

Governance in Managing Public Health Resources Among Brazilian Municipalities*

Coordenadores: George Avelino
Ciro Biderman

Pesquisadores: Guilherme Finkelfarb Lichand
Marcos Felipe Mendes Lopes

* This research is funded by the World Bank. The findings, interpretation and conclusions are entirely those of the author and do not necessary represent the view of the World Bank, its executive directors, or the countries they represent. I would like to thank Marcos Felipe Mendes Lopes and Guilherme Lichand for excellent research assistance. This is a draft report not to be quoted without formal agreement by the author.

Introduction

As members of a federal country, Brazilian sub-national governments perform an important role in delivering public services; therefore, it is important to take a close examination of institutional incentives and governance performance at these levels of government. As it is well known, since the 1988 Constitution, Brazil has decentralized the provision of health services. In this process, which culminated with the SUS (Unified Health System), municipalities have acquired a fundamental role as they became responsible for the management of health resources. Therefore, as good governance is necessary to address problems of inefficiency and low quality services, it is in order a more careful analysis of how these municipalities are performing in managing health funds.

The effects of policy decentralization have been subject to intense debate. Decentralization is usually presumed to enhance public policies performance. More decentralized policies should show not only greater efficiency, as they are more easily monitored by, or beneficiaries, but also greater efficacy, as they have more flexibility to focus on local needs. Yet, this expectation relies on at least two strong assumptions. First, it assumes that local bureaucrats are qualified to carry out their duties. Though the average qualification of subnational government's personnel might reach expected standards, in a country with large regional disparities like Brazil, one should also expect a large variation in the qualification of local bureaucracies.

The second assumption is that local voters are able to distinguish the performance of local elected authorities, and reward or punish them at the ballot box.¹ Local governments, therefore, would be held more accountable than their national counterpart. Again, this assumption of a dual accountability – national, subnational – might be questioned, especially where subnational spending is financed through federal transfers rather than local taxation. This not only impairs local autonomy in deciding about more effective policies but also confine subnational governments to implement federal policies, a situation that increases difficulties voters have to distinguish between responsibilities for local performance.²

Despite all the decentralization caveats mentioned above, there is scarce attention to how these transfers are managed by sub-national governments, which can be attested by the virtual inexistence of large comparisons among Brazilian municipalities. The lack of analysis is very much connected to the lack of data; therefore, earlier attempts to assess the effects of health decentralization have been restricted to in depth case studies or to regionally constrained quantitative analysis.

This report presents a new data set that allows comparisons of health resources management in a representative sample of Brazilian municipalities. It also undertakes a preliminary analysis to estimate the relationship between governance institutions and the management of public health care funds at municipal level.

¹ For a discussion of the relationship between accountability and representation, see the collection organized by Przeworski et al (1999).

² As argued by Wibbels (2006), “With complex formulas for matching programs, opaque rules for governing discretionary transfers, and policy a function of intricate intergovernmental negotiation and contestation, voters seem prone to take informational shortcuts that weaken the traditional notion of dual national/subnational accountability for distinct policy spheres.” (Wibbels, 2006, 170).

In the case of Brazilian Unified Health System (SUS), effects of the decentralization have not been verified empirically in a more general way. A recent World Bank report on health public spending in Brazil focused on the resource allocation and budget planning.³ In line with this report, this paper deepens some issues raised by it, and observes how budget is implemented, with particular attention to the federal transfers. More specifically, whether the earlier report raises the concern of a “diffuse accountability” process – difficulties posed by the decentralized nature of the Unified Health System (SUS) on tracking and monitoring financial flows – we verify whether this concern is also valid for the budget implementation.⁴ In sum, though both researches share the same concern with the governments’ ability to effectively cope with their daily tasks, they focus on complementary aspects.

Besides this introduction, this paper has five more sections. The first section describes the data for detecting mismanagement at municipal levels. The second section shows some descriptive results, and association not only among types of mismanagement, but also between types of mismanagement and some measures of health outcomes. The third section presents the model for estimating the effects of local governance estimates on mismanagement. The fourth section discusses the results for the estimation. Finally, the last section concludes.

1. Detecting Mismanagement in Brazilian Municipalities: The Brazilian Audit Program for Subnational Governments.

The data on management of federal grants at the municipal level will be obtained from the random audit program implemented by the Controladoria Geral da União - CGU (General Comptroller’s Office). The program consists of a random selection of municipalities under 500 000 inhabitants for an audit of federal transfers. The selection is done in a regular basis through the public lottery. Once a municipality is selected, it is visited by a team assembled and trained by the CGU, who will undertake a close scrutiny of the use of federal public funds transferred to the municipality during the preceding two years, the conditions of the local infrastructure, and the quality of the services provided. The CGU program started in May 2003 and, currently, is in its 22nd round, whose municipalities were selected in July 2006. The information collected by the audits is made public through the site of the CGU (www.cgu.gov.br).⁵

As pointed above, the random selection of municipalities has initiated in May 2003. The first selection included just 5 municipalities. Currently, 60 municipalities are selected bi-monthly. The full sample comprises more than 1000 municipalities already audited.⁶ We decided to work with a smaller set comprised by the mayor term that spans from 2001 to 2004. This restriction to a mayor term enables us to analyze the influence of local political variables detailed below. 741 municipalities were audited during this

³ Report No. 36601 – BR, led by Gerard La Forgia.

⁴ At the same time, this research verifies the validity of some of the issues raised by the report can be generalized at the country level.

⁵ Complete reports of the audits are available on the site only for the last three rounds. For the other rounds, only the summaries of the audits are public available. The CGU kindly furnished the complete data for all rounds for the research here proposed.

