

**FACTORS WITHIN THE COMMUNITY AND COMMUNITY MENTAL
HEALTH SERVICE THAT CONTRIBUTE TO HOSPITAL ADMISSIONS OF
PSYCHIATRIC OUT-PATIENTS**

A Report
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ABSTRACT

The factors within the community and community mental health service that contribute to hospital admission of psychiatric out-patients.

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There is accumulating evidence of community and community mental health service factors contributing to hospital admissions of psychiatric out-patients. The primary aim of this study was to determine the factors present among patients attending the out-patient clinics of Sector IV psychiatric care region in the South-West of Trinidad. The study has significance in identifying these factors and in the long term to improve primary care, reduce admissions to tertiary care and thereby optimize tertiary care of psychiatric patients. The study was a cohort study, a nested case-control study involving 75 cases and 75 matched controls. Primary care factors of support staff contact namely Psychiatric Social Worker contact with relative risk (RR) = 0.55 (95% CI 0.34, 0.88), non-compliance with medication, RR = 1.50 (95% CI 0.89, 2.52), and clinic interval of > 3 months, RR = 2.21 (95% CI 0.87, 5.59) were found. Substance use/abuse factors of marijuana, RR = 1.51 (95% CI 0.68, 3.31) and cocaine, RR = 1.87 (95% CI 0.40, 8.64) were also found. Chi-square analysis revealed no significant differences in demographic variables of clinic attended, age, gender, marital status and ethnicity. Recognition of these factors should lead to action towards improved mental health care at the primary level

with secondary benefits at the tertiary level. Sample size in this study was low however; it is expected to continue the study to obtain a sample size of 305 per group – cases and controls in order to detect an effect size of 10% at $\alpha = 0.05$ and power of 80%.

Keywords: Mervyn Edmund Sinanan; community; community mental health service; hospital admissions and psychiatric out-patients.

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Dedication

This work is dedicated to the mentally challenged patients – the Cinderellas of health care.

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Research Question

What are the factors within the community and community mental health service that contribute to hospital admissions of psychiatric out patients?

Significance:

1. Epidemiologic studies suggest that inadequate primary psychiatric care may result in increased rate of acute psychiatric admissions.
2. Increased rate of acute psychiatric admissions results in sub-optimal care at the tertiary level.
3. There is a need to reduce the rate of acute psychiatric admissions so as to improve psychiatric care at the tertiary level.
4. By finding the factors of inadequacy in the primary psychiatric care, steps may be taken to improve these inadequacies and therefore reduce the rate of acute psychiatric admissions.

Introduction

Hospitalization is often a painful experience for patients with mental illness and their families. Although hospital admission represents only one aspect of outcome of mental illness, it is an important event which typically indicates that the patient's symptoms have reached a level of severity that cannot be tolerated or safely managed outside of an institutional setting. In practice, the decision to admit a patient with severe psychiatric illness for inpatient care may turn on a combination of clinical, behavioural, social, referral and resources factors.

Hospitalization of psychiatric patients puts increased demand on the tertiary care services. The capacity of the psychiatric units available is limited in terms of space and staffing and with patients being admitted at high rates, the service may be compromised and treatment quality may become sub-optimal.

It is useful to know which patients are at greatest risk of relapse and rehospitalization. An accurate assessment of risk provides opportunities to implement appropriate measures to prevent rehospitalization. For example, patients at high risk may be appropriate candidates for more effective antipsychotic regimes, enriched psychosocial community-based services and improved quality of primary psychiatric care.

Background and Problem Statement

The Psychiatric Unit at the General Hospital, San Fernando consists of twenty-two (22) beds and four (4) seclusion rooms with a maximum in-patient capacity of twenty-six (26) patients – thirteen (13) males and thirteen (13) females. It is a unit designed for short-term (average two (2) weeks) hospitalization time. Sometimes the unit is so crowded that patients cannot be kept to attain optimum recovery and patients have to be discharged early or be transferred to the St. Anns Hospital.

The staff at the unit comprises of eight (8) doctors – two (2) psychiatrists, two (2) registrars, four (4) house officers. There are eleven (11) mental health officers (MHOs), eight (8) psychiatric social workers (PSWs), two (2) substance abuse officers (SAROs), one (1) psychologist and one (1) occupational therapist; these are the support staff of the unit.

The region served by the unit includes counties Victoria, St. Patrick and the southern part of county Caroni and is known as Sector IV for psychiatric coverage in Trinidad. See Appendix I. Seven (7) psychiatric out-patient clinics are distributed in the region – Couva, Princes Town, San Fernando, South Oropouche, Siparia, Point Fortin and Cedros. San Fernando and Princes Town have four (4) clinics per month, Couva, Siparia and Point Fortin have two (2) clinics per month and South Oropouche and Cedros have one (1) per month. These clinics are held at District Health Facilities or Health Centres.

All clinics are conducted by one (1) to three (3) doctors, one (1) to two (2) MHOs and one (1) PSW except for Cedros which has only a doctor and a MHO. A special clinic for substance abuse is conducted by a doctor and two (2) SAROs. A Child Guidance Clinic provides services for children and adolescents ages 3 yrs to 16yrs and is serviced by a psychiatrist, a PSW and the psychologist. The clinics are therefore done by doctors and support staff. The clinic attendance is often large in relation to the level of staffing and this may result in a compromising of time spent per patient.

The MHOs and PSWs are responsible for follow-up of patients discharged from hospital to the clinic as well as to follow up of patients in the field i.e. at the patient's homes. They monitor patients in terms of their status and ensure compliance on medication and attendance to clinic. They administer depot injections and deliver oral medications when necessary. Problems which patients may have are dealt with by these officers. These problems can be domestic – requiring counselling or financial – requiring granting of public assistance or disability grants. In cases of substance abuse or alcoholism, appropriate assistance is obtained for the patient by way of the Substance Abuse Treatment Program. New patients are seen by the most senior doctor in the clinic, a thorough history and examination are done, a diagnosis is made and a treatment regime is formulated. Sometimes the number of patients has to be limited to allow proper consultations.

All mental illnesses being treated at primary care level were considered as any illness followed in an out-patient clinic and would have the potential of relapse and progress to a

point requiring tertiary care. Medical staff and support staff contact are important inputs for the maintenance of well being of out-patients. Any short-fall in these contacts may increase the risk of relapse of illness.

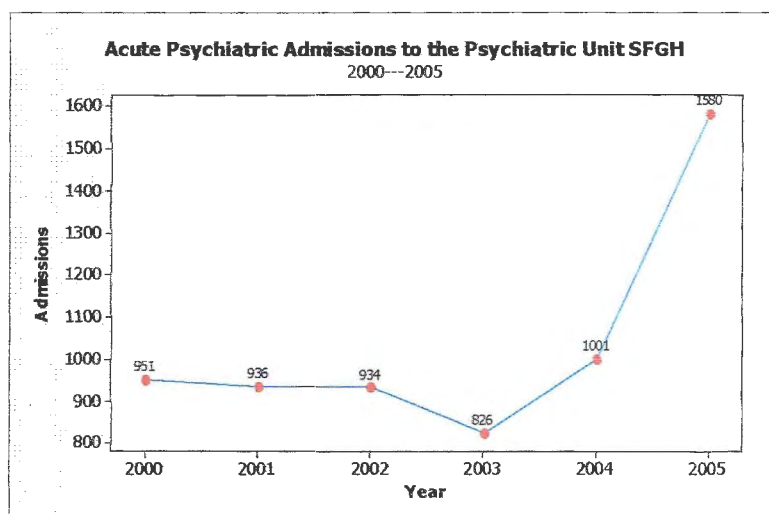
Availability of medication at the clinic is at times a problem which can result in patients being without medication if they do not do their own purchase. Having the medication and being non-compliant increases the risk of relapse of illness.

Socioeconomic status (SES) is an indicator of quality of life of patients. Education, financial status, housing, amenities available and social support of patients were the SES factors considered in this study. If a patient lives a poor quality of life there may be increased risk of relapse of illness. Substance use and abuse impact negatively on mental health. This is especially so in the case of patients who are already diagnosed of mental illness. The use of cigarettes, alcohol, marijuana and cocaine were considered as precipitants of relapse of mental illness.

Admissions of acute psychiatric patients to the Psychiatric Unit of the General Hospital, San Fernando (SFGH) over the period 2000 – 2005 obtained from the statistics office of the Records Department at the SFGH is shown in Table 1 below.

Table 1: Psychiatric Admissions 2000 – 2005

Year	Admissions
2000	951
2001	936
2002	934
2003	826
2004	1005
2005	1580

**Figure 1: Acute Psychiatric Admissions to the Psychiatric Unit SFGH, 2000-2005.**

The problem identified is that the rate of psychiatric admissions to the Psychiatric Unit, SFGH is becoming too high in relation to the capacity of this unit.

Literature Review

Readmissions rates are commonly used in the health care field as a quality indicator. In the case of this particular study, readmission rate will be observed not for evaluation of quality of health care directly but instead to determine what factors can be improved in order to reduce admission rate. Readmission is a cause for concern, as it is not only a step backward in treatment but also a costly alternative to effective and efficient outpatient care. Readmissions call into question the quality of care initially received; specifically they raise the issue of premature discharge. It has been found that non-compliance with outpatient follow-up is a strong predictor of readmission¹.

Inpatient care has shifted from being long-term care to crisis stabilization with continued care coordinated through outpatient services. This is the means by which tertiary health care demands may be reduced thereby increasing its efficiency and efficacy. It is imperative therefore to have a properly functioning primary psychiatric care service.

Hospitalized patients who did not comply with at least one outpatient appointment after discharge were two times more likely to be rehospitalized than those who kept at least one appointment after discharge². There was a positive benefit of keeping an outpatient appointment. The rate of rehospitalization increased as the time since the initial admission increased, no such increase in rates over time was found for patients who kept at least one outpatient appointment after discharge.

Social factors is a broad term comprising domestic, and financial problems. It was found that social factors contribute to 38.9 percent of admissions³. This was followed by factors related to psychiatric and physical illness (31.1 percent), dangerousness to self and others (20.3 percent), and substance abuse (9.7 percent). It is important therefore to address social issues in primary psychiatric care.

Patients with multiple admissions were significantly more noncompliant with medication and significantly more likely to abuse drugs and alcohol⁴. They were also younger at their first hospitalization and had more previous admissions, shorter lengths of stay, and more incidents of leave without consent than the patients who did not have multiple admissions.

Socioeconomic Status is a determinant of admission likelihood⁵. In an in-patient population, the proportion of social class I, II and III was 62% while the corresponding out-patient population proportion was only 15%; 18% of all the inpatients were Caucasians whereas there were no Caucasians in the out-patient group. The racial and socioeconomic distribution of the outpatient group corresponded closely to the distribution of the general population in Jamaica.

In the Caribbean context where patients' families tend to take a proactive stance with respect to the mental health of their family members and where the state has established a broad-based community mental health service to facilitate the management of patients with psychoses, the use of the relapse as an outcome indicator is especially relevant⁶. The

relapse rates of first contact schizophrenia patients in Trinidad and Tobago in 1996 was 19%⁷, and the rate of 23% was found for other developing countries in 1998⁸. Hickling et al found an extremely low one-year relapse rate of 13% in their study of 2001. The Jamaican rates of relapse is very much lower than the rates reported for West Indians in the UK⁷.

In Jamaica the Mental Health Law was amended in 1974 when mental health officers were empowered to bring the severely mentally ill compulsorily for treatment by involuntary admission. Community psychiatry closely involves the families of the patients as caregivers and cases are recognised early with acute treatment instituted in the community and home settings. High employment and high levels of medication compliance particularly depot injections are other favourable factors. These are hypotheses stated by Hickling et al which are yet to be tested by appropriate studies.

Schizophrenia and the affective disorders accounted for 70% of all admissions to a general psychiatric unit and over 50% of all outpatients as found from a Jamaican study of 1971⁵.

It is presumed that this distribution reflects the patterns in other under-developed Caribbean societies. There is a low incidence of para-suicide and personality disorders when compared with industrialized countries. This may be due to the more affluent societies having to live under industrialized and urban conditions. General Hospital psychiatric units are faced with the problem of coping with an ever increasing number of

patients in the ratio of 3 new follow-up patients for every one discharged. With closely allied community follow-up services, the general hospital psychiatric unit is certainly an effective instrument of mental health care in the Caribbean.

Psychiatric patients with comorbid substance abuse are not at greater risk for serious illness than psychiatric patients without such comorbidity⁹. Substance abuse facilitates and enhances destabilisation of psychopathology in many psychiatric patients which explains the high frequency with which it is seen at emergency services. This may be due to drug effect so that drug withdrawal brings rapid improvement in cognition and behaviour. By allowing detoxification by means of sleep, patients may not require hospitalization. Treatment of alcoholism and substance abuse will not in itself substantially decrease the number of admissions to acute inpatient units.

Reduction of hospitalization, particularly schizophrenia and other psychoses, requires improved community care by means of counselling and education, depot medications, home visits and family support. The cost benefit of decreased hospitalization may be used to support the enhanced community based care.

Contrary to the findings of Sanguinetti et al, 1996 that substance abuse does not increase the risk of hospitalization of psychiatric patients, it is documented that there is a high prevalence of substance abuse among patients presenting to psychiatric facilities^{10, 11, 12}. There was a high rate of utilization of the psychiatric unit of the San Fernando General

Hospital by substance abusing patients, especially young males as seen in a study done in 2004¹³.

Methods

The Design

The design was a cohort study – a nested case-control study^{14, 15, 16}. In this design, patients who were admitted (cases) were matched with patients who were not admitted during the study. This type of study reduces cost by requiring smaller samples and shorter times compared to the full cohort approach and has similar efficiency.

