



USAID | DELIVER PROJECT

FROM THE AMERICAN PEOPLE

Technical Brief

Using Geographic Information System Tools to Address Disparities in Access to Family Planning Services and Commodities in Latin America and the Caribbean



Community facilitators, such as these indigenous Kaqchikel women who work in the San Pablo Community Center in Sololá Department, provide health services, including family planning, to the most remote and difficult-to-access communities in Guatemala.

One of the first steps in improving equity and access to care is to identify *where* vulnerable populations are located.

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Countries in Latin America and the Caribbean (LAC) have made significant progress in achieving reproductive health commodity security in recent years, as reflected by increasing contraceptive prevalence rates (CPR), decreasing unmet need, and decreasing total fertility rates (TFR). Nonetheless, market segmentation analyses,¹ which disaggregate country-level health indicators by specific groups, have consistently shown that populations with characteristics such as rural area of residence, lowest socioeconomic quintile, indigenous ethnicity, and little or no education continue to experience low CPR, high unmet need for family planning (FP), and high TFR. To achieve contraceptive security in the region, efforts should be made not only to reduce disparities in access to primary health care services in countries throughout the LAC region, but also, specifically, to increase access to FP services for all segments of the population. This paper demonstrates a methodology that LAC ministries of health can easily use to geographically identify and target scarce resources to improve access to FP. Guatemala was chosen as a case study for implementing the methodology, in large part because of the disparities that exist between its different subpopulations (e.g., urban and rural, indigenous and non-indigenous, high and low socioeconomic quintile). The results highlight the potential for applying this methodology in other countries in the LAC region.

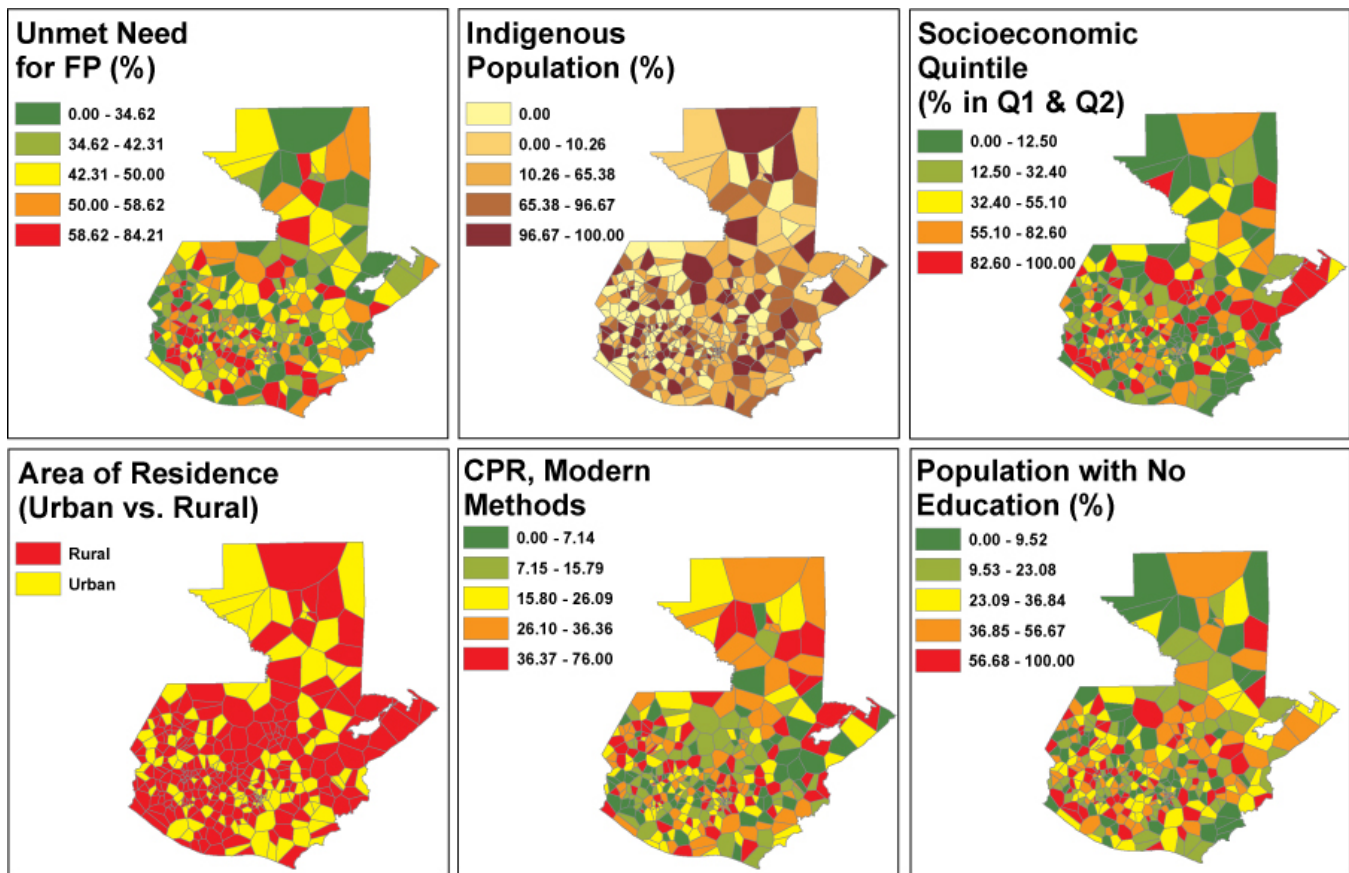
One of the first steps in improving equity and access to care is to identify *where* vulnerable populations are located. As a result, the analysis uses geographic information system (GIS) technology and geo-referenced survey data to visualize the distribution of vulnerable populations and to identify specific areas for targeted interventions. Within these areas, the factors that contribute to inequity may be diverse, ranging from operational barriers, such as supply chain management bottlenecks and inefficiencies, to cultural barriers and obstacles, including a lack of social acceptance of FP and language and cultural differences between service providers and clients. Ultimately, to reduce disparities in access to primary health care and to family planning in particular, decisionmakers will need to address the full range of challenges and attempt to answer the question of how to go the “last mile” and extend FP coverage and contraceptive availability.