⁶ The lottery is with reposition after 5 months, i.e. the municipality can be re-selected after 5 months of the audit. So far, less than 5 municipalities were selected twice.

period; yet, we decided to work with 500 municipalities that will be randomly drawn from that first group.⁷

The reason for using a sub-sample is twofold. First, it would be very difficult to classify the whole universe in such a short time frame.⁸ So, we can reduce the sample to almost half without losing significance. The second and more important reason is that the selection probability of each municipality is uniform. We would like to replicate the distribution of both the income per capita and the size of the population in the universe of municipalities below 500 000 inhabitants. To do so, we will select our municipalities in three steps. In the first step we random select the population range; in the second step we select the income range; and in the third step we select the municipality. The first two steps will be drawn from a lognormal distribution where the parameters will be taken from the universe of Brazilian municipalities with less than 500 thousand inhabitants (which comprises around 99% of all Brazilian municipalities) while the third step will be uniform.⁹

The information from CGU reports comprises all funds transferred from the federal government to the municipality, including health transfers, and it is very detailed in a variety of aspects. Following (Zamboni Filho and Litschig, 2006), we call the reported violations of the public sector rules and regulations as irregularities in public administration. For the purpose of this paper, CGU reports detail issues involving the management of health funds, and draw a reliable picture about how health decentralization is performing at the municipal level. For instance, the reports provide information on irregularities related to the Municipal Health Council (composition, regularity of meetings, and effectiveness); human resources in health care delivery (payment, hiring, and training); public medical supplies (absence of medical supplies, inventory control, and storage conditions); infra-structure conditions; general performance (unfinished public works and unaccomplished goals); and problems with documentation (absence of papers, incorrect ones, etc.).

This is first time we have this type of detailed information for a sample that is representative of the whole universe of Brazilian municipalities since the implementation of federal transfers to municipalities determined by the NOB/93 (Basic Operational Norm) of the Ministry of Health in 1993 and deepened by the NOB/96. These two measures increased the autonomy of municipalities in managing health transfers from the federal government, especially those related to basic assistance procedures.

Finally, the reports also provide objective evidence of corruption practices (illegal procurements, over invoicing, fake receipts, etc), enabling us to overcome the greatest shortcoming in corruption studies: the measures' subjectivity.¹⁰ In sum, the information

⁷ Problems with data information after the draw had reduced the number of observations to 467.

⁸ To classify the municipality we have to actually scrutinize the report.

⁹ The size of the population for municipalities included in the random selections increased during the first rounds; yet, after the 9th round, the population size reached its current limit of 500 000 inhabitants. This upper threshold leaves out only state capitals and few others municipalities.

¹⁰ Despite the growing correlation between different measures of corruption at country levels, these measures still remain mostly based on subjective assessments, causing the problem of distinguishing between corruption and its perception by informants. For a recent review of the literature, see Svensson (2005) and Treisman (2007). For other works on corruption on general government transfers that have used the CGU reports see Ferraz and Finnan (2005a and 2005b).

contained in the reports will allow us to assess either the overall performance by counting the total number of irregularities in health programs detected in a municipality or the performance on each type of problem presented above, or even to focus on a more specific aspect.

2. Descriptive Analysis

The newness and richness of information gathered in the dataset calls for some preliminary descriptive work before getting into trying to assess causal relationships. Hence, this section is dedicated to descriptive inferences. Next section will deal with causal inferences.

2.1 The Correlates of Health Resources Management Irregularities

The first part is to analyze the information contained within CGU reports. As discussed above, the information contained within the CGU reports draws a nice picture about the management of health funds transferred by the federal government. Table 1 below shows the descriptive statistics of the types of irregularities.

Table 1: Descriptive Statistics of Type of Irregularities

Variable	Mean	Std. Dev.	Min	Max
Any Type	16.00428	13.9839	0	133
Evidence of Corruption	2.231263	3.285102	0	44
Documentation	3.674518	4.342258	0	34
Performance	2.289079	2.522846	0	18
Medical Supplies	1.985011	2.343329	0	23
Infrastructure	1.775161	2.017835	0	12
Human Resources	.7173448	1.120133	0	6
Health Council	.4261242	.6748093	0	4

As one can observe, most of these irregularities are related to procedural aspects inspected by CGU auditors, who reported an average of sixteen irregularities by municipality, with a minimum of zero and a maximum of 133!¹¹ However, a closer inspection of the distribution shows that almost 90% of the municipalities are within the range between zero and 30 irregularities, and 95% fall between zero and 40 irregularities reported. An average of two corruption evidences was reported by municipality audited; but, again, 130 municipalities had no corruption evidence reported, and more than 95% of the municipalities are within the range between zero

¹¹ Actually, only four, out of 467, municipalities did not have any irregularity reported, each from a different state. They are Marechal Thaumaturgo in the state of Acre (North Region); Ribeirão do Largo in the state of Bahia (Northeast Region); Laranjeiras do Sul in the state of Paraná (South Region); and Itaara in the state of Rio Grande do Sul (South Region). The maximum number of irregularities, 133, was reached by São Braz in the state of Alagoas (Northeast Region).

and seven evidences reported. Problems with documentation are more common, with an average of 3.7 irregularities reported. Though the maximum irregularities reported for documentation reached a maximum of 34, almost 95% of the municipalities falls within the range between zero and 10 irregularities reported. Irregularities related to performance, medical supplies, and infrastructure show a similar pattern, with an average number of irregularities around two per municipality audited, and smaller ranges between minimum and maximum values.¹² Finally, irregularities related to human resources and health councils also seem to comprise a separated group. Both have average irregularities below one and very short ranges between maximum and minimum values, indicating that these type of irregularities are less widespread than the others.

Table 2, below, take a different look at the distribution of irregularities, and analyses how the type of irregularity described above varies along Brazilian municipalities. In this table, the right column shows the percentage of municipalities that had at least one irregularity of each type reported.

