

SOME COMMENTS ON BIRTH, DEATH AND INFANT MORTALITY RATES IN THE PHILIPPINES, AND A SUGGESTED DEVICE FOR REGISTRATION IMPROVEMENT

by

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In an effort to arrive at something near the true birth and death rates in the Philippines, since the question has been raised many times, a rather simple empirical study throws considerable light in the subject. It is performed by separating the cities and provinces with reported birth rates significantly below the national birth rate, from those reported birth rates above the national birth rate. The birth rate is then computed for the cities and provinces in the first category, from their combined populations based on the latest estimates, and their aggregate number of births.

Tables Based on Reported Births, 1954—
Source: Bureau of Health

TABLE I

*Cities with Birth Rates Significantly Below the National Birth Rate**

<u>Cities</u>	<u>Population</u>	<u>Births</u>	<u>Rate/1000 Population</u>
Basilan	114,116	655	4.6
Bacolod	127,376	3,296	25.9
Calbayog	96,960	1,075	11.1
Tagaytay	7,372	137	18.6
Zamboanga	120,636	2,376	19.7
Totals	493,460	7,539	15.2

TABLE II

*Remaining Cities***

<u>Total Population</u>	<u>No. of Births</u>	<u>Rate/1000 Pop.</u>
2,613,592	117,207	44.8

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** It will be noted the five cities in Table I have a general birth rate 15.2 per 1000 population, as compared with a general birth rate of 44.8 for the remaining cities. For all cities, the overall birth rate is 40.2 per 1000 population.

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second independent estimate, all first stage units having number two order of selection; etc. There would be five estimates as there are five first stage units in each stratum.

The estimating formulas to be used are similar to the one used for the stratum estimates. Thus, the country total estimate is

$$X' = R \sum_{h=1}^5 X'/5$$

where

R is the raising factor

X'_h is the total of all h th ordered selected sample in the strata

and the variance of the estimate X' is

$$\begin{aligned} \text{Var } X' &= \frac{1}{5} \left\{ \sum_{h=1}^5 (X'_h - X')^2 / (5 - 1) \right\} \\ &= \frac{\text{Var } X'_h}{5} \end{aligned}$$

REFERENCES

¹ It was recently changed to Philippine Statistical Survey of Households.

² Lahiri, Debabrata; National Sample Survey No. 5 (Government of India).



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TABLE III

Provinces With Birth Rates Below the National Birth Rate

<u>Province</u>	<u>Population</u>	<u>No. of Births</u>	<u>Rate/1000 Pop.</u>
1. Agusan	103,100	2,928	28.4
2. Antique	253,585	4,874	19.2
3. Batanes	11,395	325	28.5
4. Bulacan	457,681	10,987	24.0
5. Capiz	429,114	10,683	24.9
6. Cavite	236,203	6,689	28.3
7. Cotabato	522,676	8,053	15.4
8. Ilocos Sur	279,107	9,071	32.5
9. Iloilo	737,379	18,454	25.0
10. Lanao	367,889	4,521	12.3
11. Leyte	936,761	28,406	30.3
12. Masbate	228,018	5,838	25.6
13. Misamis Or. ..	395,129	8,977	22.7
14. Mountain Prov.	248,858	5,381	21.6
15. Negros Occ. ...	1,037,514	19,209	18.5
16. Negros Or.	445,878	12,709	28.5
17. Palawan	133,721	1,626	14.3
18. Romblon	114,406	3,262	28.5
19. Samar	784,659	17,492	22.3
20. Sorsogon	316,806	8,239	26.0
21. Sulu	240,826	935	3.9
22. Surigao	287,998	6,270	21.8
23. Zamboanga del Sur	173,057	4,063	23.5
	<u>8,641,760</u>	<u>198,992</u>	<u>23.0</u>

TABLE IV

Remaining Provinces

<u>Population</u>	<u>No. of Births</u>	<u>Rate/1000 Pop.</u>
9,432,239	358,924	38.1

TABLE V

Combined Totals — Tables II and IV

<u>Areas</u>	<u>Population</u>	<u>No. of Births</u>	<u>Rate/1000 Pop.</u>
29 Provinces	9,432,239	358,924	38.1
22 Cities	2,611,412	116,997	44.8
Totals	12,043,651	475,921	39.5

TABLE VI

Combined Totals — Tables I and III

<u>Areas</u>	<u>Population</u>	<u>No. of Births</u>	<u>Rate/1000 Pop.</u>
23 Provinces	8,641,760	198,992	23.0
5 Cities	493,460	7,539	15.2
Total	9,135,220	206,431	22.5

From the above tables it is strikingly apparent which cities and provinces have reasonably good birth registration, and

which are deficient. Yet we know that those which have reasonably good registration still have some underregistration.