Measurements in the

present of patients from the past

The Present

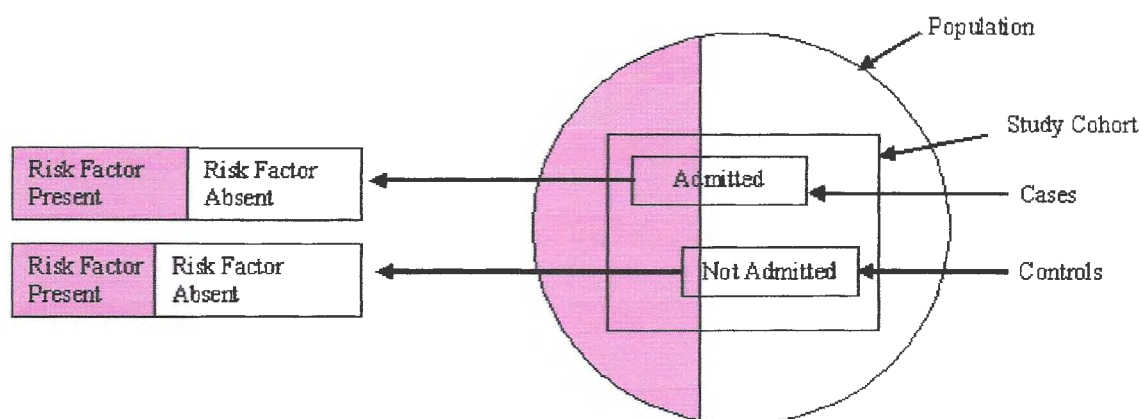


Fig. 2: The Nested Case-Control Study

In this study, the investigator

- identified a cohort (sector IV psychiatric out-patients) with banked information (clinic notes)
- identified admissions to the hospital (cases) meeting inclusion criteria
- selected a sample from the rest of the cohort (~~controls~~) – patients who were not admitted and matched for age, gender and diagnosis with the cases (controls).
- measured predictor variables in cases and controls.

Subjects

- Inclusion Criterion:**
- i. All psychiatric out-patients acutely admitted (cases) to SFGH.
 - ii. Psychiatric patients who attend out-patient (OP) clinics of the region known as Sector IV.
 - iii. Patients who attended OP clinic at least three times prior to acute admission or selection as a control.
 - iv. Patients who give signed consent to participate.

- Exclusion Criteria:**
- i. Psychiatric patients who are acutely admitted from non-sector IV regions.
 - ii. Psychiatric patients who attended OP clinic less than three times prior to acute admission.
 - iii. Patients who were previously admitted and included in the study and are re-admitted.
 - iv. Patients who refuse to consent to participate.
 - v. Controls that cannot be matched for age, gender and diagnosis.

Target Population

The target population is all known psychiatric patients attending psychiatric out-patient clinics.

Study Cohort

The study cohort is all out-patients attending Sector IV psychiatric clinics.

Sample

The Sample consists of admitted psychiatric patients (cases) and those not admitted (controls).

Demographic Data

Simple demographic data were also obtained from the questionnaire. Variables pertaining to clinic attended, age, gender marital status, ethnicity diagnosis and religion were collected.

Predictor Variables

Variables related to primary mental health care, socioeconomic status (SES) and substance use/abuse were measured. These broad categories were sub-divided as follows:

i. Primary Health Care

- clinics attended
- medical staff contact – SMO, Registrar, House Officer
- support staff contact – MHO / SARO, PSW
- home visits by support staff
- availability of medication at clinic
- compliance with medication by the patient
- interval between clinic appointments.

ii. Socioeconomic Status (SES)

- education level – primary and below, secondary and above
- family support
- financial support – self/family, government assisted
- housing – shelter, electricity, potable water

iii. Substance use / abuse

- cigarettes
- alcohol
- marijuana
- cocaine

Outcome Variable

The outcome variable was the occurrence of an acute psychiatric admission.

Confounding Factors

Confounding factors of gender, age and diagnosis were avoided by matching controls and cases for these factors.

The Instrument

The instrument for collecting the demographic data and measuring the variables is shown as Appendix II.

Ethical Issues¹⁷

Four ethical principles guided this research with human subjects. These principles were as follows: -

- i. Respect for persons
- ii. Autonomy of persons
- iii. Beneficence
- iv. Justice

Patients were shown respect and information was not demanded from them but instead was obtained after invitation and explanation by the research assistant (RA). The questionnaire was completed only after the patient or next-of-kin (NOK) gave signed consent to participate. See Appendix I. Confidentiality of the information was ensured by having the interview done in a private setting with only the patient or patient and NOK present with the RA. Records of patients carried index numbers for identification and were kept securely at the Family Medicine Unit. Patients had autonomy and were free to exercise their right to refuse to participate in the study. At any point they had the right to change their mind and withdraw.

Information was sought to determine or reveal inadequacies within the mental health care services. It was shown that by participating in the study there may be the benefit of improved mental health care in the long term which is the beneficence.

Benefits and burdens of research ought to be fairly distributed if one is doing justice. It was not that the mentally ill were targeted here but rather there appears to be a need to improve care in this sector of patients and to confer the benefit of improved care for the mentally ill.

The research proposal was submitted for ethics approval by both the South West RHA and the University of the West Indies and met all requirements. See Appendix IV for the correspondence and ethics committees approvals.

Data collection

The research assistant (RA) recruited was a retired mental health officer with tremendous experience in the field of mental health. See Appendix V for curriculum vitae. He was comfortable handling mentally ill patients and was familiar with the system. He knew most of the patients and they recognized and respected him which aided in reliability of their responses.

He was responsible for administering the questionnaire to the patients – both cases and controls after ensuring all consent forms were signed. The questionnaire did not carry the patients name to maintain patient privacy and confidentiality. Controls were randomly selected from the clinics. During the data collection period the investigator (I) was available for consultation should any unforeseen circumstances arise.

The RA returned completed questionnaires of cases and controls to the I.

The I entered the data into Excel spreadsheet using numerical codes. The data was then imported into Minitab 14 statistical program.

Data Clean-up

Data was found to be in much too narrow categories in some instances and had to be merged to obtain dichotomous responses for analysis.

The operations manual is shown in Appendix VI.

Presentation of Data

Data was presented as 2x2 tables as follows: -

Table 2: The 2x2 Table

	Case	Control	Total
Risk Factor Present	a	b	a + b
Risk Factor Absent	c	d	c + d
	a + c	b + d	N

Each predictor variable was considered in the form of the above 2x2 table.

Sample Size

Time permitted the collection of 75 cases and 75 controls. $N = 150$,

$$a + c = b + d = 75$$

Errors

No study is free from errors, and the inferences that are derived are never perfectly valid.

It was aimed to minimize errors at each stage of the study.

A random error is due to chance and can be reduced by increasing sample size which has its limitation due to time and cost. Time and cost limited the sample size to 75 for each group in this study.

Systematic error is due to bias which can distort a study in one direction. Increasing sample size has no effect on systematic error. In this study design, bias was minimized by carefully matching the controls with the cases to eliminate confounding errors due to age, gender and diagnosis and systematic errors as well.

Statistical Issues¹⁸**Hypothesis (H_A)**

There will be a higher rate of acute psychiatric admissions with the presence of risk factors within the community and community mental health service.

Null Hypothesis (H₀)

There will be no increase in the rate of acute psychiatric admissions with the presence of risk factors within the community and community mental health service.

The predictor variables or risk factor being either present or absent and the outcome variable of the patient being either admitted (a case) or not admitted (a control) were both dichotomous. The chi-square (χ^2) test was therefore the test applied and it was a one sided test since one wanted to determine if the population with risk factor present was greater than that of risk factor absent.

Setting α and β

The probability of committing a Type I error (rejecting the null hypothesis when it is actually true) is called alpha (α). The probability of committing a Type II error (failing to reject the null hypothesis when it is actually false) is called beta (β).

For a one sided χ^2 test, setting $\alpha = 0.05$ and $\beta = 0.2$

$$\text{Power} = 1 - \beta = 1 - 0.2 = 80\%$$

Calculation of Proportions and effect size

$$\begin{aligned} P_1 &= \text{rate of admission with} \\ &\quad \text{risk factor (RF) present} \\ &= a / a + b \end{aligned}$$

$$\begin{aligned} P_2 &= \text{rate of admission with} \\ &\quad \text{risk factor (RF) absent} \\ &= c / c + d \end{aligned}$$

$$\text{Effect size } (\Delta) = P_1 - P_2$$

Hypothesis Testing

The null hypothesis can be expressed as: -

$$H_0 : P_1 = P_2 \quad \text{or} \quad P_1 - P_2 = 0$$

and the alternative hypothesis which was one-sided as: -

$$H_A : P_1 > P_2 \quad \text{or} \quad P_1 - P_2 > 0$$

Relative Risk Calculations¹⁹:

$$\begin{aligned}\text{Relative Risk (RR)} &= \frac{\text{Rate of Admission with RF present}}{\text{Rate of Admission with RF absent}} \\ &= P_1 / P_2\end{aligned}$$

Confidence Interval (CI) for Relative Risk (RR)

A 95% CI for RR is derived from the natural log of RR ($\ln RR$) –

A 95% CI for $\ln RR$ is

$$\ln RR \pm Z_{1-\alpha/2} \text{ SE } (\ln RR)$$

$$\text{SE } (\ln RR) = \sqrt{1/a + 1/a + c + 1/b + 1/b + d}$$

$$Z_{1-\alpha/2} = 1.96$$

CI of RR is then

$$e^{\ln RR \pm 1.95 \text{ SE } (\ln RR)}$$

Chi – Square, p-Value and Fisher’s Exact Test (FET) p-Value

These values were generated from the Minitab 14 statistical program by selecting ‘Chi-square test’ and ‘Fisher’s Exact Test’ from ‘Tabulated Data’ in the Minitab worksheet.

Results

Data collection was started on 9/01/06 and continued until 16/04/06. The number of patients admitted (cases) consecutively was 105 and from this a sample of 75 was obtained based on the inclusion and exclusion criteria of this study. Thirty patients were rejected from the study, the Table 3 below gives the patients tally and Table 4 lists the reasons for rejection of the 30 cases. 75 matched controls were obtained randomly from the clinics.

Table 3: Patients Tally

Cases	Number (%)
Admitted from 9/1/06 to 16/4/06	105 (100)
Participated in the study.	75 (71.4)
Rejected from the study	30 (28.6)

Table 4: Tally for rejected Cases

Reasons for Rejected of Cases	Number (%)
Records unavailable at clinic	7 (6.7)
Unable to locate patient	5 (4.8)
Less than 3 clinic attendances	7 (6.7)
No clinic attendances (New Cases)	10 (9.5)
Unable to find matched control	1 (0.9)
Total	30 (28.6)

Table 5 gives the final number of cases and controls which add up to a total of 150, comprising 75 in each group.

Table 5: Tally for Subjects

Subjects	Number (%)
Cases	75 (50)
Controls	75 (50)
Total	150 (100)

Table 6: Predictor Variables (including Demographic Data)

Predictor Variables	N = 150 n (%)	N = 75 Cases n (%)	N = 75 Controls n (%)	p-Value
(i) Demographic Data				
Clinic				0.242
San Fernando	59 (34)	33 (44)	26 (35)	d.f. = 1
Other	91 (61)	42 (56)	49 (65)	
Age				1.000
< 40	74 (49)	37 (49)	37 (49)	d.f. = 1
> 40	76 (51)	38 (51)	38 (51)	
Gender				1.000
Male	86 (57)	43 (57)	43 (57)	d.f. = 1
Female	64 (43)	32 (43)	32 (43)	
Marital Status - Living with mate				0.172
No	116 (77)	62 (83)	54 (72)	d.f. = 1
Yes	34 (23)	13 (17)	21 (28)	
Ethnicity				0.538
Afro-Trinidadian	63 (42)	32 (43)	31 (41)	d.f. = 2
Indo-Trinidadian	78 (52)	37 (49)	41 (55)	
Other	9 (6)	6 (8)	3 (4)	
Religion				0.138
Non-Christian	85 (57)	38 (51)	47 (63)	d.f. = 1
Christian	65 (43)	37 (49)	28 (37)	
Diagnosis				1.000
Schizophrenia	96 (64)	48 (64)	48 (64)	d.f. = 1
Other	54 (36)	27 (36)	27 (36)	

Predictor Variables	N = 150 n (%)	N = 75 Cases n (%)	N = 75 Controls n (%)	p-Value
(ii) Primary Care Factors				
SMO Contact				0.675
No	122 (81)	62 (83)	60 (80)	d.f. = 1
Yes	28 (19)	13 (17)	15 (20)	
Registrar Contact				0.123
No	125 (83)	59 (79)	66 (88)	d.f. = 1
Yes	25 (17)	16 (21)	9 (12)	
House Officer Contact				0.238
No	7 (5)	2 (3)	5 (7)	d.f. = 1
Yes	143 (95)	73 (97)	70 (93)	
Support Staff Contact -				
MHO Contact				0.869
No	63 (42)	32 (43)	31 (41)	d.f. = 1
Yes	87 (58)	43 (57)	44 (54)	
PSW Contact				0.002
No	132 (88)	60 (80)	72 (96)	d.f. = 1
Yes	18 (12)	15 (20)	3 (4)	
Home Visits				0.593
No	45 (30)	21 (28)	24 (32)	d.f. = 1
Yes	105 (70)	54 (72)	51 (68)	
Availability of				0.186
Medications				d.f. = 1
No	64 (43)	28 (37)	36 (48)	
Yes	86 (57)	47 (63)	39 (52)	

Predictor Variables	N = 150 n (%)	N = 75 Cases n (%)	N = 75 Controls n (%)	p-Value
Compliance on Medication				0.018
No	94 (63)	54 (72)	40 (53)	d.f. = 1
Yes	56 (37)	21 (28)	25 (33)	
Clinic Interval				0.000
> 3 months	38 (25)	32 (43)	6 (8)	d.f. = 1
< 3 months	112 (75)	43 (57)	69 (92)	
(iii) Socioeconomic Status (SES)				
Education				0.327
Primary and below	74 (49)	34 (45)	40 (53)	d.f. = 1
Secondary and above	76 (51)	41 (55)	35 (47)	
Financial Status				0.601
Family /Self Support	49 (33)	23 (31)	26 (35)	d.f. = 1
Government assisted	101 (67)	52 (69)	49 (65)	
Shelter				1.000
Nil	4 (3)	2 (3)	2 (3)	d.f. = 1
Sheltered	146 (97)	73 (97)	73 (97)	
Electricity				0.814
No	21 (14)	11 (15)	10 (13)	d.f. = 1
Yes	129 (86)	64 (85)	65 (87)	
Potable Water				0.535
No	29 (19)	13 (17)	16 (21)	d.f. = 1
Yes	121 (81)	62 (83)	59 (79)	