Table 2: Type of Irregularities by Municipalities

Type of Irregularity	Percentage of Municipalities
Any Type	99%
Evidence of Corruption	69%
Documentation	83%
Performance	74%
Medical Supplies	70%
Infrastructure	69%
Human Resources	41%
Health Council	33%

The first line shows that almost all municipalities in the sample have reported at least one irregularity. Getting into specific types of irregularity, corruption evidence seems to be widespread, as 69% of the municipalities had reported at least one irregularity that could be interpreted as evidence of corruption. The second most common type of irregularity is problems with documentation, indicating either a low level of bureaucratic qualification or an excessive red tape. The low qualification hypothesis seems to be reinforced by the types of irregularity identified in a second group, usually comprising around 70% of the municipalities. They are: problems with performance (unfinished public works and unaccomplished goals), the management of medical supplies, and the infrastructure conditions. As in the case of table 1, irregularities related to both human resources and health councils are less common; though, in the case of

¹² Almost 95% of municipalities with performance irregularities fall between zero and seven irregularities reported. Municipalities with irregularities related to either infrastructure or medical supplies show a similar distribution, with 95% of the observations are within the range between zero and six irregularities reported.

human resources, this type of irregularity is present in more than 40% of the municipalities. Finally, irregularities related to the municipal health councils (composition, regularity of meetings, and effectiveness) were reported in one third of the municipalities; though high, this percentage renders council problems the less reported irregularity of the group.

Table 3: Correlates between Types of Irregularity and Governance Variables across Municipalities

Type of Irregularity/Governance Variable	Municipalities with Council Problems	Municipalities that Adopted PB	Municipalities with SUS Qualification
Documentation	0.1467 (0.0015)	0.0317 (0.4945)	0.0251 (0.5887)
Performance	0.0872 (0.0596)	-0.0048 (0.9171)	0.0467 (0.3138)
Medical Supplies	0.1472 (0.0014)	0.0070 (0.8974)	0.0710 (0.1255)
Infrastructure	0.0797 (0.0855)	0.0731 (0.1145)	0.0513 (0.2690)
Evidence of Corruption	0.1220 (0.0083)	0.0127 (0.7847)	0.0528 (0.2552)
Human Resources	0.1925 (0.0000)	-0.0437 (0.3462)	0.0203 (0.6615)

Significance levels between parentheses

Table 3 above explores the relationship between irregularities and some local governance variables. For instance, one crucial measure of local governance is whether the CGU auditors reported any problem with the municipal health council (Conselho Municipal de Saúde).¹³ Municipal health councils are composed by representatives of health beneficiaries, health professionals, health providers, and the local government. They are responsible for monitoring all government transfers and health spending, as well as to elaborate health local planning and goals; councils should meet at least once a month. Since health councils are important governance institutions, a dummy variable identifies the municipalities where auditors found any problem related to the council.¹⁴

Another measure of governance is whether the municipality has received SUS full management qualification from the Ministry of Health, as this qualification assumes better local governance, as the municipality become responsible to manage the entire local health system. Since the NOB/96, Brazilian municipalities can be allowed increasing levels of autonomy in managing local health system.¹⁵ A municipality fully qualified in the Unified Health System (SUS) is assumed to have proved above average management capacity; therefore, it will be entitled to receive larger federal transfers than other municipalities, and full responsibility of health care delivery to its

¹³ Recall that irregularities with municipal health councils might be related to its composition, the regularity of its meetings, or its effectiveness.

¹⁴ As discussed above, the audits report, for instance, problems with the council composition, regularity of meetings, and work infra-structure conditions

¹⁵ This process has not changed significantly with the NOAS/02, introduced in 2002.

inhabitants, including procedures of medium to high complexity. To advance candidacy for SUS full management qualification a municipality have to show evidence of technical and administrative condition to receive larger federal funds and greater autonomy to manage these funds. A municipality candidacy is then approved or rejected by the estate CIB (Comissão Intergestores Bipartite). A dummy variable identifies municipalities that have acquired SUS full qualification until the year 2000. The source of information will be the Ministry of Health, which provided the relationship of all municipalities that attained full qualification (Gestão Plena de Sistema Municipal).

Finally, the latter governance variable is related to the local budgetary process and denotes greater transparency and social control of public spending in general. It is a dummy variable for the existence of participatory budgeting in the municipality until the year 2000. Unfortunately, there are only eleven municipalities in the sample that have implemented participatory budgeting.

As one can observe, the variable for problems with the municipal health council is the only variable that shows a consistent association with all types of irregularities, as it positively related to them, with varied intensity. The strongest association is with the human resources irregularities, followed by medical supplies and documentation problems. It also seems to be related with evidences of corruption, but in a weaker way, and with both problems with performance and infrastructure, but at this time with a very weak significance.

The variable for the existence of municipal participatory budgeting shows a smaller association with all types of irregularities and none of them is significant at any traditional level. These results might be explained by the small number of municipalities in the sample that have implemented participatory budgeting, only eleven, as reported above. With so few observations, it would be harder to detect any stable pattern of association.

Results for the variable representing the SUS full management qualification are unexpected. Although the number of observations is not very high, there are 50 municipalities in the sample with this type of qualification, the variable shows very weak associations with types of irregularities, and none of them significant at any level. This is unexpected because the health management in these municipalities is supposed to be the highest. In other words, these municipalities should show a negative association with any type of irregularity. A preliminary conclusion here is that the SUS qualification might not be working as expected.

2.2. The Correlates of Health Outcomes

This part, still descriptive, addresses questions like the correlates of both types of irregularity and governance variables and health outcomes across municipalities. It will relate the variables discussed above, most of them related to procedural aspects of health care, with some general measurements of health outcomes, such as infant mortality and immunization coverage.¹⁶

¹⁶ These are the same variables analyzed by Lewis (2006) in comparing countries performance. The data for Brazilian municipalities will come from the DATASUS (www.datasus.gov.br)

Though these two measures represent governments' capacity to provide basic health care, they still have some validity issues; so, all results should be taken with caution. As it is widely recognized, infant mortality rates are measured with considerable error, particularly in the poorest regions. The same would be valid for immunization coverage, though in this case, immunization coverage represents better assessment of governments' ability to provide a basic health care service.¹⁷ The source of the data to construct both variables was the DATASUS.¹⁸

Table 4: Descriptive Statistics of Health Outcomes

Variable	Mean	Std. Dev.	Min	Max
Immunization Coverage	78.04117	7.928932	41.76	99.1825
Infant Mortality Rate	.0230421	.0105002	.0035939	.1

Table 4 above presents some basic statistics of the two health outcome variables. As one can observe, the average rate of immunization coverage is relatively high. From the standard deviation, it is possible to say that around 95% of the municipalities should fall within the range between 62 and 94% of the target population. Despite that, it is still possible to perceive a great inequality among municipalities, as the minimum is only 41.46% of the target population covered to a maximum of almost 100%.