The tables also disclose where the most intensive efforts are needed to improve birth registration, but in the areas of better registration efforts must still be continued to improve it.

It is assumed that death registration is more complete than birth registration due to burial permit requirements and governmental control of cemeteries. In other words, cities and provinces with the better registration of births are also most likely to have better registration of deaths, and vice versa. Therefore the same arrangement of cities and provinces is used in the tables for deaths as was used for births. It will be noted that the tables tend to confirm this assumption.

Tables Based on Reported Deaths — 1954
Source: Bureau of Health

TABLE VII

Cities with Apparent Underregistration of Deaths

<u>Cities</u>	<u>Popu- lation</u>	<u>No. of Deaths</u>	<u>Rate 1000 Pop.</u>	<u>Deaths Under 1 Yr.</u>	<u>Rate/1000 Live Births</u>
Basilan	114,116	273	1.9	92	140.5
Bacolod	127,376	1,169	9.2	394	119.5
Calbayog	96,960	627	6.5	153	142.3
Tagaytay	7,372	28	3.8	14	102.2
Zamboanga	<u>120,636</u>	<u>806</u>	<u>6.7</u>	<u>286</u>	<u>120.4</u>
Totals	493,460	2,903	5.8	939	124.5

TABLE VIII

Remaining Cities

<u>Areas</u>	<u>Popu- lation</u>	<u>No. of Deaths</u>	<u>Rate 1000 Pop.</u>	<u>Deaths Under 1 Yr.</u>	<u>Rate/1000 Live Births</u>
22 Cities	2,612,592	27,980	10.7	9,345	79.7

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TABLE IX

Provinces with Apparent Underregistration of Deaths

<u>Provinces</u>	<u>Popu- lation</u>	<u>No. of Deaths</u>	<u>Rate 1000 Pop.</u>	<u>Deaths Under 1 Yr.</u>	<u>Rate/1000 Live Births</u>
1. Agusan	103,100	883	8.6	325	111.0
2. Antique	253,585	2,326	9.2	520	106.7
3. Batanes	11,395	106	9.3	20	61.5
4. Bulacan	457,681	4,798	10.5	1,559	141.9
5. Capiz	429,114	4,416	10.3	1,238	115.9
6. Cavite	236,203	3,017	12.8	925	128.3
7. Cotabato	522,676	1,691	3.2	486	60.4
8. Ilocos Sur	279,107	2,893	10.4	702	77.4
9. Iloilo	737,379	6,581	8.9	1,736	94.1
10. Lanao	367,889	1,172	3.2	399	88.3
11. Leyte	936,761	11,466	12.2	2,661	93.7
12. Masbate	228,018	1,664	7.3	538	92.2
13. Misamis Or.	395,129	3,031	7.8	1,166	129.9
14. Mt. Province ...	248,858	1,273	5.1	267	49.6
15. Negros Occ.	1,037,514	8,272	7.9	2,434	126.7
16. Negros Or.	445,878	3,907	8.8	1,097	86.3
17. Palawan	133,721	507	4.5	102	62.7
18. Romblon	114,406	1,225	10.7	343	105.2
19. Samar	784,659	5,351	6.8	1,254	71.7
20. Sorsogon	316,806	3,676	11.6	847	102.8
21. Sulu	240,826	359	1.5	74	79.1
22. Surigao	287,998	3,038	10.5	951	151.7
23. Zamboanga del Sur	173,057	1,467	8.5	487	119.9
Totals	8,641,760	73,119	8.4	20,131	101.6

