GEO Health

City of São Paulo

Green and Healthy Environments Project – PAVS

SUMMARY AND LESSONS LEARNED

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2008

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FIOCRUZ Foreword

GEO Health in City of São Paulo is a methodological approach based on the understanding of the complex interrelation of environmental variables, hazards to health and loss in the quality of life.

The proposal for developing integrated health and environment assessments arises from an initiative of the United Nations Environment Programme (UNEP) and the Pan American Health Organization (PAHO) which, since 2003, have joined their efforts together with those of the National School for Public Health of the Oswaldo Cruz Foundation (ENSP/FIOCRUZ), as well as other scientific and technical partners, governments and experts from Latin America and the Caribbean, to carry out the technical coordination of the GEO Health project.

GEO Health, thus, links the GEO Process (Global Environment Outlook), started in 1995 by UNEP, and the HEADLAMP project (Health and Environment Analysis for Decision-Making) of the World Health Organization in order to provide decision-makers and health and environment professionals with information on the environmental impacts on human health, as well as to strengthen technical support for environmental health policies.

This methodological approach aims to integrate quality and science-based information that identifies and evaluates environmental problems that have an adverse impact on the health of communities/populations, which is crucial in guiding the formulation and implementation of actions capable of preventing, minimizing or controlling these problems. In this regard, GEO Health proposes to steer the strengthening of technical capacities for local, regional and/or national information generation (environmental monitoring programmes, health databases, epidemiological surveys, qualitative environmental and health evaluations, among others). At the same time, since it is notably participatory, GEO Health promotes enhancement of stakeholder capacities.

During the development of GEO Health, eight methodologies on the relation between health and environment were evaluated. Later the methodological approach for the process stages (participatory, interdisciplinary and intersectoral assessment) was formulated. This proposal was presented and reviewed by a group of Latin American and Caribbean experts in September 2004, in the city of San José, Costa Rica, together with a technical glossary drawn up by members of the Mexico – United States Foundation for Science.

In February 2005, participants of the interdisciplinary and intersectoral working group got together in Mexico City to discuss the strategy for executing pilot projects to apply, evaluate and, if necessary, propose reformulations for the methodological approach developed.

It is in this regard that FIOCRUZ is pleased to introduce GEO Health in City of São Paulo, the result of the pilot application of the aforementioned methodology. The Green and Healthy Environments Project (PAVS), executed by the Green and Environment Secretariat and the Health

Secretariat of the city of São Paulo with the support of UNEP, provided an excellent opportunity to involve not only the health and environmental policy managers of the city, but also the regional coordinators and the community health agents.

The integration of GEO Health under PAVS provided FIOCRUZ with the elements and the opportunity for testing, together with local partners, the application of the methodology while at the same time contributing to a methodological tool for participatory building of health and environment indicators.

Dr. Antônio Ivo
Director
National School for Public Health

UNEP Foreword

The complex interrelation between the quality of the environment and human health is the central theme of this report – GEO Health in City of São Paulo. This study joins a series of integrated environmental assessments carried out by the United Nations Environment Programme (UNEP) since 1995 on global, regional, sub-regional, national and sub-national scales. The GEO (Global Environment Outlook) methodology was gradually adjusted to sectoral, thematic and ecosystem approaches, which, as it brought together technical and scientific knowledge and participatory processes for formulating public policies, resulted in valuable inputs for decision-making.

In 2004, an urban environmental assessment was developed by the Green and Environment Secretariat (SVMA) of the city, in partnership with UNEP and the Institute of Technological Research (IPT), among other local technical partners. Its final report, GEO City of São Paulo, clearly showed the interface between environmental problems and the issues of unplanned land occupation, especially in urban areas, and the shortcomings in urban and security services. In addition to these impacts, the impacts of climate change on air quality and water availability and the unsustainable patterns of production and consumption are elements that have a direct and negative impact on the quality of life in a city. The results of this assessment have reinforced the need to enhance the integration of health and environment indicators to develop local integrated diagnoses that can guide future interventions in these two important areas.

In addition to its prior experience with the GEO process, the city of São Paulo also provided the ideal context for applying the GEO Health methodology in the Green and Healthy Environments Project (PAVS). This process, developed by SVMA, by the Health Secretariat, the Social Assistance Secretariat of the city of São Paulo, in close coordination with the Family Health Program (FHP) and with the support of FIOCRUZ and UNEP, introduced three major innovations: interdisciplinary methodological approach, using georeferenced health and environmental databases; intersectoral decision making, involving a plural and multidisciplinary network of organizations; and a high degree of community participation.

Approximately 300 people participated in this pilot study, whose central theme was “water and waste”. Among the participants were researchers, PAVS agents, members of local communities and another 20 institutions who all contributed towards the mapping, analysis and integration of health and environment indicators that depict the situation, the pressures and the effects of the sanitary conditions in each of the 96 administrative districts.

This publication seeks to provide PAVS managers, regional agents, community leaders and policy formulators in the city of São Paulo with the results and recommendations of the application

of this approach in the hope that they will provide valuable inputs for designing differentiated, efficient action strategies and continuous improvements to each area in which it is used.

UNEP wishes to specially thank the Green and Environment Secretariat of the city of São Paulo and FIOCRUZ for having fostered a fertile and favourable environment for improving the GEO Health methodology.

Cristina Montenegro
Coordinator
UNEP Brazil Office

SVMA Foreword

This publication is the result of the desire to further the development of intersectoral action programmes. The Green and Healthy Environments Project (PAVS) and GEO Health City of São Paulo are true expressions of this wish. This project involved the active participation of the Green and Environment, Health and Social Development and Assistance Secretariats of the city of São Paulo, in partnership with the United Nations Environment Programme (UNEP), the Oswaldo Cruz Foundation (FIOCRUZ) and other entities.

The intense involvement of more than 5000 Community Health Agents and Social Protection Agents in a capacity-building programme on health and environment generated the ideal context for applying the GEO Health methodology, bringing together interdisciplinary methodological approach, intersectoral decision making and community and social organization participation.

The project enabled mapping, analysis and integration of health and environment indicators, showing the state of the art, pressures and effects of sanitary conditions of the city districts, operating as a pilot test of the GEO Health process in the city of São Paulo and methodological tools for participatory building of health and environment indicators. It identified the environmental sanitation problems that most affected the local population and enabled the definition of priority areas for developing integrated actions.

This work, continuing the work of the GEO City of São Paulo, published in 2004, also in partnership with UNEP and with the Technological Research Institute (IPT), confirms that the urban growth seen in the last few decades in São Paulo led to the increase of the exposure of the population to undesirable environmental conditions, with an increase in the incidence of diseases related to these environmental exposures.

Its results show the efficacy of the intersectoral approach and reinforce the need to enhance the integration between health and environment, be it for carrying out integrated and efficient diagnoses, be it for defining and developing integrated and more effective public policies for promoting the quality of life and health of the population.

Hélio Neves
Director
PAVS Project/SVMA

contents

FIGURAS

Introduction

The United Nations Environment Programme (UNEP) has been carrying out an integrated environmental assessment project called GEO (*Global Environment Outlook*) since 1995.

GEO is a consultative and participatory process of building capacities for developing environmental assessments through reports that portray the current state, trends and future panorama of the environment. To achieve this goal, UNEP developed a methodology that allows scientific evaluation of the dynamics of the relations established between natural environments and human society at the various levels of geographic aggregation, be they defined by natural limits (e.g. biome, ecoregion, continent) or by socio-political limits (e.g. cities, states, countries and regions).

The GEO report systematizes the information gathered during the environmental assessment process so that the integrated analysis of this information can guide decision-making, help define management goals and provide inputs for public policies. The process concludes with the formulation of proposals and recommendations that adhere to the principles of technical, scientific, political, economic and socio-environmental feasibility.

The GEO process has been improved and adapted, for over a decade, to various realities, scales of analysis and availability of data and information. Therefore, as it accumulates lessons learned it also strengthens capacity-building for the sustainable management of natural resources, highlighting the essential role of the environment in development and, more importantly, in human wellbeing. There is no doubt that the quality of the environment has a direct bearing on the quality of life and health of the population.

In fact, many of the GEO reports – particularly those developed in several Latin American and Caribbean cities – have addressed hazards to health as a result of environmental degradation, by including, among others, sanitary indicators to assess the environmental impacts on quality of life and health (e.g. morbidity or mortality rates).

It was in this regard that UNEP and the Pan American Health Organization (PAHO), with the technical collaboration of a large number of experts, institutions and organizations of the Americas headed by the National School of Public Health (ENSP) from the Oswaldo Cruz Foundation (FIOCRUZ) of the Ministry of Health of Brazil, decided to join efforts to build a methodology that can provide scientific basis for an interdisciplinary, intersectoral and participatory process for carrying out an integrated assessment of health and environment in Latin America and the Caribbean. This process came to be known as GEO Health.

This report presents a summary of the results, conclusions and recommendations for action generated by a pilot test of the GEO Health developed in 2007 in the city of São Paulo, Brazil, through a partnership with the São Paulo Municipal Health Secretariat (SMS), the city's Green and Environment Secretariat (SVMA) and UNEP. This action was executed under an intersectoral programme of both these secretariats – Green and Healthy Environments Project (PAVS) – with the technical coordination of ENSP/FIOCRUZ.

Background of Health and Environment Intersectoral Work

One of the main outcomes of the United Nations Conference on Environment and Development, held in 1992, in Rio de Janeiro, Brazil, was Agenda 21. Even today, it is considered an important guidance instrument for sustainable development. Chapter 6 of this document deals with "Protecting and Promoting Human Health". Several other chapters address the linkages existing among health, environment and social development.

The interrelation between health and environment also underlay the Summit of the Ibero-American Heads of State and Government in 1993, and the Summit of the Americas in 1994, held in Salvador, Bahia, Brazil, and Miami, United States, respectively.

