Original papers

Estimates of Induced Abortion in Urban and Rural Sri Lanka

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Abstract:

Objectives: To estimate the incidence of induced abortion during the year 1998. The present study quantifies for the first time, the extent of the problem of induced abortion in Sri Lanka.

Methodology: A survey was conducted among women 15 – 49 years old, living in 10,000 households sampled to represent the urban and rural populations of all provinces of the country, other than the Northeastern province. A total of 12,168 women were interviewed. This consisted of 94.2% of all women in the 15-49 age group, living in the households selected for the survey. The Randomised Response Technique was used to estimate the incidence of induced abortion during the year 1998. This method ensures anonymity in estimating induced abortion rates.

Results:

The abortion rate for the year was estimated to be 45/1000 women of 15-19 years of age (95% C.L 38/1000 – 52/1000), and 13/1000 population (95% C.L. 11/1000 – 15/1000). The total abortion rate was estimated as 1.6 (95% C.L. 1.06-2.18), for women of 15-49 years. For currently married women it was estimated to be 1.9 (95% C.L. 1.2-2.6).

Induced abortion rates were noted to be low among the unmarried, students and among the adolescent women. It was seen to be concentrated largely around the middle of the childbearing years. Married women, those with a low educational level and rural populations were noted to have higher rates of abortion. A high rate of abortion is resorted to space or limit families.

The study identifies sub groups in the population who need knowledge, motivation and quality service for the prevention of unplanned pregnancies.

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Introduction

Legislation in Sri Lanka allows the termination of pregnancy only to save the life of the mother. However, the practice of induced abortion is believed to be high and is perceived as a growing public health problem. No reliable national level estimates are available.

In a setting where laws are restrictive and abortion carries a social stigma, direct questioning has been shown to under-report the incidence (1). This has led to the development of mathematical demographic models and the application of indirect techniques for estimating the incidence of abortion. The Randomised Response Technique (RRT) is one such method (2). The method enables a respondent to provide truthful information on a sensitive question without revealing to the interviewer his status on the question.

In the present study, the RRT method was used to estimate the incidence of induced abortion in a sample of women 15-49 years of age, representative of urban and rural populations of all provinces other than the North-eastern province of Sri Lanka.

Methods

The study sample consisted of 12,913 consenting women 15 to 49 years of age, living in 10,000 households selected to represent the urban and rural populations of the seven provinces of the country, other than North-eastern province. A multistage cluster sampling procedure was used for selection of households, the cluster size being 50 households. The primary sampling unit was a Public Health Midwife (PHM) area except within the Colombo Municipality, where a electoral ward was used. Clusters were allocated to districts, urban and rural sectors within the district and then to MOH areas based on probability proportional to the size of the population. The PHM area within an MOH area was selected randomly. The eligible couples register of a selected PHM area was used to identify a starting address for a cluster. If the selected address was unoccupied the very next address on the register was substituted. The investigator was advised to proceed from the identified address to the one nearest and to the left, until she had identified a cluster of 50 households. For purposes of this study, a household was identified as a group of persons who cooked their food together.

Trained Public Health Midwives (PHM) were selected as interviewers. Data needed for identification of females eligible for study were collected from each household. Verbal consent was obtained from the women identified and confidentiality assured. The women who consented to participate were administered a brief questionnaire to collect socio-demographic information. The procedure for the Randomized Response Technique was explained to the respondents and was applied. The term "induced abortion" was explained to the respondent as a procedure of some kind, which a pregnant woman may carry out herself or have some other person perform in order to end her pregnancy. (Details of the Random Response Technique and the procedure for estimation are given as an annex to the paper).

Results

There were 45,142 people living in the selected 10,000 households. The age sex distribution of the household population is comparable with the age sex distribution of the household population obtained from the Demographic and Health Survey of 1993 (DHS, 93), indicating that the sample selected is representative of the population of the districts studied.

There were 12,913 women in the 15-49 year age group in the identified population, of which, 12,168 were interviewed giving a response rate of 94.2%. The 745 (5.8%) women missed at this stage were women who could not be met even after a second visit.

Table 1 describes the characteristics of the 12,168 women 15-49 years of age who were included in the survey. It is seen that the majority of persons were Sinhalese and living in rural areas.

Sixty seven percent of the study population were married, while 3.4 % were separated, divorced or widowed. Only 4% had never been to school while 46% had completed the General Certificate of Education (Ordinary Level), or studied to a higher level. Twelve percent of the study population were students and 23% were employed.

