Prevalence and Patterns of Substance Abusers: Neurobehavioural and Social Dimensions

Research Coordinator:  Professor Samuel Wray
Faculty of Medical Sciences

Research Fellow:  Mrs. Pansy I. Hamilton

The study was designed to investigate the prevalence and pattern of substance abusers in Jamaica, within the age range of 15 to 50 years. Additionally, it assessed the neurobehavioural and social determinants thought to be associated with substance use.

A national sample of 2005 persons was selected using multi-stage random sampling. Data collected by questionnaire investigated the following issues: substance use and their correlates, such as sex, age, occupation, education and religion; psychosocial risk factors for substance use; knowledge, attitude and practices associated with substance use and distribution; perceived availability of illegal drugs and neuropsychological and computer models of substance abuse detection.

The sample had a gender ratio of 59 females to 41 males. Respondents were mainly in the 15-34 year age group, well educated, having received secondary education and the majority (53%) were gainfully employed.

Substance use reported for the previous 30 days saw extensive use of alcohol (51%). Other substances, reported by rank, were: painkillers 27.9%; tobacco products 14.6%; ganja/marijuana 11.5%; inhalants 1.5%; and tranquilizers 1.1%. All other named substances were less than one percent.

Individual parish data for the use of substances showed that between 48% to 78% of the sample used both licit and illicit substances.

Overall substance use by age was highest among the 15-34 year olds. The heaviest consumers of alcohol were the 25-29 age group (56%), marijuana and cocaine the 30-34 age group with proportions of 16% and 1.3% respectively. Overall, at least 50% of all the age groups reported using a substance. For the most part, the use increased with age, with fluctuations after the age group 30-34 through to 50. The age groups reporting the highest proportions, using two to three substances, are the under-20 years and the 30-34 years (45.5%).

More than 90% of the sample perceived cocaine and crack use as serious national problems, while for ganja and alcohol it was 47.7% and 37% respectively. Ganja was cited as easily available by 72.8% of the sample and cocaine by 27.5%.

Almost three percent of the sample by their endorsements indicated persistent drug use which had some influence on aspects of their individual behaviour, and also in relation to family, work and peers.

The findings have been utilised by Family Life Educators in their drug education programmes in schools and the community. The methodology has been used to conduct similar studies among Jamaican school children to explore further their substance use. It is also currently being used to conduct a study among school children in St. Lucia under a Health and Family Life project funded by the United Nations International Drug Control Programme.
This research was initiated in view of the relatively high levels of marijuana use in the Jamaican society, including school children; and the concurrent high levels of stress and societal violence. Psychobiological and social stresses are well known to be associated with drug-taking behaviour in humans. In animal studies, acute stress has been shown to increase self-administration or reward of drugs of abuse such as morphine, cocaine, alcohol and amphetamine. Surprisingly, there are no such scientific studies of this phenomenon on marijuana or its psychoactive component, delta-9-tetra-hydro-cannabinol. It was therefore proposed that environmental stressors could provide a stimulus for increased drug-taking behaviour and ultimately, addiction to marijuana.

An animal model of addiction, using the technique of place preference, was used to test this hypothesis. A given low dose of marijuana extract was first identified which produced neither rewarding nor aversive effects in the rat model. This same low dose was then used in combination with three parameters known to induce moderate to severe stress in rats, namely, i) acute isolation stress (AIS); ii) restraint stress (RS) and iii) swimming stress. This technique was repeated using delta-9-tetrahydrocannabinol.

The results showed that the combination of marijuana extract with either isolation or restraint stress increased place preference to marijuana (for AIS, p=0.02; and for RS, p=0.07). Swimming stress had no effect on place preference to marijuana.
The Neurobiology of Drug Addiction: Neurophysiological and Behavioural Mechanisms Associated with Addiction

(continued)

The dose of delta-9-tetrahydrocannabinol used also produced place preference. This finding has not been published before. Our success may have been due to the fact that the low dosage used was comparable to the amounts found in a typical cigarette.