TABLE X

Remaining Provinces


<u>Areas</u>	<u>Popu- lation</u>	<u>No. of Deaths</u>	<u>Rate 1000 Pop.</u>	<u>Deaths Under 1 Yr.</u>	<u>Rate/1000 Live Births</u>
29 Provinces	9,432,239	113,648	12.0	35,760	99.7

TABLE XI

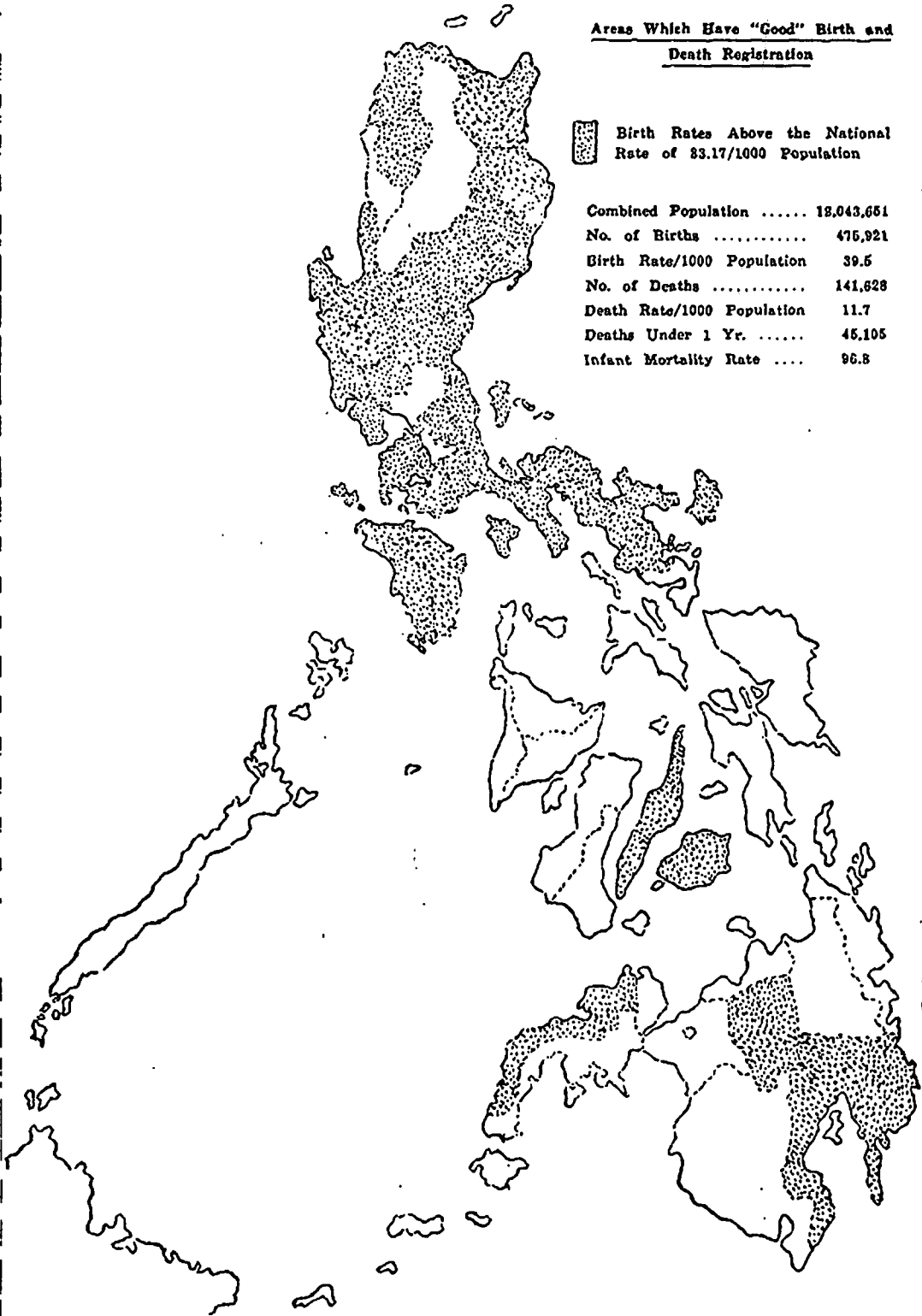
Combined Cities and Provinces with Apparent Under-Registration of Deaths