The RRT method failed in 311 persons (2.5%), out of which 0.9% did not know the month of their birth. These persons were excluded in estimating abortion rates. Method failure was higher among older women, less educated persons and among the rural. The highest failure rates were observed among the widowed, this probably being related to the increase seen in older age groups.

Table 1: Characteristics of the study sample

Age group		
15-19 years	1848	15.2
20-24 years	2128	17.5
25-29 years	2026	16.7
30-34 years	2010	16.5
35-39 years	1692	13.9
40-44 years	1378	11.3
45-49 years	1086	8.9
Ethnicity		
(Missing information = 2)		
Sinhala	10277	84.5
Tamil	661	5.4
Moor	1135	9.3
Burger	39	0.3
Malay	54	0.4
Sector		
Urban	2766	22.7
Rural	9402	77.2
Religion		
(Missing information = 4)		
Buddhist	9702	79.7
Hindu	432	3.6
Islam	1212	9.9
Christian / Catholic	811	6.7
Other	7	0.1
Marital status		
Married	8185	67.3
Unmarried	3569	29.3
Separated	198	1.6
Divorced	33	0.3
Widowed	183	1.5
Educational level		
(Missing information 16)		
No schooling	455	3.7
Primary	1518	12.5
Secondary	4602	37.9
G.C.E. O'Level	3749	30.9
G.C.E. A'Level	1683	13.8
Higher	145	1.1
Work status		
(Missing information 40)		
Full time student	1451	12.0
Employed	2830	23.3
Not employed	7847	64.7

Estimates of the proportion of women having an abortion during 1998, by age, marital status,

Box 1: Estimates of abortion for 1998

Abortion rate for 1998:

45/1000 women 15-49 years (95% C.L. 38/1000 - 52/1000)
13/1000 total population (95% C.L. 11/1000 - 15/1000)

Estimate of the total number of abortions during 1998:
(Rate applied to the estimated population of 18,774,000 for year 1998) :

= 240,055 (95% C.L. 201,388 – 278,184)
= 658 / day (95% C.L. 552 /day – 762 /day)

Abortion ratio : 741 abortions per 1000 live births
(95% C.L. 622 abortions per 1000 live births – 859 abortions per 1000 live births)

sector, level of education, employment and the number of living children are shown in Table 2.

The proportion of women 15-49 years of age having an abortion during 1998 was estimated to be 0.0447 (95% C.L. 0.0375-0.0518). It is seen that the estimates increase gradually with age up to the age group 35-39 years and then decreases in the 40-49 age group. The estimated rate is much less for unmarried women (0.012) compared to the currently married women (0.0569), and ever married women (0.0584) and is higher for the rural sector compared to the urban sector. The estimates for those who are still schooling is very low; the confidence interval of the estimate for this group is very wide, the lower limit being zero. It is observed that being employed does not increase the rate.

Estimates by educational level indicated the

Table 2. Estimated proportion of women having an induced abortion by socio-demographic characteristics in 1998

		Estimated proportion having an induced abortion	95% confidence limits Lower limit	Upper limit
Women 15-49 years		0.0447	0.0375	0.0518
Age group	15-24 years	0.0236	0.0125	0.0346
	25-29 years	0.0438	0.0264	0.0612
	30-34 years	0.0570	0.0385	0.0755
	35-39 years	0.0667	0.0458	0.0877
	40-49 years	0.0548	0.0380	0.0716
Marital status	Currently married	0.0569	0.0477	0.0661
	Unmarried	0.0120	0.0011	0.0229
	Ever married	0.0584	0.0493	0.0674
Sector	Urban	0.0331	0.0190	0.0472
	Rural	0.0481	0.0399	0.0563
Employment	Student	0.0091	0.00	0.0257
	Employed	0.0421	0.0274	0.0567
	Unemployed	0.0520	0.0428	0.0612
Education	No schooling + primary	0.0863	0.0644	0.1081
	Grades 6-9	0.0519	0.0400	0.0638
	>=O'levels	0.0260	0.0166	0.0355
Living children	Have a live child	0.0648	0.0550	0.0747
	2 or less children	0.0439	0.0334	0.0544
	3 or more children	0.0921	0.0744	0.1098

highest proportion among those with no schooling and those with less than 5 years of schooling. It is seen that the women who have a live child have higher estimates compared to women who do not have a live child and those with three or more live children had higher estimates than those with two or less. The trend seen with education may also be a reflection of the higher number of women with more pregnancies among the less educated. . It is however noted that the confidence intervals in most subgroups are wide.

Table 3 gives the estimated proportion of women having an induced abortion by province. The estimates for the provinces vary from 0.0290 (95% C.L.0.0173 - 0.0404) for the Western province to 0.0624 (95% C.L. 0.0390 - 0.0857) for the Sabaragamuwa provine. These values have to be interpreted with caution as the confidence intervals are wide for many of the estimates.