The results of the study strongly suggest that a dose of marijuana, which is not normally addictive, can become addictive if used in combination with certain acute stressors. Although further studies need to be conducted, this finding could have significant implications for humans, and particularly for the Jamaican society which is characterised by a high degree of societal stress, violence and drug taking behaviour. This information may also be important in light of the current controversies in Jamaica surrounding the use of marijuana.

Publications generated from the research include:


The Relationship of Parental Factors to Late Childhood Development and Behaviour

Research Coordinator: Dr. Maureen Samms-Vaughan
Department of Obstetrics, Gynaecology and Child Health

Research Fellow: Dr. Maria Jackson

This research project investigated the influences of prenatal, social, nutritional and family characteristics on individual differences in a birth cohort of 11-12 year-olds in the areas of school achievement, cognition and externalizing behaviour (self-reporting). The relationship between these factors and children's self-esteem was also examined. The study was an extension of the earlier project, *epidemiological analysis of cognition, educational attainment and behaviour in a cohort of Jamaican children*.

The sample for this study comprised 1,062 children attending schools in the Kingston Metropolitan Area (510 males [48%] and 552 females [52%]) whose records were linked to the Perinatal Mortality and Morbidity Survey, 1986. Measures of achievement in arithmetic, reading, spelling and language comprehension were not explained by prenatal/birth outcome or current nutrition variables but were largely predicted by social and demographic factors.

For example, factors such as social status (occupation of the head of household), were consistently associated with higher educational attainment; the child's gender (girls), education of the father figure, and preschool attendance, positively predicted higher outcomes in two or more of these variables. Exposure to severe violent events, such as witnessing gang wars and shootings, was associated with lower scores in reading and language comprehension. The inclusion of children's self-esteem in their scholastic competence predicted improved achievement scores.

Excluding self-esteem variables, higher cognitive performances were predicted by antenatal visits, male gender, preschool attendance, socio-economic status and nutritional status (height-for-age). Initially, exposure to violence appeared not to influence cognition. However, when scholastic competence was added to the regression model, antenatal care and nutritional status lost their significance, as did educational attainment of the father figure, indicating that their effect on cognition was not mediated through self-esteem. When self-esteem was included, better cognitive performances were predicted by gender (male), occupation of head of household, preschool attendance and household possessions, and negatively associated with witnessing traumatic events of gang wars.
Externalizing behaviours of aggression and delinquency were not predicted by prenatal variables, cohesiveness of the family, socio-demographic or nutritional factors. In fact, both anti-social behaviours were predicted only by children's exposure to violence. Several violent events predicted higher aggression but did not necessarily predict delinquency; whereas severe events such as being stabbed were associated with higher levels of both anti-social behaviours. The introduction of self-esteem in the model predicted lower levels of both deviant behaviours.

The study should provide information that will guide policy decisions on the improvement of child development and behaviour and should be particularly useful to the Ministries of Health, Education and Culture, Labour and Social Security. The results imply that social, demographic and environmental factors may be of modest importance in the formulation of interventions to improve academic performance. Exposure to violence impacted differentially to the common set of risk factors associated with children’s self-reported externalizing behaviours.
This study examined the relationship between maternal nutritional status and the weight and body proportions of a baby at birth. This was a retrospective study of births which occurred between January and December 1990 and was conducted at the University Hospital of the West Indies, Jamaica. The study was confined to 1794 live singleton infants between 38 and 42 weeks gestation.

The main measures studied were birth weight, crown heel length, head circumference, ponderal index, head circumference: length ratio (HC:L ratio), placental weight and placental: birth weight ratio. The study found that: mothers who were lighter had babies who had lower birth weight, were shorter, had smaller heads and had a higher HC: L ratio. Shorter and thinner women had babies who had lower birth weights, were shorter, had smaller heads and lighter placentas. Women whose first trimester haemoglobin levels were < 9.5g/dl had babies with the lowest birth weight, crown heel length, placental weight and ponderal index. These measurements increased as the haemoglobin levels rose to 12.5 g/dl but then fell at haemoglobin levels >12.5 g/dl.

