



Madagascar 2005

Technical Information

<i>Country</i>	<i>Year</i>	<i>Size of Sample</i>	<i>Weighted/Unweighted</i>
Madagascar	2005	National 3300 Public Sector 900	See below

The National Sample

The national sample was designed to represent the entire adult population of Madagascar. As such, it covered all non-institutionalized voting-aged adults.¹ The sample distribution was based on the most recent population data from the Institut National de la Statistique, which provides population estimates for the year 2001.

In order to be able to compare respondents in the newly devised regional structure, the sample was stratified into 22 zones that correspond to the nation's 22 regions. These samples, at the regional level, were designed to be representative of each of the units. Therefore, within each of these 22 regions, the sample was substratified into urban and rural areas, as defined by the census bureau. Probability Proportional to Size (PPS) criteria was employed for all selections levels of stratification; no weighting of the sample within regions was, but weights will be applied to the sample at the national level (see below).

In *each* of the 22 regions, a total of 150 interviews were carried out for a total of 3,300 interviews for the entire country. Within the household, respondents were selected based on a quota system with the quotas being determined by gender, age and education based on the census data for that region. Thus, our sample for each regions should come close to representing the basic demographic and socio-economic characteristics of the region as known from the national census. Respondents were clustered by municipalities, with a maximum sample size per municipality being 12 respondents in rural areas, and 8 in urban areas. In terms of statistical the precision of the sample, our design has a confidence interval at the national household level of $\pm 1.7\%$. This means, *ceteris paribus*, that the actual results we would have obtained by interviewing the entire adult population of Madagascar would not have differed by more than 1.7% (higher or lower) than we obtained with our sample design, 95 times out of 100.

The sample we drew included all of those regions, as is shown in the table below:

1. Distribution of Uweighted Sample by Province

Province	Sample	% of total	Cumulative %
1 Antananarivo	600	18.2	18.2
2 Fianarantsoa	750	22.7	40.9
3 Toamasina	450	13.6	54.5
4 Mahajanga	600	18.2	72.7
5 Toliary	600	18.2	90.9
6 Antsiranana	300	9.1	100.0
Total	3,300	100.0	

¹ That is, we do not include those in hospitals or incarcerated in prisons.

The sample needs to be weighted in order to reflect the variations in the sample design by each region. The table below shows population sizes as taken from the census. Since our sample is of the voting-age population, our interest is in the fourth column, which provides those numbers.

2. Census Data on Departments and Regions

	REGION	Population totale	Population 18 et plus	Taux d'urbanisation	Nombre de points d'échantillonnage			Echantillon
					Urbain	Rural	Total	
ANTANANARIVO	ANALAMANGA	2 237 429	1 194 182	49	7	8	15	150
	ITASY	588 696	272 398	13	3	12	15	150
	VAKINANKARATRA	1 455 618	666 680	22	4	11	15	150
	BONGOLAVA	299 044	141 056	13	3	12	15	150
FIANARANTSOA	AMORON'I MANIA	625 426	291 221	16	3	12	15	150
	HAUTE MATSIATRA	990 626	463 486	19	4	11	15	150
	VATOVY	1 018 675	480 939	16	3	12	15	150
	ATSIMO ATSINANANA	560 698	264 406	20	4	11	15	150
	IHOROMBE	170 867	82 905	18	3	12	15	150
TOAMASINA	ATSINANANA	1 014 223	496 958	25	5	10	15	150
	ALAOTRA MANGORO	797 115	381 422	30	5	10	15	150
	ANALANJIROFO	781 725	368 557	28	5	10	15	150
MAHAJANGA	SOFIA	860 353	403 165	9	2	13	15	150
	BOENY	496 835	255 335	34	6	9	15	150
	BETSIBOKA	216 201	102 866	24	5	10	15	150
	MELAKY	160 528	80 919	23	5	10	15	150
TOLIARY	MENABE	358 622	179 744	30	5	10	15	150
	ATSIMO ANDREFANA	934 539	459 782	23	5	10	15	150
	ANDROY	437 103	212 711	20	4	11	15	150
	ANOSY	499 286	242 781	22	4	11	15	150
ANTSIRANANA	DIANA	447 155	229 588	42	6	9	15	150
	SAVA	741 269	355 311	11	3	12	15	150
	TOTAL	15 692 033	7 626 412		94	236	330	3 300