Table 3. Estimated proportion of women having an induced abortion by Province

Province	Estimated proportion having an induced abortion	95% Confidence Limits	
		Lower limit	Upper limit
Western	0.0290	0.0176	0.0404
Central	0.0488	0.0285	0.0691
Southern	0.0378	0.0200	0.0555
North Central	0.0561	0.0268	0.0853
North Western	0.0566	0.0349	0.0782
Sabaragamuwa	0.0624	0.0390	0.0857
Uva	0.0627	0.0330	0.0923

Table 4. Estimated Total Abortion Rate – All women 15-49 years

Age group	Estimated proportion having an induced abortion	95% Confidence Limits	
		Lower limit	Upper limit
15-24years	0.0236	0.0125	0.0346
25-29 years	0.0438	0.0264	0.0612
30-34 years	0.0570	0.0385	0.0755
35-39 years	0.0667	0.0458	0.0877
40-49 years	0.0548	0.0380	0.0716
Total Abortion	1.62	1.06	2.18

Abortions during the year 1998

Table 5. Estimated Total Abortion Rate – Married women 15-49 years

Age group	Estimated proportion having an induced abortion among currently married women	95% Confidence Limits	
		Lower limit	Upper limit
15-24 years	0.0474	0.0252	0.0697
25-29 years	0.0549	0.0339	0.0759
30-34 years	0.0628	0.0426	0.0830
35-39 years	0.0660	0.0437	0.0883
40-49 years	0.0526	0.0348	0.0703
Total Abortion	1.92	1.20	2.64

Conversion of the estimated proportion of women having an induced abortion during the year 1998 to actual numbers and to a meaningful index is useful (Box 1). Therefore, the total number of abortions, total abortion rate and abortion ratios were calculated.

The estimates obtained from the study were applied to the estimated population for the year 1998. The abortion rate for the year was estimated to be 13/1000 population (95% C.L. 11/1000 –15/1000 population). The total number of abortions that may have occurred in 1998 was computed using the crude rate. It is estimated that a total of 240,055 abortions, i.e. 658 abortions /day (95% C.L. 552 / per day – 762 /day) may have occurred in 1998. The use of age specific rates in the calculation would have yielded more accurate estimates, but this was not possible as the population data necessary was not available. The induced abortion ratio for the year 1998 was estimated to be 741 abortions per 1000 live births (95% C.L. 622 abortions per 1000 live births – 859 abortions per 1000 live births)

Total abortion rates were calculated for all women 15-49 as well as for currently married women using the age specific rates obtained from the study. In the extreme age groups where the estimates have a wide confidence interval the age groups were amalgamated for this calculation (Tables 4 and 5).

The Total Abortion Rate for women 15-49 years of age is 1.62 (95% C.L. 1.06-2.18). For currently married women, the rate is 1.92 (95% C.L. 1.20-2.164). The confidence limits for both these estimates are wide, a reflection of the small numbers in the sub groups used in the estimations. However, it is interesting to note that the rate for currently married women is as high as the Total Fertility Rate.

Discussion

There is no quantitative data that can be compared with the findings of the present study. The Annual Health Bulletin of Sri Lanka reports hospitalisation and hospital deaths due to abortions. These statistics include both induced and spontaneous abortions. In 1982, Kodagoda and Senanayake(4) reported a rate of 54 per 1000 population per year based on inquiry from health providers of all categories, in a suburban town situated about 100 km. north east of Colombo. Rajapaksa and Perera (5) using the RRT technique reported an incidence of 16 per 1000 married women between the ages of 15-49 years in a suburban population for the period 1988-1990. That study was however confined to one Medical Officer of Health area and is not comparable with the present estimates.

In an estimate of this kind the non-response rate is of primary importance. In the present study 94.2% of the women eligible for study were interviewed and the population identified is representative of the urban and rural populations of the districts in which the study was carried out. The failure rate for the RRT method (2.5%) is very low compared to failure rates of 29.6% in Taiwan and 21% in Turkey (6)(7). The low failure rates are probably a reflection of the high levels of literacy of the population. Although women in whom the method failed were older, had low levels of education and were living in rural areas, characteristics associated with higher abortion rates, their exclusion may not have biased the estimates to a great extent because of the small number of persons involved.

The estimates are based on the assumption that women would provide a truthful answer and that one twelfth of all births would fall in a given month. The RRT method has been tried out in many developed and developing countries and the feasibility and potential usefulness for estimating induced abortion has been demonstrated (7)(8)(9). The value of 0.083 used in this estimate as the proportion of women in the sample born in April is almost identical to the values of 0.0826 and 0.083 obtained from birth records in the studies reported by Abernathy et al (9) and Rajapaksa and Perera (5) respectively.

