

**APPENDIX  
Table 1**

**Estimates of Population and their Standard Errors and Coefficients of Variation by PSSH Method and Alternative Method, by Subdivision, for Regions IV and IX: March, 1957**

PHILIPPINE STATISTICAL SURVEY OF HOUSEHOLDS

| Region<br>and<br>Subdivision | Estimate         | Standard error |                       | Coefficient of variation (%) |                       |
|------------------------------|------------------|----------------|-----------------------|------------------------------|-----------------------|
|                              |                  | PSSH<br>Method | Alternative<br>Method | PSSH<br>Method               | Alternative<br>Method |
| 161 Region IV .....          | <u>3,148,850</u> | <u>56,800</u>  | <u>146,420</u>        | <u>1.81</u>                  | <u>4.66</u>           |
| Barrios .....                | 2,078,250        | 117,270        | 121,160               | 5.64                         | 5.83                  |
| Poblaciones .....            | 589,500          | 61,430         | 74,250                | 10.42                        | 12.60                 |
| CC and PC* .....             | 476,100          | 29,930         | 35,290                | 6.29                         | 7.41                  |
| Region IX .....              | <u>2,066,400</u> | <u>132,710</u> | <u>169,510</u>        | <u>6.42</u>                  | <u>8.20</u>           |
| Barrios .....                | 1,422,900        | 129,380        | 157,630               | 9.09                         | 11.08                 |
| Poblaciones .....            | 157,500          | 30,540         | 39,200                | 19.39                        | 24.89                 |
| CC and PC* .....             | 486,000          | 17,310         | 48,480                | 3.56                         | 9.98                  |

\* Chartered Cities and Provincial Capitals

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Table 2

Estimates of Population and Variances, by Subdivision and Stratum,  
for Regions IV and IX: March, 1957

| Region,<br>Subdivision and<br>Stratum | Population<br>Estimate | Variance of<br>Estimate | Variance Components |                    |                    |
|---------------------------------------|------------------------|-------------------------|---------------------|--------------------|--------------------|
|                                       |                        |                         | First-stage         | Second-stage       | Third-stage        |
|                                       | (10 <sup>3</sup> )     | (10 <sup>6</sup> )      | (10 <sup>6</sup> )  | (10 <sup>6</sup> ) | (10 <sup>6</sup> ) |
| <u>Region IV</u> .....                | <u>3,144</u>           | <u>21,440</u>           |                     |                    |                    |
| <u>Barrios</u> .....                  | <u>2,078</u>           | <u>14,681</u>           | <u>2,163</u>        | <u>10,782</u>      | <u>1,736</u>       |
| Str. No. 4 .....                      | 336                    | 3,585                   | 724                 | 2,655              | 206                |
| Str. No. 5 .....                      | 352                    | 528                     | — 878               | 1,107              | 299                |
| Str. No. 6 .....                      | 518                    | 3606                    | — 1,874             | 4,925              | 555                |
| Str. No. 7 .....                      | 465                    | 4,459                   | 3,625               | 540                | 294                |
| Str. No. 8 .....                      | 407                    | 2,503                   | 565                 | 1,555              | 383                |
| <u>Poblaciones</u> .....              | <u>590</u>             | <u>5,513</u>            | <u>5,208</u>        | —                  | <u>305</u>         |
| Str. No. 4 .....                      | 267                    | 4,466                   | 4,333               | —                  | 132                |
| Str. No. 5 .....                      | 109                    | 256                     | 184                 | —                  | 72                 |
| Str. No. 6 .....                      | 49                     | 258                     | 215                 | —                  | 13                 |
| Str. No. 7 .....                      | 96                     | 412                     | 355                 | —                  | 58                 |
| Str. No. 8 .....                      | 68                     | 121                     | 92                  | —                  | 30                 |
| <u>CC and PC</u> .....                | <u>476</u>             | <u>1,246</u>            | <u>1,011</u>        | <u>235</u>         |                    |
| Str. No. 4 .....                      | 158                    | 263                     | 199                 | 64                 |                    |
| Str. No. 5 .....                      | 139                    | 257                     | 160                 | 97                 |                    |
| Str. No. 6 .....                      | 94                     | 476                     | 435                 | 41                 |                    |
| Str. No. 7 .....                      | 85                     | 250                     | 217                 | 32                 |                    |

