Algemeen Bureau voor de Statistiek
Censuskantoor

CENSUS 2004
COVERAGE EVALUATION

Seventh
General Population and Housing
Census in SURINAME

GENERAL BUREAU OF STATISTICS
CENSUS OFFICE

REPORT ON
CENSUS 2004 COVERAGE EVALUATION

NO TAN NA BAKA, MEK' A SEYBI CENSUS WAKA

CENSUS OFFICE GENERAL BUREAU OF STATISTICS

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PREFACE

"A "perfect" census is impossible; errors inevitably occur. Nevertheless, census figures that are subject to error are still valuable if the limitations of the data are understood by the users and if the errors do not adversely affect the major uses of the data" (US Bureau of the Census, 1985).

Population and Housing Censuses are meant to be the most authoritative social accountings of people and housing in a country. Therefore all efforts have to be made to obtain coverage that is as complete as possible. It is also of utmost important that the quality, particularly as it relates to coverage is assessed. After all, ***"A critical assessment of our past successes and failures makes us better equipped to provide future successes"*** (N. Cressie in Survey Methodology, June 1992).

It is sometimes erroneously assumed that quality control issues and evaluation only come into play at the end of the project cycle, i.e. apply merely to the final product. These issues apply to the total project cycle to ensure that the error level of the final results is within tolerable limits. To assure that this is the case, checks on quality need to be performed at each stage.

This publication comprises the technical evaluation, largely of the coverage of the 7th Population and Housing Census. It was originally planned for November 2005, but it was quickly realized that it would be better and more logical to produce a technical evaluation report as the penultimate output of the Census, after all substantive reports had been issued hence it was postponed with 1 year to November 2006. The ultimate output will be a report with corrections (mainly caused by coding & classification errors and omissions), some of which have already been reported in National Results, Volume III.

This publication comes in time though, since the Inter-American Development Bank will also conduct its own evaluations, be it of both the results and operational aspects of the Seventh Population and Housing Census. The first evaluation, the so-called mid-term review is scheduled for December 2006 or January 2007 and the second evaluation will take place at the end of the project life cycle.

The General Bureau of Statistics, particularly its Census Office, takes this opportunity again to thank all institutions, organizations and persons, particularly those members of the general public in Suriname who have responded and thus made the Seventh General Population and Housing Census of Suriname a success. This publication is dedicated to you all.

Algemeen Bureau voor de Statistiek – Paramaribo, november 2006
General Bureau of Statistics – Paramaribo, November 2006

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GENERAL INTRODUCTION

"A Population and Housing Census (or a Population Census by itself) is perhaps the single most extensive, complicated and expensive statistical operation, consisting of a complex series of interrelated steps that a country undertakes".[1]

In 2004, through its General Bureau of Statistics (GBS), Suriname conducted its Seventh General Population Census. It was the Second Census, legally under directions of the GBS, since enactment of the new Statistics Act (S.B. 2002, no 97). From 2 to 15 August 2004, the field operations for the Base Population Count took place. From 16 August to 22 August 2004 the so-called 3rd week Field Operations took place, whereby the Enumeration blocks for which there was no field staff during the first 2 weeks were canvassed. From 23 August 2004 up to 18 September 2004 the so-called follow-up count (a.k.a. "completion" count) took place. During that phase all addresses where the enumerators were unable to secure a response during the first 3 weeks were re-approached several times to obtain as much as possible response.

Since Suriname conducted its Census using a so-called comprehensive approach (i.e. enabling both a De Jure and a De Facto count of its population[2]), in principle everybody present in Suriname during Census night (1 August 6.00 P.M to 2 August 6.00 A.M.), should have been counted. However, no Population Census is able to account for everybody. Since the Census is supposed to be the most authoritative social accounting of people in a country it is imperative that an assessment is made to find out how many were missed by the Census field operations.

For Evaluating the Census Project one could look at the Logical Framework and/or at the Project Objectives. One could also evaluate the Census results in a more technical manner. For Evaluating Population Censuses technically, several methods are available. In the publication at hand the Seventh General Population and Housing Census will be evaluated technically. The following table relies heavily on US Bureau of the Census[3].

Source of Data	Matching Studies	Non-matching Studies
Single (Census only)		**Demographic Analysis of the Census using Age-Sex ratios** **Statistical Analysis of mean household size**
Multiple (Census and Other)	**Post Enumeration Surveys** (Reverse) Record Checks Comparison with existing Household Surveys	**Demographic Analysis using previous Censuses** **Comparison with Independent, external data** Comparison with existing Household Surveys

The boldfaced items have been applied and will be treated in this publication.

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[1] UN 1998, p 11.
[2] Albeit that detailed tabulations were only planned and issued for the De Jure Population.
[3] US Bureau of the Census: 1985, p 9.

PART I: Demographic Analysis, Comparison with Independent, External data and Statistical Analysis of household size

1- Demographic Analysis based on a Single Census

Demographic Analysis, using only the Census at hand focuses on internal consistency checks and on revealing demographic regularities.
We shall start with computation of well known age-sex accuracy indices for the population of 2004[4] .
"It has been discovered by examining many censuses that there is a link between reliable age reporting and complete enumeration. However, good age reporting is not quite the same guarantee of completeness of enumeration in a society that holds exact age to be culturally important as in societies which do not" (Caldwell et al, in Li Chengrui, 1984).

If we exclude effects of wars and/or pandemics in the past, a high index value outside the acceptable interval could mean: age and/or sex errors (reported by the respondent, noted by the enumerator or made while keying in the results), but also selective under-coverage or age and sex selective (unreported) migration.

1.1 Whipple's Index

This index uses the single age distribution on the interval 23-62 years of the Census population and measures the attraction to terminal digits 0 and 5. Deviations from 100 indicate digital preference.

Whipple's Index for both sexes is 101.2
Whipple's index for males is 100.4; Whipple's index for females is 102.0

1.2 Myers' Blended Index

This index also uses the single age distribution of the population, usually on the interval 10-89 (and 20-99) to compute a measure of the tendency for ages ending in certain digits to be preferred to others in enumeration. The index is 0 when there are no anomalies and it is 90 when everybody has chosen to report the same terminal digit.
This index, computed using age ranges 10-89 and 20-99 is as follows:

Myers' Blended Index for both sexes is 1.48
Myers' Blended Index for males is 1.81; Myers' Blended Index for females is 1.35

Using the age ranges 10-89 and 20-89 (preferred in PAS-software of the US Bureau of the Census) the results are as follows:

Myers' Blended Index for both sexes is 1.44
Myers' Blended Index for males is 1.78; Myers' Blended Index for females is 1.33

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[4] Whipple's index: <105 Very good, 105-<110 Good, 110-<125 So-so and 125 and over is Poor, for Myers' Index <10 Good, 10-20 is So-so and over 20 is Poor.

Graph I.1: Digital Preference as revealed by Myers' blended index
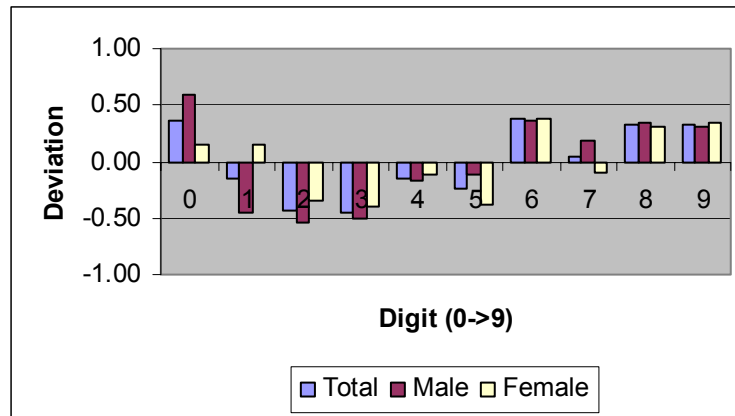
1.3 The United Nations Age-Sex Accuracy Index[5]

This index or score utilizes grouped data up to the age of 70 and is based on the observation made by the UN in the early fifties that: *"… differences between sex ratios for successive quinquennial age groups and deviations of quinquennial age ratios from 100 are likely to be slight for all ages up to age 70 if the statistics are accurate and if the population has not been severely affected by birth cycles, birth deficits, military casualties, and large discontinuous migrations."* (UN, 1952)

The United Nations Age-Sex Accuracy Index is 20.9, without a correction for population size, while corrected for population size the Age-Sex Accuracy Index* is 18.9

1.4 Sex ratio at birth and mean parity pattern for Children ever born questions

For assessing quality and or internal consistency, the sex ratio at birth for the questions on children ever born can be used, as well as the pattern of the mean parity. **The sex ratios at birth should not vary systematically with age of the mothers and their value (as well as the overall value) should be between 102 and 107.** As regards the mean parity per woman, this should normally exhibit a pattern of increasing with age. The data in table 1 largely exhibits the expected pattern. Only the sex ratio at birth for the age group 15-19 is (barely) outside the expected range. This age group is always notoriously problematic.

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[5] UN Age-Sex accuracy index: < 20 Accurate, 20-40 Inaccurate and 40 and over is highly inaccurate. The UN index can be computed without or with (*) a correction for population size. The corrections have to be made for populations with size between 10,000 and 1 million and the application for very small populations is discouraged. These figures differ slightly from those published previously in National Volumes I to IV.

Table I.1: Boys Ever Born, Girls Ever Born by Age Group of Woman, as well as Sex
         Ratio at Birth and Mean Parity

Age group	Women	Boys ever born	Girls ever born	Sex ratio* at birth	Mean parity per woman
15-19	23,035	2,455	2,420	101.4	0.2
20-24	21,399	8,207	7,790	105.4	0.7
25-29	18,874	13,770	13,205	104.3	1.4
30-34	19,156	21,571	20,861	103.4	2.2
35-39	18,083	25,065	24,035	104.3	2.7
40-44	16,327	25,189	24,280	103.7	3.0
45-49	12,992	22,907	22,333	102.6	3.5
50-54	10,485	20,135	19,583	102.8	3.8
55-59	8,027	17,094	16,444	104.0	4.2
60-64	7,059	15,675	15,257	102.7	4.4
Total	155,437	172,068	166,208	103.5	

* boys/girls x 100

1.5 Comparison with other countries[6]

It is always interesting and valuable to make comparisons with other countries. In the
table below the various indices for Suriname are compared to those of selected other
countries. We have chosen the larger CARICOM member countries: Guyana, Jamaica
and Trinidad & Tobago, selected small CARICOM Associate member countries,
Bermuda and Turks and Caicos Islands. We also present the Netherlands Antilles and the
USA with which we have frequent contact, and finally the United Kingdom.

