jamaica's public agencies, under the supervision of Professor Hubert Devonish.



# **Background and justification**

Urinary tract infections (UTIs) are among the most frequently encountered hospital- and community-acquired bacterial diseases in humans, and result in significant morbidity and healthcare expenditures. Primarily caused by Escherichia coli (E. coli), many of these bacteria have developed multidrug resistance (MDR) and a vast arsenal of virulence factors (disease-causing characteristics) to now pose a serious threat to public health. Considering the emerging issues associated with resistance, the diminished usefulness of newer antibiotics. such as the fluoroguinolones, are a cause for concern. It becomes imperative to increase surveillance programmes to prevent widespread dissemination (via transmissible plasmids that bacteria share promiscuously) and seriously consider alternative treatment approaches. The study examined the prevalence and genetic environment of plasmid-mediated quinolone resistance (qnr) genes and distribution of various virulence factors in uropathogenic Escherichia coli (UPEC). Since differential DNA methylation may serve as a vital precursor to disease causation by pathogenic bacteria, this study also sought to determine whether DNA adenine methylase gene (dam) could be a potential therapeutic target through its influence on gene expression.

# Methodology

The polymerase chain reaction (PCR) was used to determine the prevalence and genetic environment of qnr genes from plasmid DNA isolated from 174 non-duplicate UPEC clinical isolates. Subsequently, restriction fragment-length polymorphism (RFLP) analysis was used to check for genetic variation. The distribution of virulence factors among antibiotic-resistant and antibiotic-susceptible strains was also analysed by

PCR amplification. To confirm any influence of the dam gene on bacterial attachment (important for colonisation and disease causation) and fluoroguinolone resistance, the dam gene was knocked out from selected UPEC strains to create dam mutants. These bacteria were compared in terms of growth rate, susceptibility to antibiotics, ability to form biofilms (slime) in the presence of antibiotics and oxidative stress, expression of several virulence genes and the extent of attachment to human kidney and bladder cells. Any differences noted in the mutants were also compared with strains in which the dam gene was restored by complementation, using a plasmid containing the dam gene.

# New knowledge created/gaps filled

Up until the initiation of this study, the prevalence of qnr-mediated resistance, distribution of virulence factors and the examination of gene regulatory networks as potential targets for the control of bacteria





causing UTIs locally and regionally were unknown. This work revealed a considerable frequency of qnr genes (43.5 %) and class I integrons (93%) in these bacteria. Integrons are gene capture cassettes which are used by bacteria to disseminate various genes, including those that are responsible for antibiotic resistance and the ability to cause disease. Further examinations for virulence factor distribution confirmed 14 subtypes with genes for adhesin fimH (97.1%) and cytotoxic necrotising factor cnfl (75.3%) as the dominant epidemiological indicators. When the dam gene was knocked out, the absence of DNA methylation among dam mutants was apparent: there was significant differences in cell shape (elongated and filamentous mutant cells), and deficiencies in cell growth and antimicrobial resistance were observed. In addition, the expression of virulence genes was reduced or completely abolished in the mutants. Of note, however, were the increases in biofilm formation (when exposed to oxidative stress) and adherence to human kidney and bladder cells by the mutants, relative to the parental strains. Phenotypic characteristics of parental strains were restored in damcomplemented strains. These results indicated that there were noticeable positive impacts of dam mutation in the bacteria. While dam is significant to DNA methylation and gene expression in UPEC strains, further investigations are necessary to determine its level of regulatory influence on the network of virulence genes fundamental to disease causation.

#### Benefits to be derived

Predominantly a burden among females, UTIs primarily caused by UPEC may harbour MDR and virulence genes. However, recommendations for UTI management are restricted to international guidelines, since limited studies are available from developing countries, and there is insufficient published data on the epidemiology of this infection in the Caribbean. Within this milieu, the surveillance of antimicrobial resistance, virulence gene distribution, and development and utilisation of non-antimicrobial therapeutics through molecular research are anticipated to improve preventative strategies, patient outcome and curtail the burden of UTIs.