In the second and third trimester as the haemoglobin level increased, birth weight, crown heel length, head circumference, placenta weight and ponderal index decreased. In summary, the data support the hypothesis that poor maternal nutrition is associated with foetal growth restraint. Poor maternal nutrition as indicated by low weight, height, and body mass index, are associated with smaller, shorter babies with smaller heads. Haemoglobin levels >12.5g/dl in pregnancy are associated with lighter, shorter, thinner babies, with smaller heads.

This project was used to plan a detailed prospective study of maternal determinants of foetal and placental growth and which is now an on-going project at the Tropical Metabolism Research Institute. Papers have been published on the relationship between maternal nutritional status and infant's weight and body proportions at birth, and presentations have been made at the Commonwealth Caribbean Medical Research Council Meeting and to the Commonwealth Caribbean Medical Research Council (CCMRC).
Research Coordinator: Dr. Dalip Ragoobirsingh  
Department of Basic Medical Sciences

This research project, now completed, was designed to investigate the point prevalence of diabetes mellitus in Jamaica. The survey resulted in the discovery of many new diabetics. In addition, many of those persons who had been previously diagnosed with the disease had their diabetic management programmes reviewed, and where necessary, restored. As a result of the survey, information was incorporated into the programme for increasing the public's awareness of diabetes and its complications, and diabetes education packages were distributed nationwide.

This survey was one in which predetermined homes were visited in all fourteen parishes. Only individuals 15 years of age and over were interviewed. The questionnaire included personal, medical and family histories. In addition, measurements such as weight, height, waist, hip, blood sugar and blood pressure were taken. All subjects with a fasting blood sugar of 6.1 mmol/L or greater were asked to visit a nearby health facility after fasting overnight (12-14 hours) and not consuming anything the following morning.

On arrival at the clinic, an abbreviated oval glucose tolerance test - in which fasting blood sugar was measured - was conducted on each subject. The subject was then given a drink containing 75 grams of glucose, and another blood measurement was taken two hours later.

By World Health Organization criteria, 18 adults in every 100 Jamaicans are diabetic. The causative factors for diabetes among Jamaicans are varied and include old age, low level of education, truncal obesity (big belly), alcohol consumption, family history and multiple parity (having too many children).

Following from the research, several papers were presented at a number of conferences and/or subsequently published. This Diabetic Survey provided information for policymakers at the Ministry of Health on the extent of the burden of diabetes on the country. The survey has become the reference point for the World Health Organization for Scientific Studies in the Caribbean, Central and South American region.
Studies on Molecular Signal Transduction Mechanisms in Diabetes Mellitus

Research Co-ordinator: Dr. Dalip Ragoobirsingh
Department of Basic Medical Sciences (Biochemistry Section)

Research Fellow: Donavan McGrowder

This research project is designed to confirm the role of nitric oxide (NO) in the pathogenesis of insulin receptor (IR) impairment and/or signal transduction in non-insulin dependent diabetes (NIDDM or Type II diabetes), as well as to identify and characterise the protein kinase C (PKC) activity and fusion peptides that interact specifically with the activated IR or insulin-like growth factor receptors (IGF-IR). With the frequent association of hypertension and diabetes, the emphasis of the study will be on the diabetogenic effect(s) of two NO-generating anti-hypertensive drugs, S-nitrosoglutathione (SNOG) and S-acetylpenicillamine (SNAP). Recent studies conducted in our laboratory revealed that both drugs caused persistent hyperglycaemia in normoglycaemic dogs, involved receptor binding and caused significant reduction in mean arterial blood pressure. This research will delineate the direct pathologic effects of NO in skeletal and adipose tissues, thus deepening our understanding of the ability of NO to affect various levels of the insulin-stimulated signal transduction pathway. Understanding the mechanism(s) by which NO may play a role in NIDDM is essential to mitigate secondary NIDDM in hypertensive patients.

