

Socio-cultural and Economic Determinants of Contraceptive Use in the Lao People's Democratic Republic

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The challenge will be to adopt IEC activities for minority groups, who currently express high levels of demand and the lowest levels of knowledge and use of contraception

There is a lack of detailed information about population issues in the Lao People's Democratic Republic. The available estimates are based on the results of the most recent national census, which was taken in 1985, and a multi-round survey of a sub-sample of the population conducted during the period 1988-1991 (Frisen, 1991; D'Souza, 1992; State Statistical Centre, 1993). No contraceptive prevalence survey has ever been undertaken on a large scale, although a limited demographic and health survey was carried out in one district of the Vientiane Municipality in 1991 (Foley and Vongsak, 1991).

With a total fertility rate of 6.7 children per woman and an annual population growth rate of 2.9 per cent (ESCAP, 1992), fertility in the Lao People's Democratic Republic is among the highest in the world. The total population was estimated at 4,469,000 in mid-1992, with a doubling time of only 24 years. Other important features of the country's population include ethnic diversity (about 68 registered ethnic groups), low density (18 persons per square kilometre), unequal distribution of settlements with a large majority living along the Mekong River, and low urbanization (under 20 per cent).

It seems that, at least in recent years, resources have not been able to meet the needs of the population: food has to be imported, and health, education and social services are generally inadequate in terms of quantity, quality and coverage. In view of this situation, there would seem to be justification for initiating a policy advocating control of population growth. However, population density is very low, a significant proportion of the people have emigrated as a result of previous hostilities, and the Government is concerned about the large population size of neighbouring countries. All these factors have resulted in the Government adopting a pro-natalist policy, although it is one that is in line with the country's potential for economic development (Robinson, 1989; UNFPA, 1988). Therefore, it is not fertility limitation but birth spacing that has recently been proposed and officially endorsed as part of a national policy to protect the health of mothers and children. Indeed, both maternal and infant mortality are at alarmingly high levels: around 6.5 and 117 per thousand live births, respectively (UNICEF, 1992).

Before preparing the details of a national birth-spacing programme, however, it was necessary to explore the demand for contraceptive services. This was done through a series of household surveys, interviewing women and their husbands about their actual and ideal family size, their knowledge of contraceptive methods and sources of supplies, and their current and potential use of contraception (Morris and others, 1981). This quantitative approach was complemented by a qualitative investigation of people's perceptions, attitudes and reactions about fertility and contraception, which will be detailed elsewhere (Escoffier-Fauveau, 1993), the main purpose of this article being to present the results of the household surveys.

For couples in the Lao People's Democratic Republic as well as elsewhere, the choice of having children or limiting or spacing births is based on a complex mix of interrelated factors. Not all of these factors are easily measurable. In this study, we have chosen six indicators to analyse the socio-cultural and economic determinants of contraception. They are: (a) place of residence (urban, semi-urban, rural), (b) ethnic group (three main groups), (c) perception of economic status by the interviewer (three groups), (d) years spent at school (a proxy for education), (e) possession of items of communication with the modern world (radio, television, bicycle, motorcycle) and (f) personal experience (number of living children). It was felt that, as an indicator, occupation or employment status would be too unreliable to assess under prevailing conditions, where almost everyone is involved in several income-generating activities; specifically, most people are engaged in agriculture in addition to other activities.

In this article, we examine the distribution of these factors with regard to knowledge of the fecund period during the menstrual cycle, knowledge of various contraceptive methods and their source of supply, ideal family size and composition, demand for limitation or spacing of births, ever- and current use of contraception, reasons for non-use or for stopping use, satisfaction with the currently used method, and readiness to pay for contraception.

General characteristics of the population

The Lao People's Democratic Republic is a land-locked country in the heart of Indochina bordered by China to the north, Myanmar to the north-west, Thailand to the west (with the Mekong River forming the border for over 1,500 km), Viet Nam to the east (with the Annamitic cordillera forming the border), and Cambodia to the south. The country is composed of 17 provinces, 12 of them bordering the Mekong River. Communication between the people and the capital city of Vientiane or between provinces is still very difficult if surface transport must be relied upon. Agriculture is devoted mainly to the production of rice, which is grown in flooded paddy fields in the valleys or on slopes in hilly areas. Hydro-power, timber and other forest products are the main exports.

A high proportion of the population (about 65 per cent) live along the Mekong River and in the lowlands. Referred to as "lowlander" in this article, these people are mainly "Lao Loum", or ethnic Lao of T'ai (Thai) origin. They are Buddhist and speak languages of the Thai group. The rest of the population, about 35 per cent of the total, are scattered in the country's vast hilly and mountainous areas. They are either "midlanders" from the "Lao Theung" ethnic group, mainly aboriginal animists speaking languages of the Mon-Khmer group, or "highlanders" from the "Lao Soung" ethnic group. The latter group includes several minorities originating from Myanmar, or parts of China; the are animists and speak languages of the Tibeto-Burman or the Miao-Yao groups. This simple classification of the population into three main ethnic groups is based on geographic and linguistic criteria. The proportions of the three ethnic groups comprising the population are about 50 per cent lowlanders, 40 per cent midlanders and 10 per cent highlanders, although these approximations vary considerably according to different reports and surveys, and also over time. Since the end of hostilities in 1975, there have been attempts to integrate various minorities and resettle whole villages in the lowlands, partly as an effort to reduce "slash-and-burn" agricultural practices.

With regard to health, traditional medicines (plants and plant products) are used mostly in villages and by ethnic minorities; in these settings, such medicines are always the first to be used by those seeking curative health care. Preventive health care is only slowly being implemented. As for public health services, these are under the responsibility of each province's health department. There are 17 provincial hospitals and about 120 district hospitals, the latter being inadequately equipped and poorly attended. As a result and especially since the liberalisation of the economy in 1989, the private sector has been flourishing, with pharmaceutical sellers and private practitioners being located practically everywhere.

Except for three pilot birth-spacing clinics in the capital, there is no way for couples to obtain government supplied family planning services. Abortion is illegal, and surgical sterilization is restricted to medically justified cases: for example, women must have at least five children to be allowed to undergo sterilization. Therefore, people who want to use a modern contraceptive must either purchase their supplies from the private sector locally, or cross the border to do so in a neighbouring country.

Data and methods

A household survey was conducted in seven provinces by the provincial maternal and child health (MCH) departments; the analysis of the data was centralized at the Institute of Maternal and Child Health in Vientiane. In most provinces, the provincial Lao Women's Union cooperated in these tasks, with financial support being provided by various non-governmental organizations (NGOs).

The objective of the survey was to explore the demand for contraception among the population potentially targeted by the forthcoming birth-spacing programme, and thus to compile baseline data for future evaluation. In view of the difficulties of accessing the remotest villages, the sample was drawn from a list of "reasonably accessible" villages in randomly selected districts of the seven provinces. (Except for Khammuone and Savannakhet provinces, most of the districts surveyed are not far from the Mekong River.) It is therefore likely that the population surveyed had a slightly better knowledge and higher use of contraception than the average of the general population. A list of 10 villages accessible in one day from district towns was randomly drawn in each of the surveyed districts. The choice of 20 families in each selected village was either systematic when a list of all the families was available, or random when there was no list.

The questionnaire was administered to one currently married woman of reproductive age in each of the selected households. In many cases, the husband also attended the interview and was encouraged to answer, but his presence was not required systematically if he was working outside the home. Each team comprised two female surveyors, at least one of whom was medically trained. After completion of the interview, the surveyors were encouraged to expand on the issues addressed during the interview, taking the opportunity to describe various contraceptive methods, to explain the practice of safe contraception and to rectify any wrong ideas about contraception. The supervisors' role also included a systematic review of the completed questionnaires at the end of each day in order to detect any error and code the answers.

Results

General characteristics of the sample population

A total of 4,154 currently married women of reproductive age were interviewed. They were scattered in 22 districts within the seven provinces; 54 per cent were living in rural areas, 23 per cent in semi-urban areas (small towns), and 23 per cent in urban areas (provincial capitals or the national capital, Vientiane). Of the total, almost 83 per cent were from the lowlander group, almost 13 per cent from the midlander group, and almost 3 per cent from the highlander group. Another 2 per cent (66 women) belonged to other or unspecified ethnic groups, including people of Vietnamese and Chinese derivation, most of whom were living in cities ([table 1](#)).

Table 1: General characteristics of the sample population in seven provinces of the Lao People's Democratic Republic, Fertility-Contraception Survey, 1993

	Percentage of total sample	Mean age (years)	Mean years at school	Percentage with no schooling	Percentage poor ^a	Percentage possessing items of communication ^b	
						None	1-3 items
Lowlanders (N=3,440)	83	30.6	4.5	15	35	23	35
Midlanders (N=532)	13	29.1	1.6	49	70	56	2
Highlanders							

(N=116)	3	29.9	1.4	64	56	29	4
Other and unspecified (N=66)	2	32.1	4.8	16	20	4	70
Urban (N=968)	23	31.7	6.2	9	20	8	53
Semi-urban (N=961)	23	30.4	4.4	13	31	23	23
Rural (N=2,225)	54	29.9	2.9	28	52	38	7
All (N=4,154)	100	30.4 ^c	4.0 ^d	20	40	27	22
Median		30.0	4.0				

Notes: a = Includes families judged "very poor" and "poor";

b = Either/or radio, television, bicycle, motorcycle;

c = Age range: 16-50 years; standard deviation 7.0;

d = Range: 0-18 years; standard deviation 3.3.

Mean age: The mean age of the women interviewed was 30.4 years (median 30; range 16-50 years), with 21 per cent being under 25 years and 31 per cent over 34 years (figure). On average, at the time of the interview, women from the minority groups were one year younger than lowlander women; urban women were almost two years older than rural women.

Figure: Age distribution of women in the sample Fertility-Contraception Survey, 1993



Source: Fertility and Contraception Survey in seven provinces of the Lao People's Democratic Republic, the MCH Institute, 1993.

Attendance at school: Twenty per cent of all women had never been to school, 64 per cent attended between one and seven years of school and 16 per cent attended school for more than seven years (mean years of school attendance: 4.0). On average, urban women had twice as much schooling as rural women. Midlander and highlander women had fewer opportunities to attend school. Thus, their average attendance was only 1.6 and 1.4 years, respectively, compared with lowlander women who had an average of 4.5 years of schooling.

Economic status: In the opinion of the interviewers, 9 per cent of all the women could be considered "very poor", 31 per cent "poor", 59 per cent "reasonably comfortable", and 1 per cent "rich". Greater proportions of midlanders (70 per cent) and highlanders (56 per cent) than lowlanders (35 per cent) were termed poor or very poor.

Possession of items of communication (radio, television, bicycle, motorcycle): Twenty-seven per cent of the entire sample had none of these items (56 per cent of that portion being midlanders), while 22 per cent had 3-4 items (2 per cent of them being midlanders and 4 per cent highlanders). Only 9 per cent had all four items of communication.

Nuptiality and fertility

Table 2 shows some characteristics of the sample grouped by ethnicity, residence, education and economic status. Midlander women and very poor women tended to marry one year earlier than the average age of marriage, i.e. 19.3 years, whereas urban and more educated women tended to marry one year later than the average.

Table 2: Fertility characteristics by selected groups, Fertility-Contraception Survey in seven provinces of the Lao People's Democratic Republic, 1993

Mean age at marriage	Mean no. of pregnancies	Mean no. of live births ^c	Mean no. of live children	Mean no. of deceased children	Mean ideal no. of children
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Lowlanders	19.4	4.8	4.1	3.6	.4	4.0
Midlanders	18.1	5.0	4.3	3.1	1.2	4.7
Highlanders	19.6	4.1	3.4	2.8	.6	4.2
Urban	20.5	4.6	3.8	3.5	.2	4.0
Semi-urban	19.1	4.8	4.2	3.7	.4	3.9
Rural	18.8	4.9	4.3	3.5	.8	4.0
No schooling	19.0	6.2	5.3	4.2	1.1	4.6
1-7 years	19.1	4.8	4.2	3.6	.5	4.0
8+ years	20.5	3.2	2.7	2.5	.2	3.7
Very poor	18.6	5.2	4.4	3.4	1.0	4.1
Poor	19.2	5.0	4.3	3.6	.7	4.1
Not poor	19.4	4.7	4.0	3.5	.4	4.1
All	19.3 ^a	4.8	4.1	3.5	.5	4.1 ^b
Median	19.0	4.0	4.0	3.0		4.0

Notes: a= Age at first marriage, range: 11-42 years, standard deviation 3.7;

b = Ideal number of boys, 2.05; girls, 2.03.

c = Estimated total fertility rate for the whole sample: 5.7 children per woman.

On average, women in the sample had had 4.8 pregnancies, 4.1 live births, and 3.5 currently living children. Midlander women were found to marry younger and on average have more births and more child deaths. Although highlander women tended to marry at the same age as the lowlanders, they had fewer births, and therefore fewer living children at the same age as lowlanders. These features need to be supplemented by a comparison of age-specific fertility rates and total fertility rates.

The total fertility rate estimated for the whole sample by the indirect Brass method (United Nations, 1983) was 5.7 children per married woman. Bearing in mind that the sample comprises women living in "accessible" villages, it is not surprising that their TFR is one point lower than the national estimate.

The mean ideal number of children that the respondents wanted was found to be 4.1, with insignificant variations according to residence or economic status. Educated women wished to have 3.7 children, whereas illiterate women wished to have over 4.6 children. Overall, there was no gender preference in the ideal family composition, but closer examination indicates that the ethnic Lao, the rich and the educated women expressed a slight preference for girls, whereas the poor, the illiterate and the women from minority groups expressed a slight preference for boys (data not shown).

Knowledge of fecund period, desire for subsequent births

With regard to knowledge of the fecund period and desire for subsequent births, only 14 per cent of the respondents seemed to know that the fecund period is in the middle of the interval between menstruations (table 3), while 23 per cent thought that their fecund period occurs immediately after menstruation; 58 per cent had no opinion about when that period occurred. Place of residence, economic status, possession of communication items and years spent in school, all made a difference as expected with regard to those having correct knowledge about the fecund period, but none of these factors made a significant difference among those who believed that the fecund period occurs just after menstruation. Also, personal experience, i.e. the number of living children, made no difference concerning this knowledge. Overall, 60 per cent of the respondents said they wanted no additional children (the "limiters"), 24 per cent wished to delay their next pregnancy (the "spacers"), and only 4 per cent wanted a child as soon as possible (table 4). Therefore, at least 84 per cent of the women surveyed are potential users of contraception, not taking into account the 12 per cent who were currently pregnant and were not asked to express their wish in this regard. The figure rises to 92 per cent among women who had already reached the "ideal family size" of four living children, and remains remarkably constant among the various groups, except for the highlander women who had relatively more "spacers" and fewer "limiters" (and also fewer currently pregnant women).

