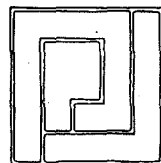# AN ANALYSIS OF UNDERREGISTRATION OF VITAL EVENTS IN THE PHILIPPINES

S. Vijayakumari

ABSTRACT

The paper analyzes the distribution patterns of birth and death registration in the Philippines by type of area and identifies groups of provinces of the country which are high, medium, low and poor registrants. It discusses the role of some of the important factors affecting the registration and assesses, through regression analysis, the extent to which they influence the level of registration of births, deaths and marriages.

INTRODUCTION

Vital registration data have become one of the basic sources for numerous studies on population and its changes. Unlike census data which are available periodically, vital statistics are obtained in a continuous and relatively inexpensive manner. These are used in the preparation of intercensal estimates of the population and in forecasting requirements for social services and other needs. They also help demographers and sociologists to measure fertility, morbidity and mortality. The statistical advantages obtained from them are numerous. Knowing their importance and being aware of their incompleteness in registration, the Philippine government strives to improve the civil registration system in the country as a whole. It is, therefore, worthwhile to measure the level of registration and factors responsible for underregistration. The present study attempts to provide an understanding of the differentials in the rates of registration in different provinces of the country for the three major vital events, namely, births, deaths and marriages. It also evaluates some of the factors affecting the registration.

METHODOLOGY

The paper presents the mean level of the three vital rates of registration by type of geographical area and their variability as measured by the coefficient of variation. It further identifies the provinces which contribute more to the underregistration by considering the relative deviations of these rates from the corresponding population projections currently estimated by the National Census and Statistics Office (NCSO). To find out whether any similarities exist in the registration of births and deaths, the Spearman's correlation coefficient between the rankings of the percentages of relative deviations of these rates is carried out. The study also tries to enumerate various factors which are likely

to affect the civil registration. Finally, regression analysis is employed to determine in quantitative terms the nature and extent of impact of these factors on the registration of birth, death and marriage events. All the vital rates in the study are compiled from the Vital Statistics Report of 1979, published by the NCSO.

AREAL DISTRIBUTION OF REGISTRATION

Table 1 gives the mean level and variability (as measured by the coefficient of variation) of crude birth registration rate, crude death registration rate and crude marriage registration rate based on the respective number of events registered in 1979 by place of occurrence. These rates are alternatively referred to as CBRR, CDRR and CMRR in this paper. To study whether any variation exists in registration by type of area, the country is divided into three levels: 1) the provincial cities; 2) municipalities alone; and 3) the provinces as a whole.

The table shows that for all the three events, the average rates of registration are higher for the cities than

for the municipalities. For the National Capital Region (NCR), however, while the average figures for birth and death registration rates exceed those of the provinces, the mean marriage registration rate is lower than that of the provinces. This may be attributed to a large single migrant population in the NCR who have their marriage ceremonies performed in their places of origin witnessed by their families.

For the Philippines as a whole, the birth rates as registered were about 29 per thousand population and that of deaths were about six per thousand population in 1979. The corresponding figures reported by Mijares (1974) for the year 1972 were lower at 24.8 and 7.3. The mean level of the marriage rate is in the vicinity of 14 per thousand.

From the death rates in Table 1 for the cities and municipalities, it is not expected that city rates would be lower than that of the former since there is usually a higher level of medical services and better hospital facilities in the cities. On the other hand, it is possible that the availability of medical facilities in the cities attract rural folks to the cities to avail themselves of these facilities and eventually

Table 1 — Mean Level and Variability of Vital Rates in 1979 Based on Vital Registration Records Classified by Areas

Area	Average			Co-efficient of Variation (%)		
	CBRR	CDRR	CMRR	CBRR	CDRR	CMRR
Cities	36.92	8.71	15.54	33.47	47.21	27.94
Municipalities	28.37	6.00	14.66	30.09	37.50	31.58
Provinces	29.68	6.41	14.76	29.05	34.59	31.33
NCR (National Capital Region)	35.52	7.13	9.72	35.89	33.50	39.38
Philippines	28.75	6.19	13.64	30.15	34.72	32.39

die while receiving medical treatment. This event is registered at the place of occurrence, that is_ the city. The crude death rates given in Table 1 are, therefore, to be viewed with some caution. Death registration certificates do not have as much use for legal purposes than birth and marriage certificates and are, therefore, less functional. This is more so for the rural populace who is more influenced by factors arising from apathy towards registration in general, social and cultural traits, religious beliefs and customs, lack of adequate communication, etc. The later analysis reported in the paper tends to provide support for such a viewpoint.

In view of large differences in the mean levels of the three registration rates, it is meaningless to consider their standard deviations to study the extent of variability. The more appropriate measure would be the coefficient of variation defined as standard deviation from the mean. The death rates show the highest coefficient of variation for both the cities and municipalities in contrast to those of the other two events; for the NCR, however, marriage rates have a higher coefficient of variation. For the country as a whole, the variability is least for birth registration and largest for death registration.

While the above conclusions have been drawn at aggregate levels, it is instructive to examine the data at micro levels to identify the geographical units of the country which contribute more to the underregistration of the three events.