In order to weight the sample by these population figures, we first add to the data set the population of the adults, by region, as shown in the table below. We then divide the population of the region by the total population of the 22 regions to get the sampling fraction of the national population in that region. We next determine the desired sample size for each region by multiplying that number by the total sample N , and then finally we multiply that number by our sample size for each region (150).²

² The syntax for this operation is as follows:

```
compute wt = 0.
compute fpop=(pop/7626412).
var label fpop 'Fraction of national population in region'.
compute dn=(fpop*3300).
variable label dn 'Desired sample N for region'.
compute wf=(dn/150).
variable label wf 'Weight factor'.
if (domain = 2)wt = 1.
comment. Makes public sector respondents all have an equal weight of 1'.
if (domain = 1)wt =wf.
variable label wt 'Weight factor to adjust regional samples to match national population distribution'.
```

3. Population of Adults per Region

Region	Population 18 and older
11 Analamanga	1,194,182
12 Bongolava	141,056
13 Itasy	272,398
14 Vakinakaratra	666,680
21 Diana	229,588
22 Sava	355,311
31 Amoron'i Mania	291,221
32 Atsimo Atsinanana	264,406
33 Haute Matsiatra	463,486
34 Ihorombe	82,905
35 Vatovavy	480,939
41 Betsiboka	102,866
42 Boeny	255,335
43 Melaky	80,919
44 Sofia	403,165
51 Alaotra Mangoro	381,422
52 Analanjirofo	368,557
53 Atsinanana	496,958
61 Androy	212,711
62 Anosy	242,781
63 Atsimo Andrefana	459,782
64 Menabe	179,744
Total	7,626,412

For the public employee sample, we do not apply any weights. To do so would merely get us back to the point at which we began, namely, that the school teachers would predominate, thus minimizing the role of other public officials in the overall outcome of the survey. In short, the reader should keep in mind that the national public sample is representative of the distribution of the national population, while the public employee sample is meant to reflect the public sector as a whole independent of the size of its various components.

The Public Sector Sample

The sample of public officials was designed to represent the public sector in its entirety. Our funds allowed us to interview a total of 900 public sector employees. This gave us a confidence interval of $\pm 3.2\%$. We decided not to try to make the sample proportionately representative of the public sector because it includes a very large number of employees in one sector, namely that of primary and secondary education, and also a substantial number of employees in the health sector, as shown on the following table, it was necessary to limit the number of teachers and health workers in the sample, so as to be able to include public employees from others sectors in reasonable numbers. We also decided to eliminate those public employees who have little or no contact with the public, as shown on the table below.

4. Public Employees in Madagascar, by Sector, as of May, 2004

ENTITE	NOMBRE	SERVICE PUBLIC
Ministère de enseignement secondaire et de l'éducation de base	54,362	
Ministère de la santé	15,077	
Ministère de l'intérieur et de la réforme administrative	6,771	O
Ministère de la police nationale	6,735	N
Ministère de l'économie, des finances et du budget	6,539	N
Ministère de l'agriculture, de l'élevage et de la pêche	5,425	O
Ministère de la justice	3,077	N
Vice primature	2,658	O
Ministère de l'enseignement technique	2,456	N
Ministère de la recherche et de l'enseignement supérieur	1,653	O
Ministère de l'industrialisation, du commerce et de développement du secteur privé	1,510	N
Ministère de la jeunesse et des sports	1,267	N
Ministère de l'environnement et des eaux & forêts	1,145	O
Ministère des télécommunications, des postes et de la communication	715	O
Ministère de la population	553	O
Ministère de la fonction publique, du travail et des lois sociales	500	N
Ministère des affaires étrangères	387	O
Ministère de l'énergie et des mines	359	N
Présidence de la République	358	O
Ministère de la culture	320	O
Primature	261	O
Ministère du tourisme	147	O
Ministère de la décentralisation	132	O
TOTAL	112,407	
Fonctionnaires identifiés de juin à septembre 2004	3,653	

The sample design that we developed grouped public employees into a limited number of strata, and assigned a sample size to each one that would be large enough for analytical purposes.

