DISABILITIES PEOPLE: QUOTAS LAW WHICH MAY EXIST BEHIND THE RAIS STATISTICS AND CENSUS OF IBGE

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In this paper, we consider RAIS data and IBGE Census, both 2010, studied as different situations that are on the margins of the Quota Law for employment of people with disabilities in the labor market. For this study, we took into account variables such as gender, education level, income in minimum wage, the main type of employment, physical, intellectual, visual and auditory disabilities and multiple disabilities.

INTRODUCTION

According to the World Health Organization (WHO), it is estimated that more than a billion people live with some form of disability, about 15% of the world population (based on 2010 estimates). This is lower than the estimates coming from IBGE, which also date back to 2010 and suggest that approximately 23.9% of Brazil's population, represented by 45.6 million, are people with at least one disability, 6.9% being for serious cases that represent 13.1 million approximately.

Since 1970, worldwide, and since 1990, in Brazil, it has been recognized the importance of the development of probabilistic reasoning, that is, the need to break with the deterministic culture, by inserting notions of Probability and Statistics in the content of Mathematics in basic and secondary levels.

It is known that people with disabilities have, compared to people without disabilities, greater difficulties in accessing education, inadequate infrastructure, prejudice and lack of accessibility that make these people have lower levels of education, which limits their entrance in the formal labor market and take advantage of other human rights such as leisure, health and full citizenship (Oliveira, 2013).

In the twentieth century, education was assumed as a social responsibility, becoming a right for all individuals, adding new concerns and constituting a policy geared towards the achievement of new assumptions, the so-called inclusive education. This has been considered in Brazil, since the last decade of the twentieth century and it is, nowadays, a subject frequently discussed in various segments of society (Santos, 2010).

For this work, we consider a study, jointly with the Quota Law, to employ people with disabilities in the labor market, using data obtained from the databases of the IBGE Census (selected as those who answered the full questionnaire) and RAIS (that concerns the relationship of formal workers with contracts) in 2010.

For a better understanding of this work, we define and clarify the following topics: Disabilities, Quota Law for workers with disability, IBGE Census and RAIS.

- *Disabilities*. The term disability means a physical, intellectual or sensory impairment, whether permanent or temporary, which limits the ability to perform one or more activities. Disabled person refers to any person who has a disability and who are under the protection of a law.
- *Quota Law*. In order to encourage people with disabilities to be hired by companies, since 1991 a law was passed establishing quotas that companies with 100 or more employees are required to complete two to five percent of their positions with rehabilitated beneficiaries, or disabled persons, as follows: up to 200 employees with 2%; 201-500 employees with 3%; 501-1000 employees with 4%, and finally; 1001 onwards employees with 5%.
- *Annual Report of Social Information*. The Annual Report of Social Information (RAIS) is a report of socioeconomic information requested by the Brazilian Ministry of Labor and Employment to corporations and other employers annually.
- *IBGE Census*. In the census, the IBGE researchers visit all households in the country to use a questionnaire. After traveling all over Brazil, going from house to house, the researchers organize and analyze the information collected in the questionnaires. They report the results in a series of publications on the topics studied.

In K. Makar, B. de Sousa, & R. Gould (Eds.), *Sustainability in statistics education. Proceedings of the Ninth International Conference on Teaching Statistics (ICOTS9, July, 2014), Flagstaff, Arizona, USA.* Voorburg, The Netherlands: International Statistical Institute. iase-web.org

For the census two questionnaires are used: a basic questionnaire that is answered by all households and the full questionnaire answered by the selected households. In this study, we considered only the full questionnaire because it contains data on persons with and without disabilities.

METHODS

Motivation

In 2010, it was estimated that the number of people aged up to 15 years (age considered active) were, according to the IBGE, 41 830 812 with disabilities, 13 005 002 being serious cases, and 95 709 238 without disabilities; on the other hand, according to RAIS, this same year, the number of registered workers without disabilities were 43 762 487 and 306 013 who have presented disabilities. If the Quota Law for hiring people with disabilities had been fully complied, there should be recorded in RAIS, around 950 000 people with disabilities. In this work, we intend to show results with regard to people with disabilities from a more critical analysis of the results at the 2010 demographic census, the relationship existing between workers in RAIS and Quota Laws to employ people with disabilities.