For this purpose, analysis is carried out on the registered rates of births and deaths based on the usual residence of the mother and the deceased, respectively. The NCR is included in the analysis as a separate entity.

Figures 1 and 2 exhibit geographical patterns of the status of birth and death rates respectively for the year 1979 in terms of their deviations from the corresponding expected rates of registration as compiled from the population projections with moderate fertility and moderate mortality decline (Population Projections, Series 2, NCSO). These projections have been made for the period 1980-2030 under the above assumptions and using the 1980 population census as base population. For the present analysis, it is taken that these projections, together with the assumptions on which they rest, are tenable. Since the actual registration data are currently available only for the year 1979, the projected data have been extrapolated for the same year in order to make valid comparisons.

The actual (A) and projected (P) rates of births and deaths are given in Appendix 1 (a and b) respectively for various provinces of the country. To measure the gap in registration, the relative deviations (P-A)/P expressed as percentages are computed for each province. These are shown in the third column of the same Appendix.

For birth registration, the provinces which fare better in actual registrations than the expected are grouped together and those which are less than the expected are divided further into six groups: 0-9 percent; 10-19 percent; 20-29 percent; 30-39 percent;

MAP OF THE PHILIPPINES

Legend

Provincial Boundary... ———

Figure I. GEOGRAPHICAL DISTRIBUTION OF BIRTH REGISTRATION BY
PERCENTAGE DEVIATIONS: 1979

LEGEND

A > P ....
0 - 10 ....
10 - 20....
20 - 30....
30 - 40....
40 - 60....
> 60....
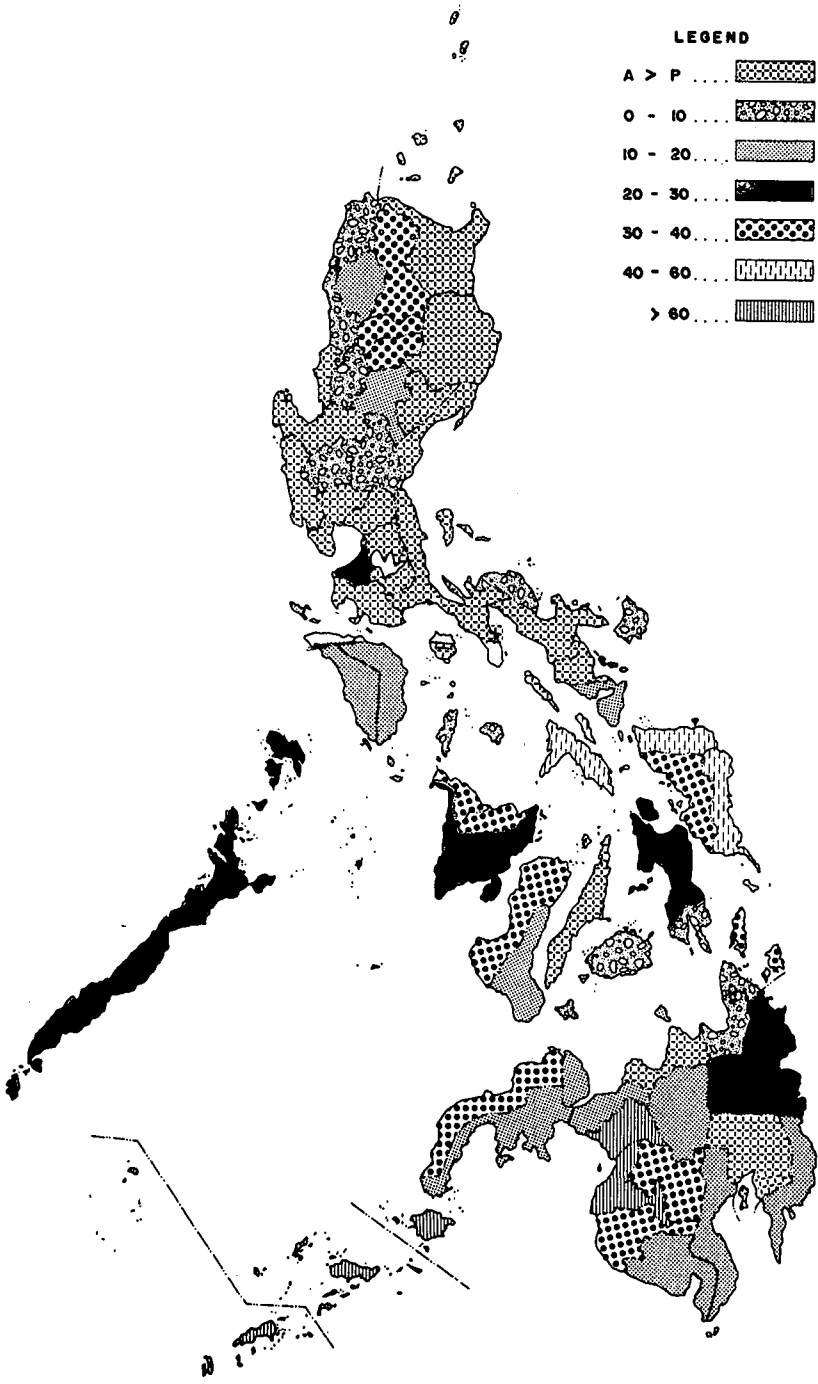
Figure 2. GEOGRAPHICAL DISTRIBUTION OF DEATH REGISTRATION BY PERCENTAGE DEVIATIONS: 1979