6. Sample of the Public Sector, as Distributed in the 2005 Sample

Ministry/entity	Sample size
Ministere de l'Education de base et Superieure, divided into two groups : (1) primary and secondary, and (2) superior, proportional to their size in the national distribution ³	150
Ministere de la Sante	150
Ministeres de la Justice et la Policie Nationale (cacun divisé en deus)	150
Miistere charge de Douane (Economie) es des Domaines (Agricultrue) (chacun divisé en deux)	150
All remaining ministries, proprtional to the size of the ministry (see table below)	200
Communes	100
Total	900

6. Sample for the "Remaining Ministries" from the Table Above

Ministry/entity	Employees
Vice primature	2,658
Ministère de l'enseignement technique	2,456
Ministère de la recherche et de l'enseignement supérieur	1,653
Ministère de l'industrialisation, du commerce et de développement du secteur privé	1,510
Ministère de la jeunesse et des sports	1,267
Ministère de l'environnement et des eaux & forêts	1,145
Ministère des télécommunications, des postes et de la communication	715
Ministère de la population	553
Ministère de la fonction publique, du travail et des lois sociales	500
Ministère des affaires étrangères	387
Ministère de l'énergie et des mines	359
Présidence de la République	358
Ministère de la culture	320
Primature	261
Ministère du tourisme	147
Ministère de la décentralisation	132
Total	14,421

The survey firm obtained a list of all public employees and select the sample based on a *systematic selection* from these lists by each substratum. That is, if a list contained 100 names, and the sample size was to be 10, the firm started at the top of the list and counted down every 10th name, and that is the person who was requested to be interviewed.

³ Note that the interviews with the teachers, and those in the ministry of health, the police and communes was based on PPS criteria geographically. Thus, the selected firm interviewed these people nation-wide based on the percent of the national population in each *region*

The actual sample obtained, listed by their ministries in descending order of size of sample, is shown in the following table:

8. Distribution of Public Sector Sample by Ministries

Ministry	Sample	% of total	Cumulative %
1 Min. of secondary education	152	16.9	16.9
2 Min. of health	151	16.8	33.7
22 Municipalities (communes)	100	11.1	44.8
6 Min. of agriculture, cattle	92	10.2	55.0
7 Min. of justice	74	8.2	63.2
5 Mini. of economy, finances	73	8.1	71.3
4 Min. of national police	58	6.4	77.8
8 Vice-primature	28	3.1	80.9
9 Min. of technical education	28	3.1	84.0
13 Min. of environment and water	24	2.7	86.7
11 Min. of industrialization, commerce	21	2.3	89.0
10 Min. of research and education	19	2.1	91.1
12 Min. of youth and sports	18	2.0	93.1
16 Min. of public function	13	1.4	94.6
18 Min. of energy and mining	12	1.3	95.9
14 Min. of telecommunications	10	1.1	97.0
15 Min. of population	7	.8	97.8
17 Min. of foreign affairs	5	.6	98.3
19 Presidency of the Republic	5	.6	98.9
21 Primature	5	.6	99.4
3 Ministry of interior and reform	3	.3	99.8
20 Min. of culture	2	.2	100.0
Total	900	100.0	

Our research project then grouped these respondents into six strata based on the design described above. This grouping produced the following result:

8. Distribution of Public Sector Sample into Six Primary Strata

Ministry	Sample	%	Cumulative %
1.00 Education	152	16.9	16.9
2.00 Health	151	16.8	33.7
3.00 Justice and Police	132	14.7	48.3
4.00 Economy & Agriculture	165	18.3	66.7
5.00 Local government	100	11.1	77.8
6.00 All others	200	22.2	100.0
Total	900	100.0	