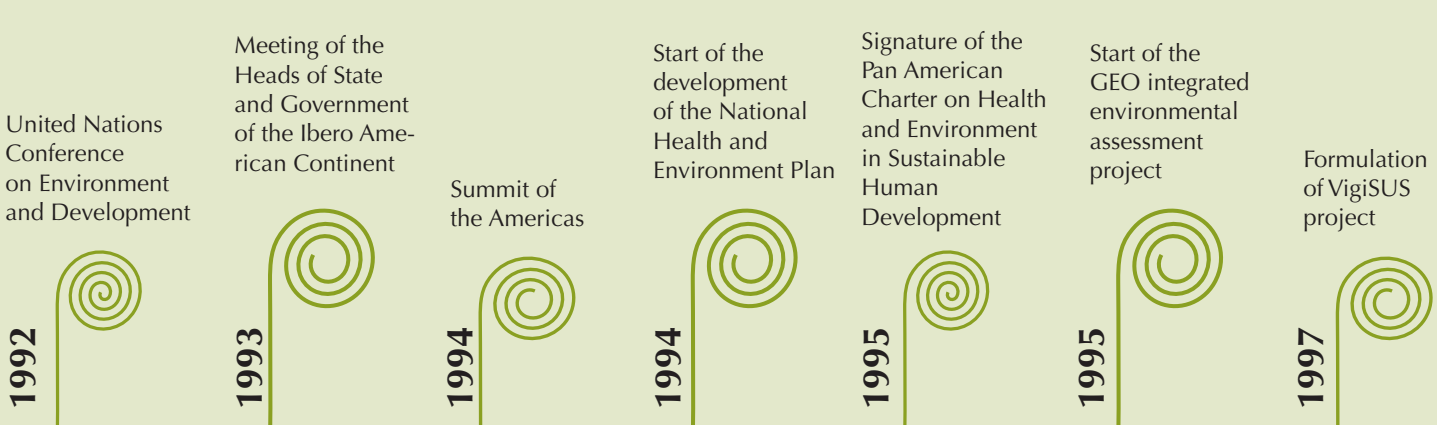
In Brazil, initiatives to draft the National Environmental Health Policy began in 1994, during the preparatory process of the Pan American Conference on Health and Environment in Sustainable Human Development. To this end, an Interministerial Commission was created to provide inputs for the Interministerial Working Group that was drafting the first official document, interrelating the areas of health and environment: the National Health and Environment Plan.

In 1995, in Washington, the Brazilian Ministers of Health and of the Environment signed the Pan American Charter on Health and Environment in Sustainable Human Development.

In that same year, the United Nations Environment Programme began its project of integrated environmental assessments called GEO.

In 1997, in Brazil, the Ministry of Health formulated the VigiSUS project to structure the National Environmental Health Surveillance System, using SUS (Brazilian Public Health System) guidelines, among others.

In March 2002, the meeting of Health and Environment Ministers of the Americas was held in Ottawa, Canada. On that occasion, the Ottawa Declaration was signed, through which Ministers called on the international cooperation agencies active in the Region to officially integrate health and environment



issues in their respective working agendas and to foster inter-institutional cooperation.

To meet this demand, in 2003 the GEO Health Project was launched. It was an UNEP – AHO partnership with the technical support of FIOCRUZ (Brazil), in collaboration with a great number of Latin American and Caribbean experts, organizations and agencies. The main goal of the project is to develop a strategy for an integrated assessment of health and environment that provides information for decision makers and public policy formulators in order to promote a healthier environment and improve the health of the population.

In the following years, the project partners dedicated themselves to consolidating the conceptual framework and the integrated assessment instruments for health and environment, which would provide the foundation of the GEO Health methodology. In June 2005, at the meeting of Health and Environment Ministers of the Americas, held in Mar del Plata, Argentina, the first outcomes of the project were presented: a report reviewing the methodologies for assessing health and environment that were already being used in the region; a report on the proposed methodological approach for the integrated GEO Health assessment; and versions in Spanish, English and Portuguese of the technical glossary developed specially for the project.

In 2007, a pilot test of the GEO Health process was carried out in the city of São Paulo, as part of the Green and Healthy Environments Project (PAVS), led by the Green and Environment Secretariat (SVMA) and the Municipal Health Secretariat (SMS).

At the XVI Meeting of the of the Forum of Ministers of Latin America and the Caribbean, held in February 2008, ministers decided to prioritise health and environment and, in particular, chemical contamination, in the item "Social issues, health, poverty and inequality" of the Latin American and Caribbean Initiative for Sustainable Development (ILAC) (Decision 1).

In June 2008, the 186th Ordinary Meeting of the National Health Council approved the establishment of the First National Environmental Health Conference, foreseen for the second half of 2009, with the participation of the Ministries of Environment, Health and Cities, as well as of the National Councils of Health, of Environment and of Cities. The National Conference will be preceded by State Environmental Health Conferences.

2002 Signing of the Ottawa Declaration

2003 Start of the GEO Health Project

2005 Meeting of Health and Environment Ministers of the Americas in Argentina

2007 Pilot test of the GEO Health in the city of São Paulo

2008 XVI Meeting of the Forum of Environment Ministers of Latin America and the Caribbean

2008 Approval of the First National Environmental Health Conference

1. Conceptual Framework of the GEO Health Process

GEO Health regards that environment-based human health problems cannot be determined just by the direct assessment of environmental variables (physical, biological and/or chemical). The complex *cause* (environmental impact) and *effect* (damage to health and/or diminished quality of life) relation, arising from the human and economic development model implemented in a region must also be taken into account. This model in itself, is the historical outcome of the socio-political, economic and institutional arrangements employed to make use of the ecosystem services and the social distribution of its benefits. More specifically, in Latin America and the Caribbean, these arrangements are permeated by structural poverty, inequality and social exclusion.

Hence, anthropic activities (such as economic activities, occupation and use of land) driven by the development model may result in pressures acting on the ecosystem that are capable of generating environmental impacts that will have adverse effects on the health of the population. Because of its crosscutting nature, poverty, inequality and social exclusion increase vulnerability to exposure to environmental impacts and, consequently, increase the risk of hazards to health and reduce the quality of life.

The **methodological approach** developed for the GEO Health process is a blend of the PSIR (Pressure - State - Impact - Response) model, one of the instruments of the methodology applied in developing the UNEP GEO reports, and the methodological proposal developed by the HEADLAMP Project (*Health and Environment Analysis for Decision-Making*), of the World Health Organization, based on the DPSEEA framework (Driving Forces-Pressures-State-Exposure-Effects-Action). It also uses the ecosystem and human wellbeing approach of the fourth global GEO (GEO-4), which incorporated conceptual elements of the Millennium Ecosystem Assessment.

The GEO Health analysis instrument aims to integrate all these components in order to build indicators and indices (integrated indicators) that best depict the environment-health relationship. The elements of the chain are as follows:

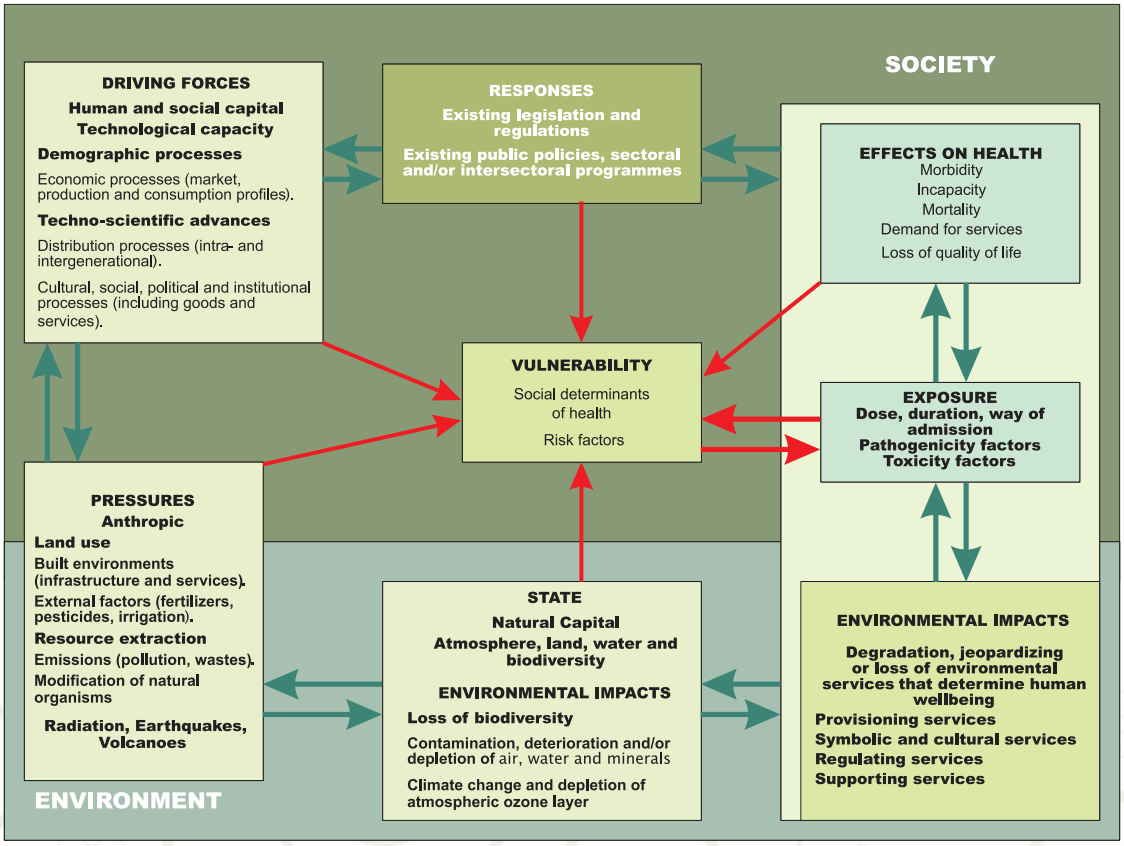
- **Driving forces** (social and material capital for development): demographic profile; economic processes; scientific and technological innovation; income level and distribution; socio-political and institutional characteristics.
- **Pressures** (dimensions of the development model implemented may affect the structure and dynamics of the ecosystem): land use; use of natural resources; polluting emissions (chemical and biological contaminants, solid wastes); etc.
- **State** (situations and trends of environmental change that affect the natural capital): pollution, degradation or depletion of water, air, soil, biodiversity and the climate change process.
- **Environmental impact** (degradation and/or loss of ecosystem services, causing adverse effects on health and decreasing human wellbeing): losses of supply services (water, food); of regulation (water, climate); and of symbolic value (identity, culture) services.
- **Exposure**: mediator factors between the environmental impact and hazards to health

– vectors, for example – that determine the **environmental risk** (individual and collective) and that depend on the **vulnerability** (age, gender, housing, occupation, etc.).