LEGEND

A > P ...
0 - 10 ...
10 - 20 ...
20 - 30 ...
30 - 40 ...
40 - 60 ...
60 - 80 ...
> 80 ...
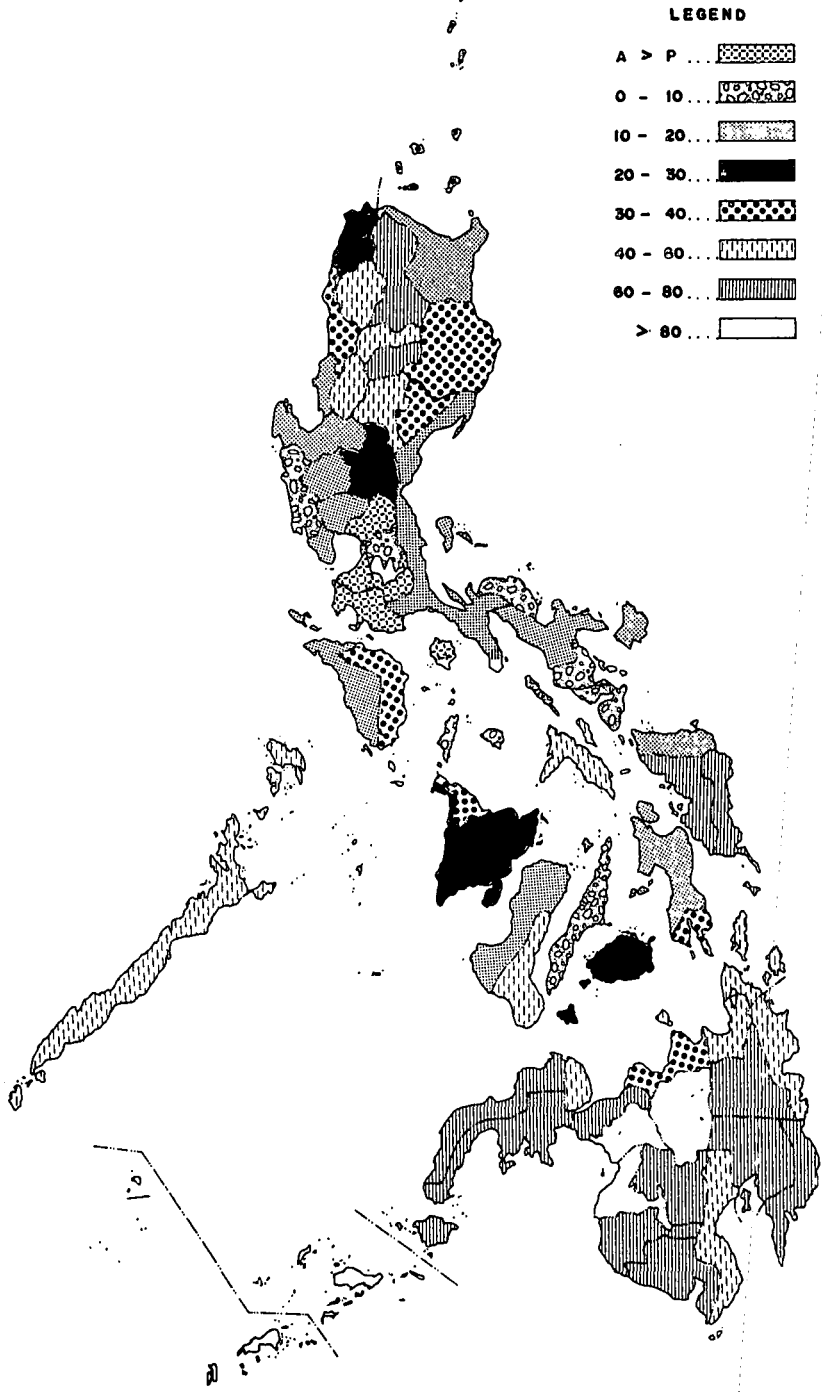
40-59 percent; and 60 percent and over.

As may be seen in Appendix 1(a), out of the 73 provinces (including the NCR), 21 provinces perform better than the projected birth registration rates. These are shown under the legend A > P in Figure 1. It is worth noting that 18 of these provinces are located in the north. The southern provinces belonging to this group are Cebu, Davao del Norte and Misamis Oriental.

Among the provinces whose birth registration rates are less than the projected ones, 12 provinces have 0-9 percent relative deviations; Benguet, Ilocos Norte, Agusan del Norte, Nueva Ecija, Romblon, Tarlac and Siquijor deviate by not more than five percent and the remaining five provinces between 5-9 percent.

The second group showing underregistration comprises 14 provinces whose percentage deviations from the projected values range between 10 percent and 19 percent. Out of these, two provinces (Abra and Nueva Vizcaya) lie in the north, four in the central region and the rest in the south.

