Children's Environmental Health in Argentina:

Survey Responses from Pediatricians who are Members of the Argentine Society of Paediatrics

Canadian Institute of Child Health
Institut canadien de la santé infantile

Sociedad Argentina de Pediatría
Por un niño sano en un mundo mejor

Asociación Argentina de Médicos por el Medio Ambiente, AAMMA

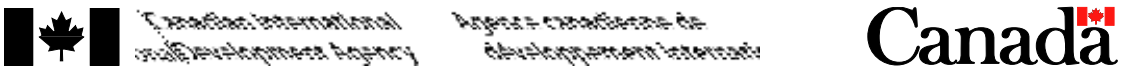
Children's Environmental Health in Argentina:

Survey Responses from Pediatricians who are Members of the Argentine Society of Paediatrics

Researched and Prepared by:
Daniel Beltramino, Argentine Society of Paediatrics (SAP); Linda Longerich, Memorial University of Newfoundland; Lilian Corra, Asociación Argentina de Médicos por el Medio Ambiente (AAMMA); Shelley Callaghan, Canadian Institute of Child Health (CICH); Verónica Monti, Asociación Argentina de Médicos por el Medio Ambiente (AAMMA); Louise Hanvey, Canadian Institute of Child Health (CICH); Julia Piñero, Argentine Society of Paediatrics (SAP) Juan Carlos Bossio, Instituto Nacional de Enfermedades Respiratorias (National Institute of Respiratory Diseases) "Dr. Emilio Coni".
Project undertaken with the financial support of the Government of Canada provided through the Canadian International Development Agency (CIDA).

Projet réalisé avec l'appui financier du gouvernement du Canada agissant par l'entremise de l'Agence canadienne de développement international (ACDI).

Proyecto realizado con el apoyo financiero del Gobierno de Canadá, provisto a través de la Agencia Canadiense de Desarrollo Internacional (ACDI).



Electronic copies of the *Children's Environmental Health in Argentina: Survey Responses from Pediatricians who are Members of the Argentine Society of Paediatrics* can be downloaded in English or Spanish at:
Asociación Argentina de Médicos por el Medio Ambiente - www.aamma.org
Argentine Society of Paediatrics - www.sap.org.ar
Canadian Institute of Child Health- www.cich.ca/Publications.html

This publication is also available in Spanish under the following title: *"La Salud Ambiental de la Niñez en la Argentina: Encuesta sobre salud ambiental infantil a pediatras miembros de la Sociedad Argentina de Pediatría"*.

Table of Contents

Acknowledgements

1.0 Background 5

2.0 Rationale 8

3.0 Objectives 8

4.0 Methods 9

5.0 Survey scope 9

6.0 Results 14

7.0 Discussion 31

8.0 Strengths and limitations of the study 35

9.0 Conclusions and recommendations 36

Appendix A: A Pediatric perspective on the environment and child health in Argentina (Adapted from the Spanish version)

Acknowledgements

The Asociación Argentina de Médicos por el Medio Ambiente, (AAMMA), Canadian Institute of Child Health (CICH) and the Argentine Society of Paediatrics (SAP) would like to recognize the support provided by the Canadian government through the Canadian International Development Agency (CIDA-ACDI). Without this support and cooperation it would not have been possible to conduct the study and produce this report entitled: *Children's Environmental Health in Argentina: Survey Responses from Pediatricians who are Members of the Argentine Society of Paediatrics*.
The Asociación Argentina de Médicos por el Medio Ambiente (AAMMA), Canadian Institute of Child Health (CICH) and the Argentine Society of Paediatrics (SAP) would also like to recognize the hard work and commitment from the following institutions and individuals who shared their experience and vision in the development of this document.

Institutions:

- National Secretariat of Determinants of Health and Sanitary Relations, Ministry of Health of Argentina
- Secretariat of Environment and Sustainable Development, Chief of the Cabinet of the Presidency of Argentina
- National Academy of Medicine, Argentina
- National Bureau of Maternal and Child Health, Ministry of Health of Argentina
- National Bureau of Promotion and Protection of Health, Ministry of Health of Argentina
- National Unit of Chemical Substances and Products, Secretariat of Environment and Sustainable Development, Chief of the Cabinet of the Presidency of Argentina
- Sub-commission of Child Health and Environment, Argentine Society of Paediatrics (SAP)
- Regional Offices, Argentine Society of Paediatrics
- National Institute of Respiratory Diseases "Dr. Emilio Coni" (INER)
- Health Canada
- Memorial University of Newfoundland, Canada
- University of Ottawa, Canada
- World Health Organization

Individuals:

- Dr. J.H. Andrade, Nacional Academy of Medicine
- Sergio Arias, National Institute of Respiratory Diseases "Dr. Emilio Coni", INER
- Gloria Califfano, Argentine Society of Paediatrics
- Yue Chen, University of Ottawa, Canada
- Dra Susana Curto, Nacional Academy of Medicine
- Ernesto De Titto, Secretariat of Environment and Sustainable Development
- Maria Angelica Flores, Ministry of Health of Argentina
- Susana Garcia, Ministry of Health of Argentina
- Gines González García, Ministry of Health of Argentina
- Susana Gonzalez, Argentine Society of Paediatrics
- Pablo Issaly, Secretariat of Environment and Sustainable Development
- Flavio Landra, National Institute of Respiratory Diseases "Dr. Emilio Coni", INER
- Robin Moore-Orr, Canadian Institute of Child Health
- Adela Penna, Ministry of Health of Argentina
- Atilio Savino, Ministry of Health of Argentina
- Janice Sonnen, Canadian Institute of Child Health
- Ana Speranza, Ministry of Health of Argentina
- Lorenzo Gonzalez Videla

Daniel Beltramino[1], Linda Longerich[2], Lilian Corra[3], Shelley Callaghan[4], Verónica Monti[3], Louise Hanvey[4], Julia Piñero[1], Juan Carlos Bossio[5].

[1]Argentine Society of Paediatrics (SAP), [2] Memorial University of Newfoundland, , [3] Asociación Argentina de Médicos por el Medio Ambiente (AAMMA), [4] Canadian Institute of Child Health (CICH), [5] Instituto Nacional de Enfermedades Respiratorias (National Institute of Respiratory Diseases) "Dr. Emilio Coni"

1.0 Background

1.1 Child Health and the Environment

According to WHO, environmental health involves all aspects of human health that influence the quality of life, and that are determined by the relationship between human beings and the physical, chemical, biological, social and psychological factors of the environment where they live. It also refers to the theory and practice of measuring, to correct, control and prevent the environmental factors that adversely affect the health of present and future generations.

In recent years, the relationship between the environment and child health has become an important determinant of the health status of the population in general. Numerous investigations have demonstrated the role that the environment plays from the time of conception through childhood.

Children are especially vulnerable to environmental factors due to the fact that their organs and systems are still in the development stage. Studies have demonstrated that exposure to diverse environmental factors can affect the growth and normal development of children with long-term or lifetime consequences.

1.2 Brief History of Children's Environmental Health (CEH) in Argentina

The Department of Environmental Health, currently the coordinating Unit of Health and Environment, Ministry of Health of Argentina has been working for some years on environmental issues and their relationship to human health. This Department coordinates the National Toxicological Network.

Beginning in 2003, the Unit of Health and Environment and its various departments, especially the National Bureau of Maternal and Child Health, has shown strong support for the development of a *Profile of Children's Environmental Health in Argentina* by participating on the Steering Committee of the *Profile* project as well as supporting other related initiatives in Argentina since that time.

In June 2005, the Meeting of Health and Environment Ministers of the Americas (HEMA) was held in Argentina. Children's environmental health (CEH) was one of the three main topics selected by the Ministers as central for the Americas. On this occasion, the Ministers from Chile, Uruguay, Paraguay and Argentina signed the *"Mar del Plata Declaration of the Meeting of Ministers of Health and Environment of the Americas[1]" (HEMA Meeting - June 17th, 2005)* where they stated: *"…We recognize that our countries are facing difficult and complex challenges related to the health and environmental areas. Our efforts, both at the regional and sub regional levels, will be aimed at supporting the progress and achievement of the results on the following three priority issues: Integrated Management of Water Resources and Solid Waste; Sound Management of Chemicals; and Children's Environmental Health … We are committed to*

[1] Meeting of Ministers of Health and Environment of the Americas (www.aamma.org/english/index.html)

developing and implementing strategies to manage risks, reduce threats to ecosystems and to human health in our region from pesticides and other chemical pollutants, particularly with respect to vulnerable populations, including indigenous groups, industrial and agricultural workers, women and children. This will be done in order to comply with the obligations under the Stockholm, Rotterdam and Basel Conventions…"

1.3 Profile of Children's Environmental Health in Argentina

This project was developed as a joint initiative of the Canadian Institute of Child Health (CICH), and the Asociación Argentina de Médicos por el Medio Ambiente (AAMMA). AMMMA is also a member of the International Society of Doctors for the Environment (ISDE). CICH and AAMMA (ISDE) are members of the International Network on Children's Health Environment and Safety, INCHES (promoted and co-funded by the World Health Organization, Geneva since 1998). Both ISDE and INCHES have Consultative Status with WHO.

The *Profile* project has been supported through the cooperative, international, multi-lateral collaboration of key stakeholders who are members of the *Steering Committee (SC*). Argentinean members are: the Coordinating Unit of Health and Environment (Ministry of Health of Argentina), Unit of Health and Environment (Secretariat of Environment and Sustainable Development), the Argentine Society of Paediatrics (SAP), the Asociación Argentina de Médicos por el Medio Ambiente, (AMMA). In Canada, Steering Committee members are: the Canadian Institute of Child Health (CICH), the University of Ottawa and Health Canada. The Canadian partners have shared their experience with the rest of the project partners. Funding support for this project has been provided by the *Canadian International Development Agency (CIDA) of the Canadian Government.*

The commitment made by all the *Profile* Project stakeholders is based on a shared goal but distinct and different responsibilities; with the goal to improve healthy environments for all Argentine children. This project is based in the conviction that every child of the world has the inalienable right to live on a healthy planet where they can grow and develop to their full capacity.

1.4 Argentine Society of Paediatrics

The Argentine Society of Paediatrics (SAP) is one of the oldest scientific institutions in Argentina. It was founded in 1911 and at the present time has more than 13,000 members. It is organized into 40 Branches, grouped in nine Regions that cover the entire country.

The majority of pediatricians who are members of the Argentine Society of Paediatrics work within the three sub-sectors system upon which the health system of Argentina is built.

Most of the pediatricians in Argentina work at *primary health care centres*, in direct contact with children and their families at all socio-economic levels. In 1997, the Ministry of Health of Argentina recognized pediatricians as "general practitioners" of the life stage from birth through 19 years of age (Ministerial Resolution 123/97).

Since signing the Children's Environmental Health Cooperation Agreement in 2001, SAP and AAMMA have jointly organized multiple activities across Argentina in order to protect children from environmental threats. It was at a time when the largest socio-economic crisis in the history of Argentina began (a crisis that affected its social structure), that SAP and AAMMA signed the

Cooperation Agreement. Both organizations committed to working together on education projects, dissemination of information and epidemiological research to identify environmental threats, prevention of disease related to the environment, and the promotion of healthy environments where Argentinean children live, play and learn.

Until that time, the information received on children's environmental health by pediatricians had been partial, fragmented, discontinuous and in general, focused only on traditional environmental threats such as those related with the bacterial contamination of water and food. Looking at the issues from a wider perspective, SAP has tried to incorporate the topic of children's environmental health in continuous pediatric education activities, but has also taken on a leadership position in the national and international community around the protection of healthy environments for children.

1.5 SAP and AAMMA Working Together

Since signing the Children's Environmental Health Cooperation Agreement, SAP and AAMMA have jointly organized multiple activities across Argentina. Tools and training materials have been developed to disseminate reliable and scientifically-based information to the pediatric community. CEH training materials have been presented at conferences, round tables, panels, training workshops and congresses to train trainers on Children's Health and Environment, to engage pediatricians in this new topic and to promote action at the local level.

Studies related to environmental epidemiological research have been promoted to identify communities at risk, to prevent and understand the types of exposure facing Argentine children. Moreover, the sharing of new information and the development of new partnerships has served to position CEH concerns high on the political agenda and inform decision-makers on the issue.