- **Effect on health**: morbidity, mortality, psychological suffering, loss in the quality of life (restriction on freedom of choice and actions for human development).
- **Responses**: feasible integrated health and environment proposals and recommendations, developed, implemented and monitored intersectorally.

It should be stressed that the GEO Health process defines the most relevant land areas and/or populations in terms of vulnerability to environmental exposures that represent the greatest health risks. Thus, the information generated in the process becomes not only a tool for the socio-environmental management of the territory but also a collective health management tool, supporting the formulation of integrated health and environment actions to be implemented in an intersectoral manner.

Figure 1: Conceptual Framework of GEO Health



Note: The green arrows show the interaction of the DPSEER chain components. The red arrows show the relationship of these components to vulnerability and the thick red arrows show the vulnerability/exposure interaction.

2. Particularities of the City of São Paulo

The territory of the city of São Paulo concentrates more than 50% of the population of the largest Brazilian metropolitan region, that is approximately 11 million people, distributed heterogeneously throughout an area of 1,509 km², at an average height of 760 m above sea level, in the Upper Tietê River Basin, in an ecological region where the rain forest is predominant.

The city of São Paulo has different subdivisions, according to each secretariat. In general terms, the city is divided into 31 subdistricts, organized in 96 Administrative Districts (AD).

The Municipal Health Secretariat divides the city into five regional health coordination offices (North, South, Southeast, Central-West and East). These are further divided into 41 health districts, which encompass 2 to 3 ADs, each one corresponding to approximately 250,000 people. The city of São Paulo has 384 basic health units, of which 173 (45%) have an office of the Family Health Programme (FHP). The city has 796 Family Health Teams, which are only able to provide services to 25.13% of the population. The approximate 5,200 Community Health Agents can only provide services to 27.40% of the city population.

The level of the services that the Family Health Teams provide varies significantly among the 96 ADs of São Paulo. In fact, only 50% of the ADs have services for Family Health, which is less than 10% of the total population is covered. Only four districts (Jardim Ângela, Jaguará, Vila Curuçá and Pari) have cover more than 70% of the population and only the Vila Curuçá AD has 100% of its 144,226 inhabitants covered by the Family Health Teams. This distribution originates in the initial design of the implementation of the FHP that prioritised the ADs with the greatest number of families whose income was less than 5 minimum monthly wages.

From an environmental perspective, São Paulo is one of the largest and most complex cities of the world, with socio-environmental characteristics and problems that are also multifaceted and that vary according to the needs of each region. To make environmental protection more effective in the city, the Green and Environment Secretariat (SVMA) created, in August 2005, four Decentralized Management Centres: North, Central-West, East and South.

Nevertheless, for the sewage collection system, the subdivisions are defined by river basins and have nothing to do with the above-mentioned divisions, while the water distribution grid depends on the network of springs and sources. Both sewage collection/treatment and water supply in the city of São Paulo are the responsibility of the Basic Sanitation Company of the State of São Paulo (SABESP), linked to the State Water Resources Secretariat. On the other hand, household waste collection falls under the responsibility of two consignee companies that carry out the service throughout the entire municipal territory.

In spite of the complexity arising from the enormous territorial, demographic and multicultural dimensions of the metropolis, São Paulo has several quality databases with consolidated historical series of both environmental and health variables, in addition

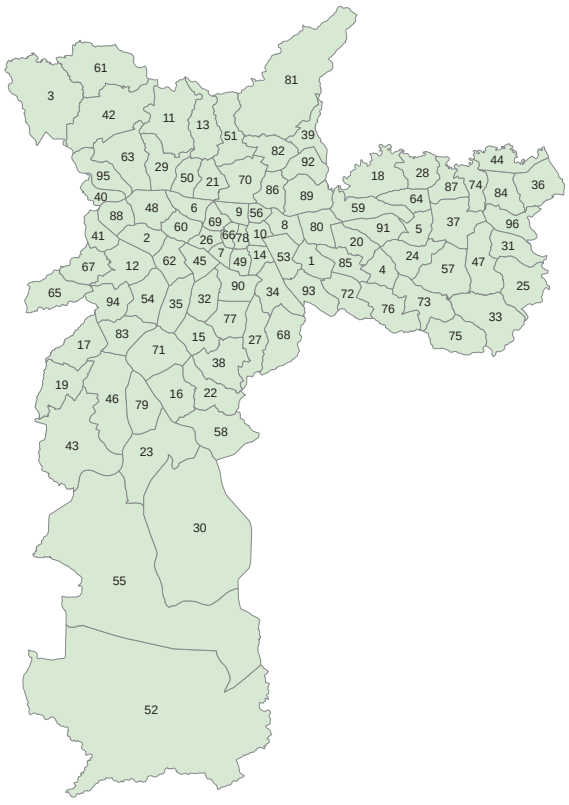
to prior assessment experiences. Some of these should be mentioned as they facilitated the GEO Health process in São Paulo:

» **Epidemiology and Information Coordination Office – CEInfo**, of the Municipal Health Secretariat.

» The **Report for the City of São Paulo: Panorama of the Urban Environment**, prepared in 2004, through a partnership between UNEP and SMVA and together with the technical partnership of the Technological Research Institute of the State of São Paulo (IPT).

» The **Environmental Atlas of the Municipality of São Paulo**, an interdisciplinaryand intersectoral project of SVMA and the Municipal Urban Planning Secretariat (SEMPLA), with the aim of creating and maintaining a Municipal Environmental Information System, an item provided for in the Organic Law of the Municipality of São Paulo.

Figure 2: Division of the City of São Paulo in Administrative Districts



São Paulo – Administrative Districts

IBGE Code	District Name	IBGE Code	District Name
1	Água Rasa	49	Liberdade
2	Alto de Pinheiros	50	Limão
3	Anhanguera	51	Mandaqui
4	Aricanduva	52	Marsilac
5	Artur Alvim	53	Mooca
6	Barra Funda	54	Morumbi
7	Bela Vista	55	Parelheiros
8	Belém	56	Pari
9	Bom Retiro	57	Parque do Carmo
10	Brás	58	Pedreira
11	Brasilândia	59	Penha
12	Butantã	60	Perdizes
13	Cachoeirinha	61	Perus
14	Cambuci	62	Pinheiros
15	Campo Belo	63	Pirituba
16	Campo Grande	64	Ponte Rasa
17	Campo Limpo	65	Raposo Tavares
18	Cangaiba	66	República
19	Capão Redondo	67	Rio Pequeno
20	Carrão	68	Sacomã
21	Casa Verde	69	Santa Cecília
22	Cidade Ademar	70	Santana
23	Cidade Dutra	71	Santo Amaro
24	Cidade Lider	72	São Lucas
25	Cidade Tiradentes	73	São Mateus
26	Consolação	74	São Miguel
27	Cursino	75	São Rafael
28	Ermelino Matarazzo	76	Sapopemba
29	Freguesia do Ó	77	Saúde
30	Grajaú	78	Sé
31	Guaianases	79	Socorro
32	Moema	80	Tatuapé
33	Iguatemi	81	Tremembé
34	Ipiranga	82	Tucuruvi
35	Itaim Bibi	83	Vila Andrade
36	Itaim Paulista	84	Vila Curuçá
37	Itaquera	85	Vila Formosa
38	Jabaquara	86	Vila Guilherme
39	Jaçanã	87	Vila Jacuí
40	Jaguara	88	Vila Leopoldina
41	Jaguaré	89	Vila Maria
42	Jaraguá	90	Vila Mariana
43	Jardim Ângela	91	Vila Matilde
44	Jardim Helena	92	Vila Medeiros
45	Jardim Paulista	93	Vila Prudente
46	Jardim São Luís	94	Vila Sônia
47	José Bonifácio	95	São Domingos
48	Lapa	96	Lajeado

fonte: IBGE; lei municipal 11.220 de 20/5/1992.

3. GEO Health Pilot Study in the City of São Paulo

The development of a pilot study for the GEO Health project was one of the goals of the Project Green and Healthy Environments: Building integrated public policies in the city of São Paulo, an intersectoral initiative involving both SVMA and SMS.

The first two steps of the GEO Health process were developed under this framework. The third step, according to the methodological criteria of the process, was to begin with the analysis of the integrated indicators and of the recommendations for action published in this report.

STEP 1: PREPARATION AND AWARENESS-RAISING

The proposal for the thematic definition of the pilot study was undertaken by SVMA. The Secretariat selected the water and waste problems in the city of São Paulo as the environmental dimension. This "sanitary condition" was defined as the level of environmental health with regard to the existence of hygienic conditions of the housing and public areas, ranging from household sanitary water installations right through to public sanitation systems.

The interdisciplinary and intersectoral approach of the "water-waste-health" problem was ensured by the participation of the PAVS project (in particular SVMA and SMS) and the technical staff of ENSP/FIOCRUZ. In addition to experts from the environmental and health sectors, also participating were educators, managers, and other stakeholders.

The participatory assessment of the problem was carried out in workshops with the partners of the process and Community Health Agents of the Family Health Programme of the Brazilian Public Health System. Five workshops were held. The first one was held at the Open University for Environment and Culture of Peace (UMAPAZ) to introduce the methodological instruments of the GEO Health process and the other four workshops were held in areas with Basic Health Units as selected by SMS to meet the methodological criteria of the GEO Health process as much as possible.

Steps of the GEO Health process

The GEO Health pilot test implemented in the city of São Paulo had three methodological steps:

1. Participatory, interdisciplinary and intersectoral assessment of the existing problem and identification of priorities.
2. Collection, selection and analysis of data and indicators in existing databases. Building integrated health and environment indicators.
3. Analysis of integrated health and environment indicators; formulation of priorities for action and start of participatory process for implementing, monitoring and evaluating the defined priority actions.

