Suicide in urban Kampala, Uganda: a preliminary exploration

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Abstract

Background: Suicide was investigated in the urban setting of Kampala, Uganda.

Objectives: Firstly, to explore the use of two research methodologies, a retrospective review of patient records and the psychological autopsy methodology in suicide research in Uganda. Secondly to investigate the characteristics and correlates of urban suicide in Uganda.

Results: A male to female ratio of suicide of 3.4:1 and a peak age of suicide in the 20-39 years age group were found. The main methods of suicide were hanging and ingestion of poison (organophosphates). Problems with social networks, negative life events, higher psychological distress and lower quality of life were associated with suicide at univariate analysis. It was only psychological distress that retained significance at multivariate analysis.

Conclusion: The retrospective review of records at Mulago hospital was beset by incomplete records whereas a pilot psychological autopsy study was well accepted and might contribute valuable data in African settings.

Key words: suicide, Africa, psychological autopsy, risk factors

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Introduction

Vijayakumar and colleagues[1] have shown that there are cultural differences in risk factors for suicide. There is, however, a paucity of data on this subject from sub-Saharan Africa, with only a handful of countries on the continent submitting regular mortality indices to the WHO. Understanding the antecedents of suicide in a given cultural context is an important first step to developing effective and locally relevant suicide interventions. As a first step to investigating suicide in an African cultural context, an exploratory study of the suitability of various methodologies was undertaken in Kampala; the capital city of Uganda. In this preliminary investigation, a retrospective review of suicide mortuary records as well as a pilot case-controlled psychological autopsy study of suicides were undertaken.

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Methods

The study was carried out at the Kampala City Council Mortuary which serves the entire urban centre of Kampala. Kampala city has a resident population of 1.2 million people although the population swells up to about 2 million people during the day.[2]

The study had two components:

1) A retrospective review of records; a methodology previously used in both the West and in some developing country settings[3,4,5,6]. A comprehensive retrospective review of all suicide records of a circumscribed geographical location may provide data on suicide rates, methods of suicide and trends over time.

2) A case-control structured psychological autopsy study. The psychological autopsy methodology arose out of the pioneering work by Shneidman[7] and has since then been modified to include the structured psychological autopsy case-control design which has been used in the West as well as in some developing country settings[8,9,10,11]. This part of the study was envisaged to compliment the retrospective review of records by providing information on risk factors for suicide in this particular socio-cultural context.[12]

Retrospective review of records

A retrospective review of pathology records at the Kampala City Council Mortuary was undertaken. Records from the period January 1975 - December 2004 (a 30 year period) were examined. The variables included were age, sex, area of residence, place of death, date of death, and suicide method. Many of the patient records were, however, incomplete with data missing on a number of the study variables.

The case-control psychological autopsy study

Cases (suicides) and controls were consecutively recruited over a 6-month period from January 1, 2005 to June 30, 2005. The controls were matched by age (± 5 yrs) and sex. The inclusion criteria for the cases were: a) died of suicide during the study period, b) age 15 years and above, c) brought to the Kampala City Council Mortuary, d) next of kin gave informed consent to participate in the study. The inclusion criteria for the controls were: a) died of a road traffic accident during the study period, b) brought to the Kampala City Council Mortuary, c) the next of kin gave informed consent to participate in the study.

As recommended by Beskow and colleagues,[12] we contacted the next of kin who in 78.9% of the cases and 59.4% of the controls was a close relative; usually a brother or a sister of the deceased. All the interviews were conducted by a retired senior psychiatric nurse with training in counseling. A senior house officer resident doing his masters of medicine in pathology undertook the post mortem examinations and also supervised the retrieval of medical records. To ensure that a uniform interview format was applied to all respondents, a structured questionnaire with standardized instruments based on the European Parasuicide Interview Schedule I (EPSIS I)[13] was employed. This instrument has previously been used locally. [14,15,16] The informants were in most cases contacted from the Kampala City Council Mortuary as they came to retrieve the remains of their deceased relatives for burial. Of all those approached, none declined to be interviewed. The majority was actually grateful that someone was willing to share their pain.