In October 2003, SAP and AAMMA co-organized the first one-day "*Pre-Congress Workshop on CEH"* in Mar de la Plata under the 33rd Argentine Pediatric Congress. Nearly 500 pediatricians from more than 7 South American countries attended this workshop which was developed with the advice and technical support of the World Health Organization. The Presidents of the Societies of Pediatrics of Argentina, Brazil, Bolivia, Chile, Paraguay, Peru and Uruguay were invited to attend. Together they developed and signed a "*Declaration of the Presidents of the Pediatric Societies of the Southern Cone and Peru on Children's Environmental Health"*[2].

Moreover, SAP and AAMMA coordinated the first meeting of the International Pediatric Association (IPA) Working Group on CEH, made possible through the support of the IPA President, WHO HQ representatives and pediatricians from all continents.

In June 2005, a Meeting of the Ministers of Health and Environment of the Americas (Meeting MiSaMa) took place in Argentina. This process involved a commitment to include participation from civil society. As a result, AAMMA was invited to play a leadership role in establishing children's environmental health as one of the three priority topics selected by the Ministers as central for the Americas.

In November 2005, Buenos Aires was the location of the *World Health Organization's 2nd International Conference on Children's Environmental Health,* co-organized by WHO/PAHO,

[2] Declaration of the Presidents of the Pediatric Societies of the Southern Cone and Peru on Children's Environmental Health, Mar del Plata October 2003 (See Annex)

the National Ministry of Health and Environment and the Argentine Society of Paediatrics. For this Conference WHO/PAHO, AAMMA and SAP co-organized a Pre-Conference Training on CEH attended by more than 120 health care professionals, including pediatricians from Argentina, Brazil, Bolivia, Chile, Paraguay and Uruguay. These pediatricians were trained with the technical training material ("*WHO Modules on CEH for Health Care Professionals")* for the first time in Latin America. The modules were prepared by a group of experts assembled by WHO and were translated into Spanish by AAMMA. The intention was to train pediatricians to be trainers in their own countries.

2.0 Rationale

Under the framework of the *Profile* Project, a survey to more than 13,000 pediatricians who are members of SAP was developed.

The "Children's Environmental Health" survey was designed to gather data on the level of knowledge of pediatricians on the main environmental determinants of children's disease in Argentina. A further goal of this survey was to learn the sources of information on children's environmental health and what environmental issues affecting children were of most concern to parents. Finally, because the survey was sent to every pediatrician and requested their active participation, it served to increase interest on the issues and to develop a network coordinated by the Sub-commission on Children's Health and Environment of SAP that brings together pediatricians interested in CEH.

This national survey was the first of its kind. The results of the survey will allow the project team and its partners to plan appropriate strategies to encourage initiatives to protect children's health and their environment.

The information from the survey will influence decision-making on capacity building, dissemination of information strategies, research and the identification of interventions at the community level on CEH issues and will be used by the Ministry of Health and Environment, Universities, SAP, AAMMA, other NGOs and any other sector interested on CEH.

3.0 Objectives

Main Objectives:

- To evaluate Argentine pediatricians' level of knowledge on the environment as a determinant of children's health;
- To learn about the perception pediatricians and their communities have on the issue;
- To collect information on pediatricians' perceptions of the main environmental factors and related diseases affecting children's health in Argentina.

Secondary Objectives:

- To learn the sources of information pediatricians receive on CEH;
- To evaluate pediatricians' interest in increasing their knowledge on the issue;
- To identify pediatricians' interest to participate in a network to take action to protect and improve children's environmental and their health.

4.0 Methods

The Survey was designed and reviewed collaboratively by the Canadian and Argentine Steering Committee of the Profile Project. A pilot test of the survey was carried out and received final approval from the Steering Committee in September 2004.

The survey was evaluated and approved by the Ethics Committees of the participating institutions in Argentina and Canada; in particular, SAP in Argentina and Memorial University of Newfoundland and Labrador in Canada.

The survey was descriptive and cross-sectional. All members of SAP were invited to participate. The responses were voluntary and confidential. In order to complement the epidemiological data, voluntary additional demographic was requested at the end.

The complete survey can be found in Appendix A. Both closed and open-ended questions were included. The respondents had the option of checking different options in a printed questionnaire as 'closed' questions and blank space was provided where they could write down their opinion on the matter, in "open" questions. The "open" answers, corresponding to each question, were analyzed qualitatively and grouped and reported according to common themes.

The printed survey was distributed by mail to all members of SAP who are pediatricians. It was sent by the *Argentine Courier* (with a pre-paid envelope to facilitate the return of the responses) in the *SAP Bulletin* mailing. During the survey period, copies of the printed survey were also distributed amongst pediatricians attending scientific events such as Congresses, Conferences, Workshops and Seminars organized by SAP in different regions the country. Responses to the survey could be sent back to SAP by three different processes: through the Argentinean Mail (with pre-paid postage included); depositing the printed version in mailboxes set up at scientific meetings or by completing the survey through an online version at the SAP website.

The survey was promoted before its distribution and during the survey period through the publication of two articles in the *SAP Bulletin* and in an editorial note published in the scientific magazine edited by SAP: *Argentine Paediatrics Archives ("Archivos Argentinos de Pediatría").* These articles highlighted the importance of the *Profile* Project and of CEH. They also explained the survey initiative, its goals, the ways participants could respond and encouraged members of SAP who are pediatricians to promote the active participation of all members of SAP.

Data entry, database validation and analysis were completed using Epi-Info 2000 epidemiology software (Centers for Disease Control, Atlanta, GA, USA). Excel software was used to generate tables and figures. Statistical analysis for comparisons among different groups used chi-squared (χ^2) test with Yates correction with a 95% confidence level ($p<=0.05$). Analysis of continuous data used a linear tendency test. The analysis was completed under the supervision of the Argentine National Institute of Epidemiology "Emilio Coni".

This report includes all responses received between October 1st, 2004 and July 31, 2005.

5.0 Survey scope

In September 2004, SAP had 13,509 members: 9,010 (66.7%) female and 4,499 (33.3%) male. By July 31st 2005, the survey had been answered by 835 pediatricians who are members of SAP, representing 6.2% of the total SAP membership

From the 835 surveys received, 831 cases (99.5%) were identified according to the mode of response. Forty-six point seven percent (46.7%) of the answers were sent by mail, 38.3% were collected at scientific events organized by SAP and the remaining 14.5% completed the survey via internet at SAP Website.

TABLE 1. METHOD OF RESPONSE BY AGE OF THE PEDIATRICIAN

	All methods		Bulletin		Congresses		Internet	
	Number	%	Number	%	Number	%	Number	%
Total	818		386		315		117	
20-29	80	9.8	22	5.7	45	14.3	13	11.1
30-39	187	22.9	87	22.5	61	19.4	39	33.3
40-49	280	34.2	142	36.8	103	32.7	35	29.9
50-59	198	24.2	89	23.1	85	27.0	24	20.5
60-69	63	7.7	37	9.6	21	6.7	5	4.3
70 or more	10	1.2	9	2.3	0	0.0	1	0.9

The percentage of pediatricians responding varied according to the different SAP Regions in Argentina. Responses varied from a minimum of (3.6%) in Pampeana Norte Region to 16.7% in Patagonica Atlantica Region (Figure 1).

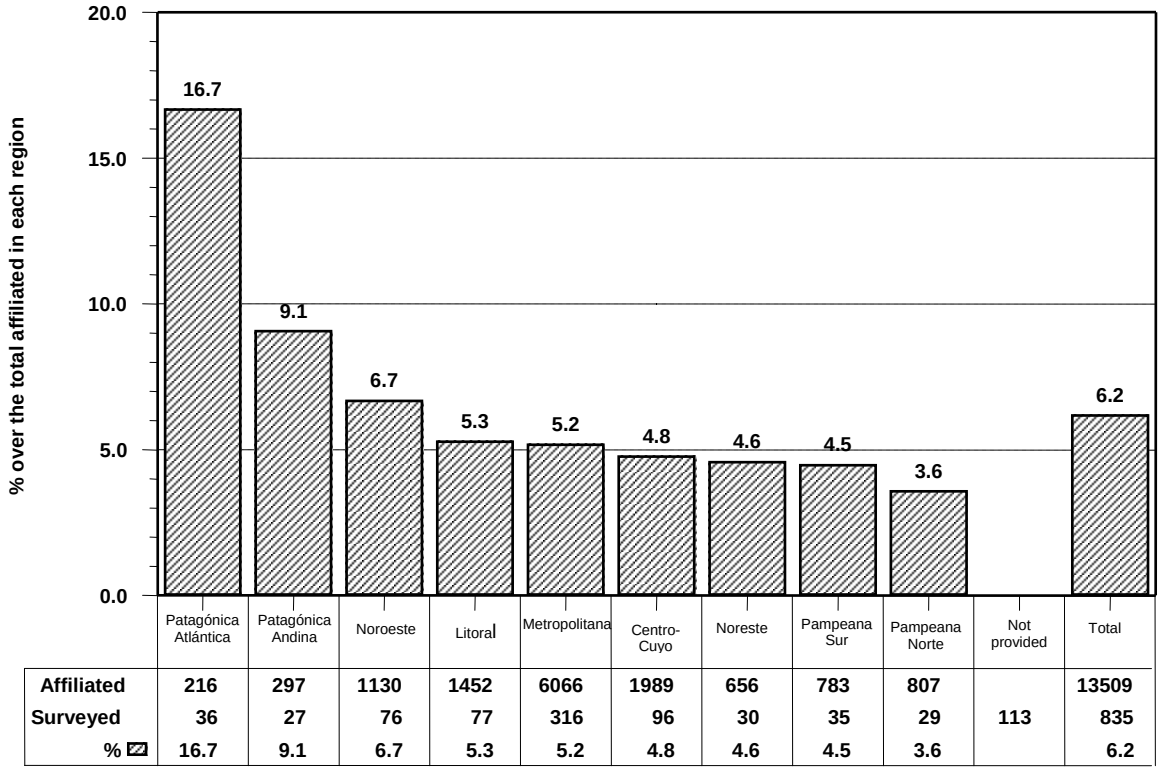


***Figure 1*. Proportion of pediatricians who responded to the survey on children's environmental health, compared to the number of SAP members in each region (n=835).**

5.1 Characteristics of pediatricians who responded to the survey

TABLE 2. CHARACTERISTICS OF PEDIATRICIANS WHO RESPONDED TO THE SURVEY

Characteristics	Number	Proportion
Total of answers	**835**	**100.0**
Sex	**826**	**100.0**
Women	536	64.9
Men	290	35.1
Age	**821**	**100.0**
20-29	80	9.7
30-39	189	23.0
40-49	281	34.2
50-59	198	24.1
60-69	64	7.8
70 or more	9	1.1
Years of Practice	**815**	**100.0**
Under 10	179	22.0
10 to 14	113	13.9
15 to 19	93	11.4
20 to 24	160	19.6
25 to 29	118	14.5
30 to 34	92	11.3
35 and more	60	7.4
Main Area of Practice	**808**	**100.0**
Urban	738	91.4
Rural	35	4.3
Both	35	4.3
Main Occupation	**825**	**100.0**
Private service	164	19.9
Public service	320	38.8
Both	341	41.3
Status of Patients	**815**	**100.0**
Inpatients	100	12.3
Ambulatory	646	79.2
Both	69	8.5
Main Place of Activity	**738**	**100.0**
Hospital	294	39.8
Primary care centres	344	46.6
Both	100	13.6
Patients Socio-economic rate level	**835**	**100.0**
Only high	11	1.3
High and medium	14	1.7
High and low	1	0.1
High, medium and low	9	1.1
Only medium	372	44.6
Medium and low	117	14.0
Only low	286	34.3
No answer	25	3.0

Ninety-one point four percent (91.4%) of the pediatricians who answered the survey work in urban areas. Seventy-nine point two percent (79.2%) answered that most of their patients were ambulatory, 38.8% worked in public service and 19.9% in private services and the remaining 41.3% answered 'in both', public and private systems. Forty-six point six percent (46.6%) answered that they work in primary care centres and 39.8% in hospitals, with 13.6% working on both.

The average age of the pediatricians who completed the survey was 45 years of age and the majority of the responses were concentrated in the range of 30 to 59 years of age (668 answers, 81.4%) (Table 3).

