RESEARCH COMMUNICATION

Knowledge about Cancer in West Bengal - a Pilot Survey

Kausik Ray[1], Syamsundar Mandal[1]

Abstract

A pilot survey was conducted based on 900 respondents of the population of West Bengal to assess their level of awareness regarding cancer with the aim of estimating associations between response variables (knowledge about cancer) and predictor variables (age, sex, level of education). The data of the pilot survey revealed that 98% of the respondents had heard of the disease 'Cancer' . Unfortunately only 35% of the respondents were aware of the 7-danger signals (i.e. the primary symptoms of cancer) as defined by the World Health Organisation (WHO). None of the respondents knew all 7-primary symptoms of cancer and the majority (about 88%) knew only one or two (mainly tumour lumps and ulcers). Only 44.67% were aware of the major risk factors (like smoking and tobacco chewing). The percentage of the respondents believing that most cancers are curable in early stages was 58%. Some of the respondents (21%) expressed the vague idea that cancer is a infectious disease which is creating a problem of isolation from the family/society with some unfortunate cancer patients. Over 11% of the respondents suggested that a cancer diagnosis should be kept secret from neighbours due to some social stigma like problems with daughters' marriage. Only 8% had experienced any cancer awareness programme conducted by any organisation, only 37% had listened to any cancer awareness programme conducted by the All India Radio, only 36% had seen any cancer awareness programme conducted by Doordarsan/ private Television channels, only 34% had read cancer awareness articles in the newspapers/magazines and only 13% had seen posters/hoardings regarding cancer awareness. The results thus revealed a huge lack regarding cancer awareness in the region. Most of the respondents (68%) expressed a wish for starting cancer awareness programmes. From the Pilot Survey it has been found that the average Knowledge Index of the respondents is 58+ 1.7 irrespective of the socio-economic and personal status. On testing of associations, there was no statistically significant association of the Knowledge Index with the domicile status (rural or urban), sex, occupation and religion of the respondents. However, statistically significant links were evident with the level of education (p=0.00001), social participation (p=0.00004) and income (p=0.00013) of the respondents.

Key Words: Cancer statistics - cancer awareness - education programme - cancer prevention - knowledge index

Asian Pacific J Cancer Prev, **5**, 205-212

Introduction

Cancer is a public health problem worldwide. It is the second leading cause of death in developed countries and is among the three leading causes of mortality in developing countries after individuals reach 15 years of age. Each year, some 6 million people die from cancer, which is roughly 12 percent of the total number of deaths in the world and 10 million new cases are diagnosed; more than half occur in developing countries. Twenty years from now the cancer burden will rise 50% due to aging of the population, control of other diseases and increasing exposure to risk factors according to World Health Organisation (WHO). The Geneva-based organisation estimates the toll will rise to 10 million deaths and 15 million new cases annually over the next 20 years.

One-third of the world's 10 million cancer cases diagnosed each year can be prevented and another one-third can be cured through early detection and treatment, according to a WHO report and National Cancer Control Programs: Policies and Managerial Guidelines, released to coincide with the International Union Against Cancer Congress, which was held in Oslo in 2002.

The report on 'National Cancer Control Programmes' recommended primary prevention and early detection programmes, saying that countries should not rely merely on treatment-oriented approaches.

The most common cancers worldwide among men are

[1]*Department of Medical Records, Chittaranjan National Cancer Institute (CNCI), Kolkata, India*
Correspondence: Dr. Syamsundar Mandal, Statistical Officer & Head, Department of Medical Records, Chittaranjan National Cancer Institute, 37, S. P. Mukherjee Road, Kolkata- 700 026, West Bengal, India. Phone & FAX - 91-33-24757606. E-mail: ssmandal@hotmail.com

lung and stomach cancers, and among women breast and cervical cancer are the most common killers.

Over half of those diagnosed with cancer live in the developing world, WHO said, while cancer remains the second cause of death in the industrialised world, after heart disease. Men in industrialised countries are more likely to have prostrate cancer, whereas cervical cancer was primarily found among women in the developing world. The report, which is based on six years of research, underlines the role of cigarettes as the most common preventable cause of cancer.

Prevention means eliminating or minimizing exposure to the causes of cancer, and includes reducing individual susceptibility to the effects of such causes. It is this approach that offers the greatest public health potential and the most cost-effective long-term cancer control.