Predictor Variables	N = 150 n (%)	N = 75 Cases n (%)	N = 75 Controls n (%)	p-Value
Support				0.497
No	23 (15)	13 (17)	10 (13)	d.f. = 1
Yes	127 (85)	62 (83)	65 (87)	
(iv) Substance Use / Abuse				
Cigarettes				0.222
No	101 (67)	47 (63)	54 (72)	d.f. = 1
Yes	49 (33)	28 (37)	21 (28)	
Alcohol				0.217
No	103 (69)	48 (64)	55 (73)	d.f. = 1
Yes	47 (31)	27 (36)	20 (27)	
Marijuana				0.018
No	116 (77)	52 (69)	55 (73)	d.f. = 1
Yes	34 (23)	27 (36)	20 (27)	
Cocaine				0.003
No	136 (91)	63 (84)	73 (97)	d.f. = 1
Yes	14 (9)	12 (16)	2 (3)	

Table 7: Analyses of 2x2 tables for Risk Factors

Risk Factor	Incidence Rate (IR)	Relative Risk (RR)	95% Confidence Interval (CI)	Chi-square (χ^2)	p-Value d.f. = 1	FET p- Value d.f. = 1
(i) Primary Care Factors						
SMO Contact						
No	0.51	1.09	0.68, 1.76	0.176	0.675	0.834
Yes	0.46					
Registrar Contact						
No	0.47	0.73	0.45, 1.17	1.379	0.123	0.188
Yes	0.64					
House Officer Contact						
No	0.29	0.57	0.11, 3.03	1.391	0.238	0.442
Yes	0.51					
Support Staff Contact						
MHO Contact						
No	0.51	1.00	0.56, 1.80	0.027	0.869	1.000
Yes	0.49					
PSW Contact						
No	0.45	0.55	0.34, 0.88	9.826	0.002	0.005
Yes	0.83					
Home Visits						
No	0.47	0.92	0.47, 1.79	0.286	0.593	0.722
Yes	0.51					
Availability of Medications						
No	0.44	0.80	0.44, 1.44	1.748	0.186	0.248
Yes	0.55					

Risk Factor	Incidence Rate (IR)	Relative Risk (RR)	95% Confidence Interval (CI)	Chi-square (χ^2)	p-Value d.f. = 1	FET p-Value d.f. = 1
Compliance on Medication						
No	0.57	1.50	0.89, 2.52	5.630	0.018	0.028
Yes	0.37					
Clinic Interval						
> 3 months	0.84	2.21	0.87, 5.59	25.622	0.000	0.000
< 3 months	0.38					
(ii) Socioeconomic Status (SES)						
Education						
Primary and below	0.46	0.85	0.49, 1.49	0.961	0.327	0.414
Secondary and below	0.54					
Financial Status						
Self/Family Support	0.47	0.92	0.48, 1.76	0.327	0.601	0.728
Government Assisted	0.51					
Shelter						
Nil	0.50	1.00	0.63, 1.58	0.000	1.000	1.000
Sheltered	0.50					
Electricity						
No	0.50	0.96	0.60, 1.53	0.055	0.814	1.000
Yes	0.52					
Potable Water						
No	0.51	1.13	0.96, 1.82	0.385	0.535	0.680
Yes	0.45					

Risk Factor	Incidence Rate (IR)	Relative Risk (RR)	95% Confidence Interval (CI)	Chi-square (χ^2)	p-Value d.f. = 1	FET p-Value d.f. = 1
Support						
No	0.57	1.16	0.47, 2.81	0.462	0.497	0.651
Yes	0.49					
(iii) Substance use/abuse						
Cigarettes						
No	0.57	1.21	0.63, 2.32	1.489	0.222	0.296
Yes	0.46					
Alcohol						
No	0.57	1.23	0.64, 2.38	1.523	0.217	0.291
Yes	0.46					
Marijuana						
No	0.68	1.51	0.68, 3.31	5.572	0.018	0.031
Yes	0.45					
Cocaine						
No	0.86	1.87	0.40, 8.64	8.661	0.003	0.009
Yes	0.46					

One hundred and fifty completed questionnaires were received then coded and the data entered on excel spreadsheet. This data was then cleaned-up and imported to the Minitab 14 statistical program worksheet for relative risk calculation and chi-square (χ^2) analysis including Fisher's exact test (FET).

The relative risks calculated ranged from 0.55 to 2.21.

Chi-square analysis revealed no significant differences at 95% confidence interval for demographic variables of clinic attended, age, gender, marital status, religion and ethnicity ($p > 0.05$).

However, significant differences at 95% CI were found for the patients having support service of the PSW ($p = 0.002$) patients who were non-compliant on medications ($p = 0.018$), patients given clinic appointments over three months ($p = 0.000$), patients who use marijuana ($p = 0.018$) and those who use cocaine ($p = 0.003$).

Table 6 provides predictor variables including demographic data.

Table 7 of provides 2 x 2 tables, relative risks and chi-square analysis of the data.

At the sample size of 75 and $\alpha = 0.05$, $\beta = 0.20$ and power = 80%, the effect size for all predictor variables ranged between 0.17 to 0.21 as calculated using the Minitab 14

statistical program. This was done by input of P_2 , which is the higher incidence rate (IR) from Table 7, sample size = 75 and power = .80. The Minitab output gave detectable P_1 values and effect sizes were obtained from Effect Size (Δ) = $P_2 - P_1$.

Appendix VII provides the Minitab printouts for calculations and statistical analyses.

Appendix VIII provides pie-charts showing the distribution of patients by marital status, ethnicity, education, financial status, availability of medication and substance use/abuse.

Discussion

This paper examined factors within the community and community mental health service which were thought to be causative factors for acute psychiatric admissions to the psychiatric unit of SFGH. Most of the admissions to the psychiatric unit comes from the out-patient clinic therefore by examination of the factors within the community mental health service some meaningful explanation for the high admission rate to hospital was expected to be achieved.

These factors were examined by means of a nested case-control study, a sub-type of a cohort study. A consecutive sampling of acute admissions to the psychiatric unit was done from the cohort of the Sector IV psychiatric patients catchment. The predictors of acute psychiatric admissions were not totally and successfully determined, most likely due to the small sample size.

This paper illustrates the large mental health burden facing the population. There is the need to have an equitable utilization of the mental health service both at the primary and tertiary care levels. By so doing, the effectiveness and efficiency of mental health care can be optimized.

The rates of admissions were found to be higher from the larger clinics namely San Fernando and Princes Town and lower from the smaller clinics. See Figure 2. This is in

keeping with the fact that higher the throughput of patients the higher will be the admission rates.

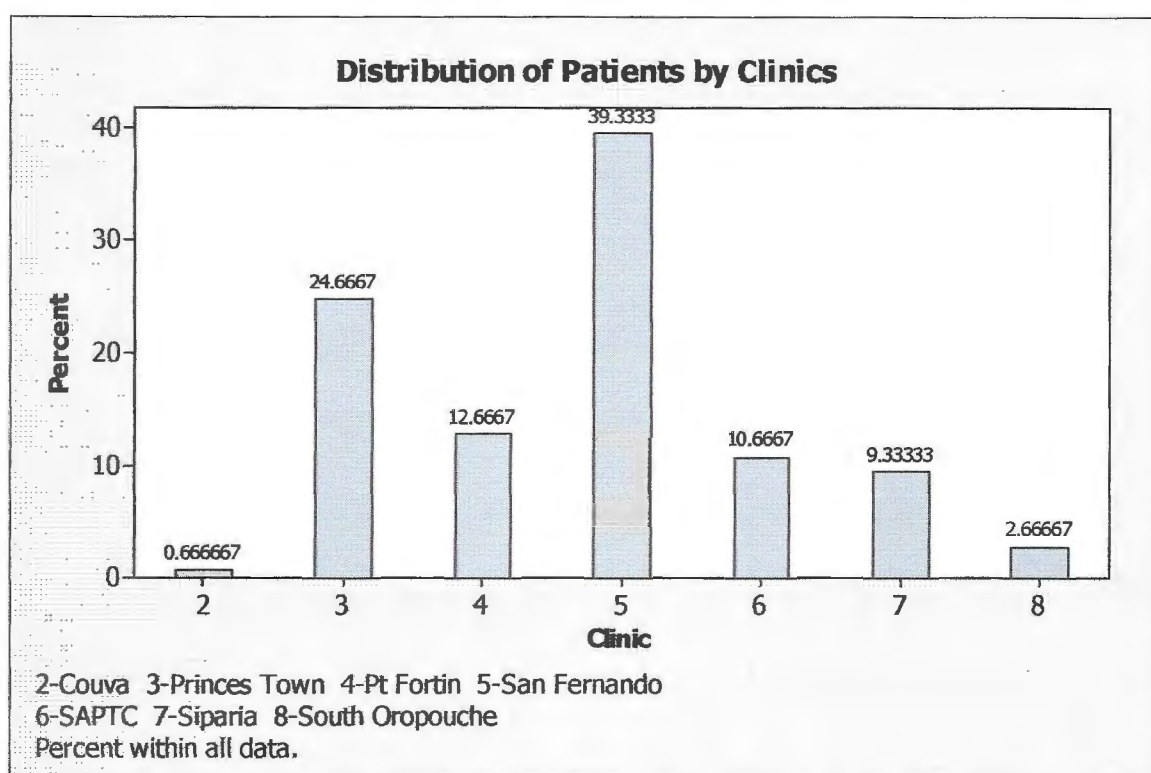


Figure 3: Distribution of Patients by Clinics

The admission of 40-49 year old patients was found to be highest. See Figure 3. This may be related to the predominance (64%) of schizophrenic patients. See Figure 4. It could also mean that more late onset schizophrenia which occurs from 40 years old is predominant. In a Jamaican study, schizophrenia and the affective disorders accounted for 70% of all admissions and 50% of out patients (Hickling, 1975).

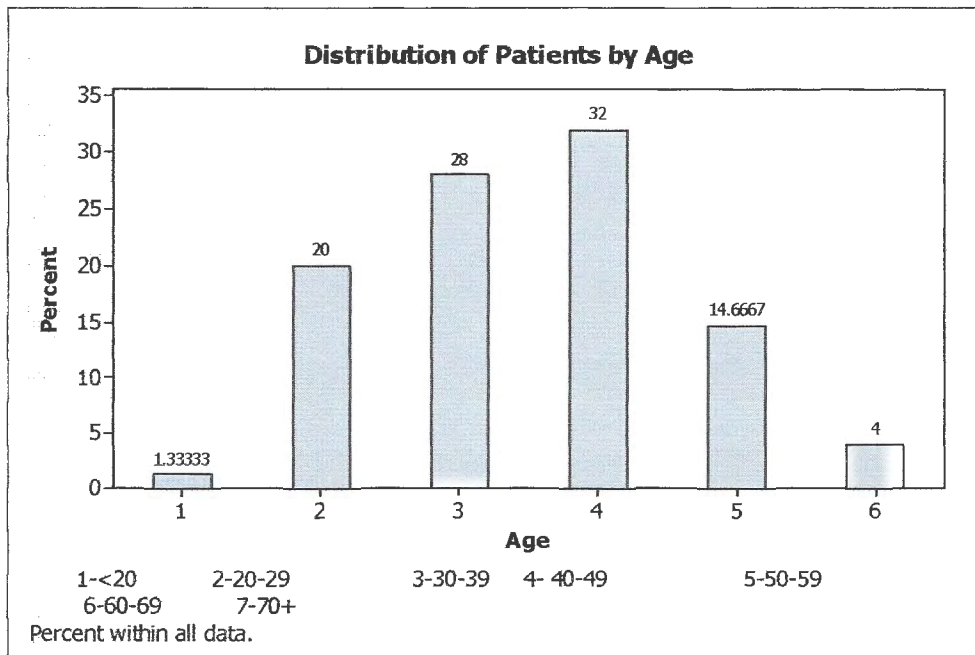


Figure 4: Distribution of Patients by Age

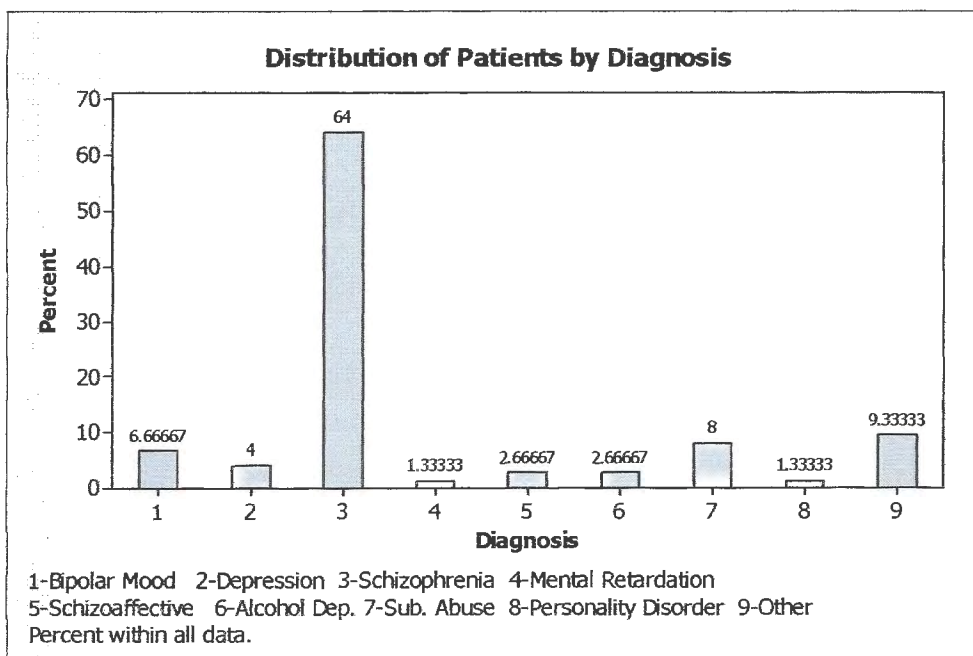


Figure 5: Distribution of Patients by Diagnosis

The male gender was found to be slightly more at risk for admission than females, 57% compared to 43% respectively. In an American study done, it was found that there was a predominance of male schizophrenic subjects for early rehospitalization (Olfson et al, 1999). This probably is due to the male being more exposed to environmental factors such as high risk behaviour and drug use.