The age distribution of the sample compared to the SAP membership is shown in Table 3. While pediatricians who were less than 30 years of age represented a low proportion of all pediatricians who are members of the SAP, this group actually had the highest response rate (Table 3). Their response rate was 19.8% compared with 5.8% for all other ages combined – representing a statistically significant difference ($\chi^2 = 128.60$, $p<0.001$).

TABLE 3. NUMBER OF MEMBERS OF SAP AND RESPONDENTS BY AGE

Age Group	Number of members of SAP		Number of respondents to the Survey		Survey Response Rate (%)
	Number	%	Number	%	
Total	13509	100.0	821	100.0	6.1
< 30	405	3.0	80	9.7	19.8
30 – 39	4129	30.6	189	23.0	4.6
40 – 49	3671	27.2	281	34.2	7.7
50 – 59	3009	22.3	198	24.1	6.6
60 and more	1890	14.0	73	8.9	3.9
No information	405				

The gender distribution of our sample (64.9% F, 35.1% M) was not significantly different from that of SAP membership (66.7% F, 33.3% M).

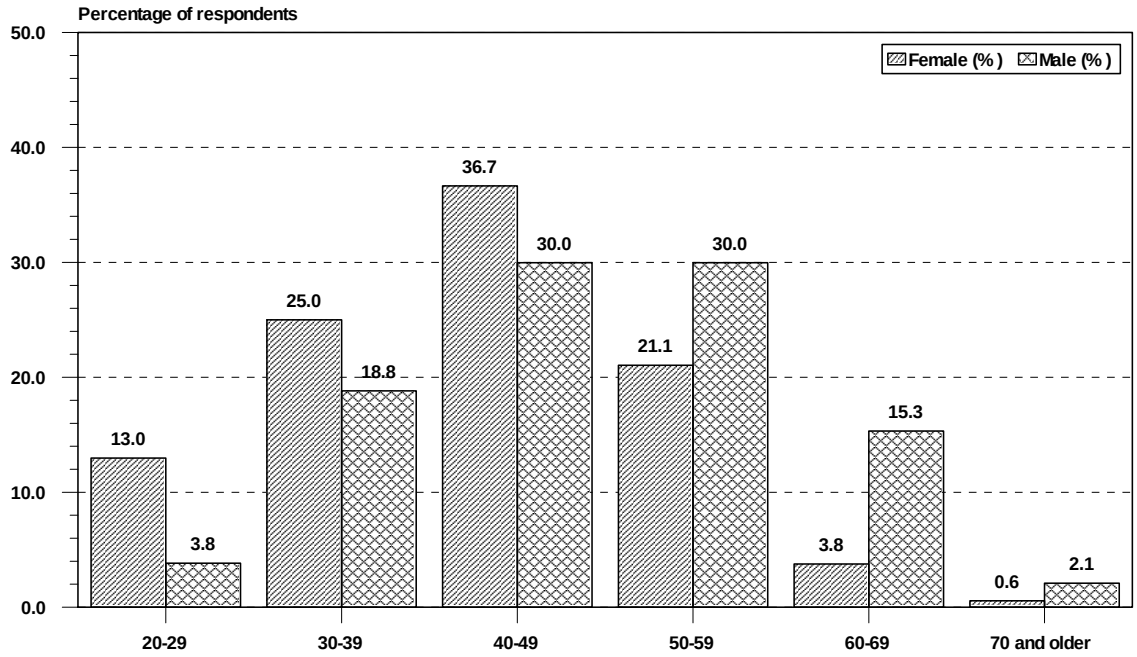


***Figure 2*. Age and gender distribution of pediatricians who responded to the survey**

The average "years of professional practice" was 19 years. There are no statistically significant differences between "years of professional practice" of women and men (data not presented).

Male pediatricians are more likely to work exclusively in primary health care centres rather than exclusively in Hospitals compared to female pediatricians and the difference was statistically significant. 63.0% of male pediatricians worked exclusively at primary health care centres compared to 49.6% of female pediatricians (χ^2= 9.48, p=0.002).

Eight-hundred and three respondents (96.2%) provide information regarding the age of their patients. Over half cared for children and adolescents of all ages (between 0 and 18 years). About one-third cared only for children less than 5 year olds. (Figure 3)

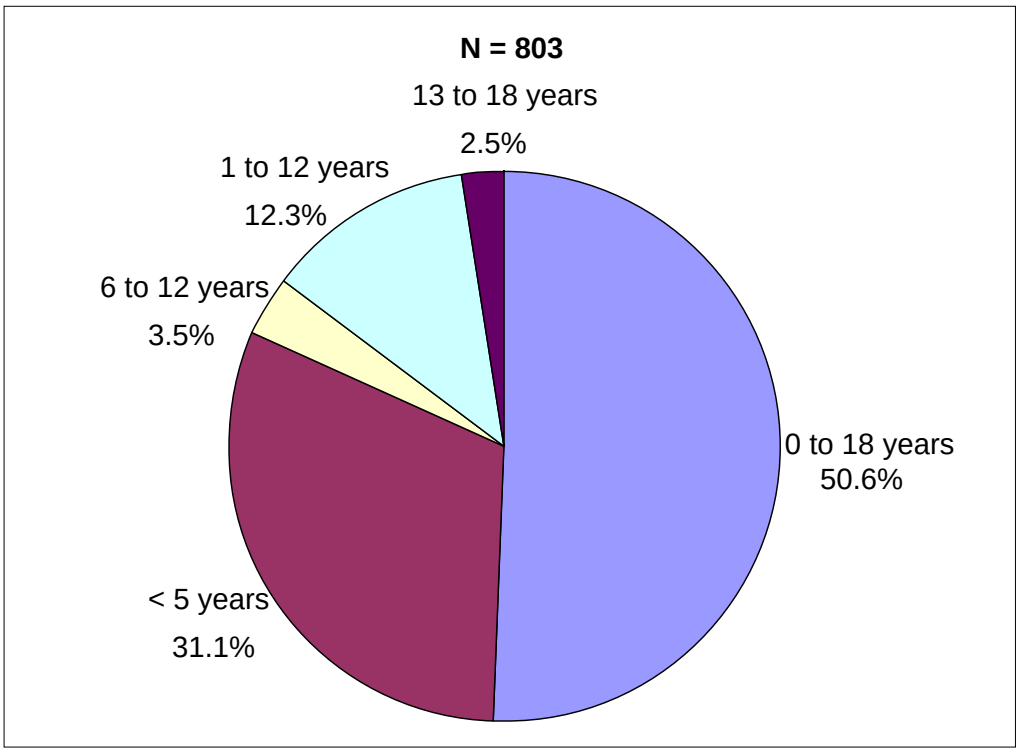


Figure 3. **Proportion of pediatricians caring for each age group.**

In general, most of the pediatricians who answered the survey (93%) work with children of medium and low socio-economic levels. Less than 2% of the pediatricians answered that they work with children of high socio-economic levels.

6.0 Results

6.1 Responses by question

The numbers of responses received were not equal for each question. The total number of responses and percent for each question is shown in Table 4.

TABLE 4. NUMBER OF RESPONSES BY QUESTION

Question	N	% (of 835)
1.0	812	97.2
2.0	800	95.8
3.0	810	97.0
4.0	823	98.6
5.0	823	98.6
6.0	828	99.2
7.0	828	99.2
8.0	826	98.9
9.0	829	99.3
10.0	769	92.1
11.0	809	96.9
12.0	791	94.7

Question 1.0: What information do you have on children's environmental health issues?

From the 835 surveys, 812 (97.2%) answered this question.
Most (59.6%) pediatricians responded they have "Some" information on the issue and nearly one out of three pediatricians (31.2%) indicated they have "Little" or "No Information". Only 7.8% mentioned they have "Much" information on CEH (Figure 4).

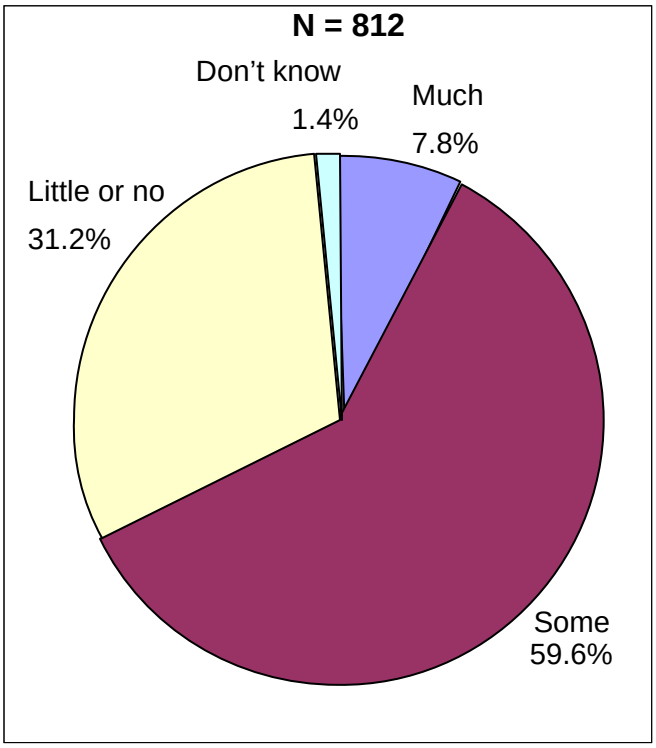


Figure 4. **Proportion of pediatricians who have received "Much", "Some" or "Little or no" information on children's environmental health (n=812).**

The answers to this question were disaggregated by gender, type of work and place of work (Table 5).

TABLE 5. QUESTION 1: WHAT INFORMATION DO YOU HAVE ON CHILDREN'S ENVIRONMENTAL HEALTH ISSUES? (N=812)

	Total	Much Information N (%)	χ^2, p
Gender			
Female	525	61 (6.1%)	
Male	279	29 (10.4%)	4.21, 0.040
Age			
<50	550	32 (5.8%)	
50+	262	31 (11.8%)	8.15, 0.004
Years practice			
<30	644	41 (6.4%)	
30+	149	21 (14.1%)	8.98, 0.003
Type of practice			
Hospital	284	13 (4.6%)	
Primary centre	336	34 (10.1%)	5.98, 0.014
Status of patients			
Ambulatory	631	54 (8.6%)	
Inpatients	98	4 (4.1%)	1.75, 0.186

*χ^2 *compares respondents who say they have 'much' knowledge with those who say they have "some, little, none or don't know."*

Question 1.1: If you selected, "Much" or "Some", in which way(s) did you receive it?

All the 548 pediatricians who responded they have "Much" or "Some" information on CEH also answered the question on the source(s) through which they received it. Articles and magazines were the most frequently mentioned sources (Figure 5).