The objective of the workshops was to develop the capacity of the Community Health Agents to implement GEO Health as a methodological tool for assessing health and environment problems and at the same time, to obtain qualitative indicators for health problems associated with exposure to water and waste in their areas of action. A kit (booklet and CD) for capacity-building of the Agents was designed to assist workshop participants in becoming trainers for the process. The participatory assessment of the water-waste-health problem involved visual records and discussion of priorities through a Rapid Participatory Diagnosis (RPD), based on a "problem tree". More than 120 Agents built 28 problem trees, on which the RPD was based.

Rapid Participatory Diagnosis (RPD)

RPD is a research-action tool that helps a community obtain a panorama of specific issues and, therefore, allows setting of hierarchy and priority of the main socio-environmental problems and exploring solutions. The priorities identified in the workshops held under the São Paulo GEO Health process corresponded to the following categories: presence of rodents (rats) and other synanthropic animals; construction and demolition debris and waste in public areas (streets, unbuilt areas and streams); need for environmental education; water pollution; lack of green areas and deforestation; precarious urban areas; precarious housing, and lack of coordination between health and environment public policies.

Hierarchy of problems

Item	Level 1	Level 2	Level 3
Frequency (F)	Low	Medium	High
Magnitude (M)	Small	Moderate	Large
Solution (S)	Easy	Moderate	Difficult

Priority of problems

Problem	F	M	F+M+S	Priority

STEP 2: PROCESS FOR BUILDING INTEGRATED INDICATORS

Selection of DPSEER indicators for the pilot test

The selection of indicators followed, with some necessary adaptations, the general GEO Health methodological criteria. These criteria should:

i. Express associations that are "social determinants of health/environmental exposures/effects on health" previously reported in scientific literature.

ii. Have quality, strength of association and statistical significance.

iii. Be available in local consolidated databases (in this case, SVMA and SMS), and have been used in previous experiences in São Paulo (particularly, the 2004 GEO City, the Environmental Atlas of the City and the CEInfo reports).

iv. Be a previously used negative indicator (that is, report the worst conditions) and, according to the results of the correlations, show the greatest difference among the studied areas.

v. Must be recognized as valid in the interdisciplinary, intersectoral and participatory framework of the process.

Following these criteria, several indicators were analysed using multiple regression. The dependent variables were indicators of effects on health and the independent variables were indicators of exposure, state, pressure and driving force. With respect to the DPSEER chain, correlations were made among the tested indicators for the same component and also for the tested indicator of the next component of the chain.

Therefore, the Driving Force indicator (e.g. % of household heads without schooling) was chosen because it translated satisfactorily the human capital of the vulnerable population.

The Pressure indicator (e.g. % of the population living in slums) proved to synthesize, with strength of association and statistical significance, the pressure dynamics in the evaluated urban environments (demographic, territorial and socio-economic dynamics).

The common characteristic of the tested indicators for the State component was that they adhered to the criterion of association of environmental cause/epidemiological effect reported in health literature, indicating the *State of urban environment* as a determinant of environmental exposure. Among them, the most statistically suitable variable was "% of households without sewage systems" (in an ecosystem approach to health, this would be an Exposure indicator). On the other hand, the Exposure indicator selected (rate of rodent infestation in buildings) met the perception of risks/losses in quality of life seen in the participatory process of the RPD.

Finally, the indicators for Effects on Health were chosen from a series of morbidity and mortality variables. The ones selected were those that had the best association in multiple regressions with other DPSEER chain components.

In the GEO assessments, effects on health are reported in the environmental impact category. However, in GEO Health, this specific type of environmental impact is the central focus of the approach. Therefore, component I of the GEO PSIR chain was replaced by component E of the DPSEEA chain (HEADLAMP).

Tested and selected indicators for the São Paulo GEO Health pilot test. Collection Periods and Source.

Component	Indicator	Source
Driving Force	- % of heads of households without schooling [selected].	IBGE (2000)
	- % of heads of households with an income of up to 1 minimum wage.	>
Pressure	- % of the population living in slums [selected].	SVMA (2004)
	- % of the population living in areas of unregulated occupation.	>
	- % of the population living in invaded areas.	>
	- Population density per km^2.	>
State	- % of households without sewage system [selected].	IBGE (2000)
	- % of households with a well or spring.	>
	- % of households without a bathroom.	>
	- % of households with waste collections in containers.	>
	- Number of flooded areas.	SVMA (2004)
Exposure	- Rate of rodent infestation in buildings [selected].	SMS (2006)
	- % of households with water piped to the property.	IBGE (2000)
Effects on health	- Average rate of hospitalisation due to waterborne diseases among children less than 5 years of age (2000 to 2003) [selected].	DATASUS and SMS
	- Average mortality rate due to waterborne diseases (codes A00 to A09 - of ICD-10, Chapter I) - 2000 to 2003.	>
	- Mortality rate due to infectious and parasitic diseases (ICD-10, Chapter I) - 2000 to 2003.	>
	- Average rate of infant mortality [selected] (2000 to 2003).	>
	- Average incidence of leptospirosis [selected] (2000 – 2006).	>

Building integrated health and environment indicators

The procedure for integrating DPSEER chain indicators involved the following steps:

- Each indicator was converted into an index (standardized measure varying from 0 to 1 without a measurement unit) using the formula: *Index = maximum amount – observed amount / maximum amount – minimum amount*. In this index, 0 (zero) corresponds to the worst result and 1 (one) to the best;
- Once the indicators were standardized, the index values were combined according to the following formulas:

» DP integrated indicator (Driving Force index + Pressure Index / 2)

» DS integrated indicator (Driving Force index + State Index / 2)

» DPS integrated indicator (DP + DS / 2)

» DPS (i) integrated indicator (DPS + Effect index (i) / 2)

(i) represents each of the Effects on health indicators tested

- For the descriptive analysis, results were categorized according to quartiles, that is, identification and description of ¼ or 25% of the ADs with the worst results. The range of results was Very Good (the quartile with the best indicators), Good (the quartile just

below Very Good) Bad (the quartile below Good) and Very Bad (the quartile with the worst results).

Identification of most vulnerable areas

On the analysis of the quartiles, levels of priority were defined for the development of health and environment intersectoral actions/interventions for the "water-waste-health" problem in the city of São Paulo. The classification followed the methodological criteria below.

- The ADs whose results were in the worst category in all integrated indicators evaluated in the pilot test were included in **Priority Level 1**.
- The ADs whose results were in the worst category in at least one of the integrated indicators were included in **Priority Level 2**.
- The ADs that had no results in the worst category were considered **Non Priority**.

Factors that influenced the type of approach and the selection of indicators in the São Paulo pilot test

One of the objectives of submitting the GEO Health method to various pilot tests is to test criteria that help to select reference indicators for each of the DPSEER chain components. This selection, with a focus on Latin America and the Caribbean, would help to consolidate the methodology both in terms of the conceptual framework and of the methodological instruments. Nevertheless, this objective must be complemented by another one: to test, in practice, the proposal for generating integrated health and environment indicators, which separates GEO Health from other existing assessments of environmental impacts on health.

The test implemented in São Paulo did not aim to carry out an *integral* and *integrated* assessment of health and environment in the city, but rather to be a pilot test limited to carrying out an *integrated* evaluation of a previously defined problem: the water-waste-health hazard relationship in needy urban areas of the city, covered by the Family Health Programme, and with the participation of the Programme's Agents. That is, a participatory assessment of an urban problem that is essentially sanitary in nature.

Nevertheless, the institutional process was developed within the context of a broader intersectoral project – PAVS – making it necessary to adapt time periods and human resources to meet an agenda of targets and commitments, which, in fact, made it harder to develop broader environmental assessments in the territorial areas selected for the test.

In this conditioned operational context, with the main objective of testing the generation of integrated indicators, a more epidemiological approach (one cantered on diseases) was selected, rather than an ecosystem one (focused on human wellbeing). This meant that the pilot test in São Paulo did not evaluate losses in quality of life resulting from losses in ecosystem services, but was limited to evaluating environmental exposure determined by the urban infrastructure characteristics (built environment) and to establish the sites (and populations) vulnerable to these exposures.

It must be remembered, however, that GEO Health proposes an ecosystem approach as a conceptual framework for *integral* and *integrated health and environment assessments*; that the epidemiological analysis is just one more tool of the method (essential for assessing the exposure variables, morbidity and mortality). But in the GEO Health conceptual framework, human wellbeing is not reduced to the mere absence of disease or risk of death.

Spatial analysis of the indicators selected per DPSEER component in the city of São Paulo

Figure 3: Driving force – *Share of heads of households without schooling per Administrative District (2000)*

Twenty-four ADs had from 8% to 20% of heads of household without schooling. These districts are located mostly in the periphery of the southern and eastern areas of the city of São Paulo. Among the districts with more than 10% of the heads of households without schooling are Marsilac, Parelheiros and Jardim Ângela, in the South, and Lajeado, Iguatemi and Jardim Helena in the East.

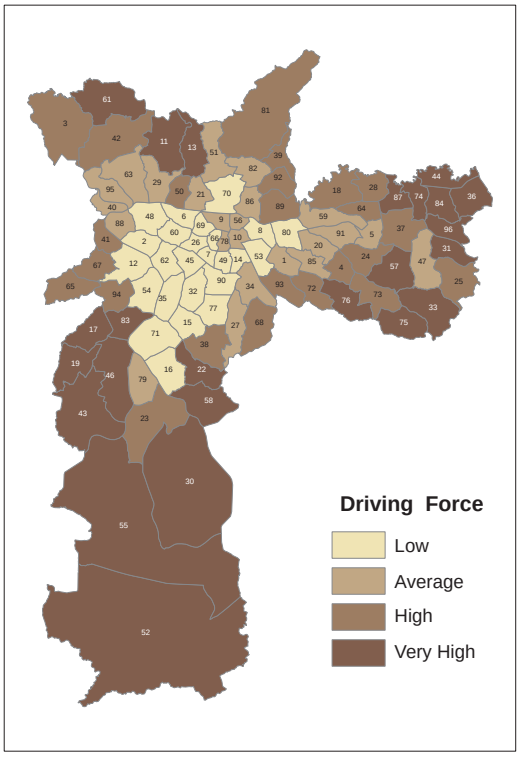


Figure 4: Pressure – *Share of the population living in slums per Administrative District (2004)*

The ADs with more than 25% of their population living in slums are Vila Andrade (41%), Jardim Ângela (30%), Grajaú (28%) and Pedreira (27%); and the Ermelino Matarazzo district (33%), situated in the East; Perus (31%), in the North, and Jaguaré (30%) in the Central-West. The districts with the worst results tend to be concentrated in the South, although the indicator shows the classic centre-outskirts contrast.