### Potential application

Previous studies with other bacterial pathogens have proposed the therapeutic potential of dam attenuated strains as live vaccines, dam mutants as antagonists, or Dam inhibitors as antibacterial drugs. Despite this background, our findings illustrating continued viability and low level of adherence in vitro to human kidney and bladder cells by dam mutant strains may annul immediate singular use of dam as prime targets for inhibitors, or dam mutant strains as live vaccines for UTIs. Notwithstanding, areas considering societal benefit and future developments include:

- (a) Kick-starting the effort required to tackle drug resistance and the spread of infectious diseases (particularly UTIs) encountered locally and regionally, as mandated by WHO Global Action Plan
- (b) Application of cutting-edge molecular techniques in the development of non-antibiotic therapeutic agents tailored to Jamaica and the region
- (c) Economically lessening the annual high fiscal burden, decreased workforce productivity and elevated patient morbidity associated with increased incidence of infections
- (d) Sharing of information required to establish effective healthcare management guidelines to overcome challenges





through collaborative efforts with relevant policymakers and stakeholders

- (A) Schematic diagram for creating UPEC dam mutants by gene disruption with chloramphenicol resistance gene
- (B) Growth curve (CFU/ml versus time) for parental and dam mutant UPEC strains
- (C) Micrographs for wild-type (WT) and dam mutant ( $\Delta$ dam) UPEC strains, illustrating the occurrence of short rods and elongated (filamentous) rods, respectively

Photograph related to research

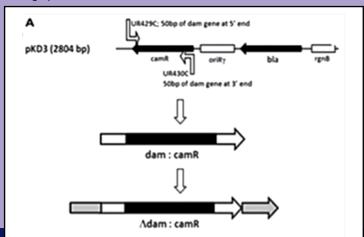
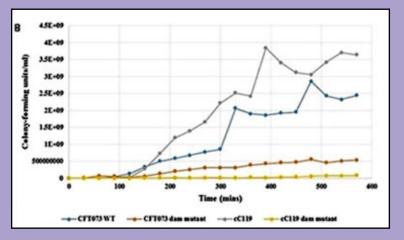
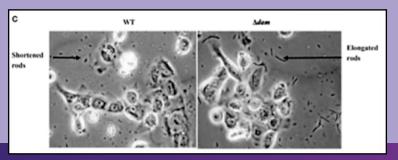


Figure 1. Genotypic and growth characteristics displayed by parental and dam-mutant strains of UPEC





Bio

Stacy Ann-Marie Stephenson-Clarke earned her bachelor's degree in microbiology, and was recently awarded the Doctor of Philosophy degree in molecular biology with high commendation from the University of the West Indies, Mona Campus. Her field of research includes antimicrobial resistance and gene regulation in bacteria responsible for urinary tract infections in women in Jamaica. Within this context, she hopes to understand why the bacteria are resistant and dangerous, and through this knowledge, develop non-antimicrobial therapeutic strategies which could disrupt the bacteria's ability to cause disease. She is optimistic such studies will serve to alleviate health challenges encountered at the local and regional level. From her thesis, has emanated four publications



Changes in the morphology of urban residential space are evinced by a fragmentation that seems to reflect the negative imposition of globalisation and neoliberalism on the island of Jamaica. At the hub of this transformation is the emergence and subsequent development of gated communities in middle and upscale neighbourhoods, and the fragmentation of low income neighbourhoods based on political and social difference. The recent proliferation of gated communities reflects the ways in which the urban landscape has been encoded by a discourse of fear resulting from increases in levels of crime. Residents of garrison enclaves have also used the politics of identity and exclusion to negotiate the fear of crime. By creating a selectively permeable boundary, residents in both spaces have attempted to exclude difference through the economic and social investment in measures of defence which inadvertently engages

an implicit social contract with others in the enclave. The social contract deployed in the mitigation of fear possibly has important implications for the production of social capital in residential enclaves across the city.