Table 3: Knowledge of relationship between fecund period and menstruation: Fertility-Contraception Survey of seven provinces of the Lao People's Democratic Republic, 1993

Selected variables/characteristics	Fecund period (percentages)			
	In the middle of the interval between menstruations	Immediately after menstruation	Before menstruation	Don't know
Urban	26	21	5	47
Semi-urban	13	24	6	57
Rural	9	23	4	64
Lowlanders	15	24	5	56
Midlanders	13	19	2	67
Highlanders	2	6	1	91
Very poor	6	12	2	80
Poor	11	22	3	65
Not poor	17	24	6	53

Possess no items	10	21	4	66
1-2 items	13	24	4	59
3-4 items	25	23	7	46
No schooling	8	21	3	69
1-7 years	12	24	4	60
8+ years	30	21	8	41
No living children	11	18	3	68
1-3 living children	15	25	6	55
4-6 living children	15	21	5	60
7+ living children	9	24	4	64
All	14	23	5	58

Table 4. Percentage of currently married women in seven provinces of the Lao People's Democratic Republic who wished to stop having children, to postpone next pregnancy, or to have a child as soon as possible: Fertility-Contraception Survey, 1993.

	Want no more children	Want to delay next pregnancy	Want to have a child as soon as possible	Currently pregnant
Lowlanders	63	22	3	12
Midlanders	58	27	6	10
Highlanders	45	30	19	6
Urban	61	27	3	10
Semi-urban	64	23	2	11
Rural	61	22	4	13
Very poor	60	22	4	14
Poor	61	22	3	14
Not Poor	62	24	4	10
No schooling	68	6	4	12
1-7 years	64	22	3	11
8+ years	45	38	4	13
No living children	5	18	29	48
1-3 living children	40	43	4	13
4-6 living children	87	5	0	7
7+ living children	91	2	0	7
Possess no items	57	25	3	15
1-2 items	61	23	4	12
3-4 items	61	27	3	9
All	60	24	4	12

Knowledge of contraception

Overall, 79 per cent of all the women surveyed had heard about at least one modern contraceptive method ([table 5](#); these figures include unprompted and prompted answers). More than half of the women knew about modern contraceptive methods such as daily and monthly pills, injectables, IUDs, or female sterilization. About 40 per cent had heard about condoms or vasectomy, and 15 per cent had heard about contraceptive implants, a method available only outside the country. The mean number of methods known (five in the whole sample, four when modern methods only are considered) was lower among illiterate, rural and isolated women. The number was lowest among the midlanders (two methods) and highlanders (1.5 methods) who combine all of these characteristics.

Table 5: Percentage of married women in seven provinces of the Lao People's Democratic Republic who knew about selected contraceptive methods (unprompted and prompted): Fertility-Contraception Survey, 1993

	Possession of items of communication			Ethnic group			Years at school			Residence			All
	0	1-2	3-4	Low	Middle	High	0	1-7	8+	Urban	Semi-urban	Rural	
Any modern method													79
Daily pill	52	69	88	76	28	19	46	72	83	87	74	58	65
Monthly pill	47	59	75	65	24	17	38	61	75	76	65	48	55
Injectable	48	65	87	72	22	19	42	67	82	86	72	52	60
IUD	37	57	82	64	21	17	33	59	80	82	65	42	53
Condom	30	44	73	51	18	16	23	47	71	75	49	31	43
Implant	12	14	30	19	7	1	7	18	23	27	22	10	15

Tubectomy	53	71	90	78	27	25	48	73	87	90	78	58	68
Vasectomy	27	36	62	43	14	8	19	41	53	64	42	26	36
Withdrawal	14	17	42	24	7	8	8	21	39	44	17	12	20
Periodic abstinence	21	30	59	37	11	12	16	33	57	61	29	23	31
Traditional	35	40	50	45	18	11	29	43	47	52	39	36	38
Know zero method	29	15	2	9	63	70	40	14	4	2	10	24	17
Mean number of methods known	3.7	5.0	7.3	5.5	2.0	1.5	3.0	5.2	6.9	7.5	4.8	4.1	5.0*

* Notes:

Mean number of modern methods known: 3.9. Percentages are not cumulative.

Of the women who knew at least one modern contraceptive method, 17 per cent said they would go to the nearest MCH clinic to obtain a supply ([table 6](#)), 32 per cent would go to the provincial hospital, 16 per cent to a private provider and 3 per cent to a provider abroad; 32 per cent did not know where to go. Overall, almost half of the potential users said they would go to the public sector to obtain contraceptives, which is an interesting finding in view of the absence of an official family planning programme in the public sector.

Table 6. Knowledge of the source of procurement of modern contraceptive methods (percentage of women who knew at least one modern contraceptive method: Fertility-Contraception Survey in seven provinces of the Lao People's Democratic Republic, 1993.

	Nearest MCH clinic	Provincial hospital	Private practitioner	Abroad	Don't know
Urban	9	53	18	2	17
Semi-urban	23	14	19	5	40
Rural	19	28	10	2	41
Lowlanders	18	32	17	3	31
Midlanders	10	20	7	0	62
Highlanders	16	47	11	0	26
Very poor	11	29	6	0	53
Poor	18	29	10	2	42
Not poor	18	33	17	4	29
Possess no items	17	28	10	1	44
1-2 items	16	30	16	2	36
3-4 items	17	40	20	5	18
No schooling	12	24	15	1	48
1-7 years	17	31	17	3	32
8+ years	18	42	15	4	21
All	17	32	16	3	17

The proportion of women who did not know where to go reached 41 per cent among the rural women, 44 per cent among those who did not possess any item of communication, 48 per cent among those who never attended school, 53 per cent among the very poor, and 62 per cent among the midlanders.

Practice of contraception

Ever use: When respondents were asked whether they had ever used a contraceptive method, 29 per cent of them said they had (32 per cent of them being lowlanders, but only 8 per cent midlanders and 5 per cent highlanders) ([table 7](#)). There were proportionally more ever-users among the urban than rural women, mature than young women, high parity than low parity women, better off than poor women, educated than illiterate women and, of course, among those who possessed items of communication (almost 50 per cent) than among those who did not. The most striking determinants of contraceptive use were ethnic group and economic status.

Table 7: Percentage of currently married women aged 15 to 49 years who had ever used and who were current users of contraceptive methods (both modern and traditional): Fertility-Contraception Survey in seven provinces of the Lao People's Democratic Republic, 1993

	Ever used*	Currently using*
Lowlanders	32	21
Midlanders	8	2
Highlanders	5	2
Urban	45	30
Semi-urban	36	25
Rural	18	11
15-24 years of age	14	9
25-34 years of age	31	20
35+ years of age	35	23
No living children	7	2

1-3 living children	26	18
4-6 living children	35	23
7+ living children	32	18
Very poor	8	3
Poor	19	11
Not poor	36	25
No schooling	13	8
1-7 years	30	19
8+ years	40	27
Possess no items	14	8
1-2 items	27	16
3-4 items	49	35
All	29	19
N =	1,185	774

* Notes: Percentage of all women interviewed in each subgroup.

Current use: Current users of contraceptive methods did not exceed 19 per cent of the sample (65 per cent of them being ever-users), and most of them were lowlanders, with the same determinants as for the ever-users (3 per cent "very poor" compared with 40 per cent "rich"). Only 2 per cent of the women with no living children were current users.

Most used methods: Overall, the most used methods among current users were the following, in order of popularity: female surgical sterilization (27 per cent of users, [table 8](#)), daily pill (21 per cent), periodic abstinence (16 per cent), monthly pill (13 per cent), injectable (11 per cent), IUD (7 per cent), withdrawal (2 per cent), condom, implants and traditional medicine (1 per cent each). There was only one case of vasectomy reported in the whole sample.

Table 8: Contraceptive methods used by current users (percentage of users only), Fertility-Contraception Survey in seven provinces of the Lao People's Democratic Republic, 1993

Methods	Number	% of users	% of total sample
Tubal ligation	210	27	5.1
Daily pill	165	21	4.0
Monthly pill	101	13	2.4
Injectable	87	11	2.1
IUD	50	7	1.2
Condom	5	1	.1
Implant	6	1	.1
Vasectomy	1	0	.0
Total modern methods	624	81	15.1
Periodic abstinence	119	16	2.9
Withdrawal	18	2	.4
Traditional plant preparations	13	1	.2
Total traditional	150	19	3.5
Total methods	774	100	18.6

The major determinants of female surgical sterilization were urban residence (proximity to the provincial hospital) and achievement of the desired family size; education and economic status did not discriminate ([table 9](#)). Economic status, however, did discriminate with regard to the use of oral contraceptives (both daily and monthly pills), poorer women making the most use of them. More users of injectables were found in rural than urban households and in households with no items of communication than in modern households.

Table 9: Modern contraceptive method mix used by current users: Fertility-Contraception Survey in seven provinces of the Lao People's Democratic Republic, 1993

	Residence			Living children			Ethnic group			Years at school			Socio-economic status			Possession of items of communication			All
	Urban	Semi-urban	Rural	0	1-3	4-6	7+	Low	Middle	High	0	1-7	8+	Very poor	Not poor	0	1-2	3-4	
Tubal ligation	38	40	25	-31	41	26	34	18	100	34	30	30	33	25	35	17	26	36	34
Daily pill	24	25	26	-32	22	23	26	27	0	34	24	35	33	33	25	26	27	29	25
Monthly pill	10	16	22	-15	14	25	16	27	0	21	19	9	33	25	14	28	20	11	17
Injectable	11	11	21	-14	15	9	13	18	0	11	16	11	0	10	15	24	19	9	15
IUD	12	7	6	-7	8	15	8	9	0	0	9	11	0	5	9	4	7	11	8
Condom	3	0	0	-1	0	3	1	0	0	0	1	1	0	1	1	0	0	2	1

Implant	1	1	0	-	1	1	0	1	0	0	0	1	3	0	2	1	2	1	0	1
Vasectomy	1	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

* Percentage of modern users only (N = 624).

Notes:

Sources of supplies: Forty-four per cent of users of modern contraceptives obtained their supplies from private pharmacies (data not shown); 24 per cent obtained them from sources abroad (neighbouring countries mostly for female surgical sterilization and implants), 21 per cent from government hospitals, and 8 per cent from private practitioners). Private pharmacies were the main source of oral pills, injectables and condoms, while IUDs were supplied and inserted in equal shares by government hospitals and private clinics.

The women who had used a contraceptive method but stopped using it were mostly users of daily oral pills, followed by injectables and monthly pills. The main reasons for stopping use were side-effects (46 per cent), desire to become pregnant (21 per cent), and expense (11 per cent).

Never use: Asked why they had never used contraception, 37 per cent said that they feared side-effects, 24 per cent of the women who gave a reason said that they were not aware of the existence of contraceptive methods, 22 per cent said that they did not mind being pregnant, 8 per cent said that they preferred not to interfere with natural events, 4 per cent said that contraceptives were too expensive, 3 per cent mentioned that they had personal health problems, and a mere 0.5 per cent spoke about their husband's opposition to contraception. Not surprisingly, the women who said they did not know about contraceptive methods were found mostly among the poor, illiterate, rural, isolated women and among the minorities (see [table 10](#)). The women who said that they feared side-effects were found mostly among the educated, urban, well-off, high-parity women and among those who were most exposed to the outside world. These data indicate a need to develop a better means of transmitting information to potential users through information, education and communication (IEC) programmes.

Table 10: Reasons for not using contraception among women who had never used it: Fertility-Contraception Survey in seven provinces of the Lao People's Democratic Republic, 1993

	Living children				Socio-economic			Years at school			Residence			Possession			Ethnic Group			All
	0	1-3	4-6	7+	Very poor	Poor	Not poor	0	1-7	8+	Urban	Semi-urban	Rural	0	1-2	3-4	Low	Middle	High	
Fear of side-effects	6	33	47	48	32	36	40	22	44	40	49	42	32	33	41	45	44	14	3	37
Did not know about contraceptive methods	20	23	27	26	44	25	20	43	20	7	6	19	32	33	22	6	17	54	56	24
Don't mind being pregnant	68	29	6	1	9	20	25	15	20	38	27	23	20	17	21	30	21	21	27	22
Other reasons*	6	15	20	24	15	19	15	20	16	15	18	15	16	16	15	19	18	12	14	17*

Notes: * = Other reasons include cost (judged too expensive, 4 per cent), let Nature decide (8 per cent), personal health problems (3 per cent), husband's opposition (0.5 per cent), and others (2 per cent).

Percentage of those who expressed a reason.

Asked whether they were ready to pay for obtaining a regular supply of contraceptives, 76 per cent of the respondents said they were ready, a fact that should be taken into account when deciding whether contraceptive services in the public sector should be for a fee or not. The proportion of those ready to pay rose to 93 per cent among the Lao Loum (compared with 56 per cent among the Lao Theung and 61 per cent among the Lao Soung), 89 per cent among the urban women, 93 per cent among the most educated, and 97 per cent among the rich and among those with 3-4 items of communication.

A set of sensitive questions about voluntary pregnancy termination produced results that need to be interpreted with caution. Asked whether they knew of neighbours who had voluntarily terminated a pregnancy, 16 per cent of the women who gave an answer (544 women out of 3,401) said they knew at least one such woman (13 per cent knew more than one). Urban women were more likely to have known such women than rural women (22 per cent versus 11 per cent).

Asked whether they ever had a voluntary pregnancy termination themselves, only 3 per cent of the 4,070 women who responded said they had. These 139 women were mostly Lao Loum, urban, well-off, educated, aged over 35 years, possessing 3-4 items of communication, and having over four living children. The methods used were aspiration and curettage in a private clinic for 55 per cent of the cases, followed in frequency by curettage in a government hospital (20 per cent) and traditional methods (13 per cent). These figures, probably largely underestimated, indicate that these induced abortions were performed as family-limitation procedures on women who could afford to pay for the procedure. (The authors remain doubtful about the number of induced abortions performed on young unmarried women and those carried out in remote areas).