These studies will also characterise PKC, which has the effect of exacerbating insulin resistance and precipitating NIDDM, as well as those peptides that interact with IR or IGF-IR, in order to further understand the mechanisms of activation or inhibition of insulin-mediated signal transduction. Should these peptides or proteins be involved in mitogenic signalling by IR or IGF-IR, it would be possible to characterise their involvement in the regulation of the mitotic cell cycle; confirm new substrates for IR-phosphorylation, and hence, alternative signal transduction pathways; and could lead to additional possibilities of treatment modalities for NIDDM.

There has been constant collaboration with Dr. Paul Brown of the Molecular Biology Section in this project. However, this project will also involve inputs from the departments of Biochemistry, Chemistry, Chemical Pathology, Medicine, Molecular Biology and Pharmacology. The research should further the University’s interest in providing additional information on one of the leading causes of death in Jamaica and the Caribbean and a major public health concern.
Chromium Levels and Diabetes Mellitus in Jamaica

Research Coordinator: Professor Errol Morrison
Professor of Biochemistry, Professor of Endocrinology
and Pro Vice Chancellor, Graduate Studies & Research

Research Fellow: Dr. Dalip Ragoobirsingh

The research project investigated the relationship between chromium levels and diabetes mellitus in Jamaica. The research is aimed at determining the chromium status of Jamaican diabetics and to establish whether the prevalence of diabetes mellitus within a given parish is related to chromium levels.

The findings revealed that:
* the point prevalence of diabetes mellitus in Jamaica for the adult population is high (17.9%)
* Obesity is one of the main causes of diabetes mellitus
* Forty in every hundred adult Jamaicans have high blood pressure
* Chromium levels were well within acceptable range for healthy subjects.

These findings on diabetes have become the World Health Organization's reference point for population-based studies in the Caribbean. In Jamaica, an education programme has been launched by the Diabetes Association of Jamaica in conjunction with the Ministry of Health. The findings have also been presented at scientific meetings in Japan, Finland, France and the Caribbean and are published in peer reviewed scientific journals, including Diabetes Care and Diabetologia.
Screening, Assessment and Identification of Anti-Nutritional Factors in Selected Common Caribbean Food Crops and Spices and a Study of the Effects of their Consumption in Normal and Disease States

Research Overseer: Professor Errol Morrison
Professor of Biochemistry, Professor of Endocrinology, and Pro-Vice Chancellor (Graduate Studies and Research)

Research Coordinator: Dr. Helen Asemota
Department of Basic Medical Sciences (Biochemistry Section)

Research Fellow: Dr. Felix Omoruyi

This research project seeks to screen, assess and identify anti-nutritional factors in different varieties of selected Caribbean food crops with a view to elucidating the effects of their consumption in normal and disease states.

A major factor limiting a wider use of many tropical plants is the ubiquitous occurrence in them of a diverse range of natural compounds capable of precipitating deleterious effects in humans and animals. Manifestations of toxicity range from severe reduction in food intake and nutrient utilisation to profound neurological effects and even death. Compounds, which act to reduce nutrient utilisation and/or food intake, are often referred to as anti-nutritional factors. Although toxic compounds are widely distributed in the plant kingdom, it is generally considered that tropical legumes contain a more complex array of these substances than any other crop species. The toxic factors may occur in all parts of the plant, but the seed is normally the most concentrated source. The commonly eaten food crops in the Caribbean have many beneficial nutrients, but there are traces of anti-nutritional components such as cyanoglucosides, phytic acid, phenolics, protease inhibitors, heavy metals etc. These anti-nutritional factors in foods may have adverse effects on health through the inhibition of protein digestion, growth, iron and zinc absorption (Liener and Kakade, 1980 and Larsson et al., 1996). A survey of the literature reveals that most food crops commonly eaten in the Caribbean are yet to be screened for anti-nutritional factors. These food crops may contain chemicals known to have toxic properties. The following food crops, namely: gungo peas, red peas, lettuce, callaloo, pumpkin, green banana,
The following food crops, namely; gungo peas, red peas, lettuce, callaloo, pumpkin, green banana, yellow yam, dasheen, cocoyam and sweet potato have been analysed for some anti-nutritional factors. The effect of cooking on the levels of some anti-nutritional factors in Yellow yam, Cocoyam and Sweet potato was also assessed.