(Continued on next page)

|                          |              |               |               |               |              |
|--------------------------|--------------|---------------|---------------|---------------|--------------|
| <u>Region IX</u> .....   | <u>2,066</u> | <u>28,733</u> |               |               |              |
| <u>Barrios</u> .....     | <u>1,423</u> | <u>24,846</u> | <u>13,063</u> | <u>10,438</u> | <u>1,345</u> |
| Str. No. 27 .....        | 834          | 10,092        | 6,062         | 4,083         | 846          |
| Str. No. 28 .....        | 589          | 13,854        | 7,001         | 6,355         | 499          |
| <u>Poblaciones</u> ..... | <u>157</u>   | <u>1,537</u>  | <u>1,407</u>  | —             | <u>130</u>   |
| Str. No. 27 .....        | 87           | 507           | 407           | —             | 100          |
| Str. No. 28 .....        | 70           | 1,030         | 1,000         | —             | 30           |
| <u>CC and PC</u> .....   | <u>486</u>   | <u>2,350</u>  | <u>2,112</u>  | <u>238</u>    |              |
| Str. No. 19 .....        | 93           | 31            | —21           | 55            |              |
| Str. No. 20 .....        | 81           | 189           | 151           | 38            |              |
| Str. No. 21 .....        | 120          | 1,129         | 1,066         | 63            |              |
| Str. No. 27 .....        | 83           | 563           | 531           | 31            |              |
| Str. No. 28 .....        | 110          | 435           | 385           | 51            |              |

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Table 3

Estimates of Population and Variances, by Stratum, for  
Manila Proper, the Suburbs and Metropolitan  
Manila: March, 1957

| Area and Stratum     | Population Estimate | Variance of Estimate | Variance Components |                    |
|----------------------|---------------------|----------------------|---------------------|--------------------|
|                      |                     |                      | First-stage         | Second-stage       |
|                      |                     | (10 <sup>3</sup> )   | (10 <sup>3</sup> )  | (10 <sup>3</sup> ) |
| <u>METRO. MANILA</u> | <u>1,971,200</u>    | <u>8,159,040</u>     | <u>7,031,598</u>    | <u>1,127,442</u>   |
| <u>Manila Proper</u> | <u>1,198,000</u>    | <u>5,388,080</u>     | <u>4,715,885</u>    | <u>672,195</u>     |
| Str. 1               | 64,800              | 153,040              | 102,153             | 50,887             |
| Str. 2               | 42,800              | 79,040               | 67,394              | 11,646             |
| Str. 3               | 54,400              | 151,760              | 117,888             | 33,872             |
| Str. 4               | 64,800              | 71,440               | 51,034              | 20,406             |
| Str. 5               | 52,000              | 71,200               | 19,256              | 51,944             |
| Str. 6               | 47,600              | 143,760              | 86,274              | 57,486             |
| Str. 7               | 63,200              | 178,640              | 161,248             | 17,392             |
| Str. 8               | 42,000              | 17,600               | 1,053               | 16,547             |
| Str. 9               | 47,200              | 119,840              | 100,337             | 19,503             |
| Str. 10              | 97,600              | 2,078,960            | 2,040,435           | 38,525             |
| Str. 11              | 50,800              | 109,040              | 69,656              | 39,384             |
| Str. 12              | 59,200              | 124,240              | 75,746              | 48,494             |
| Str. 13              | 41,200              | 169,040              | 148,968             | 20,072             |
| Str. 14              | 109,200             | 879,440              | 838,532             | 40,908             |