Thus, conducting a cancer prevention programme, within the context of an integrated noncommunicable disease prevention programme, is an effective national strategy. Tobacco use, alcohol, nutrition, physical inactivity, and obesity are risk factors common to other noncommunicable diseases, such as cardiovascular disease, diabetes, and respiratory diseases. Chronic disease prevention programmes can efficiently use the same surveillance and health promotion mechanisms.

The wealth of knowledge that already exists about these predisposing factors provides obvious and ample scope for action to reduce the cancer burden of all countries. Enough is now known about the causes of cancer and means of control for suitable interventions to have a significant impact. At least one-third of the 10 million new cases of cancer each year are preventable by such means as controlling tobacco and alcohol use, healthy diet, and immunizing against viral hepatitis B. Early detection, and therefore prompt treatment, of a further one-third of cases is possible where resources allow. Effective techniques for pain relief are sufficiently well established to permit comprehensive palliative care for the remaining, more advanced, cases. The establishment of a national cancer control programme, tailored to the socio-economic and cultural context, should allow countries to effectively and efficiently translate the present knowledge into action.

A national cancer control programme is a public health programme designed to reduce cancer incidence and mortality and improve quality of life of cancer patients, through the systematic and equitable implementation of evidence-based strategies for prevention, early detection, diagnosis, treatment, and palliation, making the best use of available resources.

In the absence of any national or state-level co-ordinating mechanism, it is possible for limited resources to be largely consumed in the treatment of cancer by prestigious hospitals. Such institutions often serve only selected populations and do little to reduce the national cancer burden. An effective cancer control programme, on the other hand, is an integrated set of activities covering primary prevention; early diagnosis and treatment, palliative care and operates with appropriate allocation of available resources.

Millions of cancer deaths could be prevented annually if more emphasis were placed on early detection according to a WHO report. WHO aims to reverse the rising trend of cancer morbidity and mortality by putting the present knowledge into effect for the prevention and control of cancer. This is especially challenging in developing countries where about half of all cancers occur. In these countries there is a rising trend in exposure to risk factors, resources for cancer control are limited and the majority of cases are diagnosed at advanced stages.

This is a key strategy supported by WHO to reduce cancer morbidity and mortality and improve quality of life of patients and their families. It is a systematic, comprehensive approach for assessing the cancer burden, setting priorities and allocating resources, taking into account the social, economic and cultural context.

These tumours are leading causes of cancer among women world-wide. National cancer control programmes give priority to cervical and breast cancer early detection in countries where these cancers are common and effective interventions are feasible.

There are effective treatment approaches for some tumours if they are detected early (cervical, breast, oral and prostate cancers). Some other cancers can be treated effectively at disseminated stages (childhood tumours, leukaemias, lymphomas and seminomas).

The earlier a cancer is detected and diagnosed, the greater is the chance that curative treatment will be successful. This is particularly true of cancers of the breast, cervix, mouth and skin. It is therefore critical that people are taught to recognize early signs of the disease, such as lumps, sores that fail to heal, abnormal bleeding, persistent indigestion, and chronic hoarseness, and urged to seek prompt medical attention. Encouragement of individuals to rapidly seek medical attention and primary health workers to rapidly seek referral of suspected cases is known as “early diagnosis”, which can be promoted in all countries by public health education campaigns and through training of primary health workers. (Caruso et al., 2000; Halverson, 2000; Hinton et al., 1999; Shankar et al., 1999; Shetty et al., 1999; Thiemann et al., 1999; Uche, 1999; Wamakulasuriya et al., 1999). This is where ultimate success lies although perhaps not immediately and certainly not readily measured.

The deaths due to cancer of some primary sites are preventable rather these cancers are curable only by early reporting by the patients. Unfortunately only few cancer cases are reporting in early stage of their diseases resulting to an increasing number of deaths due to cancer (National Cancer Registry Programme, 1992; Siddiqi et al., 1997; Siddiqi et al., 1998; Sen U et al, 2002). The records of patients of Chittaranjan National Cancer Institute (CNCI), Kolkata, India shows that on an average 20-25% of the patients are completing their treatments due to advanced stage of their disease and the successes are very poor (Siddiqi et al., 1997; Siddiqi et al., 1998; Mandal et al. 2000).

Compliance to treatment and follow-up is directly related

to the Cancer Awareness Programmes. If we can make aware peoples about cancer, we can save a lots of lives and money keeping in mind with the fact that most of our patients are from poor socio-economic background (Bennett CL, 2000; Sherman et al., 1999; Parvez, 1999; Shetty et al., 1999). Now to start an well-organised awareness programme the results of this kind of survey is necessary to a great extent.