The same structured protocol was used to collect data on both the cases and controls. The following information was obtained from the post mortem report: age, sex, cause of death, presence of stigmata of chronic debilitating physical illnesses including HIV/AIDS, cancer or a degenerative illness.

One person close to the deceased (family member, other relative or close associate) was interviewed for each of the cases and controls. The interview guide for the psychological autopsy study included the following parts: Socio-demographic information including sex, residence, age, employment status, highest educational attainment, marital status, living arrangements, religion, wealth quintile index, ethnic group, and type of housing.

Precipitating factors for suicide were assessed using a modified version of the European Parasuicide Interview Schedule I (EPSIS I)[13,14]. The following items were included: relationship problems with spouse, children, parents; poverty; unemployment and mental illness/symptoms. Additional items derived from findings from local studies[17] were also included, namely impotence, pregnancy related problems, feelings of shame and poverty.

A module derived from the quality of life index used by Phillips and colleagues[10] in China was included to assess the quality of life of the deceased in the month before death. The respondent was asked to rate the deceased in six areas, namely physical health, psychological health, economic circumstances, work, family relationships and relationship with non-family associates on a scale from 1 (very poor) to 5 (excellent). The scores in each of these six areas were then summarized to yield a quality of life index. The possible range of scores was 1- 30 with a higher score indicating a better quality of life. Information on psychological distress in the last 2 weeks before death was collected by means of the WHO Self Report Questionnaire (SRQ– 25). The questions were asked in the third person: 'did he/she often complain of the following'.

Presence of negative life events was assessed using some of the items in the modified Life events and history section of the EPSIS I.[13,15] The items assessed looked at the relationship of the deceased with the parent, sibling, child(ren), spouse and significant others for the time periods; childhood, later in life and in the last year. A total score of all positive items was made for each of the above specified relationships at three specified time periods (childhood, later in life and in the last year).

To assess the socio-economic status of study subjects, a wealth quintile index was constructed from the following variables: type of housing (1= hut, 2= tenement/Muzigo, 3= semi-detached house, 4= detached house); tenure of dwelling unit (1= rented, 2= free/subsidized, 3= owner occupied);

permanency of walls (where 1= temporary, 2= semi-permanent, 3= permanent); roofing material (where 1= grass, 2= iron sheets, 3= tiles); windows (where 1= no windows, 2= wooden shutters, 3= glass panes) and livestock in the homestead (1= having chicken, 2= having goats and/or sheep and/or pigs, 3= having cows). The possible range of scores on this index were 1-19 with a higher score indicating a higher socio-economic status.

Data analysis

Data were analyzed using version 10.0 of SPSS. Tests of association were carried out using the chi-square test and the independent t-test. Logistic regression analysis was conducted to determine the independent effect of each of the identified predictors of suicide.

The study obtained science and ethical clearance from Makerere University (Faculty of Medicine Science and the ethics board) and the Uganda National Council of Science and Technology.

Results

A follow-up of some of these cases by the research team indicated that despite the fact that suicide is still a criminal act on the Ugandan statute books and requires a mandatory post-mortem report before burial, this law is rarely implemented. All that was required of the next of kin of a suicide victim to transport the body for burial to the ancestral home was a letter of introduction from the civic leadership where the deceased used to reside. Thus, these records are not representative of the entire population of those deceased by suicide in this urban centre.