Table I. 2: Selected measures of Age-Sex accuracy for selected countries

Standard		Age-sex measure			
		less than 20	less than 20	less than 105	less than 10
Country	**Census**	**UN-score**	**UN-score***	**Whipple-b**	**Myers-b**
Suriname	2004	20.9	18.9	101.2	1.44
Guyana	2002	15.1	14.1	NA	NA
Trinidad and Tobago	2000	15.9	15.9	107.1	1.50
Jamaica	2001	16.9	16.9	107.4	1.49
Netherlands Antilles	2001	23.5	18.5	100.4	1.12
Bermuda	2000	19.5	11.5	100.2	1.95**
Turks and Caicos Islands	2001	50.2	28.2	104.2	1.30
United Kingdom	2001	14.9	14.9	98.0	.30
USA	2000	13.1	13.1	NA	NA

* Corrected for population size; ** Not completely comparable since single years of data stops at 74.
Whipple-b and Myers-b are measures for both sexes; NA = Not Available

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[6] More comparisons (e.g. regarding provisional versus final results, undercount and publications calendar)
are presented in Appendix 1

2- Demographic Analysis based on Two Censuses and comparison with Birth Statistics

2.1 Simple Extrapolations

(i) A simple extrapolation of the growth rate resulting from comparison of the enumerated population in July 1980 with the enumerated population in March 2003. This produces an annual growth rate of 1.34% per year, which over a period of 16 months would have resulted in a population of circa 490,000.

(ii) A simple extrapolation of the growth rate resulting from a comparison of the enumerated population in 1980 with the estimated (i.e. enumerated + missed) population in 2003. This produces an annual growth rate of 1.46% per year, which over a period of 16 months would have yielded a population of circa 504,000. **The enumerated population (492,829) lies between the two values thus obtained.**

2.2 Population Projections

A Population projection is an attempt to describe what would happen given certain hypotheses. It answers the hypothetical question how would the population behave if certain conditions were to be maintained for a specified period. (Caswell, 1989)

Yet another way of assessing population Census results (especially regarding totals and age-sex composition) would involve using a cohort component projection, based on the previous Census. For Suriname this means a very long projection interval (1980-2005, or even beyond 2005). Anyway, we would have to utilize the 1980 Census Population as Base population and make plausible assumptions regarding: Mortality, Fertility and Net Migration.

For Mortality we would use the Life table for Suriname, based on Population Census 1980 results and vital statistics of the Civil Registry Office (CBB) for the years 1979-1981, as well as the WHO life table for Suriname for the year 1999. (See appendix 2 for the life tables). Note that the weak point in any population projection is almost always the "Migration" component. Although CBB, has negative net migration for all (but one) years between 1980 and 2004, we think that as is customary a "fan" of projections needs to be prepared, most likely involving negative net migration, net migration at zero and positive net migration. Though we would be prepared to use at least three migration assumptions, the age-sex profile of migrants also needs to be conjectured and in the absence of any other information most likely some sort of standard pattern would have to be adopted. At the time of writing this report, we do not feel comfortable in specifying fertility assumptions. A better approach will be to wait for pertinent CBB data and produce projections based on Census-2004, up to 2015 or 2020.

In view of the aforementioned, no population projections have been undertaken.

2.3 Intercensal Survival Ratios

The enumerated population of x years at a Census in year t (Px,t) is compared with the enumerated population of x+n years of age at a Census in year t+n (Px+n, t+n) with n>0. If the population is (approximately) closed then P(x+n,t+n) has to be less than P(x,t) and the developments are caused by the pattern of mortality. The drawback of this method in relatively small populations is that the influence of migration is not negligible. **The method thus measures the results from interplay of mortality and migration!**

The application of Census survival ratios turns out more fruitful in countries with a (very) large population. The "giants" India and China for any practical purpose may assume that their population is closed, because any comprehensible international migratory movement will have a negligible demographic effect on their population of over a billion!

Notwithstanding the aforementioned we shall look at the pertinent developments for Suriname over the period 1980-2004 (circa 24 years).

Table I.3: Intercensal survival ratios 1980-2004 for Surinamese Males and Females[7]

Age group		Males			Females		
1980	2004	1980	2004	Ratio	1980	2004	Ratio
00-04	24-28	23,487	19,553	0.8325	22,944	19,279	0.8403
05-09	29-33	24,926	20,090	0.8060	24,506	19,020	0.7761
10-14	34-38	25,043	19,170	0.7655	24,724	18,291	0.7398
15-19	39-43	23,712	18,722	0.7896	23,499	17,280	0.7354
20-24	44-48	15,990	13,616	0.8515	16,615	13,670	0.8228
25-29	49-53	11,160	10,694	0.9582	11,887	11,187	0.9411
30-34	54-58	8,556	7,353	0.8594	9,270	8,175	0.8819
35-39	59-63	7,449	6,430	0.8632	8,410	7,328	0.8713
40-44	64-68	7,265	5,347	0.7360	8,007	5,799	0.7242
45-49	69-73	7,006	4,502	0.6426	7,263	4,829	0.6649
50-54	74-78	5,857	2,730	0.4661	5,895	3,111	0.5277
55-59	79-83	4,640	1,512	0.3259	4,670	1,867	0.3998
60-64	84-88	3,128	520	0.1662	3,231	851	0.2634
65-69	89-93	2,704	216	0.0799	2,538	344	0.1355
70+	94+	4,896	58	0.0118	5,962	124	0.0208
		175,819	130,513		179,421	131,155	

Although the Surinamese Population is far from closed, the survival ratios look plausible in part. Firstly they are all below 1.0 as expected. The results of the under five age group and the age groups 30 and over are acceptable to us, but even with a separate treatment of the sexes, the pattern for the age groups 5-9 up to 25-29 is not fully satisfactory as a pure measure of mortality. **Most likely the influence of migration comes into play!**

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[7] The total numbers in this table differ somewhat from those presented in e.g. Volume III (Fertility and Mortality) of the national results, as in this table all cases with age and or sex unknown have been distributed proportionately.

2.4 Comparison with Birth Statistics

A comparison between registered births and the enumerated local-born population should exhibit a certain trend. <u>When we compare the local born population at a certain point in time with the pertinent birth cohorts, the former has to be smaller all the time</u>. For instance, persons who were 30 years old on 2 August 2004 are the survivors of the births during the period 2 August 1973 up to 1 August 1974. <u>This procedure of (graphical) Demographic Analysis is also a matter of comparisons with independent external sources as data regarding births are provided by the Civil Registry Office (CBB)</u>. If unexpectedly the enumerated population is larger than the number of births for the concomitant period[8] this could be indicative of an over count in that category or of an under registration in the pertinent period. Another possibility is a change in the registration pattern. If for instance, vital events are registered with a greater time lag we may indeed have a problem.[9] Finally, the problem could have to do with a change in the ratio of live births vis-à-vis those classified as "notice given of a stillbirth". This category refers to all live births that die before the birth is registered. This category is not included in the live births and also not included in the infant deaths.

Graph I.2 : Local born population, 40 to 0 years of age as at Census Day 2 August 2004 and Births August t-1 up to July t
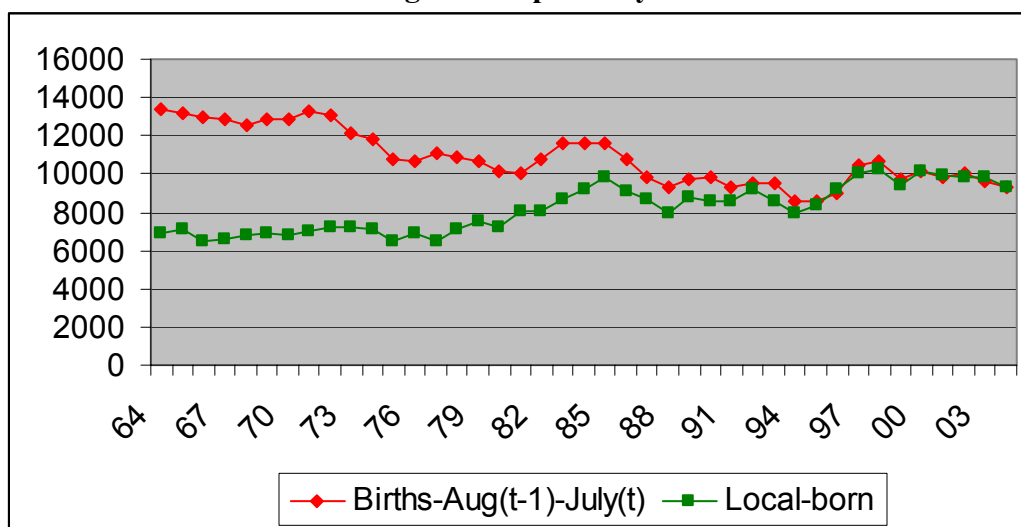
The data for 1964 up to 2004 (40 down to 0 year of age) exhibit the expected pattern. There is a problem with August 1995 up to July 1996 (those 8 years of age), with August 2000 up to July 2001 (those 3 years of age) and with August 2002 up to July 2003 (those 1 years of age). If we exclude the aforementioned categories it can be seen that for all ages from 1 to 40 the enumerated local-born population is lower than the pertinent

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[8] The number of births reported by CBB pertains to a calendar year but is adjusted to enable comparisons with the enumerated population as at 2 August. As information on births is available on a monthly basis (and not on a daily basis) we have separated the series as follows: August to December versus January to July to approximate 2 August of the previous year up to 1 August of the current year.
[9] Births and Deaths can be registered by year of occurrence or by year of notification. CBB in Suriname adheres to the second convention.

number of births. Actually, even though not all the information is depicted, the expected pattern is exhibited for all ages up to 81 years (Please note that no birth statistics are available before 1923). Problems with the 1-year old, 3-year old and 8-year old children will have to be sorted out. A possibility is an under registration of births (either permanently or caused by very late registration). From August 2003 up to July 2004, the Civil Registry Office reported 9,339 live births. The Census question on live births in the 12 months preceding the Census date (i.e. between 2 August 2003 and 1 August 2004), yielded 10,072 live births. Although some telescoping (but also some omissions, for that matter) can never be excluded, a difference of more than 700 births cannot be ignored. However, the good news is that the UN cut-off to consider registration "complete" is 90% and at least for 2003/2004 Suriname attained 93%, if we assume the Census number to be correct. **It can be seen that if the deviant observations are corrected using the ratio 10,072/9,339 then the complete series will be well-behaved.**

2.5 Comparison of Census infant mortality, with infant mortality of BOG[10]

For producing estimates of infant mortality, the questions on children ever born and children surviving are used. They result in the table below.