Seven provinces have birth registration falling behind the projected ones by 20-29 percent. Among them, two are in the south and four (Iloilo, Leyte, Palawan and Antique) are the island provinces from the central region; surprisingly, the province of Cavite which is located near NCR (and is, therefore, expected to perform better) also falls in this group.

The 11 provinces following the above are those with 30-39 percent underregistration. These include three provinces from the north (Kalinga-Apayao, Mountain Province and Ifugao), Sultan Kudarat, Zamboanga del Norte and North Cotabato from the south and the rest from the central region.

The next category of three provinces (Eastern and Northern Samar, and Masbate) showing underregistration deviations of as much as 40-59 percent may be considered as poor performers.

Finally, the sixth and the last group is made up of the five Muslim provinces in the south which have the poorest birth registration rates with deviations ranging from as high as 70 percent to 100 percent. In particular, the provinces Tawi-Tawi and Lanao del Sur have deviations exceeding 90 percent.

On the whole, the above analysis shows that although 29 percent of the total number of provinces perform better than expected in birth registration, still a larger number of provinces have to show improvement. The last three groups (with deviations 50 percent and above) account for about 10 percent of the total provinces and need more and specific attention.

Figure 2 shows the 1979 status of death registration.

As may be seen, the country is classified into six groups excluding the NCR and the five provinces (Marinduque, Laguna, Batangas, Cavite and Bulacan) whose actual rates of registration exceed the expected ones.

The first group of underregistrants with 0-9 percent deviations consists of seven provinces. As the figure

shows, most of them are in the north surrounding the NCR and the rest are the island provinces from the center.

The next set (10-19 percent) is made up of 13 provinces scattered in the north as well as from among the island provinces of the center.

Seven provinces have underregistration deviating between 20-29 percent of the expected rates. Two of these are located in the north and the remaining five are the island provinces from the center.

The provinces having relative percentage deviations ranging between 30-39 percent are scattered over a wide area of the archipelago. Three provinces lie in the north, four in the center and one in the south.

Likewise, the next group with 13 provinces and percentage deviations between 40-59 percent consists of six from the south, three from the center and four from the north.

The last group (60 percent and above), is the poorest performer in so far as death registration is concerned. Out of the 19 provinces belonging to this group, 15 are in the south, two (Kalinga-Apayao and Ifugao) in the north, and two (Eastern and Western Samar) from the center.

Table 2 compiled from Appendix 1 (a and b) summarizes the foregoing analysis.

On comparing the status of registration of the birth and the death events as shown in Table 2, the CBRR seems to fare better than the CDRR. For CBRR, while as much as 29 percent of the total provinces exhibit actual birth registration rates exceeding the projected numbers, only eight percent do so for deaths. At the other extreme, whereas 25 percent of the provinces have death registrations lower than the projected figures by 60 percent and more, only seven percent come under the same category in the case of birth registration. About the same percentage (64.4 percent for births and 65.8 percent for deaths) of provinces fall in the range of 0-60 percent. These findings are not illogical

Table 2 — Number of Provinces Under Different Ranges of Underregistration
for CBRR and CDRR

Percentage Range	CBRR		CDRR	
	Number of Provinces	Percent of Total Provinces	Number of Provinces	Percent of Total Provinces
A > P	21*	28.8	6*	8.2
0 – 9	12	16.4	7	9.6
10 – 19	14	19.2	13	17.8
20 – 29	7	9.6	7	9.6
30 – 39	11	15.1	8	11.0
40 – 59	3	4.1	13	17.8
≥60	5	6.8	19	26.0
Total	73	100.0	73	100.0

* – Including NCR

considering that public use of birth records is extensive from the time a person starts schooling until his death, whereas the death registration is, as mentioned earlier, relatively less functional and therefore considered more optional.

In order to test the hypothesis that the pattern of registration of birth is similar to that of death in all the provinces and that there is an association between the registration of these two events, the Spearman's correlation coefficient between the rankings of the percentage relative deviations of the two rates was carried out. This coefficient on the whole works out to 0.641 which is very highly statistically significant thus refuting the above hypothesis and lending credence to presence of dissimilar patterns in the birth and death registration rates.

A further analysis of the rankings reveals that (a) in the Muslim provinces of Maguindanao, Basilan, Sulu, Tawi-Tawi and Lanao del Sur, the rates of registration of birth and death events both deviate by more than 70 percent from the corresponding projected figures; (b) in Cavite, while the actual death rate registration exceeds the projected rate, the actual birth rate registration is lesser than the projected value; in Davao del Norte however, the reverse is the case; (c) in the provinces of Bukidnon, Davao Oriental, Lanao del Norte and South Cotabato (all of which lie in the south), the deviations of CBRR from the projected values are lower only by about 10-12 percent whereas the deviations in respect of CDRR are as high as from 68 percent to 80 percent; and (d) in Northern Samar, although the CDRR shows only a deviation of about 20 percent from the corresponding projected rate, the CBRR exhibits a deviation of about 54 percent.

Excluding the provinces listed under (b), (c) and (d) above, whose similarity between birth and death rates of registration (as measured by the deviations) is not in line with that of the remaining provinces, the Spearman's coefficient turns out to be 0.753 which is appreciably higher than the earlier value.