Table 1: Socio-demographic characteristics of suicides (N=375) (Retrospective study)

	N=375	%
Gender (N= 375)		
Male	289	77
Female	86	23
Age Group (n=139)		
10-19 yrs	14	10.1
20- 29 yrs	49	35.2
30-39 yrs	52	37.4
40- 49 yrs	16	11.5
50- 59 yrs	4	2.9
60+ yrs	4	2.9
Age Range: 13-70 yrs		
Mean age: 30.6 years (Std= 10.3 years)		
Nationality (n=347)		
Ugandan	314	90.4
Non- Ugandan[Œ]	33	9.5
Ugandan tribal groupings (n=314)		
Muganda	180	57.3
Southern/ Western Uganda	40	12.7
Northern Uganda	54	17.3
Eastern Uganda	40	12.7
Religion (n=285)		
Christian	260	91.2
Muslim	25	8.8
Site of death (n=298)		
Residence	181	48.3
Place of work	2	0.5
Prison	1	0.3
Hospital	43	11.5
Police Cell	4	1.1
Other places	67	17.9
Method of Suicide (n=306)		
Hanging	185	63
Ingestion of Poison	75	25.8
Drug Overdose	1	0.3
Jumping from a height	14	4.8
Drowning	8	2.1
Gunshot	14	4.8
Alcohol intoxication	2	0.6
Burn with Kerosene	3	0.9
Cut throat	2	0.6
Injecting self with unknown chemical	1	0.3
Large cut wound	1	0.3

Note: [Œ] Non-Ugandan citizens included British, Congolese, German and Kenyans

For the retrospective component of this study, 375 medical records of suicides were obtained for the period between January 1975 - December 2004 (a 30 year period). Table 1 shows the results from the retrospective component of this study. As can be seen from the totals of the different variables in this table, apart from gender, the rest of the data on the other variables was incomplete and in some cases such as on age group missing by as much as 63%. Considering the obtained results, 289 (77%) were males whereas 86 (23%) were females giving a male to female ratio 3.4:1. Where age was recorded, about three quarters were in the age group 20-39 years (range 15-70 years). Half of the suicides occurred at home. The main methods of suicide were hanging (63.0 %), ingestion of poison (mostly organophosphates; 25.8%), jumping from a height (4.8%) and gunshot (4.8%).

Table 2: A comparison of the socio-demographic characteristics of the cases and controls

Variable	Cases (n = 19)		Controls (n= 31)				
	n	%	n	%	X^2	df	p-value
District							
Kampala	12	61.5	20	61.3	0.00	1	0.96
Others (Luweero, Wakiso)	7	38.5	12	38.7			
Gender							
Male	14	73.7	25	78.1			0.74
Female	5	26.3	7	21.9			
Tribe							
Baganda	12	63.5	20	62.5	0.00	1	0.96
Others	7	36.5	12	37.5			
Nature of relationship with decedent							
Relative	10	76.9	17	54.8	1.88	1	0.174
Non-relative	3	23.1	14	45.2			
Religion							
Catholics	7	36.8	13	40.6	4.84	2	0.09
Protestants	12	63.1	13	40.6			
Muslims	0	0	6	18.8			
Marital Status							
Never married	10	52.6	21	65.6			
Married/ Cohabiting	4	21.1	5	15.6	1.11	3	0.78
Widowed	1	5.3	2	6.3			
Divorced/ Separated	4	21.1	4	12.5			
Living Arrangement							
Living alone	9	50	12	37.5			
Alone with children	2	11.1	6	18.8	1.93	3	0.58
Living with partner no children	3	16.3	3	9.4			
Other arrangements	4	22.3	11	34.5			
Highest Educational attainment							
No formal education	3	15.5	6	18.8			
Primary level	14	73.4	15	46.9	4.23	2	0.12
Secondary level and above	2	11.1	11	34.3			
Type of housing							
Detached house	1	5.3	3	9.4			
Semi- detached house	4	21.1	9	28.1	0.71	2	0.7
Tenement/ Muzigo	14	73.6	20	62.5			
	Mean (S.D)		**Mean (S.D)**		**t-test**		**P-value**
Age (years)	32 (7.46)		30.2 (9.68)		0.68		0.5
Age Range19-46 years	17-49 years						
Socio-economic status							
Wealth quintile index	7.85 (0.99)		8.8 (1.67)		2.33		0.03*

***** Statistical significance set at p=0.05

Nineteen cases of suicide and 31 controls were enrolled in the psychological autopsy study. As shown in Table 2, the cases scored significantly lower on the wealth quintile index as compared to the controls. There were no statistically significantly differences between the cases and controls on district of residence, tribe, nature of relationship with decedent, marital status, living arrangement, highest educational attainment, type of housing or religion. Cases and controls were not compared on age and gender because these were the variables used for matching. The methods of suicide used were hanging (n=12; 63.1%) and poisoning (mostly organophosphates (n=7; 36.9%) (A similar pattern was observed in the retrospective component of this study).