Table I.4:   Mean number of Children Ever Born (CEB) and mean number of Children Surviving (CS) by Age Group of Mother

Age group	Women	Children ever born	Mean CEB	Died	Mean survived (CS)
15-19	23,035	4,875	0.212	111	0.207
20-24	21,399	15,997	0.748	321	0.733
25-29	18,874	26,975	1.429	533	1.401
30-34	19,156	42,432	2.215	1061	2.160
35-39	18,083	49,100	2.715	1356	2.640
40-44	16,327	49,469	3.030	1617	2.931
45-49	12,992	45,240	3.482	1869	3.338

The information in the next table is the basis for producing so-called indirect estimates[11] of infant mortality ($_1Q_0$). These estimates can be combined with a direct estimate, also resulting from the Census, to provide a series, which spans the period from February 2004, direct Census estimate, to February 1990[12].The Census estimates will be compared to the BOG direct estimates of infant mortality although the BOG estimates naturally have a different reference point and there is some conceptual difference. The BOG estimates are the conventional infant deaths divided by the number of births in a calendar year. Normally this figure is attributed to the midpoint of the year.

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[10] BOG is the Bureau for Public Health under the Ministry of Health

[11] We used the Q-Five software of the United Nations and have chosen the Coale-Demeny East Model.

[12] The indirect estimates span the period from January 2003, up to February 1990. Interestingly, we thus also have a starting point for an important MDG indicator!

Table I.5:   Infant mortality from Census-2004 and from BOG 1990-2004

Period	Infant Mortality (1q0)			Period
	Census	BOG	BOG*	
Feb-90	31	21.1		Jul-90
Feb-93	27	21.4		Jul-93
Aug-95	25	15.4		Jul-95
Oct-97	23	14.9		Jul-97
Oct-99	18	16.8		Jul-99
Aug-01	19	15.9		Jul-01
Jan-03	19	17.7	19.9	Jul-03
Feb-04	20	15.9	19.2	Jul-04

* For 2003 and 2004, figures corrected by BOG with data obtained from their hospital surveillance system.

The Census series varies between 18‰ and 31‰, while the BOG series varies between 14‰ and 22‰. Interestingly the corrected BOG figures for 2003 and 2004 come very close to the Census estimates. Also both series exhibit a downward trend. The Census estimates are all higher than the BOG estimates, which could be a sign that there may be a downward bias in the direct series, caused by the well-known "still-births" problem[13] in Suriname

Graph I.3: Infant Mortality rates from Census-2004 and from BOG 1990-2004

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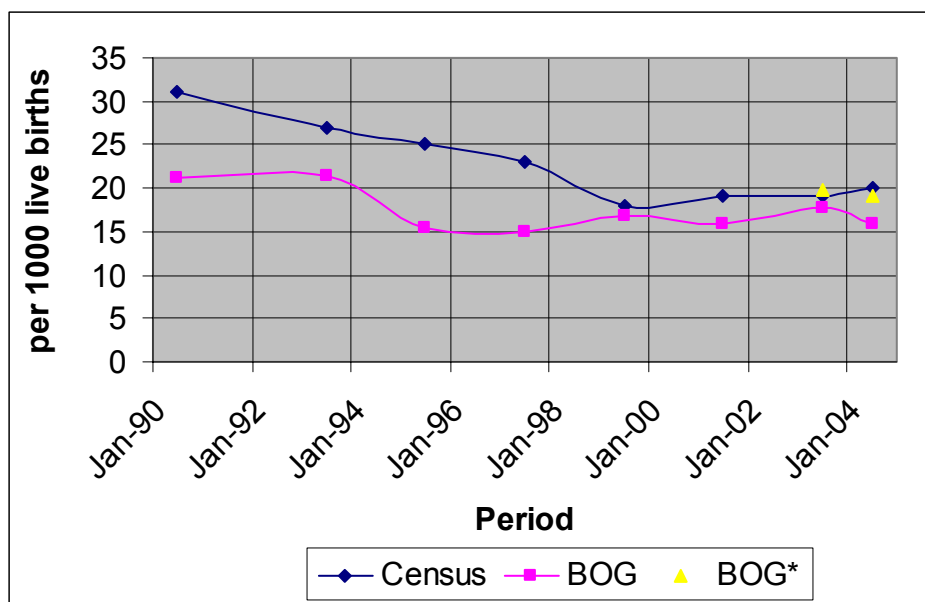
[13] If an infant dies before the birth is registered, it is excluded from both live birth statistics and infant death statistics.

2.6   The Demographic Balancing Equation

This well-known equation (which is almost never completely in balance) simply states that the **P**opulation at a certain time t can be obtained by adding inter temporal **B**irths and **I**mmigration to a chosen base population and by subtracting **D**eaths and **E**migration over the same period. In formula (re-arranged): $P_t = P_0 + (B_{0t} - D_{0t}) + (I_{0t} - E_{0t})$

Restated: The Population at a certain time equals the base population plus natural growth plus net-migration. Normally, the balancing equation is applied over relatively short periods (not exceeding ten years), **but in the Surinamese case the period is 24 years, which is unusually long.**
The vital statistics (births, deaths and net-migration) are from the Civil Registry Office (CBB: "Demografische Data Suriname 2003 & 2004, January 2006, received June 2006)

The Census population as at 1 July 1980 was   : **355,240**

Natural growth between 1 July 1980 and 2 August 2004 was   : **173,186**
Net Migration between 1 July 1980 and 2 August 2004 was   : **-62,859**
Thus total Growth was   : **110,327**

The expected population as at 2 August 2004 is 355,240 + 110,327 = 465,567, which falls 27,262 short of the Census tally of 492,829.

Errors[14] may be in both natural increase and in net-migration. Errors in natural increase are assumed negligible. Even if we were to assume (unrealistically) that over the entire period under consideration the completeness of births and deaths was 93% (see paragraph 2.3), we would still fall short more than 13,000 of the Census tally. This discrepancy must be ascribed to undocumented net-migration.

It is worth noting that the practice of using the Immigration numbers of Statistics Netherlands to estimate emigration from Suriname has been a great improvement, but still provides only part of the picture. Other destinations favoured by Surinamese are the Netherlands Antilles and the USA. For example, the official emigration tally for the period 2000-2004 which stands at 16,917 would have to be increased with 1,339, reckoning only with the Netherlands Antilles. However, we would still have a problem with unregistered Immigration.

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[14] Actually the Balancing Equation offers a check on all components: Base Population, Natural Increase, Net-migration and the End Population.

3-   Comparisons with other Independent External Data

For comparison with independent external sources we looked at:
1- Old Age Pensioners of the Ministry of Social Affairs and Housing (SOZAVO);
2- Claimants for medical aid of SOZAVO;
3- Those registered with the State Health Insurance Company (SZF);
4- Government employees registered by the Government Computing Center (CEBUMA);
5- Selected information from the Ministry of Education;
6- The Database of the Electricity Company of Suriname (EBS).

1- Old-age pensioners registered by SOZAVO. These numbered between **37,000 and 39,000** during July-September 2004. The Census yielded 42,189 persons in the category 60+, of which **40,051** Surinamers. We think a census figure, lower than the number of Social Affairs and Housing would have been questionable.
2- Claimants for medical aid of SOZAVO were between **135,000 and 137,000** in July-August 2004, while the Census produced **114,740.** If the large category **"not reported" (78,000)** in the Census is distributed pro rata among the substantive categories we obtain **136,336** which is consistent with SOZAVO
3- SZF had a number of **circa 129,500** registered, while the Census produced **circa 104,000**. Applying the same pro rata distribution as in -2- yields **124,851** which again comes close to the SZF total.

It should be noted that information regarding medical insurance provided by respondents is generally considered notorious in Suriname. This must be judged against the background of findings of several IDB studies regarding *"health care utilization and expenditure, and Ministry of Social Affairs Card holding"*.

4- With regard to employment, CEBUMA registered **37,087 public servant**s as of the end of July 2004. When the branches of industry 'Government' and 'Education' from the Seventh Census are added up, the number of employees amount to **36,350**. The difference in number of employees between the CEBUMA-registration and the Seventh Census results for July 2004 amounts to **737 persons**. Actually we need to add: 'Government' + part of education + part of health from the Census, but the corrections to be made are not clear. We thus choose to add 'Education' and to ignore 'Health' as an approximation.

5- Since the Census did not ask for enrollment, but only asked about educational attainment, these checks are less straight forward. However, we can still look at the plausibility of some of the Census data. In the school year 2004/2005 (the school year in Suriname ranges from the beginning of October to mid August), there were **16,975** pupils enrolled in Pre-primary schools. As these are approximately the 4 year olds and 5 year olds, these numbers can be compared to the Census figures for 4-5 years old, namely **20,442**.
In the school year 2004/2005, there were **65,766** pupils enrolled in primary schools. As these are approximately 6-14 year olds, the number can be compared to the corresponding Census figure of **84,698**. Had the Census numbers been

much less than the numbers of enrolled pupils this would certainly have been a serious concern. Similar comparisons could be made for Junior Secondary schools and Senior Secondary schools, but these would require much more efforts, especially for the Junior Secondary schools given the proliferation of types at this level.