Table 5 below shows correlates between the number of irregularities and health outcome variables. According to the first column, one observes that all variables associations show the expected negative sign, though none show strong levels of significance, except for the association between problems with health councils, which is not significant after all. Looking more specifically, it is possible to observe that municipalities that have more irregularities reported are expected to also have smaller rates of immunization coverage. The strongest association is with municipalities that reported higher number of performance problems. In this last case, it is reasonable to expect that municipalities that are unable either to finish public works or accomplish previously established goals will also be unable to accomplish immunization tasks. A similar reasoning would apply to the relationship with infrastructure irregularities; that is, municipalities that show higher number of infrastructure irregularities would have less condition to perform their basic health care tasks.

Table 5: Correlates between the Number of Irregularities and Health Outcomes across Municipalities

Number of Irregularities	Immunization Coverage	Infant Mortality Rates
Any Type	-0.0869 (0.0617)	-0.0061 (0.8956)
Evidence of Corruption	-0.0502 (0.2807)	0.0454 (0.3288)
Documentation	-0.0779 (0.0939)	-0.0336 (0.4703)

¹⁷ See Lewis (2006,) and the bibliography discussed therein.

¹⁸ The data is available for download at the following internet site: www.datasus.gov.br.

Performance	-0.1055 (0.0232)	0.0416 (0.3716)
Medical Supplies	-0.0492 (0.2912)	-0.0092 (0.8426)
Infrastructure	-0.0883 (0.0577)	-0.0191 (0.6823)
Human Resources	-0.0115 (0.8052)	-0.0363 (0.4354)
Health Council	0.0559 (0.2296)	-0.0626 (0.1786)

Statistical significance levels between parentheses

The second column shows correlations between the number of irregularities and infant mortality rates. Looking at the results, one cannot perceive any stable sign pattern, as signs practically alternate between positive and negative along the lines; moreover, none of the associations is significant at any traditional level. This failure in detect any stable association is probably due to the measurement issues discussed earlier.

Table 6: Correlates between Health Outcomes and Governance Variables across Municipalities

Type of Irregularity/Governance Variable	Municipalities with Council Problems	Municipalities that Adopted PB	Municipalities with SUS Qualification
Immunization Coverage	0.0570 (0.2205)	-0.0085 (0.8549)	-0.0211 (0.6508)
Infant Mortality Rates	-0.0715 (0.1240)	-0.0581 (0.2114)	-0.1055 (0.0230)

Statistical significance levels between parentheses

Finally, table 6 above presents the correlates between the health outcomes and governance variables. According to the results there is no significant association between immunization coverage and any of the governance variables. The same pattern is valid for the infant mortality rates, except for the relationship with municipalities that present SUS full management qualification, which shows an expected negative relationship at conventional levels of significance.

To summarize this section, it is necessary to remember its main findings. First, practically all municipalities had at least one irregularity reported by CGU auditors; though there is a great variation in the number of irregularities reported by municipality. Second, when one discriminates irregularities by type, it is possible to observe some variation, with irregularities related to both documentation and performance as the most common, and irregularities related to human resources and health councils as the least. Third, the analysis of the relationship between types of irregularities and governance variables showed a consistent positive association with problems with the municipal health council, raising the suspicion that this type of problem might be pivotal to the presence of other types of irregularities. Fourth, health outcome variables are weakly

related to the number of irregularities reported by municipality, with distinctions for the relationship with performance and infrastructure irregularities that showed an expected and significant negative sign. Finally, the analysis of the correlates of health outcomes and governance variables also showed no consistent pattern; though one should mention the expected negative association between infant mortality rates and municipalities with SUS full management qualification, the only occasion that variable showed a significant relationship.

In other words, though all caution is necessary due to the exploratory character of this analysis, problems with health municipal council showed a consistent and expected association with other types of irregularities, which are most related to procedural aspects of health care, but no pattern with health outcomes variables. What is surprising is the absence of relationship between municipalities with SUS full qualification and types of irregularities, since this qualification is granted mostly after the municipality has proven its capacity to manage the local health system; that is, procedural aspects. All these preliminary results raise some questions that needed to be pursued for further investigation.

3. Model Presentation and Variables Definition

Conditional on the description of the characteristics of the data set, the third step will undertake a preliminary causal inference model, with all the caution mentioned earlier. The method for estimating the effects of governance on mismanagement and corruption in health funds transferred from the federal government among Brazilian municipalities will be a cross-section multivariate regression.

The research will focus on the determinants of mismanagement and corruption. A number of reasons make the health sector more vulnerable to corruption practices. The large amounts of money involved in the sector; the number, dispersion, and power differential among actors (drug companies, professional unions, etc.), the basic information asymmetry that characterizes the relationship between health professionals and their patients are some of the most common reasons. Moreover, despite the decentralization issues mentioned earlier, there is a scarce attention to the corruption problem in sub-national governments, which can be attested by the virtual inexistence of large comparisons among Brazilian municipalities. This lack of analysis is very much connected to the lack of data as the distinction between inefficiency and corruption practices is usually not easy to depict. Fortunately, CGU reports provide information enough (over invoicing, illegal procurements, and fake receipts) to allow building a variable that detects evidence of corruption practices, overcoming the greatest shortcoming in corruption studies: the measures' subjectivity.¹⁹

Running a cross-section regression raises the concern about endogeneity problems, and difficulties in establishing a firm causality direction. In other words, there might be an influence of the number of irregularities and corruption practices over the variable in the right hand side of the equation. For instance, local governments that seem to be inclined to corruption practices do not have the incentives to help in forming an active council.