Table 3: Acute stressors reported for both cases and controls

Variable*	Cases (n= 19)		Controls (n= 31)				
	n	%	n	%	X^2	df	p-value
Problems with Partner	5	38.5	2	6.5	7.02	1	0.008
Problems with Parents	1	7.7	0	0.0	0.3[t]		
Problems with children	2	15.4	1	3.2	0.2[t]		
Feeling loneliness	9	69.2	4	12.9	13.96	1	0.000*
Problems with making/ maintaining friends	8	61.5	3	9.7	13.14	1	0.000*
Rejection by lover	4	30.8	1	3.2	6.9	1	0.009
Physical illness/ disability	3	23.1	0	0.0	7.68	1	0.006
Mental illness/symptoms	3	23.1	0	0.0	7.68	1	0.006
Unemployment	9	69.2	4	12.9	13.96	1	0.000*
Addiction to alcohol & drugs	6	46.2	4	12.9	5.77	1	0.016
Poverty	9	69.2	4	12.9	13.96	1	0.000*
Feelings of shame	9	69.2	5	16.1	11.91	1	0.001*
Sexual impotence	2	15.4	0	0.0	5	1	0.0225
Unwanted pregnancy	0	0.0	1	3.2			1.00

***** To control for multiple comparisons, Bonferroni corrected level of significance was set at p= 0.004 (0.05 /14) [t] Student's t-test

Table 3 shows that the cases more often than the controls had experienced feelings of loneliness, problems with making/maintaining friends, were unemployed, suffered from poverty and had feelings of shame. There were no statistically significant differences between cases and controls on problems with partner, parents, or children, rejection by lover, physical illness/disability, mental illness/symptoms, addiction to alcohol or drugs, sexual problems or problems related to unwanted pregnancies.

Table 4: Social and psychological factors associated with suicide

Variable	Cases		Controls			
	Mean	S.D	Mean	S.D	t-test	p-value
Adverse life event[¥]						
Parent Related scores						
Parent related events in childhood	2.08	2.18	0.93	1.84	1.66	0.11
Parent related events later in life	3.46	1.98	2.06	2.22	2.06	0.05
Parent related events in the last year	1.69	1.7	2.07	2.21	0.6	0.55
Sibling Related scores						
Sibling related events in childhood	0.115	0.38	0.065	0.25	0.79	0.44
Sibling related events in later life	0.31	0.63	0.16	0.45	0.76	0.46
Sibling related events in last year	0.23	0.44	0.35	0.49	0.83	0.42
Personal scores						
Personal events in childhood	0.15	0.38	0	0	2.32	0.03
Personal events in later life	1.31	2.06	0.39	0.84	2.13	0.04
Personal events inlast year	5.04	1.29	4.32	2.2	1.04	0.31
Partner related scores						
Partner related events later in life	0.23	0.83	0.13	0.72	0.41	0.69
Partner related events in the last year	1.38	2.4	0.74	1.75	0.99	0.33
Psychological wellbeing						
Psychological distress scores (SRQ-25)	13.33	5.21	8.87	4.15	2.65	0.02*
Quality of life scores	7.54	2.7	11.23	5.08	2.46	0.02*

* Statistically significant difference, p=0.05

[¥] To control for multiple comparisons, Bonferroni corrected level of significance was set at p= 0.005 (0.05 /11) for the adverse life events

As shown in Table 4, the cases scored significantly higher on psychological distress (SRQ-25) and significantly lower on the quality of life index. Source of information (relative versus non-relative) could be a possible confounder of the observed relationship with psychological distress. In this study there was no statistically significant difference between psychological distress scores obtained from interviewing relatives (mean score= 10.48; std = 5.07) as compared to interviewing non-relatives (mean score =9.65; std=5.07; t-test =0.54; p=0.592.