To develop an educational package, both for community level and for cancer patients attending the clinics, to test and to validate them, it is necessary to find out the associationship between response variable i.e. knowledge and selected predictor variables i.e. educational status, domicile status etc. On the basis of the associationship it can be developed an appropriate cancer literacy programme (Shetty et al., 1999; Bloom et al., 1956). Then the educational intervention program can be implemented with the help of the newly developed package and can be assessed its impact on early reporting, treatment and follow-up in respect of cancer disease. In this way it can be created a baseline for future better cancer awareness programme in this region. To assess the awareness level regarding cancer disease of the population of this region this pilot survey has been conducted.

Materials and Methods

Details of the Variables:

In attempts to prepare a cancer literacy programme, it is quite impossible to go through all the relevant factors that exert their influence on the literacy programme. For this reason it is desirable to draw a sample of the pertinent variables and to determine their mode of patterning (De et al., 1998). The variables selected were as follows: -

Response Variables for knowledge of respondents about symptoms, established risk factors, treatment and follow-up regarding cancer disease. A Knowledge Index was developed and used for measurement.

Predictor Variables which are socio-personal and economic factors of the respondents. Some standard indexes were used for the study purpose.The reason behind the inclusion of variables in the study is that knowledge level of respondents will help us to prepare educational package/ literacy programme in cancer and variables like socio-personal and economic factors may be searched for, as they impact on people obtaining & utilising different types of treatment available for cancer disease. People with a higher socio-economic status can be expected to make themselves aware of the best treatment facilities available. Hence the relation between socio-personal & economic status and knowledge level of respondents should be explored.

Measurement of Variables:

Response Variables: Questions related to response variables were framed to test the knowledge of the respondents. Equal weightage was given to all the questions assuming that all those included were equally difficult to understand, apply & recall (Bloom et al., 1956; John, 1954).

The following formula was used to calculate the Knowledge Index,

$$KI = \frac{X1 + X2 + X3 + \ldots\ldots\ldots + Xn}{N} \times 100$$

Where X1, X2, ... Xn are correct answers for first, second, ... nth question and N is the maximum score possible to secure or the number of questions.

Predictor Variables:

Socio-personal:

a) Age: The number of years completed by an respondent at the time of interview.

b) Educational status of the respondents, father, mother, and husband /wife (if married) which is quantified on the basis of the socio-economic status scale developed by Trivedi (Trivedi, 1963).

c) Occupation variable is quantified on the basis of various professions pursued by the respondent, father, mother and husband/wife. (Trivedi, 1963).

d) Social Participation: It refers to the degree of involvement of a respondent in formal organisation simply as a member or an office bearer. It is quantified as per the socio-economic scale developed by Trivedi. (Trivedi, 1963).

Total income:

Income in terms of rupees from different sources of respondent/father/ mother/husband/wife in a month/year.

Sources of data:

A Pilot Survey has been conducted on 900 peoples of West Bengal during the period March to April, 2003. A well designed short data acquisition proforma based on some suitable questionnaires was used to collect the data. All the information were stored in a Personal Computer with the help of suitably designed software.

Statistical Analysis:

In order to answer to research questions the following appropriate statistical techniques are used as i) Frequency distribution ii) Percentage distribution iii) Different Means & their Standard Errors and iv) Test of Association.

Results

The individual findings are provided in Tables 1-26.

Summary and Conclusion:

Though this was a pilot survey and the sample size is too small to give a precise idea about the awareness level regarding cancer among the population of West Bengal, the data of the pilot survey revealed the following facts:

1. Almost all the respondents (98.33%) have heard of 'cancer'.

2. Though most of the cancer patients (approximately

70%) are totally either curable or their disease can be restricted in terms of more lengthy disease free life if the patients can report to any cancer specialised treating centre in early stage of their disease, unfortunately only 35% of the respondents know the 7-danger signals (i.e. the primary symptoms of cancer) as directed by WHO of cancer.

3. Also none of the respondents knew all the 7-primary symptoms of cancer and the majority (about 88%) were only aware of one or two. This may be one of the major causes of delay in reporting by cancer patients.