6- Finally, we looked at the database of EBS, as at Mid August 2004. The EBS had **94,252 subscribers**, while the Census yielded **94,451** dwellings of which people reported a direct connection to the EBS. One possible explanation for the fact that the Census figure is marginally higher could be that people reported a direct connection, while they were excluded by EBS because of failing to pay their bills.

The results can be summarized in the table below.

Table I.6: Comparison of selected Census results with independent external data

	a	b	b/a x 100%	c	
External Source	Number	Census	Percentage	Census*	percentage
OAP-SOZAVO	38,000	40,051	105.4	40,051	105.4
Med-Aid SOZAVO	136,241	114,740	84.2	136,336	100.1
SZF-registrants	129,524	104,345	80.6	114,740	88.6
CEBUMA-registrants	37,087	36,350	98.0	36,350	98.0
Education-pre-primary	16,975	20,442	120.4	20,442	120.4
Education primary	65,766	84,698	128.8	84,698	128.8
Electricity company	94,252	94,451	100.2	94,451	100.2

* Census adjusted pro rata (to correct for 'not reported' category) if necessary

The same information is portrayed in the graph below.

Graph I.4: Comparison of selected Census Results with Independent External Data

16
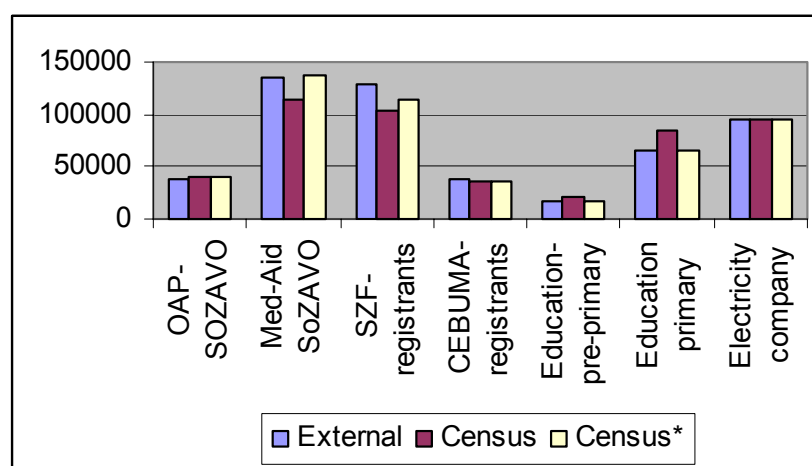
4-   Statistical Analysis (single Census): Mean Household Size[15]

When evaluating Censuses of Population and Housing it is (rightly or wrongly) assumed that too much variation in the mean household size is either indicative of coverage errors (i.e. for missed persons and/or households) or of the presence of relatively many collective households. In our opinion there are at least two problems with this approach. Firstly, the approach fails to specify what amount of variation is tolerable and secondly the approach fails to indicate the size[16] of the geographic area that one needs to pay attention to. In the Surinamese situation the second point would raise the question whether to look at data at the District level or data at the Ressort level or even at the Enumeration Block level. In what follows, we shall pay attention to all three levels.

4.1-   Mean Household size at the District level

We start looking at data at the District level and we utilize a so-called 3-sigma error band. When we apply a so-called 3-sigma error band to the mean household sizes of Suriname at the District level, we can see that for all ten Districts the mean household size is within this band. The observed means vary between 3.08 (Coronie) and 4.24 (Para). Admittedly, the result of the District of Coronie falls just within the 3-sigma error band. But Coronie is so small that it should be relatively easy to verify or estimate if and possibly how many dwellings, households and/or persons have been missed. We are confident that those (dwellings, households and/or persons) missed in Coronie are not of such an extent that the average household size has to be rejected.

Graph I.5: "3-sigma error band" for the Mean Household Size per District (Suriname Census 2004)

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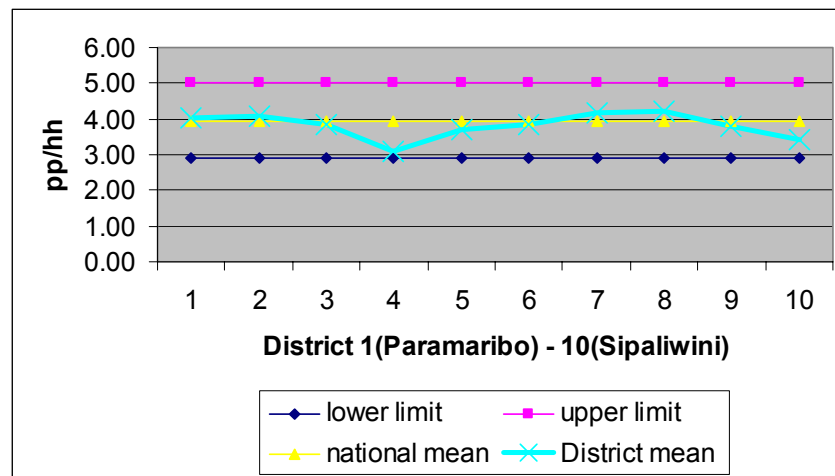
[15] In all cases the "national mean", 486907/123463 =3.94 is used and not the unweighted mean of means, which would be 3.82 at the District (n=10) level and 3.80 at the Ressort (n=62) level. At the block level (n=844, mean 3.98) the difference is only circa 0.035, which would be negligible for all practical purposes.
[16] What is considered small (in terms of Land area or Population) in say the USA or Russia may still be too large for Suriname.

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4.2-   Mean Household Size at the Ressort Level

At the ressort level there are 62 observations. Again, we utilize a 3-sigma error band. The observed ressort means vary between 2.77 for Wanhatti and 5.10 for Pontbuiten. The grand mean is 3.94, and all ressort means are within the 3-sigma error band.

Graph I.6: "3-sigma error band" for the mean household size per Ressort (Suriname Census 2004)
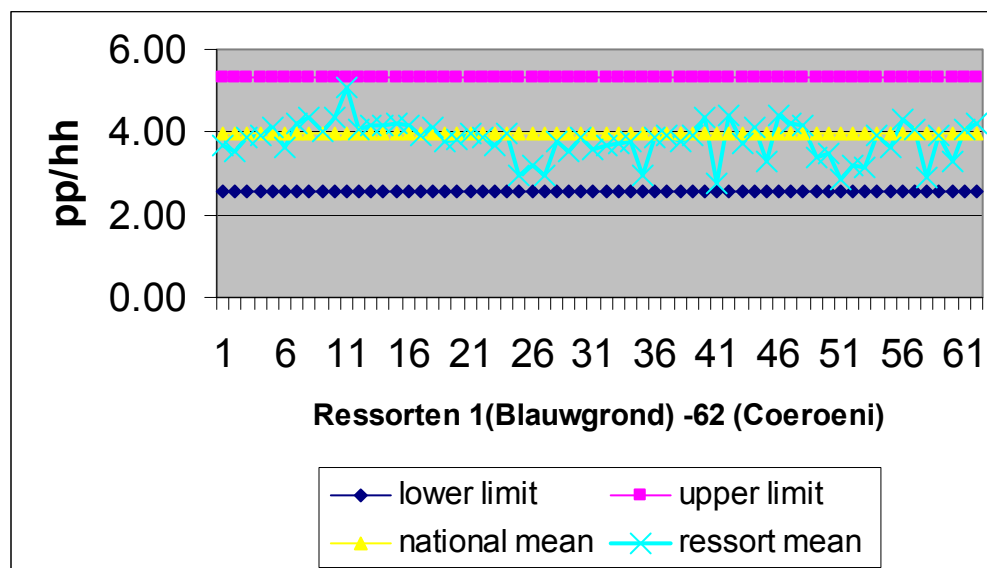
4.3-   Mean Household Size at the Enumeration Block Level

Enumeration blocks were in principle designed to contain 100-150 households. In practice the Enumeration blocks that result may differ from the target, because in demarcating enumeration blocks, natural borders such as streets and ponds are preferred to synthetic borders, such as gates. Other important issues to reckon with are that enumeration blocks <u>must</u> fall within the borders of one ressort and cannot be allowed to extend over more than one ressort and also the fact that some areas are clearly more built up than others. Finally, for several reasons the initial number of enumeration blocks, may differ from the ultimate number. **The present analysis comprises 844 enumeration blocks and areas (down from initially 951).** Actually, the number of blocks changed like this: 951 ➡ 891 ➡ 846 ➡ 843 ➡ 844

At the enumeration block level the observed mean household size varies between 2.49 for an enumeration block in the ressort of Boven Suriname (District of Sipaliwini) and 6.51 for an enumeration block in the ressort of Pontbuiten (District of Paramaribo). One enumeration block fell below the lower limit and 17 (of which 10 in Pontbuiten), exceeded the upper limit of the 3-sigma error band. <u>The graph is provided in Appendix 3</u>.

5- SUMMARY of Part I

The Evaluation results of Part I can be summarized in the table below. Like any other Census the seventh Census cannot be deemed perfect, but the message in the table below is reassuring as regards the consistency and quality of the Census.