This study set out to examine the expression of fear and social capital in two different types of enclaves across the KMA. It explored the extent to which the fear of crime was potentially moderated by the social capital existing in the community and the relevance of place attachment to understandings of fear and social capital in the city. The decision to undertake this research was partially influenced by observations of increasing crime rates and public concern about the effects of crime and a changing social landscape. Ominous macroeconomic trajectories also suggest that observed trends are likely to intensify in coming years, and this may potentially lead to severe compromises in the quality of urban life.

Quality of life, and by extension urban sustainability, constitute necessary components of development and social problems, such as the fear of crime, inevitably affect how individuals experience and respond to their environments. Social capital is also an important component of urban sustainability and development. Fine (2003) and others, such as Madden (2011) and Lister (2012), have identified social capital as a necessary tool in offsetting the challenges of development and compensating for deficiencies in other types of capital, such as economic and human capital. The fear of crime may be positioned as one of those challenges potentially addressed by the engagement of social capital.

The analysis of fear of crime was premised on the notion that rising enclavism in the KMA is, on one hand, a response to the fear of crime and, on the other hand, a spatial mechanism deployed in the management



of fear even when residence in these spaces was not precipitated by fear. The borders of these enclaves are sometimes material but always symbolic and serve to facilitate excluded identities. Fear was, therefore, an important contributor to the fragmentation of the city, as exclusive zones were established out of an apparent need to counter threat. This exclusion was based on identity negotiations which residents or agents (such as security guards acting on behalf of residents) engaged in to determine who had spatial and social rights to the place. The use of identity and fear to legitimate exclusive practices meant that some individuals in garrison enclaves had very constricted geographies marked by the deployment of various avoidance of particular routes, sections of the ambient neighbourhood, or times.

These patterns broadly reflect some of the consequences of neoliberalism on Kingston. In this way, the increases in crime, combined with diminishing faith in the efficacy of the public defence system, creates the condition for the emergence of an internally focused system of defence. In the case of the gated community, this system found expression mainly in the form of engagements with private security firms, while for garrison communities, some residents alluded to the presence of community members who informally policed community territory. The results of this research therefore suggest that rise of enclavism in Kingston, as expressed by increasing fragmentation, is a symptom of greater levels of disconnection between the state and society.

While the fragmentation of communities is almost inextricably linked to macro scale processes related to structural vagaries and emerging social inequalities, it is also influenced by residents' attachment to place. Attachment to place was found to be an important aspect of the expression of social identity which affected the negotiation of fear. In both gated and garrison enclaves, there were strong discursive connections between the attachment to place and nature of social relations within the community. These social relations constituted the building block of social capital

Social capital was found to have varied expressions in both contexts. For residents of garrison enclaves the networks of interaction

which formed the building blocks of social capital were strong, and effectively served to allay fears of crime within the boundaries of the enclave. Individuals reported feeling safe within the boundaries of their enclave, and often articulated these sentiments in relation to connections they had with other individuals in the enclave.

The networks of interaction in gated communities appeared to be less consolidated than those of the garrison communities. In gated community environments formal structures, such as home owners' associates, served to partially fill gaps in social capital evinced by comparatively shallow interaction. But the same formal structures paradoxically compromised the strength of community networks by excluding renters from community meetings and, in turn, affecting their sense of belonging – an important component of social capital and attachment to place.

This study is of practical and theoretical relevance because it partially compensates for existing gaps in knowledge of gated and garrison enclaves and the expression of fear and social capital in each. Much of this knowledge may be used by planning practitioners as well as researchers to garner greater understanding of the pathology of an important but understudied feature of the urban landscape.

A spatial database was created which has since been used by



academics and planners in various capacities. It provides valuable baseline data which can be subsequently updated and, therefore, it will now be possible to track the rates and levels of growth of gated communities as these features become an increasingly common phenomenon of urban development. In a similar vein, it also offers the opportunity for deeper investigation into the extent of socio-spatial discontinuities in the urban landscape, which may be of relevance to those interested in exploring emerging patterns of segregation.