4. Only 44.6% know the major risk factors (e.g. smoking, tobacco chewing) for cancer.

Table 1. Distribution of Respondents According to Their Knowledge Index

Knowledge Index	Number of respondents	Percentage (%)
<100	795	88.34
100 - 150	105	11.66
Total	900	100.00

Table 2. Distribution of Respondents According to Domicile Status Vs. Knowledge Index

Domicile Status	Knowledge Index <100		Knowledge Index 100 - 150		Total	
	Number	%	Number	%	Number	%
Rural	411	45.67	57	6.33	468	52.00
Urban	384	42.67	48	5.33	432	48.00
Total	795	88.34	105	11.66	900	100.00

The test of association (Chi-square=0.25) shows that there is no statistically significant association between them p=0.6179.

Table 3. Distribution of Respondents According to Age Group Vs. Knowledge Index

Age Group (in years)	Knowledge Index <100		Knowledge Index 100 - 150		Total	
	Number	%	Number	%	Number	%
0-35	375	41.67	39	4.33	414	46.00
36-55	357	39.67	57	6.33	414	46.00
56 & above	63	7.00	9	1.00	72	8.00
Total	795	88.34	105	11.66	900	100.00

The test of association (Chi-square=2.668) shows that there is no statistically significant association between them p=0.1023

Table 4. Distribution of Respondents According to Their Sex Vs. Knowledge Index

Sex	Knowledge Index <100		Knowledge Index 100 - 150		Total	
	Number	%	Number	%	Number	%
Male	483	53.68	69	7.66	552	61.34
Female	312	34.66	36	4.00	348	38.66
Total	795	88.34	105	11.66	900	100.00

The test of association (Chi-square=0.96) shows that there is no statistically significant association between them p=0.3266

Table 5. Distribution of Respondents According to Their Religion Vs. Knowledge Index

Religion	Knowledge Index <100		Knowledge Index 100 - 150		Total	
	Number	%	Number	%	Number	%
Hindu	600	66.67	81	9.00	681	75.67
Muslim	186	20.67	24	2.66	210	23.33
Buddhist	09	1.00	0	0.00	09	1.00
Total	795	88.34	105	11.66	900	100.00

The test of association (Corrected Chi-square=0.348) shows that there is no statistically significant association between them p=0.5552

Table 6. Distribution of Respondents According to Their Level of Education Vs. Knowledge Index

Level of Education	Knowledge Index <100		Knowledge Index 100 - 150		Total	
	Number	%	Number	%	Number	%
Illiterate	51	5.67	0	0.00	51	5.67
Can read only	3	0.33	0	0.00	03	0.33
Can read & write only	36	4.00	9	1.00	45	5.00
Primary School	91	9.00	0	0.00	81	9.00
Middle School	180	20.00	3	0.33	183	20.33
High School	114	12.67	1	1.67	129	14.34
Intermediate/Diploma	24	2.67	0	0.00	24	2.67
Graduate	225	25.00	45	5.00	270	30.00
Post Graduate & above	81	9.00	33	3.66	114	12.66
Total	795	88.34	105	11.66	900	100.00

The test of association (Corrected Chi-square=52.422) shows that there is statistically significant association between them p=0.00001

Table 7. Distribution of Respondents According to Their Occupation Vs. Knowledge Index

Occupation	Knowledge Index <100		Knowledge Index 100 - 150		Total	
	Number	%	Number	%	Number	%
Labour, House Wife & Student	186	20.66	24	2.67	210	23.33
Caste Occupation	114	12.67	6	0.67	120	13.34
Business	132	14.67	18	2.00	150	16.67
Independent Profession (e.g. Tutor, Computer Programmer etc.)	72	8.00	3	0.33	75	8.33
Agriculture	9	1.00	3	0.33	12	1.33
Service	282	31.34	51	5.66	333	37.00
Total	795	88.34	105	11.66	900	100.00

The test of association (Corrected Chi-square=2.868) shows that there is no statistically significant association between them p=0.09036

Table 8. Distribution of Respondents According to Their Social Participation Vs. Knowledge Index

Type of social participation	Knowledge Index <100		Knowledge Index 100 - 150		Total	
	Number	%	Number	%	Number	%
No membership of any organisation	597	66.34	48	5.34	645	71.68
Member of one organisation	144	16.00	45	5.00	189	21.00
Member of more than one organisations	9	1.00	6	0.66	15	1.66
Office holder	36	4.00	3	0.33	39	4.33
Public leader	9	1.00	3	0.33	12	1.33
Total	795	88.34	105	11.66	900	100.00