No statistically significant difference was observed between the cases and controls on the adverse life events scores.

Table 5: Logistical regression model for the correlates of suicide

Correlates[1]	Wald	Adjusted Odds	P-value
***S*ocio-economic factors**			
Wealth quintile index	0.54	0.62	0.46
Proximal stressors			
Feelings of loneliness	0.02	0.00	0.90
Problems with making/ maintaining friends	0.02	5.12×10^{4}	0.90
Un-employment[Œ]	0.02	9.84×10^{7}	0.91
Feelings of shame	0.01	5.0×10^{-4}	0.94
Psychological wellbeing			
Psychological distress scores (SRQ-25)[”]	4.29	1.31	0.04*
Possible confounder			
Nature of relationship with the decedent	1.17	0.16	0.2

* Statistically significant difference, p= 0.05

[Œ] In this model unemployment and poverty were correlated together so only unemployment was retained to avoid redundancy

[”] Psychological distress but not the Quality of life index was included in this final model to avoid redundancy

The factors that were significantly associated with suicide at bivariate analysis were entered into a multivariate model using logistical regression (Table 5). These variables fell under three main domains, namely socio-economic factors (wealth quintile index), proximal stressors (feelings of loneliness, problems with making/ maintaining friends, unemployment and poverty) and factors of psychological wellbeing (psychological distress scores and quality of life scores). Additionally, to control for source of information, the variable 'nature of relationship with decedent' was included in this model. The proximal stressor 'poverty' was dropped from the final model as it was found to be correlated with 'unemployment.' The variable 'quality of life index' was also not included in the final multivariate model because it was thought to overlap significantly with the variable 'psychological distress' hence a potential source of redundancy. In the final model, only psychological distress was independently significantly associated with suicide in this study.

Discussion

In this study the male to female ratio of suicide was 3.4:1 with a peak age of suicide in the 20-39 years age group. Despite the fact that many cases of suicide over this period may not have been recorded, these results are relatively similar to those recently obtained from a verbal psychological autopsy study in four sub-counties in war affected Northern Uganda. There a male to female ratio of 4.4:1, and a mean age of 39 years (SD=17.3) was found.[19] The results of this study showing a male preponderance in suicide are similar to data from the West but dissimilar to data from China where higher female suicide rates have been reported.[3,20] The peak age of suicide in this study was, however, much lower than reported in the West where suicide rates consistently peak at midlife (roughly between 45 and 54 or 64 years), but similar to that found in the non-western setting of India.[3,11]

The main methods of suicide in this study were hanging and ingestion of poison (mostly organophosphates), a situation similar to other developing countries.[10,11] In the West the main methods of suicide among males are firearms and hanging whereas in females it is poisoning with drugs/medications.[20] Unlike data from the West,[21] marital status, highest educational attainment, living arrangements and nature of housing were not significantly associated with suicide in this study.

Having experienced loneliness, problems with making/maintaining friends, unemployment, poverty and feelings of shame were found to be significantly associated with suicide; a finding in keeping with what has been observed in the West.[21] In this study adverse life events scores were not significantly associated with suicide. This is unlike the findings from most studies from the West,[22] China,[10] and recent studies of deliberate self-harm from this environment,[15] one possible explanation for these results is that the small sample size affected the study's power. A second possible explanation is that we may be observing the effect of bias introduced by the 'flooring effect' associated with the case-control psychological autopsy methodology arising out of the use of 'decedent control subjects'. McLaughlin and colleagues[23] have suggested that since decedent controls present higher levels of exposure to variables that may be relevant to suicide risk, their use in studies focusing on these same factors may easily bring a "floor effect" that minimizes any existing differences between the cases and the controls.