These considerations suggest that the above provinces exhibit sufficiently large disparities in their registration of birth and death events. It would thus seem worthwhile to investigate the physical and other socio-economic reasons which bring about such disparities in these provinces.[1]

FACTORS AFFECTING REGISTRATION

In a developing country like the Philippines, there are numerous factors which determine the levels of registration of marriages, births and deaths. The 1964 survey on under-registration of births and deaths in the Philippines as reported by Barretto (1965) shows that of the factors contributing to underregistration, lack of people's interest tops the list with 37.1 percent and 42.6 percent of the number of people surveyed for births and deaths respectively. This is followed by ignorance (21.2 percent and 26.7 percent) and custom (13.1 percent and 22.7 percent). Other reasons enumerated are distance, belief that

baptism is registration and lack of proper maintenance of the registry offices. Mortel (1975) has analyzed some of the causes from the surveys conducted by the Bureau of the Census and Statistics and POPCOM/NCSO Project in 1964 and 1974 respectively. Some of the major reasons cited are: indifferent attitude and/or ignorance on the part of the people, inadequate mechanism for registration of vital statistics, problems of commuting and a variety of social and cultural characteristics of the society. In what follows, we discuss some of the factors which are capable of being quantified and use the same for further statistical analysis.

It is admittedly difficult to establish, in precise terms, the nature and extent of services offered by the government agencies in the matter of registration of vital events due to lack of communication between the people and the administration. Nevertheless, it is possible to get an idea of the obstacles facing ordinary citizens if and when they wish to report the vital events. If the obstacles are known, one may then proceed to examine how they may be quantitatively assessed for each area of registration. The first question in this connection is whether the responsibility to report vital statistics resides with the designated officials or the citizenry. For instance, the births, deaths and marriages which occur in hospitals and churches are to be reported by the officials concerned. But in cases where the events take place in homes and are not medically attended, the responsibility lies on the citizenry itself. This

is particularly relevant in the rural and remote areas. In these areas, therefore, it is worthwhile to try to ascertain the obstacles that people may encounter in reporting.

One such impediment is the accessibility to a registry office. This will vary with the mileage and conditions of existing roads as well as with the distance from the registry offices of the places where the vital events occur. It may be determined by considering the number of registry offices and kilometers of roads available per square kilometer in each municipality. The product of both these densities will give an index of accessibility (Ia) (Arriaga, 1967).

For computing this index, the required raw data are available from the Bureau of Maintenance, Ministry of Public Works and Highways, Manila. The Bureau maintains records on road mileages for all types of roads up to barangay level (the smallest unit within a municipality).

In the Philippines, every municipality and city have their own registry offices. On a provincial basis, each province would consist of several municipalities and cities. Given the number of registry offices, the length of roads, and the total area of each province, the following densities may be calculated for each one of them.

The number of registry offices and the total area of a province are computed from the 1980 Special Report No. 3 of the NCSO. The data on lengths of roads in kilometers are extracted from the records of the Bureau of Maintenance, Ministry of Public Works and Highways.

Using these figures, one may calculate:

$$Dp = \frac{\text{No. of Registry Offices}}{\text{Area in square kms.}} \times 1000$$

and

$$Dr = \frac{\text{Kms. of road}}{\text{Area in square kms.}} \times 1000$$

Dp, as may be seen, is the density of registry offices in a given area and Dr, the road density. The index of accessibility Ia is then obtained as:

$$Ia = Dp \times Dr$$

The hypothesis is that the larger (smaller) the Ia, the greater (lesser) would be the rate of registration.

Another factor which one may consider is whether the number of registry offices available in an area in relation to the population it is expected to serve is adequate enough to take care of the registration in that area or whether the number of offices should be increased so as to reach more people. This may be called the rate of availability (Ra) of the offices in a given area. Of course, one may find cases where offices do exist but they may not be adequately equipped with men and materials to cater to the needs of registration processes. Efficient administration, organization, control and management are all important inputs which do affect the level of registration; however, they cannot be quantified as Ra can be. For this reason, it is assumed here that much of these qualitative factors are uniform for all the registry offices.

The rate of availability of registry offices in a given area is computed as:

$$Ra = \frac{\text{No. of Reg. Of. in an area}}{\text{Total pop. in the area}} \times 1000$$

The third factor which can influence registration is the availability of transport for the people to move from their residences to the registry offices. The data required to compute the same are, however, not readily available and are difficult to compile. It has, therefore, been assumed that once there are roads, either cement or gravel, in an area, there are adequate transport facilities for the people to undertake the travel for registration.

The awareness of civil registration by the citizenry also plays a major role. To be aware, the people must be literate enough and must know the importance and usefulness of registering the events. This is more applicable in rural areas where the people are less knowledgeable on the use of these documents. Accordingly, literacy rate (expressed in percentage) as recorded in the 1980 census is included in the present analysis.