The test of association (Corrected Chi-square=17.008) shows that there is statistically significant association between them p=0.00004

Table 9. Distribution of Respondents According to Their Monthly Family Income Vs. Knowledge Index

Monthly Family Income (in Rs.)*	Knowledge Index <100		Knowledge Index 100 - 150		Total	
	Number	%	Number	%	Number	%
<1000	54	6.00	0	0.00	54	6.00
1000 – 5000	420	46.67	45	5.00	465	51.67
More than 5000	321	35.67	60	6.66	381	42.33
Total	795	88.34	105	11.66	900	100.00

* - Rs. (Rupees); Indian Currency; 1Us$=Rs.48 (Approximately) The test of association (Corrected Chi-square=14.635) showed no statistically significant association p=0.00013

Table 10. Answers to 'Have you Heard about the Disease Cancer?'

Answer	Number of respondents	Percentage (%)
Yes	885	98.33
No	5	01.67
Total	900	100.00

Table 11. Answers to 'Do you Know the Symptoms of Cancer?'

Answer	Number of respondents	Percentage (%)
Yes	315	35.00
No	585	65.00
Total	900	100.00

Table 12. Responses to 'Give the Symptoms of Cancer'

No. of symptoms correctly given **	Number of respondents	Percentage (%)
1	180	57.14
2	96	30.48
3	18	05.71
4	6	01.91
5	15	04.76
Total	315	100.00

** According to the WHO there are 7-Danger Signals/Symptoms of Cancer, which are universally accepted.

Table 13. Answers to 'Do you Know the Major Risk Factors of Cancer?'

Answer	Number of respondents	Percentage (%)
Yes	402	44.67
No	498	55.33
Total	900	100.00

Table 14. Answers to 'Do you Think that Cancer is Curable in Early Stage?'

Answer	Number of respondents	Percentage (%)
Yes	525	58.33
No	375	41.67
Total	900	100.00

Table 15. Answers to 'Do you Think that Cancer is an Infectious Disease?'

Answer	Number of respondents	Percentage (%)
Yes	192	21.33
No	708	78.67
Total	900	100.00

Table 16. Answers to 'Do you Think that Cancer Disease should be Kept Secret from Neighbours?'

Type of answer	Number of respondents	Percentage (%)
Yes	105	11.67
No	795	88.33
Total	900	100.00

Table 17. Answers to 'Do you Know the Specialised Cancer Treating Centres/Hospitals in this Region/ Country?'

Answer	Number of respondents	Percentage (%)
Yes	609	67.67
No	291	32.33
Total	900	100.00

Table 18. Answers to 'Do you Know the Investigation Procedures for the Diagnosis of Cancer?'

Type of answer	Number of respondents	Percentage (%)
Yes	246	27.33
No	654	72.67
Total	900	100.00

Table 19. Answers to 'How long do you Think that it will Take to Complete the Treatment of a Cancer Patients?'

Answer	Number of respondents	Percentage (%)
One to two weeks	387	43.00
More	513	57.00
Total	900	100.00

Table 20. Answers to 'Do you Know that Cancer Patients have to Come for Regular Check Ups as Desired by Doctors after Completion of Treatment?'

Answer	Number of respondents	Percentage (%)
Yes	120	13.33
No	780	86.67
Total	900	100.00

Table 21. Answers to 'Have you Ever been Faced/Seen/ Participated any Cancer Screening/Awareness Programme?'

Answer	Number of respondents	Percentage (%)
Yes	25	08.33
No	275	91.67
Total	900	100.00

5. The percentage of the respondent believe in the fact that most of the cancer is curable in early stage is 58.3%.

6. Some of the respondents (21.33%) are having the vague idea that cancer is an infectious disease, which is creating problem of isolation from the family/society to some of the unfortunate cancer patients.

7. 11.67% of the respondents are suggesting that the cancer disease should be kept secret from neighbours due to some social stigma like problem of daughters' marriage etc.

Table 22. Answers to 'Have you Listened to any Cancer Awareness Programmes Conducted by All India Radio?

Answer	Number of respondents	Percentage (%)
Yes	336	37.33
No	564	62.67
Total	900	100.00

Table 23. Answers to 'Have you Listened to any Cancer Awareness Programmes Conducted by Doordarsan?'