Two recent qualitative analyses of the market (the first conducted by the USAID | Health Policy Initiative² and the second by UNFPA, Population Council, and the Guatemala Ministry of Health³), examined the barriers to accessing family planning services for two different populations in Guatemala. The first study identified barriers that contribute to lower contraceptive prevalence among indigenous populations; primarily, these barriers are operational barriers at health facilities (e.g., discrimination against indigenous women by health personnel, inadequate facilities, and inadequate informational material), and cultural barriers within the community and family environments (e.g., beliefs about negative physical and social effects of FP, and the influence of religious beliefs that oppose FP). By comparison, the second study evaluated barriers that affect contraceptive use in nonindigenous populations, and found several similarities, including provider bias against clients of lower socioeconomic status and fears about negative physical effects of FP.

Building on the insights gained from the market segmentation analysis and the studies on barriers to accessing family planning among indigenous and nonindigenous populations, the current analysis attempts to refine the task of identifying underserved populations for targeted initiatives to improve access to FP.

METHODOLOGY

Figure 1: Geographic Distributions of Individual Variables, Reproductive Health Survey (2002)



To determine which areas of the country exhibit the greatest inequity in access to FP commodities and services, it is necessary to define the term *inequity*. For the purpose of this study, high-inequity areas are defined and identified using the same characteristics from market segmentation analyses that have been done across the region—rural, low socioeconomic quintile, low levels of education, high unmet need for FP, and a high percentage of indigenous population. The ultimate goal of the analysis is to identify regions with low usage of family planning services in order

to develop strategies to concentrate on addressing gaps and targeting interventions. Thus, the areas of low CPR are also included in this definition of inequity.

The first part of the analysis takes the geo-referenced survey locations from the 2002 Reproductive Health Survey (RHS)⁴ and creates maps depicting each variable from the inequity definition, as described above (as shown in figure 1). The survey locations can be represented as points on a map, but also can be associated with the areas closest to them, creating a series of polygons that cover the entire country. Each polygon is associated with one survey cluster location and encompasses all of the land closest to that survey cluster. Figure 1 demonstrates this concept, with the color scales on the maps showing the different values for each variable.