	Evaluation Method	Result
	Demographic Analysis - Single Census	
1	Whipple Index	OK
2	Myers Blended Index	OK
3	UN Age Sex Accuracy Index*	OK
4	Sex Ratio at birth from CEB question	OK
5	Mean Parity per woman pattern	OK
	Demographic Analysis - Two Censuses and Comparison with birth Statistics	
6	Simple Extrapolations	OK
7	Population Projections	Not executed
8	Intercensal Survival ratios	OK
9	Comparison with Birth statistics	OK
10	Comparison of Census Infant Mortality with Infant Mortality from BOG	OK
11	Demographic Balancing Equation	Inconclusive
	Comparison with Other independent, external data	
12	Old Age Pensioners of the Ministry of Social Affairs and Housing (SOZAVO)	OK
13	Claimants for Medical Aid of SOZAVO;	OK
14	Those registered with the State Health Insurance Company (SZF)	OK
15	Government Employees registered by the Government Computing Center (CEBUMA)	OK
16	Selected information from the Ministry of Education	OK
17	The database of the Electricity Company of Suriname (EBS).	OK
	Statistical Analysis (Single Census)*	
18	Mean Household Size at the District level	100%
19	Mean Household Size at the Ressort level	100%
20	Mean Household Size at the Enumeration Block level	97.9%

*The percentages in 18, 19 and 20 refer to observations falling within the 3-sigma error band (all at the District level and at the Ressort level and 826 of 844 at the Block Level).

PART II: The 2004 Post Enumeration Survey

1-   Introduction

In modern Censuses it has become standard practice in many countries to conduct an independent Survey as close as possible from the Census reference moment, without interfering with the census enumeration field operations. These surveys, designed to check on the accuracy of the census count or sometimes to check and correct the census count are most often termed: post enumeration surveys (PES), but have sometimes been called post-census validation surveys (UK) and even Accuracy and Coverage Evaluation Surveys (USA).

2-   Undercount in a Census

As stated earlier, during a Census, every attempt is made to include everyone belonging to the target population. For various reasons one does not succeed in enumerating everyone. The following reasons are not exhaustive and are in random order:

1-   Persons were very mobile during the Census field operation and therefore difficult to contact, or in some cases, single people or whole households were overseas
2-   Persons assumed that they were already enumerated, in other words that their information was already provided by a "proxy" respondent
3-   They were concerned about their security and denied enumerators access to their premises or they worried about confidentiality of their data and refused to respond
4-   They refused to respond because of the general social-economic situation in the country
5-   They made every effort not to be counted, without refusing point blank, in other words they made sure they were not found at home, they made appointments with enumerators which they did not keep
6-   Field workers skipped certain areas accidentally or deliberately
7-   Defective Cartography (Maybe some areas were not on the enumerator maps).

As regards refusal, it is worthwhile to note that the penalties for refusing to cooperate are very stiff, so at the end of the day the GBS ended with a list of only 27 outright refusals, of which it decided to prosecute[17] 9 cases, because for those cases the GBS instruction on how to deal with refusals were followed painstakingly. It may be inferred that some people did not refuse outright, but cunningly decided, "Never to meet with an enumerator". This may be food for thought for future Census legislation.

Although the Census Cartography for 2004 was not "spotless", the last reason either is absent or is thought to have minimal consequences, because the ABS Census Office staff improved the Census-2003 Cartography with the help of the staff of the Ministry of Regional Development (Staff of the District Commissioners).

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[17] Approximately 2 months after our lawyer submitted our request, we asked him to withdraw it, because pending the outcome of a lengthy legal battle (given the situation of the Judiciary in Suriname), we would not be able to publish final results.

There are several measures of undercount. In this report, undercount will be measured as the percentage difference, between the final Census de Jure count and the expected totals estimated, using the so-called Sekar-Deming method[18], albeit the more modern version elaborated upon in the 1980s and 1990s and "almost perfected" in the UK's 2001 Census.

The total observed Census population comprises everybody within the scope of the Census captured during the base count, the completion count and the PES, while the estimated "true" population is the Sekar-Deming estimate.

Figure 1: Schematic representation of Census/PES confrontation
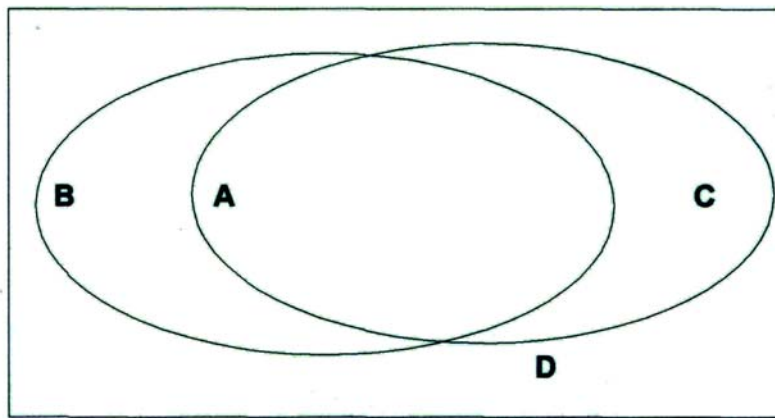
If one looks at the figure above, the Census operation is supposed to capture A+B+C+D. After the Census and PES are combined, one ends up with A+B+C, and under certain conditions[19] D (those missed), may be estimated. The most critical conditions are:

1-   Independence between the PES and the Census
2-   Homogeneity
3-   Closure
4-   Accurate Matching
5-   No database inflation.

[18] C. C. Sekar and W. Edwards Deming, 1949 (POPLAB, Reprint Series 1, May 1971)
[19] Cf. Wolter, 1986.

3- The 2004 Post Enumeration Survey

Suriname did not conduct a Census in the 1990s and as far as we know the censuses conducted before (1921, 1950, 1964, 1972 and 1980) were not evaluated by means of a PES.[20]

The Sixth Census, conducted in 2003, was the first in which a PES was conducted to evaluate the Census. It yielded a provisional figure of 2.6% undercount. As is well known, a horrendous fire, emanating from arson, destroyed the former premises of GBS, inclusive of the Census forms, so apart from partial (Census and PES) information keyed in already, there was not much left to be evaluated.

The Post Enumeration Survey for the Seventh General Population Census was a massive operation undertaken in all 10 Districts, in a total of 116 Enumeration Districts (out of a final grand total of 844). A random sample was chosen per District, assuring that each Ressort or paired cluster of Ressorts had 2 enumeration Blocks[21]. Enumeration Blocks were classified as: Urban, Rural and Interior and a proportionately stratified sample was drawn. PES enumerators had to visit each and every dwelling within the Enumeration Block selected.

All measures were taken to ensure that the PES was operationally as independent as possible from the Census. The PES sample was only known to a selected number of Census team members, no enumerator was allowed to canvass the same Enumeration Block where he had worked during the previous period and the number of census responses was not available for PES enumerators.[22]

The fieldwork for the PES was undertaken during 27 September 2004 to 11 October 2004. The start of the PES, was thus 7 weeks after Census date, and only 5 weeks after conclusion of the Base Population count. The scope of the PES was the usual for this type of survey, **i.e. only the non-institutional population was targeted**. Another group excluded (by giving the blocks no chance to be drawn) from the PES, because of their high mobility was the group of "Garimpeiros" in the Gold Fields. For some this may not be a problem, as they may still be captured, but conclusions drawn from the PES are not applicable to Brazilian Garimpeiros. We shall try to estimate a possible undercount of Garimpeiros from information obtained from the Cooperation of Brazilian Garimpeiros. Please note that Brazilians in the General population are indeed covered by the PES.

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[20] Humphrey Lamur (1973, pp 13-19) used the balancing equation, as well as the United Nations Age-Sex Accuracy Index to evaluate the Censuses of 1950 and 1964. To the best of our knowledge, the 1972 and 1980 Census were not evaluated. However, the Civil Registry Office uses the 1972 Census as its benchmark for a time-series of Population data!

[21] There was / is no intention to produce PES results at the Ressort level (given the small size of some of the Ressorts), but it was expected that this approach would provide good representation and lower the variance in a Cluster design.

[22] While the PES was being conducted, it turned out that this was a weak link in the chain, as in two of the blocks, PES enumerators were able to obtain population numbers from raw census counts, to assess their own performance.

Contrary to the field operations during the Census canvass, PES Enumerators worked in pairs in each Enumeration Block. While the Census questionnaire had 47 questions the PES questionnaire had only 16 questions, so as to assure voluntary cooperation by the population. PES Enumerators were instructed to make as many calls as necessary to obtain a response, and to call at different times and on different days to minimize the probability of non-contact. The PES achieved a 92.9% response rate, which varied by District as follows:

Table II-1: PES Response Percentage per District

District	Response-%
Paramaribo	96.5
Wanica	92.8
Nickerie	94.1
Coronie	98.7
Saramacca	**99.5**
Commewijne	92.4
Marowijne	86.4
Para	*83.6*
Brokopondo	93.0
Sipaliwini	85.2
Total	92.9

For the so-called interior areas (Sipaliwini, Brokopondo, Marowijne and Part of Para) a lower response was to be expected. However, Para stands out. At the time of the census, a village within the PES-site initiated a public protest against Central Government by blocking the road. This certainly impacted negatively on the performance of the PES enumerators. **Nevertheless, the overall PES results can be considered excellent.**

According to the PES (rev. 2) results the Seventh Population and Housing Census, missed on average 15,900 persons. As was to be expected, the undercount was not evenly distributed. Tables with results and short discussions are presented in the next section.

4-   The 2004 PES results (rev. 2)

We have to compute sampling errors from aggregate data with approximation formulas, instead of using the familiar Jackknife replication technique[23] for these computations. For illustrative purposes we therefore only report the sampling errors for the males, females and total population. Percentages are presented with two decimals and numbers are rounded to the nearest hundred.

We like to stress again that the results apply to the non-institutional population.
 Although we conducted a de Jure Census and a de Jure PES, some Garimpeiros precisely because of their high mobility may indeed be encountered by the PES in a PES enumeration block and be included.

PES-1-a: Undercount Percentage by Sex, and Total

	Undercount-%
Total	3.16
Males	3.21
Females	3.03

PES-1-b: Undercount Numbers by Sex, and total

	Undercount Numbers	95% confidence Interval Plus or minus*
Total	15,900	293
Males	8,100	208
Females	7,800	205

* Computations from aggregate data have a tendency to produce narrow intervals
** Due to rounding males + females do add to total, even though there are persons with "Sex not stated".

The pattern is familiar, as usually more males than females are undercounted.