Another factor which is equally important in this context is the social and cultural traits of the society. The Philippines is predominantly composed of Roman Catholics, and the churches used to record these vital events even before the law on civil registration was passed. This, to a considerable extent, has made people of this faith aware of civil registration and its uses. But there are also areas in the country which are dominated by the Islamic religion and the mosques are not in the practice of maintaining vital records. It is, therefore, possible that these areas are indifferent to registration. Thus, reli-

gion may be expected to influence registration substantially. Although censuses have been carried out by the NCSO in 1975 and 1980, the question on religion has been omitted in both. To overcome the lack of recent data therefore, the percentage of the population belonging to a particular religion is worked out for different areas from the 1970 census data. It is assumed that even though the population has increased over time, the percentages of population belonging to specific religions would not have substantially altered to vitiate the analysis.

REGRESSION ANALYSIS

The foregoing discussion helps to formulate a tentative hypothesis that underregistration of the vital events is motivated by some of the factors considered above. The nature and extent of the impact of these factors may be ascertained by using the regression technique. In the present study, this is done for the three types of areas listed at the beginning.

With the rate of registration of a given event as the dependent variable and the index of accessibility (Ia), literacy (Lty), religion (Rlg), and rate of availability (Ra) as the independent variables, a number of regressions which included all the independent variables as well as their selected combinations were run using the actual and log-transformed data.

The final choice of regressions was based on criteria such as R^2, Durbin-Watson (DW) test, multicollinearity, significance status of the coefficient estimates and their meaningful signs. These equations are given in Tables 3 to 5. It may be mentioned that all the variables included in the regressions reported in these tables are in terms of natural logarithms.

Table 3 presents the results for CBRR.

For the cities, religion and literacy are the two factors which mainly contribute to the rate of birth registration whereas for municipalities, aside from the above two factors, availability of registry offices also plays a somewhat important role with its coefficient estimate being very close to five percent probability

Table 3 — Regression Results for CBRR

Area	n	Const.	Ia	Ra	Rlg.	Lty.	R^2(%)	DW
Cities	56	−15.7424			2.3586[b] (0.2488)	1.9068[b] (0.6111)	70.22	1.60
Municipalities	72	− 1.3664		−0.1216 (0.0616)	0.2029[b] (0.0279)	0.7795[b] (0.2487)	74.71	1.84
Provinces	72	1.7319		−0.1341[a] (0.0571)	0.2681[b] (0.0194)		74.89	1.74

All variables are in natural logarithms.
Figures in parenthesis are the standard errors.
a—Significant at 5% probability level
b—Significant at 1% probability level

level. For the provinces as a whole, religion and rate of availability turn out to be significant at five percent and one percent probability levels respectively. Between 70-75% variations present in CBRR are explained by the regressions of the three areas studied. The DW value is in the inconclusive region of significance for the cities. One of the plausible reasons for this is that this regression is relatively more susceptible to systematic errors (like measurement errors) in the "explained" variables (Johnston, 1965). The three regressions suggest that Ia does not influence the birth registration in any of the three areas.

When we examine the CDRR regressions in Table 4, the factors of religion and accessibility seem to be important for registration of deaths in the municipalities and provinces as a whole. For cities, however, accessibility does not appear to affect the registration of this event and only religion does; however, the R^2 values of this regression are not as high as those of the other two.

The regression outputs for CMRR for the three areas are given in Table 5.

For the cities, the variation in CMRR is influenced only by the index of accessibility which is significant at five percent probability level. It should, however, be noted that the value of R^2 is as low as 10 percent and as in the case of the "cities" regression for CBRR the DW value lies in the inconclusive region of statistical significance when considered at 5 percent probability level possibly suggesting again that the regression is unduly influenced by the presence of systematic errors. In this connection, it may also be mentioned that a number of alternative specifications both in functional forms and variables were attempted but the resulting regressions did not provide a better fit than the one reported in the table. Perhaps, factors of qualitative nature like indifference of the people as well as those relating to the administration may be more at work in determining the registration of marriages than the quantitative variables included in the regression. All the same, it is interesting to note that Ia plays an impor-

Table 4 — Regression Results for CDRR

Area	n	Const.	Ia	Ra	Rlg.	Lty.	R^2(%)	DW
Cities	56	−5.4908			1.6609[a] (0.2995)		36.28	1.62
Municipalities	72	−0.5988	0.1333[b] (0.0369)		0.2824[b] (0.0275)		63.13	1.78
Provinces	72	−0.4847	0.1286[b] (0.0335)		0.2811[b] (0.0243)		68.11	2.13

All variables are in natural logarithms.
Figures in parenthesis are the standard errors.
a—Significant at 5% probability level
b—Significant at 1% probability level

Table 5 — Regression Results for CMRR

Area	n	Const.	Ia	Ra	Rlg.	Lty.	R^2(%)	DW
Cities	54	1.5625	0.0505^a (0.0208)				10.21	1.54
Municipalities	70	1.8320		0.1787^b (0.0628)	0.2895^b (0.0231)	0.6019^b (0.2097)	87.57	2.20
Provinces	70	−1.3903		$−0.1840^b$ (0.0562)	0.3041^b (0.0225)	0.4761^a (0.2140)	89.07	2.52

All variables are in natural logarithms.
Figures in parenthesis are the standard errors.
a—Significant at 5% probability level
b—Significant at 1% probability level

tant role.