Likewise, the mapping of garrison enclaves also represents a potentially useful step in creating a spatial inventory of informal enclave boundaries across the city. In fact, understanding informal boundaries and, by extension, the nature of division in these communities, may provide a necessary platform for undertaking planning initiatives, particularly those which will result in the type of urban upgrading where entire sections of communities are demolished and residents given access to new government housing. A study of this nature that reduces fear to the level of the enclave provides potentially useful insight into the ways in which urban residents negotiate their environments through the social construction of threat. Additionally, it plays an important role in understanding

how urban space is differentially produced by urban residents who increasingly use fear to legitimise motivations for exclusions. The value here resides in the fact that understanding the expression of fear may be a necessary precursor to addressing issues of an increasingly divergent society.



#### Bio

**Dr Robert Kinlocke** currently serves as the president of the Jamaican Geographical Society, and is an assistant lecturer in the Department of Geography and Geology where he currently teaches courses in urban geography, geographic information systems, and research methods. His research interests include climate change vulnerability and adaptation, and various aspects of urban geography and planning.





# Language use on Twitter

Like Facebook, Twitter is one of the many social media platforms used for communication today. People using these platforms have to communicate with special symbols and patterns of use which are different from the language of everyday, regular informal interaction among people outside of the space. Twitter is a written medium, employing special writing conventions, non-standard uses of punctuation and particular ways of expression.

Tweets are limited to 140 characters and, so, this brevity means that tweeters have to develop creative ways of conveying their meaning despite the length restrictions. In this way, tweeting differs from the language used on a platform like Facebook, where users can write an epistle because the platform does not stipulate the length of a message. Twitter also contrasts with Instagram, where users

communicate mainly in terms of hashtags. The combination of the linguistic conventions, the informality of the medium and the real time exchange which Twitter facilitates, makes the interaction conversational-like. Thus, Twitter is seen as a written medium which effectively merges features of both writing and speech into a single, communicative platform.

This research project examines the main linguistic conventions in the Jamaican Twitter community, and the ways in which tweeters use the conventions to convey and negotiate meaning in their tweets. The results show that the most frequently occurring conventions are: (i) Acronyms, (ii) Ellipsis, (iii) Capitalisation (CAPS), (iv) Iconic words and (v) Hashtags. This article will show some of the ways in which these conventions serve as contextualisation cues which indicate the way in which a tweeter's meaning is to be interpreted. In this written, online platform,

these cues act as gap-fillers which insert the contextual information which is available in face-to-face communication, but not accessible in a written medium like Twitter.

Linguistic conventions and their functions
Although there are generally accepted meanings for these conventions in the Jamaican Twitter space, there is no rigid set of interpretations which tweeters have to adhere to when they use them. Thus, tweeters can associate very different meanings with the use of the same convention. However, this section focuses on the main functions of these conventions in tweets in the Jamaican Twitter community.

#### **Acronyms**

The acronym 'lol' (laugh out loud) was by far the most frequently used acronym in the data. 'Lol' is used to indicate something that is considered by the tweeter to be funny. It





does not necessarily indicate that the tweeter is literally 'laughing out loud', but it does suggest that there is something humorous about the tweet in which it is used. For example:

**"Lol.** I just remembered when I took out my tongue ring and threw it in my ex's eye."

'Lol' can also be used to soften the impact of a serious statement or to indicate friendly jeering. Other frequently occurring acronyms include: kmt – 'kiss (hiss) my teeth'; idk – 'I don't know'; Imao – 'laughing my ass off'; tbh – 'to be honest'; and smh – 'shake my head'.

#### **Ellipsis**

The ellipsis is used to carry out a range of functions which are associated with its position in a tweet, i.e., at the beginning, middle or end.

At the beginning of a tweet, the ellipsis may be used to indicate the continuation of a topic that was being discussed before:

"....we soak the Xmas cake for a year too. Pretty sure that's customary."