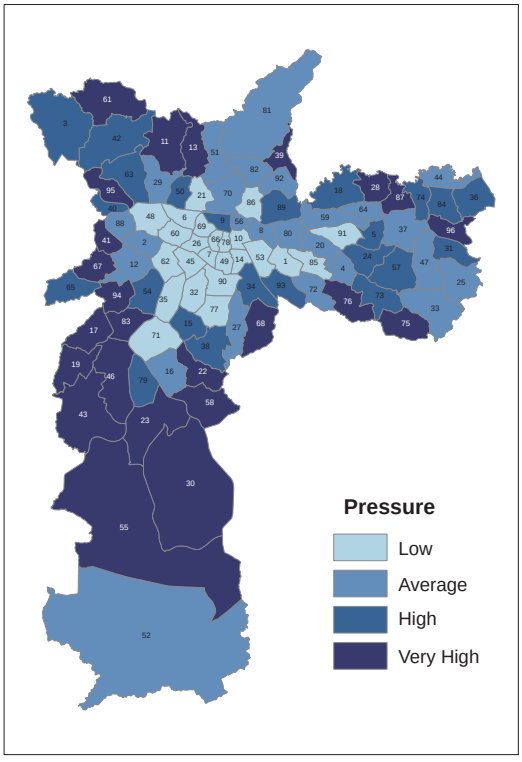


Figure 5: State – *Share of households without sewage system (2000)*

Distribution of the indicator per AD shows a greater concentration of the worst results in the outskirts of the city. The six ADs with results greater than 38% are in the South, with the exception of Anhanguera, in the North, where almost 50% of the population do without a sewage system.

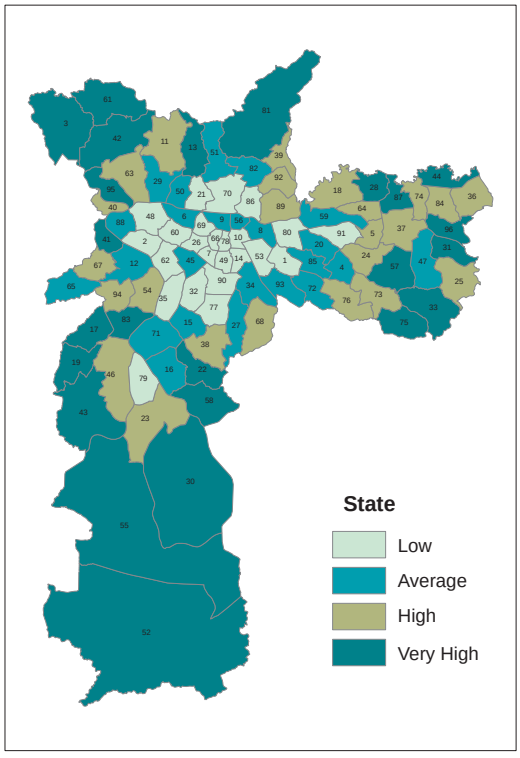


Figure 6: Exposure – *Index of rodent infestation in buildings per AD (2006)*

Of the 96 ADs, 22 were included in the worst quartile, with 27% to 48% of building infestation. Even though this is a global problem, since only 29 (30%) of the ADs have less than 10% of building infestation, the worst results were seen in the outskirts. The building infestation index has shortcomings in that it extends the average value found by the local government to all the ADs of that area.

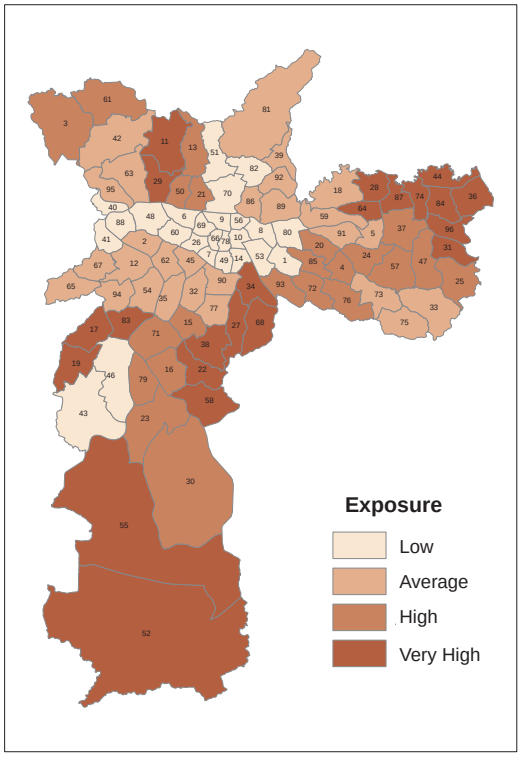


Figure 7: Effects on Human Health (1) – *Average rate of hospitalisation per waterborne disease among children less than 5 years of age per 100,000 inhabitants (2000 - 2003)*

The observed rates varied from 7.81 to 0.07 hospitalised children per 100 thousand inhabitants. Tatuapé had the highest average hospitalisation rate, followed by Brasilândia, in the North, and Parelheiros, in the South.

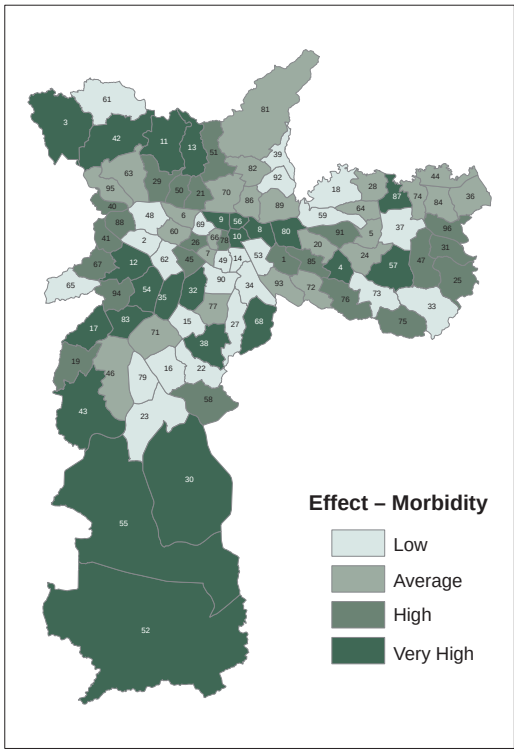


Figure 8: Effects on Human Health (2) – *Average rate of infant mortality per thousand live births (2000 - 2003)*

The results varied from 21.7 to 6.6 deaths of infants less than one year of age per 1,000 live births. The worst result was seen in Guaianases, located in the East Zone. The República AD, however, in the centre of São Paulo, showed the second worst average infant mortality rate. Even though there is a spatial pattern to the infant mortality rates that is concentrated in the outskirts of the city, the ADs of Vila Leopoldina, Santa Cecília, and Barra Funda, all in the Central-West Zone (central area), are included in the worst quartile of the indicator. The indicator includes causes of death other than those derived from water-waste exposure.

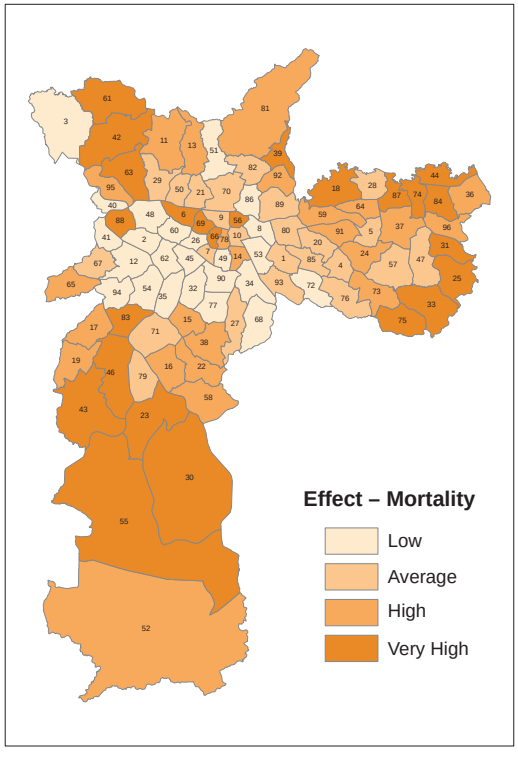
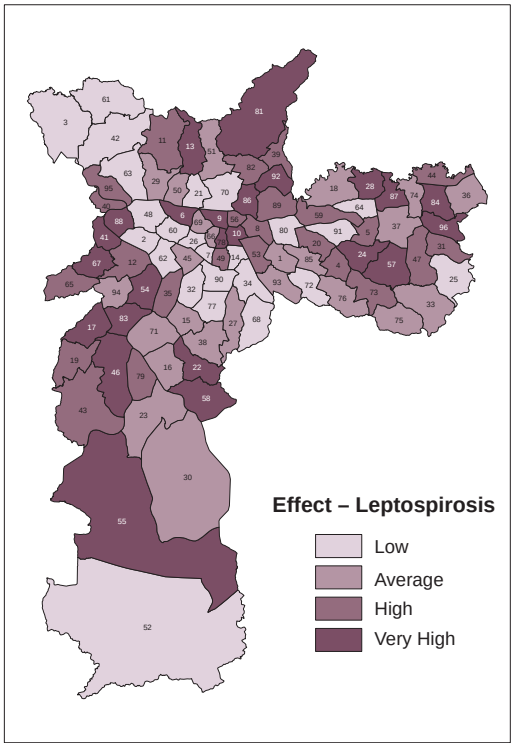


Figure 9: Effects on Human Health (3) – *Average rate of leptospirosis per 100,000 inhabitants (2000 - 2003)*

The districts with the highest rate do not make up a spatial pattern in periphery areas, but rather they are spread out throughout all areas, including the central region. The Sé, Barra Funda and Morumbi ADs have the worst results. Determinants of this endemic disease that were not assessed in this study should explain why the distribution of leptospirosis occurrence is different to that found in the other Effect indicators under study.