Variables Description

This project will consider the following variables allocated in the following topics: identification, disability, education, family, housing conditions, other existing data in residence and work (Oliveira, 2013b; Oliveira, 2014).

RESULTS AND DISCUSSION

This paper considers data from the full questionnaire of the 2010 demographic census and the RAIS data of disabilities to see, hear, walk, intellectual, multiple and rehabilitated (for RAIS data only), for a better assessment and better support for public and private resources that can contribute to improved learning, education level, and hence the quality of life of these people.

For the variables used, more details can be found in the layout and table of the sample data by state provided by IBGE micro data page results http://www.ibge.gov.br/home/estatistica/populacao/censo2010/resultados_gerais_amostra/gerais_amostra_tab_uf_microdados.shtm and in the RAIS 2010 case can be found in http://www3.mte.gov.br/rais/2010/arquivos/Apresentação.pdf.

In this study, we use descriptive analysis for the one-dimensional distribution of the variables that are relevant, descriptive bi-dimensional analysis to study situations with respect to people with disabilities and those who aren't likely to be well exploited by different social sectors.

Table 1. Estimated people in the IBGE Census by gender and disability type (%).

Disability	Male		Female		IBGE estimate	
See	9 369 122	50.98	12 427 691	52.99	21 796 813	52.10
Hearing	1 710 821	9.31	1 178 275	5.02	2 889 096	6.91
Physical	1 603 644	8.73	2 267 256	9.67	3 870 900	9.25
Intellectual	576 069	3.13	388 769	1.66	964 839	2.31
Multiple	6 035 601	32.84	7 190 629	30.66	13 226 230	29.43
Rehabilitated	*		*		*	
With disability	18 881 319	100	22 949 493	100	41 830 812	100
Without Disability	51 501 433		48 713 608		100 215 041	
Total	70 382 752		71 663 101		142 045 8533	

* This value not obtained for the IBGE Census Data

Table 1 shows the amounts and proportions (%) by disability and gender to IBGE and Table 2 shows the same for RAIS include rehabilitated. Varying sex levels, total and quotient

between RAIS and IBGE (%) for each of the different disabilities are considered in this study. From the results of Table 1 it is possible to show that people with disabilities consist of a majority (proportionally) of females in visual, physical and total disabilities formed by all persons with disabilities, while the males are mostly for the hearing, intellectual and multiple and the set of people who has no disabilities. The disability type that has increased participation is the visual, and intellectual participation is lower.

Already, for RAIS results in Table 2, in all types of disabilities, it's possible to see that, most people employed are male, and that the largest number of hires were people with physical disabilities and the least amount of people were with multiple disabilities.

Making a comparative study between the results in Table 1 (RAIS) and Table 2 (IBGE), Table 2 has the highest estimated, with visual with 21,796,814 persons (a ratio of 52.10%). In the case of RAIS, a disability that has greater amount of registered workers is 166690 people with physical disabilities, representing 54.46% of people with registered disabilities.

Table 2. Numbers of people with disabilities registered under the RAIS to 2010 by gender, disability type and the ratio between the proportions RAIS and IBGE (%).

Disability	Male	%	Female	%	RAIS estimate	%	RAIS/IBGE
See	11 414	5.70	6 296	5.95	17 710	5.79	0.11
Hearing	45 415	22.69	23 404	22.12	68 819	22.49	3.25
Physical	107 246	53.56	59 444	56.10	166 690	54.46	5.89
Intellectual	11 232	5.62	4 374	4.13	15 606	5.10	2.21
Multiple	2 564	1.28	1 281	1.22	3 845	1.26	0.04
Rehabilitated	22 322	11.15	11 021	10.41	33 343	10.90	
With disability	200 193	100.00	105 820	100.00	306 013	100.00	
Without disability	25 552 565		18 209 777		43 762 342		
RAIS/IBGE	25 752 758		18 315 597		44 068 355		

Whereas, the IBGE estimates were obtained by enumerators who were collected, the answers given by the respondents in the full questionnaire and RAIS data were obtained from worker data provided by companies. It is possible to observe that:

- In IBGE, estimates show a higher proportion of people with visual impairment, while in the RAIS case, note a higher proportion of people with physical disabilities.
- For the variable RAIS/IBGE, it was noticed that 4.31% of people were actually contracted with physical disabilities, 2.31% hearing, 1.62% intellectual, 0.08% visual and 0.03% multiple; 1.05% males, 0.45% females and 0.71% of all people with disabilities.