¹⁹ Despite the growing correlation between different measures of corruption at country levels, these measures still remain based mostly on subjective assessments. For a recent review of the literature, see Svensson (2005) and Treisman (2006).

In this case, corruption evidences in the local government management were not reported because the local council was not active, but the council was not active because local government inclined to corruption practices. To minimize such problems, information for most variables is taken around the year 2000, with the assumption that irregularities or corruption evidence uncovered after 2000 should not influence these variables. The hypothesis of exogeneity for the 2000 data is reinforced if we consider that our sample is restricted to the 2001-2004 administration. The model that will be used is defined by following econometric specification:

$$Y_i = \beta_1 G_i + \beta_2 P_i + \beta_3 E_i + \beta_4 M_i + \alpha_i + \varepsilon_i$$

In the model, Y_i represents number of irregularity, or evidence of corruption practices reported in municipality “i”, and the term ε_i represents the (hopefully well behaved) error term. As discussed above, we will define as irregularity any reported violations of the public sector rules. We will define as corruption evidence a specific type of irregularity related to illegal procurements, and other types of fraud (diversion of funds towards spending areas outside health, fake receipts, and over invoicing). With this data we build two dependent variables. The first is the ratio of the number of irregularity over the number federal transfers audited in that municipality. Likewise, the second dependent variable is the ratio of the number of corruption evidences and the number of federal transfers audited in that municipality.

As discussed above, our purpose in this section to analyze the effects of governance on the management of local health resources; therefore, we divided governance into two aspects, or vectors of variables. The first, G, was the management capacity of municipal secretaries, which was measured by variables indicating municipalities that received the SUS full management qualification (Gestão Plena de Sistema Municipal), and a variable identifying municipalities where CGU auditors reported problems with the municipal health council. The hypotheses behind these variables were simply that better local management would imply smaller number of irregularities (the dependent variable was the number of irregularities reported by CGU in a municipality weighted by the number of health transfers received by that municipality).

The second vector of variables related to governance was vector P, which contains political variables. As mentioned above, all decentralization policies assumed that this process would increase local accountability; yet, accountability might be related to some specific conditions. It is important to recall that health decisions are made by municipal elected authorities, who might pursue their specific objectives that might be distinct from the ones associated with federal transfers. In other words, as conditions for these transfers were not related to the accomplishment of specific objectives, there is room for local politicians to adequate these transfers to their own needs.²⁰

The hypotheses behind those variables are common sense in the literature about democratic accountability (greater political competition should lead to a better use of resources, and mayors in their second term should be less careful). For instance, political economy agency models, such as Barro (1970) and Ferejohn (1986),²¹ argue that election provide political accountability by diminishing the costs of government

²⁰ This is what makes CGU audition reports so important, as they enable us to analyze how these transfers are managed locally.

²¹ See also the collection organized by Przeworski, Stokes, and Manin (1999).

removal. The less costly is to remove incumbents the greater the incentive for them to have a responsive government by adopting policies preferred by voters. More specifically, as the city mayor is still responsible for local policies, an analysis of governance institutions would be incomplete without local electoral competition, which will be measured by the distance between the mayor elected in the 2000 elections and the runner-up. The intuition behind this variable is that the stronger the opposition the greater the danger of being removed from power for mismanagement. Also important is a dummy variable representing mayors that are in their second term. As verified by Ferraz and Finan (2005a) in their analysis of electoral incentives for Brazilian mayors, as mayors are forbidden by law to run for a third term, they will be less restrained to engage in rent-seeking behavior.

The Vector E is a set of variables related to local health expenditures. Due the newness of the analysis, we cannot make a definite prediction about the effect of these variables. Yet, we can theorize that some type of health expenditures (payment to health service providers, or for medical supplies, and investments, for instance) might be more prone to mismanagement and corruption than other types (expenditures with local personnel). The source of information is the SIOPS (Sistema de Informações sobre Orçamentos Públicos em Saúde).²² SIOPS is a dataset, with information supplied by all Brazilian states and municipal governments, which specifies how the health public budget is implemented. More specifically, besides of the share of health transfers on the municipal health budget (the degree of dependence of the local health budget dependent on federal health transfers), we will also be able to specify the share of the municipal health budget that is dedicated to expenditures on personnel, medical supplies, health providers, and investment.²³

The vector M is the set of municipal characteristics. These variables gauge the local social conditions, relating these conditions to the capacity of municipality inhabitants to have information about their government. These variables are: the average years of schooling, the more educated people is able to process and disseminate information more quickly. The second variable is the percentage of people below the poverty line, the greater the share of people under poverty line, the smaller their capacity to have access to information. The third variable of this set is the log of the local population, with the assumption that wrongdoings by local authorities will circulate more easily among smaller populations. All this data came from the IPEADATA site (www.ipeadata.gov.br), a government organization. Following Zamboni Filho and Litschig (2006) who argue that the population easy access to justice can have a deterrent effect over rent-seeking behavior by local authorities, we also included a dummy variable that specifies municipalities that have a court seat. The source of this last variable is the IBGE publication “Perfil dos Municípios Brasileiros – Gestão Pública”²⁴

Finally, as CGU teams are assembled by state, the model includes a set of dummy variables to control for any state specific influence.

4. Results and Comments

²² Information System on Health Public Budgets, the information has been retrieved from the following internet address: www.siops.datasus.gov.br

²³ See the appendix for a description of these variables.

²⁴ The information is available at the following site: <http://www.ibge.gov.br/munic2001/index.htm>

Number of Irregularities and Governance Variables

Table 7 below analyses the relationships between the number of irregularities reported by municipality and the set of independent variables. All models control for the number of health programs audited in the municipality – the first line – and, as discussed above, a set of dummy variables for the states, which are not reported for the sake of presentation.