The information produced from this study will provide a clearer understanding of the anti-nutritional factors present in commonly eaten Caribbean food crops. The findings from this study will also be useful in rendering nutritional advice especially in the management of nutritional related diseases. In addition, the isolation and characterisation of the protease inhibitors in the legumes analysed may enhance their utilisation in nutraceutics.

There have been many achievements that have emanated from this ongoing research project which include the following:

• Analysis of the results so far obtained has shown that the consumption of most of these food crops in the raw or improper processed forms might elicit some adverse effects in humans and animals.

• The cooking process reduced the levels of anti-nutritional factors in all the tuber crops except for sweet potato where the ratio of phytate to zinc was sufficiently high enough to affect zinc utilisation. The effect of consumption of the phytic acid extract (from sweet potato) on a rat model is in progress.

• Reports on the findings from this anti-nutritional factor research are in various stages of preparation. Some of the findings have been published in peer reviewed journals while other technical papers have been submitted.
This research project focuses on addressing current problems affecting yam production (Dioscorea Sp) and specifically, the lack of disease-free, efficient planting materials. Traditional propagation of yam relies heavily on the use of the edible tuber as planting material. At times up to 40% of harvested tubers has to be retained for planting. This considerably reduces the amount available for local consumption and export. The project seeks through the use of in vitro technologies, to produce quality yam planting materials for farmers’ use.

The results will inform strategies for reduction in the production cost to farmers as well as bring about an improvement in the shelf life of harvested tubers. Tissue-culture-derived yam plantlets have been produced and an effective post-flask management protocol developed. The protocol has been used to harden plantlets initiated for field studies. Apart from the commonly cultivated yams, varieties that are on the decline or on the verge of extinction have been placed into culture for possible reintroduction to the field. They include cultivars such as Calabash, Dark Night, Moonshine, Akam, Yampie, Tau, Snake, St. Vincent, Mozzella, Chinese, Diamond and Snake White Yam. Wild varieties of Jamaican yams are being established in culture. These yams are known for their medicinal properties. Diosgenin, a steroidal precursor used in the production of oral contraceptive has been isolated from Bitter yam.

The scope of the study includes the characterisation of yam starches and the investigation of the association between starch type and yield capability of the tuber. Results to date have revealed striking differences in composition (amylose/amylpectin ratio), x-ray diffraction patterns and granule shapes and sizes. Further studies are being done to fully characterise the starches from Jamaican yam.

Yam planting materials obtained from this project are being prepared for trials with the local farming community. Some of the results from this project have been presented at seminars and published in reference journals. A number of papers have been submitted to international journals while others are under preparation.
Investigation of Some Jamaican Plants for Biomedical and Agrochemical Compounds

**Researcher:** Dr. Lawrence Williams  
Department of Basic Medical Sciences

This ongoing multi-disciplinary research project focuses on the evaluation of extracts/compounds from selected Jamaican plants - e.g. *Cleome viscose* (wild caia), *Petiveria alliacea* (guinea hen weed/strong man's weed), *Pilea elizabethae* (related to maroon bush), and *Rhizophora mangle* (red mangrove) - which could be used as pharmaceuticals, insecticides, herbicides and anti-microbial agents.

Earlier investigations revealed that several fractions of *C. viscose* have demonstrated very high toxicity (90% mortality at 6 mg) against the sweet potato weevil, and that the insecticidal toxicity of these extracts can be enhanced when formulated with other plant extracts e.g. peppermint and cedar wood oils. This study revealed that several of these extracts inhibited the germination and radicular growth of some seeds, thus suggesting that these plant compounds may have herbicidal activity. Extracts of the red mangrove also demonstrated potent acaricidal activity with low to moderate insecticidal action.