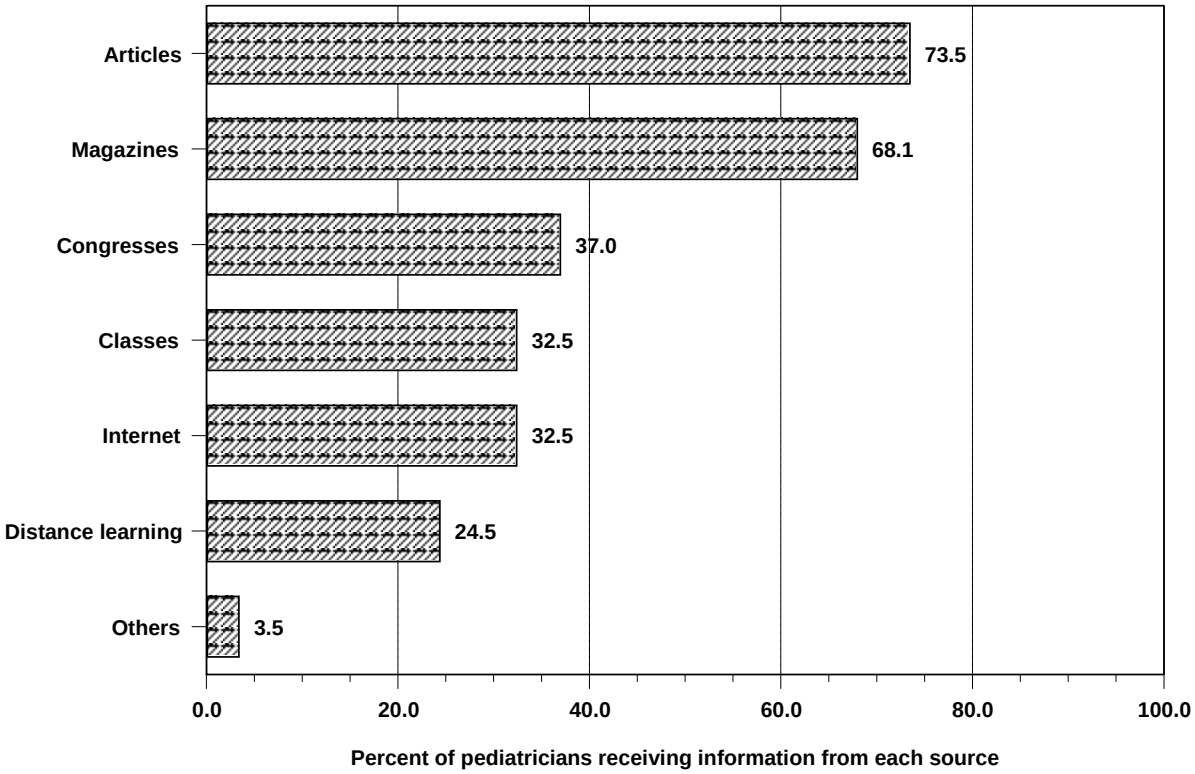


Figure 5. **Sources of information on children's environmental health (n=548).**

Men and women receive their information on CEH from the same sources. Similarly there was no statistically significant difference when the respondents' place of work was considered – that is hospitals versus primary health care centres.

Instead, there is a statistically significant difference between pediatricians who obtained information on CEH from attending classes according to whether they work exclusively in public health services or exclusively in private health services. 32.0% of pediatricians who work in public services mentioned "classes" as the main source of information opposed to 19.3% who work in private services (χ^2=5.31, p=0.021).

In the space provided for "open" answers, most said that they had received information through the mass media (newspapers, radio, television). A small number of pediatricians said that they received information from non-governmental organizations.

Question 1.2: If you selected 'Much' or 'Some', on what issues did you receive information?

All the 548 pediatricians who had "Much" or "Some" information on CEH, 514 (93.8%) provided information on specific topics on which they had received information. The issues most frequently mentioned were: indoor air pollution, water pollution, outdoor air pollution and pesticides (Figure 6).

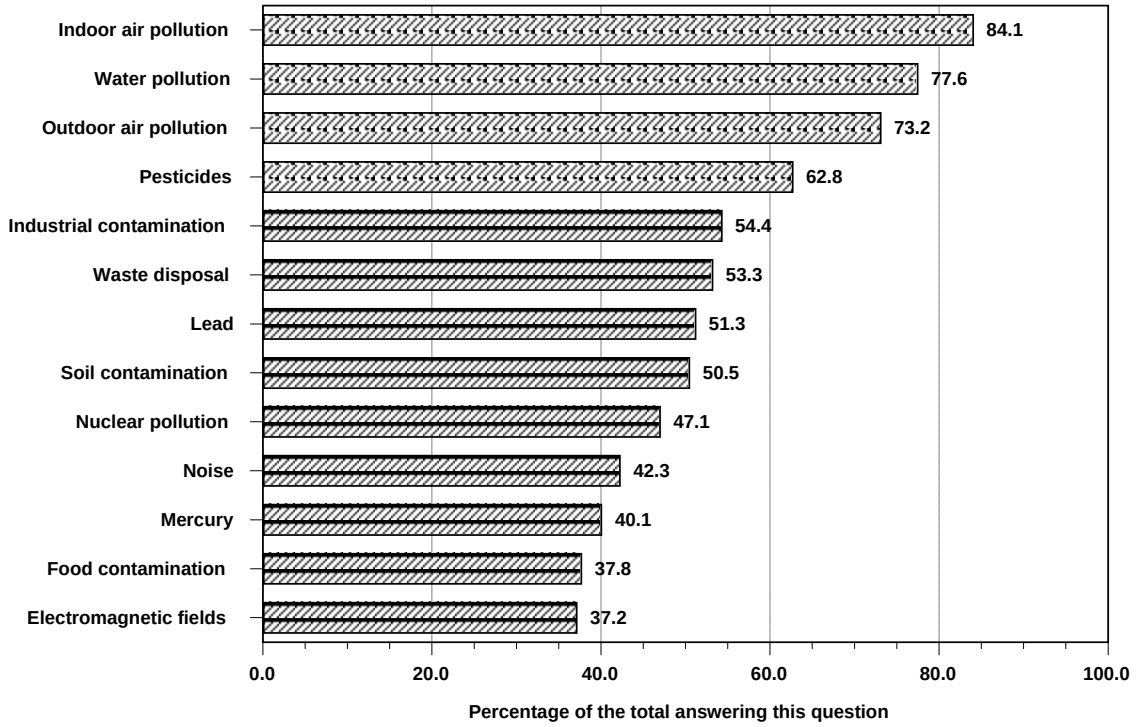


Figure 6. **Types of environmental information received. (n=514).**

A statistically significant difference is found among pediatricians by gender related to the information received on some particular topics. Waste disposal: males (64.3%) and females (47.3%) (χ^2=13.91, p<0.001). Electromagnetic fields: males (44.4%) and females (33.7%) χ^2=5.64, p=0.018). Nuclear pollution: males (40.3%) and females (51.6%) (χ^2=5.95, p=0.015). Food contamination: males (43.9%) and females (34.6%) (χ^2=4.21, p=0.040).

Significantly more pediatricians working in private services received information on noise pollution compared to those working in public services (64.3% vs 47.3% respectively, χ^2=13.91, p<0.001). Significantly more pediatricians taking care of ambulatory patients received information on pesticides compared to those taking care of inpatients (62.4% vs 45.7% respectively, χ^2=4.24, p=0.039).

In the issues mentioned above, there are no statistically significant differences among pediatricians based on their main place of activity - hospitals or primary health care centres.

In the space provided for "open" answers, contamination with PCBs and contamination of water with arsenic were mentioned specifically.

Question 2.0: When conducting a clinical history, do you record information about the environment where the child lives, grows, plays and studies?

From 835 surveys, 800 (95.8%) provided an answer to Question 2.0. Of these 19.5% answered that they "Always" record information about the environment; 54.5% answered that they "Occasionally" record; 26.0% 'Never'. (Table 6)

No statistically significant difference was found among pediatricians who always or occasionally record information about the environment and those who do not, according to gender or whether they work exclusively at primary health care centres or at hospitals.

TABLE 6. WHEN CONDUCTING A CLINICAL HISTORY, DO YOU RECORD INFORMATION ABOUT THE ENVIRONMENT WHERE THE CHILD LIVES, GROWS, PLAYS AND STUDIES? (N= 800).

Pediatricians' Characteristics	Total	Always		Occasionally		Never	
		No.	%	No.	%	No.	%
Total of answers received	**800**	**156**	**19.5**	**436**	**54.5**	**208**	**26**
Gender	***794***	***153***	***19.3***	***435***	***54.8***	***206***	***25.9***
Females	517	104	20.1	287	55.5	126	24.4
Males	277	49	17.7	148	53.4	80	28.9
Main area of practice	***712***	***138***	***19.4***	***390***	***54.8***	***184***	***25.8***
Urban	34	2	5.9	23	67.6	9	26.5
Rural	34	10	29.4	14	41.2	10	29.4
Both	825	154	18.7	435	52.7	206	25
Main occupation	***825***	***154***	***18.7***	***435***	***52.7***	***206***	***25***
Public service	320	69	21.6	162	50.6	74	23.1
Private service	164	22	13.4	81	49.4	56	34.1
Both	341	63	18.5	192	56.3	76	22.3
Status of Patients	***138***	***138***	***100.0***	***138***	***100.0***	***138***	***100.0***
Inpatients	94	29	30.9	52	55.3	13	13.8
Ambulatory	628	106	16.9	340	54.1	182	29.0
Both	65	18	18.7	37	18.7	10	18.7
Main place of activity	***738***	***141***	***19.1***	***392***	***53.1***	***178***	***24.1***
Hospitals	294	47	16	167	56.8	63	21.4
Primary health care centres	344	65	18.9	178	51.7	95	27.6
Both	100	29	29	47	47	20	20

Pediatricians working in public service are more likely to record environmental information compared to those working in Private Services (75.7% vs 64.8% respectively, χ^2=5.69, p-0.017). Those working primarily with inpatients were more likely to record environmental information compared to those with primarily ambulatory patients (86.2% vs 71.0% respectively, χ^2=8.77, p=0.03).

Pediatricians who indicated that they had "Much" or "Some" information on CEH in Question 1.0 are significantly more likely to gather environmental information compared to those that had "Little" or "No" information. (76.8% vs 68.2% respectively, χ^2=5.98, p=0.014). No statistically significant difference was found among pediatricians who always or occasionally record information about the environment and those who never do according to the main area of practice being rural or urban.

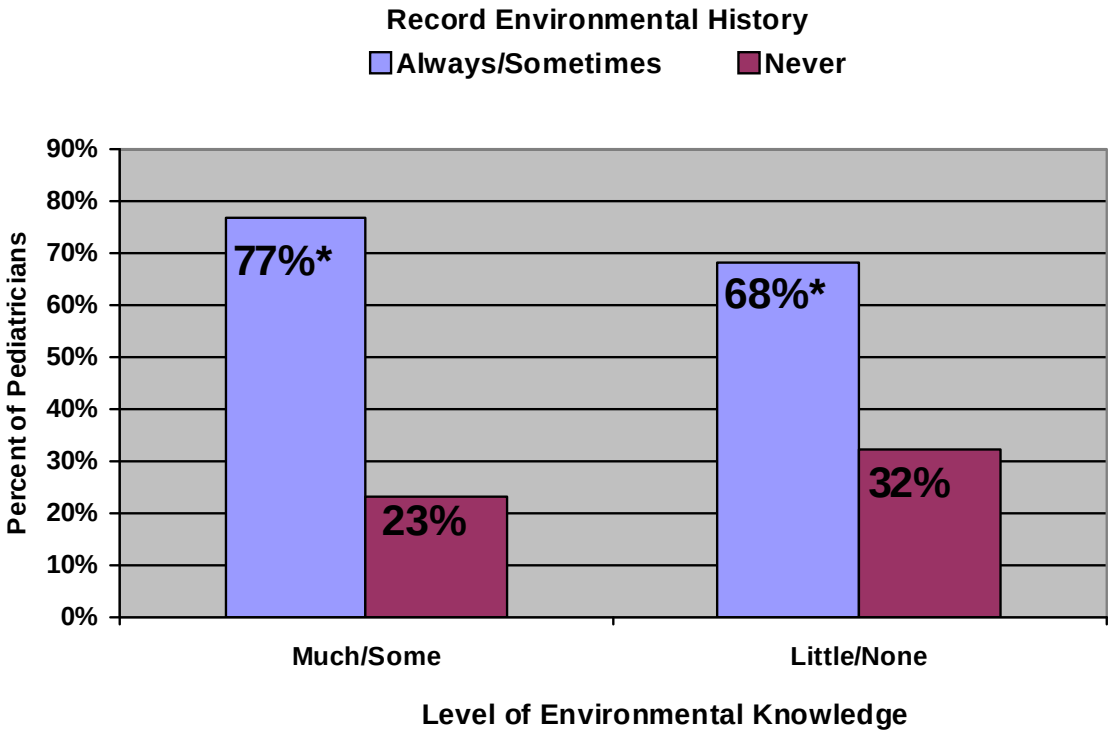


Figure 7. **Percentage of pediatricians who "Always" or "Never" record information about the environment according to their level of "information" on Children's Environmental Health (n=770). *Significantly different**

Question 3.0: How frequently in your medical practice do you receive questions from parents regarding the following children's health and environmental issues?

From the 835 surveys received, 810 (97.0%) answered this question.

Sixteen point two percent (16.2%) or less of the pediatricians who answered indicated they "Often" received questions from the parents regarding children's health and environmental issues (Table 7). From 30.0% to 86.0% based on the topics, answered they "Never" received questions.