Answer	Number of respondents	Percentage (%)
Yes	327	36.33
No	573	63.67
Total	900	100.00

Table 24. Answers to 'Have you Read any Cancer Awareness Articles in Newspapers?'

Answer	Number of respondents	Percentage (%)
Yes	306	34.00
No	594	66.00
Total	900	100.00

Table 25. Answers to 'Have you Seen any Poster/ Hoarding Regarding Primary Symptoms of Cancer any Where?'

Answer	Number of respondents	Percentage (%)
Yes	117	13.00
No	783	87.00
Total	900	100.00

8. Till now only 67.67% of the population of West Bengal know the specialised cancer treating centres/hospitals in this region/our country.

9. Only 27.33% of the respondents have some knowledge about the investigation procedures for the confirmation of diagnosis of cancer, which again is probable cause of delaying onset of the treatment of the cancer patients.

10. Another interesting thing to note that 43% of the respondents know that it will take only either a few days or one to two weeks to complete the treatment of a cancer patient which again most probable cause of non-compliance to treatment by the cancer patients.

11. After the completion of treatment it is necessary to come for regular check-up/follow-up at a certain interval as advised by the Oncologists even in the disease-free condition. But only 13.33% of the respondents know this fact. This ignorance leads to a large number of drop out (lost to follow-up) cases.

12. Other information regarding cancer awareness programmes are as follows: -

a) Only 8.33% have faced any cancer awareness programme conducted by Govt. Organisation/NGOs/ other organisations.

b) Only 37.33% have listen to any cancer awareness programme conducted by the All India Radio.

c) Only 36.33% have seen any cancer awareness programme conducted by Doordarsan/any private Television channels.

d) Only 34% have read any cancer awareness articles in the newspapers/magazines.

e) Only 13% have seen any poster/hoarding regarding cancer awareness.

All these information reveal that there is huge lack of cancer awareness programmes in this region.

13. Most of the respondents (68.33%) have suggested to start cancer awareness programmes and rests of them 31.67% have suggested to give more facilities to cancer patients.

14. From the Pilot Survey it has been found that the average Knowledge Index (as defined in Methodology pp.-7) is 58.020 _ 1.768 irrespective of their socio-economic and personal status of the respondents.

Conclusion:

The basic level of cancer knowledge of the population is as important in controlling cancer as diagnostic tools, screening, and new approaches to prevention, early diagnosis and treatment. The survey is conducted in West Bengal where the overall literacy rate is 69.22% according to the Census

Table 26. Distribution of Respondents According to Their Suggestion to Our Government to do Something for the Cancer Disease

Answer	Number of respondents	Percentage (%)
To Conduct Cancer Awareness Programme	615	68.33
To do something other for the cancer patients e.g. better as well as less costly treatment etc.	285	31.67
Total	900	100.00

of India (Census of India, 2001) and West Bengal can be considered as a model village of India or in broad sense a model village of the developing countries where peoples are more or less ignorant about the facts with the dreadful disease like cancer. Even most of them do not know the primary symptoms of cancer. The data are based on a Pilot Survey. Therefore to draw any final conclusion it is necessary to go for a large scale survey with suitably sampling design and then there is immediate necessity to start population/ community based cancer literacy programme which aims at:

a) Creating public awareness about established risk factors of cancer as a Cancer Control Programme (e.g. tobacco eradication)

b) Creating public awareness about the symptoms of cancer for down staging.

c) Creating public awareness about the usual side effects of cancer therapy and to make them understand the importance of continuation of treatment despite the potentially curable side effects.

d) To create public awareness about importance of follow-up of cancer patients.

Acknowledgement

The authors are grateful to the respondents for spending their time to answer the questions.

References

Bennett CL, Stinson TJ (2000). Comparing cost-effectiveness analyses for the clinical setting: the example of the Gynaecological Oncology Group III trial. *Cancer Invest*, **18**, 261-8.

Bloom BS, Enoelhard M, Furst S, Hill W, Krathwhol DR (1956). Taxonomy of educational objectives. The Cognitive Domain, New York, Longman's Green & Co.

Caruso A, Di Francesco B, Pugliese P, Cinanni V, Corlito A (2000). Information and awareness of diagnosis and progression of cancer in adult and elderly cancer patients. *Tumori*, **86**, 199-203.

Census of India (2001). Series-20, West Bengal. Director of Census Operations, West Bengal.