Most of the patients (77%) were single. Is it that mental illness results in the inability to get a mate or that being single is a risk factor for mental illness? Very likely, mental illness is considered taboo and lessens the chance of a mentally ill person getting and keeping a mate. Rehospitalised schizophrenic patients were predominately persons who had never married (Olfson et al, 1999).

The Indo-Trinidadian population was found to be at slightly greater risk of admission than the Afro-Trinidadian population. Since men of East Indian descent in Trinidad tend to abuse alcohol (Reid et al, 2004), this may be the cause of their predominance in admissions.

It was found that there were no statistically significant differences ($p > 0.05$) at 95% confidence interval for demographic variables of clinic attended, age, gender, marital status, religion, diagnosis and ethnicity. However, statistically significant differences ($p < 0.05$) were found for acute admission rates associated with primary care factors and substance use/abuse. The primary care factors found were support staff contact namely PSW contact, non-compliance with medication and long (> 3 months) clinic intervals

between appointments. The use/abuse of marijuana and cocaine were also found to be associated with acute psychiatric admissions.

The primary care factor of PSW contact is interesting in that the relative risk of admission is decreased by not seeing the PSW relative risk = 0.55 (95% CI .34 to .88) ($p = 0.002$). At the clinic, the PSW saw 12% of patients sampled and did not see 88%.

See Figure 5.

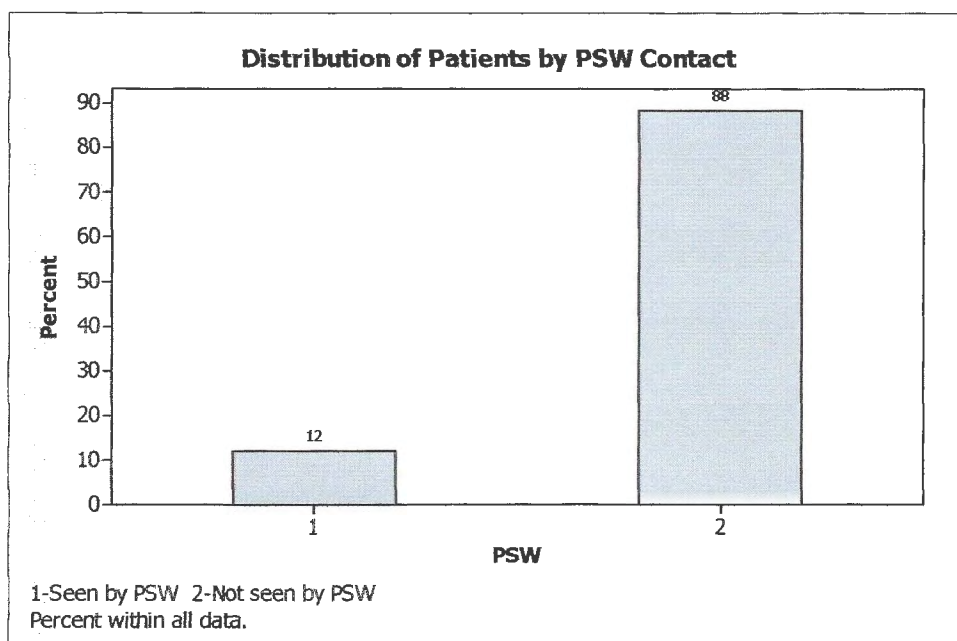


Figure 6: Distribution of patients by PSW Contact.

For a patient to see the PSW, he/she has to be referred by the medical staff at the clinic if the doctor sees a need for support intervention by the PSW. It means that social factor(s) is/are recognised as important with respect to the care and well being of the patient. Therefore, when a patient has to see the PSW it implies that there is/are social factor(s)

that need(s) to be aggressively addressed in order to curtail the potential acute admission of the patient. Social factors were found to contribute to 38.9% of admissions (Kent et al, 1994). PSW support intervention needs to be more effective in resolving whatever social factor(s) that is/are impacting negatively on the patients.

Availability of medication was not a significant factor for acute psychiatric admissions. However, the non-compliance with medications by the patients was found to be associated with admissions ($p = 0.018$). This is a well known reason for relapse (Carpenter et al, 1985). Measures need to be taken to ensure compliance with medication. Education of patients as to the need and importance of medication compliance is one way of dealing with this factor. Only 37% of patients were compliant with medication. See figure 6.

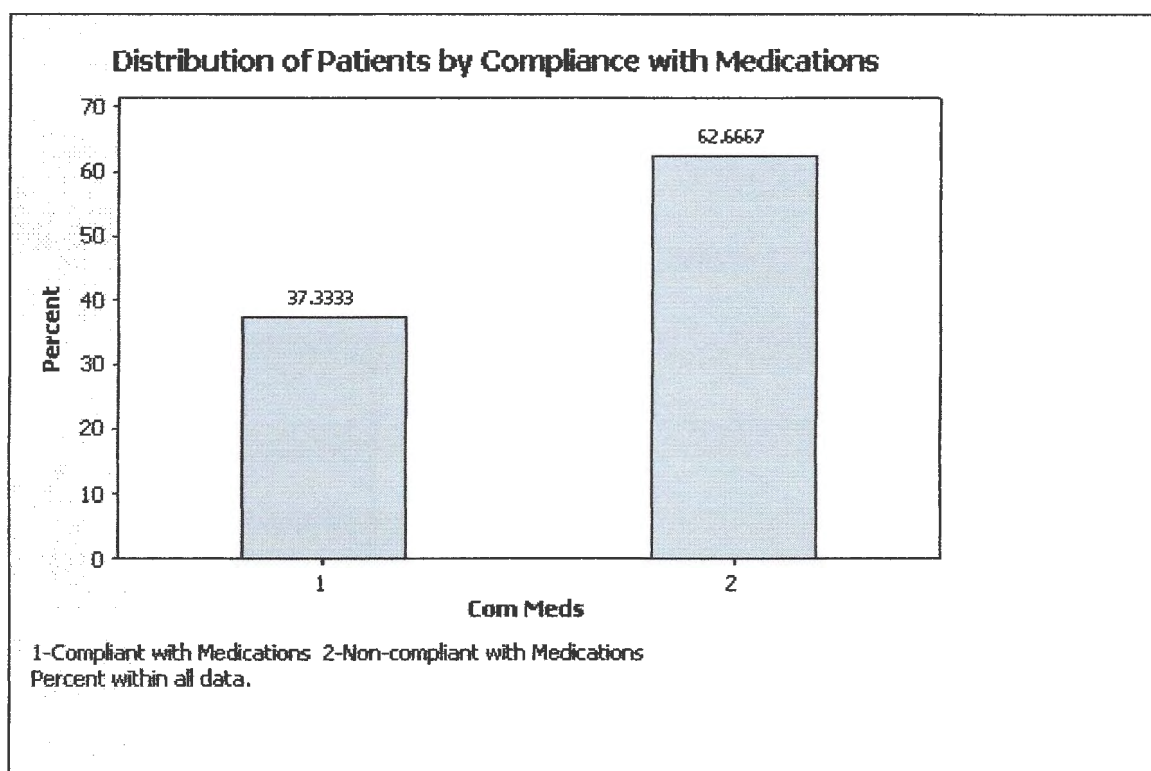


Figure 7: Distribution of Patients by Compliance with Medication

Long clinic intervals (≥ 3 months) was found to be a significant factor ($p = 0.000$) hospital admissions. Long clinic intervals may be due to the patient given a long appointment or that the patient was non-compliant with an earlier appointment. Figure 7 shows the distribution of patients by clinic interval. Non compliance with out-patient follow-up is a strong predictor of readmission (Nelson et al, 2000). Patients who are not seen at the clinic for long intervals may become deluded that they are well and do not need medications or follow-up care. The result of such a delusion can be an acute admission.

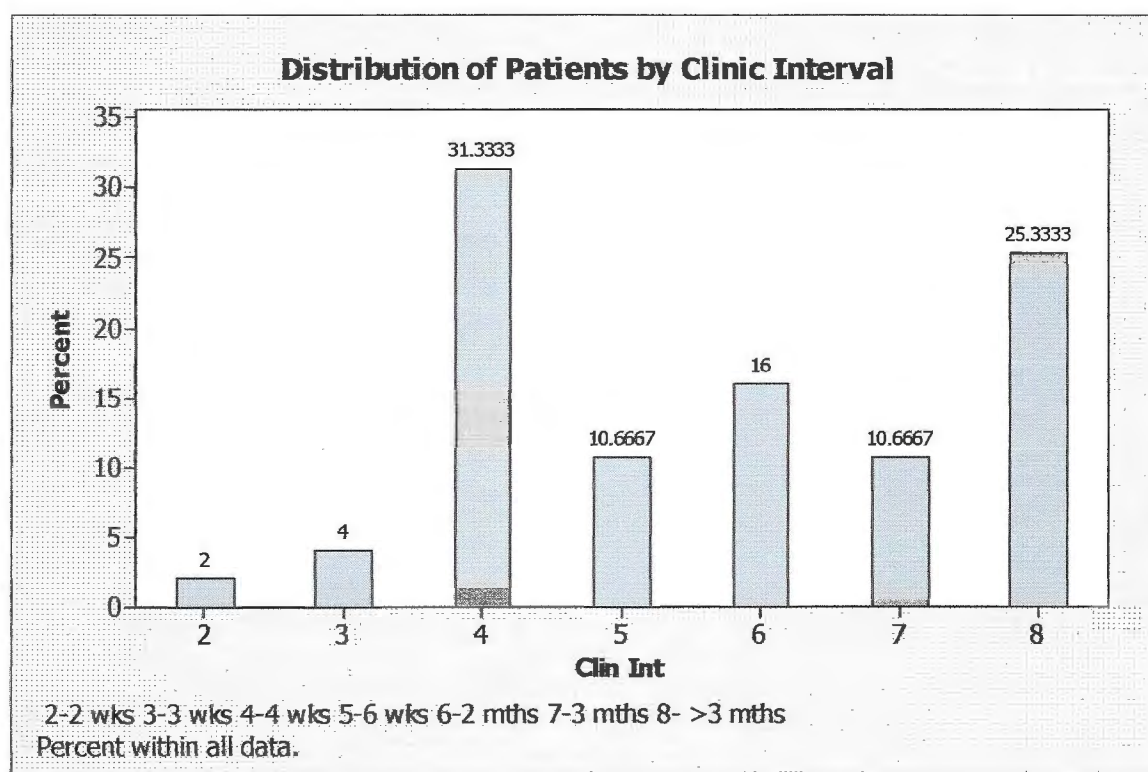


Figure 8: Distribution of Patients by Clinic Interval

Patients need to be given early appointments – less than 3 months and if they are non-compliant with their appointment, they should be encouraged back to clinic by way of home visits very early to avoid delay of > 3 months. The setting up of more clinic sessions to facilitate more contact with patients at clinic is another means of avoiding long intervals between appointments.

Substance abuse is a well established precipitant of mental illness and frequent rehospitalization. Substance abuse contributed 9.7% to rehospitalization in an Australian Study (Kent et al, 1994). A study of first admissions to the psychiatric unit, SFGH showed a high rate of utilization of the unit by substance abusing presents, especially young males (Reid et al, 2004).

Issues surrounding drug and alcohol abuse among heavy users of services must be actively addressed.

In this study, marijuana was significant ($p = 0.018$) and cocaine was also quite significant ($p = 0.003$). Figures 8 and 9 show the distribution of patients by use/abuse of these drugs.

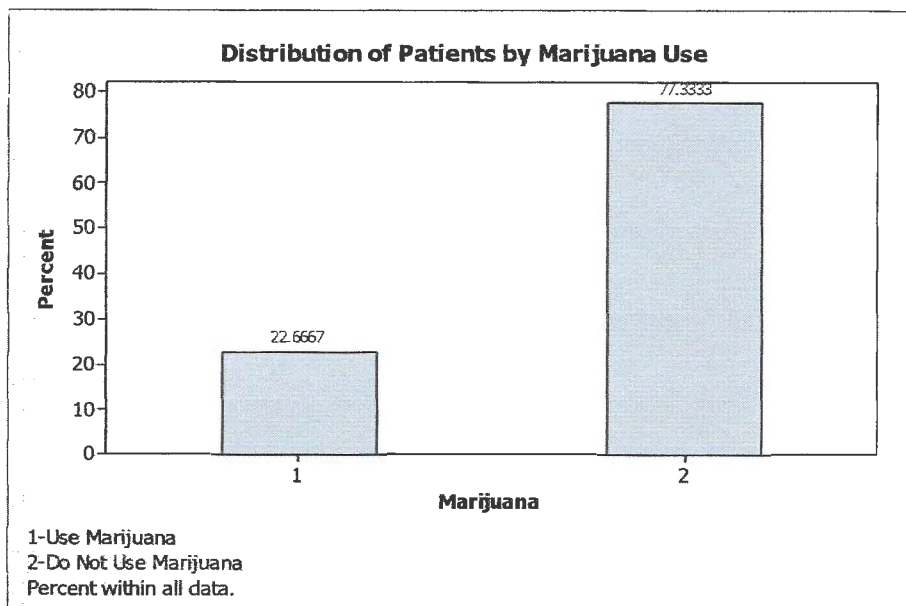


Figure 9: Distribution of Patients by Marijuana use.

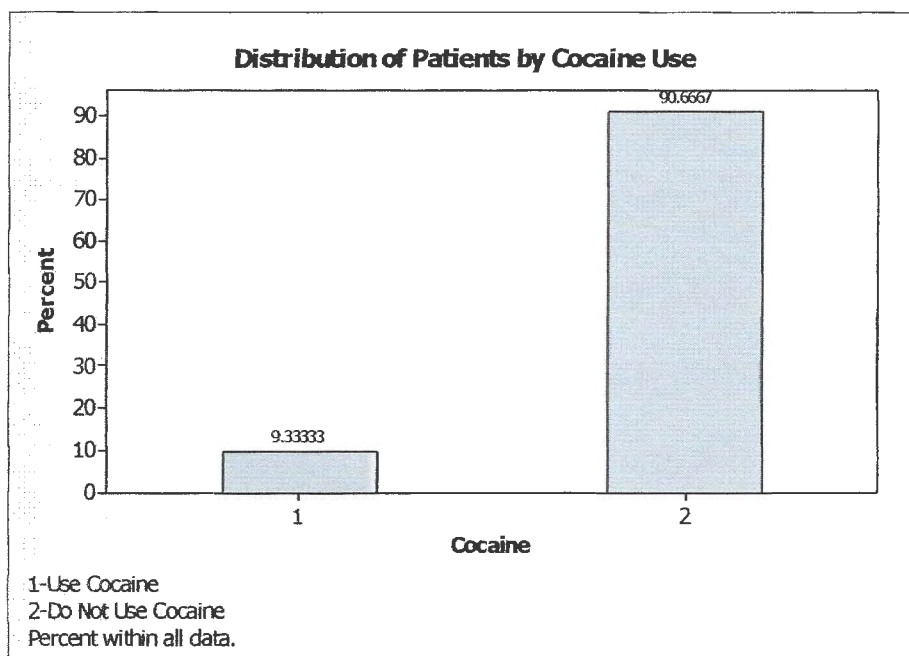


Figure 10: Distribution of Patients by Cocaine use.