Indoor air quality was the topic most "Often" mentioned by parents.

TABLE 7. FREQUENCY OF PEDIATRICIANS WHO RECEIVE QUESTIONS FROM PARENTS ON THE EFFECTS OF ENVIRONMENTAL FACTORS ON CHILDREN'S HEALTH. (N=810)

Topic	Often		Sometimes		Never	
	No.	%	No.	%	No.	%
Indoor air quality (wood, tobacco smoke and others)	122	16.2	374	49.7	257	34.1
Water pollution (biological and chemical)	104	14.5	341	47.4	274	38.1
Nuclear pollution	68	11.0	197	32.0	351	57.0
Outdoor air quality (waste burn, incinerators, smoke, dust and others)	56	8.1	280	40.3	359	51.7
Use of pesticides	40	6.3	229	36.1	366	57.6
Industrial pollution	36	6.0	188	31.1	380	62.9
Soil contamination	27	4.6	119	20.1	445	75.3
Waste disposals	26	4.3	136	22.6	441	73.1
Electromagnetic fields (antennas, high tension, others)	15	2.7	97	17.5	442	79.8
Lead	12	2.2	90	16.5	443	81.3
Noise	12	2.2	114	20.4	434	77.4
Mercury	11	2.1	62	11.8	452	86.1

At least three out of four pediatricians indicated they have "Never" received questions on mercury, lead, electromagnetic fields, noise, soil contamination or waste disposal.

There are statistically significant differences between pediatricians who work exclusively in hospitals and those who work exclusively in primary health care centres regarding the number of them who said they receive questions from parents regarding different issues of CEH often or sometimes in contrast to those who said they never received those questions.

Forty-four percent (44.0%) of pediatricians working exclusively in hospitals receive questions from parents on industrial pollution, 24.6% on lead exposure and 18.9% on Mercury exposure often or sometimes in contrast to 29.2%, 12.1% and 8.4%, respectively, of pediatricians working exclusively at primary health care centres (χ^2= 10.34, p=0.001, for industrial pollution; 10.67, p=0.001 for Lead exposure and 9.10, p=0.003 for Mercury exposure).

We have a separate source of information regarding food contamination from 121 respondents who answered via the Internet. Of these 121, 20.7% identified food contamination as the number one issue parents asked about, followed by indoor air quality (17.4%) and water contamination (10.7%). Outdoor air pollution and industrial pollution at 4.1% were the next most common parental concerns.

Of those pediatricians providing further information in the open-ended question, most mentioned that they had received questions on food contamination. Chemical contamination, cereal dust contamination (silos), injuries and vector transmissions of infectious disease were also mentioned.

Question 4.0: Based on your medical practice, which of the following health problems affecting boys and girls could be associated with negative environmental factors?

From the 835 pediatricians who answered the survey, 823 (98.6%) answered this question.

Nine out of ten pediatricians surveyed mentioned respiratory illnesses as the health problem most "Often" associated with negative environmental factors (Table 8).

TABLE 8. HEALTH PROBLEMS AND PEDIATRICIANS' ANSWERS ON THE DEGREE OF ASSOCIATION WITH NEGATIVE ENVIRONMENTAL FACTORS (N=823)

Health Problems	Often		Sometimes		Never	
	No.	%	No.	%	No.	%
Respiratory illnesses	689	90.4	69	9.0	5	0.7
Poisonings	473	64.8	217	29.7	40	5.5
Skin problems	465	63.8	225	30.8	39	5.4
Cancer	351	53.1	250	37.9	60	9.0
Accidents	297	48.5	224	36.6	91	14.9
Pre-mature birth	263	42.2	284	45.5	77	12.3
Nutritional problems	273	40.4	292	43.3	110	16.3
Congenital malformations	258	40.0	306	47.5	81	12.5
Developmental problems	227	35.0	314	48.5	107	16.5
Intellectual deficits and neurological problems	226	34.8	315	48.5	109	16.7
Endocrine alterations	90	18.6	267	55.6	124	25.8

Besides respiratory illnesses, two out of three pediatricians mentioned poisonings and skin problems "Often" related to environmental factors. Two out of four pediatricians considered the same for accidents and cancer. In contrast, only one out of five pediatricians indicated that endocrine disruptions were "Often" related to environmental factors.

There are no statistically significant differences between pediatricians who answered they have "Much" information on CEH (Question 1.0) and those who answered "Little or No" information, regarding the degree of association of negative environmental factors with health problems listed in Table 6.

Pediatricians who believe that environmental factors strongly affect the adverse health outcomes shown in Figure 8 are significantly more likely to "Always" record environmental information in clinical histories compared to "Never". The specific health issues that showed a statistical difference were premature births in both boys and girls; skin problems in boys; and nutritional disorders in both boys and girls. No significant difference was found for other health outcomes - respiratory illnesses, poisonings, cancer, accidents, genetic malformations, developmental problems, neurological problems and endocrine disruptions.

In the space provided for "open" answers, the most commonly mentioned health problems associated with environmental factors were diarrhea and other diseases transmitted by water.

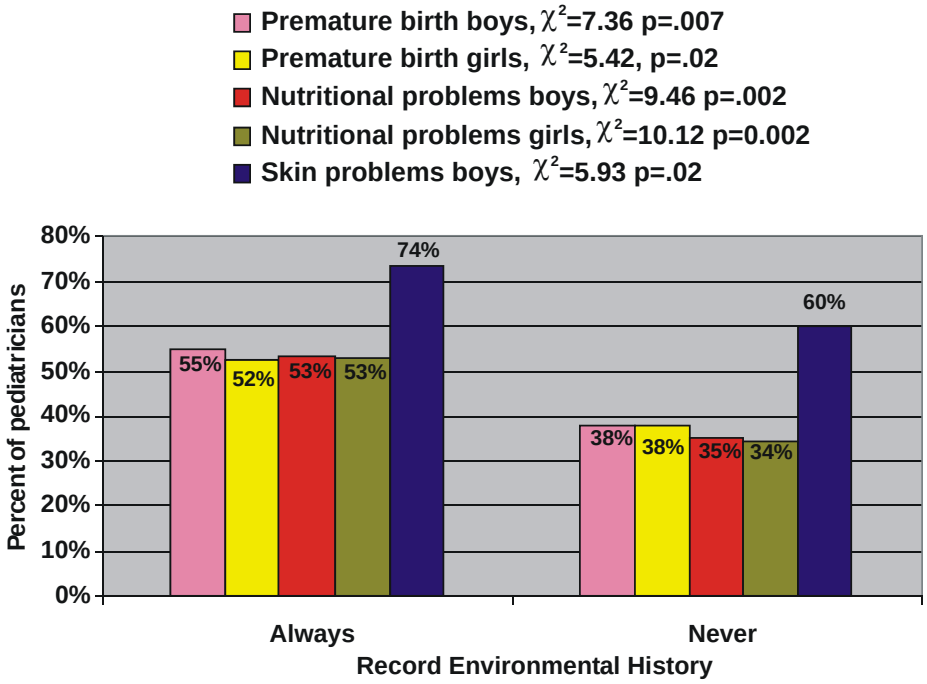


Figure 8 **Relationship between pediatricians recording environmental histories and health outcomes they strongly associate with the environment**

Question 5.0: Based on your medical practice, where are boys and girls most likely to be exposed to chemical environmental hazards?

From the 835 pediatricians who answered the survey, *823 (98.6%)* answered this question.

Work places, streets and home were mentioned by at least two out of three pediatricians as likely places of exposure to chemical environmental hazards. (Table 9).

TABLE 9. PEDIATRICIANS' OPINIONS REGARDING PLACES AND CHILDREN'S DEGREE OF EXPOSURE TO CHEMICAL ENVIRONMENTAL HAZARDS (N=823)

Place	High Exposure		Low Exposure		No Exposure	
	No.	%	No.	%	No.	%
Child's work place	415	72.4	114	19.8	45	7.8
Streets	536	71.1	189	25.1	29	3.8
Home	499	65.3	226	29.6	39	5.1
Recreational areas	305	42.3	343	47.5	73	10.1
Rural areas/farms	226	33.9	304	45.6	137	20.5
Parent's work place	198	31.1	288	45.3	150	23.6
School	199	28.0	399	56.1	113	15.8

Forty-two point three percent (42.3%) of the pediatricians considered recreational areas as a place of high exposure. School was the place least mentioned (28.0%). About one in five pediatricians consider that rural areas/farms and parents' work place offer no exposure which may affect children's health.

There are no statistically significant differences in the answers to Question 5.0 regarding pediatricians' gender and place of work at hospitals or primary health care centres.

Pediatricians working in public services were more likely to consider home and street as places of high chemical exposure compared to those working in Private Service. These significant differences hold true if you look at boys and girls separately or together.
***Significant difference between Private and Public**

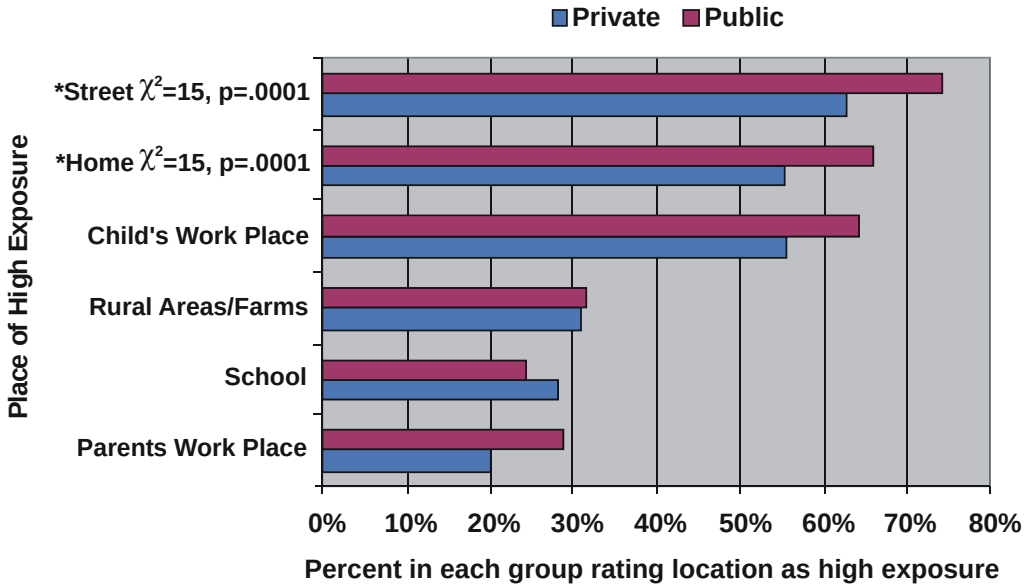


Figure 9. **Pediatricians' service type and perception of areas where children have high exposure to chemical environmental hazards (n=823).**

There were no statistically significant differences in the answers from pediatricians who mentioned they have a lot of information on CEH (Question 1) when compared to those

pediatricians with little or no information on CEH, from pediatricians who mentioned they always recorded information on CEH (Question 2) when compared to those who never did, both with regards to question 5.

In the space provided for "open" answers, the most commonly mentioned places of exposure to adverse environmental factors were health service locations and landfills.

Question 6.0: Based on your medical practice, which of the following indoor air pollutants have an impact on children's health?

From the 835 pediatricians who answered the survey, 828 (99.2%) answered this question.

Ninety percent of the respondents considered tobacco smoke as having a high impact on children's health (Table 10). Only 1% believes it has no adverse health effects.

TABLE 10. PEDIATRICIANS' OPINIONS ON THE SOURCE OF INDOOR AIR POLLUTANTS THAT AFFECT CHILDREN'S HEALTH (N=828)

Pollutant	High		Low		No effect	
	No.	%	No.	%	No.	%
Tobacco smoke	727	90.6	65	8.1	10	1.2
Combustion products (gas, wood or others)	685	84.5	105	12.9	21	2.6
Pesticides (insecticides, fungicides, herbicides, others)	491	62.8	242	30.9	49	6.3
Volatile compounds from household products and solvents	376	48.1	354	45.3	51	6.5
Construction materials (asbestos, dust and others)	362	47.9	311	41.2	82	10.9

Combustion products such as gas, wood and other combustible products were identified as the second most prejudicial indoor air pollutants. Sixty-two point eight percent (62.8%) thought that pesticides had a high impact on children's health.