<u>Areas</u>	<u>Popu- lation</u>	<u>No. of Deaths</u>	<u>Rate 1000 Pop.</u>	<u>Deaths Under 1 Yr.</u>	<u>Rate/1000 Live Births</u>
5 Cities	493,460	2,903	5.8	939	124.5
23 Provinces	8,641,760	73,119	8.4	20,131	101.6
Totals	9,135,220	76,022	8.3	21,070	102.1


Areas Which Have "Good" Birth and
Death Registration

 Birth Rates Above the National
Rate of 33.17/1000 Population

Combined Population	12,043,651
No. of Births	475,921
Birth Rate/1000 Population	39.5
No. of Deaths	141,628
Death Rate/1000 Population	11.7
Deaths Under 1 Yr.	45,105
Infant Mortality Rate	96.8



Areas Which Have "Poor" Birth and Death Registration

 Birth Rates Below the National Birth Rate of 33.17/1000 Population

Combined Population ...	9,135,220
No. of Births	206,481
Birth Rate/1000 Population	22.5
No. of Deaths	76,022
Death Rate/1000 Population	8.3
Deaths Under 1 Yr.	21,070
Infant Mortality Rate ..	102.1

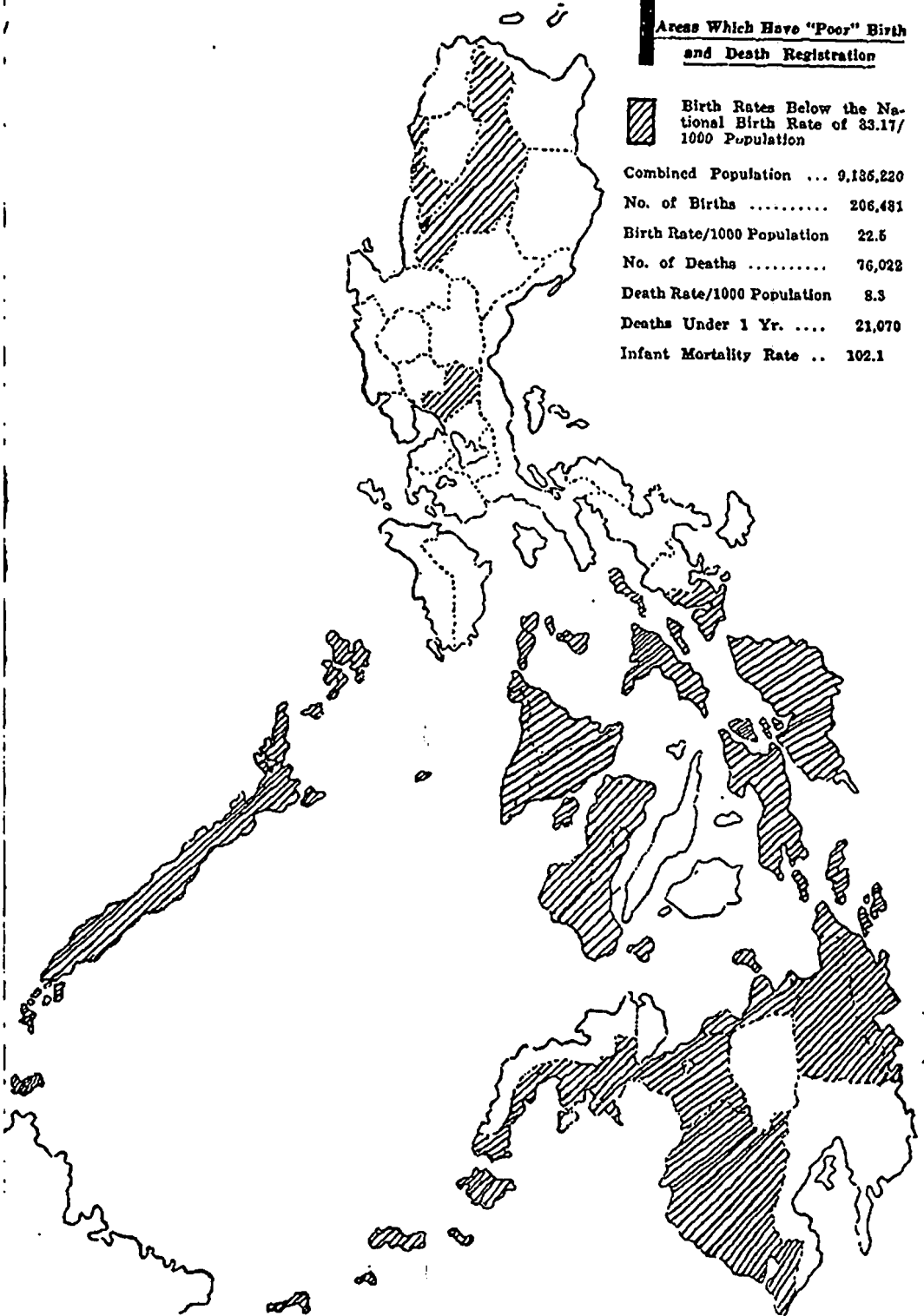


TABLE XII

Remaining Cities and Provinces

<u>Areas</u>	<u>Popu- lation</u>	<u>No. of Deaths</u>	<u>Rate 1000 Pop.</u>	<u>Deaths Under 1 Yr.</u>	<u>Rate/1000 Live Births</u>
22 Cities	2,611,412	27,980	10.7	9,345	79.7
29 Provinces	9,432,239	113,648	12.0	35,760	99.7
Totals	<u>12,043,651</u>	<u>141,628</u>	<u>11.7</u>	<u>45,105</u>	<u>94.8</u>

The areas of "good" and "poor" registration are shown on the accompanying Maps Nos. I and II, respectively, with a summary of the results from the tables in the Map legends. Since it is known that there is underregistration of both births and deaths even in the areas of better registration, it is likely that there is some ten percent underregistration of births, and a slightly lower of percentage of underregistration of deaths, in the better areas. This would represent a probable birth rate of about 45 per thousand population, as compared with the reported birth rate of 39.5 per thousand population; and a probable death rate of about 13 per thousand population, as compared with the reported death rate of 11.7 per thousand population, but the higher birth rate figure would reduce the infant mortality rate to about 92.4 per thousand live births.

Applying these hypothetical birth and death rates to the whole Philippine population shows that there were probably about 953,000 live births; 275,000 deaths; and 50,000 infant deaths, in 1954. This would represent a natural population increase of 678,000, or about three percent, in 1954.