The regression equation relating to municipalities shows that apart from religion and literacy, availability of registry offices also contributes substantially to the marriage registration rate. Unlike the earlier equation, the present one explains as much as about 88 percent of the variations in CMRR. Finally, the equation for the provinces as a whole is similar to that of municipalities and the three variables Ra, Rlg and Lty together exert considerable influence in the behaviour of the marriage registration.

In short, the above regression analysis shows that while religion influences all the three events, literacy and rate of availability of registry offices are important additional determinants for CMRR and CBRR and index of accessibility for CMRR and CDRR.

SUMMARY AND CONCLUSION

The paper examines underregistration of the three vital events — births, deaths and marriages — in the Philippines by type of area and the factors influencing registration.

To delineate the extent of underregistration of births and deaths at the micro level, spatial analysis is carried out by comparing the actual rates of registration of births and deaths with the corresponding projected rates derived from the census and grouping the country into areas of excellent, high, medium, low and poor levels of registration. The analysis refers to the year 1979. Likewise, the birth and death registrations are with reference to the usual residence of the mother and of the deceased respectively.

The results show that the provinces which deviate by more than 50 percent from the projected rates of births constitute only 10 percent of the total number of provinces. It is interesting to note that levels of registration in the areas like Mountain Province, Ifugao, Bohol and Kalinga-Apayao which have difficult terrains perform better than the Muslim provinces of Maguindanao, Basilan, Sulu, Tawi-Tawi and Lanao del Sur.

As regards death registration, the number of provinces which deviates

by more than 50 percent account for as much as 34 percent of the total number. The Muslim provinces listed above have the largest deviations in respect of death registration also.

On the whole, it is found that while as much as 29 percent of the total provinces exhibit birth registration exceeding the projected rates, only eight percent do so for death. On the other extreme, whereas 44 percent of the provinces have registered death rates much lower than the projected figures, only 11 percent are in a similar category for birth registration. The analysis further reveals that the patterns of registrations of births and deaths in seven provinces are dissimilar.

The above findings help to pinpoint the status of registration for births and deaths of each province. It is hoped that this would assist the administrators and officials concerned with registration to focus their attention and direct the resources more intensively to the areas identified by the analysis as poor registrants.

Regression analysis has also been carried out to determine the extent to which some important and quantifiable factors affect the rates of registration. It is found that religion influences the rates of registration for all the three events, literacy and rate of availability of registry offices are significant for birth and marriage registration and index of accessibility for registration of deaths and marriages.

Appendix 1(a) —   Percentage of Relative Deviation for Crude Birth Registration Rate (1979)

Provinces	Actual Rate (A)	Projected Rate (P)	Percentage Relative Deviation
NCR	35.27	29.37	−20.09
A > P			
Rizal	36.04	31.06	−16.03
Marinduque	35.65	31.28	−13.97
Albay	39.17	35.19	−11.31
Pangasinan	34.61	31.18	−11.00
Pampanga	34.41	31.03	−10.89
Batanes	34.95	31.71	−10.22
Bulacan	34.29	31.55	− 8.68
Batangas	34.74	32.18	− 7.96
Zambales	33.69	31.27	− 7.74
Misamis Oriental	36.71	34.56	− 6.22
Cagayan	36.03	34.70	− 3.83
La Union	34.24	32.98	− 3.82
Camarines Sur	36.22	35.04	− 3.37
Davao del Norte	39.86	38.65	− 3.13
Laguna	34.84	33.79	− 3.11
Isabela	36.20	35.33	− 2.46
Quirino	37.03	36.41	− 1.70
Cebu	32.00	31.48	− 1.65
Bataan	34.76	34.66	− 0.29
Quezon	34.73	34.66	− 0.20

0-9%

Benguet	34.33	34.55	0.64
Ilocos Norte	29.59	29.81	0.74
Agusan del Norte	36.75	37.36	1.63
Nueva Ecija	30.86	31.43	1.81
Romblon	28.71	29.58	2.94
Tarlac	29.87	30.80	3.02
Siquijor	27.80	28.86	3.67
Catanduanes	33.52	35.35	5.18
Ilocos Sur	29.97	32.23	7.01
Camarines Norte	36.42	39.84	8.58
Southern Leyte	30.68	33.69	8.93
Bohol	29.16	32.09	9.13

10-19%

Bukidnon	35.73	39.85	10.34
Davao del Sur	33.31	37.16	10.36
Davao Oriental	32.88	37.10	11.37
Lanao del Norte	32.61	37.10	12.10
South Cotabato	33.71	38.45	12.33
Camiguin	30.49	34.89	12.61
Sorsogon	31.51	36.31	13.22
Zamboanga del Sur	32.15	37.95	15.28
Negros Oriental	27.72	32.84	15.59
Nueva Vizcaya	31.18	37.13	16.02
Abra	26.88	32.77	17.97
Oriental Mindoro	30.23	36.91	18.10
Occidental Mindoro	30.13	36.87	18.28
Misamis Occidental	31.70	39.26	19.26