Work is now focusing on the anti-microbial action of the cembranoid diterpene isolated from the surface exudates of *C. viscose L*. At present, the molecules are being characterized and are showing anti-cellular and insecticidal activities. The minimum inhibitory concentration (MIC) values found for the diterpene have been compared with those of the commercially available antibiotic ampicillin. These studies could provide new and interesting compounds which can serve as a model for the development of cost-effective medicinal drugs and pesticides.

Collaborating in this work are Dr Roy Porter of the Chemistry Department and Mr Walton Reid of the Department of Life Sciences, UWI; and Professor W. Kraus and Dr Erlinda Vasquez of the Department of Chemistry, University of Hohenheim, Stuttgart, Germany.
Molecular Biology and Management of Tomato and Pepper Geminiviruses

**Research Coordinator:**  Dr. Wayne McLaughlin  
Department of Basic Medical Sciences

**Research Fellow:**  Dr. Marcia Roye

An additional grant allowed for broadening of the area of research in the project which examined *epidemiology and management of white-fly transmitted geminiviruses*. The aim of this expanded project was to develop disease management strategies for whitefly-transmitted (WFT) geminivirus diseases. The specific objectives were: (i) to molecularly and biologically characterize the WFT geminiviruses infecting vegetable crops including tomatoes, peppers and weeds in Jamaica; (ii) to develop rapid diagnostic systems for the identification of geminiviruses associated with tomatoes and peppers, and use these techniques to provide geminivirus diagnosis for the Caribbean Basin countries; (iii) to evaluate antiviral strategies for use in engineering tomatoes with resistance to infection of tomato yellow leaf curl geminivirus (TYLCV).

DNA probes were developed from crop- and weed-infecting geminiviruses from Jamaica, Barbados and Belize and used in DNA diagnostics of crops for geminivirus infection. Molecular biology techniques such as polymerase chain reaction (PCR) and nucleotide sequencing were used to identify and characterize geminiviruses from Jamaica and Barbados. In Jamaica, a new bipartite geminivirus, tomato dwarf leaf curl virus (TDLCV) was discovered in *L. esculentum* (tomato) and *C. chinense* (Scotch Bonnet pepper); two distinct viruses infecting cabbage were also identified. Geminiviruses or strains of them were found to affect the common weeds *Sida sp* and *Wissadula amplissima*, while three distinct geminiviruses were associated with the weed *Macroptilium lathyroides*. In Barbados, tomato, muskmelon and watermelon were found to contain the same bipartite geminivirus, whereas two distinct geminiviruses were associated with *M. lathyroides*. 

The whitefly in action
Molecular Biology and Management of Tomato and Pepper Geminiviruses
(continued)

Phylogenetic relationships with other western hemisphere geminiviruses indicate that crop- and weed-infecting geminiviruses from Jamaica and Barbados are distinct, highly diverse, and have several geographical origins. From this work, there is now evidence to show that weeds are not host to crop-infecting geminiviruses in Jamaica - a significant finding for the management of geminiviruses.

In collaboration with the University of Wisconsin, antiviral strategies were evaluated and a new strategy to genetically engineer tomato for resistance to the Tomato Yellow Leaf Curl (TYLCV) geminivirus was developed. The transgenic tomato should be available for use in the next five years. This type of research on Tomato is particularly important, as diseases caused by the geminiviruses are currently the major limiting factor in tomato production in the Caribbean region. The DNA diagnostic facility will provide effective monitoring for disease control, assisting farmers, plant breeders and commercial entities by testing for geminiviruses in crops.

Other significant highlights of the project included the deposit of eight new gene sequences from geminiviruses at the gene bank (http://www.ncbi.nlm.nih.gov/GenBank); and the training of graduate students in molecular biology and plant genetic engineering at the University of Wisconsin, USA and Hebrew University of Jerusalem.