Higher psychological distress scores were found to be associated with suicide in this study, a finding that retained significance even after controlling for other factors at multivariate analysis, this is in keeping with Shneidman's theory[7] from the West and with results from China[24] although in the latter setting, lower rates of mental disorders have been reported in suicide decedents.[24] Finally, in keeping with the findings of Phillips and colleagues[10] in China, lower quality of life was found to be associated with suicide in this study.

Limitations of this study

The sample size used in the case-control component of this study was rather small and hence may have affected the power of the associations between suicide and some of the investigated variables. Secondly, biases may have been introduced into this study through the use of the psychological autopsy methodology arising from the following areas: recall bias because of the time difference between the death of the case/control and the interview (although this was thought to have a minimal effect in this study as most interviews were conducted within a week of death); recall bias because of the passage of time when certain events occurred (such as the adverse life events) and the death of the case/control; 'use of decedent controls' which may have introduced the earlier described 'flooring effect' [23]; recall bias due to the use of both family and non-family respondents who not only have had different levels of contact intensity with the suicide decedent, but are also differentially impacted by the psychological experience of bereavement; and reliability and validity concerns associated with the indirect method of interview associated with the psychological autopsy methodology.

Bias due to the above factors was however thought to be minimal because of the following reasons: Firstly, one of the issues of concerns is that the use of control groups in psychological autopsy studies could compromise the internal and external validity of the study. These two constructs could potentially be jeopardized by insufficient control of the effects of extraneous variables linked to the subjects' profile and the lack of comparability with other studies in the number and type of variables chosen for comparison.[24] To remedy this problem, Pouliot and De Leo[24] have recommended the use of stricter criteria when matching cases and controls to minimize the risk of false interpretation of the data. In this study there was a medium risk of introducing this bias as cases and controls were only matched on two variables. However, the variables chosen for matching (sex and age) in this study have been commonly used by other investigators.

Secondly, on the issue the timing of the interview and it's impact on recall of significant events, in this study this was thought to have had a minimal effect as all the respondents were interviewed within weeks of the death of the study subject to avoid loss to follow up. Work by both Brent and colleagues[26] and Beskow and colleagues[13] has found no significant relationship between the timing of the interview and the reporting of key variables.

Thirdly, on the issue of the psychological state of respondents affecting study results, Pouliot and De Leo[25] in a review of methodological problems of psychological autopsy studies observe that both qualitative and quantitative differences in grief reactions among suicide survivors have been reported between the various bereavement groups with the potential impact of negatively influencing the emotional and cognitive state of the respondents. In the same review however, Pouliot and De Leo[24] observed no such difference in the level of psychological distress between individuals bereaved by suicide and those bereaved by accidents (the two groups compared in this study). Indeed in this study there was no statistically significant difference in the psychological distress scores obtained by interviewing

relatives of the decedents as compared to those obtained from interviewing non-relatives.

As observed in this study, respondents interviewed early in the bereavement period welcomed the opportunity to talk about their loved ones, a finding in keeping with observations by Beskow and colleagues.[12]

Fourthly, there are concerns about the reliability and validity of the psychological autopsy methodology. This is because of the potential weaknesses associated with characteristics of this research methodology such as: the indirect character of information collected, the different types of relationships between interviewees and the deceased and the varying quality of information.[12] The use of relatives as informants has been reported to be problematic because it is difficult to foresee which relative is best informed, the issue of informant's bias due to their relationships with the victims, knowledge of the cause of death (of particular concern in the Ugandan study setting where suicide still a criminal act and carries stigma) and the influence of psychological defense mechanisms.[12] The use of the same interview procedure and same types of respondents for both the cases and controls in this study was thought to minimize the impact of this phenomenon on study results. However, only one respondent for each case and control was interviewed in this study so the results should be interpreted with great caution.