Spatial analysis of the integrated health and environment indicators in the city of São Paulo

Figure 10: Integrated Driving Force, Pressure and State indicator

The results varied from 1.00 in Moema to 0.23 in Marsilac. Even though worse indices were observed in the outskirts of the city, values below 0.50 were seen in Marsilac, Parelheiros, Grajaú, Vila Andrade, Jardim Ângela and Pedreira, all situated in the South Zone.

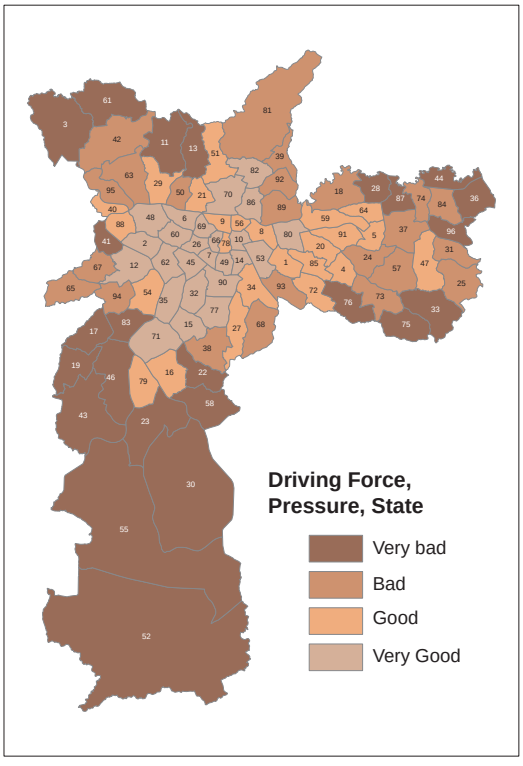


Figure 11: Integrated health and environment indicator for waterborne diseases

The results showed a range from 0.99 for the AD of Moema to 0.32 for Anhanguera, in the North Zone, the worst result. Among the six worst ADs classified by this indicator, four are in the South Zone (Marsilac, Campo Limpo, Parelheiros and Jardim Ângela) and two in the North Zone (Anhanguera and Brasilândia). All of these ADs had results below 0.65. The ADs with results greater than 0.95 are found in the centre of the city (Moema, Pinheiros, Jardim Paulista, Vila Mariana, Perdizes, Bela Vista, Saúde), with the exception of Santana, in the North Zone.

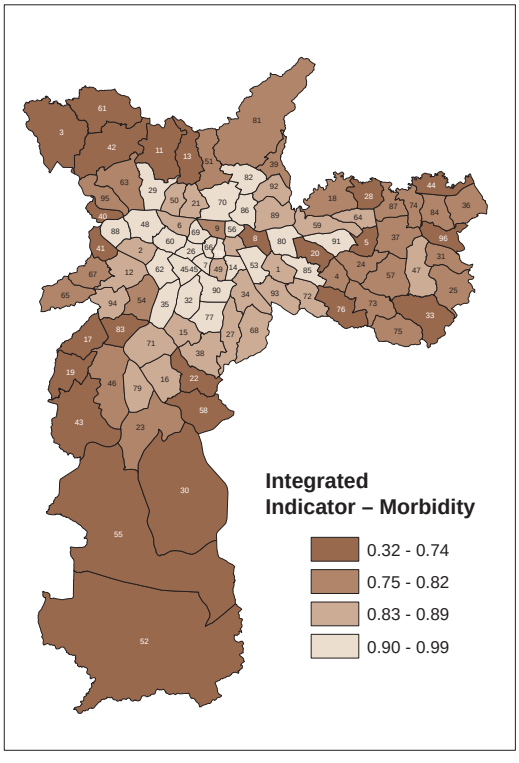


Figure 12: Integrated environment and health indicator for infant mortality

The worst results are found mainly in the South Zone ADs and include Parelheiros, Marsilac, Guaianases, Grajaú and Jardim Ângela, all with values below 0.45. Of the 96 ADs, 44 had values below 0.65, while the ADs of Moema, Pinheiros and Alto Pinheiros attained values greater than 0.95. Even though the best results were seen in the ADs of the Central-West Zone, the República AD achieved a value of 0.49, mostly due to the high infant mortality rate 21.3 deaths of infants less than 1 year of age per 1000 live births.

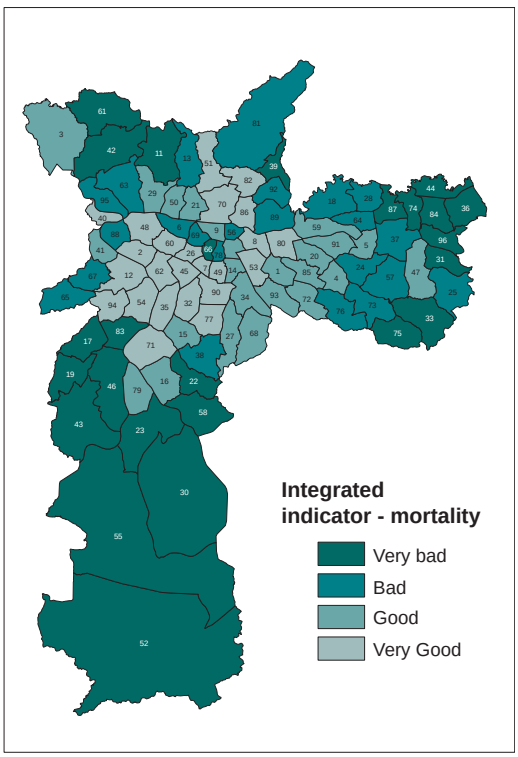
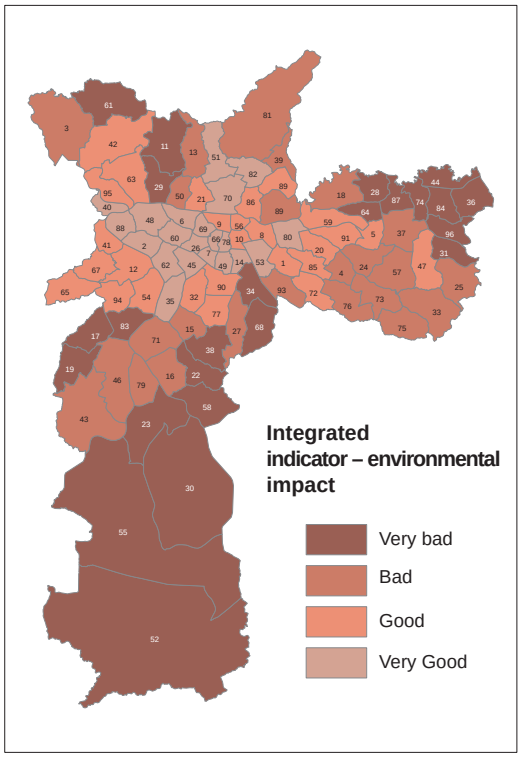


Figure 13: Integrated environment and health indicator for environmental impacts from rodent infestation

The best results are seen in the Central-West Zone. The worst indicators were seen in ADs in the South Zone (Marsilac, Vila Andrade, Capão Redondo and Campo Limpo) and of the East Zone (Lajeado/Guaianases and Ermelino Matarazzo), all with indices less than 0.40.



Spatial analysis of the priority intersectoral areas of action for dealing with the "water-waste-health" problem in the city of São Paulo

Figure 14: Integrated environment and health indicator for waterborne diseases and infant mortality

After analysing the integrated health and environment indicators for hospitalisation of children due to waterborne diseases and infant mortality, most problems were seen to occur in 14 ADs, home to 24.5% of the population of the city of São Paulo. These 14 districts fall under 10 subdistricts, 5 of which are in the South Zone. If we take into account Priority Level 2 areas, we can add another 11 ADs and 7 subdistricts, which have 17.6% of the population. Therefore, Priority Levels 1 and 2 encompass 42.1% of the population of São Paulo.

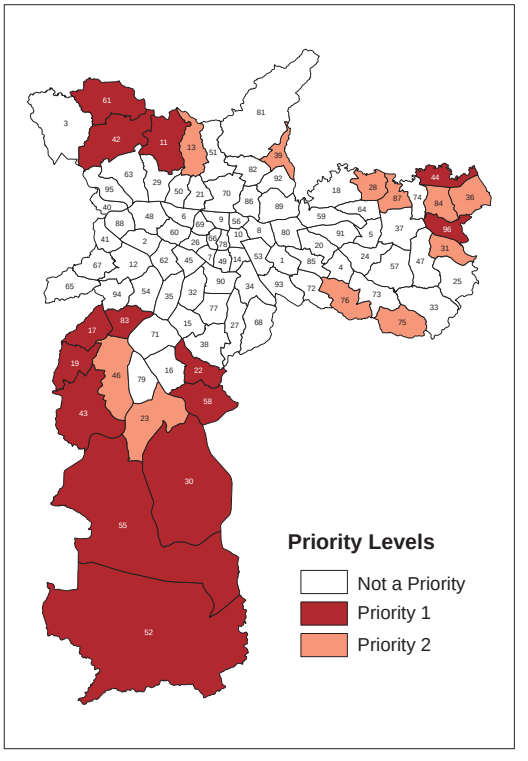
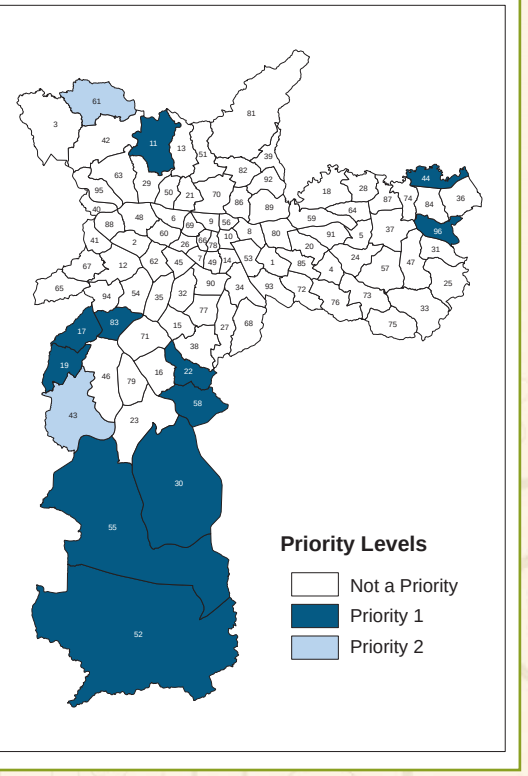


Figure 15: Integrated environment and health indicator for sanitation and leptospirosis

After analysis of all the integrated indicators for waterborne diseases, infant mortality, leptospirosis incidence and rodent infestation in buildings, it was seen that the main health and environment problems, with regard to water and waste, occur most significantly in 11 ADs, which concentrate 23% of the population of São Paulo (Vila Andrade, Capão Redondo, Campo Limpo, Parelheiros, Marsilac, Pedreira, Cidade Ademar, Grajaú, Lajeado, Jardim Helena, Brasilândia). The combination of these indicators in Priority Level 2 added the ADs of Perus and Jardim Ângela. These ADs belong to 10 subdistricts, 6 of which are in the South Zone.