This preliminary analysis confirms some findings from the descriptive analysis about the positive relationship between irregularities related to the municipal health councils and other types of irregularities. As shown by the coefficient, a municipality where CGU auditors detected a problem with its health council, on average, will have three more irregularities than municipalities without detected health council problems. Considering that the average number of irregularities detected in each municipality was sixteen, according to table 1, this is a very large coefficient, and it is statistically significant throughout all models in the table. Despite all that, this finding should be taken with caution due to endogeneity problems, as municipalities with larger number of irregularities might tend to also show irregularities in their health council. In sum, the direction of causality still needs further research to be firmly established.

Getting down to the other governance variables, it is possible to observe that Participatory Budgeting implementation has no significant effect. As discussed earlier, these results should be taken with caution, as the number of municipalities that have adopted PB is quite small to allow any sure inference in that case. The same absence of effect is noticed for the SUS full management qualification, though the variable presents an expected negative sign, its coefficients do not reach any conventional level of significance. A possible explanation for absence of significance for this last variable may rely on the inability of estate CIBs either to adequately assess a municipality technical and administrative capacity of to monitor municipalities that received the full qualification.

There are a number of variables that though showing the expected sign did not reach any level of significance. For instance, the percentage of health transfers in total health spending by municipalities also shows an expected positive sign that is not significant throughout all models. The same pattern characterizes the coefficients for the electoral competition variable; though they have the expected negative sign – the closer the competition, the smaller the number of irregularities – they are not significant in any model of the table. Schooling and Poverty coefficients also show a similar pattern, that is, they have the expected negative signs – negative for Schooling and positive for Poverty - the coefficients are not significant.²⁵

Table 7: Correlates between the Number of Irregularities and Governance Variables across Municipalities

	(1)	(2)	(3)	(4)	(5)
# of Programs	1.881*** (0.172)	1.896*** (0.172)	1.897*** (0.172)	1.899*** (0.172)	1.930*** (0.178)

²⁵ The Gini coefficient for income inequality did not show any significant effect either.

d_Council	3.089*** (1.158)	3.049*** (1.151)	3.052*** (1.152)	3.066*** (1.157)	3.307*** (1.202)
PB	2.591 (3.584)	2.383 (3.564)	2.300 (3.575)	2.333 (3.587)	2.277 (3.629)
SUS Qual	-1.833 (2.064)	-2.280 (2.060)	-2.298 (2.063)	-2.119 (2.128)	-2.731 (2.183)
HTransfers	0.018 (0.018)	0.021 (0.018)	0.021 (0.018)	0.021 (0.019)	0.015 (0.019)
ElecComp	-6.615 (4.521)	-5.559 (4.516)	-5.596 (4.522)	-5.641 (4.547)	-4.118 (4.721)
d_Reelected	-0.937 (1.148)	-0.963 (1.141)	-1.001 (1.147)	-0.958 (1.147)	-1.104 (1.183)
Judiciary	0.137 (1.432)	0.180 (1.424)	0.168 (1.425)	0.186 (1.427)	0.321 (1.472)
Schooling	-0.729 (0.835)	-0.674 (0.830)	-0.666 (0.831)	-0.664 (0.833)	-0.999 (0.872)
Poverty	5.287 (5.890)	9.476 (6.102)	9.204 (6.158)	9.789 (6.179)	9.564 (6.381)
LogPop	1.994** (0.788)	2.506*** (0.811)	2.518*** (0.812)	2.459*** (0.823)	2.672*** (0.852)
Turnout		0.278** (0.114)	0.274** (0.115)	0.281** (0.115)	0.292** (0.120)
CouncilAge			-0.058 (0.168)		
Personnel				0.011 (0.034)	
Investment				-0.008 (0.053)	
Providers					0.053 (0.042)
MedSupplies					0.100 (0.090)
OBS	460	460	460	460	438
R-squared	0.43	0.44	0.44	0.44	0.45

Standard Errors in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%.

State dummies were included in each regression but are not reported above for presentation purposes.

Two other variables, though not significant, show a negative sign. They are the dummy that identifies mayors that were reelected and are in their second term and the presence of a judiciary seat in the municipality. Though reelected mayors might have more incentive to enter into rent-seeking behavior, since they cannot run for a third term – an alternative explanation that might be explored in future analysis is that more experienced mayors might be less prone to incur in management irregularities.

Finally the last variable in model 1 is a variable for the size of population – logged to normalize the distribution – has an expected positive and statistically significant sign throughout all models in the table. According to these results, the larger the population the greater the number of irregularities.

Model 2 in the table introduces a variable for electoral turnout, that is, the number of votes cast over the number of potential voters in the 2000 election. This variable is

normally used as a proxy for political participation. Accordingly, it should have a negative effect over the number of irregularities; yet, it shows a relatively consistent, and statistically significant, positive sign, that defies any explanation. This issue should certainly be explored in later analysis.

Models 3 to 5 introduce other variables that might affect the number of irregularities. Model 3 introduces the age of municipal council on the grounds that municipalities with more experienced councils will have a smaller number of irregularities reported. Though the coefficient has the expected negative sign it is not statistically significant. Finally, models 4 and 5 test whether options of health spending composition at each municipality have an effect on the number of irregularities. All variables showed small and statistically insignificant coefficients.

Number of Corruption Evidences and Governance Variables

Table 8 below focuses on the relationship between the number of evidences of corruption practices and governance variables.

As in the case of the previous table, all models control for the number of health programs audited in the municipality – the first line – and a set of dummy variables for the states, which are not reported for the sake of presentation.