Random drug and alcohol testing of patients should be introduced at clinics in order to more objectively detect substance use/abuse. Those patients who are so detected should be treated both at the psychiatric as well as the substance abuse clinic.

Can we believe the results of this study? The sample size was limited by the time available for sample collection and the time frame to submit this report. The chi-square testing was able to detect only one statistically significant factor with $p < 0.05$ and confidence interval not including Relative Risk = 1. The other factors with $p < 0.05$ had confidence intervals which included Relative Risk = 1 and therefore lacked surety. It is anticipated that data collection will continue and thereby obtain a larger and better sample size. Sample size calculation for a smaller effect size of 10% and $\alpha = 0.05$, $\beta = 0.2$ or power = 80% yields a sample size of 305 per group. Such a sample size will be aimed at in the continuation of this study.

What can we do with such information? With risk factors for admissions clearly identified, one will be in a better position to focus attention on reduction or elimination of such factors. Measures considered to be embarked upon at the primary care level may then be evaluated by means of audits prior and post implementation of these measures. An iterative loop may be set up to adjust and evaluate these measures to eventually relieve or lift the burden of high admission rates of psychiatric out-patients to the psychiatric unit SFGH.

References

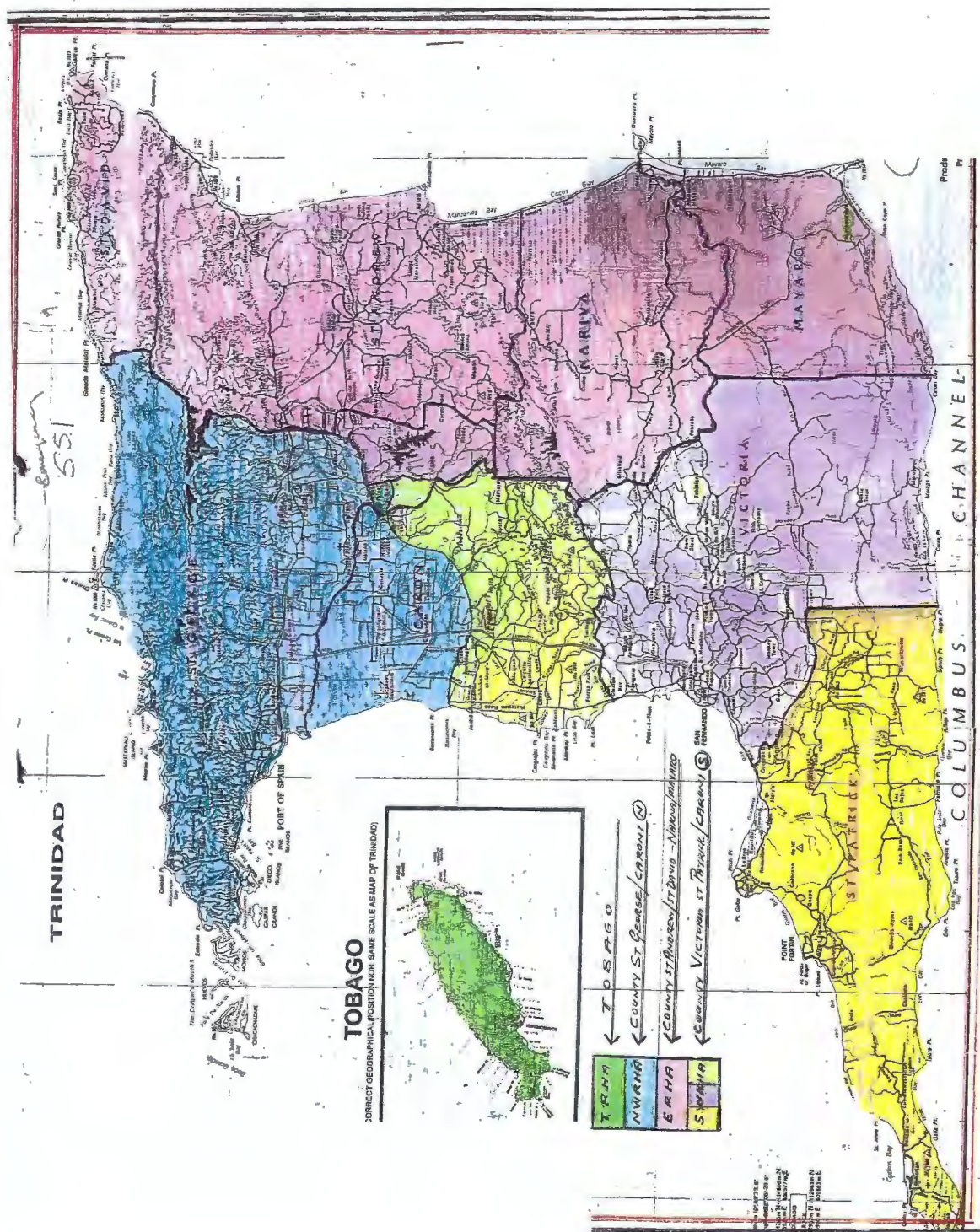
1. Haywood TW, Kravitz HM, Grossman LS, et al. Predicting the “revolving door” phenomeon among patients with schizophrenic, schizoaffective, and affective disorders. *Am J Psychiatry* 1995; **152** : 856-861.
2. Nelson EA, Maruish ME, Axler JL. Effects of discharge planning and compliance with outpatient appointments on readmission rates. *Psychiatry Serv* 2000; **51** : 885-889
3. Kent S, Yellowlees P. Psychiatric and Social reasons for frequent rehospitalization. *Hosp community psychiatry* 1994; **45** (4) : 347-50
4. Carpenter MD, Mulligan JC, Bader 1A, Meinzer, AE, Multiple admissions to an urban psychiatric centre: a comparative study. *Hosp community psychiatry* 1985; **36** (12) : 1305-8
5. Hickling FW. Psychiatric care in a general hospital unit in Jamaica. *West Indian Med J* 1975; **XXIV** : 67-75
6. Hickling FW, McCallum M, Nooks L, Rogers-Johnson P. Outcome of first contact schizophrenia in Jamaica. *West Indian Med. J.* 2001; **50** (3) : 194-97
7. Bhugra D, Hilwig M, Hossein B et al. First-contact incidence rates of schizophrenia and one year follow-up. *Br J Psychiat* 1996; **169** : 157-92
8. Lin KM, Kleinman AM. Psychopathology and clinical course of schizophrenia: a cross-cultural perspective. *Schizophr Bull* 1988; **14** : 555-67

9. Sanguineti VR, Samuel SE, Schawartz SL, Robeson MR. Retrospective study of 2,200 involuntary Psychiatric admissions and readmissions. *Am J Psychiatry* 1996; **153** : 392-97
10. Brady K, Casto S, Lydiard RB, Arana G. Substance abuse in an inpatient psychiatric sample. *Am J Drug Alcohol Abuse* 1991; **17** : 389-97
11. de Lima MS, Lorea CF, Carpena MP. Dual diagnosis on "Substance abuse". *Subst Use Misuse* 2002; **37** : 1179-84
12. Toner BB, Shugar G, Campbell B, Di Gasbarro I. Pattern of Substance abuse in psychiatric inpatients. *Can J Psychiatry* 1991; **36** : 381-3
13. Reid SD, Ramcharan C, Ghany K. Substance abuse among first admissions to the psychiatric unit of a general hospital in Trinidad. *West Indian Med J* 2004; **53** (2) : 95-98
14. Ernster VL. Nested Case-Control Studies. *pmed* 1994; **23** (5) : 587-590
15. Szklo M, Nieto FJ. *Epidemiology: beyond the basics*, Gaithersburg, MD: Aspen, 2000 : 33-38
16. Cummings SR, Newman TB, Hulley SB. Designing an observational study: Cohort studies. In: Hulley SB, Cummings SR, Browner WS et al editors. *Designing Clinical Research*. Philadelphia: Lippincott Williams and Wilkins; 2001 p. 99-101
17. Bernard Lo. Addressing Ethical Issues. In: Hulley SB, Cummings SR, Browner WS et al, editors. *Designing Clinical Research*. Philadelphia: Lippincott Williams and Wilkins; 2001 p. 215-16

18. Browner WS, Newman TB, Cummings SR, Hulley SB. Estimating sample size and power: The Nitty-Gritty. In: Hulley SB, Cummings SR, Browner WS et al, editors. *Designing Clinical Research*. Philadelphia: Lippincott Williams and Wilkins; p 65, p 73-4, p 87
19. Dr. Julie Simpson Relative Risk. In: *Introductory Statistics 2006*. Lecture 9. www.publichealth.vic.edu.au ; p 3,4.

APPENDIX I

The map overleaf shows the divisions of Trinidad and Tobago into the Regional Health Authorities (RHAs). The SWRHA is equivalent to Sector IV for psychiatric care coverage and comprises counties St. Patrick, Victoria and Southern Caroni.



APPENDIX II

THE QUESTIONNAIRE**I.D NO.:** ☐☐☐☐**1. CASE:** ☐ **2. CONTROL:** ☐**DATE:** ____/____/____

CLINIC:

1. Cedros	☐	5. San Fernando	☐
2. Couva	☐	6. SAPTC	☐
3. Princes Town	☐	7. Siparia	☐
4. Pt. Fortin	☐	8. South Oropouche	☐

SEX:

1. Male	☐	2. Female	☐
---------	--------------------------	-----------	--------------------------

MARITAL STATUS:

1. Married	☐	3. Single	☐	5. Visiting	☐	7. Common Law	☐
2. Separated	☐	4. Divorced	☐	6. Widowed	☐		

AGE:	1. < 20	☐	ETHNICITY:	1. Afro Trinidadian	☐
	2. 20 – 29	☐		2. Indo Trinidadian	☐
	3. 30 – 39	☐		3. Chinese	☐
	4. 40 – 49	☐		4. White	☐
	5. 50 – 59	☐		5. Mixed	☐
	6. 60 – 69	☐		6. Other	☐
	7. 70 +	☐			

RELIGION:

1. Anglican	☐	4. Muslim	☐	7. SDA	☐
2. Baptist	☐	5. Presbyterian	☐	8. Other	☐
3. Hindu	☐	6. Roman Catholic	☐		

DIAGNOSIS:

1. Bipolar Mood Disorder	☐	5. Schizoaffective Disorder	☐
2. Depression	☐	6. Alcohol Dependence	☐
3. Schizophrenia	☐	7. Substance Abuse	☐
4. Mental Retardation	☐	8. Personality Disorder	☐
		9. Other	☐

STAFF CONTACT: Medical and Support Staff

Medical Staff

Who was this patient seen by over the past three clinic visits, and how many times?

- | | | | |
|------------------|--------------------------|-----------------|--------------------------|
| 1. SMO | ☐ | How many times? | ☐ |
| 2. Registrar | ☐ | How many times? | ☐ |
| 3. House Officer | ☐ | How many times? | ☐ |
| 4. Intern | ☐ | How many times? | ☐ |

Support Staff

- | | | | |
|---------------|--------------------------|-----------------|--------------------------|
| 5. MHO / SARO | ☐ | How many times? | ☐ |
| 6. PSW | ☐ | How many times? | ☐ |

SOCIOECONOMIC STATUS AND SUPPORT FACTORS:

Education Level

- | | | | |
|-----------------|--------------------------|-------------------------|--------------------------|
| 1. Nil | ☐ | 4. Secondary | ☐ |
| 2. Primary | ☐ | 5. Technical/Vocational | ☐ |
| 3. Post Primary | ☐ | 6. Tertiary | ☐ |
| | | 7. Postgraduate | ☐ |

**Monthly Finance
available for care
of Patient**

- | | | | | |
|----------|--------------|--------------------------|----------------------|--------------------------|
| Dollars: | 1. < 500 | ☐ | 7. 3000 - 3999 | ☐ |
| | 2. 500-999 | ☐ | 8. 4000 - 4999 | ☐ |
| | 3. 1000-1999 | ☐ | 9. 5000 - 5999 | ☐ |
| | 4. 1500-1999 | ☐ | 10. 6000 - | ☐ |
| | 5. 2000-2499 | ☐ | 11. Public | |
| | 6. 2500-2999 | ☐ | Assistance Only | ☐ |
| | | | 12. Disability Grant | |
| | | | Only | ☐ |

Shelter

- | | | | | | |
|-------------------|--------------------------|--------------------|--------------------------|-------------|--------------------------|
| 1. Nil | ☐ | 7. < 2 bedrooms | ☐ | 13. Toilet | ☐ |
| 2. Squatting | ☐ | 8. > 2 bedrooms | ☐ | 14. Latrine | ☐ |
| 3. Rents House | ☐ | 9. Electricity | ☐ | | |
| 4. Owns/Fam House | ☐ | 10. No Electricity | ☐ | | |
| 5. Wooden House | ☐ | 11. Running Water | ☐ | | |
| 6. Concrete House | ☐ | 12. No Water | ☐ | | |

Support

- | | | | |
|------------------------|--------------------------|-------------------------|--------------------------|
| 1. Lives alone | ☐ | 5. Lives with relative | ☐ |
| 2. Lives with family | ☐ | 6. Lives with caregiver | ☐ |
| 3. Lives with spouse | ☐ | 7. Lives in hospice | ☐ |
| 4. Lives with children | ☐ | | |

Transport

- | | | | |
|---------------------|--------------------------|-------------------|--------------------------|
| 1. Nil | ☐ | 4. Owns Car | ☐ |
| 2. Public Transport | ☐ | 5. Relative's Car | ☐ |
| 3. Bicycle | ☐ | | |

HOME VISITS:

When was the last home visit made?