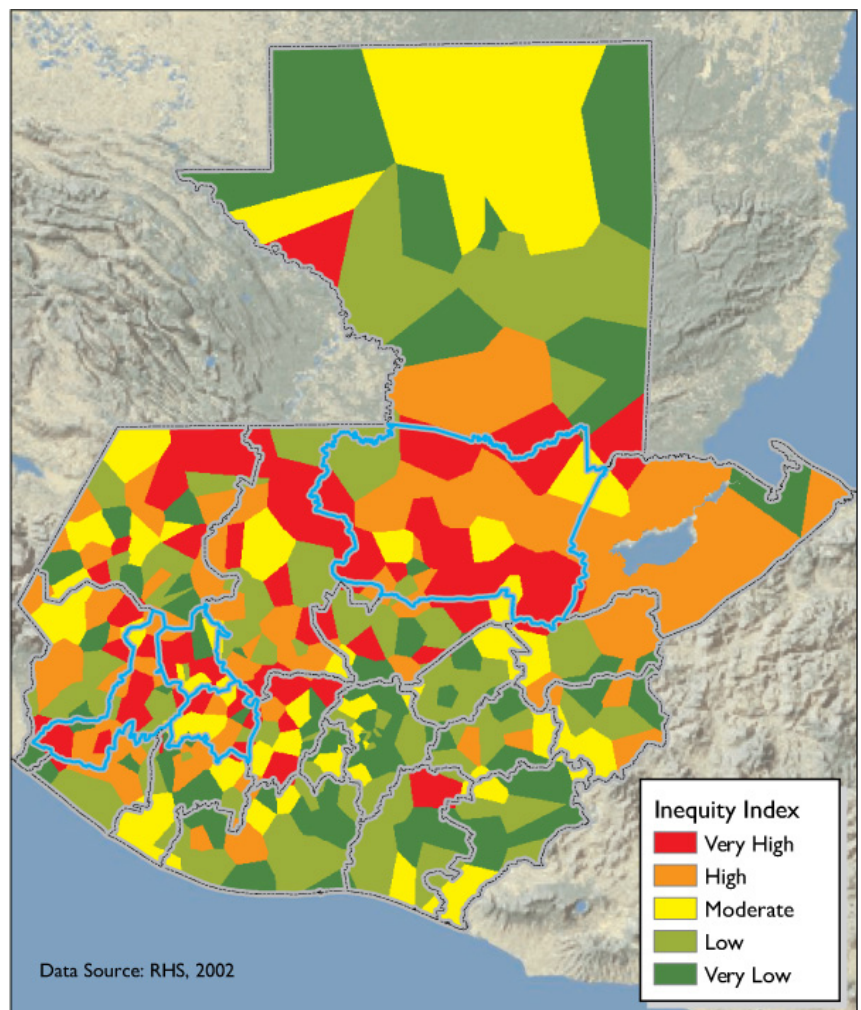
By analyzing the geographic variability in the unmet need data, policymakers can identify and quantify the extent of areas that are underserved because of weaknesses in the contraceptive supply chain, varying socioeconomic or cultural conditions, or location of facilities.

Multivariate Analysis of Inequity

Although it is useful to examine each variable individually to determine how they are distributed across the country, it is often difficult to see where multiple characteristics of interest overlap. To address this issue, it is possible to lay multiple maps on top of one other within the GIS and combine the values of the different variables into a new single index value. This method, also known as “suitability analysis,” involves first dividing each variable into quintiles and then reclassifying the maps so that the areas with the highest unmet need, highest percentage of indigenous population, highest percentage of population with no education, and highest percentage of population in socioeconomic quintiles Q1 and Q2 receive values of 5. Each of the subsequent lower quintiles for each variable receives values of 4, 3, 2, and 1, respectively. For the area of residence variable, rural areas were given a value of 5 and urban areas were given a value of 1, to maintain the same magnitude of effect on the inequity index as the other three variables. The last step in creating the inequity index involves laying the maps on top of each other and adding together the reclassified scores for each variable, by survey location (as shown in figure 2).

To summarize and compare the inequity index by department, the values are added by department boundary and the resulting sum is divided by the department area. The results of this analysis show the areas of the country with the greatest gaps in equity in accessing FP commodities and services and their geographic distribution. The departments highlighted in blue in figure 2 (Alta Verapaz, Quetzaltenango, Sololá, and Totonicapán) showed the greatest overall disparities.