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[23] See for example Westat 1997, Appendix A. Please note that these techniques are also approximations, albeit better than those using aggregate data! Close to the deadline for this publication it turned out that we have three separate databases with different structures, comprising A, B and C (see figure 1, page 21)

PES-2: Undercount percentage by Age group

Age group	Undercount-%
0-14	3.72
15-59	2.54
60+	2.77

The PES-2 table also exhibits a familiar pattern, as usually the young are harder to enumerate. In fact if we had used a finer classification (difficult with the numbers we are dealing with in Suriname), we might be able to check if we indeed have the complete familiar pattern: high for 0-9, low for 10-19, highest from 20 to 34 and then sloping downward.

PES-3: Undercount numbers by Nationality[24]

Nationality	Undercount Numbers
Surinamers	13,300
Foreigners	2,600

PES-4: Undercount numbers by District / Area of residence

District / Area of Residence	Undercount	
	Percentage	Numbers
Paramaribo	2.62	6,400
Wanica	1.16	1,000
Nickerie + Coronie + Saramacca	0.72	400
Marowijne + Commewijne	2.61	1,100
Para + Brokopondo + Sipaliwini	9.46	7,000
Total	3.16	15,900

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[24] Cases with "Nationality unknown" have been added to "Foreigners".

PART III: Controversial issues in the Seventh Population and Housing Census

1- Language Most Often Spoken in the Household

This is the easiest issue to deal with. It is likely that people that contested the fact that Dutch came out as the <u>language most often spoken in the household</u>, confused "language spoken in the household", with contact language. Indeed, "Sranan tongo" is the lingua franca (contact language), most often spoken in the streets, in the market place and other public places and is often utilized as the language of communication between various ethnic groups. Another possibility is that for whatever reason (maybe vanity?) people choose to report "Dutch" as the language most often spoken in the household. This suggestion is added, not because we think that Dutch should not be the winner, but because we had not expected such a large margin of victory for Dutch. Finally, it should be mentioned that the UN recommendations list 3 types of language data that can be collected in a census, of which "Usual language", i.e. language most often spoken in the present home.

2- Resident Population with Brazilian[25] or Chinese Nationality

2.1- Residents with Brazilian Nationality

Undoubtedly, the most controversial issue in the Census was the number of usual residents with Brazilian Nationality, for short: "resident Brazilians". To a certain extent, part of the explanation lies in the term "resident". The estimated number of Brazilians resident in "Town" (mainly Paramaribo, especially the Northern Region) varies between 1,000 persons (Cardoso Neto in EVR-2004) and 1,000 families (Veiga in EVR-2004), i.e. between 1,000 and 4,000 persons. The estimates for the number of Brazilians in the interior (so-called "Garimpeiros" or small-scale gold diggers) are even worse, as they vary between 8,000 and 40,000. We provide an overview from EVR-2004, p 69 and 90[26]:

National Planning Office	8,000	De Jure?
Brazilian Embassy	15,000 - 20,000	De Jure?
Heemskerk & van der Kooye	20,000 - 25,000	De Facto
Cardoso Neto	30,000 - 40,000	De Jure?
Majority of EVR-2004 informers	**15,000 - 20,000**	**De Jure?**

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[25] For this section we are mainly looking at the 2004 Graduation paper of Edo de Vries Robbé (EVR-2004): "Onverantwoord ondernemen" (Irresponsible business).
[26] Most of the interviews of de Vries Robbé were conducted up to January 2003 and the pertinent references in his paper all pertain to years up to 2003.

De Vries Robbé, also estimates that there were about 20,000-25,000 small scale gold diggers, of which 75% are Brazilians. So the number of resident Brazilians during 2002/2003 could be anything between 16,000 and 20,000.

Interestingly, together with Major Roeplal (Coordinator Gold fields of the Seventh Population and Housing Census) we also had an interview with Cardoso Neto[27] on 27 May[28] 2005 and at that time he estimated the total number of Brazilians resident in Suriname around the time of the Census to be 13,000 (5-10% female and 90-95% male)[29]. During the period November 2002- April 2003, the GBS prepared for the Census and conducted orientation visits to the interior; roughly 10,500 de facto Brazilians were counted in the interior of Suriname. According to Cardoso Neto, de facto Brazilians would stay at most 2 months in Suriname and then leave. Also important to note is that 80% would come without and 20% would come with family members.

Last, but certainly not least we want to note (EVR-2004, p 81) that according to Cardoso Neto, a sizable number of Brazilian women have married a Surinamese man. In that case they would obtain Surinamese nationality!

Why then do some people insist that there were between 50,000 and 60,000 Brazilians in Suriname at the time of the Seventh Population and Housing Census? Some people may have their own agenda for insisting, against knowing better than that, that the number of Brazilians around the time of the Census exceeded 40,000. Some people may honestly believe the number of de Jure Brazilians to be much larger than reported (5,822) in the Census. Possible reasons for this are: great visibility in certain parts of the capital and the overrepresentation of Brazilians in crime, either as perpetrators or as victims. Last, but not least the number of Brazilians arriving in Suriname, may influence people's perception. Regrettably the visitor statistics are only available by nationality for the arrivals, but not for the departures.

In the tables below we present an overview of the arrivals of people with Brazilian, Guyanese and Chinese nationality as of 1972.

Table III-1-a: Registered Arrivals of Selected Foreigners 1972-2004

Period	Total Registered Arrivals of selected foreigners in Suriname via Zanderij and New. Nickerie		
	Brazilians	Guyanese	Chinese
1972-1980	2,350	68,644	91
1981-1990	8,220	**392,680**	6,464
1991-1995	**14,912**	256,264	**23,589**
1996-2000	11,274	169,004	7,949
2001-2004	10,974	45,629	5,066
1991-2004	37,160	470,897	36,604

[27] Cardoso Neto is the President of the Cooperation of Garimpeiros in Suriname.
[28] Because of "bad handwriting" he date was wrongly reported as 27 June 2005 in the National Results Volumes I to IV, that have been issued since August 2005. Our apologies for any inconvenience caused.
[29] The non-institutional population with Brazilian Nationality in the Census had a distribution of 33% female and 67% male. This may indeed point to us missing more males than females.

Table III-1-b: Yearly Average of Registered Arrivals per year of
Selected Foreigners 1972-2004

Period	Yearly Average Registered Arrivals of selected foreigners in Suriname via Zanderij & New Nickerie		
	Brazilians	Guyanese	Chinese
1972-1980	261	7,627	10
1981-1990	822	39,268	646
1991-1995	2,982	51,253	4,718
1996-2000	2,255	33,801	1,590
2001-2004	2,744	11,407	1,267
1991-2004	2,654	33,636	2,615

Those who think that we should have counted more than 30,000 Brazilians, should be prepared to accept a Surinamese Population of around a million and that is certainly ludicrous!

To finalize on residents with Brazilian Nationality we present the following:

Table III.2: "Guesstimated" number of missed Brazilians

	Observed	Should be	Missed
Paramaribo	1,478	1000	-478
Brokopondo+Sipaliwini	4,215	12000	7785
Other Districts	129	0	-129
Total	5,822	13000	7,178

So the worst case scenario regarding the Census undercount would be that we have missed 7,178 (Garimpeiro) residents with Brazilian nationality altogether. If we add these to the estimated undercount of 15,900 we end with a total of 23,078 (4.47 % of the expected total population and 4.52 % of the expected non-institutional population) which we still consider acceptable.

2.2- Residents with Chinese Nationality

The number of residents with Chinese nationality has been controversial, but much less so than the Brazilians. It may be that ethnicity (8,775 Chinese), which is a "respectable" number, and nationality (3,654 Chinese), which is considered too low, are confused.

The bottom line is that people accept easily that most of these new Chinese use Suriname to move on to the USA or Canada or even other CARICOM destinations. At least, up to 2004 that was the case!

3- Ethnicity

When it comes to ethnicity, the first query is: "**Why is a question on ethnicity asked?"** The answers are simple. Ethnicity is included in the UN recommendations for Population and Housing Censuses, under "Demographic and Social Characteristics", sub item "National and/or ethnic groups", albeit as a non basic (i.e. non priority) topic. Also in all but one (Census of 1980), of the previous censuses in Suriname a question on ethnicity was included. For the medical profession everywhere the inclusion of ethnicity is of utmost importance. One only has to look at the BOG publication "Causes of Death 2003-2004", to grasp this!

Secondly, people want to know "**Why is the present classification of ethnicity used**? Specifically, questions have been asked about separate classifications of Creoles and Maroons. It has been customary in censuses to distinguish Black-coloured people originating from and living mainly in the Coastal zone from those living mainly under tribal circumstances. It must also be stressed that the General Bureau of Statistics used "self identification" for ethnic classification and as long as the response was provided by a "responsible adult" it had to be accepted!

Thirdly, people want to know "How come the Maroons have suddenly increased so much and the Creoles so little?" Let us start with Creoles. First the "growth" in the number of Creoles has to do with Demographic factors, mainly fertility. Secondly, it is likely that many "traditional" Creoles have either not reported ethnicity or have "fled" into the ethnic group "Mixed". The latter is also supported by the results of the BOG publication: "Causes of Death 2003-2004" (December 2005). If we turn attention to the Maroons, it can be seen from National Results Vol. III, Fertility & Mortality (January 2006) that they have the highest fertility.

Lastly, the Census results exhibited some anomalies. In fact there was only one query about Maroons with Chinese Nationality[30]. As we have repeatedly mentioned, no Census is without errors, even after the most thorough editing process". However, it must not be assumed that these are errors as one can never proclaim with certainty that no Maroon can obtain Chinese nationality.

Finally, one can never exclude the possibility of enumerators fabricating information and not all of these offences will be detected.

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[30] This could well be classified as a "Nationality" problem, but we prefer to include it with ethnicity.