- | | |
|------------|--------------------------|
| 1. Days | ☐ |
| 2. Weeks | ☐ |
| 3. Months | ☐ |
| 4. Year(s) | ☐ |

AVAILABILITY**OF MEDICATION:** From the pharmacy records, did this patient receive all the medications prescribed?

- | | | | |
|--------|--------------------------|-------|--------------------------|
| 1. Yes | ☐ | 2. No | ☐ |
|--------|--------------------------|-------|--------------------------|

COMPLIANCE**ON MEDICATION:** From a pill count and / or record of depot injections, is this patient compliant on medication?

- | | | | |
|--------|--------------------------|-------|--------------------------|
| 1. Yes | ☐ | 2. No | ☐ |
|--------|--------------------------|-------|--------------------------|

INTERVALS BETWEEN**CLINIC VISITS:** How long ago was this patient seen at clinic?

- | | | | |
|------------|--------------------------|---------------|--------------------------|
| 1. 1 week | ☐ | 5. 6 weeks | ☐ |
| 2. 2 weeks | ☐ | 6. 2 months | ☐ |
| 3. 3 weeks | ☐ | 7. 3 months | ☐ |
| 4. 4 weeks | ☐ | 8. > 3 months | ☐ |

ALCOHOL AND**SUBSTANCE ABUSE:** Does this patient use any of the following?

- | | | |
|------------|---------------------------------|--------------------------------|
| Cigarettes | 1. Yes ☐ | 2. No ☐ |
| Alcohol | 1. Yes ☐ | 2. No ☐ |
| Marijuana | 1. Yes ☐ | 2. No ☐ |
| Cocaine | 1. Yes ☐ | 2. No ☐ |
| Other | 1. Yes ☐ | 2. No ☐ |

APPENDIX III

CONSENT TO PARTICIPATE IN THIS RESEARCH STUDY

Title of Research Study: The factors within the community and community mental health service that contribute to hospital admissions of psychiatric out-patients.

Investigator: Dr. Mervyn E. Sinanan, Department of Family Medicine and Primary Care, University of the West Indies, St. Augustine.

Purpose and Background: This study is a requirement for the Doctor of Medicine (D.M.) in Family Medicine degree. It examines factors present in the community which may increase the risk of psychiatric out-patients being admitted to hospital from the out-patient clinics. The purpose of this research is to learn which patients are at risk of hospital admissions and thereby would allow measures to be taken to minimize hospital admissions of these patients.

Procedures: If I agree to participate, the following things will happen:

1. I will answer some questions about my primary psychiatric (psychiatric clinic) care, my compliance on medication (taking of medication), personal information concerning my standard of living and alcohol and drug use. This will take about 10 minutes.
2. My clinic notes will be checked to see which doctor and support staff saw me over my last 3 clinic visits and the intervals between my clinic appointments.
3. The pharmacy records will be consulted to see if all my medications were available to me.
4. A study report will be published eventually using data from myself and other psychiatric patients.

Benefits: There may be no direct benefit to me from participating (giving information) in the study. However, I may contribute towards the improvement of primary psychiatric care in the long term.

Risks: There is the risk of being embarrassed when giving sensitive information such as living conditions, financial status and alcohol and drug use. However, personnel taking the information will be non-judgmental and will be aware of this.

Alternatives: The management of psychiatric out-patients is standard and can be obtained without participating in the study.

Confidentiality: The results of this study will be processed by the investigator. All information obtained in this study will be considered confidential (safe) and used only for research purposes. My identity will be kept confidential insofar as the law allows.

Reimbursement: There will be no monetary (payment) benefit for participating in the study. However, the investigator will be very thankful and encourages participation for the possible long term benefit of improved primary psychiatric care that may be derived.

Questions: _____, the Research assistant, has discussed this information with me and offered to answer any questions. If I have further questions, I can contact him at _____ or Dr. Mervyn Sinanan, the investigator of the study at 681-2805.

Right to Refuse or Withdraw: My participation in the study is entirely voluntary, and I am free to refuse to take part or withdraw at any time without affecting or jeopardizing my future psychiatric care.

Consent: I agree to participate in this study. I have been given a copy of this form and had a chance to read it.

Signature:

Next of Kin/Patient

Date: ____ / ____ / ____

Signature of Investigator:

Dr Mervyn E. Sinanan

APPENDIX IV

**THE UNIVERSITY OF THE WEST INDIES**

ST AUGUSTINE, TRINIDAD AND TOBAGO, WEST INDIES

FACULTY OF MEDICAL SCIENCES**OFFICE OF THE DEAN**Telephone: (868) 645-2640 Fax: (868) 663-9836 e-mail: deanfms@fms.uwi.tt

Dean: Professor Phyllis Pitt-Miller C.M.T., M.B., Ch.B., D.A., F.R.C.A.

EC895: 11/11 - 05/06**January 26, 2006**

Dr. Mervyn Sinanan
C/o Family Medicine Unit
Faculty of Medical Sciences
The University of the West Indies

Dear Dr. Sinanan,

Re: Factors within the community and community mental health service that contribute to hospital admissions of psychiatric out-patients

At its meeting held on January 11th 2006, the Ethics Committee agreed as follows in respect of this proposal:

- a. Question 17 - A, Privacy issue should be addressed: where will the interview be conducted? Explain measures taken to maintain the subjects privacy.
- b. A trustworthy person is not enough to safeguard confidentiality. Measures taken to achieve this must be specified e.g. use of coded research numbers instead of identifiers. Use of a password protected computer which will be kept in supervisor's office. Identifiers should not being used when data is presented etc.
- c. Question 17 - C, where is the computer kept? For how long will the data be stored?

Sincerely

Professor Mohamed Omer
Chairman
Ethics Committee

Cc: ✓ Dr. R. Maharaj
Dr. C. Ramcharan

February 7, 2006

32 Irving Street
San Fernando

Professor Mohamed Omer
Chairman
Ethics Committee
University of the West Indies

Dear Professor Mohamed Omer,

Re: Factors within the community and community mental health service that contribute to hospital admissions of psychiatric out-patients.

In response to the Ethics Committee regarding Question 17 of the Ethics Committee Application, I wish to make the following amendments:

- a. The interview will be conducted in one or two parts. The first part may be done at the out-patient clinic and the second at the home of the patient or both may be done at the home of the patient depending on convenience. However, at either venue the patient and/or next-of-kin only will be seen in a private setting, preferably enclosed.
- b. Confidentiality will be safeguarded by means of using coded research numbers rather than names of patients and these codes will be presented as data. The computer to be used is password protected and will be kept at the investigator's home.
- c. As said above, the computer will be kept private and secured at the home of the investigator and for the duration of the study i.e. until June/July 2007

Sincerely

Dr Mervyn E. Sinanan

Cc: Dr R. Maharaj
Dr C. Ramcharan



THE UNIVERSITY OF THE WEST INDIES

ST AUGUSTINE, TRINIDAD AND TOBAGO, WEST INDIES

FACULTY OF MEDICAL SCIENCES

OFFICE OF THE DEAN

Telephone: (868) 645-2640 Fax: (868) 663-9836 e-mail: deanfms@fms.uwi.tt

Dean: Professor Phyllis Pitt-Miller C.M.T., M.B., Ch.B., D.A., F.R.C.A.

March 29, 2006

ECS95: 11/11 – 05/06

Dr. Mervyn Sinanan

C/o Family Medicine Unit

Faculty of Medical Sciences

The University of the West Indies

Dear Dr. Sinanan,

**Re: Factors within the community and community mental health service
that contribute to hospital admissions of psychiatric out-patients**

Thank you for the explanations given which go a long way to satisfying the ethical requirements required.

However, it is not usual for researchers to store such highly confidential and personal data at home. You are advised to seek your supervisors' help to store the data at an official location that shall meet the security requirements.

Sincerely

Professor Mohamed Omer

Chairman

Ethics Committee

Cc: Dr. R. Maharaj

April 10, 2006

32 Irving Street
San Fernando

Professor Mohamed Omer
Chairman
Ethics Committee
University of the West Indies
Faculty of Medical Sciences

Dear Professor Omer,

**Re: Factors within the community and community mental health service that
contribute to hospital admissions of psychiatric out-patients**

I wish to thank you for your advice regarding storage of research data. It was discussed with my supervisor—Dr Rohan Maharaj and it was agreed to have the data stored at the Family Medicine Unit.

Sincerely

Dr Mervyn E. Sinanan

Cc Dr R. Maharaj
Dr C. Ramcharan



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Dean: Professor Phyllis Pitt-Miller C.M.T., M.B., Ch.B., D.A., F.R.C.A.

May 22, 2006

ECS95: 11/11 - 05/06

Dr. Mervyn Sinanan

C/o Family Medicine Unit

Faculty of Medical Sciences

The University of the West Indies

Dear Dr. Sinanan,

**Re: Factors within the community and community mental health service
that contribute to hospital admissions of psychiatric out-patients**

I am pleased to inform you that I have approved your project captioned
above on behalf of the Ethics Committee.

Sincerely

Professor Mohamed Omer

Chairman

Ethics Committee

Cc: Dr. R. Maharaj
Dr. C. Ramcharan

32 Irving Street,
San Fernando

20th October. 2005

**To: Dr Austin Trinidad
Medical Chief of Staff
San Fernando General Hospital**

Re: RESEARCH FOR DM IN FAMILY MEDICINE

Dear Dr. Trinidad,

I wish to obtain permission to carry out research data collection from the psychiatric department beginning November 1st 2005.

Attached is a copy of the outline of research which has been sent for ethics review by the Ethics Committee General Hospital, San Fernando.

Thank you for your kind consideration.

Sincerely,

Dr. Mervyn Sinanan

c.c Ethics Committee SFGH

Dr. Rohan Maharaj

Dr. Celia Ramcharan



"Your Partners in Health"

SOUTH-WEST REGIONAL HEALTH AUTHORITY

*Healthview Avenue,
Paradise Pasture,
San Fernando,
Trinidad, West Indies*

January 5, 2006

Dr. Mervyn Sinanan
32 Irving Street
San Fernando

Dear Dr. Sinanan

Re: Research for DM in Family Medicine

Please be advised that the Clinical Governance and Ethics Committee has approved your request for conducting the study at San Fernando General Hospital to determine the factors within the community which contribute to the hospitalization of psychiatric patients.

This approval is subject to confirmation that the patients' permission would be sought both for research and publication. You did advise me verbally that permission would be requested, but I would appreciate your acknowledgement in writing.

My best wishes to you on a successful project. When completed, the South-West Regional Health Authority would appreciate a copy.

Sincerely

Your Partners in Health

Dr. Albert Persaud
Secretary
Clinical Governance & Ethics Committee

c: Dr. Austin Trinidad – Medical Chief of Staff, SFGH

AP/mw

January 15, 2006

#32 Irving Street
San Fernando

Dr Albert Persad
Secretary
Clinical Governance & Ethics Committee

Dear Dr Persad

Re : Reseach for DM in Family Medicine

Firstly, I wish to thank the Clinical Governance and Ethics Committee for a favourable response as regards conducting the DM research study at the General Hospital, San Fernando.

As discussed, permission would be sought both for research and publication.

I appreciate your best wishes on a successful project and on completion, the South-West Regional Health Authority would receive a copy.

Sincerely

Dr Mervyn E. Sinanan
B.Sc M.B.,B.S. Dip Fam. Med. M.Sc Fam. Med.

Cc Dr Rohan Maharaj
Dr Celia Ramcharan

APPENDIX V

Nandlal Beharry

6A Murlie Street, La Romaine. Phone 652 - 9281

Experience

2003 – 2005

Mental Health Officer.
Southwest Regional Health Authority.

1994–2003

Substance Abuse Rehabilitation Officer
Psychiatric Unit of the San Fernando General Hospital.

1978-1994

Nurse.
Psychiatric Unit of the San Fernando General Hospital.

1973-1978

Nurse
St Ann's Hospital
Participated in Post Basic Nursing Programme in Psychiatric Nursing.

1972-1973

Nurse
San Fernando General Hospital.

1969-1972

Student Nurse in General Nursing.

Education

1999-2000

CARIBBEAN REGIONAL CERTIFICATE IN ADDICTION STUDIES
Obtained from University of the West Indies, School of Continuing Studies.

1991

17th CARIAD CERTIFICATE OF ATTENDANCE
Obtained from the University of the Virgin Islands, Office of Community Services.

1984

NURSING IN COMMUNITY MENTAL HEALTH.
Certificate of Participation obtained from the Staff Development Department, Ministry of Health and Environment of Trinidad and Tobago.

1973

NURSING CERTIFICATES
Obtained from the San Fernando General Hospital and
Nursing Council of Trinidad and Tobago

APPENDIX VI

Operations Manual

The operations manual describes the method of conducting and recording the results of all measurements made in the study of factors within the community and community mental health service that contribute to hospital admission of psychiatric out-patients.

Protocol

A listing of acute admissions to the psychiatric unit SFGH will be obtained from the ward records of admissions.

All Sector IV patients will be selected and those who were admitted previously during the study will be rejected.

These patients will be located by the research assistant either at the ward, out-patient or at their homes.

Having located the patients, informed consent by patient and / or next of kin to participate in the study will be obtained. If the patient refuses, the patient will be rejected from the study.

Clinic notes of these patients will be consulted and those with clinic attendances of 3 or more prior to admission will be included as cases in the study.

For each case a control will be matched for age, sex and diagnosis and informed consent will be obtained before being included in the study. A control will be a patient who has been attending the clinic at least 3 times during the study but was not admitted.

Data will be obtained in the above manner from consecutive admissions to the SFGH. No name will be used in documenting data.

Data Entry

Questionnaires will be returned by the research assistant to the investigator. Using the codes from the questionnaire, data will be entered by the investigator on an Excel worksheet.

Data will be entered as follows:-

Index No.	Subjects	Q1	Q2	...	...	...	Q26

This data will then be imported into the Minitab 14 worksheet.

Data Clean-up

Data found to be in too narrow categories will be re-coded to facilitate dichotomous categorizing for 2x2 table presentation.

Data Analysis

The Minitab 14 Statistical Program will be used to analyse data in the 2x2 tables. Incidence Rates (IR), Relative Risk (RR), Chi-Square (χ^2) and Fisher's Exact Test (FET) will be done. 95% Confidence Intervals (CI) for RR will also be calculated.