One in ten pediatricians thought that construction materials, including asbestos, do not have any effects on children's health as indoor air pollutants and 6.5% considered that volatile compounds from household products and solvents and pesticides do not affect children's health.

There are no statistically significant differences regarding pediatricians' answers to Question 6.0 according to area of practice (rural or urban).

There are statistically significant differences regarding pediatricians' perceptions of combustion products as an adverse environmental issue for children's health in relation to their patients' socio-economic level. Eighty-seven point five percent (87.5%) of pediatricians who assist only patients of low socio-economic level consider that combustion products highly affect children's

health in contrast to 60.0% of pediatricians who assist only patients of high socio-economic level. (percentages are in comparison to those pediatricians in each group who considered that those products have little or no effect, χ^2=4.16, p=0.041).

There are no statistically significant differences regarding pediatricians' responses on indoor air pollutants in relation to the information received on CEH.

In the "open" answers to Question 6.0, pediatricians mentioned inadequate housing conditions (humidity, lack of cleaning), biological contamination (acari, mould) and indoor air contamination with outdoor air (open air burning of garbage, industrial pollution).

Question 7.0: Based on your medical practice, which of the following outdoor air pollutants have an impact on children's health?

From the 835 pediatricians who answered the survey, *828 (99.2%)* answered this question.

TABLE 11. PEDIATRICIANS' OPINIONS ON THE SOURCE OF OUTDOOR AIR POLLUTANTS THAT AFFECT CHILDREN'S HEALTH. (N=828)

Pollutant	High		Low		No effect	
	No.	%	No.	%	No.	%
Combustion products from traffic	552	70.5	191	24.4	40	5.1
Pollutants from industrial activities	503	65.8	206	27.0	55	7.2
Pesticides	492	65.7	208	27.8	49	6.5
Open burning of garbage	418	55.7	268	35.7	65	8.7
Particles and dust	382	50.7	309	41.0	63	8.4

Seventy point five percent (70.5%) of the respondents believed that combustion products from traffic have a high impact on children's health (Table 11), 65.8% and 65.7% of pediatricians mentioned industrial pollutants and pesticides in the same category, respectively.

Eight point seven (8.7%) of pediatricians considered that open burning of garbage, particles and dust have no effects on children's health. A lower percentage (7.2%) had the same opinion in relation to industrial pollutants, and combustion products from traffic and pesticides (5.1% and 6.5%, respectively).

There are no statistically significant differences regarding pediatricians' answers according to their area of practice (rural or urban) or to the information on CEH they received (Question 1) when comparing those who mentioned that each pollutant have high effect on children's health in contrast to those who mentioned that have little or no effect.

In the "open" answers to Question 7.0, forest fires were mentioned by pediatricians as outdoor air pollutants that have an impact on children's health.

Question 8.0: Based on your medical practice, which of the following pollutants related to water that is for human use have an impact on children's health?

From the 835 pediatricians who answered the survey, 826 (98.9%) answered this question.

Seventy-seven (77.8%) of pediatricians believed that, based on their medical practice, biologic contaminants in water have a high impact on children's health (Table 12).

TABLE 12. PEDIATRICIANS' OPINIONS ON THE SOURCES OF ENVIRONMENTAL WATER POLLUTANTS THAT AFFECT CHILDREN'S HEALTH (N=826)

Pollutant	High		Low		No effect	
	No.	%	No.	%	No.	%
Biological contaminants (parasites, bacteria, viruses)	628	77.8	147	18.2	32	4.0
Agrochemicals (pesticides and fertilizers)	412	59.1	212	30.4	73	10.5
Industrial chemical pollution (mining, chemical waste and others)	370	54.4	216	31.8	94	13.8
Natural chemical pollution (arsenic and others)	371	53.8	229	33.2	89	12.9

More than half of pediatricians answered that natural chemical pollution (arsenic and others), industrial chemical pollution and agrochemicals in water are also important water pollutants. In contrast, one pediatrician out of ten did not believe these last three mentioned sources could affect children's health. Four percent (4%) of the pediatricians who answered this question considered the same to be true for biological contaminants.

There are no statistically significant differences regarding pediatricians' answers according to their area of practice (rural or urban) or the socio-economical level of their patients with regard to the importance of different water pollutants on children's health.[3]

No statistically significant difference was found among pediatricians who have a lot of information on CEH when compared to those who answer they have little or no information on CEH (Question 1) with regards to the answers to the question on the importance of different water pollutants on children's health.

In the "open" answers to Question 8.0, possible contamination of water from narcotics contraceptives or hormones was mentioned.

[3] Contrast between pediatricians' answers were done among those who considered that each particular water pollutant highly affect children's health and those who consider the pollutant as having little or no effect (together) on children's health. When comparing answers to question 8 among pediatricians according to the socio-economic level of their patients, contrast was done among those who see only high socio-economic level patients and those who see only patients from the lowest socio-economic level.

Question 9.0: Based on your medical practice, which of the following actions are relevant in protecting children from environmental hazards?

From the 835 pediatricians who answered the survey, 829 (99.3%) answered this question.

The actions most often listed as very relevant to protect children's health from environmental risks were 1) to establish type and magnitude of specific environmental problems (87.1%) and 2) to educate the community (86.9%) (Table 13).

Over 80% of pediatricians also considered improving community awareness through information and communication activities and developing epidemiological environmental studies to be highly relevant.

TABLE 13. PEDIATRICIANS' OPINIONS ON THE RELEVANCE OF DIFFERENT INTERVENTIONS PROPOSED TO PROTECT CHILDREN'S HEALTH FROM ENVIRONMENTAL THREATS (N=829)

Intervention	Very relevant		Relevant		Not relevant	
	No.	%	No.	%	No.	%
Revealing the type and magnitude of specific environmental problems	702	87.1	94	11.7	10	1.2
Educating the community	711	86.9	98	12.0	9	1.1
Improving community awareness through information and communication activities	691	84.4	121	14.8	7	0.9
Developing epidemiological environmental studies	684	83.6	126	15.4	8	1.0
Providing professional training in children's environmental health	662	81.5	143	17.6	7	0.9
Encouraging Government Advocacy	643	79.7	139	17.2	25	3.1
Encouraging cooperative interdisciplinary and participative intersectoral networks	562	72.1	196	25.1	22	2.8
Developing Spanish materials	466	58.6	249	31.3	80	10.1

Fifty-nine (59%) of the pediatricians considered "developing Spanish materials" as a "very relevant" intervention. Only 10% considered it as "not relevant".

Of those pediatricians providing additional information In the "open" answers to Question 9.0, the most common actions mentioned were to educate at all levels and to disseminate environmental issues to raise awareness in the community.

Question 10.0: Based on your medical practice, which of the following actions could be applied by your Regional Society of Paediatrics?

From the 835 pediatricians who answered the survey, 769 (92.1%) answered this question.

Eighty-three (83%) of pediatricians considered that, through the Regional Society of Paediatrics, identification of the type and magnitude of specific environmental problems by the Regional Society of Paediatrics was very important. Eighty-two (82%) of pediatricians considered that community awareness through information and communication activities could be improved in the Regions by SAP. Meanwhile, 69% considered that cooperative interdisciplinary and participative intersectoral networks could be encouraged (Table 14).

The development of material in Spanish was also considered a task to be developed by SAP. Fifty-six (56%) of the pediatricians considered it as a "Very Important" action to be undertaken by the Regional Society of Paediatrics.

TABLE 14. PEDIATRICIANS' OPINIONS ON THE IMPORTANCE OF ACTIONS THAT COULD BE UNDERTAKEN BY SAP IN THE REGIONS (N=769).

Intervention	Very Important		Important		Not Important	
	No.	%	No.	%	No.	%
Revealing the type and magnitude of specific environmental problems	590	83.1	95	13.4	25	3.5
Improving community awareness through information and communication activities	604	82.4	110	15.0	19	2.6
Educate the community	585	81.5	116	16.2	17	2.4
Providing professional training in children's environmental health	577	78.4	144	19.6	15	2.0
Developing epidemiological environmental studies	557	77.1	134	18.6	31	4.3
Encouraging Government Advocacy	491	69.2	181	25.5	38	5.4
Encouraging cooperative interdisciplinary and participative intersectoral networks	479	69.0	187	26.9	28	4.0
Developing Spanish materials	396	56.0	237	33.5	74	10.5

Further open-ended comments suggested that SAP regions should: provide more training and better information; advocate to the authorities to better control and apply the laws related to environmental health; organize protection strategies based on precautionary principles, including

the possibility of taking legal action, when concrete situations exist of environmental risk to the health of children.

Question 11.0: Do you know of any activities that are being carried out in your region concerning the environment and children's health?

From the 835 pediatricians who answered the questions survey, 809 (96.9%) answered this question.

Only one out of every five pediatricians who answered this question mentioned an activity on CEH carried out in their region with a higher percentage found among pediatricians from San Luis, Chubut, Santa Fe and Neuquen. No pediatricians from Formosa and Misiones had information on any regional activities (Table 15).

TABLE 15. PEDIATRICIANS WHO IDENTIFIED A CHILDREN'S ENVIRONMENTAL HEALTH ACTIVITY BY REGION

	Yes		No	
	Number	%	Number	%
TOTAL	178	22.0	631	78.0
HEADQUARTERS	*75*	24.6	*230*	75.4
LITORAL	*96*	21.0	*362*	79.0
CENTRAL CUYO	*48*	21.0	*181*	79.0
NORTHWEST (NOA)	*15*	19.7	*61*	80.3
ANDES PATAGONIA	*9*	33.3	*18*	66.7
ATLANTIC PATAGONIA	*5*	14.3	*30*	85.7
NORTHEAST (NEA)	*1*	3.4	*28*	96.6
SOUTHERN PAMPEANA	*10*	29.4	*24*	70.6
NORTHERN PAMPEANA	*8*	28.6	*20*	71.4

Affirmative responses to question 11 were significantly higher among pediatricians who mentioned having "Much" information on CEH, compared to those who answered "Some, Little or No" information (Figure 9) (χ^2=66.86, p≤0,001).

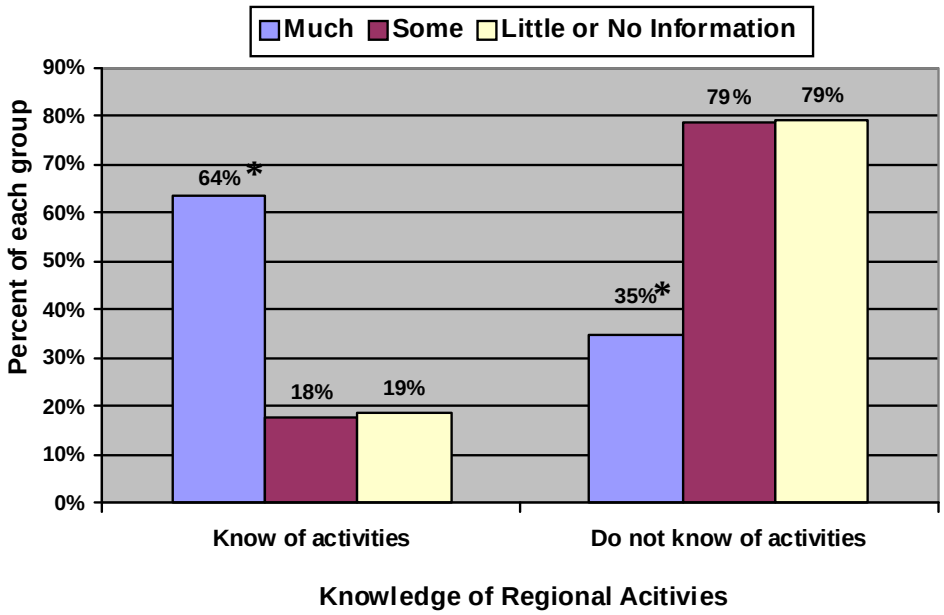


Figure 10. **Pediatricians' overall information on CEH and knowledge of regional activities concerning the environment and children's health (n=777) *significantly different**

Question 12.0: Would you like to be part of a SAP network on children's health and environment?

Of the 835 pediatricians who answered the survey, 791 (94.7%) took the option of not answering it in an anonymous way.