Breast-feeding is traditionally considered the most important factor responsible for birth spacing. When asked whether they were still breast-feeding their youngest child, 97 per cent of the 2,015 women who responded said that their last child was breast-fed (33 per cent exclusively, and 64 per cent partially). These proportions were remarkably constant across educational, socio-economic and residential groups. The absolute level of these figures,

however, cannot be interpreted in the absence of information on the age of their youngest child.

Discussion

The sample of women interviewed in this survey represent women who will be "reasonably accessible" in the forthcoming birth-spacing programme; therefore, contraceptive knowledge and use are likely to be slightly greater than would be the case in a nationally representative sample. This is confirmed by a comparison of the relative proportions of urban and rural women in this survey and in national survey samples. The proportion of rural women in this survey was 54 per cent versus 77 per cent in a recent national survey (State Statistical Centre, 1993). Similarly, the proportion of ethnic minorities in this survey did not exceed 19 per cent, whereas the results of the last population census in 1985 indicated that such groups comprise between 30 and 40 per cent of the total population (Frisen, 1991). Bearing these points in mind, the following main lessons can be extracted from the present survey.

Among the "accessible" women of the Lao People's Democratic Republic, there is generally a consistent desire for families of four children with no gender preference, which is smaller than the average total fertility rate of the country. This situation is typical of early transition Asian societies. However, most women wish to reach their desired family size as soon as possible while they are still young, and then stop having children, which is not in harmony with the proposed policies to promote delayed child-bearing and birth spacing.

About one-fourth of all women and more than half (52 per cent) of those who expressed an opinion thought that their fecund period occurs immediately after menstruation. This belief has important implications with regard to fertility and for the need to provide correct information to clients as part of the forthcoming birth-spacing programme.

At least 84 per cent of the women are potential users of contraception, either because they have already reached their ideal family size (the "limiters"), or because they want to delay their next pregnancy (the "spacers"). The most likely targets for the birth-spacing programme are urban women with high education and low parity, as well as minority women. The demand is therefore considerable, and spread over all socio-economic groups. Less than one-fourth of this demand is met by modern contraceptive methods. The demand for spacing births, i.e. less than 25 per cent of all women, is much smaller than the demand for limiting births, with a relative clustering among minorities, urban and educated women, and those with one to three living children.

More than half of the women had heard about the five main modern contraceptive methods, such as daily and monthly pills, injectables and IUDs; female sterilization was the best known of all the methods. About 40 per cent had heard about condoms and vasectomy, and 15 per cent about implants.

About 50 per cent of those who knew about modern contraceptives said that they would go to the public sector to obtain them, which is surprising since at that time there was no established birth-spacing programme in most provinces. This indicates the existence of a *de facto* contraceptive delivery system in hospitals, focused mostly on clinical methods, IUD insertion and surgical sterilization. It is ethnic group, followed by school education and opportunities for communication with the outside world (through radio, television, or access to personal transport), that seem to be the best determinants of women's knowledge about contraception. Therefore, illiterate, isolated and minority women would comprise key targets for IEC activities, provided that such women can be reached by appropriate media.

About 30 per cent of all women interviewed had ever used contraception, and 15 per cent were current users of modern methods (almost all of them lowlanders). This is consistent with a contraceptive prevalence rate for modern methods of 18 per cent in the semi-urban district of Xay Thany reported in 1991 (Foley and Vongsak, 1991). The most popular modern methods used are female surgical sterilization, followed by daily and monthly pills, and injectables. The majority of these methods were obtained from the private sector and abroad (for surgical sterilization).

The survey revealed the popularity and availability of the Chinese monthly oral pill, which ranked third in current contraceptive use. This combination of a long-acting oestrogen (3 mg quinestrol) and a regular progestogen (12 mg norgestrel) shares the side-effects, complications and contraindications of other daily oral pills, but involves fewer user failures. Although this method has not received legal endorsement from the national health authorities, it cannot be overlooked in view of its popularity (Escoffier-Fauveau and Phimmasone, 1994). In any case, this additional pill increases the already broad range of contraceptives available to Lao couples, and contributes to ensuring continuation through several possibilities of switching methods. This is in sharp contrast with neighbouring countries where dominant birth-limiting methods are proposed either by Governments (IUD in Viet Nam, sterilization in China) or by the private sector (abortion in Cambodia). It is interesting to note that in the case of the Lao People's Democratic Republic this broad choice of contraceptive methods is due exclusively to the private sector. The forthcoming national birth-spacing programme will offer the daily pill, condom, IUD and injectables.

The main reasons the women had for not using contraception were fear of side-effects (37 per cent), followed by ignorance of contraceptive methods (24 per cent), which indicates the need to develop appropriate information programmes. The challenge will be to adapt IEC activities for minority groups, who currently express high levels of demand and the lowest levels of knowledge and use of contraception.

The question about the main reasons for not using contraception, however, did not allow for an open statement of opinions, and therefore the information obtained remains incomplete. The results of a concomitant qualitative study of fertility indicate that the most important determinants of contraceptive use also have to do with the availability and accessibility of modern methods, the degree of female autonomy, and the level of child mortality (Escoffier-Fauveau and Phimmasone, 1994).

A clear relationship between the contraceptive use rate and fertility does not emerge from this survey, first because total fertility rates were not measured and second because the number of births, by ethnic group, are not comparable:

highlander women tend to be younger and marry later than lowlanders.

In conclusion, the household survey on fertility and contraception presented in this article is the first of its kind conducted on a large scale in the Lao People's Democratic Republic. It reveals a high level of demand for contraception and a low rate of contraceptive use among couples who have reasonable accessibility to potential information and services. The survey will serve as a useful guide not only for developing the forthcoming birth-spacing programme, but also as a baseline against which to monitor and evaluate it.

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Ethnic Mosaic of Modern China: An Analysis of Fertility and Mortality Data for the Twelve Largest Ethnic Minorities

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There are major variations in fertility and mortality patterns among the ethnic populations in China, mainly owing to different stages of economic development

Modern China consists of a population with diverse social, cultural, religious and linguistic backgrounds. The uniqueness of these groups constitutes a mosaic of people who add to the ethnic diversity of the world's most populous country.

In recent years, interest in the study of China's minority nationalities has increased substantially, particularly since the end of the Cultural Revolution in the mid-1970s (see, for example: Eberhard, 1982; Heberer, 1989; Moser, 1985). Numerous studies have been undertaken, both nationally and internationally, utilising the 1982 census data for ethnic minorities (see, for example: Poston and Jing, 1987; Zhang, 1984). Such studies were not possible previously because of the paucity and the suspect quality of data from earlier censuses and population surveys.

The census identifies 58 ethnic groups varying in population size from a few thousand to more than 15 million. It was decided to limit the scope of this article to the 12 largest groups, all of which had populations of 2 million or more persons each. Data for the majority Han people and the total population of China have also been used for comparative purposes, wherever appropriate.

Data and methods

The data presented in this article were taken from the published first volume of the 1990 census tabulations (China State Statistical Bureau, 1993). This volume contains 34 tabulations pertaining to various aspects of the demography of the ethnic minorities in China. The tables and figures included in this article are based on data derived from some of those tabulations, except for the 1982 census data which were taken from the relevant census publication (China State Statistical Bureau, 1985).

No adjustments were made to the age and sex data. The 1990 census table 3.29 provides data on births registered over three six-monthly periods ending on 30 June 1990, so it was essential to estimate the annual number of births. For this purpose, two methods were considered to overcome problems related to recall lapse, as the accuracy of data is inversely related to the length of the reference period. The first method involved calculating two-thirds of the total births over this period. In the second method, births during six months prior to the census were doubled. When comparing the two methods, it was noted that, for the majority of groups, the estimated number of births using the first method was between 2 and 8 per cent higher, except for the Zhuang, Yao and Tujia, where the figures were 13 to 15 per cent higher. The difference in the two estimates for the Man was very slight, i.e. less than 0.2 per cent. For the Weiwuer, on the other hand, the estimate, using the first method, was 7 per cent lower. Although the first method is based on a relatively longer reference period and therefore subjected to a higher incidence of recall lapse, the estimates using this method, contrary to expectations, were generally higher. All fertility analysis in this article is based on data derived using the first method.

Unlike the data on births, mortality data were available for a 12-month period only. Although the quality of mortality data for six months prior to the census is considered to be more accurate, census table 3.33, which gives a cross classification of deaths by age, sex and nationality, provided only aggregated data for mid-1989 to mid-1990, and therefore, similar analysis as for fertility was not possible. The authors realize that the estimates of mortality derived from these data are somewhat under-estimated.

Although the estimated population on 1 January 1990 should have been used as the denominator for the fertility and mortality rates, actually the reported census population as on 1 July 1990 was utilized. This means that the fertility and mortality rates presented are slightly under-estimated.

Preliminary analysis of the data revealed some differences between the age distributions of various ethnic groups. In order to minimize the effect of these differences on birth and death rates, it was deemed essential to standardize fertility and mortality rates for various ethnic groups. Two standardization procedures, namely the direct and the indirect methods, were both used (Pollard, Yusuf and Pollard, 1990). The total population of China was taken as the standard when calculating the age-adjusted rates using the direct method of standardization. Age-specific fertility and mortality rates for the total population of China were taken as the standard in the computation of standardized fertility (or mortality) ratios using the indirect method of standardization.

Provisional life tables, for both males and females, were prepared for various ethnic groups, for the total population and for the total of all ethnic groups combined. No attempt was made to smooth any random fluctuations in the age-gender specific death rates derived from the appropriate 1990 census tabulations.

Findings

Size, growth and age structure

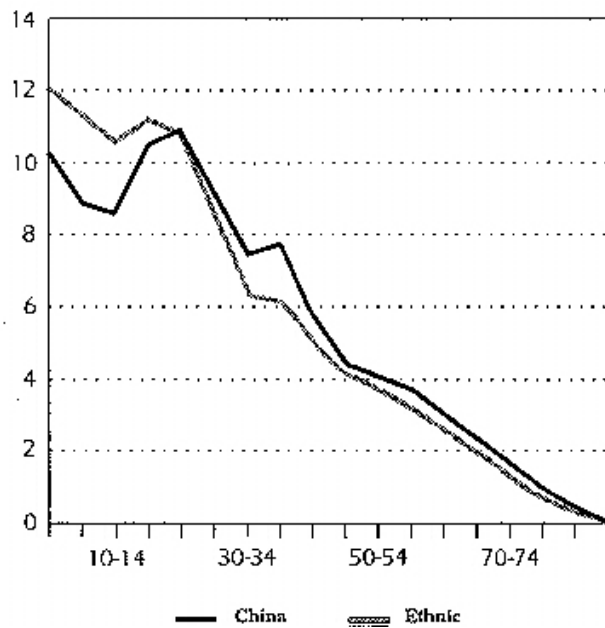
According to the 1982 census, the minority nationalities consisted of 67 million people and accounted for 6.7 per cent of the total population of China. The recently released figures from the 1990 census show that during the last eight years the population of ethnic minorities increased to more than 91 million and now accounts for 8.7 per cent of the national population. The 12 minority groups identified in table 1 account for nearly 85 per cent of the total population of ethnic minorities enumerated in the 1990 census.

Table 1: Some demographic parameters for ethnic groups: China, 1990

Ethnic group	Population 1990 census (thousands)	1982-1990 growth rate (% p.a.)	1990 sex ratio	Population (%)		
				0-14	15-54	55+
China	1,130,511	1.5	106	28	60	12
Han	1,039,188	1.3	106	27	60	13
Ethnic minorities	91,323	3.8	105	34	56	10
Selected ethnic minorities	77,499	4.0	105	34	56	10
Zhuang	15,556	1.9	104	34	55	11
Man	9,847	10.3	109	31	60	9
Hui	8,612	2.2	103	32	58	10
Miao	7,384	4.8	108	35	56	10
Weiwuer	7,207	2.4	104	39	51	10
Yi	6,579	2.3	104	35	55	10
Tujia	5,725	8.8	111	30	59	11
Mongol	4,802	4.3	99	36	57	8
Zang	4,593	2.1	98	36	53	11
Buyi	2,548	2.3	103	34	56	11
Dong	2,509	7.1	112	32	57	10
Yao	2,137	5.3	109	37	54	9

The intercensal growth rate of the minorities was more than two and a half times that of the national average and about three times that of the Han people. Half of the selected minority groups had growth rates in excess of 4 per cent per annum. The highest rate observed was among the Man people, whose rate, if correct, indicates a doubling of their population once in every seven years. Some of these extraordinarily high rates could possibly emanate from the increasing tendency among the minority groups to reveal their ethnicity in the recent censuses. This phenomenon has been referred to as the "explosion of ethnicity", whereby people are now more ready to identify with their ethnic groups than they were in the past. With the increasing recognition of the role and importance of ethnic minorities by the people and Government of China, this is a plausible explanation, at least for part of the relatively high growth among ethnic groups other than the Han.

Figure 1: Proportionate age distributions for the total population of China and of 12 selected ethnic groups

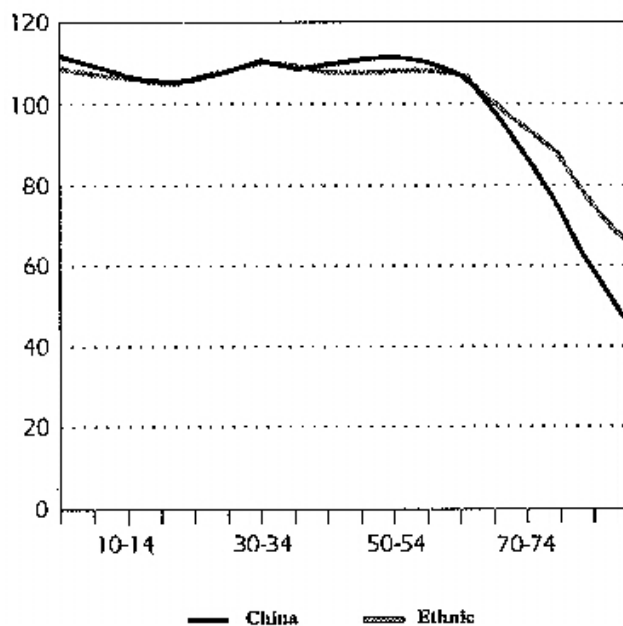


Source: 1990 Census of China

The higher growth rates among ethnic minorities are also substantiated by figure 1, which shows that in percentage terms there were many more younger people (0-24 years old) in the ethnic groups than in the total population, whereas the reverse was true for those aged 25 and older. This is also corroborated by the age data presented in table 1 .