Conclusions

The results of this study have the following implications for suicide research and suicide prevention in the developing country settings in Africa: Firstly, the methodology of retrospective review of patient records holds little promise for realizing reliable suicide mortality statistics in the near future because the region, like most of the other developing regions, still lack nationwide systems for recording vital statistics. In addition, where records are available they are often incomplete.[10] This methodology should at best be used for mapping purposes in preparation to use interviewer based methodologies which allow the researcher more control over the quality of the data. Secondly, the psychological autopsy method appears to be well accepted in this setting and even welcomed by the bereaved as an opportunity to discuss their distress and any other unresolved issues. It holds promise as a viable method for researching suicide in the sub-Saharan African setting.

Recommendations

To minimize the use of Western derived instruments that are based on Western suicide theory (which may not be locally applicable to the African setting), the initial psychological autopsy studies in Africa should use qualitative methodologies similar to those employed by Sheidman[7]. This will have the added advantage of building locally relevant suicide theory. Such a qualitative psychological autopsy study, where at least five persons around each suicide are interviewed, is now underway by a Norwegian-Ugandan research group lead by the last author of this paper.

The use of the psychological autopsy methodology with a recommended time interval between the suicide and the interview in urban Africa faces the added problem that most families losing a relative to suicide prefer to change location to avoid the associated stigma. When this happens such cases would be lost to follow-up. Thirdly, there is a need to develop indigenous study designs that take advantage of the communal way of life in rural Africa where in most circumstances a person's life is lived out in the full view of others in the same community. This would partially address the problem of poor records. This may take the form of asking local community leaders to record all past cases of suicide over a three-year period in consultation with the other community members (a methodology recently employed by the first author of this paper in a study in war affected rural Northern Uganda with good results)[19]. Identified cases through this system could then be verified through home visits. The obtained suicide figures together with the usually known population size of that community can be used to calculate a fairly accurate suicide rate and to determine the other associated characteristics[19]. Fourthly, that agricultural poisons, mainly organophosphates, are increasingly being used not only for suicide but also for deliberate self-harm[14] calls for the enactment of laws to regulate their sales and use. In other agrarian societies such as Sri Lanka, this has been observed to work, although in the specific case of Sri Lanka a switch to other methods has been observed[27]. Lastly, the fact that in this study psychological distress was independently associated with suicide highlights the centrality of mental health services in the development of any national suicide prevention and management service even in developing country settings in sub-Saharan Africa.