From this research, two papers were published in refereed journals and others are to follow.
The need to be competitive in a global economy, as well as the requirement for diversification of the local sugar industry, prompted investigations into a novel process for the production of xanthan gum. Xanthan gum is a raw material for industry that is produced through fermentation by the bacteria Xanthomonas campestris. The gum is currently used as a stabilizer, emulsifier, thickener and suspending agent in several food products such as dressings, juices and cake mixes. It is also used in the production of pharmaceutical products (such as antacids), cosmetic items (such as toothpaste and hair care products) and other products (such as fertilizers and paints). It can also be used to enhance the recovery of oil in drilling operations.

Although its use could have a positive impact on the development of the petroleum industry in the region and the wider international community, it must be used in vast quantities as an input in the oil recovery process. Its usage in this industry therefore depends on its availability at a relatively low cost. The gum is currently imported into Jamaica at costs which are often prohibitive to local manufacturers. Consequently, international research has been focusing on ways of reducing the costs of production of xanthan gum.

This research project has successfully utilized a local raw material derived from sugar cane for the production of xanthan gum. The low cost of the raw material has resulted in a reduction in the overall costs of production, which should facilitate the supply of xanthan gum at lower prices. A patent has been secured for this novel process and this should aid its transfer to industry by providing the rights to the process to the relevant parties. Under the project, there has been the establishment and commissioning of new fermentation facilities at the Mona campus, which should increase the university’s ability both to teach and conduct research in the area of fermentation technology.

Based on the work done on this project, there should be an increase in the local utilization of xanthan gum with a concomitant improvement in product quality. It should also have the effect of promoting the development of xanthan gum as a non-traditional export product. In addition, the research should contribute to the diversification of the local sugar industry through increased demand for the newly developed raw material for xanthan gum production which itself was obtained from the refining of raw sugar.

This project was developed to meet the needs of the region through the utilization of local raw materials. The willingness of the Jamaican Government to commit funding to this research should ensure that the technology and its ensuing benefits remain in the region.
Survey of the Prevalence of Cardiac Disease in Jamaica

Research Co-ordinator: Professor Howard W. Spencer
Department of Surgery, Radiology, Anaesthesia and Intensive Care

Research Fellow: Beverley P. Dinham-Spencer

Cardiovascular diseases, which include the disease of the heart, are the leading causes of death worldwide. There is no reliable data source in Jamaica, which identifies the prevalence and burden of heart disease. Research over the years has focused on some of the risk factors such as diabetes and hypertension, which may result in the development of poor blood supply to the heart. This disease known as Ischaemic heart disease is only one of the several types of heart disease which occur in Jamaica.

A Survey to determine the prevalence of the different types of heart disease in Jamaica commenced in January 2000. With the assistance of STATIN, a national sample of 2,623 individuals were selected and later interviewed using pre-tested questionnaires. 539 individuals were then selected from this group to undergo full cardiological examinations. This was done to confirm the incidences of heart disease and also to group those tested according to type. This selection was based on whether the individual gave a history of Rheumatic fever, heart murmur or had 4 or more risk factors in the case of adults and 3 or more in the case of children.

Interviews of selected individuals were done by regions, where Region 1 was defined as Kingston, St. Andrew, St. Catherine and St Thomas, Region 2 - Clarendon, Manchester and St. Elizabeth, Region 3 - St James, Hanover and Westmoreland, Region 4 - Trelawny, St Ann, St. Mary and Portland. The total sample contained 38.6% males and 61.4% females. The majority of those persons interviewed were in the age range 20-39 years. 63.9% of the households visited had at least one child (0-17 years criteria used). Those who were selected for a full cardiological examination consisted of 228 adults and 7 children in region 1, 183 adults and 7 children in region 2, 50 adults and 4 children in region 3 and 62 adults and 0 children in region 4. The main survey reveals:

* 20.6% of the total sample had a family history of heart disease, with the disease more prevalent in the female members.
* 24.7% of the total sample had a history of hypertension with the female family members more commonly diagnosed with the disease.
* 6.6% of the total sample had a history of diabetes with the female family members more commonly affected by the disease.