The age-specific sex ratios for all of China and for the 12 ethnic groups combined are shown in figure 2. It appears that up to age 60 sex ratios were very similar and that there was an excess of males over females. At age 60 and older, the reverse was true. This is usually because of the increasing gap between the longevity of males and females. Although the quality of age reporting among the Han people is known to be generally good, this may not necessarily be true for the ethnic minorities. For example, substantial misreporting of ages among the older people in Xinjiang has been noted (Coale and Shaomin, 1991).

Figure 2: Age-specific sex ratios for the total population of China and 12 selected ethnic groups



Source: 1990 Census of China

The overall sex ratios of the Han people and of the ethnic minorities, as a whole, were quite similar (table

1). There were, however, some noticeable differences in sex ratios among the 12 ethnic groups. Five of these groups showed significantly higher sex ratios while two groups (Mongol and Zang) revealed a slight excess of females over males. It is not clear whether the excess of females in these groups is because of substantially higher male mortality or the exodus of males to other parts of China. These fluctuations in sex ratios could also be due, at least partly, to the sex differentials in the completeness of census enumerations among various ethnic groups.

Table 2: Population concentration of selected ethnic groups: China 1990

Ethnic group	Highest concentration		Next highest concentration		Other areas
	Province	%	Province	%	%
Zhuang	Guangxi	91	Yunnan	6	3
Man	Liaoning	50	Hebei	18	32
Hui	Ningxia	18	Gansu	13	69
Miao	Guizhou	50	Hunan	21	29
Weiwuer	Xinjiang	99			1
Yi	Yunnan	62	Sichuan	27	11
Tujia	Hunan	31	Hubei	31	38
Mongol	Inner Mongolia	70	Liaoning	12	18
Zang	Xizhang	45	Sichuan	27	28
Buyi	Guizhou	97	Yunnan	1	2
Dong	Guizhou	56	Hunan	30	14
Yao	Guangxi	62	Hunan	21	17

Minority nationalities in China live in border or mountainous provinces (Poston and Jing, 1987). Data presented in table 2 affirm this except for three ethnic groups, namely the Hui, Tujia and Zang, which are quite scattered. For the remaining nine ethnic groups, 50 per cent or more of their population is concentrated in one province. The Weiwuer is the least segregated of the groups. Almost all of them are situated in Xinjiang Autonomous Region. They are followed by the Zhuang, with 91 per cent in Guangxi Province. The most geographically separated are the Hui, with only 31 per cent in Ningxia Autonomous Region and Gansu Province; the rest are scattered all over China. Some authors have argued that, unlike many other minority nationalities, this is probably because the main distinguishing characteristic of the Hui is their religion, Islam, otherwise in terms of their physical and other attributes they are similar to the majority Han people (Gladney, 1991; Heberer, 1989; Moser, 1985).

Fertility

In 1990, the crude birth rate (CBR) among the Han was about 20 per thousand and the average rate for all ethnic minorities was nearly 24 births per thousand population per annum. Thus, overall the CBR of the latter was 20 per cent higher than that of the former. Table 3 shows that the CBR of various ethnic groups ranged between 19 and 34. The lowest rate was observed among the Man people, which was even lower than that of the Han, and the highest rate was among the Weiwuer: a CBR in excess of 34.

Table 3: Some fertility indices for ethnic groups: China, 1990

Ethnic groups	Crude birth rate	Age adjusted rate	Total fertility rate	Percentage literate women (15+)
China	20.06	20.06	2.16	68
Han	19.74	19.65	2.10	69
All ethnic minorities	23.72	25.25	2.81	58
Selected ethnic minorities	23.52	25.07	2.79	59
Zhuang	22.25	24.22	2.65	67
Man	18.80	17.37	1.86	84
Hui	22.96	23.09	2.50	57
Miao	24.13	27.13	2.99	41
Weiwuer	34.17	40.88	4.90	71

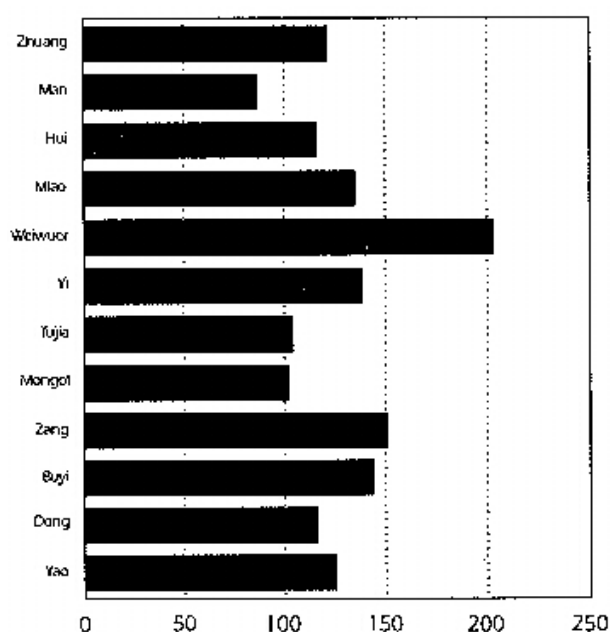
Yi	25.16	27.59	3.01	35
Tujia	20.03	21.32	2.32	63
Mongol	21.00	20.28	2.20	77
Zang	26.70	30.81	3.69	18
Buyi	25.15	29.61	3.41	38
Dong	21.51	23.18	2.51	56
Yao	22.42	24.75	2.70	57

Note: The age adjusted rates were calculated by the direct standardization procedure which involved using the age distribution of the total population of China as the standard.

Because of the inter-group differences in the age distributions, two standardized measures of fertility were calculated: the standardized fertility ratio (SFR) and the age-adjusted birth rate. The SFR is defined as the ratio of the actual to expected number of births, the expected number being estimated under the assumption that the age-specific fertility rate (ASFR) for the total population of China (used as the standard) would prevail in each ethnic group. On the other hand, the age-adjusted birth rate is the expected CBR in the standard population if it experienced the ASFR of a particular ethnic group.

The SFRs for the Tujia and Mongol people were statistically not different from those of the total population (figure 3). The Man people had an SFR which was lower than that of the standard population. The highest SFR was recorded for the Weiwuer, whose fertility level was twice that of the total population.

Figure 3: Standardized fertility ratios by ethnic group



Source: 1990 Census of China

The age-adjusted birth rates given in table 3 corroborate the above-mentioned findings. It may be noted that these rates were generally higher than the crude birth rates, which is mainly because of the effect of younger age structures of the ethnic groups vis-a-vis the standard. Exceptions were the Man and Mongol people whose age-adjusted rates were lower than their crude birth rates.

The total fertility rate (TFR) for women of the Han majority was 2.1, which declined from a figure of 2.6 recorded in the 1982 census (Zha and Ji, 1984). This decline may largely reflect the effectiveness of the national family planning programme. For the minority nationalities overall, the TFR was significantly higher at nearly three children, with the Weiwuer recording the highest at about five. Each of the other groups, except the Man, had a higher TFR than that for the whole country, thus pointing to a relatively much higher potential for population growth among the non-Han segments of China's population.

Initially, minority groups were, for the most part, exempt from the population policy in force for the rest of the population. However, in 1982 authorities agreed that they should be involved in the national family planning programme and by 1984 stated that the one-child family should be encouraged for minorities of one million or more people, while other groups were allowed to have two children per family. Moreover, according to a directive issued in 1985, minorities with one million or more people were requested to conform to the one-child policy (Gladney, 1991). In fact, in 1986, only two-thirds of the minorities adhered to family planning policies compared with nearly 100 per cent of the Han (Heberer, 1989).

Apart from the knowledge and use of contraception, many other factors could account for the observed fertility differentials between the Han and various minorities. At a macro level it is relative social and economic development which is important, while at an individual level, factors such as age at marriage, literacy and religion are crucial.

In his analysis of marriage patterns from the 1987 One-per-cent Survey, Zhang (1990) noted that the age at first marriage among a number of minority groups was substantially lower than that of the Han. This obviously has implications for fertility and mortality patterns, as well as the growth rate of the populations being studied. Moreover, Xiong and Yang (1989) also noted substantial ethnic differentials in fertility in the 1982 census, particularly among the younger Yi women. They also noted that remarriage rates of ethnic minorities were higher.

When comparing the proportion of women over 15 years who were literate, major differences were found between the Han population and the minority groups (table 3). Just over two-thirds of Han women were literate, whereas for women of all ethnic minorities this figure was 58 per cent. The Man and Mongol women represented a very high literacy rate of 84 and 77 per cent, respectively. In contrast, low rates were noted for Miao at 41 per cent, Yi at 31 per cent and a very low 18 per cent for Zang women. The literacy rate among Weiwuer seems unusually high and needs further investigation. A comparison of 1990 figures with those of the 1982 census would be useful to assess any changes in literacy levels.

The census does not provide information about religion. The fact that some minorities can be identified with certain religious groups means it is possible to study the relationship between religion and demographic behaviour. For example, although both the Hui and Weiwuer nationalities are followers of Islam, in terms of their social and economic characteristics the Hui are probably closer to the Han than to the Weiwuer. Similarly, the fertility levels prevalent among the Hui were not substantially different from those for the Han in spite of the fact it has been claimed that "the Hui are often allowed to have at least 1 child more than their Han neighbours" (Gladney, 1991). On the other hand, the fertility levels observed among the Weiwuer were significantly higher compared with the Han and all other ethnic groups. This negates the hypothesis that religion is an important determinant of fertility levels prevalent among ethnic minorities in China.

Table 4: Some mortality indices for ethnic groups: China, 1990

Ethnic groups	Crude death rate	Age adjusted rate	Sex ratio of deaths
China	6.23	6.23	120
Han	6.18	6.12	120
All ethnic minorities	6.88	7.52	117
Selected ethnic minorities	7.89	7.36	116
Zhuang	6.21	6.52	109
Man	4.53	5.55	148
Hui	5.38	5.89	121
Miao	7.50	8.20	111
Weiwer	8.60	8.30	120
Yi	8.45	9.76	111
Tujia	6.98	7.44	115
Mongol	5.78	8.48	138
Zang	8.92	9.44	103
Buyi	8.64	10.10	110
Dong	6.77	7.37	119
Yao	6.93	7.68	122

Note: The age adjusted rates were calculated by the direct standardization procedure which involved using

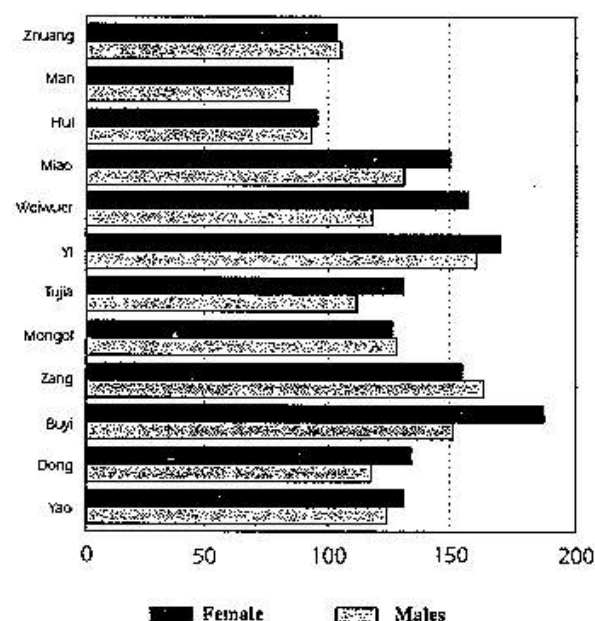
the age distribution of the total population of China as the standard.

Mortality

The overall levels of mortality, expressed in terms of the crude death rates, were substantially higher among ethnic minorities compared with the Han (table 4). Significant mortality differences were also evident within the various ethnic groups. For example, the Man experienced the lowest mortality rates, even lower than those of the Han, while the highest mortality was noted among the Zang and Buyi people. The age-adjusted death rates were, in most ethnic groups, higher than the crude death rates, reflecting the effect of differences between the age-sex distribution of the standard population and those of various ethnic groups.

The gender-specific standardized mortality ratios (SMRs) reveal two very interesting points (figure 4). Firstly, they show that the mortality levels among the Zhuang and Hui were not significantly different, while those of the Man were significantly lower and those for other groups were significantly higher compared with the standard. Secondly, there were practically no gender differences in SMRs for three ethnic groups, the Zhuang, Man and Hui, which were characterized by mortality rates similar to or lower than those of the standard, while for the majority of the remaining groups, female mortality was substantially higher. This may have been due to higher levels of maternal mortality resulting from unhygienic conditions and lack of modern child-birth facilities (Xiong, 1989).

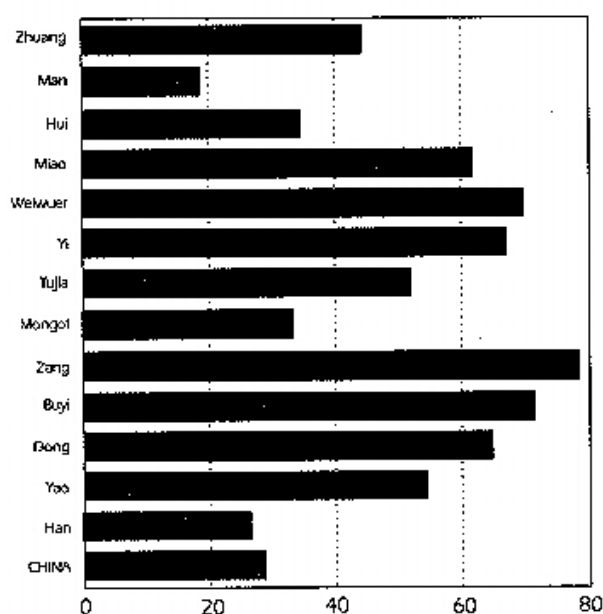
Figure 4: Standardized mortality ratios by gender and ethnic group



Source: 1990 Census of China

The infant mortality rate (IMR) for the whole of China in 1990 was 28.7 per thousand live births. The corresponding figure for 1981 was 38.6 per thousand (Wang, 1984), which means a decline of nearly 26 per cent over the intercensal period. Among the ethnic groups studied (figure 5) the level of infant mortality was substantially higher, except for the Man whose IMR was lower and the Hui and Mongols who experienced rates similar to the national average. The highest rate was found among the Zang, followed by the Buyi, Weiwuer, Yi, Dong and Miao & Aring; all showing rates nearly double those of the Han people.