In most cases, the ellipsis functions as an actual pause when it occurs within the tweet:

"Helloo.. Jesus..are you there?"

In most of the tweets within the data, when the ellipsis occurs at the end, it indicates that the tweeter has more to say:

"To put VybzKartel, Gaza Slim wid Usain Bolt and Bob Marley in the same sentence is just....."

# Capitalisation (CAPS)

Capitalisation is used mainly to highlight or draw attention to a part of a tweet in order to focus on the specific part of the message that the tweeter wants to emphasise:

"Mommy sleeping beside me last night & tonight is **EVERYTHING**" "Afraid & paranoid for all the **RIGHT** reasons."

#### Iconic words

Iconicity refers to "the relation ... between the amount of [linguistic] form and the amount of meaning [such that] more form tends to carry more meaning" (Tabakowska, 2009, p. 135). The concept can therefore be used to show how the lengthening of a word through the repetition of letters is used to represent increased intensity in meaning, as seen in the example below:

"The irony is, telling the man you're going to marry his daughter and breed her regardless of what he has to say is **ruuuuuuude.**"

#### Hashtags

Hashtags identify the precise topic or subject matter of a tweet. In such situations, the hashtag is needed to understand what the rest of the tweet is referring to, as seen in the following examples:

"This Keanu Reeves movie looks promising. **#JohnWick**" "news so creepy just now **#TVJNews**"

Hashtags also provide additional information on the tweeter's own thoughts, comments or feelings toward the subject matter of the tweet:

"Would be a disgrace if I pull out my card to pay for anything. #LordINeedYou"



Hashtags are also used to identify a trending topic, which is a particular subject matter that a large number of users are tweeting about at a particular time:

"#JamaicanChristmas Best sheet spread pon bed"
"#ConfessionHour: I'm having so much fun watching
Westbrook since he came back from injury. Didn't think it
was possible"

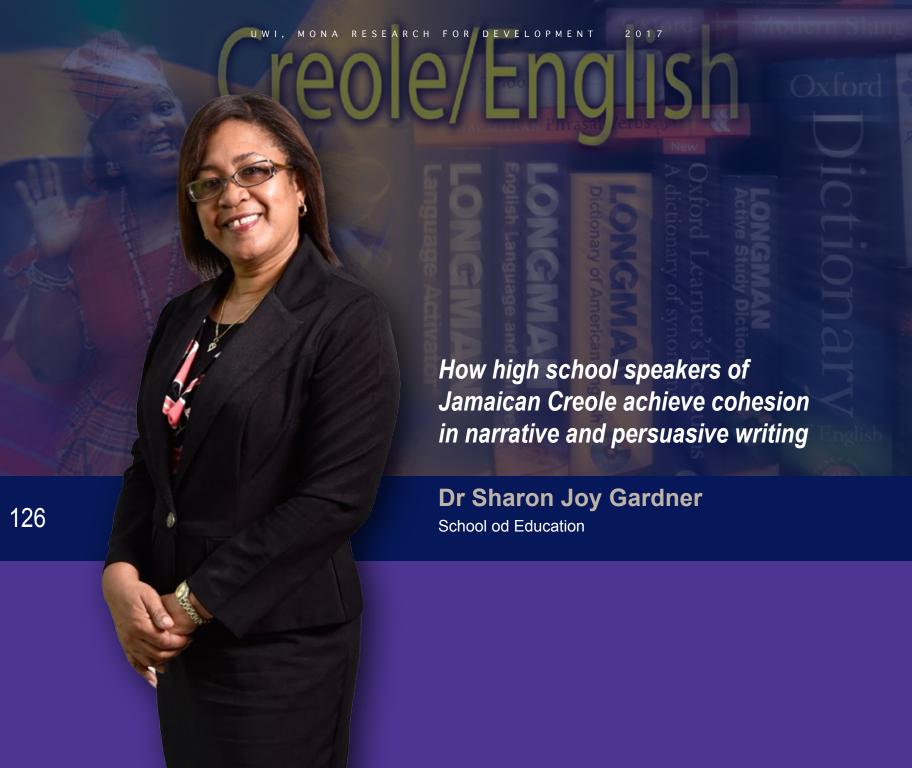
This research project has found that tweeters use these conventions in their tweets, in order to signal how their messages are to be interpreted. They are used to convey meaning in tweets by filling in the kind of information which is available in face-to-face interaction, but not accessible in a written mode of communication like Twitter.