20-29%

Agusan del Sur	31.41	39.32	20.12
Surigao del Sur	32.32	41.21	21.57
Iloilo	26.12	34.14	23.49
Cavite	26.78	35.28	24.09
Leyte	25.44	34.43	26.11
Palawan	25.48	34.55	26.25
Antique	27.21	37.36	27.17

30-39%

Sultan Kudarat	27.79	40.40	31.21
Aklan	26.45	38.49	31.28
Mountain Province	22.08	32.75	32.58
Capiz	25.79	38.52	33.05
Kalinga Apayao	23.04	34.60	33.41
North Cotabato	27.49	41.28	33.41
Ifugao	20.88	32.01	34.77
Zamboanga del Norte	25.07	39.18	36.01
Negros Occidental	22.89	36.04	36.49
Western Samar	19.56	32.53	39.90
Surigao del Norte	23.68	38.58	38.62

40-59%

Eastern Samar	12.31	30.65	59.84
Northern Samar	16.36	35.49	53.90
Masbate	16.58	39.64	58.17

$\geqslant 60\%$

Maguindanao	10.13	37.38	72.90
Basilan	10.91	43.13	74.70
Sulu	7.36	45.15	83.99
Tawi-Tawi	3.24	40.22	91.94
Lanao del Sur	3.06	38.93	92.14

Appendix 1(b) — Percentage of Relative Deviation for Crude Death Registration Rate (1979)

Provinces	Actual Rate (A)	Projected Rate (P)	Percentage Relative Deviation
NCR	6.75	5.79	−16.58
A > P			
Marinduque	8.88	7.72	−15.02
Laguna	7.42	6.56	−13.11
Batangas	7.15	6.62	− 8.00
Cavite	6.54	6.22	− 5.14
Bulacan	7.28	6.96	− 4.60
0–9%			
Romblon	7.31	7.38	0.95
Camarines Norte	9.34	9.62	2.91
Cebu	8.04	8.42	4.51
Zambales	6.16	6.46	4.64
Albay	7.63	8.18	6.72
Sorsogon	9.05	9.77	7.37
Rizal	6.83	7.58	9.89
10–19%			
Pangasinan	8.39	9.44	11.12
Camarines Sur	7.89	8.91	11.45
Cagayan	9.43	10.71	11.95
Quezon	8.45	9.80	13.78
Leyte	8.90	10.59	15.96
Negros Occidental	7.00	8.38	16.47
Occidental Mindoro	5.48	6.58	16.72
Catanduanes	9.19	11.08	17.06
Bataan	6.82	8.29	17.73
Pampanga	5.50	6.76	18.64
La Union	8.12	10.13	19.84
Northern Samar	9.29	11.59	19.84
Tarlac	6.29	7.86	19.97

20–29%

Nueva Ecija	6.31	8.09	22.00
Ilocos Norte	8.72	11.35	23.17
Antique	8.55	11.28	24.20
Capiz	7.56	10.00	24.40
Siquijor	9.43	12.82	26.44
Iloilo	6.82	9.43	27.68
Bohol	8.39	11.66	28.04

30–39%

Quirino	7.22	10.39	30.51
Southern Leyte	7.28	10.87	33.03
Isabela	7.37	11.02	33.12
Ilocos Sur	7.92	12.23	35.24
Aklan	7.40	11.63	36.37
Batanes	10.13	15.94	36.45
Misamis Oriental	6.42	10.42	38.39
Oriental Mindoro	6.20	10.15	38.92

40–59%

Agusan del Norte	7.06	12.12	41.75
Negros Oriental	5.37	9.36	42.63
Nueva Vizcaya	5.96	10.53	43.40
Benguet	4.94	8.80	43.86
Misamis Occidental	7.01	12.70	44.80
Abra	5.94	11.50	48.35
Mountain Province	5.49	10.87	49.49
Camiguin	7.76	16.04	51.62
Surigao del Norte	5.70	12.08	52.81
Surigao del Sur	6.89	15.39	55.23
Davao del Sur	5.07	11.35	55.33
Masbate	4.33	10.43	58.49
Palawan	3.92	9.72	59.67

60–79%

Western Samar	4.64	11.97	61.24
Davao del Norte	5.11	13.37	61.78
Kalinga Apayao	4.14	11.86	65.09
Zamboanga del Sur	4.74	14.29	66.83
Eastern Samar	4.24	13.07	67.56
South Cotabato	4.51	14.20	68.24
Zamboanga del Norte	4.58	14.56	68.54
Davao Oriental	4.17	13.58	69.29
Agusan del Sur	4.20	14.02	70.04
Lanao del Norte	4.42	15.80	72.03
Ifugao	3.23	12.06	73.22
Sultan Kudarat	3.44	13.86	75.18
North Cotabato	3.63	15.29	76.26
Basilan	2.92	14.23	79.48

⩾80%

Bukidnon	2.84	14.23	80.04
Maguindanao	2.06	11.89	82.67
Sulu	2.42	17.70	86.33
Lanao del Sur	0.48	14.41	96.67
Tawi-Tawi	0.39	15.90	97.55

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NOTE

[1] Analysis similar to the above has not been carried out for marriage registration rates owing to non-availability of projected rates for this event.

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