Figure 5: Infant mortality rates by ethnic group: China



Source: 1990 Census of China

Infant mortality is a good indicator of the level of social and economic development, and is affected by factors such as the availability of public health facilities, particularly maternal and child health services; adequacy of nutrition; education; and cultural practices regarding the value of children. Because of the close relationship between fertility and infant mortality observed in many developing countries (CICRED, 1975), it is possible that the higher fertility levels among ethnic groups in China could be explained at least partly by the relatively high infant mortality experienced by these groups.

The comparison of life tables for the total population, based on the 1982 census (Jiang, Zhang and Zhu, 1984) and the provisional life tables prepared by the authors for the 1990 census (table 5), reveals an increase in life expectancies at birth of 2.7 years for females and 2.2 years for males. Provisional life tables for all ethnic minorities combined, based on 1990 census data (table 6), show that the average difference in life expectancy at birth between ethnic groups and China as a whole was 4.1 years for females and 3.4 years for males. In the absence of corresponding life tables for 1982, it is not possible to comment on improvements in the mortality of ethnic groups over the intercensal period.

Table 5: Provisional life tables for the total population: China, 1990

Females						
Age (x)	Proportion of persons alive at beginning of age interval dying during interval	Of 100,000 persons born alive		Number of person years lived between age x and x+n	Total person years lived after exact age (x)	Expectation of life
		Number living at beginning of age interval	Number dying during age interval			
0	.02940	100000.	2940.	97467.	7213035.	72.130
1	.00962	97060.	934.	385885.	7115568.	73.311
5	.00310	96127.	298.	479889.	6729683.	70.009
10	.00250	95829.	239.	478547.	6249794.	65.218
15	.00449	95590.	429.	476954.	5771247.	60.375
20	.00603	95161.	574.	474392.	5294293.	55.635
25	.00558	94586.	528.	471623.	4819901.	50.958
30	.00673	94058.	633.	468754.	4348278.	46.230
35	.00792	93425.	740.	465352.	3879525.	41.525
40	.01109	92686.	1028.	461023.	3414172.	36.836
45	.01746	91657.	1600.	454582.	2953149.	32.219

50	.02759	90057.	2485.	444513.	2498568.	27.744
55	.04254	87573.	3726.	429224.	2054055.	23.455
60	.07037	83847.	5900.	405531.	1624831.	19.379
65	.11161	77946.	8700.	369406.	1219300.	15.643
70	.18418	69247.	12754.	315920.	849894.	12.273
75	.27559	56493.	15569.	244566.	533975.	9.452
80	.41340	40924.	16918.	161739.	289408.	7.072

Males

0	.02548	100000.	2548.	97747.	6858065.	68.581
1	.00903	97452.	880.	387674.	6760318.	69.371
5	.00424	96572.	410.	481835.	6372644.	65.989
10	.00324	96162.	312.	480031.	5890810.	61.259
15	.00544	95850.	521.	478033.	5410779.	56.450
20	.00717	95329.	684.	474967.	4932746.	51.744
25	.00688	94645.	651.	471628.	4457778.	47.100
30	.00906	93994.	852.	467925.	3986150.	42.408
35	.01114	93143.	1038.	463237.	3518225.	37.772
40	.01593	92105.	1467.	457096.	3054988.	33.169
45	.02496	90638.	2262.	447947.	2597892.	28.662
50	.03985	88376.	3522.	433721.	2149945.	24.327
55	.06423	84854.	5450.	411635.	1716224.	20.226
60	.10548	79404.	8375.	377431.	1304589.	16.430
65	.16513	71029.	11729.	327347.	927159.	13.053
70	.25917	59300.	15369.	259123.	599811.	10.115
75	.36685	43931.	16116.	179269.	340688.	7.755
80	.51595	27815.	14351.	101321.	161419.	5.803

Table 6: Provisional life tables for all ethnic minorities combined: China, 1990

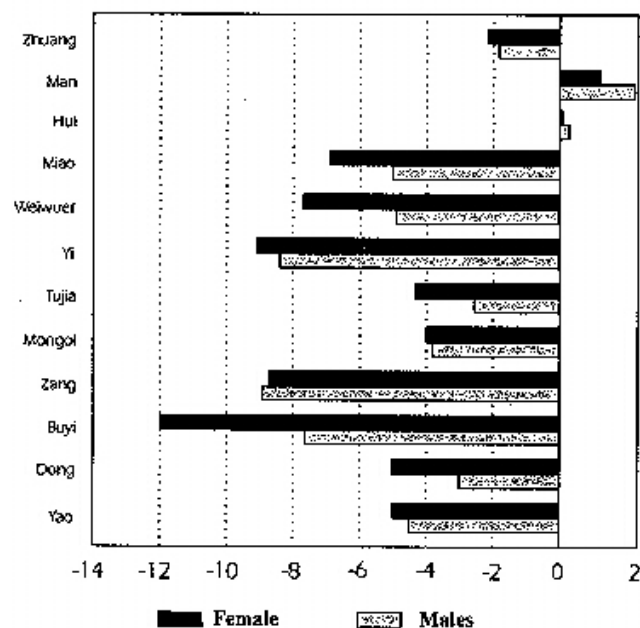
Females

Age (x)	Proportion of persons alive at beginning of age interval dying during interval	Of 100,000 persons born alive		Number of person years lived between age x and x+n	Total person years lived after exact age (x)	Expectation of life Average number of years of life remaining at beginning of age interval
		Number living at beginning of age interval	Number dying during age interval			
0	.05123	10000.	5123.	95920.	6803926.	68.039
1	.01990	94877.	1888.	374675.	6708006.	70.702
5	.00583	92989.	542.	463587.	6333331.	68.109
10	.00404	92446.	374.	461297.	5869745.	63.494
15	.00593	92072.	546.	459072.	5408448.	58.741
20	.00792	91526.	725.	455860.	4949376.	54.076
25	.00792	90801.	719.	452240.	4493516.	49.487
30	.00985	90082.	888.	448265.	4041276.	44.862
35	.01193	89195.	1064.	443415.	3593011.	40.283
40	.01593	88131.	1404.	437325.	3149596.	35.738
45	.02280	86727.	1978.	428986.	2712271.	31.274
50	.03400	84749.	2882.	417009.	2283285.	26.942
55	.05248	81868.	4297.	399317.	1866276.	22.796
60	.08277	77571.	64420.	372843.	1466959.	18.911
65	.13044	71151.	9281.	333853.	1094116.	15.377
70	.20144	61869.	12463.	279319.	760262.	12.288

75	.28786	49406.	14222.	211892.	480943.	9.734
80	.39984	35184.	14068.	139995.	269050	7.647
Males						
0	.05069	100000.	5069.	95885.	6517186.	65.172
1	.01874	94931.	1779.	375276.	6421302.	67.642
5	.00673	93152.	627.	464192.	6046026.	64.905
10	.00479	92525.	443.	461518.	5581834.	60.328
15	.00713	92082.	656.	458863.	5120316.	55.606
20	.00956	91426.	874.	454994.	4661453.	50.986
25	.00946	90552.	856.	450662.	4206460.	46.453
30	.01228	89696.	1101.	445835.	3755797.	41.873
35	.01548	88595.	1372.	439691.	3309962.	37.361
40	.02104	87223.	1835.	431793.	2870271.	32.907
45	.03216	85388.	2746.	420493.	2438478.	28.558
50	.04613	82642.	3812.	404236.	2017985.	24.418
55	.06988	78830.	5509.	381223.	1613749.	20.471
60	.10788	73321.	7910.	347991.	1232526.	16.810
65	.16849	65412.	11021.	300796.	884535.	13.523
70	.25227	54390.	13721.	238459.	583739.	10.732
75	.35500	40669.	14438.	166989.	345280.	8.490
80	.47100	26232.	12355.	98737.	178291.	6.797

As expected, the provisional life tables calculated for each selected group (which are available on request) show that life expectancies at birth were higher for females than males. Figure 6 shows the gap between life expectancy at birth, for females and males, and for each selected ethnic group relative to that of China as a whole. Most noticeable is the fact that the gap was generally greater for females. The highest observed was among the Buyi, whose female life expectancy at birth was 12 years less than the national average. It is interesting to note that the Man had higher life expectancies for both genders, and those for the Hui were about the same as for the whole of China.

Figure 6: Differences between life expectancies at birth of selected ethnic groups and those of China as a whole



Source: 1990 Census of China.

Note : Life expectancy at birth of the total population of China: 72.1 years (females) and 68.6 years (males).

Growth potential

The rate of natural increase, obtained by subtracting the age-adjusted death rates from the corresponding birth rates, reveals a very interesting picture. The rate for all ethnic minorities combined, a little over 1.5 per cent per annum, was nearly 15 per cent higher than that for the Han (1.36). However, two ethnic groups, the Weiwuer and the Zang, exhibited rates far above the rate for all ethnic groups combined. In terms of growth potential, it is worth noting that, if the current demographic conditions prevail, the Han population will double in 51 years, while all ethnic minorities combined will take 44 years to double; the Weiwuer and Zang will take only 21 and 32 years, respectively, to double. These figures reveal a substantial growth potential among the ethnic minorities in China, which can be easily realised unless some appropriate remedial measures are taken to improve the socio-economic conditions prevalent among the minority groups.

Conclusion and discussion

The above analysis reveals that overall the 12 ethnic minorities studied have higher rates of population growth than the total population of China. The greatest impact on these rates came from fertility differentials, and to a lesser extent, the mortality differences between these groups and the Han. Moreover, the age structure of the groups was generally more youthful. Exceptions to these were the Man and Hui people, who experienced fertility and mortality levels quite similar to those of the Han. In both cases this is because they are quite similar to the Han in socio-cultural terms.

The Weiwuer and the Zang people are among the most distinct for their higher fertility and mortality rates. While the Weiwuer had female literacy levels similar to the Han (these figures are markedly higher than those of the last census and need to be examined more closely), the Zang were characterized by very low levels of female literacy. These groups are concentrated mostly in Xinjiang and Xizhang, respectively.

There is no evidence to indicate that religion is an important determinant of demographic behaviour among ethnic minorities in China, as is observed from the comparison of the fertility and mortality indices of the Hui and Weiwuer people, both of which groups are Muslim.

Ethnic minorities are generally not affected as much by the national family planning activities as are the Han. Obviously the Government does not want to be accused of demographic and cultural erosion of the minority nationalities. Because of the geographic isolation of many of the groups, they have not enjoyed the fruits of the current social and economic development to the same extent as the Han. The authors believe that family planning, per se, is not the only solution to the accelerating population growth rates among ethnic minorities; more concerted efforts are also needed to institute appropriate programmes to improve the health, education and economic conditions prevalent among the ethnic minorities in China.

Finally, an important factor with significant policy implications, which contributes to the overall rapid population growth among minorities, is the recent phenomenon of reaffirmation of ethnicity. Estimates prepared by the authors, using the census survival ratios between 1982 and 1990, reveal that there were about 10.2 million more people aged eight years and older among the ethnic minorities in 1990 compared with the expected survivors of their 1982 population. For example, on a proportional basis, the highest augmentation in the population was observed among the Man, Tujia and Dong people, whose populations experienced increases of more than one-third. These are among the people who had presumably changed their identification from the majority Han to particular ethnic groups. There is also some evidence to suggest that many children of mixed marriages between the Han and minority groups have been identified as belonging to minority groups "with the aim of getting the benefits from some government regulations concerned" (China SSB, 1990:81). While detailed information about these regulations was not available to the authors, it is known that in some instances minority students have been admitted to educational institutions with somewhat lower grades than students from the majority Han ethnic group. With the existing policy of regional development in China, the remote areas generally inhabited by minorities do not rank very highly in order of priority. In view of the Chinese Government's dedication to providing equal opportunity for all its people and particularly to "the improvement of the material and cultural life of the people in areas inhabited by the minority nationalities" (China SSB, 1990), it is essential that concerted efforts and appropriate policies for rural and regional development of minority areas be implemented. Otherwise, there is likely to be a much greater migration of minority people to the relatively more developed and industrialized parts of China than is currently the case, which would exert increased pressure on the existing institutional infrastructures.

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The Social Impact of Recent and Prospective Mortality Decline among Older New Zealanders

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There is an urgent need to plan for the transfer of necessary resources to the community in order for it to cope with the increasing burden of caring for the elderly

New Zealand is experiencing a maturing population characteristic of most economically developed countries. Advances in medicine, health and social welfare have combined to extend the expectation of life of the whole population. Recent mortality declines among the older New Zealand population are significant. Longer life for the older population has affected and will continue to affect society in a number of ways. Projected growth of the age segment of the population has become the object of increasing concern among scholars and those responsible for public policy. In fact, the demography of ageing has become an almost obligatory preface to the scholarly presentation on nearly all aspects of ageing.

This article attempts to demonstrate the extent of mortality decline experienced by the total and older population and discusses its effects on population composition and family relationships. The extent of morbidity and the impact of ageing on future health care facilities is also discussed.

Recent mortality decline

Since 1950, life expectancy for both males and females has increased by 4.22 and 4.50 years, respectively. This trend is likely to continue in the future. The projected expectation of life in 2031 is likely to be 77.6 and 83.1 years, respectively, for males and females. The overall improvement in New Zealand's mortality situation has resulted in this increase in expectation of life at advanced ages. The resulting increase in life expectancies at age 60 and 80 are presented in table 1. This table includes both actual experience from 1955-1957 and the future projected experience based on recent Department of Statistics projections.

Table 1: Actual and projected expectation of life at ages 60 and 80 by sex

Year	Age 60		Age 80	
	Males	Females	Males	Females
1955-1957	16.19	19.16	5.70	6.46
1960-1962	16.09	19.39	5.50	6.43
1965-1967	15.82	19.68	5.61	6.70
1970-1972	15.82	19.91	5.52	6.75
1975-1977	16.17	20.55	5.66	7.26
1980-1982	16.74	21.17	5.89	7.70
1985-1987	17.15	21.34	6.13	7.85
1990-1992	18.20	22.25	6.78	8.42
Projected				
2001	19.52	23.35	7.04	8.50
2016	20.50	24.46	7.71	8.90
2031	21.29	25.30	8.00	9.85

Source: Demographic Trends 1992, Department of Statistics, New Zealand.