|                |                |                  |                  |                |
|----------------|----------------|------------------|------------------|----------------|
| Str. 15        | 41,000         | 58,400           | 32,653           | 25,747         |
| Str. 16        | 61,600         | 122,960          | 99,222           | 23,738         |
| Str. 17        | 49,600         | 94,560           | 42,923           | 51,637         |
| Str. 18        | 54,400         | 308,560          | 299,683          | 8,877          |
| Str. 19        | 59,600         | 205,760          | 167,107          | 38,653         |
| Str. 20        | 92,000         | 250,800          | 194,323          | 56,477         |
| <u>Suburbs</u> | <u>773,200</u> | <u>2,770,960</u> | <u>2,315,713</u> | <u>455,247</u> |
| Str. 21        | 60,400         | 214,960          | 178,337          | 36,623         |
| Str. 22        | 50,800         | 116,240          | 102,399          | 13,841         |
| Str. 23        | 41,200         | 210,640          | 190,700          | 19,940         |
| Str. 24        | 48,000         | 104,800          | 84,692           | 20,108         |
| Str. 25        | 76,800         | 341,840          | 317,503          | 24,337         |
| Str. 26        | 71,200         | 129,040          | 70,021           | 59,019         |
| Str. 27        | 56,800         | 49,040           | 1,580            | 47,460         |
| Str. 28        | 68,000         | 622,000          | 556,254          | 65,746         |
| Str. 29        | 79,200         | 249,440          | 191,360          | 58,080         |
| Str. 30        | 122,400        | 538,960          | 494,757          | 44,203         |
| Str. 31        | 41,600         | 92,160           | 58,066           | 34,094         |
| Str. 32        | 56,800         | 101,840          | 70,044           | 31,796         |

APPENDIX

Table 4

Optimum Allocation of Barrio Sample Based on Population  
and Household Expenditure Estimates with Total  
Cost and Coefficients of Variation in  
Comparison with Original PSSH  
Barrio Sample, for Region IV

(Unit Costs:  $C_1 = P42.50$ ,  $C_2 = P12.50$ ,  $C_3 = P1.85$ )

| Stratum<br>(h)   | Original Allocation |      |        | Optimum Allocation |       |           |
|------------------|---------------------|------|--------|--------------------|-------|-----------|
|                  | $m'$                | $n'$ | $q'_h$ | $m_h$              | $n_h$ | $q_h$     |
|                  | POPULATION          |      |        |                    |       |           |
| No. 4            | 5                   | 2    | 6.6    | 3                  | 6     | 3.22      |
| No. 5            | 5                   | 2    | 6.4    | 2                  | 11    | 2.36      |
| No. 6            | 5                   | 2    | 9.8    | 2                  | 13    | 2.26      |
| No. 7            | 5                   | 2    | 9.6    | 6                  | 2     | 4.96      |
| No. 8            | 5                   | 2    | 8.4    | 3                  | 5     | 6.41      |
| Total .....      | 25                  | 50   | 408.0  | 16                 | 93    | 324.21    |
| Total Cost ..... | P 2,442             |      |        | P2,442             |       | (Same)    |
| C. V. (%) .....  | 6.36                |      |        | 4.77               |       | (-25.00%) |

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Table 5

Optimum Allocation of Barrio Sample Based on Population and Household Expenditure Estimates with Total Cost and Coefficients of Variation in Comparison with Original PSSH Barrio Sample, for Region IX

(Unit Costs:  $C_1 = P87.50$ ,  $C_2 = P15.25$ ,  $C_3 = P1.95$ )

| Stratum<br>(h)    | Original Allocation |      |        | Optimum Allocation |       |          |
|-------------------|---------------------|------|--------|--------------------|-------|----------|
|                   | $m'$                | $n'$ | $q'_h$ | $m_h$              | $n_h$ | $q_h$    |
| <u>POPULATION</u> |                     |      |        |                    |       |          |
| No. 27            | 5                   | 2    | 16.6   | 5                  | 3     | 8.46     |
| No. 28            | 5                   | 2    | 12.4   | 5                  | 3     | 5.66     |
| Total .....       | 10                  | 20   | 290.0  | 10                 | 30    | 211.80   |
| Total Cost .....  | P 1,746             |      |        | P1,746             |       | (Same)   |
| C. V. (%) .....   | 10.83               |      |        | 10.12              |       | (-6.56%) |

**APPENDIX**  
**Table 6**  
**Optimum Allocation Sample Based on Population Estimates**  
**with Total Costs and Coefficients of Variation in**  
**Comparison with Original PSSH Sample**  
**for Manila Proper and the Suburbs**