Of these 791, 598 (75.6%) said they wanted to be part of a network. The proportion of women (78.8%) was higher than men (70.0%) (χ^2=7.31, p=0.007).

When analyzing the affirmative responses regarding age, a statistically significant difference was found, with a higher percent of younger pediatricians willing to take part in a network compared to older pediatricians. More than 80% of pediatricians younger than 40 were interested in being in such a network compared with less than 75% of those 55 and older. (linear trend test, χ^2=16.50, p=0.021).

7.0 Discussion

7.1 Survey coverage, reach and characteristics of the pediatricians that responded

Building on the commitment of SAP to educate pediatricians across the country on children's environmental health issues, the Coordinating Committee of the *Profile* project decided to survey the pediatricians who are members of SAP understanding that responses might be from those pediatricians with a higher interest in the topic than those who do not respond. This methodology was not unusual to members of SAP, because the membership has been approached in the past on

other topics. Historically, the percentage of voluntary responses varied between 4 and 7 % (according to information provided by SAP).

A possible explanation for the varying level of response from the different regions could be that SAP and AAMMA/ISDE in 2004 (previous to the survey) organized capacity-building workshops on CEH in the three regions of SAP with the highest number of responses.

The number of responses, according to gender, matched with the SAP membership structure expected for the 50-59 year old age group, where male responses were higher.

The distribution of responding pediatricians by region was concordant with the percentages of the urban and rural population in Argentina. Half of the pediatricians with practices in rural areas also practiced in urban areas. In general, these professionals lived in medium or small sized communities with close ties to the surrounding rural areas.

Most survey responses came from pediatricians who provided ambulatory care.

The average age of respondents was 45. When the number of responses was analyzed in relation to the different age groups of SAP members in 2004, pediatricians under 30 years contributed proportionally a larger number of responses than the rest of the age groups and this difference was statistically significant. The distribution of answers according to age group was considered relevant since it highlights the interest of the youngest members of SAP in connection with Children's Health and Environment issues. The higher proportion of responses from younger SAP members suggest that interest in children's environmental health will continue to be a priority health issue for the future.

When the number of answers was analyzed in relation to the years of professional practice, the group with less than 10 years of experience contributed the largest number of answers (22% of the total). 44.7% of those in the group with less than 10 years of practical experience were pediatricians under 30 years of age.

Results received from the participating pediatricians will be discussed with relationship to three main areas – information, knowledge and action.

7.2 Information

Results from this survey show that lack of information on the environment and health is a key issue. Only 7.8% of those surveyed considered that they possessed "a lot" of information on the topic. Even if the groups that responded as having "much" or "some" information were combined, the response is worrisome because almost one out of every three pediatricians had "little" or "no" information on children's health and environmental issues .

It is not surprising to see that a high percentage of pediatricians mentioned that they had received information on water contamination and on indoor and outdoor air quality. For years these topics have been addressed in continuing education programs delivered by SAP. It is also not surprising to see that pesticide contamination was the fourth highest issue mentioned. The use of biocides in Argentina is high and considerable information is available on this topic from academic sources as well as through the mass media. It is obvious from responses in this survey that newspaper and magazine articles are a major source of information for pediatricians.

It is surprising that fewer than 40% of respondents mentioned having received information on food contamination. This topic is a standard part of the Pediatric Residences Program in the country and of SAP's Continuous Education Program.

7.3 Knowledge

7.3.1 Clinical Practice

A very low percentage of pediatricians (< 20%) answered that they "Frequently" gather information about the environment in the clinical history. The pediatric environmental history is recognized by WHO as an important tool to identify and to assess environmental exposure.[4] Despite the low percent who report taking environmental histories, pediatricians in Argentina are often in daily contact with children and their families. This puts them in a privileged situation where they may be able to detect and address some of the environmental factors that affect their patients.

Only between 2% and 16% of the respondents indicated they "Often" received questions from parents regarding children's health and environmental issues. The three topics that motivated the largest number of consultations were: indoor air pollution, water and ionizing radiation.

However, the issue that prompted the most questions from parents changed when the issue of Food Contamination was presented as an option in the on-line questionnaires. This is not a surprise, as the concern has been brought to the public's attention by the Ministry of Health and Environment through repeated campaigns to promote safe water and food and improved indoor air quality.

Pediatricians working in hospitals received a larger number of questions from parents on industrial pollution, lead and mercury compared to those working in primary health centres. This may be due to the fact that hospitals usually have toxicology services.

7.3.2 Knowledge on Children's Environmental Health

An overwhelming number of pediatricians mentioned that respiratory diseases were "often" related to adverse environmental factors. They also highlighted poisonings, skin problems, accidents (non-intentional injuries) and cancer. It is surprising that only a small percentage of pediatricians related endocrine disruption with environmental threats. Seemingly the role that pesticides and other chemicals play as probable endocrine disruptors is not well known or accepted.

Pediatricians believed that the most likely places where children can be exposed to environmental threats were "child's workplace", "streets" and "home." Without a doubt, the importance of these places varies with the time that children spend in them and with their age. It is probable that if this question had been subdivided according to different child developmental stages, the answers could have more accurately described the places of 'high' exposure that prevail at each stage. It is surprising that only half of those surveyed considered recreational areas as places of high exposure and that schools were the least recognized places, although children spend many hours per week there.

[4] *Children's health and the environment: a global perspective*. Edited by J Pronczuk-Garbino. Geneva. World Health Organization 2005.

At least one out of five pediatricians considered that children were not exposed to environmental factors in rural areas or from their parents' workplaces.

Pediatricians working in public services were significantly more likely to describe the home and streets as places of high exposure compared to those in public services This difference could be due to the fact that, in general, the lowest socioeconomic levels of the population receive medical attention through public services.

Pediatricians believed the indoor air pollutants that caused the most harmful effects on the health of children were: tobacco smoke (90.6%), combustion products – gas, wood and others – (84.5%) and pesticides (62.8%). Only 1% considered that tobacco smoke did not have any adverse effects on health. It is important to point out that during the last years, the Coordinating Unit of Health and Environment Ministry of Health has carried out repeated campaigns in the media to discourage the use of tobacco. The Ministry also encouraged the implementation of laws that ban smoking in public places. In 2003, SAP was declared an "institution free from smoke." The smoking ban became not only effective within the organization but also in the different physical environments where scientific events organized by SAP are carried out.

Most respondents (70.5%) believed that combustion products generated by traffic had a "high" effect on the health of children; approximately two out of three pediatricians also identified pollutants coming from industrial activities and agrochemicals. It is necessary to highlight that although 65% of pediatricians recognized the harmful effect of the presence of pesticides in outdoor air, no statistically significant differences were observed according to area of practice whether it was rural or urban. It is surprising that only half of the respondents recognized the importance of particulate matter as a component of outdoor and indoor air since most (73% & 84%) had received information on these issues.

Almost 80% of pediatricians considered on the basis of their experience that the biological contamination of water was the main contaminant that affected the health of children. Natural chemicals (arsenic), industrial or agrochemical contamination was also selected by more than half of the respondents. For all survey questions regarding environmental issues and child health, most pediatricians selected options related to "traditional" environmental threats. "Traditional" environmental threats are those related with underdevelopment: lack of safe drinking water, food contamination, lack of basic sanitary services, indoor and/or outdoor air pollution, garbage disposal, and vector transmitted disease.

7.4 Actions

Of the 835 pediatricians who responded to the survey, 790 opted to be identified. Of those, 598 (75%) accepted an invitation to be part of a future "Children's Environmental Health Network" through SAP. One of the secondary objectives of the survey was to identify pediatrician members of SAP who were interested in being part of a children's health and environment network. The fact that most of the pediatricians that participated in the survey opted to be identified and an important percentage accepted the invitation to network has successfully fulfilled this important part of the overall objectives of this study.

8.0 Strengths and limitations of the study

8.1 Strengths

- All members of SAP who were pediatricians were invited to participate in the study and, through that invitation they received information on children's environmental health. The sample obtained represented 6.2% of the total membership of the institution as of June 2004. This response rate was comparable to other studies carried out by SAP using similar methodology.
- Answers to the survey were anonymous and confidential, but pediatricians were given the opportunity to identify themselves. 94.7% of those interviewed opted to be identified. This allowed the identification of a group of pediatricians from across the country who are interested in Children's Environmental Health.
- The distribution of responses by gender was similar to the population of SAP members. The rate of response according to area of professional practice was similar to the proportion of urban and rural populations in Argentina.
- The distribution of responses according to age group was similar to the age distribution of members of SAP, except for the group of pediatricians under 30 years who had, proportionally, the largest participation.
- Although in different proportions, pediatricians from all domestic regions of the country where SAP exists participated in the survey.
- There was a higher rate of response from pediatricians from the Patagonia regions. This may be due to a recent focus on environmental education and training in the area and suggests that increased education leads to increased awareness.
- It is of importance that the study was carried out with the participation of both Argentinean and Canadian partners. Argentinian partners were: Ministry of Health and Environment of the Nation, Secretary of Environment and Sustainable Development of the Nation, Argentine Society of Paediatrics (SAP), Argentine Association of Doctors for the Environment (AAMMA). Canadian partners were: Ministry of Health of Canada, University of Ottawa, Canadian Institute of Child Health (CICH) - with the support of the Canadian International Development Agency (CIDA).
- This is one of the first studies of this type and can serve as a model for other investigators. Through this work we assessed the level of information and interest on children's environmental health among pediatricians. This knowledge can help define and encourage actions that will lead to the establishment and implementation of policies directed to the protection of children from environmental threats.
- The survey questionnaire developed in both Spanish and English as part of this study can now be used in other countries, regions and jurisdictions where an assessment of child health and the environment is of importance.
- The Argentine Society of Paediatrics will be able to use the information obtained as a result of this study to create a children's environmental health pediatric network.

8.2 Limitations

- The sample was not randomized (non-random sample) and the response rate (6.2%) was low. For this reason, the results cannot be generalized to SAP's entire pediatrician population.
- It is assumed that because participation was voluntary, those who have more information on children's environmental health would have been more likely to respond, thus the results may be overestimating the degree of knowledge of pediatricians in general.
- The respondents represented a higher proportion of pediatricians under 30 years of age compared to the total SAP membership.

- The proportion of responses by region did not match the proportion of SAP members in each region. The Patagonia regions were over-represented proportionally.
- The information obtained was analyzed by SAP Region and not by Province. The number of Regions where SAP is organized (9) does not coincide with the number of Provincial States that constitute the Republic of Argentina (Federal Capital and 23 Provinces).
- The sample used to evaluate questions posed by parents on Food Contamination (Question 3.0) was of smaller size than those utilized for the rest of the issues and comes from on-line responses only.

9.0 Conclusions and recommendations

9.1 Pediatrician knowledge and awareness of the role that the environment plays in child health is low.

Recommended action:

- build capacity among health care professionals on children's environmental health at Universities;
- continue training for pediatricians who are members of SAP, during Pediatric Residence years, and after certification, through group activities related to the National Program of Continuous Education in Pediatrics (PRONAP[5], Educ@SAP [6], Certification Maintenance Program, as in congresses, lectures, and others);
- continue to train and educate future instructors in children's environmental health;
- increase training in all health areas related to chemical safety and emerging environmental threats; and
- inform the community about environmental issues through the mass media.

9.2 Most pediatricians considered that the main environmental factors that affected the health of children in Argentina were related to indoor air quality (tobacco, combustion products, pesticides), water (bacteria, virus, parasites, pesticides, industrial chemical contamination, arsenic), and outdoor air (combustion products generated by traffic, industry, open burning of garbage, pesticides). Among the illnesses related to these environmental threats, most pediatricians mentioned respiratory disease, chemical poisonings, skin problems, cancer, accidents (non-intentional injuries) and diarrhea.

Recommended action:

- build capacity around the environmental factors that were not frequently mentioned by pediatricians when talking about environmental information received (eg. ionizing and non-ionizing radiation, mercury, lead and noise).

9.3 Most pediatricians responded that the information they receive on children's environmental health comes from articles and scientific magazines.

Recommended action:

- use these modes to communicate information;
- encourage pediatricians to seek information on children's environmental health through other means such as the internet or through workshops;
- encourage the health professions to make use of a Pediatric Environmental Clinical History to document the relationship between exposure and outcomes.