In the decades since the 1950s, life expectancy at age 60 has increased by nearly 2.11 and 3.09 years, respectively, for males and females. Similarly, there also has been an increase in the expectation of life at age 80. Current projections are for continued substantial improvement in old-age mortality. In the next four decades, men can expect to add another 3.09 years and women 3.05 years to their life expectancy at the age of 60. This means that by 2031 men and women at age 60 can expect to live for another 21.29 years and 25.30 years, respectively. The improvements in expectation of life at age 80 are also noticeable. Men and women at age 80 will be expected to live for another 8.00 years and 9.85 years, respectively.

The full impact of the mortality decline, however, is not fully suggested by these changes in life expectancy alone. These changes are fully understood by having some indication of the proportion of population surviving to certain ages – in this case, to age 60 and age 80. This is very important in order to understand the social impact of the mortality decline, particularly in a society where medical care and full retirement benefits are provided after age 60. The number of people in the life table population who survive to certain ages (1x) enables us to judge the proportion of people who are likely to survive to that age (1x). Of course, this does not describe the actual experience of any population; what it demonstrates is the effect of mortality on a synthetic cohort of 100,000 people exposed from the time of birth to death occurring at the age-specific mortality rates of a given calendar year. If this synthetic experience is generated under the mortality conditions of 1955-1957, then only 76 per cent of the males born during that period would have reached age 60 and nearly 82 per cent of the females would have reached age 60. If the projected increase in mortality is achieved, then continued increases may be expected in these percentages. In 2031, survival to age 60 and older will be about 90 per cent and 95 per cent, respectively, for males and females. Table 2 also shows the increase in survival to age 80 for both males and females. If these life table values hold, almost 57 per cent of the males born in 2031 should live to age 80 and 71 per cent of the females should live to this age. In the case of females, the rise is more significant. This has raised greater concern among scholars and planners about the ability of families and societies in the future to provide support networks for the elderly members of this society.

Table 2: Numbers surviving to specified ages out of 100 born in specified time periods

Time period	Males		Females	
	60+	80	60+	80+
1950-1952	76	26	82	37
1960-1962	79	27	86	42
1970-1972	79	25	87	45
1980-1982	82	30	88	50
1990-1992	84	36	90	56
Projected				
2001	89	48	93	62
2011	89	52	94	66
2031	90	57	95	71

Source: Same as table 1.

The remainder of this article deals with some social implications of these past and projected improvements in old-age mortality. This significant improvement in mortality coupled with a dramatic decline in fertility has led to changes in the absolute and relative size of the older population as well as its composition. It has also created relatively uneven generations in size through time. This situation is bound to affect intergenerational family relationships. In addition, it has altered both the demand for and the ability to supply social, economic and health services provided by families and larger institutional structures.

Implications of declining old-age mortality for the size and composition of the older population

The demographic changes that have occurred in New Zealand since the 1930s have resulted in an increase in both the absolute and relative size of the older population. The percentage of the population comprising those 60 years of age and older has increased from about 9 per cent in the 1930s to 15.4 per cent in 1991. Table 3 shows that both the absolute and relative size of the older population are projected to increase through 2031.

Table 3: Population aged 60 and older: projected number and percentage of total under two mortality assumptions, 1991-2031

Year	Population aged 60-79 to population aged 40-59	Population aged 60-79 and 80+ to females aged 40-59		Population aged 60-79 and 80+ to non-working females aged 40-59	
		60-79	80+	60-79	80+
1991	61	123	22	387	67
1996 [*]	56	111	23	382	80
2001	53	104	24	371	86
2006	52	102	25	360	91

2011	57	111	27	390	96
2016	62	122	28	420	96
2021	72	141	31	477	106
2026	80	160	37	536	124
2031	85	168	46	568	153

Source: Based on the official Population Projections supplied by the Department of Statistics, New Zealand.

In addition, the older population itself is ageing, as indicated by the proportion of this population older than 80 (table 4). The ageing of the older population is also expected to continue. Demographic theory shows that population ageing results from the demographic transition and that declining fertility, more than declining mortality, is primarily responsible (Coale, 1956; United Nations, 1954). In discussing the ageing of the New Zealand population, Zodgekar (1990) emphasized the fact that fertility changes have been the major factor in the ageing process. Although some of the past and present ageing of the New Zealand population is due to mortality decline, it is not the major explanatory factor. The increase in the absolute and relative size of the older New Zealand population expected after 2010 is not due primarily to expected mortality declines but to the ageing of the "baby boom" cohort (Koopman-Boyden and Brown, 1991). However, the impact of mortality decline on the increase in the number of people surviving to old age and during old age cannot be ignored. Myers (1981) showed that, with low levels of fertility and levels of life expectancy at birth above 70 years, the proportion of the population 65 and older in a stable population will increase steeply as life expectancy increases.

Table 4: Characteristics of New Zealand's ageing population

Year	Index of ageing 60+/0-14 ^a	Population size 80+ (thousands)	Percentage 80+/total	Percentage 80+/60+	Percentage of two-generation geriatric families 80+/60-64	Sex ratio ^b	
						60+	80+
1991	66.76	78.1	2.27	14.8	55	796	493
1996	66.59	97.3	2.68	17.3	72	806	518
2001	67.80	114.8	3.00	18.9	75	817	531
2006	74.29	134.5	3.38	20.1	76	835	568
2011	89.54	150.7	3.65	19.8	68	836	601
2016	106.40	158.5	3.74	18.5	69	836	619
2021	121.93	175.2	4.01	18.1	69	836	628
2026	132.14	201.5	4.49	18.8	76	821	638
2031	139.97	246.2	5.37	21.2	92	816	643

Source: Data from 1996 onward are based on Projections.

Notes: a = 60+/0-14 x 100; and

b = Males/females x 1,000.

The range of life expectancies for males and females used in recent Department of Statistics projections and the resulting range in both absolute and relative size of the future older population are presented in table 3.

The difference in the number of people at age 60 and older in 2031 under the two assumptions of mortality is significant. A difference of nearly 2.5 years in the expectation of life at birth would result in approximately 64,000 more people in the old-age group at that time. This means a one-percentage point increase in the percentage of the population aged 60 and older. This outcome clearly demonstrates that at the higher levels of expectation of life, mortality changes will have had a significant impact on the ageing of the population.

The index of ageing presented in table 4 is a reflection of the interaction between fertility changes and mortality changes. The expected increase in this index is not only a reflection of fertility decline in the

future but also a larger proportion of cohorts surviving to advanced ages owing to the past and future expected declines in mortality, particularly old-age mortality. The information contained in this index of age composition is crucial for forecasting fundamental changes in the country's institutional structures. It may also mean that a considerable re-allocation of financial resources will be necessary to accommodate this population group.

The distribution of the population within the elderly age group is also going to alter significantly as a result of improvements in overall mortality, particularly in old-age groups. The number of people aged 80 years and older is going to increase in size three-fold between 1991 and 2031, whereas the elderly aged 60 years and older are going to increase in size only two-fold. This will result in an increase in the proportion of the population aged 80 and older in New Zealand. Projections indicate that by 2031 the country will have nearly 5.4 per cent of its population in the age category of 80 and older, or over one-fifth of the elderly population. This means that during the period 1991-2031 the absolute number of those aged 80 and older is likely to increase from 78,100 to 246,200 (table 4), which is likely to have significant implications for the financing, organization and utilization of health care resources (Koopman-Boyden, 1986).

The differential decline in mortality experienced by the male and female population at younger as well as older ages has resulted in a remarkable change in the composition of the older population. Improvements in female mortality rates to date have consistently exceeded male mortality rates across the entire age range. This has resulted in a change in the sex ratio in older age groups, which means that there will be a disproportionate number of women in these groups. According to the 1991 census, the sex ratio of those aged 60+ is 796; for those aged 80+, it is 493. On the basis of the future population projection to the year 2031, these ratios are likely to change to 816 and 643, respectively. The sex ratio remains considerably in favour of women and is likely to remain so as long as the existing mortality differences between males and females continue to favour females. In particular, there are likely to be disproportionately more "old old" women in the age group 80+.

The impact of these changes in old-age mortality has been an increase in the number of elderly surviving to old age and an increase in the number of people living longer in old age. This trend demonstrates that a society composed increasingly of older people is one that is becoming a society of older women, which implies greater burdens of social dependency for individual families and society as a whole.

Effect of mortality decline on family relationships

The concept of the effects of mortality decline on family relationships is difficult to measure, but vital to understanding patterns of social support and dependency. In addressing the human support dimension of social consequences of population ageing, it is necessary first to understand the relationship between population ageing and the evolving pattern of the distribution of the ageing population over alternative primary potential support group structures (Stone, 1993:30). In order to study this relationship, ideally long time-series of data need to be analyzed. However, in the absence of such data, aggregate demographic composition data have to be used. In this article, an attempt is made at addressing the social support network issue by designating people with certain demographic characteristics and labelling their particular stage in the life-cycle as a potential source of support in the network.

Professional demographers in New Zealand have recognized that the onset of a rapid shift in the levels and patterns of fertility has been concomitant with social and demographic change within the family with regard to its size and structure (Pool, 1991). Also, the number of living generations in families has been undergoing a gradual change, with families of today having more living generations than previously. Past mortality decline is one of the factors causing this increase in the number of generations, and anticipated mortality decline in the future is expected to result in a continuation of this trend. The increased life expectancy and increase in the numbers of elderly in the family has resulted and will continue to result in "two-generation geriatric families" (table 4). By 2031 it is expected that, while their parents are still alive, nearly 92 per cent of their children will enter the old-age group, 60-64 years. The emergence of two generations of older people per family will cause significant changes in the mutual support network among family members (Zodgekar, 1990:300). Although the elderly constituting those 60-64 years of age are not as dependent as their parents on outside support, their capacity to cope with this type of dependency diminishes with age, which implies that it has to be transferred elsewhere.

Today the support functions of the family and society generally do not overlap: the former may provide social and emotional support, and the latter economic support for retirement and health care. The potential of the family to act as a support network for its elderly members is related, not only to the number of generations in the family but also to the number of people within each generation. In most societies older people traditionally turn to family members for support. With the demographic changes experienced in the past as well as current and anticipated ones, the ability of successive generations to supply that support is

going to come under greater pressure. This is best understood by integrating the changes at the two ends of the family life-cycle, which will enable an assessment of the interaction between changing family dynamics and the ageing population in New Zealand. This assessment will be addressed by an indication of the implications this interaction will have on the social dependency burden of the elderly. The dependency links between successive generations is the key to understanding the social dependency burden of the elderly.

The changes occurring at the two ends of the family life-cycle are best shown in the data presented in table 5. The ratio of the population 60 to 79 years of age to those 40 to 59 years is used as the relative number of elderly parents and their children. Of course, this type of ratio does not indicate the generational composition of individual families but represents the average relative size of generations. The relative size of generations turns out to have almost doubled since the 1930s; it has temporarily peaked and will not increase until the ageing of the "baby-boom" generation begins in 2016. The relative size of the two generations is, of course, affected by both mortality and fertility, but recent sharp and future improvements in old-age mortality will intensify the effect of low and declining fertility in raising the ratio of elderly parents to their adult children.

Table 5: Familial old-age dependency ratios (per 100)

Age group	Mean number of days of hospital stay								
	Public hospitals			Private hospitals			All hospitals		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
60-64		10	10	10	5	8	6.3	8.8	9.5
65-69		12	12	12	10	17	13.2	11.6	13.0
70-74		12	16	14	27	41	33.7	14.5	20.3
75-79		14	19	17	52	97	76.0	19.5	31.0
80-84		17	26	22	75	155	120.8	24.8	44.0
85+		21	34	30	155	306	257.7	39.4	78.0
60+		13.4	19.5	16.5	36.8	87.8	63.8	17.0	31.6
80+		18.6	29.0	25.4	107.1	232.8	185.5	30.6	60.3

* Note: Data for 1996 onwards based on projected population and labour force.

The above analysis of the familial old-age dependency burden is based on the population as a whole but, as has been established, women are the primary care-givers within the family and so any consideration of the capacity of the family to provide that support should incorporate this factor, which is depicted in the familial dependency ratios presented in table 5. It is very difficult to measure the exact number of dependents and the caring work force. However, it is possible to consider, firstly, the number of dependents as being people aged 60-79 and 80+, and, secondly, the care-giving workforce as being those women in the population aged 40-59. Examination of the data given in table 5 reveals that the demands of the community, by way of its dependents on the traditional group of voluntary care-givers, will increase considerably.

In fact, this situation further deteriorates as women from this care-giving age group, 40-59 years, increasingly participate in the paid labour force. This aspect effectively reduces the pool of women available to undertake the care-giving role within the family and even within the voluntary sector where females are the prominent source of workers. The familial old-age dependency ratios expose an increasing dependency burden based on the availability of women according to work status in the age group 40-59. The increases are three to four times higher compared with all women aged 40-59. This situation may increase the caring role of women in this society as they attempt to juggle the demands of paid work and family life.

Table 6: Ratio of survival years of males and females aged 60+ to children and to daughters

Birth cohort	Year becoming 60	e ^o 60		TFR ^a	Survival ^b (Children)		GRR ^c	Survival ^d (Daughters)	
		Males	Females		Males	Females		Males	Females

1921	1981	16.74	21.17	3.18	5.26	6.65	1.56	10.73	13.57
1961	2021	20.75	24.75	2.20	9.43	11.25	1.08	19.21	22.92
1971	2031	21.29	25.30	2.00	10.64	12.65	0.98	21.72	25.82

Notes: ^a = Total fertility rate (proxy for family size);

^b = $e^{\circ}_{60}/\text{TFR}$;

^c = Gross reproduction rate (number of daughters per woman); and

^d = $e^{\circ}_{60}/\text{GRR}$.