Completion and analysis of the sample for cardiological examination will provide additional data and will determine whether further studies should be undertaken.

Further analysis of the total sample data will be done to determine lifestyle behaviour and knowledge of risk factors with the intention of influencing risk-behaviour modification. Survey findings will be used in the development of proper plans to provide a strong and effective treatment programme in Jamaica.
Documentation of the Contribution of Senior Citizens to Development

Research Co-ordinator: Dr. Denise Eldemire-Shearer
Department of Community Health and Psychiatry

Junior Research Fellow: Miss Pauline Gayle

The project seeks to document and evaluate the contribution of Senior Citizens to development at the family and community levels. It will also develop best practice models and guidelines for income generating projects involving seniors. In addition, work will be done on the development of guidelines for community projects with emphasis on inter-generational support.

Through the various projects that have been developed and operated by seniors, they should become self-sufficient and garner intergenerational support at the family and community levels.

The findings so far have indicated that the difficulties/problems surrounding the income generating projects lie within group maintenance rather than with the projects themselves. This therefore, serves as a means to guide the researcher and the National Council for Senior Citizens in the design and implementation of programmes to strengthen and reinforce group togetherness. The findings have also been relayed to the council as the researcher has kept Council members constantly abreast of developments within the project.
Prostate Cancer and Dietary Intake in Jamaican Males

Researcher: Dr. Tomlin J. Paul
Department of Community Health and Psychiatry

The project seeks to examine the relationship between the dietary intake of Jamaican males and the development of prostate cancer. Jamaica has one of the highest reported rates of prostate cancer worldwide. Although age, ethnic and familial factors are thought to be associated with prostate cancer, there are no confirmed risk factors that can be modified to impact on the occurrence of this disease. A number of studies have pointed to the potential role of dietary factors, but more work needs to be done before clear advice can be given to the public.

In laboratory and animal studies, it is apparent that the regular functioning of prostate cells is affected by fatty acids and their metabolites. Certain fatty acids appear to influence cell receptors and may also interfere with enzymes involved in maintaining the integrity of the genetic material. Abnormal expression of genetic material in cells can eventually lead to the development of malignant or cancer cells. The availability of fat in the Jamaican diet measured by calories per person per day has increased steadily over the last four to five decades. Hence there is a need to consider the potential role of the Jamaican diet in the development and progression of prostate cancer.

The proposed study will investigate the possibility of a relationship between fat intake in particular, and the development and progression of prostate cancer. Fats derived from both animal and plant sources will be examined. The diets of Jamaican men who have been diagnosed with prostate cancer will be compared with those who are free of the disease. In addition, a period of follow-up will be used to assess how variations in dietary intake may influence the outcome or prognosis of the disease.

By searching for links between diet and prostate cancer, opportunities should emerge for reducing the incidence and progression of this disease through changes in dietary behaviour at the individual and community levels.
Cancer Mortality in Jamaica

Researcher:  Professor Barrie Hanchard
            Department of Pathology

The purpose of this ongoing research project is to obtain data on cancer mortality in Jamaica with a view to facilitating further expansion of the Jamaica Cancer Registry to include not only data on cancer incidence but also on mortality.

The acquisition and analysis of cancer mortality data will enable Health Care Authorities to plan programmes to improve the control of cancers in general, to effectively monitor treatment protocols for cancers and to direct the expenditure of the health budget into areas of greatest importance. At the same time, the additional data on cancer mortality will bring the Jamaica Cancer Registry in line with other cancer registries in the region and internationally by completing the portfolio of information available from the registry.

With the co-operation of the Registrar General’s Department, the staff in the Cancer Registry have been able to acquire and analyse data on cancer mortality. A manuscript on Cancer deaths in Jamaica in 1999 was prepared and submitted for publication in the West Indian Medical Journal.