APPENDIX VII

6/1/2006 7:33:29 PM

Welcome to Minitab, press F1 for help.

Results for: MINITAB RESEARCH DATA.MTW**Tally for Discrete Variables: Subjects, Clinic, Sex, M/Status, Age, ...**

Subjects	Count	Clinic	Count	Sex	Count	M/Status	Count	Age	Count
1	75	2	1	1	86	1	33	1	2
2	75	3	37	2	64	2	13	2	30
N=	150	4	19	N=	150	3	93	3	42
		5	59			4	2	4	48
		6	16			5	1	5	22
		7	14			6	7	6	6
		8	4			7	1	N=	150
		N=	150			N=	150		

EthnicGp	Count	Religion	Count	Diagnosis	Count	SMO	Count
1	63	1	7	1	10	1	28
2	78	2	5	2	6	2	122
3	1	3	33	3	96	N=	150
4	1	4	6	4	2		
5	7	5	12	5	4		
N=	150	6	29	6	4		
		7	12	7	12		
		8	46	8	2		
		N=	150	9	14		
				N=	150		

Reg	Count	HO	Count	MHO	Count	PSW	Count	Education	Count
1	25	1	143	1	87	1	18	1	74
2	125	2	7	2	63	2	132	2	76
N=	150	N=	150	N=	150	N=	150	N=	150

Finances	Count	Shelter	Count	Electricity	Count	Water	Count
1	49	1	146	1	129	1	121
3	101	2	4	2	21	2	29
N=	150	N=	150	N=	150	N=	150

Support	Count	H/Visits	Count	Av Meds	Count	Com Meds	Count	Clin Int	Count
1	23	1	45	1	86	1	56	2	3
2	92	2	105	2	64	2	94	3	6
3	12	N=	150	N=	150	N=	150	4	47
4	6							5	16
5	15							6	24
6	1							7	16
7	1							8	38
N=	150							N=	150

Cig	Count	Alc	Count	Marijuana	Count	Cocaine	Count
1	49	1	47	1	34	1	14
2	101	2	103	2	116	2	136
N=	150	N=	150	N=	150	N=	150

6/1/2006 7:38:00 PM

Tabulated statistics: SMO, Subjects

Rows: SMO Columns: Subjects

	1	2	All
1	13	15	28
2	62	60	122
All	75	75	150

Cell Contents: Count

Pearson Chi-Square = 0.176, DF = 1, P-Value = 0.675
Likelihood Ratio Chi-Square = 0.176, DF = 1, P-Value = 0.675

Fisher's exact test: P-Value = 0.834353

Tabulated statistics: Reg, Subjects

Rows: Reg Columns: Subjects

	1	2	All
1	16	9	25
2	59	66	125
All	75	75	150

Cell Contents: Count

Pearson Chi-Square = 2.352, DF = 1, P-Value = 0.125
Likelihood Ratio Chi-Square = 2.379, DF = 1, P-Value = 0.123

Fisher's exact test: P-Value = 0.187973

Tabulated statistics: HO, Subjects

Rows: HO Columns: Subjects

	1	2	All
1	73	70	143
2	2	5	7
All	75	75	150

Cell Contents: Count

Pearson Chi-Square = 1.349, DF = 1, P-Value = 0.246
Likelihood Ratio Chi-Square = 1.391, DF = 1, P-Value = 0.238

* NOTE * 2 cells with expected counts less than 5

Fisher's exact test: P-Value = 0.441887

Tabulated statistics: MHO, Subjects

Rows: MHO Columns: Subjects

	1	2	All
1	43	44	87
2	32	31	63
All	75	75	150

Cell Contents: Count

Pearson Chi-Square = 0.027, DF = 1, P-Value = 0.869
Likelihood Ratio Chi-Square = 0.027, DF = 1, P-Value = 0.869

Fisher's exact test: P-Value = 1

Tabulated statistics: PSW, Subjects

Rows: PSW Columns: Subjects

	1	2	All
1	15	3	18
2	60	72	132
All	75	75	150

Cell Contents: Count

Pearson Chi-Square = 9.091, DF = 1, P-Value = 0.003
Likelihood Ratio Chi-Square = 9.826, DF = 1, P-Value = 0.002

Fisher's exact test: P-Value = 0.0045113

Tabulated statistics: Electricity, Subjects

Rows: Electricity Columns: Subjects

	1	2	All
1	64	65	129
2	11	10	21
All	75	75	150

Cell Contents: Count

Pearson Chi-Square = 0.055, DF = 1, P-Value = 0.814
Likelihood Ratio Chi-Square = 0.055, DF = 1, P-Value = 0.814

Fisher's exact test: P-Value = 1

Tabulated statistics: Water, Subjects

Rows: Water Columns: Subjects

	1	2	All
1	62	59	121
2	13	16	29
All	75	75	150

Cell Contents: Count

Pearson Chi-Square = 0.385, DF = 1, P-Value = 0.535
Likelihood Ratio Chi-Square = 0.385, DF = 1, P-Value = 0.535

Fisher's exact test: P-Value = 0.679749

Tabulated statistics: Av Meds, Subjects

Rows: Av Meds Columns: Subjects

	1	2	All
1	47	39	86
2	28	36	64
All	75	75	150

Cell Contents: Count

Pearson Chi-Square = 1.744, DF = 1, P-Value = 0.187
Likelihood Ratio Chi-Square = 1.748, DF = 1, P-Value = 0.186

Fisher's exact test: P-Value = 0.247766

Tabulated statistics: Com Meds, Subjects

Rows: Com Meds Columns: Subjects

	1	2	All
1	21	35	56
2	54	40	94
All	75	75	150

Cell Contents: Count

Pearson Chi-Square = 5.585, DF = 1, P-Value = 0.018
Likelihood Ratio Chi-Square = 5.630, DF = 1, P-Value = 0.018

Fisher's exact test: P-Value = 0.0277758

Tabulated statistics: Cig, Subjects

Rows: Cig Columns: Subjects

	1	2	All
1	28	21	49
2	47	54	101
All	75	75	150

Cell Contents: Count

Pearson Chi-Square = 1.485, DF = 1, P-Value = 0.223
Likelihood Ratio Chi-Square = 1.489, DF = 1, P-Value = 0.222

Fisher's exact test: P-Value = 0.296204

Tabulated statistics: Alc, Subjects

Rows: Alc Columns: Subjects

	1	2	All
1	27	20	47
2	48	55	103
All	75	75	150

Cell Contents: Count

Pearson Chi-Square = 1.518, DF = 1, P-Value = 0.218
 Likelihood Ratio Chi-Square = 1.523, DF = 1, P-Value = 0.217

Fisher's exact test: P-Value = 0.290867

Tabulated statistics: Marijuana, Subjects

Rows: Marijuana Columns: Subjects

	1	2	All
1	23	11	34
2	52	64	116
All	75	75	150

Cell Contents: Count

Pearson Chi-Square = 5.477, DF = 1, P-Value = 0.019
 Likelihood Ratio Chi-Square = 5.572, DF = 1, P-Value = 0.018

Fisher's exact test: P-Value = 0.0309978

Tabulated statistics: Cocaine, Subjects

Rows: Cocaine Columns: Subjects

	1	2	All
1	12	2	14
2	63	73	136
All	75	75	150

Cell Contents: Count

Pearson Chi-Square = 7.878, DF = 1, P-Value = 0.005
 Likelihood Ratio Chi-Square = 8.661, DF = 1, P-Value = 0.003

Fisher's exact test: P-Value = 0.0092178

RR CI Calculations

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	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
	Cases	Controls	RR	Chi-square	lnRR	1.96SElnRR	c5+c6	c5_c6	RR1a	RR2a
1	62	60	1.09	0.176	0.086178	0.47794	0.56412	-0.39177	1.75780	0.675889
2	*	*	*	*	*	*	*	*	*	*
3	59	66	0.73	2.379	-0.314711	0.47514	0.16043	-0.78985	1.17400	0.453948
4	*	*	*	*	*	*	*	*	*	*
5	2	5	0.57	1.391	-0.562119	1.67080	1.10868	-2.23292	3.03000	0.107240
6	*	*	*	*	*	*	*	*	*	*
7	32	31	1.00	0.027	0.000000	0.58857	0.58857	-0.58857	1.80130	0.555154
8	*	*	*	*	*	*	*	*	*	*
9	60	72	0.55	9.826	-0.597837	0.46885	-0.12898	-1.06669	0.87900	0.344183
10	*	*	*	*	*	*	*	*	*	*
11	34	40	0.85	0.961	-0.162519	0.55810	0.39558	-0.72061	1.48518	0.486489
12	*	*	*	*	*	*	*	*	*	*
13	23	26	0.92	0.273	-0.083382	0.64593	0.56255	-0.72931	1.75503	0.482278
14	*	*	*	*	*	*	*	*	*	*
15	73	73	1.00	0.000	0.000000	0.45573	0.45573	-0.45573	1.57725	0.634013
16	*	*	*	*	*	*	*	*	*	*
17	64	65	0.96	0.055	-0.040822	0.47071	0.42989	-0.51153	1.53702	0.599607
18	*	*	*	*	*	*	*	*	*	*
19	62	59	1.13	0.385	0.122218	0.47908	0.60130	-0.35686	1.82437	0.699896
20	*	*	*	*	*	*	*	*	*	*
21	13	10	1.16	0.462	0.148420	0.88437	1.03279	-0.73595	2.80859	0.479087
22	*	*	*	*	*	*	*	*	*	*
23	21	24	0.92	0.286	-0.083382	0.66741	0.58403	-0.75080	1.79315	0.472027
24	*	*	*	*	*	*	*	*	*	*
25	28	36	0.80	1.748	-0.223144	0.58852	0.36537	-0.81166	1.44100	0.444157
26	*	*	*	*	*	*	*	*	*	*
27	54	40	1.50	5.630	0.405465	0.51925	0.92472	-0.11379	2.52092	0.892458
28	*	*	*	*	*	*	*	*	*	*
29	32	6	2.21	25.622	0.792993	0.92885	1.72184	-0.13586	5.59382	0.872981
30	*	*	*	*	*	*	*	*	*	*
31	28	21	1.21	1.489	0.190620	0.65006	0.84068	-0.45944	2.31774	0.631669
32	*	*	*	*	*	*	*	*	*	*
33	27	20	1.23	1.523	0.207014	0.66091	0.86793	-0.45390	2.38175	0.635178
34	*	*	*	*	*	*	*	*	*	*
35	23	11	1.51	5.572	0.412110	0.78658	1.19869	-0.37447	3.31535	0.687681
36	*	*	*	*	*	*	*	*	*	*
37	12	2	1.87	8.661	0.625938	1.53081	2.15675	-0.90487	8.64105	0.404632

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
	Risk Factor	Cases	Controls	Total	IR	RR	CI	Chi-square	p-Value	FET p-Value
1	SMO No	62	60	122	0.508197	1.09	0.68,1.76	0.176	0.675	0.83435
2	SMO Yes	13	15	28	0.464286	*		*	*	*
3	Reg No	59	66	125	0.472000	0.73	0.45,1.17	2.379	0.123	0.18797
4	Reg Yes	16	9	25	0.640000	*		*	*	*
5	HO No	2	5	7	0.285714	0.57	0.11,3.03	1.391	0.238	0.44189
6	HO Yes	73	70	143	0.510490	*		*	*	*
7	MHO No	32	31	63	0.507937	1.00	0.56,1.80	0.027	0.869	1.00000
8	MHO Yes	43	44	87	0.494253	*		*	*	*
9	PSW No	60	72	132	0.454545	0.55	0.34,0.88	9.826	0.002	0.00451
10	PSW Yes	15	3	18	0.833333	*		*	*	*
11	Edu 1	34	40	74	0.459459	0.85	0.49,1.49	0.961	0.327	0.41427
12	Edu 2	41	35	76	0.539474	*		*	*	*
13	Fin 1	23	26	49	0.469388	0.92	0.48,1.76	0.273	0.601	0.72791
14	Fin 3	52	49	101	0.514851	*		*	*	*
15	Shelter 1	73	73	146	0.500000	1.00	0.63,1.58	0.000	1.000	1.00000
16	Shelter 2	2	2	4	0.500000	*		*	*	*
17	EI 1	64	65	129	0.496124	0.96	0.60,1.53	0.055	0.814	1.00000
18	EI 2	11	10	21	0.523810	*		*	*	*
19	Water 1	62	59	121	0.512397	1.13	0.69,1.82	0.385	0.535	0.67975
20	Water 2	13	16	29	0.448276	*		*	*	*
21	Support 1	13	10	23	0.565217	1.16	0.47,2.81	0.462	0.497	0.65113
22	Support 2	62	65	127	0.488189	*		*	*	*
23	H/Visits No	21	24	45	0.466667	0.92	0.47,1.79	0.286	0.593	0.72182
24	H/Visits Yes	54	51	105	0.514286	*		*	*	*
25	Av Meds No	28	36	64	0.437500	0.80	0.44,1.44	1.748	0.186	0.24777
26	Av Meds Yes	47	39	86	0.546512	*		*	*	*
27	Com No	54	40	94	0.574468	1.50	0.89,2.52	5.630	0.018	0.02778
28	Com Yes	21	35	56	0.375000	*		*	*	*
29	Clin Int 1	32	6	38	0.842105	2.21	0.87,5.59	25.622	0.000	0.00000
30	Clin Int 2	43	69	112	0.383929	*		*	*	*
31	Cig Yes	28	21	49	0.571429	1.21	0.63,2.32	1.489	0.222	0.29620
32	Cig No	47	54	101	0.465347	*		*	*	*
33	Alc Yes	27	20	47	0.574468	1.23	0.64,2.38	1.523	0.217	0.29087
34	Alc No	48	55	103	0.466019	*		*	*	*
35	Marijuana Yes	23	11	34	0.676471	1.51	0.68,3.31	5.572	0.018	0.03100
36	Marijuana No	52	64	116	0.448276	*		*	*	*
37	Cocaine Yes	12	2	14	0.857143	1.87	0.40,8.64	8.661	0.003	0.00922
38	Cocaine No	63	73	136	0.463235					

6/1/2006 8:56:07 PM

Welcome to Minitab, press F1 for help.