[5] National Program of Pediatric Actualization. Long distance education program.

[6] **Educ@SAP**. Long distance education program on informatics basis. Virtual classroom.

9.4 The majority of those who completed the survey chose not to remain anonymous and agreed to be part of a children's environmental health network.

Recommended action:

- provide training opportunities for the pediatricians who agreed to be part of the Children's Environmental Health Network;
- encourage the pediatricians once trained to act as educational trainers in their local regions;
- continue communication through this network to advance capacity around children's environmental health issues.

Appendix A

Children's Health and Environment
In the framework of the project SANA Profile
Under the supervision of the Steering Committee of the project SANA Profile:
Argentine Society of Paediatrics (SAP); National Direction of Maternity and Child's Health, National Direction for Health Prevention and Promotion, National Direction of Environmental Management of the Secretary of Environment and Sustainable Development of the National Ministry of Health and Environment (MSyA); and Argentine Society of Doctors for the Environment (AAMMA).

A PEDIATRIC PERSPECTIVE ON THE ENVIRONMENT AND CHILD HEALTH IN ARGENTINA (ADAPTED FROM THE SPANISH VERSION)

Introduction

Over the last few years, the environment and its relation with population health, specifically for children, has become an important issue around the world, putting it on the agendas of the World Health Organization, governmental and nongovernmental organizations.

The Argentine Society of Paediatrics (SAP), Asociación Argentina de Médicos por el Medio Ambiente (AAMMA) and the Argentine Government have partnered with the Canadian Institute of Child Health (CICH), the University of Ottawa and Health Canada to examine the effects of environmental conditions on the health of Argentine children. The Project has been developed with support from the Canadian government through the Canadian International Development Agency (CIDA-ACDI).

In the framework of this project, data collected through this survey on **Children's Health and the Environment** will provide information on children's environmental health in Argentina and will be an integral part of the project's profile. This profile will greatly enhance Argentina's ability to generate action that will protect children from environmental hazards. It will also help the Society of Paediatrics understand the needs and interests of pediatricians in relation to children's environmental health.

The survey is designed to collect information on: the type of environmentally related health problems seen in pediatric practice; specific information on the prevalence of air, water and chemical pollutants in practice locations; and, the need/interest of professional education to prevent and detect environmental risks for the protection of children's health.

Characteristics of the Survey

The survey was jointly developed by Argentinean and Canadian partners, and reviewed by the Ethics Committees of the Argentine Society of Paediatrics and the Memorial University of Newfoundland (Canada). All data collected through this survey will be analyzed starting July 31, 2005 and results made available through the SAP Journal of Pediatrics in October 2005.

This survey is individual, voluntary and confidential. Most of the questions have multiple options. In order to complement the epidemiological analysis; additional information on the person who answers the survey has been included at the end.

Please complete each question based on your experience and please print clearly in questions where you are asked to write down your answer. Please note that when the word "children" is used throughout the survey, it represents girls/boys and adolescents. The estimated time to complete the survey is approximately 15 minutes.

Please mail the survey to the following address: ***Sociedad Argentina de Pediatría, Av. Coronel Díaz 1971/75 (C1425DQF). Ciudad de Buenos Aires***. You can also fill out the survey electronically at the following website address: www.sap.org.ar. Please direct questions about the survey to saludambiental@sap.org.ar. Thank you for your collaboration.

SECTION I. KNOWLEDGE ON CHILDREN'S HEALTH AND ENVIRONMENT

1. What information do you have on children's environmental health issues?

[ ] Much information
[ ] Some information
[ ] Little or no information
[ ] Not aware of children's environmental health issues

1.1. If you selected, much or some, which way(s) did you receive it? (please check all that apply)

1.1.1. [ ] Courses/workshops
1.1.2. [ ] Congresses
1.1.3. [ ] Distance classes
1.1.4. [ ] Articles
1.1.5. [ ] Magazines
1.1.6. [ ] Internet
1.1.7. [ ] Other (please specify): _____

1.2. If you selected much or some, on what issues did you receive information? (please check all that apply)

1.2.1. [ ] Indoor air quality (wood, tobacco smoke and others)
1.2.2. [ ] Outdoor air quality (waste burn, incinerators, smoke, dust and others)
1.2.3. [ ] Waste disposal
1.2.4. [ ] Water pollution (biologic and chemical)
1.2.5. [ ] Ground pollutants
1.2.6. [ ] Industrial pollutants
1.2.7. [ ] Lead
1.2.8. [ ] Mercury
1.2.9. [ ] Use of pesticides
1.2.10. [ ] Electromagnetic fields
1.2.11. [ ] Noise
1.2.12. [ ] Nuclear pollution
1.2.13. [ ] Food contamination
1.2.14. [ ] Other (please specify): _____

2. When conducting a clinical history, do you gather information about the environment where the child lives, grows, plays and studies?

[ ] Frequently
[ ] Occasionally
[ ] Never

3. How frequently in your medical practice, do you receive questions from parents regarding the following children's health and environmental issues.
(please indicate 3 = often, 2 = sometimes, 1 = never and 0 = I don't know)

3.1. [ ] Indoor air quality (wood, tobacco smoke and others)
3.2. [ ] Outdoor air quality (waste burn, incinerators, smoke, dust and others)
3.3. [ ] Waste disposal
3.4. [ ] Water pollution (biologic and chemical)
3.5. [ ] Ground pollutants
3.6. [ ] Industrial pollutants
3.7. [ ] Lead
3.8. [ ] Mercury
3.9. [ ] Use of pesticides

3.10. [ ] Electromagnetic fields
3.11. [ ] Noise
3.12. [ ] Nuclear pollution
3.13. [ ] Soil contamination
3.14. [ ] Other (please specify)_____

4. Based on your medical practice, which of the following health problems affecting boys and girls could be associated with negative environmental factors?
(please indicate 3 = very much, 2 = sometimes, 1 = never and 0 = I don't know)

		Boys	Girls
4.1.	Respiratory illnesses	[ ]	[ ]
4.2.	Pre-mature birth	[ ]	[ ]
4.3.	Learning disabilities and neurological problems	[ ]	[ ]
4.4	Developmental problems	[ ]	[ ]
4.5.	Skin problems	[ ]	[ ]
4.6.	Cancer, lymphoma, leukemia	[ ]	[ ]
4.7.	Poisonings	[ ]	[ ]
4.8.	Endocrine disruptions	[ ]	[ ]
4.9.	Genetic malformations	[ ]	[ ]
4.10.	Nutritional problems	[ ]	[ ]
4.11.	Unintentional injuries (accidents)	[ ]	[ ]
4.12.	Others (please specify):_____		

5. Based on your medical practice, where are boys and girls most likely to be exposed to chemical environmental hazards?
(please indicate 3 = often, 2 = sometimes, 1 = never and 0 = I don't know)

		Boys	Girls
5.1.	Home	[ ]	[ ]
5.2.	Streets	[ ]	[ ]
5.3.	Recreational areas	[ ]	[ ]
5.4.	School	[ ]	[ ]
5.5.	Rural areas/farms	[ ]	[ ]
5.6.	Parent's work place	[ ]	[ ]
5.7.	Child's work place	[ ]	[ ]
5.8.	Others (please specify):_____		

6. Based on your medical practice, which of the following indoor air pollutants have an impact on children's health?
(please indicate 3 = often, 2 = sometimes, 1 = never and 0 = I don't know)

6.1. [ ] Combustion products, (gas, wood and others)
6.2. [ ] Volatile compounds from household products and solvents
6.3. [ ] Construction materials (asbestos, dust and others)
6.4. [ ] Pesticides (insecticides, fungicides, herbicides and rodenticides)
6.5. [ ] Tobacco smoke
6.6. [ ] Others, specify:_____

7. Based on your medical practice, which of the following outdoor air pollutants have an impact on children's health?
(please indicate 3 = very much, 2 = sometimes, 1 = never and 0 = I don't know)

7.1. [ ] Combustion products from traffic (particle matter and exhaust)
7.2. [ ] Pollutants from industrial activities (heavy metals, volatile chemicals, etc.)

7.3. [ ] Particles and dust (silos, building material, demolitions and others)
7.4. [ ] Open Burning of Garbage
7.5. [ ] Pesticides (insecticides, fungicides, herbicides and rat poison)
7.6. [ ] Others (please specify):_____

8. Based on your medical practice, which of the following pollutants related to water that is for human use, have an impact on children's health?
(please indicate 3 = very much, 2 = sometimes, 1 = never and 0 = I don't know)

8.1. [ ] Biologic contaminants (parasites, bacteria, viruses)
8.2. [ ] Natural chemical pollution (arsenic and others)
8.3. [ ] Industrial chemical pollution (mining, chemical waste and others)
8.4. [ ] Agrochemicals (pesticides and fertilizers)
8.5. [ ] Others (please specify):_____

9. Based on your medical practice, which of the following actions are relevant in protecting children from environmental hazards?
(please indicate 3 = very relevant, 2 = relevant, 1 = not relevant and 0 = I don't know)

9.1. [ ] Revealing the type and magnitude of specific environmental problems
9.2. [ ] Developing epidemiological environmental studies
9.3. [ ] Providing professional training in children's environmental health
9.4. [ ] Developing Spanish materials
9.5. [ ] Encouraging Government Advocacy
9.6. [ ] Improving community awareness through information and communication activities
9.7. [ ] Including the topic as part of the school curriculum
9.8. [ ] Encouraging cooperative interdisciplinary and participative intersectoral networks
9.9. [ ] Others (please specify):_____

10. Based on your medical practice, which of the following actions could be applied by your Regional Society of Paediatrics, and with what level of importance?
(please indicate 3 = very important, 2 = important, 3 = not important and 0 = I don't know)

10.1. [ ] Revealing the type and magnitude of specific environmental problems
10.2. [ ] Developing epidemiological environmental studies
10.3. [ ] Providing professional training in children's environmental health
10.4. [ ] Developing Spanish materials
10.5. [ ] Encouraging Government Advocacy
10.6. [ ] Improving community awareness through information and communication activities
10.7. [ ] Including the topic as part of the school curriculum
10.8. [ ] Encouraging cooperative interdisciplinary and participative intersectoral networks
10.9. [ ] Others (please specify):_____

11. Do you know of any activities that are being carried out in your region concerning the environment and children's health?

[ ] YES [ ] NO

If Yes, please provide a description of the activity and contact information below:
……..……
……..……
……..……

SECTION II: PEDIATRICIAN PROFILE

12. Age: ____ years

13. Sex:

[ ] Male
[ ] Female

14. Do you have a Pediatric subspecialty:

[ ] YES
[ ] NO

15. How many years have you practicing Pediatric medicine: _____ years

16. Major Area of Practice:

[ ] Urban
[ ] Rural

17. Province where you live: _____

Buenos Aires, C. de Buenos Aires, Catamarca, Córdoba, Corrientes, Chaco, Chubut, Entre Ríos, Formosa, Jujuy, La Pampa, La Rioja, Mendoza, Misiones, Neuquén, Río Negro, Salta, San Juan, San Luis, Santa Cruz, Santa Fe, Santiago del Estero, Tierra del Fuego, Tucumán

18. Where do you work the majority of the time:

[ ] Private (offices, clinics, house calls, etc.)
[ ] Public (government hospitals, centers of primary attention, etc.)

19. Where do you treat the majority of your patients?

[ ] In hospital
[ ] Outside of the hospital (ambulatory)

20. From where are the majority of your patients referred?

[ ] Hospitals
[ ] Primary Health Centres

21. Within which age group do the majority of you patients fall:

[ ] <1 year
[ ] 1-5 years
[ ] 6-12 years
[ ] 13-18 years
[ ] All ages
[ ] I don’t know

22. How would you describe the majority of your patients in terms of socioeconomic background?

[ ] Low
[ ] Middle
[ ] High

23. Regional Society of Paediatrics Affiliation: _____

24. Would you like to be part of a SAP network on children's health and environment:

[ ] YES
[ ] NO

If you would like to be part of this network, please contact:

Argentine Society of Paediatrics:

By e-mail: saludambiental@sap.org.ar

By mail: Subcomisión Salud Ambiental Infantil

Av. Coronel Díaz 1971/75

(C1425DQF) – Ciudad de Buenos Aires

Or to your nearest Regional Society of Paediatrics Affiliation