It is important to note that up to this point, there has been limited research on Twitter from the perspective of focusing on the linguistic structures that characterise Twitter discourse. Studies which look at the language of Twitter often do not examine it from a linguistic perspective, while others examine the connections with politics, journalism and business (Wikström, 2014). This research project is therefore the first to present linguistic work on Twitter from the perspective of the Jamaican Twitter users.



**André Bernard** holds a BA(Hons) and an MPhil (High Commendation) in Linguistics. He has worked as a tutor in the Department of Language, Linguistics and Philosophy and is a news presenter and talk show host at the University's radio station, NewsTALK 93FM.





The Jamaican language situation is complex. Learning and acquisition of English takes place in a context where there are two languages (English and Jamaican Creole) co-existing. This context creates a number of challenges for native speakers of Jamaican Creole (JC) who are in the process of learning English, especially since both languages share vocabulary. Many learners have difficulty distinguishing between the two languages, and this is of concern. One of the concerns is the difficulties that learners experience with making their writing cohesive. Cohesion is concerned with how ideas within the same sentence and ideas between and among sentences within the same text are linked. The reports of the performance of the candidates sitting the Caribbean Examinations Council (CXC) English A examinations, for example, indicate that the problem related to cohesion persists throughout the years.

There are a number of questions which this problem generates. What is the nature of the weaknesses with cohesion? Do the problems change in nature as learners progress through the high school grades? Since the problems suggest that Jamaican learners achieve cohesion in different ways from the ways in which it is achieved in English, how do native speakers of JC achieve cohesion? Because the problem persists throughout the years, what is the nature of the feedback given to students when they make errors related to cohesion in their writing? Could this focus or lack of focus on these types of errors account, at least in part, for the problem remaining persistent? These are some of the questions that this investigation addressed. The thinking is that if the nature of the problem is understood, this will enable stakeholders to successfully address the issues.

The description of cohesion that the investigation provides was not previously available and, therefore, adds to the body of knowledge. The study investigated how cohesion is achieved in narrative and persuasive writing because these two genres are such an integral part of the Jamaican high school curriculum. In describing the ways in which cohesion is achieved, generally, in these two genres, the study also focused on the ways in which cohesion is achieved differently in each of these two genres. This is useful information for educators who are charged with the responsibility of making Jamaican native Creole learners competently use these two types of writing. Also useful was the information that the study provided on the stages when specific cohesive ties (the links that achieve cohesion) appear in the writing of these learners. Knowledge of when ties appear in the writing, and the nature of the ties used at the different stages







(as well as those not used) will enable educators to know what ties need to be focused on at various stages of the education system. This is also useful information which was not previously available.

With the realisation that the weaknesses related to cohesion persist throughout the five grades of the Jamaican secondary system, this study examined the nature of teachers' comments on students' errors in cohesion in order to identify, or eliminate, the lack of teacher focus on ties (through feedback) as a possible reason for its persistence. The results of this study serve as valuable information to point educators and other stakeholders to the nature of teacher feedback (or the lack of feedback) as a possible reason for the persistent problem. This information will point to solutions to the problem.

The information provided by this study is not only relevant to the Jamaican society because Creole speakers learning English is not a peculiarly Jamaican phenomenon. This phenomenon is a part of territories in which at least one Creole operates alongside another language. Such places include the wider Caribbean and the United States of America. The benefits to be derived from this study, therefore, extend beyond the borders of the country in which the phenomenon was studied to others where the phenomenon studied exists.