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References

1. Vijayakumar L, John S, Pirkis P, Whiteford H. Suicide in developing countries (2). Risk factors. *Crisis,* 2005; 26(3): 112-119.
2. Uganda Bureau of Statistics. Preliminary census results released. *Census 2002 Newsletter;* 2002; 1(2): 1-2.
3. Diekstra RFW. Suicide and the attempted Suicide: An international perspective. *Acta Psychiatrica Scandinivica,* 1989; 80 (Suppl. 371): 9-20.
4. Muniu E, Katsivo MN, Mwaura LW, Amuyunzu M. Fatal non-transport injuries in Nairobi, Kenya. *East African Medical Journal*, 1994; 71(6): 346 – 349.
5. Phillips MR, Xianyun L, Zhang Y. Suicide rates in China, 1995-99. *Lancet*, 2002; 359: 835-40.
6. Meel BL. A study on the incidence of suicide by hanging in the sub-region of Transkei, South Africa. *Journal of Clinical Forensic Medicine,* 2003; 10:153 – 157.
7. Shneidmen ES. Suicide as Psyache: A Clinical approach to self destructive behaviour. North Vale, New Jersey: Jason Aronson Inc, 1993.
8. Cavanagh JTO, Carson AJ, Sharpe M, Lawrie SM. Psychological autopsy studies of suicide: a systematic review. *Psychological Medicine,* 2003; 33: 395-405.
9. Cheng ATA, Chen THH, Chen C-C, Jenkins R. Psychosocial and psychiatric risk factors for suicide; Case-control psychological autopsy study. *British Journal of Psychiatry,* 2000; 177: 360-5.
10. Phillips MR, Yang G, Zhang Y, Wang L, Huiyu Ji, Zhou M. Risk factors for suicide in China: a natural case-control psychological autopsy study. *Lancet*, 2002; 360:1728 –1735.
11. Gajalakshmi V, Peto R. Suicide rates in rural Tamil Nadu, South India: Verbal autopsy of 39000 deaths in 1997-98. *International Journal of Epidemiology,* 2007; 36: 203-7.
12. Beskow J, Runeson B, Asgard U. Psychological autopsies: Methods and ethics. *Suicide and Life Threatening Behavior,* 1990; 264: 307-323.
13. Kerkhof AJFM, Bernasco W, Bille Brahe U, Platt S, Schmidtke A. A WHO/EURO Multicentre study on parasuicide. European Parasuicide Study Interview Schedule EPSIS I version 6.2. H. Schiÿdt & B. Aagaard (Eds.). The Netherlands: Department of Clinical and Health Psychology, University of Leiden, 1989.
14. Kinyanda E, Hjelmeland H, Musisi S. Deliberate self-harm as seen in Kampala, Uganda: A case-control study. *Social Psychiatry & Psychiatric Epidemiology,* 2004; 39: 318-325.
15. Kinyanda E, Hjelmeland H, Musisi S. Negative life events associated with deliberate self-harm in an African population in Uganda. *Crisis*, 2005; 26(1): 4-11.
16. Kinyanda E, Hjelmeland H, Musisi S. Psychological factors in deliberate self-harm as seen in an urban African population in Uganda: A case- control study. *Suicide and Life Threatening Behaviour,* 2005; 35(4), 468-477.
17. Fallers LA, Fallers C. (1960). Homicide and Suicide in Busoga. In P. Bohannen, (Ed.), African homicide and suicide (pp. 65 – 93). Princeton, New Jersey: Princeton University Press, 1960.
18. WHO. A user's guide to the Self-Reporting Questionnaire (SRQ). Geneva: WHO, 1994
19. Kinyanda E, Nakku J, Oboke H, Oyok T, Ndyanabangi S, Olushayo O, Hjelmeland H. Suicide in rural war affected Northern Uganda: A study from 4 sub-counties. An abstract submitted and accepted by the 25th World Congress on Suicide Prevention of the International Association for Suicide Prevention, Uruguay due 27th-31st October, 2009.
20. Qin P, Mortensen PB. Specific characteristics of suicide in China. *Acta Psychiatrica Scandinavica,* 2001; 103: 117-121.
21. Makinen IH, Wasserman D. (2001). Some social dimensions of suicide. In D. Wasserman (Ed.), Suicide- An unnecessary death (pp. 101-108). London: Martin Dunitz Ltd, 2001.
22. Wasserman D. Negative life events (losses, changes, traumas and narcissistic injury) and suicide. In D. Wasserman (Ed.), Suicide- An unnecessary death (pp. 111-117). London: Martin Dunitz Ltd, 2001.
23. Mclaughlin JK, Bliot WJ, Mehl ES, Mandel JS. Problems in the use of dead controls in case-control studies. *American Journal of Epidemiology,* 1985; 121: 131-139.
24. Phillips MR. Rethinking the role of mental illness in suicide. *American Journal of Psychiatry,* 2010; 167: 731-733.
25. Pouliot L, De Leo D. Critical issues in psychological autopsy studies. *Suicide and Life-Threatening Behavior,* 2006; 36(5): 491-510.
26. Brent DA, Perper JA, Goldstein CE, Kolko DJ, Allan MJ, Allman CJ, Zelenak J.P. Risk factors for adolescent suicide. A comparison of adolescent suicide victims with suicidal inpatients. *Archives of General Psychiatry,* 1988; 45(6): 581-588.
27. Roberts DM, Buckley NA, Manuweera G, Eddleston M. Influence of pesticide regulation on acute poisoning death in Sri Lanka. *Bulletin of the WHO*, 2003; 81: 789-798.