Discussion of the methodological approach applied to the GEO Health pilot study

Building integrated indicators for health and environment made it possible to identify in which Administrative District actions that change the pattern of the Driving Force, Pressure or State components would have the most impact on population health, because of reduced exposure and/or recomposition of the environmental quality of the affected sites.

Furthermore, the pilot study showed the relevance of the integrated analysis of the DPSEER chain components used in the GEO Health process. Therefore, the analysis of integrated indicators is different from the side-by-side interpretation (even though segmented) of environment and health indicators.

The methodological approach proposed by GEO Health allows objective reading of the health and environment conditions of the territorial area under analysis and classification according to priority for action.

Finally, the integrated health and environment indicators built in this process may be the start of a historical series that could be useful for monitoring integrated public policies in the areas of the city considered a priority.

STEP 3: ANALYSIS OF THE RESPONSES AND FORMULATION OF RECOMMENDATIONS

Current profile of the responses for the water-waste problem in the city of São Paulo

The qualitative results of the Rapid Participatory Diagnosis (RPD) during the first step of the GEO Health process indicate a deep concern of the communities that live in the outskirts of the city of São Paulo, as expressed by the Community Health Agents, who are active in these areas for environmental exposures with impacts on health arising from the unsound disposal of waste (domestic and debris) in public areas and from pollution of streams in the city. This situation is perceived and reported by the community with emphasis on the presence of rodents (rats) and other synanthropic animals and on the degradation of the quality of life and self-esteem of the local population. In fact, this environmental problem is not a feature of the São Paulo metropolis alone, but a more or less common feature of Latin American and Caribbean cities, proportional to their sizes. Nevertheless, the lack of or shortfalls in basic sanitation is one of the largest environmental liabilities in Brazil (and with the most impacts).

The governments of the city of São Paulo and of the state of São Paulo, through their competent bodies, are adopting a series of measures to minimize or resolve environmental problems related to the degradation of water streams and the presence of waste (domestic and debris) in public areas. Among these actions are:

- The ***Córrego Limpo*** (Clean Stream) Programme aims to clean up 42 streams of the city of São Paulo, an effort involving the State Sanitation and Energy Secretariat and the Municipal Coordination Secretariats of the subdistricts for Urban Infrastructure, Public Works and Services, and for Green and Environment. The programme provides for improvements in sewage collection. The Basic Sanitation Company of the State of São Paulo (SABESP) is responsible for carrying out

works to expand existing systems, eliminate clandestine discharges in streams and storm drains, and improve the transfer of sewage to treatment plants. The work of the São Paulo subdistricts is to maintain the banks and beds of streams, as well as to remove constructions from the bottom of valleys that hinder the passing of sewage pipes. In addition to committing to the cleanup and to the adjustment of the river banks, the *Córrego Limpo Programme* intends to undertake efforts to raise awareness of the population living around these streams, to prevent waste from being disposed in the water courses.

- The ***Operação Defesa das Águas*** (Water Protection Operation) is a set of measures taken by the City and State Governments to prevent new invasions in and damage to the springs that supply water to the population and to the woods, as well as to recover areas previously illegally occupied. The *Operação Defesa das Águas* began in the South Zone, initially in the region of the Guarapiranga and Billings dams, and later extended to the North Zone, to protect the Serra da Cantareira springs and then to the East Zone, to deal with the degradation of the Tietê floodplains. The operation includes satellite surveillance and the creation of several parks and leisure areas together with the environmental recovery of degraded areas.

- The Green and Environment Secretariat (SVMA) has been undertaking a number of steps to assist in the preservation of water. The main strategic objectives of SVMA in this regard are as follows:

a) Implementation of a policy to preserve and use the springs of the city, since the recovery of this region is of utmost importance for the city, which today depends largely on other cities for its water supply.

b) Sustainable management of lakes and microbasins existing in municipal parks, directly managed by SVMA, which have a very important role in the quality of life of the population.

- Through the ***Programa Mananciais*** (Springs Programme), the Municipal Housing Secretariat carries out urbanization works in the region of the springs to improve the quality of life of the population and preserve the dams located in the South Zone of the city. In partnership with the local government, the Housing and Urban Development Company of the State of São Paulo (CDHU), SABESP and the Federal Budget, the Programa Mananciais intends to continue the creation and recovery of linear parks and slum urbanization.

- The ***Programa de Intervenções em Áreas de Risco Geológico*** (Programme for Interventions in Areas with Geological Risks) managed by the Technical Works and Services Department of the Municipal Secretariat of the subdistricts has been carrying out works and services to eliminate risks for inhabitants, thereby preventing the need to relocate families. At the same time, the City Government, through its Municipal Housing Secretariat, is developing a housing programme that includes urbanization of slums, several of which are in areas subject to risks. Services provide for drainage of rainwater and sewage, slope retention by building retaining walls (gabions), cleaning and removal of waste and debris. The surface draining works encompass many actions including the construction of flood spillways and the opening of gutters to guide the course of waters and prevent invasion of internal streets and housing settlements. In

places where it is necessary to remove housing, landscape projects are carried out and leisure areas are created for the community, and to prevent new occupations.

- To combat illegal disposal of construction and demolition debris in the city of São Paulo, the Oversight Department of the Urban Cleaning Department of the Municipal Services Secretariat (Limpurb) is strengthening actions to combat illegal waste containers in streets and parking lots. To do so, it receives assistance from the Traffic Engineering Company (CET) and the Municipal Police (GCM). The illegal disposal of materials in streets and streams is still common in the city of São Paulo. Lack of awareness worsens the problem. Generally, the amount of debris used in small home improvements isn't worth the cost of hiring a waste container, so people throw the debris on any sidewalk, ground or building site. This type of attitude increases the risks of floods and diseases like dengue fever and leptospirosis. It estimated that these small debris generators are responsible for almost 65% of all illegally disposed materials in the city.

- The local government encourages the participation of the population in the control and reporting of irregularities in waste management through 156 Call Centres or by e-mail limpurbses@sac.prodam.sp.gov.br.

- The city has 22 Ecospots managed by Limpurb where residents can discard construction debris, old furniture, tree wastes and other objects, thus avoiding the illegal disposal of wastes. Most of the material received in these centres is recyclable. The debris, for example, is sent on to the Parelheiros Landfill and the recyclable materials are sent to the Sorting Centres of the Waste Sorting Programme.

- The ***Programa Socioambiental de Coleta Seletiva de Resíduos Recicláveis*** (Socio-environmental Programme for Sorting of Recyclable Wastes) currently serves 71 of the 96 São Paulo Administrative Districts. These districts receive door-to-door collection services from the utility company with compactor trucks and by cooperatives with open trucks. The material sorted by the residents is collected on different days and times than the regular household waste collection. Waste Sorting is carried out by the utility companies (Ecourbis and Loga) and by the cooperatives hired by the local government to administer the Sorting Centres. Currently, 15 Sorting Centres distributed throughout the city receive the collected recyclable material. This material is sorted, compressed and commercialised in the centres.

The issue of intersectoral work

It is worth underlining the existence of partnerships between municipal and state government agencies, and even with the private sector in several of these programmes. These programmes certainly represent improvements in the quality of life of the population of São Paulo. That said, environmental interventions still show the segmented nature of sectoral actions and in some cases we see repetition of goals.

Managing socio-environmental problems, when based solely on environmental or urban sanitation, can have irreversible ecosystem consequences, jeopardizing the load capacity of the environment, with social, cultural and economic implications. Without discussing the social determinants of health, it will be difficult

for environmental interventions to incorporate variables that are relevant to the wellbeing of the community. Hence, actions that involve the ecosystem in urban environments should place high priority on intra- and intersectorality, on the ecosystem approach and on participatory methodologies.

The absence of the health sector in environmental sanitation actions is as notable as the absence of the environmental sector in health programmes, which continue to reproduce strategies based on a culture of dependence on government assistance. This characteristic is neither unique to the city of

Legal framework for the intersectoral work of health and environment

Legal references for environmental health in Brazil is found in the 1988 Federal Constitution in the following Articles:

- Art. 23, paragraphs II, VI, VII and IX, which establish that the Union, the States, the Federal District and the municipalities, in common, have the power to: provide for health, protect the environment and fight pollution in any of its forms; to promote housing construction programmes and the improvement of housing and basic sanitation conditions; and to preserve the forests, fauna and flora.

- Art. 196, which defines health as a "right of all and a duty of the State and shall be guaranteed by means of social and economic policies, aimed at reducing the risk of illness and other hazards and at the universal and equal access to actions and services for its promotion, protection and recovery".

- Art. 200, paragraphs II and VIII, which state that it is incumbent upon the Brazilian Public Health System (SUS), in addition to other duties, "to carry out actions of sanitary and epidemiological vigilance as well as those relating to the health of workers" and "to cooperate in the preservation of the environment, including that of the workplace".