| Stratum<br>(h)       | Original Allocation |       | Optimum Allocation |          |
|----------------------|---------------------|-------|--------------------|----------|
|                      | m'                  | n'h   | mh                 | nh       |
| <b>MANILA PROPER</b> |                     |       |                    |          |
| 1                    | 5                   | 5.0   | 6                  | 3.06     |
| 2                    | 5                   | 2.8   | 5                  | 2.80     |
| 3                    | 5                   | 3.8   | 5                  | 3.80     |
| 4                    | 5                   | 4.8   | 5                  | 4.80     |
| 5                    | 5                   | 4.6   | 3                  | 12.09    |
| 6                    | 5                   | 3.8   | 5                  | 3.80     |
| 7                    | 5                   | 4.0   | 6                  | 2.23     |
| 8                    | 5                   | 2.6   | 2                  | 16.44    |
| 9                    | 5                   | 4.4   | 6                  | 2.56     |
| 10                   | 5                   | 6.2   | 7                  | 2.53     |
| 11                   | 5                   | 3.4   | 5                  | 3.40     |
| 12                   | 5                   | 4.2   | 5                  | 4.20     |
| 13                   | 5                   | 3.6   | 5                  | 3.60     |
| 14                   | 5                   | 8.4   | 8                  | 2.76     |
| 15                   | 5                   | 3.2   | 5                  | 3.20     |
| 16                   | 5                   | 5.0   | 6                  | 3.06     |
| 17                   | 5                   | 3.8   | 4                  | 6.41     |
| 18                   | 5                   | 3.4   | 5                  | 3.40     |
| 19                   | 5                   | 4.2   | 5                  | 4.20     |
| 20                   | 5                   | 7.0   | 6                  | 4.73     |
| Total .....          | 100                 | 441.0 | 104                | 408.47   |
| Total Cost .....     | P1,490              |       | P1,490             | (Same)   |
| C. V. (%) .....      | 6.13                |       | 5.60               | (-8.65%) |



S U B U R B S

|                         |               |              |               |                 |
|-------------------------|---------------|--------------|---------------|-----------------|
| 21                      | 5             | 4.6          | 6             | 2.66            |
| 22                      | 5             | 3.8          | 5             | 3.80            |
| 23                      | 5             | 3.0          | 5             | 3.00            |
| 24                      | 5             | 3.2          | 5             | 3.20            |
| 25                      | 5             | 5.6          | 6             | 3.49            |
| 26                      | 5             | 5.4          | 5             | 5.40            |
| 27                      | 5             | 4.8          | 2             | 22.61           |
| 28                      | 5             | 5.6          | 6             | 3.49            |
| 29                      | 5             | 6.0          | 6             | 3.82            |
| 30                      | 5             | 10.8         | 9             | 2.86            |
| 31                      | 5             | 3.2          | 5             | 3.20            |
| 32                      | 5             | 3.8          | 5             | 3.80            |
| <b>Total</b> .....      | <b>60</b>     | <b>299.0</b> | <b>65</b>     | <b>263.64</b>   |
| <b>Total Cost</b> ..... | <b>P1,013</b> |              | <b>P1,013</b> | <b>(Same)</b>   |
| <b>C. V. (%)</b> .....  | <b>6.81</b>   |              | <b>6.39</b>   | <b>(-6.17%)</b> |

METROPOLITAN MANILA

|                         |               |              |               |                 |
|-------------------------|---------------|--------------|---------------|-----------------|
| <b>Total</b> .....      | <b>160</b>    | <b>740.0</b> | <b>169</b>    | <b>672.12</b>   |
| <b>Total Cost</b> ..... | <b>P2,503</b> |              | <b>P2,503</b> | <b>(Same)</b>   |
| <b>C. V. (%)</b> .....  | <b>4.58</b>   |              | <b>4.22</b>   | <b>(-7.86%)</b> |

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Table 7

Alternative Allocations of Barrio Sample Based on Population  
and Household Expenditure Estimates with Total  
Costs and Coefficients of Variation Compared  
with Those of Original PSSH Barrio  
Sample, for Region IV