Figure 2: Guatemala Multivariate Analysis of Inequities in Access to FP Commodities and Services



This methodology allows policymakers to visualize multiple variables simultaneously and identify where Guatemala's greatest disparities exist between wealthy and poor, urban and rural, indigenous and non-indigenous, and more educated and less educated. It also facilitates a much more geographically disaggregated analysis of disparities in health care, in this case in access to family planning. With additional analysis done in the field, barriers can be further investigated and specific, targeted interventions to improve access can be developed.

UNDERSTANDING INEQUITY AND BARRIERS TO ACCESS

To complement the GIS desk analysis, field visits were carried out to select facilities in two of the departments identified as having the greatest inequity in FP access (Sololá and Totonicapán). A small sample of service providers were interviewed about the challenges and barriers they observe in providing FP to the population they serve. Although the sample size of providers interviewed is not statistically significant, a number of important conclusions regarding both indigenous and nonindigenous underserved populations can be drawn from these interviews. Data collected on nonindigenous underserved populations comes from interviews with providers in Jutiapa, a primarily nonindigenous department that has a slightly higher socioeconomic status than Sololá and Totonicapán, but which also exhibited a high level of unmet need for FP in the 2002 RHS survey. It is important to note that the results of the interviews with service delivery providers in the present study complement the results from client interviews conducted by the USAID | Health Policy Initiative during its 2006 study on access barriers to FP for indigenous populations. Taken together, these two studies provide a comprehensive view of the challenges on both the supply and demand side of FP services and commodities for these vulnerable populations.

Key results from the interviews with service providers are as follows:

Cultural Barriers

Cultural factors among indigenous and nonindigenous populations—Cultural factors appear to be the most significant obstacles to accessing FP among indigenous populations. Husbands hold substantial influence over their wives—89 percent of the facilities surveyed stated that a significant portion of their clients do not feel they can use FP without consent from their husbands. Others stated that not only husbands, but also mothers-in-law play a large role in whether a woman is able to use FP methods. In the predominantly nonindigenous department of Jutiapa, *machismo* is still a significant issue, yet respondents said they believed that the Universal Access to FP Law⁵ has contributed to increased acceptance of family planning in recent years.

Language—Of the 39 service providers interviewed, only 10 percent said they had occasional difficulties in communicating with clients. In these situations, there was either another health worker in the facility who could communicate effectively in the client's language or community members who could help with language translation/interpretation (e.g., school teachers, community facilitators, neighbors). The remainder of the interviewees spoke the languages of the populations they served.

Physical Barriers

Interviewees stated that clients travel on average between 20 and 60 minutes (median) from their homes to reach health facilities, but that a few will travel as much as four hours. The vast majority of clients walk to facilities, while a smaller proportion rely on public transportation.

The types of health facilities accessible in the most remote communities can vary considerably. Most of these rural areas, found in all three departments visited, are served by nongovernmental organizations (NGOs) contracted by the Ministry of Health (MOH) under its Health Coverage Extension Program. Because of limited resources, health personnel are required to travel specific routes, visiting communities an average of once a week, but sometimes only once or twice a month. This level of service is a step in the right direction, but once-a-week visits are not sufficient to provide adequate

availability of FP services and commodities to the catchment population of these rural NGOs. Several respondents from the MOH-contracted NGOs interviewed said that if a user cannot wait for the service provider to arrive, she must walk to the nearest health post or health center, which can be approximately one to four hours by foot.

Because of the stigma related to FP among some indigenous people, several service providers shared stories of women who sought FP without the knowledge of their spouses and who travel to facilities that are far away from their home so they are not recognized. In other instances, it is not uncommon for women to take their youngest child for a vaccination and at the same time get an injectable contraceptive.

Operational Barriers

Provider Bias—Of the 39 total respondents, 13 percent, all of whom worked in rural areas, said they believed spousal permission is absolutely necessary before a woman can receive FP, creating a relatively small though not insignificant provider bias encountered by some clients. In contrast, 74 percent of interviewees, the majority in urban areas, believe that all women have the right to choose, obtain, and use FP regardless of whether their husbands agree or provide consent, and that health care service providers are obligated to fulfill that need. Finally, another 13 percent of the interviewees, especially those located in the most remote rural locations, expressed their belief in a woman’s right to access FP, yet also said that the woman and her husband should be in agreement on the issue before they take any action in order to avoid putting themselves in physical danger should a husband find out that his wife is secretly using FP.