These data might well serve as a basis for further study with a view to setting up registration areas for births and deaths with separate criteria for each. Additional criteria should be considered. For example, in setting up a death registration area, the percentage of deaths with medical attendance and certification of cause of death should be taken into account. The statistics for the registration areas should be separately tabulated to provide a basis for comparison, and for evaluation of the data from the areas outside the registration area. The registration area device would be used to encourage improvement in registration in the poorer areas by concentra-

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ted efforts, without neglecting, of course, continued improvement of registration within the registration areas themselves. As the poorer areas improved to meet the standards fixed for the registration areas, they would be admitted to the registration areas, until eventually all of the cities and provinces in the Philippines would be included. Consideration might also be given to applying the registration area concept to other types of statistics, such as morbidity statistics and statistics of marriages.

These suggestions are in conformity with recommendations of the United Nations¹ with the concurrence of the World Health Organization.

There is another factor that affects the birth and death rates which is worthy of mention. The official population estimates of the Bureau of Health are calculated by the arithmetic increase method, from the population figures of the census of 1939, which reported a population of 16,000,303, and the census of 1948 which showed a population of 19,234,182. The average annual population increase during the intercensal period was projected to arrive at the 1954 estimate. This method assumes that population growth has continued at the same average rate per annum as it did between the two censuses. Obviously, the longer the period of projection is continued from the last census, the greater the error is likely to be in the official estimates. The magnitude of the error can only be determined by another census. The population estimates by the arithmetic increase method for cities and provinces are subject to a still wider margin of error, due to internal migration which has been very extensive since the 1948 census was taken.

¹ Statistical Papers, Series M., No. 19, Principles for a Vital Statistics System, United Nations, New York.