(Unit Costs:  $C_1 = P42.50$ ,  $C_2 = P12.50$ ,  $C_3 = P1.85$ )

| Stratum<br>(h)   | Alternative Alloc. 1 |       |           | Alternative Alloc. 2 |       |           |
|------------------|----------------------|-------|-----------|----------------------|-------|-----------|
|                  | $m_h$                | $n_h$ | $q_h$     | $m_h$                | $n_h$ | $q_h$     |
|                  | <u>POPULATION</u>    |       |           |                      |       |           |
| No. 4            | 3                    | 5     | 4.74      | 3                    | 6     | 3.95      |
| No. 5            | 3                    | 5     | 5.15      | 3                    | 6     | 4.29      |
| No. 6            | 3                    | 5     | 6.81      | 3                    | 6     | 5.67      |
| No. 7            | 3                    | 5     | 5.94      | 5                    | 6     | 4.95      |
| No. 8            | 3                    | 5     | 5.66      | 3                    | 6     | 4.72      |
| Total .....      | 15                   | 75    | 424.53    | 15                   | 90    | 424.51    |
| Total Cost ..... | P2,360               | 75    | (- 3.35%) | P2,548               |       | (+4.32%)  |
| C. V. (%) .....  | 5.72                 |       | (-10.06%) | 5.48                 |       | (-13.84%) |

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Table 8

Alternative Allocations of Barrio Sample Based on Population and Household Expenditure Estimates with Total Costs and Coefficients of Variation Compared with Those of Original PSSH Barrio Sample, for Region IX

(Unit Costs:  $C_1 = P87.50$ ,  $C_2 = P15.25$ ,  $C_3 = P1.95$ )

PHILIPPINE STATISTICAL SURVEY OF HOUSEHOLDS

| Stratum<br>(h) | Alternative Allocation 1 |       |           | Alternative Allocation 2 |       |          | Alternative Allocation 3 |       |            | Alternative Allocation 4 |       |            |
|----------------|--------------------------|-------|-----------|--------------------------|-------|----------|--------------------------|-------|------------|--------------------------|-------|------------|
|                | $m_h$                    | $n_h$ | $q_h$     | $m_h$                    | $n_h$ | $q_h$    | $m_h$                    | $n_h$ | $q_h$      | $m_h$                    | $n_h$ | $q_h$      |
| No. 27         | 5                        | 3     | 12.61     | 5                        | 3     | 8.24     | 20                       | 4     | 3.46       | 15                       | 5     | 4.29       |
| No. 28         | 5                        | 3     | 8.94      | 5                        | 3     | 5.85     | 20                       | 4     | 2.46       | 15                       | 5     | 3.04       |
| Total .....    | 10                       | 30    | 323.25    | 10                       | 30    | 211.35   | 40                       | 160   | 473.76     | 30                       | 150   | 459.52     |
| Total Cost ..  | P1,963                   |       | (+12.45%) | P 1,745                  |       | (-0.05%) | P8,864                   |       | (+293.23%) | P5,984                   |       | (+242.83%) |
| C. V. (%) ..   | 9.15                     |       | (-15.51%) | 10.12                    |       | (-6.56%) | 5.03                     |       | (- 53.55%) | 5.48                     |       | (- 49.40%) |

APPENDIX

Table 9

Alternative Allocation Sample Based on Population Estimates with Total Costs and Coefficients of Variation in Comparison with Original PSSH Sample for Manila Proper and the Suburbs

| Stratum (h)                | m                              | n <sub>h</sub>     |
|----------------------------|--------------------------------|--------------------|
| <u>MANILA PROPER</u>       |                                |                    |
| 1 to 20                    | (Same as original PSSH sample) |                    |
| Total .....                | 100                            | 441.0              |
| Total Cost .....           | P1,490                         | (Same as original) |
| C. V. (%) .....            | 6.13                           | (Same as original) |
| <u>S U B U R B S</u>       |                                |                    |
| 21                         | 6                              | 2.65               |
| 22                         | 6                              | 2.00               |
| 23                         | 6                              | 2.00               |
| 24                         | 6                              | 2.00               |
| 25                         | 6                              | 3.49               |
| 26                         | 6                              | 3.32               |
| 27                         | 6                              | 2.82               |
| 28                         | 6                              | 3.49               |
| 29                         | 6                              | 3.82               |
| 30                         | 6                              | 7.82               |
| 31                         | 6                              | 2.00               |
| 32                         | 6                              | 2.00               |
| Total .....                | 72                             | 224.49             |
| Total Cost .....           | P1,027                         | (+1.43%)           |
| C. V. (%) .....            | 6.54                           | (-3.96%)           |
| <u>METROPOLITAN MANILA</u> |                                |                    |
| Total .....                | 172                            | 665.49             |
| Total Cost .....           | P2,517                         | (+0.58%)           |
| C. V. (%) .....            | 4.52                           | (-1.31%)           |