The data available from most countries (10) show that induced abortion is concentrated largely around the middle of the child bearing years. This inverted U shaped pattern is observed in the present study. This is probably because these age groups are more likely to be married, sexually active, fecund and have high pregnancy rates. The higher rates seen among the rural population compared to urban, are probably a reflection of differences in accessibility of family planning services. The data demonstrate the preference for small families and the findings suggest that abortion is resorted to space or limit families.

The study shows that the problem of induced abortion is a phenomenon seen predominantly within marriage. The higher rates seen for ever married women compared to the currently married is probably a reflection of the emerging problem of widowhood at relatively young ages and may need special attention in the future. The estimated rate for unmarried women is 12/1000 women 15-49 years of age. This rate reflects the low rates observed among students (9 per 1000 students) and those in the 15-24 year age group (24 per 1000 women 15-24 years of age). The low rates seen among adolescents are compatible with data from Asian countries (10). Although the rates for young and the unmarried are comparatively low, they reflect a sizeable number of young people who need protection from unwanted pregnancies.

The lower proportion of women estimated to have an induced abortion among those with higher educational attainment is probably because they are more successful in averting an unplanned pregnancy. This may reflect higher levels of knowledge, appropriate use and improved accessibility to modern methods of contraception, as well as, a shorter period of protection from an unwanted pregnancy due to delay in age at marriage. May be, they are more motivated to achieve a smaller family size because of higher opportunity costs of child bearing.

The study quantifies for the first time the extent of the problem in Sri Lanka. The figure probably includes women who had menstrual delays and thought that they were pregnant and therefore resorted to a method for induction of menstruation. However this percentage is likely to be low.

The total abortion rate, both for females 15-49 years of age as well as for currently married women in the age group is very high. This highlights the fact that induced abortion has probably played an important role in the reduction of birth rates observed in recent times.

More importantly, the study identifies the socio-demographic characteristics of women undergoing induced abortions and highlights the specific subgroups in the population who need knowledge, motivation and quality services for the prevention of unplanned pregnancies.

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Annexure: the RRT procedure

RRT technique

The randomizing device used was an opaque container with 30 small pink beads and 20 blue beads of the same size. The mouth of the container was wide enough to allow the respondent to pick a bead at random. The two questions used were "I was born in the month of April" and " I have had an induced abortion during the year 1998". The innocuous question was printed on blue paper and the sensitive question on pink paper.

The method was explained to the respondents in the following fashion. " This container has some beads in it. Shake it well, put your fingers in and take out a bead without looking inside. Just note the colour of the bead you have selected and keep it in mind. Do not tell me the colour or let me see the bead. After noting the colour please put the bead back in to the container. I have two questions here with me. One is written on blue paper and the other on pink paper. If you have taken a blue bead answer the "blue question" (the one written on blue paper) and if you have picked a pink bead answer the "pink question" (written on pink paper). Just answer "yes" or "no" to the appropriate question depending on the colour of the bead you have picked. I have no way of knowing which question you are answering. If you have understood the procedure, I will now place the two questions before you and read both questions to you.. If you have any difficulty, I can read the two questions to you again. Even when we analyze the data we cannot identify an individual. But from information collected from a large group of women, we can identify the percentage of women who may have said yes to any one of the questions. This survey will help us to decide what health workers can do about the problem of induced abortion. I assure you that there is no trick to it and there is no way in which we can identify which question you have answered". I can go over the procedure if you have not understood what you have to do.

The term "induced abortion" was explained to the respondent as a procedure of some kind, which a pregnant woman may carry out herself

or have some other person perform in order to end her pregnancy. After the above explanation the investigator would place the two questions before the respondents and read it out. The responses to the procedure were categorized as "yes", "no", "respondent does not know the month of birth" and "method failed due to other reasons".

Procedure for estimating abortions

The estimates were calculated based on the assumption that the women answered truthfully and that the proportion of women born in a given month was 0.0833, i.e. one in twelve. The formulae used for estimating the proportion of women reporting an abortion and its variance are given below (Abernathy et al 1970).

$$\pi_1 = \frac{\lambda - \pi_y (1-P)}{P}$$

Variance of π_1 = variance of λ / P^2

Where,

π_1 = The estimated proportion of women reporting an abortion in 1998

π_y = Proportion of women in the sample born in April

P = Probability of selection of the abortion question

λ = Proportion answering "yes" to the RRT question.