In addition, while this study is clearly useful to the education sector, because of the nature of the phenomenon studied, linguists who are interested in the languages of the Caribbean and the languages of other territories where Creoles operate alongside other languages (even if they are not particularly interested in education) will also find the results of this study valuable.

It is evident, then, that the findings from this study will have a significant impact, not only on the Jamaican society, but on the societies where Creoles exist. The results of the study are useful

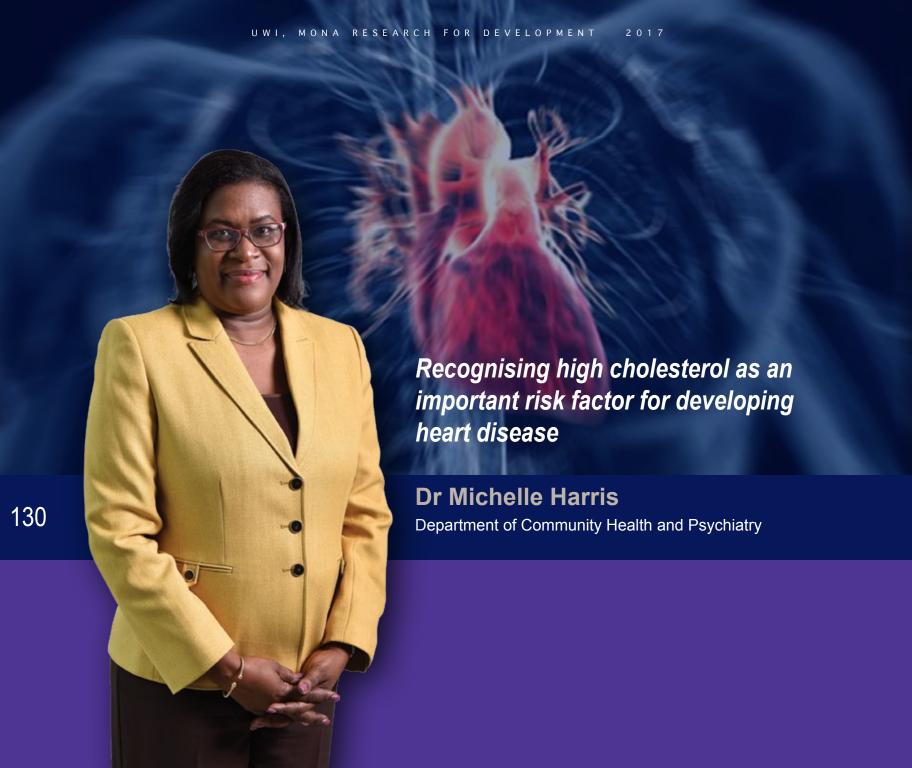
to the education system that seeks to make native speakers of Creole more competent users of English. The information provided by this study will create an understanding of the nature of the problem with cohesion and contribute to informed solutions that will produce a greater number of competent users of English. The results will also enable educators and other stakeholders, including those who formulate policies, as well as linguists, to have a greater understanding of the role that Creole plays in influencing cohesion.

#### Bio

**Dr Sharon Joy Gardner** is an educator with twenty-nine years of experience at the secondary and tertiary levels. She currently works at the Bethlehem Moravian College in Malvern, St Elizabeth, Jamaica.







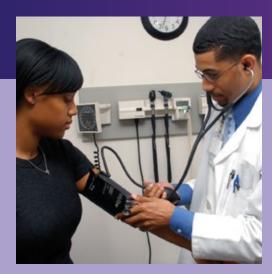
Heart disease is the leading cause of death in Jamaica. People with hypertension, diabetes and high cholesterol are at increased risk of developing heart disease, stroke and kidney failure. Half of all Jamaican adults with hypertension, one of every four persons with diabetes, and almost 90% of those with high cholesterol do not know that they have these conditions. Studies have shown that up to 49% of heart attacks and 25% of strokes can be reduced if cholesterol levels are normalised. Yet there has been very little documented about high cholesterol among persons who seek care at our health facilities.