Power and Sample Size

Power and Sample Size

Test for Two Proportions

Testing proportion 1 = proportion 2 (versus <)
Calculating power for proportion 2 = 0.51
Alpha = 0.05

Sample Size	Power	Proportion 1
75	0.8	0.311625

The sample size is for each group.

Power and Sample Size

Test for Two Proportions

Testing proportion 1 = proportion 2 (versus <)
Calculating power for proportion 2 = 0.64
Alpha = 0.05

Sample Size	Power	Proportion 1
75	0.8	0.439022

The sample size is for each group.

Power and Sample Size

Test for Two Proportions

Testing proportion 1 = proportion 2 (versus <)
Calculating power for proportion 2 = 0.83
Alpha = 0.05

Sample Size	Power	Proportion 1
75	0.8	0.653526

The sample size is for each group.

Power and Sample Size

Test for Two Proportions

Testing proportion 1 = proportion 2 (versus <)
Calculating power for proportion 2 = 0.54
Alpha = 0.05

Sample Size	Power	Proportion 1
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75 0.8 0.339852

The sample size is for each group.

Power and Sample Size

Test for Two Proportions

Testing proportion 1 = proportion 2 (versus <)
Calculating power for proportion 2 = 0.5
Alpha = 0.05

Sample			
	Size	Power	Proportion 1
	75	0.8	0.302368

The sample size is for each group.

Power and Sample Size

Test for Two Proportions

Testing proportion 1 = proportion 2 (versus <)
Calculating power for proportion 2 = 0.52
Alpha = 0.05

Sample			
	Size	Power	Proportion 1
	75	0.8	0.320957

The sample size is for each group.

Power and Sample Size

Test for Two Proportions

Testing proportion 1 = proportion 2 (versus <)
Calculating power for proportion 2 = 0.57
Alpha = 0.05

Sample			
	Size	Power	Proportion 1
	75	0.8	0.368770

The sample size is for each group.

Power and Sample Size

Test for Two Proportions

Testing proportion 1 = proportion 2 (versus <)
Calculating power for proportion 2 = 0.55
Alpha = 0.05

Sample			
	Size	Power	Proportion 1
	75	0.8	0.349414

The sample size is for each group.

Power and Sample Size

Test for Two Proportions

Testing proportion 1 = proportion 2 (versus <)
 Calculating power for proportion 2 = 0.84
 Alpha = 0.05

Sample Size	Power	Proportion 1
75	0.8	0.666120

The sample size is for each group.

Power and Sample Size

Test for Two Proportions

Testing proportion 1 = proportion 2 (versus <)
 Calculating power for proportion 2 = 0.67
 Alpha = 0.05

Sample Size	Power	Proportion 1
75	0.8	0.470388

The sample size is for each group.

Power and Sample Size

Test for Two Proportions

Testing proportion 1 = proportion 2 (versus <)
 Calculating power for proportion 2 = 0.68
 Alpha = 0.05

Sample Size	Power	Proportion 1
75	0.8	0.481022

The sample size is for each group.

Power and Sample Size

Test for Two Proportions

Testing proportion 1 = proportion 2 (versus <)
 Calculating power for proportion 2 = 0.6
 Alpha = 0.05

Proportion 1	Sample Size	Target Power	Actual Power
0.5	305	0.8	0.800013

The sample size is for each group.

Power and Sample Size

Test for Two Proportions

Testing proportion 1 = proportion 2 (versus <)

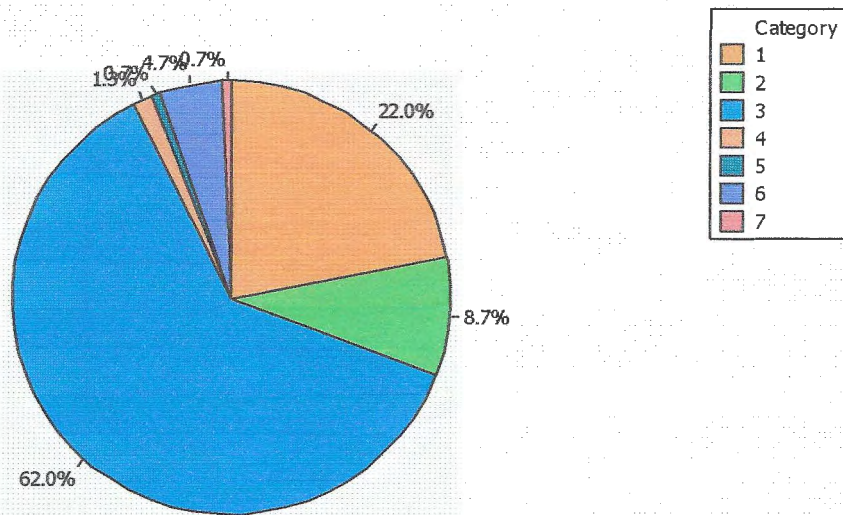
Calculating power for proportion 2 = 0.7

Alpha = 0.05

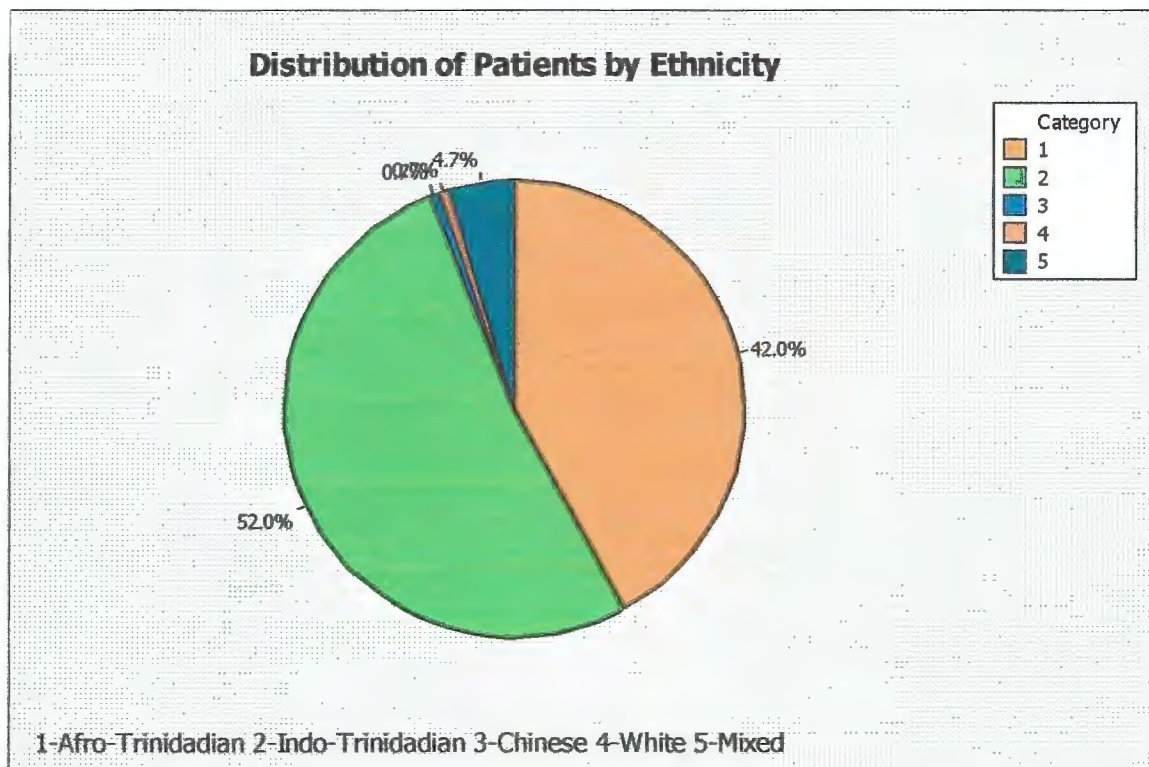
Proportion 1	Sample Size	Target Power	Actual Power
0.5	74	0.8	0.804127

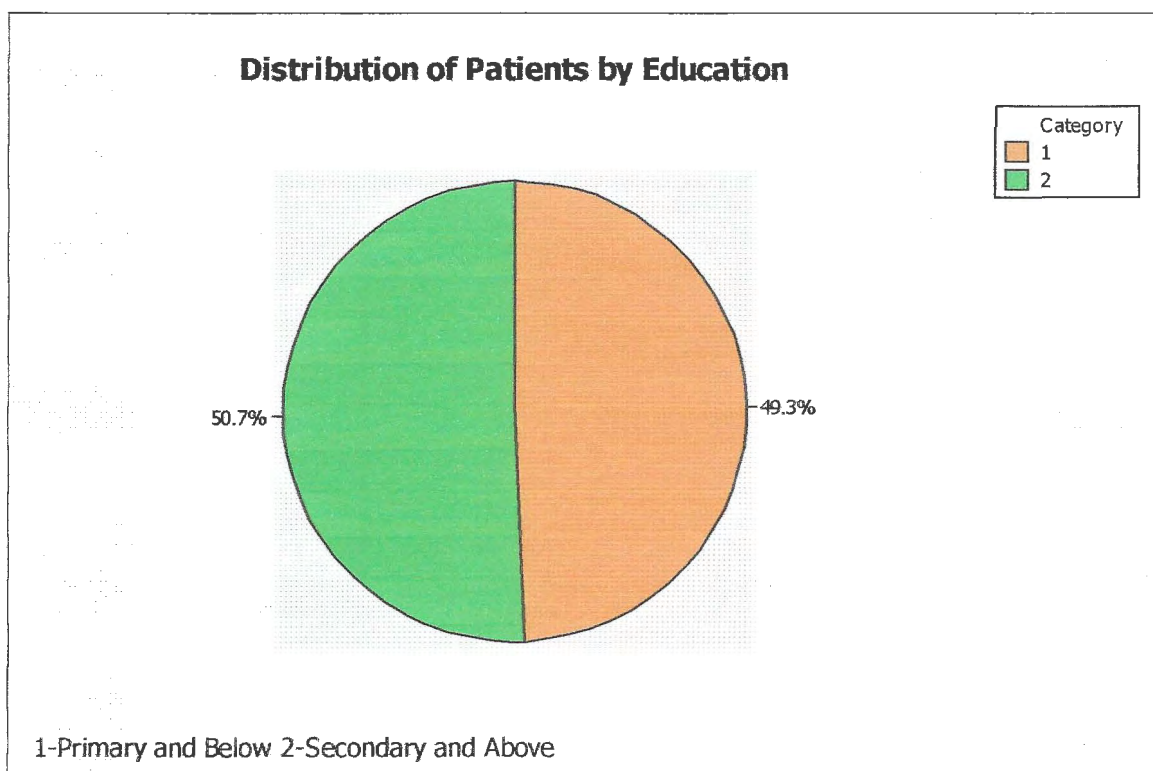
The sample size is for each group.

APPENDIX VIII

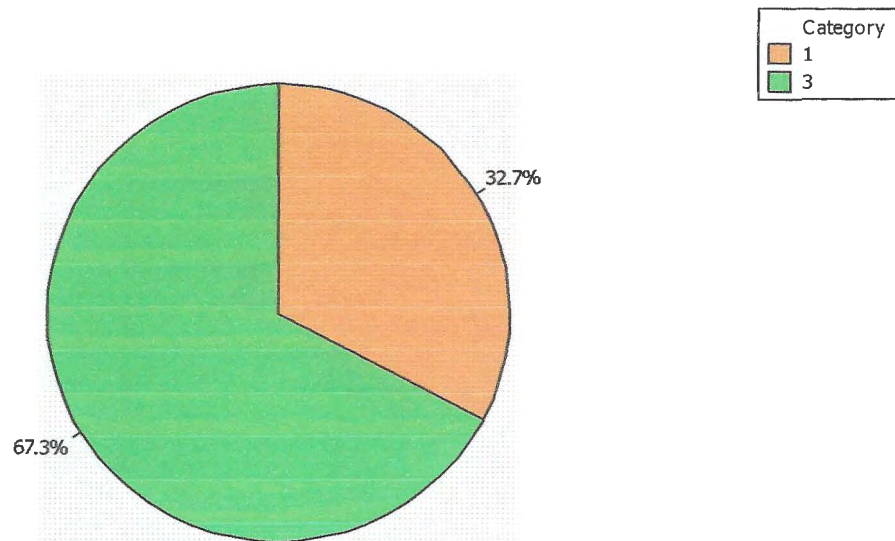
Distribution of Patients by Marital Status

1-Married 2-Separated 3-Single 4-Divorced
5-Visiting 6-Widowed 7-Common Law



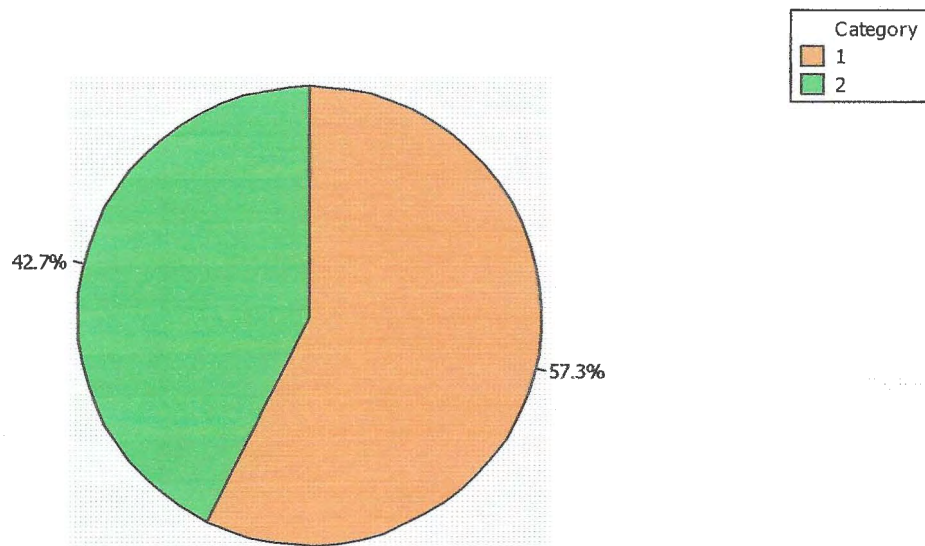


Distribution of Patients by Financial Status



1-Self/Family 3-Government Assisted

Distribution of Patients by Availability of Medication



1-Available 2-Unavailable