PART IV: Selected Results of the Publicity Survey

At the end of the PES interview a simple publicity survey was conducted, asking Six questions.
1. If the respondent had heard about the Seventh Census before (1a)
   and if so from which source (1b)
2. Do you know what a Population Census is?
3. What is your opinion about the publicity for and the information provided regarding the 7th Census?
4. What do you generally think about the questions asked?
5. Can you please state 2 questions of the 7th Census, which you regarded as difficult, sensitive or improper?
6. Can you provide us with 2 topics or questions, which should have been included in the Census in your opinion?

The publicity Survey had an overall response of: 85.8%.
Selected results are presented below.

Table IV.1a: Have you heard about the seventh Census before?
(IF Yes go to 1b otherwise go to 2)

District	Yes	No	not reported	Total	Yes-%
Paramaribo	2899	100	35	3,034	95.6
Wanica	1,551	79	17	1,647	94.2
Nickerie	1,635	126	13	1,774	92.2
Coronie	520	53	8	581	89.5
Saramacca	1,371	40	6	1,417	96.8
Commewijne	972	77	11	1,060	91.7
Marowijne	845	199	4	1,048	80.6
Para	761	71	5	837	90.9
Brokopondo	1,315	209	15	1,539	85.4
Sipaliwini	1,394	327	33	1,754	79.5
Total	13,263	1,281	147	14,691	90.3

Given the communications infrastructure in Suriname, it is no surprise that Sipaliwini, Marowijne and Brokopondo (so-called interior Districts) have the lowest percentages regarding prior knowledge of the Seventh Census. Interestingly Saramacca (with also the highest PES response) has the highest percentage, followed by Paramaribo and Wanica.

Table IV.1b (part 1): Source of knowledge about the Census

District	Radio	TV	Banner	Newspaper	Friends, etc.	Other specified*	Other not specified
Paramaribo	126	348	2	16	53	91	14
Wanica	81	224		5	39	39	5
Nickerie	80	192		1	41	120	6
Coronie	66	58		5	34	35	5
Saramacca	119	165	1	2	54	36	9
Commewijne	82	129		2	9	48	
Marowijne	129	66	8	6	80	140	10
Para	61	62		1	37	54	8
Brokopondo	169	63		3	232	232	14
Sipaliwini	330	11		7	179	430	28
Total	1,243	1,318	11	48	758	1,225	99

* Visitors who came by to ask questions, Village Chief, Posters

Table IV.1b (part 2): Source of knowledge about the Census

District	Radio and TV	Other combinations of two sources	All Other combinations*	Total
Paramaribo	818	164	1,267	2,899
Wanica	471	112	575	1,551
Nickerie	617	186	392	1,635
Coronie	170	45	102	520
Saramacca	379	150	456	1,371
Commewijne	418	57	227	972
Marowijne	130	90	186	845
Para	246	84	208	761
Brokopondo	133	200	269	1,315
Sipaliwini	25	252	132	1,394
Total	3,407	1,340	3,814	13,263

* Combinations of two or more sources

Although Radio and TV stand out as single and combined sources of information, it seems that to optimize results it is indeed necessary to target several sources!

Table IV.2: Do you know what a Census is?

District	Yes	No	No answer	Total	No-%
Paramaribo	45	68	22	135	50.4
Wanica	38	52	6	96	54.2
Nickerie	28	104	7	139	74.8
Coronie	22	36	3	61	59.0
Saramacca	5	41		46	89.1
Commewijne	14	68	6	88	77.3
Marowijne	19	184		203	90.6
Para	18	55	3	76	72.4
Brokopondo	15	206	3	224	92.0
Sipaliwini	44	300	16	360	83.3
Total	248	1,114	66	1,428	78.0

We have provided the percentages of the people answering "no", as these are the people with a response of "no", "Don't know" or "No answer" on question 1a. The higher the percentage is, the worse the situation.

Table IV.3 Opinion about publicity and information provided

Response on opinion	Prior knowledge of 7th Census Numbers				Prior knowledge of 7th Census Percentages			
	Yes	No	Not reported	Total	Yes	No	Not reported	Total
Very good	735	7	1	743	5.5	0.5	0.7	5.1
Good	7,846	137	18	8,001	59.2	10.7	12.2	54.5
Sufficient	2,300	35	7	2,342	17.3	2.7	4.8	15.9
Insufficient	1,099	187	3	1,289	8.3	14.6	2.0	8.8
Bad	296	167	2	465	2.2	13.0	1.4	3.2
Very bad	123	68	0	191	0.9	5.3	0.0	1.3
Not reported	864	680	116	1,660	6.5	53.1	78.9	11.3
Total	13,263	1281	147	14,691	100.0	100.0	100.0	100.0

It can be seen that the majority of respondents is of the opinion that the Census publicity and information provided were:
good (54.5%) or at least sufficient (15.9+54.5+5.1=75.5%).

Table IV.4: What do you generally think about the questions asked?

		Prior knowledge about 7th Census Numbers			Prior knowledge about 7th Census Percentages		
		YES	NO	Not Reported	YES	NO	Not Reported
Opinion about questions	Easy	8,652	563	28	**65.2**	**44.0**	19.0
	Difficult	188	38	1	1.4	3.0	0.7
	Some Easy, some difficult	549	63	1	4.1	4.9	0.7
	Some too sensitive or personal	430	24	1	3.2	1.9	0.7
	Improper questions	108	5	1	0.8	0.4	0.7
	Other response	170	22	0	1.3	1.7	0.0
	Was not interviewed during Census	2,635	366	36	19.9	28.6	24.5
	Not reported	531	200	79	4.0	15.6	53.7
	Total	13,263	1281	147	100.0	100.0	100.0

It can be seen that the majority of both respondents with (65.2%) and without (44.0%) prior knowledge about the 7th Census was of the opinion that the Census questions were easy. If we correct for the answer category "was not interviewed during Census", we get an even more favourable picture.

Finally, it can be mentioned that since the respondents (who had answered "easy" on question 4) were free to make suggestions regarding questions they felt we had omitted, we obtained quite some suggestions. Too much to be tabulated, but it is worth noting that some of the questions suggested might be considered improper by other respondents. It is also worth noting that among other things people mentioned:

Education problems
Housing problems and Housing Construction problems
Land holding problems
Living Conditions (should be in a survey and not in a census)
Prices (are not for the Census but for CPI survey)
Bad Infrastructure and particularly bad roads
Recreation facilities for children and youths
Water supply problems
Environmental Issues
Health Insurance (was in the Census)
Unemployment (was in the Census)
Garbage (refuse) collection (was in the census)

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APPENDIX 1
Selected National and International Comparisons

1- Provisional versus Final Population totals

Land	Census Year	Provisional	Final	Change-%
Suriname	1972	384,900	379,607	-1.38
Suriname	1980	352,041	355,240	0.91
Suriname	**2004**	**487,024**	**492,829**	**1.19**
Jamaica	1991	2,366,067	2,380,667	0.62
Jamaica	2001	2,599,334	2,607,632	0.32
Guyana	2002	742,041	751,223	1.24
Trinidad & Tobago	2000	1,262,366	1,262,366	0.00

2- Estimated "undercount" (%)

Land	Census year	Undercount	Status*	Method**
Suriname	**2004**	**3.16**	**2**	**2**
Jamaica	1991	2.8	1	3
Jamaica	2001	NA	1	2
Trinidad & Tobago	2000	2.6-10.2	1,2	2
St. Lucia	2001	4.1	1	3
Antigua & Barbuda	2001	6.5	1	3
Belize	2001	3.5	1	3
Canada	1986	2.7	2	2
Canada	1991	2.9	2	2
Canada	1996	2.4	2	2
The Gambia	1993	2.7	9	2
UK	1981	2.3	2	2
UK	1991	1.9	2	2
UK	2001	0.0	1	2
USA	1980	1.2	2	2
USA	1990	1.8	2	2
USA#	2000	-0.49	2	2
Australia	1991	1.8	2	2
Australia	1996	1.6	2	2
New Zealand	1996	1.6	2	2
New Zealand	2001	2.2	2	2
South Africa	1996	10.7	2	2

NA = Not Available

<u>A negative number actually means an overcount</u>. This is rare but can happen occasionally!

*   Status: 1=Provisional - 2= Final or Revised - 9 = Unknown
**   Method: 1= Comparison with external sources
                             2= Post Enumeration Survey and/or "Reverse Record Check"
                             3= Other   9= Unknown

3- Publications Calendar

Publications Calendar Suriname Census August 2004 (data publications)

Title	Period planned	Realized/presented
Provisional Results	December 2004	27 January 2005
Demographic and Social Characteristics	July 2005	31 August 2005
Employment and Education Characteristics	October 2005	30 November 2005
Fertility and Mortality	January 2006	10 February 2006
Characteristics of Living Quarters, Households and Families	April 2006	19 May 2006
Paramaribo	June 2006	14 July 2006
Para and Wanica	July 2006	10 August 2006
Nickerie and Coronie	August 2006	13 September 2006
Commewijne and Saramacca	September 2006	29 September 2006
Marowijne, Brokopondo and Sipaliwini	October 2006	27 October 2006
Technical Evaluation Report	November 2006	

Publications Calendar Jamaica Census September 2001 (data publications)
(Not necessarily in the order listed)

Provisional Results (September 2002)

Volume 1   Country Report (April 2003)
Volume 2   Age and Sex (September 2003)
Volume 3   Education and Training (Parts A and B)
Volume 4   Housing (Parts A and B –January 2004)
Volume 5   Household Composition (changed to "Living Arrangements"- Jan 2004)
Volume 6   Birthplace, Residence and Internal Migration
Volume 7   Ethnic Origin and Religious Affiliation
Volume 8   Marital and Union Status
Volume 9   Economic Activity (May 2005)
Volume 10   Fertility and Mortality (December 2004)
Volume 11   Disability (originally planned as Miscellaneous –May 2004)
Volume 12   Miscellaneous

Selected publications Calendar USA Census April 2000 (data publications)

Census 2000 Redistricting Data Summary File (March 2001)
Demographic Profile (May – June 2001)
Census 2000 Housing Unit counts (May 2001)
Summary File 1 Advance National (November 2001)
Summary File 1 Final National (October 2002)
Summary File 1 Supplement (June 2003)