Differently from the table 7, in this table none of the governance variables is statistically significant at any level and only problems with the municipal health council keeps its expected positive sign along all models. The coefficient for proportion of health transfers in local health spending though shows a consistent positive sign is quite small and never significant. On the other hand, the coefficient for electoral competition has an unexpected positive sign, which implies that greater electoral competition enhances the number of corruption practices.²⁶ One last point to be noticed is that though the signs for the coefficients of the judiciary variable are negative as expected by Zamboni Filho e Litschig (2006), in no model this coefficient reaches statistical levels of significance. One possible explanation, that would fit other similar situations as well, is that the number of observations needs to be increased to allow a clear specification of these variables effect.

Table 8: Correlates between the Number of Corruption Evidences and Governance Variables across Municipalities

	(1)	(2)	(3)	(4)	(5)
#_programs	0.225*** (0.047)	0.230*** (0.047)	0.231*** (0.047)	0.229*** (0.047)	0.230*** (0.049)
D_Council	0.079 (0.318)	0.067 (0.315)	0.071 (0.314)	0.064 (0.316)	0.102 (0.329)
PB	0.076 (0.984)	0.011 (0.976)	-0.111 (0.976)	-0.064 (0.982)	-0.173 (0.997)

²⁶ An alternative explanation is that mayors in a more politically competitive and uncertain environment have incentives to resort to any instrument to gain electoral leverage over its local challenger.

SUS Qual	-0.159 (0.567)	-0.299 (0.564)	-0.325 (0.563)	-0.432 (0.581)	-0.227 (0.598)
HTransfers	0.002 (0.005)	0.003 (0.005)	0.003 (0.005)	0.003 (0.005)	0.001 (0.005)
Elec Comp	0.039 (1.241)	0.370 (1.237)	0.316 (1.234)	0.382 (1.242)	0.248 (1.295)
D_Reeleito	-0.189 (0.315)	-0.198 (0.313)	-0.252 (0.313)	-0.250 (0.314)	-0.266 (0.326)
Judiciary	-0.098 (0.393)	-0.084 (0.390)	-0.102 (0.389)	-0.104 (0.390)	-0.130 (0.404)
Schooling	0.134 (0.229)	0.151 (0.227)	0.163 (0.227)	0.154 (0.228)	0.104 (0.239)
Poverty	2.388 (1.617)	3.701** (1.672)	3.300* (1.680)	3.121* (1.697)	3.164* (1.764)
Logpop	0.198 (0.216)	0.359 (0.222)	0.375* (0.222)	0.403* (0.225)	0.454* (0.234)
Turnout		0.087*** (0.031)	0.081** (0.031)	0.079** (0.032)	0.087*** (0.033)
CouncilAge			-0.086* (0.046)	-0.082* (0.046)	-0.102** (0.048)
Personnel				-0.007 (0.009)	
Investment				0.003 (0.015)	
Providers					-0.007 (0.012)
Medsupplies					0.011 (0.025)
Constant	-4.974* (2.554)	-14.563*** (4.268)	-13.356*** (4.303)	-13.337*** (4.319)	-13.741*** (4.537)
OBS	460	460	460	460	438
R-squared	0.23	0.24	0.25	0.25	0.25

Standard Errors in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%.

State dummies were included in each regression but are not reported above for presentation purposes.

Another surprise is the positive sign for the schooling variable, which is also consistent, though never significant, throughout all models. Also worth mentioning is the negative sign for the variable representing mayors in their second term, which is consistent with the pattern found in table 7. Though not significant, these results reinforce the hypothesis about the negative effect of experienced mayors in the number of irregularities. Finally, the coefficients for the poverty and the logged population variables show the expected positive sign, which are statistically significant in some models of the table.

As in the previous table, model 2 introduces a variable for electoral turnout. Following its earlier pattern, the coefficient shows a relatively consistent, and statistically significant, positive sign. In other words, the greater the turnout, the greater the number of corruption evidences in that municipality. This result reinforces the need for further investigation.

Model 3 introduces the most important finding of the table, the negative and statistically significant effect of the age of the municipal health council, which is measured in years. Though the magnitude of the coefficient is not very large – 10 years more in the council age will reduce by about one the number of corruption evidences – this result raises an interesting issue for further investigation. Moreover, as there is no reason to believe why the number of corruption evidences would have an effect on health council age, the causality direction in this case is easier to establish.

Finally, as in the previous table, models 4 and 5 assess the effect of options of health spending on corruption evidences. The results follow a similar pattern with very small and not statistically significant coefficient for any variable.

Again, to summarize this section, it is necessary to remember its main findings. First, irregularities related to the municipal health council seem to have a strong effect over the total number of irregularities, but not on the number of corruption evidences. In the first case, it is necessary to take into account possible endogeneity problems, as the number of irregularities might influence irregularities with municipal health councils. In the second case, what apparently matter is the age of the health council more than irregularities related to it. Moreover, in this case the direction of causality is not compromised by endogeneity problems, as there is no reason to believe that the corruption evidences would affect the age of municipal health councils. Second, the other two governance variables, PB implementation and SUS qualification, did not show any type of relationship with either the number of irregularities or corruption evidence. Third, the size of the population showed the expected negative sign in both tables, that is, municipalities with larger population tend to show both a higher number of irregularities as well as corruption evidences. Fourth, the reason why the percentage of the population living below poverty levels showed an expected positive sign with corruption evidences, but not with the number of irregularities by municipality, is still up for grabs. Finally, it is important to have a better comprehension on the coefficients for the electoral turnout variables; commonly used as proxy for political mobilization, the coefficients showed an unexpected positive relationship in both tables. As in the previous section, all these preliminary results raise some questions that call for further investigation.

5. Conclusion

As we wrote in the report, we are just scratching the information contained within CGU reports. The conclusion of this preliminary report could not be different than considering future issues for research.

Besides the points discussed in the summaries of last sections, some other points might be added in future research. One main point is the need to grasp how local accountability works. As discussed in the introduction, though municipal councils may perform an important role in local accountability, this last is still a political phenomenon. Therefore, it is crucial to understand the constraints and incentives mayors face while managing health care resources, which usually represent a large fraction of local budget and have a potentially high electoral impact. In other words,

there are no reasons to expect that mayors would delegate authority over resources of that importance to a council, which is usually unknown by most voters. If decentralization is going to work, it is necessary a better comprehension about how these local political mechanisms work.