Table 3 of IBGE data and Table 4 for RAIS data show education level by type of disability, for people who do not have disabilities and for the total, note that the levels of education were defined for both tables by: 1 - uneducated, 2 - incomplete until the fifth year of elementary level, 3 - the fifth until the ninth year of incomplete fundamental level, 4 - Full fundamental level, 5 – incomplete secondary school level, 6 - complete secondary school, 7 - incomplete higher education and 8 – complete higher level. The Tables contain variables for the following types of disabilities: physical, hearing, visual, intellectual, multiple, which means total disabled persons with disabilities and without disability, representing the total number of people without disability and total for each level of education for Tables 2 and 3, and, finally Table 3 presents the variable rehabilitated consisting of people with disabilities who were considered rehabilitated.

Notice in Table 3 there exists in all disabilities types and in no disability, a greater amount of people aged over 15 years with maximum education level no later than primary school and lower amount of people with incomplete higher education. Among different education levels, we find that the level without any schooling was formed by a majority of people with multiple disabilities, a minority of people with physical disabilities and other education level are formed by majority of the people with visual impairment and a minority people with intellectual disabilities. Table 4 shows the results for schooling level and disability type for 2010 RAIS data.

Table 3. Estimated results of educational attainment by disability type for 2010 IBGE Census Data.

Schooling	Physical	Hearing	Visual	Intellectual	Multiple	Disabilities	Without disability	Total
1	271 138	499 357	3 249 271	469 452	4 264 273	8 753 491	7 543 018	16 296 509
2	1 775 299	1 094 447	8 213 719	307 233	6 062 801	17 453 499	24 153 694	41 607 193
3	261 527	228 339	1 617 932	62 140	569 274	2 739 212	9 103 074	11 842 286
4	231 594	198 580	1 581 029	41 781	520 202	2 573 187	8 579 296	11 152 483
5	109 534	106 837	741 085	21 111	225 734	1 204 301	4 627 227	5 831 528
6	415 015	422 104	3 283 046	59 985	787 782	4 967 933	21 024 759	25 992 692
7	34 371	33 601	282 023	5 484	59 306	414 786	1 828 551	2 043 337
8	155 598	159 000	1 492 386	15 177	277 842	2 100 003	8 228 713	10 328 715
TOTAL	3 254 076	2 742 265	20 460 492	982 364	12 767 214	41 830 812	84 888 332	125 094 743

Table 4. Results by schooling level disability level for RAIS 2010 Data.

Schooling	Physical	Hearing	See	Intellectual	Multiple	Rehabilitated	With disabilities	Without disabilities	Total
1	1 054	742	124	933	87	186	3 126	219 125	222 251
2	14 270	9 245	1 339	3 492	615	3 077	32 038	3 536 091	3 568 129
3	15 347	8 946	1 489	3 211	477	3 541	33 011	3 414 117	3 447 128
4	22 823	9 451	1 880	2 085	500	4 471	41 210	5 757 703	5 798 913
5	13 546	6 516	1 401	1 690	344	2 214	25 711	3 471 829	3 497 540
6	69 092	24 857	7 875	3 839	1 285	14 200	121 148	18 321 935	18 443 083
7	7 982	2 086	904	126	110	1 458	12 666	1 806 700	1 819 366
8	22 576	6 976	2 698	230	427	4 196	37 103	7 234 842	7 271 945
TOTAL	166 690	68 819	17 710	15 606	3 845	33 343	306 013	43 762 342	44 068 355

In Table 4, for formal workers, observed for all different types of disabilities and rehabilitated, a larger amount of people with disabilities educated high school graduates and fewer people with disabilities who have no education level.

Making a comparative study between Tables 3 and 4, we see that there is a greater number of people with visual impairments estimated in 20.5 million people, however, according to RAIS report 2010, are employed, only 17 710 people with visual disability, representing an effective rate of approximately 0.09%.

Most disabled people formally employed as RAIS data with education level between secondary education and higher incomplete, on the other hand, according to the IBGE data, shows that most people with disabilities have educational attainment between no schooling and incomplete primary.

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