Summary File 2 Advance National (May 2002)
Summary File 2 Final National (January 2003)
Summary Population and Housing Characteristics (PHC-1 – May to December 2002)
Summary Social, Economic, and Housing Characteristics (PHC-2 – March to July 2003)
Population and Housing Unit Counts (PHC-3 –June 2003 to April 2004)

Selected publications Calendar UK[31] Census April 2001 (data publications)

Provisional Results (September 2002[32])
Key Statistics for local authorities (February 2003)
Other Key Statistics (April 2003 to June 2004)
National Report part 1 (May 2003)
Standard Tables (July 2003 to March 2004)
National Report part 2 (February 2004)
Census Area Statistics (August 2003 to October 2004)
Origin-Destination Statistics (May 2004-December 2004)

4- Miscellaneous

Country and Census Year	A	B	C	D
Suriname 1980*	81	1	NB	DJ
Suriname 2004	**47**	**1¾**	**2¼**	**DJ**
Jamaica 1991	66	3¾	NB	DJ
Jamaica 2001	26-short			
Jamaica 2001	68-long	3¾	5	DJ
St. Lucia 2001	113	NB	NA	DF
Antigua & Barbuda 2001	113	1¾	NA	DF
Belize 2000	91	3	NA	DF
Barbados 2000	65	NB	NB	DF
Guyana 2002	88	NB	NB	DF
USA 2000	8-short			
USA 2000	55-long	3¾**	6¼***	DJ
Netherlands Antilles 2001	77	1¼	NB	DJ

*   So-called Ordinary count - NA = Not Available - NB = Not applicable
**   Exclusive so-called Coverage Improvement Follow-up (CIFU).
***   Only reckoning with "Personal Visits" en corrected for CIFU

A = Number of Main Questions on the Questionnaire
B = Data collection period in months (exclusive of a possible PES)
C = Data collection period in months (inclusive of a PES)
D = De Jure (DJ) or De Facto (DF) count

[31] In fact this Calendar mainly applies to England and Wales.
[32] The "provisional" results do not differ from the final results released as of February 2003, so maybe the situation is comparable to the USA

APPENDIX 2
Selected Life Table Functions for Suriname (ABS 1980 and WHO 1999)

| Age | ABS LIFE TABLES 1980 | | | | WHO-LIFE TABLES 1999 | | | |
| | Males | | Females | | Males | | Females | |
x	nQx	lx	nQx	lx	nQx	lx	nQx	lx
0	0.0552	100,000	0.0359	100,000	0.0285	100,000	0.0221	100,000
1	0.0065	94,478	0.0080	96,410	0.0060	97,146	0.0055	97,794
5	0.0034	93,868	0.0025	95,635	0.0026	96,567	0.0020	97,256
10	0.0032	93,549	0.0020	95,401	0.0030	96,312	0.0020	97,058
15	0.0055	93,251	0.0039	95,215	0.0091	96,024	0.0034	96,864
20	0.0137	92,739	0.0051	94,844	0.0147	95,145	0.0043	96,531
25	0.0120	91,472	0.0066	94,362	0.0159	93,747	0.0051	96,115
30	0.0162	90,372	0.0075	93,741	0.0175	92,257	0.0068	95,627
35	0.0173	88,906	0.0155	93,036	0.0202	90,640	0.0096	94,981
40	0.0299	87,367	0.0143	91,590	0.0237	88,808	0.0135	94,073
45	0.0385	84,757	0.0234	90,285	0.0316	86,699	0.0202	92,805
50	0.0542	81,492	0.0340	88,173	0.0454	83,956	0.0315	90,929
55	0.0928	77,079	0.0505	85,176	0.0656	80,147	0.0473	88,066
60	0.1474	69,925	0.0858	80,871	0.0988	74,887	0.0755	83,903
65	0.1972	59,618	0.1209	73,929	0.1355	67,490	0.1070	77,568
70	0.2485	47,863	0.1963	64,994	0.1978	58,344	0.1603	69,270
75	0.3228	35,968	0.2676	52,238	0.2717	46,800	0.2290	58,163
80	0.4641	24,358	0.3696	38,257	0.3666	34,084	0.3200	44,846
85+	1.0000	13,054	1.0000	24,118	1.0000	21,589	1.0000	30,496

APPENDIX 3
Mean Household Size at the Enumeration Block Level
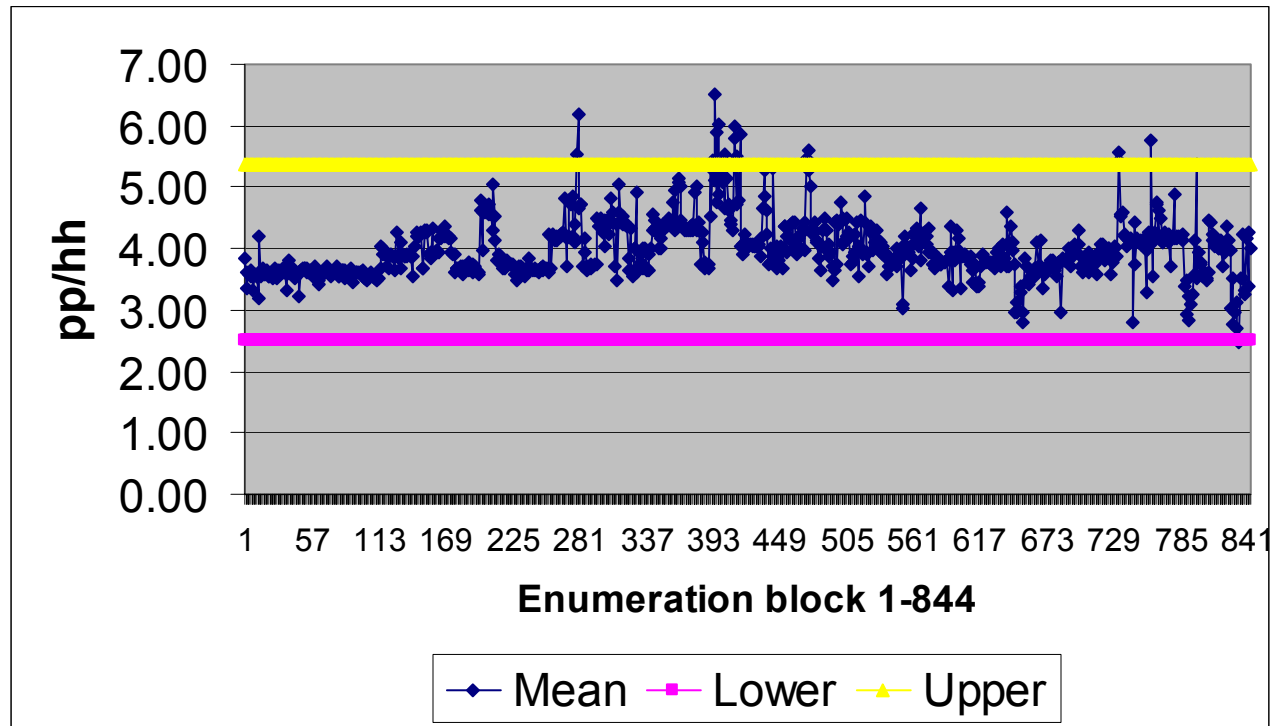
Enumeration Blocks with mean household size outside the 3- sigma error band

Enumeration Blocks	Ressort	District
0724, 0725	Welgelegen	Paramaribo
1103, 1105, 1107, 1108, 1112, 1114, 1121, 1122, 1124, 1126	Pontbuiten	Paramaribo
1506, 1507	Koewarasan	Wanica
4002, 4003	Moengo	Marowijne
4604	Para Noord	Para
5807	Boven Suriname	Sipaliwini

Below we provide Histograms of Mean Household Size and Log Mean Household Size at the Enumeration Block level. Deviations from Normality do not seem to be too serious, especially for the log series.

Std. Dev = .48
Mean = 3.98
N = 844.00

HHSize

Std. Dev = .12
Mean = 1.37
N = 844.00

LNHHsize
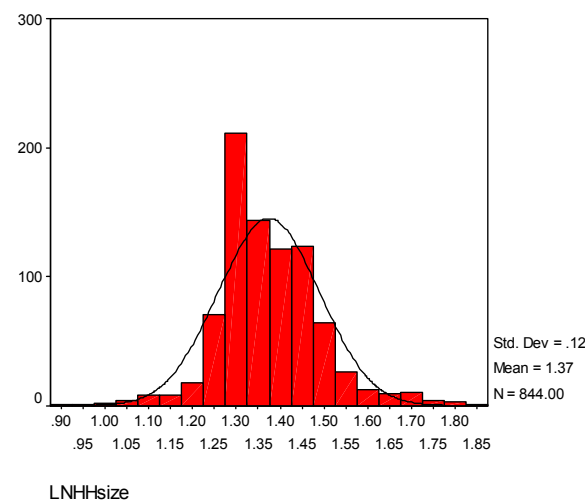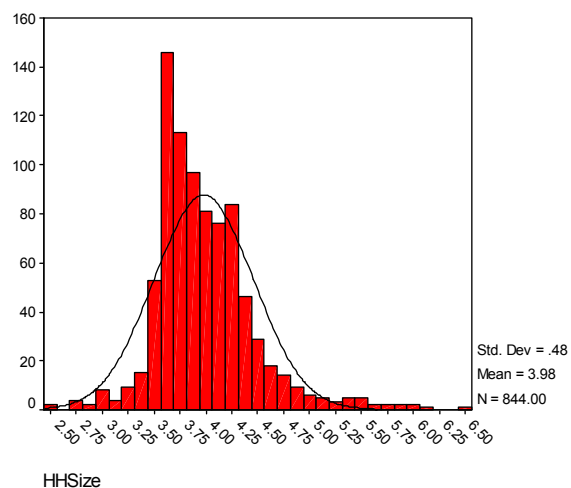
APPENDIX 4
Census Team Members
(Special Thanks to John T. Sontosoemarto)