Chakrabarti RN (1999). Knowledge, attitude and practice of rural people and cancer : An Observation: (Meeting Abstract): 2nd World Conference for Cancer Organisations. May 19-23, 1999, Atlanta Hilton & Towers, Atlanta, GA, USA, SC-03, p.117.

De D, Doshi S (1998). Rationale for selecting variables in social research : a Statistical Perspective. *Indian Science Cruiser*, **2**, 1-6.

Gregory T O'Conor (1980). Some Perspective In Preventive Oncology. *Ind J Cancer*, **17**, 1-6.

Halverson PK, Mays GP, Rimer BK, et al (2000). Adoption of a health education intervention for family members of breast cancer patients. *Am J Prev Med*, **18**, 189-98.

Hinton J (1999). The progress of awareness and acceptance of dying assessed in cancer patients and their relatives. *Palliative Med*, **13**, 19-35.

John D (1954). An Introduction to Social Research. Harrisberg Pa. Stackpole Press.

Mandal S, Basu PS, Ray K (1999). Multivariate Analysis of factors associated with non-compliance to treatment and follow-up of cancer patients in a Regional Cancer Centre in India. Conference Proceedings, XV Asia Pacific Cancer Conference (APCC), 12-15 December, 1999, WIA, Chennai, India, P2-010, p.125.

Mandal S, Ray K (1999). Pattern of treatment compliance in cancer patients at Chittaranjan National Cancer Institute. International Symposium on Cancer Control in Developing Countries: Symposium Proceedings, 10 December, 1999, Chittaranjan National Cancer Institute, Kolkata, India.

Mandal S, Ray K (2000). Pattern of compliance with treatment and follow-up of cervical cancer patients at Chittaranjan National Cancer Institute. Calcutta. *Asian Pac J Cancer Prev*, **1**, 289-92.

Mandal S, Sen AN, Kar S, Roy K, Hait A (2001). Distribution of cancer patients according to time taken from starting day of symptoms to reporting at a Regional Cancer Institute in Eastern India. *Asian Pac J Cancer Prev*, **2**, 1-6.

National Cancer Registry Programme: Biennial Report (Population Based Cancer Registries-1988-89), An Epidemiological Study. Indian Council of Medical Research.

Parvez T (1999). No cancer control strategy would be successful in developing world without public education: (Meeting Abstract) : 2nd World Conference for Cancer Organisation. May 19-23, 1999, Atlanta Hilton & Towers, Atlanta, GA, USA, SM-01, p.146.

Sen U, Sankaranarayanan R, Mandal S, Parkin DM, Siddiqi M (2002). Cancer Patterns in Eastern India : The First Report of Kolkata Cancer Registry, 1997-99. *Int J Cancer*, **100**, 86-91.

Sen U, Mandal S, Ghosh O (1999). A survey of tobacco habit prevalence in Calcutta: Conference Proceedings, XV Asia Pacific Cancer Conference (APCC), 12-15 December, 1999, WIA, Chennai, India, OP12-9, p.75.

Shankar S, Figueroa-Valles N (1999). Cancer knowledge and misconceptions: a survey of immigrant Salvadorean women. *Ethnicity & Disease*, **9**, 201-11.

Sherman EJ, Ruchin Hs et al (1999). Clinical economics of head and neck malignancies (Review). *Haematol-Oncol Clin of North America*, **13**, 867-81.

Shetty KH, Johnson NW (1999). Knowledge, attitudes and beliefs of adult South Asians living in London regarding risk factors and signs for oral cancer. *Comm Dental Health*, **16**, 227-31.

Siddiqi M, Sen U, Mandal S (1997). Hospital Cancer Registry Report. Chittaranjan National Cancer Institute Publication 1996.

Siddiqi M, Sen U, Mandal S (1998). Hospital Cancer Registry Report. Chittaranjan National Cancer Institute Publication 1997.

Thiemann KM, Frost MH, Thomson RA (1999). A multifaceted educational approach to increasing awareness and use of physician data query (PDQ). *J Cancer Education*, **14**, 78-82.

Trivedi G (1963). Measurement and Analysis of Socio Economic Status of Rural Families. Ph. D. Thesis, Division of Agril Extension, IARI, New Delhi.

Uche EE (1999). Cancer awareness among a Nigerian population. *Tropical Doctor*, **29**, 39-40.

Warnakulasuriya Ka, Harris CK, Scarrott DM, et al (1999). An alarming lack of public awareness towards oral cancer. *Br Dental J*, **187**, 319-22.