- Art. 225, which states that: "All have the right to an ecologically balanced environment, which is an asset of common use and essential to a healthy quality of life, and both the Government and the community shall have the duty to defend and preserve it for present and future generations".

Article 3 of Law No. 8,080/90, which creates SUS, establishes that the determinant and conditioning factors of health are, among others, "*housing, basic sanitation, environment, work, income, education, transport, leisure and access to essential goods and services*". *Furthermore, it stresses that the "levels of health of the population represent the social and economic organization of the country*". In its Article 6, it defines the area of action of SUS, including actions on: sanitary and epidemiological surveillance; participation in policy formulation; implementation of basic sanitation actions and cooperation in the protection of the environment.

The priority for building integrated and participatory intersectoral agendas comes from the need for a permanent dialogue among the various government agencies, the private sector and civil society to promote public policies for health and environment – both essential human rights established in the Brazilian Federal Constitution. Nevertheless, up until now, the intersection among the mandates of the respective ministries (Health, Environment, Labour and Employment, Education, Science and Technology, Culture, among others) does not clarify the responsibilities of each one.

The First National Environmental Health Conference, to be held in the second half of 2009, with the participation of the Environment, Health and Cities Ministries will provide an excellent opportunity for the intersectoral debate of guidelines for a future National Environmental Health Policy.

São Paulo nor even to Brazil. However, the building of intersectoral bridges that unite an environmentally sustainable development policy with actions to promote health is a great challenge to be overcome, because it is not possible to promote the quality of life of a population without a sound environment for all.

Priority lines of action for the city of São Paulo

- Developing intersectoral, intramunicipal and participatory agendas for the promotion of healthy environments, involving various secretariats (SVMA, SMS, SEMPLA, SIURB, SEHAB, SEMAD and others), the subdistricts and the Mayor's office.

- Preparing intersectoral, intramunicipal and participatory agendas for the promotion of healthy environments, involving the state of São Paulo and the municipal administrations of the metropolitan area.

- Establishing partnerships among the Federal, State and Municipal Governments with cooperation agencies, universities and technical partners to:
  - » Encourage production of knowledge and development of technical capacities in integrated health and environment evaluations.
  - » Construct an Integrated Information System on health and environment, with a consolidated database, providing open access, covering the municipality, the metropolitan area and the state of São Paulo.

- Broadening the dialogue among the metropolitan region governments and the state and federal Governments with civil society and the private sector to establish consensual intersectoral strategies for promoting social responsibility, and health and environmentally friendly economic development.

- Establishing partnerships among the different levels of government and civil society with a view to incorporating in their daily activities:
  - » Strengthening of environmental education and health promotion, encouraging the development of individual and collective potentials and capacities.
  - » Promoting healthy environments that support human wellbeing, from the most local environment (e.g. family, workplace, neighbourhood) up to the most ecosystem-based and global environments.

Recommendations for action in the city of São Paulo

- **Creation of an intersectoral and intrasectoral health and environment working group within the government of the city of São Paulo:** The opportunity has been provided by the PAVS project, a first experience that joined SVMA and SMS. Its strength resides in the human capital, lessons learned and a methodological tool (GEO Health). While building an intersectoral participatory agenda for action, the working group could draft a proposal for principles and guidelines on Health and Environment for the city of São Paulo to take to the State and National Environmental Health Conferences in 2009.

- **Strengthening of social participatory action and expanding partnerships:** As result of their complexity and socio-environmental and cultural multideterminants, the development of health and environment actions, even when

intersectoral, will not have the required efficacy, efficiency and effectiveness without the broad participation of civil society and the support of the private sector with social responsibility. An important role in this regard is reserved to the members of mass media with their solid communication channels.

Re-declaration of the commitment to environmental education and health promotion: The communities partaking in health and environment actions should have readily available updated and adequate knowledge on the issues relating to the social determinants of health, with emphasis on the environmental ones. In Brazil, education on health in coordination with the environment is still incipient, as seen by the small number of courses offered in teaching institutions. Nevertheless, implementation of the GEO Health process in PAVS showed the multiplying potential of the Community Health Agents.

Social empowerment, inclusion policies and access to citizens' rights: Based on this social structure, the community will be able to participate in the prevention of environmental exposures with harmful effects on health, as well as in building solutions for local problems such as: pollution and degradation of streams; deforestation; urban infrastructure; illegal occupation of land and slum-tenements; the wrongful disposal of waste and debris; floods and the proliferation of disease vectors in their neighbourhoods.

Expansion of capacity-building provided by Community Health Agents in the PAVS to Zoonosis Agents: In addition to professional capacity-building and personal growth, this measure will increase the number of training personnel capable of disseminating environmental education information on health promotion, with the advantage that the zoonosis agents, unlike the ACS, work in the entire municipal area.

Expansion of the Family Health Programme (FHP) in the city of São Paulo, directed to the health sector practices to promote: In São Paulo, the largest city in Brazil with more than ten million inhabitants, only 25.13% of the population live in areas covered by PHP and only 27.40% receive the services of the Community Health Agents. This shortage is not unique to the city, but a common phenomenon in Brazilian cities with more than 500,000 inhabitants, which have instrumental and budgetary difficulties in implementing or expanding the programme. Nevertheless, historical series of Ministry of Health indicators show that in the municipalities with broader programme coverage, hospitalisations, infant mortality and live births without prenatal care have decreased. This shows that investing in primary care and health promotion in large cities is a challenge well worth facing, and it is up to the Ministry of Health to facilitate these initiatives.

Structuring and strengthening of environmental health surveillance: SVS/MS Regulatory Instruction No. 1, dated 7 March 2005, established the National Environmental Surveillance System for Health (SINVAS) and defined the responsibilities of the three levels of Government in the area of environmental health surveillance, which is being gradually structured in Brazil. SINVAS encompasses

a range of actions and services provided by public and private agencies and entities related to environmental surveillance for health, with the vision of acquiring knowledge and detecting or preventing any change in the environment al factors that affect human health. The objective of the initiative is to recommend and adopt measures to prevent and control environmental risk factors related to diseases and other hazards to health.

- **Fostering the promotion of healthy environments:** This is effected through: (1) the adoption of principles such as the "precautionary" and the "polluter pays" principles; (2) mapping the areas with resident populations that are subject to environmental risk; (3) analysing and establishing exposure limits as well as the concrete possibility of eliminating the risks to which populations are exposed; (4) reassessing the regulatory framework and standards related to environmental health; (5) including health considerations in the establishment of environmental quality criteria, and (6) supporting legislative and judicial branch agencies and civil society.

- **Stimulus for the generating knowledge, developing capacities and building of an Integrated Information System for Health and Environment**: Multisectoral participation should be promoted to assess and manage risks and environmental impacts so that it contributes to establishing priorities and targets for health and environment; setting a hierarchy for the intervention measures to promote health and environmental protection; defining intervention measures with a view to limiting hazards to human health and to the environment; identifying thematic areas for scientific research; and outlining effective and objective communications on risks. Intra- and intersectoral cooperation of the various existing databases is essential for building an Integrated Information System for Health and Environment, defining a group of indicators, integrated indicators and indices that allow assessment of the environment with respect to health, as well as for designing scenarios.

4. Lessons learned from the pilot test in São Paulo

In addition to the procedure for generating integrated indicators previously discussed, the development of the pilot test for GEO Health assessment in São Paulo resulted in significant knowledge towards the consolidation of the methodology, both for improving the instruments and for enhancing analysis of its conceptual framework. Among the most important lessons learned are:

1 – Local process implementation stage: It is necessary to systematize the establishment of partnerships, working groups, mechanisms for coordination, communications and discussion channels. An initial analysis of the Strengths, Weaknesses, Opportunities and Threats (SWOT) could have been useful for designing objectives and final targets.

2 – Participation of community stakeholders and knowledge about assessed area: The process implemented in São Paulo had the valuable participation of the Community Health Agents. Through them, it was possible to develop a participatory diagnosis of the perception of risk and quality of life and to learn about aspects of population, territorial and socio-economic dynamics, as well as the environmental history of the area. This confirms the importance of incorporating community stakeholders in local assessments.

3 – Monitoring and evaluation activities: Because it is inserted in a broader intersectoral project as a PAVS target, the GEO Health process in São Paulo became a part of the monitoring and evaluation activities coordinated by the Healthy Cities Centre for Studies, Research and Documentation (CEPEDOC) of the University of São Paulo (USP). These activities, not considered in the original GEO Health formulation, proved to be very useful in fostering communication, redefining targets, and conflict resolution.

4 – Ecosystem Approach: One of the major challenges in the pilot test in São Paulo was to overcome the operational difficulty in developing the integrated health and environment assessment with an ecosystem approach. This difficulty originated mainly in a combination of situational and institutional factors that emerged during the implementation of the GEO Health process in São Paulo as one of the targets of another broader programme.

5 – Health (understood as "general wellbeing") and quality of life: It is a fact that quality data and consolidated historical series, available for building indicators of effects on health, usually provide information for the **objective components of quality of life**. However, these components, which are the variables that represent morbidity, mortality and shortcomings, as a rule, do not encompass quality of life as a social component that expresses the degree of satisfaction of the population with its own wellbeing, in its broader sense. But, the incorporation of local stakeholders in participatory diagnosis activities enabled GEO

Health to evaluate and provide information for the **subjective components of quality of life**, which are crucial when formulating recommendation to decision makers.

6 – Interdisciplinarity, intersectorality and participation: Finally, the GEO Health pilot test in São Paulo represented a valuable experience in participatory work, which strengthened technical and human capacities in an interdisciplinary and intersectoral effort, generating democratic room for debate and the construction of a healthier environment for all.

References

This executive summary was based on the GEO Health São Paulo report, prepared in 2007 by UNEP, ENSP / FIOCRUZ and PAVS/PMSP.

Additional information was obtained at the official PMSP site (http://www.capital.sp.gov.br/), and from the document "Information for Building a National Environmental Health Policy", prepared in 2007 by the National Health Council/Ministry of Health. Brasília, DF. (Available at: http://conselho.saude.gov.br/biblioteca/livros/subsi_miolo.pdf)