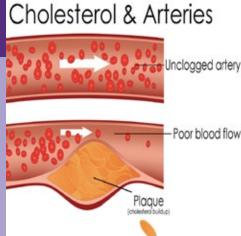
This research project was a cluster randomised controlled study to look at ways to improve the management of high cholesterol among patients who attend government primary care clinics. The lifestyle changes that help to improve cholesterol levels are similar to those needed to control hypertension and diabetes.

Medications to control high cholesterol are readily available for those who need them, and monitoring tests that should be done are similar to those that are recommended to monitor hypertension and diabetes.

The study, therefore, sought to find out how many of the persons attending the clinics had high cholesterol, how many were controlled, and to what extent the recommended guidelines on management of the risk factors were being followed by the health care providers. With the permission of the health authorities, 500 patient records from six primary care clinics in Kingston and St Catherine were reviewed in 2012. An intervention to improve care was then provided to half of the clinics. It ran for one year, and included sharing the findings of the initial review with the staff, training the staff in motivational interviewing, placing a reminder stamp in patients' records, and distribution of pre-tested educational cards to the patients after their usual counselling sessions. A second review of the patient charts was done in 2013 and those findings are reported here. The most recent blood pressure reading and the cholesterol and blood glucose tests that were done within a year prior to each review were used to determine control.

Most (94%) of the patients attending the chronic disease clinics had hypertension, while just less than half (48%) had high cholesterol and diabetes. Hypertension was controlled among 27% of patients, diabetes among 41% of patients and cholesterol (LDL-C) among 11% of patient records that were reviewed in 2013. There was no improvement in outcomes among those patients that attended the clinics that received the intervention when compared with those that received the usual standard of care.





Almost all of the patients had their blood pressure and weights done at their last clinic visit, and about half had their blood glucose and cholesterol done within the previous year. Two of every three patients had their ECG (heart tracing) done at least once, but eye examinations were very rarely done. Advice on diet and exercise was recorded in half of the patients, while 70% were given advice about taking their medications.

When compared with a similar study that was done in 1995, more of the patients had control of hypertension, but diabetes control remained the same. There was an overall improvement in the processes of care measures for patients with chronic disease when compared with what was recorded in 1995. Newer drugs for hypertension and diabetes are now available to these patients, and this may have contributed to the improved hypertension control. There needs to be further studies to look at issues such as overall increase in weight in the population, and persons not taking medication as prescribed that may be responsible for no improvement in the proportion of persons with their diabetes controlled.

This study has provided an important baseline of the level of cholesterol (LDL-C) control among clinic patients, as this was not reported in previous studies. Also, some of the interventions can be implemented on a wider scale and assessed at a later date. It is evident that high cholesterol affects as many patients as diabetes and, given its effect on heart disease, it is an area that should be given more attention.

The findings of this study were shared with those with responsibility for the management of primary care patients. Recommendations were also made for routine assessment of the levels of control of cholesterol as well as of hypertension and diabetes, as these are important risk factors among patients attending the primary care clinics. There is the need to move from just recording the numbers of patients that attend these clinics, to recording how many of them have their conditions controlled. This should form a part of the monthly reporting systems in the clinics and provide information that can be acted upon.

The researcher is now involved in a collaboration with the Ministry of the Health and the CHRI (formerly TMRI) looking at ways in which some of the evidence that has been gathered in this and other studies can continue to be used to improve the care offered to patients that attend primary care clinics. This has the potential to lead to a reduction in the burden, both human and financial, of heart disease in the population.

#### Bio

**Dr Michelle Harris** MD, MPH, MSc, PhD is a public health physician and epidemiologist with over 25 years of experience working at various levels within the health care services and in academia. Since joining the UWI in 2007, Dr Harris been involved in the development and delivery of the competency based Doctor of Public Health (DrPH) degree that is geared towards mid to senior level public health professionals across the Caribbean. Research interests include prevention and control of cardiovascular diseases, immunization and leadership development.







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