Another dimension of the growing social dependency is studied by constructing an indicator showing the length of possible dependency which the elderly will place on their care-givers. The measures presented in table 6 provide a good indication of the growing duration of possible dependency. For example, daughters whose mothers turned 60 in 1981 could expect to live at least another 21 years. These mothers on average are expected to have a little over 1.5 daughters, which means that the duration of the possible dependency burden per daughter is going to be around 13.6 years. This will change substantially for those women born in the 1960s and 1970s. For these cohorts, each daughter could expect to provide nearly 23 and 26 years of support, respectively. While mortality change certainly has had a substantial effect on the duration of the dependency burden, it must not be forgotten that the relative number of parents and children, so important in the older person's support network, is largely determined by previous fertility. Even though declining mortality will result in an increase in the number of generations in the family, the elderly will have a smaller number of living children and grandchildren because of the long-term decline in fertility. The social and economic transformation accompanying an ageing society has particular significance for women owing to their greater expectation of life and their traditional care-giving role within the family.

These demographic changes are going to reduce considerably the family's and the community's ability and capacity to keep on providing the necessary support currently being provided in caring for the elderly. This social dependency burden is likely to intensify further as the emphasis of public policy shifts from institutional care to community care. Therefore, there is an urgent need in New Zealand to plan for the transfer of necessary resources to the community in order for it to cope with this increasing burden. Without such a transfer, a family's resources will come under considerable pressure.

Old age, morbidity and health care

The number of elderly in New Zealand is growing rapidly in absolute terms and relative to other age groups. The elderly are also living longer. The distribution of the population within the old age group is also going to alter significantly. People aged 60 and older are more likely to experience serious illness and functional disability than those at younger ages. All these factors suggest that important questions should be raised regarding the magnitude of this demographic change for the country's health services.

Data on the prevalence rate of hospitalization and mean number of days spent in public and private hospitals for those aged 60 and older are presented in tables 7 and 8.

Table 7: Public and private hospital usage rates, 1991

Age group	Public		Private	
	Males	Females	Males	Females
60-64	15.25	11.71	4.64	3.72
65-69	21.03	15.14	5.00	3.91
70-74	27.95	19.46	5.66	3.98
75-79	32.70	26.37	5.51	4.78
80-84	45.72	33.22	7.11	5.39
85+	56.04	40.63	8.93	7.77

Table 8: Public and private hospital discharge and hospital stays for patients aged 60+, 1991

Age group	Mean number of days of hospital stay		
	Public hospitals	Private hospitals	All hospitals

Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total
60-64	10	10	10	5	8	6.3	8.8	9.5	9.1		
65-69	12	12	12	10	17	13.2	11.6	13.0	12.2		
70-74	12	16	14	27	41	33.7	14.5	20.3	17.2		
75-79	14	19	17	52	97	76.0	19.5	31.0	25.4		
80-84	17	26	22	75	155	120.8	24.8	44.0	35.7		
85+	21	34	30	155	306	257.7	39.4	78.0	64.3		
60+	13.4	19.5	16.5	36.8	87.8	63.8	17.0	31.6	24.3		
80+	18.6	29.0	25.4	107.1	232.8	185.5	30.6	60.3	48.5		

Source: Same as table 7.

The average number of days spent in the hospital for males and females over age 60 during 1991 is 17 and 31.6, respectively. The length of hospital stay increases dramatically for those who are aged 80 and older. This has great significance in terms of the number of beds occupied in the hospital, since the elderly population in the future is going to have a much larger proportion of elderly in the 80 and older age group than is currently the case. The mean number of days per hospital admission for acute care indicates that the demand for hospital space will increase dramatically in the future, since older people already form the majority of public hospital admissions and hospital stays.

Such admissions are largely for treatment of degenerative conditions. In 1991, on the basis of age-specific use rates, the number of beds required for geriatric care (for people aged 60 and older) per hospital stay is set out in table 9. The number of beds occupied in 1991 in both public and private hospitals totalled 9,772. If it is assumed that the age-specific use rates remain constant and if the analysis is extended by applying the rates to the projected elderly population in 2031, the number of public and private hospital beds required for geriatric care will increase by nearly 162 per cent, even though the elderly population will increase by only 120 per cent. One could question the assumption of constant age-specific use rates, which are clearly arbitrary assumptions that have been made to show the effects of changing mortality rates and population composition of the elderly on the likely increase in the demand for hospital beds required for geriatric care.

Table 9: Provision of hospital beds for patients aged 60+ in public and private hospitals, 1991 and 2031 *

Age group	Number of hospital beds required					
	1991			2031		
	Public	Private	Total	Public	Private	Total
60-64	525	103	628	986	196	1,182
65-69	758	207	965	1,489	407	1,896
70-74	890	439	1,329	1,959	962	2,921
75-79	1,056	848	1,904	2,260	1,808	4,068
80-84	1,074	938	2,012	2,903	2,488	5,391
85+	1,140	1,794	2,934	3,849	6,315	10,164
Total 60+	5,443	4,329	9,772	13,446	12,176	25,622

* Notes: Data for 2031 projected on the basis of prevalence of hospitalisations and mean number of days stayed in the hospital in 1991.

The key issue is whether mortality declines will result in a reduction in utilization rates. Improvements in mortality rates in New Zealand during this century have not been accompanied by equivalent improvements in mortality (Koopman-Boyden, 1986). A recent study based on data from a number of countries suggests that the ratio between healthy life expectancy and total life expectancy was diminishing (Robine and Ritchie, 1991). Malcolm (1991) argues that, although life expectancy may be increasing for the elderly, there has been little or no expansion of life free of disability and morbidity. Thus, the debate should centre around a possible increase in the morbidity level and the possibility that longer life may be accompanied by a prolonged period of chronic disease, illness and disability. To further assess the effects of an ageing population on the demand for support services, it is necessary to give some indication of the number of elderly disabled people in the population. Green (1993) presents various estimates for the elderly population aged 65 and older based on some survey data. For every category, the number of disabled elderly in 2031 is at least 2.5 times higher than that for 1986. Thus, the likely effect of the ageing

of the population is an increase of 100,000 in the total number of elderly people requiring help by the year 2031 (Green, 1993:155). The majority of the disabled elderly population in New Zealand live in the community, which implies a need for expanding community care facilities. Thus, the increase in the number of disabled elderly is going to create further pressures on familial dependency ratios.

Conclusion

Significant improvements in mortality coupled with a dramatic decline in fertility have led to changes in the absolute and relative size of the older population of New Zealand. The distribution of the population within the older age groups is also going to alter significantly as a result of improvements in overall mortality and particularly mortality in old age. The main impacts of the changes in old-age mortality have been an increase in the number of elderly surviving to old age and an increase in the number of people living longer in old age. This has resulted and will continue to result in "two-generation geriatric families". In addition, declining fertility will mean that successive generations will certainly contain fewer people. This will have a considerable effect on the familial support network, and this effect is likely to intensify further as the emphasis of public policy shifts from institutional care to community care for the elderly. There is an urgent need in New Zealand to plan for the transfer of necessary resources to the community in order for it to cope with this increasing burden. Without such a transfer, a family's resources will come under considerable pressure. Increases in the proportion of the elderly population will also create increased demands for geriatric hospital and community care, since a number of studies have shown that the improvements in mortality during this century have not been accompanied by equivalent improvements in morbidity.

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Twelve-year Follow-up of Respondents in a Sample Survey in Peninsular Malaysia * (Demographers' Notebook)

By John Haaga

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Comparable household-level survey data for the same population at two times are essential for many types of analysis in which age, period and cohort effects must be distinguished. Until recently, it was rare to have usable micro-level data from developing countries collected at two times, far enough apart to allow for significant demographic change in the interim (Hermalin, Entwisle and Myers, 1985). The availability of data sets from the Demographic and Health Surveys (DHS) for many of the same countries in which the World Fertility Survey was carried out has started to improve the situation greatly, enabling cross-national comparisons of changes over a decade or more for countries at different stages of the demographic transition. A growing number of countries have conducted a second DHS survey, and third surveys are planned in some countries, e.g. Indonesia.

Even comparable data from separate samples of the same population at two times, though, are insufficient for some analyses and inefficient for others compared with having data on the same sample at two or more times. The ability to link data on the same families enables, for example, the study of whether fertility expectations are realized over many years, whether and how these expectations change over time, and how decisions about marriage, child-bearing and children's education at one point in time affect family welfare in the future. With panel data, much of what has to be assumed about the linkage of cross-sectional results to the experience of individual families over time can be studied directly, and without the distortions inherent in recall data on many topics. Panel data also enable use of efficient techniques for handling bias owing to unobserved individual-specific or family-specific variables correlated with the variables of interest in a particular model.

Collecting panel data poses significant logistical problems for survey managers. If re-interviews are frequent, the expense of maintaining the sample can be very great. On the other hand, if the second or subsequent contacts are not attempted until years after the first (long enough for meaningful changes to have taken place in the interim), many respondents will be lost to follow-up. It is necessary to look at not only overall follow-up rates but also the selectivity of follow-up. Highly selective attrition from a panel may make the resulting data unusable for some of the research purposes for which they are intended. These problems may not be insoluble, however, and the effort to overcome them may be rewarded by the research value of the data that can be collected.

This note reports the experience of an attempt to find and re-interview in late 1988 and early 1989, as part of the Second Malaysian Family Life Survey (MFLS-2), the female respondents to the 1976-77 Malaysian Family Life Survey (MFLS-1) and a sample of their adult children aged 18 or older. The MFLS-1 female respondents were 1,262 ever-married women (EMW) living in Peninsular Malaysia, aged less than 50 in 1976. The MFLS-1 collected complete retrospective life histories for all the EMW and their husbands, covering marriage, fertility, education, employment and migration. Detailed data on current income, assets and intergenerational transfers were also collected.

The MFLS-1 data set has been widely used by demographers and other social scientists. (A list of publications based on these data is available on request from RAND.) The addition of the MFLS-2 data enables the study of demographic and economic change over the 1976-1988 period for this sample of women and their households.

In this note, we discuss the field methods used to track the panel members and their adult children, report follow-up rates and analyze the selectivity of attrition from the panel, using data from the MFLS-1 on characteristics of both the missing and the re-interviewed respondents and their families. We then discuss the degree to which these results might be generalized to other such attempts at re-contacting survey respondents.

Field work

MFLS-2 was designed by staff of RAND and the National Population and Family Development Board of Malaysia (NPFDB). Field work was carried out by the NPFDB between August 1988 and January 1989. MFLS-2 conducted interviews with four samples:

- The "Panel" Sample, where the women who had been interviewed for MFLS-1 in 1976, were sought for re-interview 12 years later;
- The "Children" Sample, a sample of the children aged 18 or older of the MFLS-1 respondents;
- The "New" Sample, a new random sample of women aged 18-49 (regardless of marital status) and of younger ever-married women; and
- The "Senior" Sample, a sample of men and women aged 50 and older living in the same enumeration areas as those in the New Sample.

When MFLS-1 was fielded in 1976-77, there were no plans to try to interview the respondents at a later date, and, hence, no attempts had been made to collect any information (national identity card numbers, or names and addresses of close relatives) for later use in tracking the respondents. The NPFDB field scouts and interviewers who traced the MFLS-1 respondents had to rely on names and addresses of respondents as recorded on the cover sheets of the 12-year-old questionnaires. To locate the MFLS-1 primary sampling units (PSUs), MFLS-2 field staff used hand-drawn maps that had been prepared in 1976 by the field staff of Survey Research Malaysia, Sdn. Bhd., a private firm that had carried out the MFLS-1 field work.

In MFLS-2, three teams of scouts, interviewers, data entry staff and their supervisors covered different regions of the country. Field work was carried out in two waves, starting in more remote areas and ending in the Klang Valley (site of the capital, Kuala Lumpur, the main port and several industrial centres), which was the most common destination for interstate migrants. During field work, the teams regularly sent to headquarters lists of names and current locations of respondents whom they learned had moved to another team's territory, so the other team could try to do the interview without waiting for a "mop-up" round.

In both rural and urban areas, the best sources of information for finding MFLS-1 respondents who had moved were the ex-neighbours still living in the original area. One problem that arose fairly often was that these neighbours knew the respondent by a name different from the formal name recorded on the survey forms. In rural areas especially, the village headmen (ketua kampung), who are part-time officials paid by the State Governments, proved to be a useful source of information; many knew where long-time residents had moved. In urban areas, postmen could often remember where respondents had gone. In several cases, the respondent had moved, but kept ownership of the house, and the current tenants were able to supply their landlord's new address. The most difficult PSUs in urban areas were those that contained large blocks of railway worker or government staff quarters: residents move frequently, and people do not know their neighbours as well as in more established settlements.

Urban squatter settlements posed a particular problem. Initially one such settlement could not be located at all from the sketch maps; eventually it was found with the aid of an electricity meter-reader. Further, two such settlements had been demolished for slum clearance.

Many of the respondents of Indian ethnic background were workers on rubber or oil palm estates. Besides ex-neighbours, the best sources included estate clerks (often a worker had been re-assigned to different quarters on a large estate, or to another estate managed by the same company) and shop-owners, some of whom had kept in touch with old customers who still owed them money.

Follow-up rates for the Panel Sample

There were 1,262 ever-married women who completed interviews in Round 1 of MFLS-1 in 1976. The MFLS-2 interviewers and field scouts learned that 31 of these women had died during the years between MFLS-1 and MFLS-2. Two were reported to have moved out of Peninsular Malaysia, and were dropped from the lists owing to travel and budget constraints. Of the remaining 1,229 women presumed eligible for the MFLS-2 Panel Sample, 889 (72 per cent) were located and successfully re-interviewed with the MFLS-2 Female Life History Questionnaire (MF22). Another 13 of the women were located, but refused to participate in MFLS-2; 21 others were unable to participate for other reasons (most of them because they were never at home during the field work period).

The other 306 presumably moved away; attempts to locate and interview them were unsuccessful. (Some of these 306 may have died or moved outside Peninsular Malaysia. In some of these cases, the MFLS-1 address information was very poor and it was difficult to locate the correct dwelling unit.)

Table 1: Follow-up of MFLS-1 respondents by ethnic group

		Malay	Chinese	Indian	Others	Total
Potential (interviewed in MFLS-1, round 1)	603	496	148	15		1,262
Reported to have died, 1976-1988	22	7	2	0		31
Reported to have moved outside Peninsular						

Malaysia	1	0	1	0	2	
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Subtotal: Presumed eligible for MFLS-2 interview	580	489	145	15	1,229	
Completed MF22 questionnaire	(percentage of those eligible) (83.4)	482 (59.9)	293 (69.6)	101 (86.7)	13 (72.3)	889
Unable to locate	87 (15.0)	176 (36.0)	42 (29.0)	1 (6.7)	306 (24.9)	
Refusal	1 (0.2)	11 (2.2)	1 (0.7)	0 (0.0)	13 (1.1)	
Other incomplete	10 (1.6)	9 (1.8)	1 (0.7)	1 (6.7)	21 (1.6)	

Table 1 shows the response rates separately for each of the main ethnic groups in Peninsular Malaysia. Chinese women in the MFLS-1 sample were the least likely to be successfully re-interviewed in MFLS-2 (60 per cent of those presumed eligible), while Malays were the most likely to be re-interviewed (82 per cent). The rate for respondents of Indian background (67 per cent) was between those for the two larger ethnic groups.