Overall, in the three departments surveyed, the logistics system appears to have been functioning relatively well during the time frame of the 2002 RHS. During the MOH’s March 2003 national physical inventory of contraceptives, Sololá reported that 13.7 percent of its facilities were stocked out of one or more contraceptives, while Jutiapa reported 12.2 percent, and Totonicapán 9.7 percent. Nevertheless, CPR in all three was also low during the 2002 RHS (see table, below), revealing that even though contraceptives have been available at the facilities, clients were not demanding them, possibly as a result of the barriers mentioned earlier in this brief. Updated CPR values are forthcoming in the 2008 RHS, but the MOH’s March 2008 national inventory of health commodities revealed that contraceptive stockouts continue to be fairly low in two of the departments (Jutiapa 4 percent, and Totonicapán 6 percent), while they have increased in Sololá (19 per cent) since 2003.

Department	CPR (Modern Methods)	Unmet Need	Percentage with No Education	Percentage with Primary School Education	Percentage Indigenous Population
Jutiapa	30.1	40.7	38.2	56.4	0.0
Sololá	16.9	32.2	49.4	40.8	90.1
Totonicapán	10.2	46.3	51.3	44.0	97.0

Source: RHS. 2002.

CONCLUSIONS

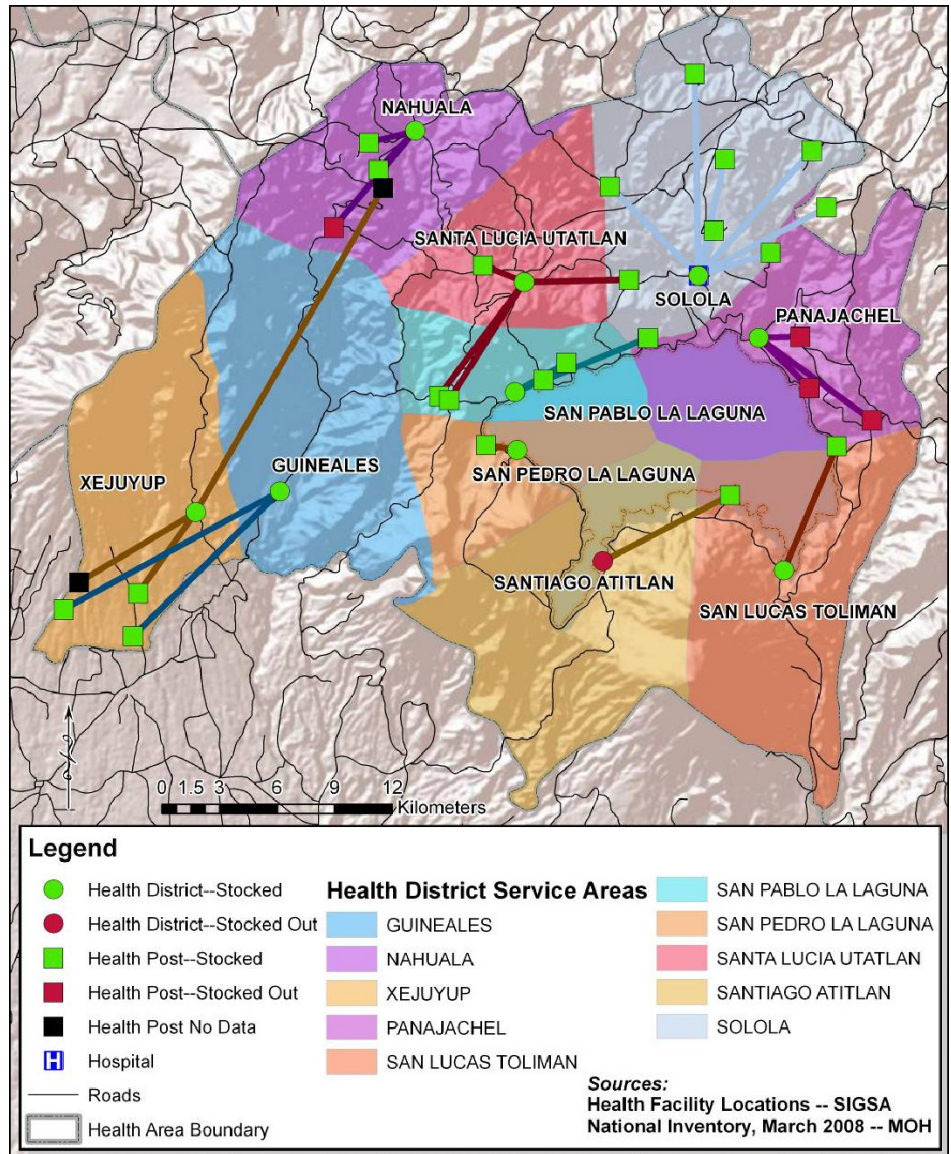
This analysis shows that the Guatemalan departments with the greatest disparities in access to FP are Alta Verapaz, Quetzaltenango, Totonicapán, and Sololá. To reduce unmet need for target populations in these departments, as well as to increase overall access to FP services and commodities, various approaches may be taken simultaneously. Some approaches and interventions may involve service delivery providers, particularly the MOH and community-based NGOs. Other strategies may be taken by advocacy and interest/community groups and local religious leaders who can explain the benefits of FP in improving family well-being and prosperity. Such strategies might include working