For instance, one is the role of media in providing access to information. As discussed by Ferraz and Finnan (2005a and 2005b), to have a better idea about the extension of local governments accountability, it is important to account for the process by which the information about governments wrongdoings is spread to local voters. The easier it is to acquire information the greater the government accountability control. Another point to enlarge the idea of political competition and investigate is the composition of the City Council and the mayor support on it. Finally, we could analyze how the two governance vectors, management and political, related to each other.

Another point that deserves closer investigation is about the qualification of local human resources, as attested by the average number of irregularities per municipality. The effect of poverty on local management of local resources can be interpreted as a nice terrain for a badly intentioned mayor, or simply the result of an unqualified bureaucracy. We should analyze specific types of irregularities (human resources, medical supplies, etc) as well as irregularities by specific programs to see whether there is variation among them. It would be interesting to compare different types of programs. The information contained in CGU reports provides this unique opportunity to make this more detailed comparison for the whole universe of Brazilian municipalities. We are able to investigate issues such as does the “Saúde da Família” program face similar problems than the “Programa de Agentes Comunitários de Saúde”? Certainly, managing hospitals entails different issue than managing less complex health care, but how these issues relate to the decentralization problems discussed above.

As Brazil has 5560 municipalities, which show a great social and economic variation, it would be wise for the federal government to deal with these municipalities in different ways. Due to the complexities involved in its management, to make health decentralization work, a task force for local bureaucracy’s qualification should be in order.²⁷

Finally, another related point is to compare decentralization outcomes in different areas. Again, CGU reports provide a rare opportunity do undertake this comparison, as they provide information on all transfers from the federal government, which for most municipalities represent the lion’s share of their spending. Comparing health and education decentralization would be an interesting task, as both processes are relatively recent and both required the formation of a municipal council to transfer resources. How have they performed relatively to each other? Do they share similar characteristics? What would explain possible different patterns? These are questions that need an urgent answer.

²⁷ The problem that needs to be taken into account is that a more qualified work force might find better employments outside local public bureaucracies.

BIBLIOGRAPHY

- Barro, Robert (1970). The Control of Politicians: An Economic Model. Public Choice, 14:19-42.
- Coleman, James S. (1990). Foundations of Social Theory. Cambridge, Harvard University Press.
- Ferejonh, John (1986). Incumbent Performance and Electoral Control. Public Choice, 50:5-25.
- Ferraz, Cláudio and Frederico Finan (2005a). Reelection Incentives and Political Corruption: Evidence from Brazil Municipal Reports. Manuscript
- Ferraz, Cláudio and Frederico Finan (2005b). Exposing Corrupt Politicians; The Effect of Brazil's Publicly Released Audits on Electoral Outcomes. Manuscript
- Lewis, Maureen (2006). Governance and Corruption in the Public Health Care Systems. Washington, Center for Global Development, Working Paper # 78. Available for download at: www.cgdev.org/content/publications/detail/5967
- Putnam, Robert D. (1993). Making Democracy Work: Civic Tradition in Modern Italy. Princeton, Princeton University Press.
- Przeworski, Adam; Susan C. Stokes; and Bernard Manin (1999). Democracy, Accountability and Representation. Cambridge, Cambridge University Press.
- Svensson, Jakob (2005). Eight Questions About Corruption. Journal of Economic Perspectives, 19(3): 19-42.
- Treisman, Daniel (2007). What Have We Learned About the Causes of Corruption from Ten Years of Cross-National Empirical Research. Annual Review of Political Science, 10: 211-244.
- Wibbels, Erik (2006). Madison in Baghdad? Decentralization and Federalism in Comparative Politics. Annual Review of Political Science, 9:165-88.
- Zamboni Filho, Yves; and Stephan Litschig (2006). Law Enforcement and Local Governance in Brazil: evidence from random audit reports. Manuscript

APPENDIX

Econometric Model: Variables Definition and Sources

1. Vector G (Governance Variables)

Variable	Variable Description	Years	Source
SUSQual	Dummy variable = 1 if the municipality has SUS Full Management Qualification (Gestão Plena de Sistema Municipal)	After 1998	MS
SUSage	Dummy variable = 1 if the municipality was qualified by the SUS during the current administration (2001-2004)	2001-2004	MS
Council	Problems identified with the health council	2001-2004	CGU
Councilage	Time since the creation of the health council until the year 2001 (observe the correlation)	2001	MS
PB	Dummy variable for Participatory Budget	01	Inst. Pólis; Biderman

2 Vector P (Political Variables)

Variable	Variable Description	Years	Source
ElecComp	Electoral Competition	2000	TSE
d_reelected	Mayors in Second Mandate	2001	TSE
Turnout	Number of voters / potential voters in the 2000 election	2000	TSE

3. Vector E (Health Expenditure Variables)

HTransfers	Health Transfers / Total Health Expenditures	2000-2004	SIOPS
Personnel	Personnel Expenditures / Total Municipal Health Expenditures	2000-2004	SIOPS
Medsupplies	Medical Supplies Expenditures / Total Municipal Health Expenditures	2002-2004	SIOPS
Investment	Investment Expenditures / Total Municipal Health Expenditures	2000-2004	SIOPS
Providers	Service Providers Expenditures/ Total Municipal Health Expenditures	2000-2004	SIOPS

4. Vector M (Municipal Variables)

Variable	Variable Description	Years	Source
PIB pc	Municipal GDP per capita	00	IBGE / IPEA
Schooling	Average schooling	00	IBGE
Poverty	Individuals bellow poverty line	00	IBGE / IPEA
Population	Number of Municipal Inhabitants	00	IBGE
Judiciary	Municipality that has a Judiciary seat	00	IBGE