Ethnic and urban-rural differences

As shown in table 2, the differences between ethnic groups were only partly attributable to differences in urbanization (a much higher percentage of Malays than of Chinese live in rural areas). Within each of the strata, follow-up rates were always higher for Malays than Chinese. Within ethnic groups, for Malays and Chinese, follow-up rates were lowest for those who lived in the largest cities in 1976 and highest for rural dwellers. The reverse was true for those of Indian background (the smallest of the three main ethnic groups, accounting for 11 per cent of the population). This reflects the difficulty of tracking estate workers, who comprise the majority of rural Indians.

Table 2: Follow-up rates for Panel Sample members, by ethnic group and urban/rural residence

Ethnic group	Residence in 1976 (percent)		
	Metropolitan	Smaller cities	Rural
Malays	63.8	77.2	87.2
Chinese	45.3	65.5	66.8
Indians	80.6	67.7	65.4
Total	54.9	69.8	79.4
Number	(244)	(272)	(713)

Migration of the respondents

Of those MFLS-1 respondents who were located for MFLS-2 and re-interviewed with the MF22 questionnaire, 63 per cent were found at the same house where they had been in 1976; 28 per cent had moved, but were found in the same district; 4 per cent had moved farther away, but had not crossed a State boundary; and 5 per cent had moved across a State boundary (table 3).

Table 3: Percentage mobile of MFLS-1 respondents re-interviewed in MFLS-2, by ethnic group, 1976-1988

Where found in 1988	(compared with 1976 address)		Malay	Chinese	Indian	Others	Total
Same address	63.4	71.3		35.6	61.5	62.8	(559)
Different address within same district	28.4	22.9		44.6	30.8	28.4	(253)
Different district within same State	4.8	2.1		6.9	7.7	4.2	(37)
Different State within Peninsular Malaysia	3.5	3.8		12.9	0.0	4.6	(41)

Total interviewed in MFLS-2	100 (483)	100 (293)	100 (101)	100 (13)	100 (890)		
Of those presumed eligible and not living at same address in 1988 as in 1976,	(259)	percentage interviewed with MF22 in 1988 (272)	68.3 (110)	30.9 (7)	59.1 (648)	71.4	51.1

The 559 interviewed at the same address as in 1976 constitute 46 per cent of the 1,229 respondents presumed eligible. Of those known or believed to have moved, 331 (51 per cent) were successfully interviewed. Thus, a majority of both movers and stayers were re-interviewed.

To assess whether longer-distance moves are proportionally represented among the Panel women who moved, we compared the 1976-1988 migration of the MFLS-1 respondents who were re-interviewed in MFLS-2 to the 1976-1988 migration rates implied by the migration histories collected for the MFLS-2 New Sample, a representative sample of women aged 18-49 years in 1988. Mobility data for these two samples are presented in table 4. Of Panel respondents aged less than 50 years in 1988 who moved between 1976 and 1988-89 (and it was known where they moved), 9.7 per cent moved to a different district in the same State and 12.7 per cent moved to a different State. However, of New respondents who were ever-married in 1976 and who moved between 1976 and 1988-89, 16.5 per cent moved to a different district in the same State and 30.7 per cent to a different State. Hence, it appears that the follow-up survey disproportionately missed longer-distance movers.

Table 4: Mobility rates between 1976 and 1988 for comparable sub-samples of MFLS-1 sample and MFLS-2 New Sample, by ethnic group

Comparison of 1976 and	1988 locations		Ethnic group (per cent)			
	Malay	Chinese	Indian	Other	Total	
MFLS-1						
Same address	45.9	42.3	16.9	50	41.1	
Different address, same district	27.2	16.1	36.0	30	24.0	
Different district, same State	4.8	0.7	3.4	10	3.1	
Different State in Peninsular Malaysia	4.8	2.8	7.9	0	3.9	
Unable to locate	17.3	38.1	34.8	10	27.4	
Total	100 (353)	100 (286)	100 (89)	100 (10)	100 (738)	
MFLS-2 New sample						
Same address	30.6	35.4	23.4	0.0	31.0	
Different address, same district	28.8	42.5	53.7	0.0	35.6	
Different district, same State	14.5	8.4	9.2	37.5	12.2	
Different State in Pensinular Malaysia	26.2	13.7	13.8	62.5	21.3	
Total	100	100	100	100	100	

Demographic and socio-economic differentials in follow-up

Overall and in each of the ethnic groups, younger women were the hardest to trace. Figures 1a and 1b show the follow-up rates by age groups, for the total sample, each ethnic group and each rural/urban stratum. Follow-up rates were notably higher for women over age 30.

Figure 1a: MFLS-2 follow-up rates, by age and urban/rural residence in 1976

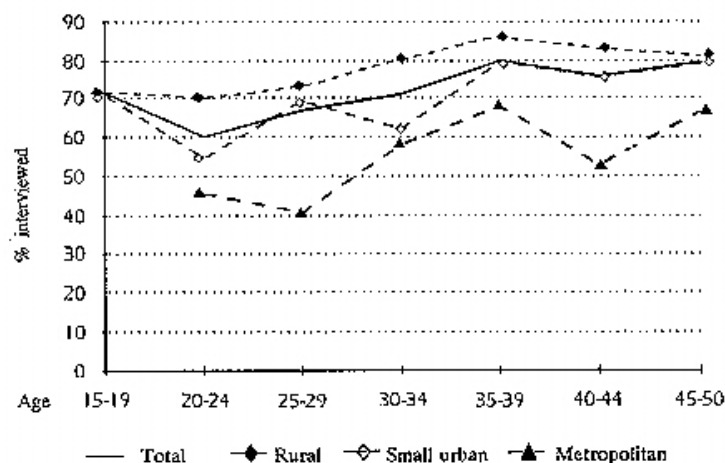
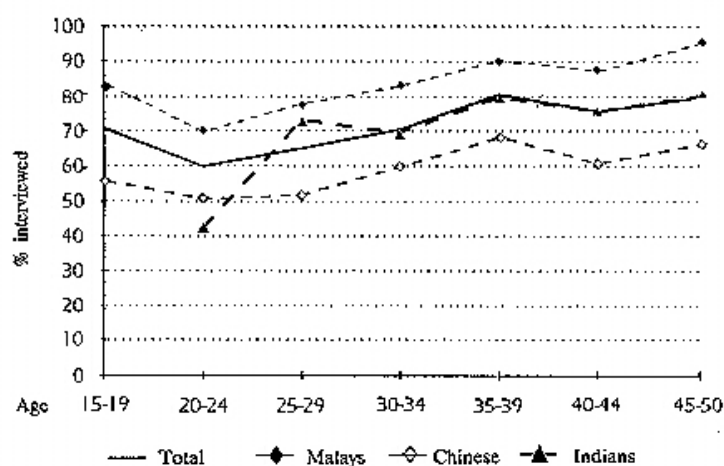
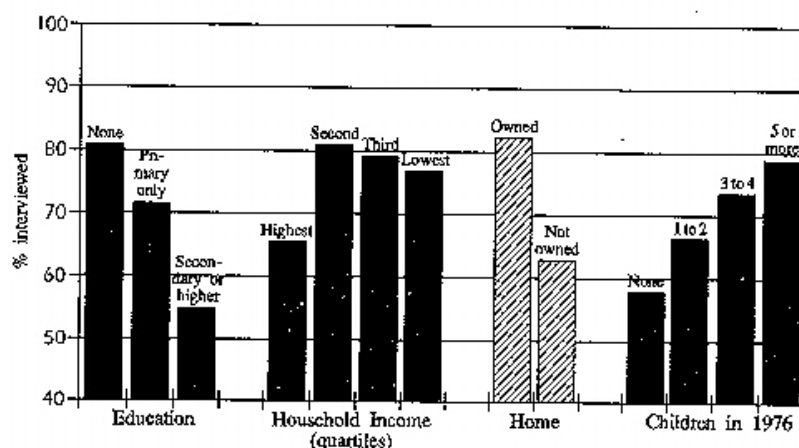


Figure 1b: MFLS-2 follow-up rates, by age and ethnicity



Ethnicity, urban/rural residence and age are all associated with educational status, occupation, fertility and household composition in Malaysia. The differences in follow-up rates among ethnic groups and between urban and rural residents are therefore associated with selectivity of the Panel Sample along these other dimensions. In multivariate analyses not reported here, ethnicity, urban/rural residence, age and house ownership in 1976 remain significantly associated with the likelihood of follow-up (Haaga and others, 1993b). Figure 2 shows that the follow-up rates were higher for uneducated women (among whom Malays and rural dwellers were over-represented). The quartile of the sample with the highest household incomes in 1976 had the lowest follow-up rates. Respondents who lived in houses owned by themselves or their husbands were easier to trace than those who were renting their residence or living in relatives' houses in 1976. Women with more children in 1976 generally had higher follow-up rates. One corollary of this is that the loss to follow-up of children or pregnancies covered in the first survey was lower than the loss to follow-up of mothers, though selectivity is obviously still a problem.

Figure 2: MFLS follow-up rates, by social and economic characteristics



In MFLS-1, respondents were asked about every time they had changed house since age 15, or their first marriage (whichever was earlier). Table 5 shows follow-up rates for groups of women classified by whether they reported no moves across district boundaries, one, or more than one in MFLS-1 (and classified by age in 1976, as a crude control for differences in length of exposure to the risk of moving). Follow-up rates were indeed lower in each category for those who had moved frequently before 1976. Since people who moved previously are more likely to move again. These results are consistent with those presented previously which show that the MFLS-2 follow-up disproportionately missed (longer-distance) movers.

Table 5: Follow-up rates for Panel Sample members, by age and prior mobility

Age in 1976	Percentage moving across district boundaries between age 15 and 49 in 1976, by number of moves		
	None	One	More than one
15-24	69.1	61.0	48.7
25-34	73.2	66.7	61.2
35-49	82.6	81.2	71.3

Discussion

Implications of the MFLS-2 for users

The MFLS-2 Panel Sample is a selective subset of the original MFLS-1 sample. Younger, better educated women, those who lived in the largest cities in 1976, those who were more mobile prior to 1976, and those of Chinese background are all under-represented to varying degrees in the Panel Sample, reflecting in large part the higher rates of internal migration and emigration of these groups. But in nearly all the cells of two- and three-way cross-classifications examined here, follow-up rates exceeded 50 per cent – they usually well exceeded that level. Furthermore, for the total sample and for Malays and Indians, the majority of those presumed to have moved were successfully re-interviewed. However, only 31 per cent of the Chinese presumed to have moved were successfully re-interviewed. A number of Chinese may have left the country and thus were not eligible for follow-up. For most of the analyses envisioned, this degree of selective loss to follow-up should not be crippling, provided analysts take it into account both in designing and interpreting studies: for example, by re-weighting to adjust for differential non-response at the second wave (MFLS-2).

Data from MFLS-2 are available for public use from the Inter-University Consortium for Political and Social Research at the University of Michigan, from the National Population and Family Development Board, and from RAND. (For more information about the survey design, see Haaga and others, 1993a. A fuller analysis of the selectivity of follow-up of Panel respondents and of their children can be found in Haaga and others, 1993b.)

Implications for other follow-up efforts

The experience of the MFLS-2 Panel Sample suggests that fairly high follow-up rates can be attained even after a period as long as 12 years and even when there were no plans for such a follow-up when respondents were first interviewed. In the MFLS-2 Panel Sample, we were able to locate and successfully re-interview over 70 per cent of the women interviewed 12 years earlier in MFLS-1 who were not known to have died or immigrated during the intervening years. The MFLS-2 experience suggests some recommendations that may help to improve follow-up

rates in other panel surveys.

Names of Malaysian Chinese respondents were recorded in MFLS-1 only in Roman-letter transcriptions; field workers reported that it would have been easier for them if the Chinese characters for names had been available. Nicknames would have helped for all three ethnic groups. Another suggestion field workers made for future such attempts was that more information about the respondents (such as their own, or their husbands', occupations) be printed on the forms.

Peninsular Malaysia is not very large, so moves within the country do not take migrants too far from their original homes. Migration in Malaysia often takes the form of stage migration, whereby the first urban residence is in a medium-sized city with strong ties to the surrounding countryside rather than in a vast metropolis. Rural-to-urban migrants maintain contact with their places of origin, which helped the follow-up. None the less, even in larger countries, the hinterland of one migration pole is often not larger than Peninsular Malaysia, so that this experience with MFLS-2 could provide a reasonable basis for expectations in other developing countries concerning attempts to re-locate survey samples. As in MFLS-2, former neighbours are likely to be the most important source of information about the current whereabouts of respondents who moved, but many others (e.g. village headmen, shopkeepers) can also provide useful information.

In MFLS-2, residents of large cities were generally the most difficult to find and re-interview. If this experience is typical, then similar follow-up efforts could expect greater success in less urbanized countries. The World Bank has estimated that, around the time of the MFLS-2 survey, 40 per cent of the Malaysian population lived in urban areas: this proportion is relatively low for the group of "lower middle-income countries" within which Malaysia is classified, but roughly the same as for the Philippines and higher than the urban proportions for the neighbouring countries of Thailand and Indonesia (World Bank, 1993).

Follow-up efforts for demographic surveys in the future could be more successful if care were taken to collect information to assist later tracking at the first contact. (For example, in MFLS-2 we collected identity card numbers in case we should later wish to re-interview the respondents.) Addresses are not useful in most developing countries and sketch maps or detailed descriptions are needed to find locations of dwellings. Groups for which higher attrition is expected could be over-sampled in the initial design. During the second wave of field work, attrition rates could be decreased by assigning extra workers, or taking more time, in areas where greater attrition is expected. The scientific value of tracking a panel from an earlier survey, rather than interviewing an independent sample in every survey, would often justify these efforts.

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