on advocacy and community engagement; information, education, and communication; quality of service delivery; and organizational strengthening.

Although the logistics system does not appear to contribute significantly at this time to disparities in access to FP, CPR in the departments identified is quite low and unmet need is high, leading us to conclude that a number of supply and demand barriers are in play. As these obstacles are overcome, FP demand should increase and therefore the MOH will need to maintain and plan for a well-functioning supply chain to manage greater volume of contraceptives in the system. One recommendation for further improvements in the logistics system is to determine if the distribution networks of MOH Areas (DAS) are designed so that health districts supply commodities to the health facilities closest to them. To best explain this observation, the MOH distribution network in Sololá is displayed in figure 3, where some health districts distribute commodities to facilities—shown as a bold line connecting health districts to health posts—that are located closer to another district.⁶

Finally, from a more general standpoint, using GIS as a planning tool for policymakers demonstrates how existing data sources can be leveraged to gain new information about the complex issue surrounding health inequities and poverty. Approaching the problem from an inherently geographic perspective allows detailed variations in health and demographic data to be examined for spatial trends, and using GIS tools facilitates an integrated analysis of multiple variables to identify priority areas for future targeted initiatives to reduce inequity in access to FP.

Figure 3: Sololá MOH Network of Health Facilities and Stock Status (March 2008)



FUTURE APPLICATIONS OF GIS TECHNOLOGY IN LAC

Geographic information system tools may be used in the future to analyze other equity and primary health care issues. The potential exists to link automated logistics management information systems with a GIS to enable geographic

monitoring and evaluation of logistics system performance. Ministries of Health may also analyze their distribution networks to ensure that they place facilities close to vulnerable populations to deliver commodities to the last mile.

References

- ¹ Market segmentation analyses have been completed in countries throughout the region under the POLICY II (<http://www.policyproject.com/>), DELIVER (<http://deliver.jsi.com>), and Calidad en Salud II (<http://www.urc-chs.com/projects/health/calidadII.htm>) projects.
- ² USAID | Health Policy Initiative and UNFPA. Guatemala City, 20 noviembre de 2007. *Presentación de Barreras para el acceso de la población indígena a la planificación familiar—Resultados del estudio realizado en Sololá, Quiché y Totonicapán entre mayo y agosto de 2006.*
- ³ Ministerio de Salud Pública y Asistencia Social, UNFPA, y Population Council. Guatemala, 5 de Mayo de 2007. *Presentación del Estudio Colaborativo: Opiniones de las usuarias de servicios públicos de salud con necesidad insatisfecha de planificación familiar.*
- ⁴ Ministerio de Salud Pública y Asistencia Social (MSPAS), Instituto Nacional de Estadística (INE). 2002. *Encuesta Nacional de Salud Materno Infantil 2002.* Guatemala: Impreso en Editorial ÓSCAR DE LEÓN PALACIOS.
- ⁵ Congreso de la República de Guatemala. *Ley de Acceso Universal y Equitativo a Servicios de Planificación Familiar y su Integración en el Programa Nacional de Salud Reproductiva.* 2005. Decreto No. 87-2005 <http://www.congreso.gob.gt/>
- ⁶ Other data sources used in the analysis to construct the maps include:
Instituto Geográfico Nacional. 2006. BD Sunil. <http://www.ign.gob.gt>.
Instituto Nacional de Estadística. 2005. Sistema Geoestadístico Nacional. <http://www.ine.gob.gt/index.php/sgn>.

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