



Swiss Toxicological
Information Centre

■ Annual Report 2006

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■ Editorial

Dear Readers

During the meeting of the quality circle of German-speaking Poisons Centres on 9th and 10th November 2006 the STIC was able to celebrate its 40th anniversary – a reason to think of the future, but also to reflect on the years since its inauguration. Not only do the optimism and foresight of our founder fathers deserve our respect and thanks, it is also unique in our country's health care system that all partners could be persuaded to support the STIC. I hope we will succeed in renewing the support of the medical profession who profit most from the services the STIC provides, but who have been standing on the sidelines for the last few years.

The idea of the founders and the desire of all concerned to provide an essential service for drug and chemical safety to the population is invaluable from today's point of view and has been the guiding principles of all our efforts which have gained us respect and a lot of goodwill. Success, however, must not blind us – we have always had to fight for our existence and the means required to secure operations. The last year has been characterised by our efforts to secure the long-term financial support of the STIC. This has led to a recently signed service level agreement with the cantons (via the Swiss conference of the cantonal directors of public health CDS) which regulates emergency advice given to the general public in case of pharmaceutical, chemical and natural toxin intoxications.

Furthermore, we aim to continue to provide a high-quality service. This can only be achieved by linking up with an academic institution. The University of Zurich was the obvious choice. Following preliminary talks with the rectorate of the University, the STIC was assessed by a team of external experts. Their report is very positive, but also clearly shows several weak points. Its recommendations to the University include an association of the STIC to the University, but it also advises to keep the independent character of the foundation.

This can be a form of collaboration which opens up new synergies for both parties, being only advantageous. The corresponding talks should be completed in the present year. The strengthening of international collaboration which has already begun supports our aim of maintaining high quality standards.

I am very proud to state that the STIC today is a permanent component of our public health system. The management and staff deserve our recognition, confidence and thanks. We have to continue to strive for and give highest priority to maintaining high quality standards.

My thanks go to the Foundation Council, our clients and supporting organisations for their confidence in, and support of the STIC.

DR. FRANZ MERKI
PRESIDENT OF THE FOUNDATION COUNCIL



Introduction

This annual report 2006 provides information on enquiry statistics, type and severity of poisoning incidents, educational activities, research projects, collaborations, the Swiss Antidote Network and publications. The section entitled «Human Poisoning» is summarised in tabular format. More detailed information can be found in an appendix to this annual report which is available separately from the STIC.

In 2006 the record number of enquiries to the STIC in 2005 returned to the levels known from previous years (31 184). The number of calls decreased overall by 7 %, especially in the months where an increase above average has been encountered in the previous year. A clear link could be established with prevailing weather conditions in 2006; the number of enquiries was particularly low during wet and cold months. This reflects the fact that in warmer months exposure is more common, a phenomenon observed in Poisons Centres across the globe. The main reason for these peaks is accidental exposure of children with plants.

Although this volume of calls keeps the STIC busy, it is nevertheless able to react swiftly and competently to unusual events. Within one hour it can assemble an emergency response team to deal with extraordinary incidents in addition to the routine telephone service. Such an event occurred in summer 2006 when the antifreeze ethylen glycol entered the drinking water supply of a large office building due to a broken air conditioning system. Around 200 people were potentially affected, and thus the support given to the individuals concerned, the hospitals and the emergency services was considerable until it became apparent that nobody had developed severe symptoms. Whether it is chlorine gas entering a public swimming pool due to a ruptured pipe in the canton of Tessin or the suspected escape of several highly venomous snakes in the canton of Bern, the STIC is expected to provide the relevant information. In the latter case the Swiss Antivenin Network ANTIVENIN-CH put together an emergency plan for the provision of antidotes for exotic snake bites.

An assessment carried out by international experts in summer 2006 has shown that the STIC is well equipped for its tasks in terms of staff, infrastructure and processes. This evaluation was carried out as part of the STIC's planned association with the University of Zurich. The aim of this association is to strengthen and support the scientific work of the STIC and to reinforce the traditional collaboration with the University of Zurich and the University Hospital Zurich. High quality poisoning advice cannot be given without scientifically sound evaluation of own data as well as of the data in the scientific literature.

For many substances no or very little data exists on human exposure, and toxicity data from animal studies often do not sufficiently provide clinically useful information in cases of human poisoning. The systematic analysis of poisoning incidents by clinical toxicologists in Poisons Centres is therefore of important in filling this gap. We would like to thank especially those treating physicians who for many years have been reliably supplying us with follow-up information. They provide an invaluable contribution to the knowledge in human toxicology.

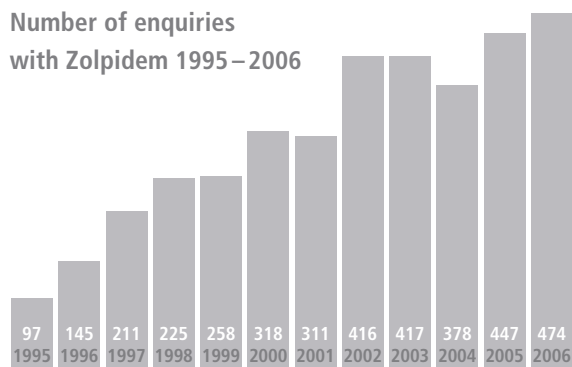
Focus

Pharmaceuticals represent the largest group of potential toxins and account for 37 % of all enquiries but food and chemicals can also occasionally lead to serious poisonings.

For some time now the STIC has observed a noticeable increase of poisoning incidents with the tranquillizer **Zolpidem** (Fig. 1). We attribute this increase to the drug being very popular and thus widely available. 92 % of cases concern adults, mean age 35 years. 89 % of cases represent deliberate self-harm. This is also true for teenagers (11 to 16 years) where 128 of 150 cases (112 concerning girls) were intentional. In children under 10 years of age this only applies to 4 out of 131 cases. Zolpidem was taken in combination with other substances in 64 % of all incidents. 57 of 407 Zolpidem mono-intoxications with available medical follow-up data resulted in moderate or severe symptoms. In contrast 418 of 1228 combinations with other substances developed moderate or severe symptoms. Two deaths are attributable to intoxications with a combination of Zolpidem and other substances.

Figure 1

Number of enquiries with Zolpidem 1995–2006



In spring 2006 the STIC encountered its first case of **botulism** in humans since 2001. An elderly lady developed vomiting and diarrhoea after eating a duck terrine followed by progressive dysphagia and paralysis one day later. Despite antitoxins having been administered the patient had to be mechanically ventilated for several months. The toxin could be detected in both the patient's blood and the duck terrine.

After seven weeks of intensive care treatment and a subsequent 8-month stay in rehabilitation the patient returned home.

During 1995 to 2006 the STIC was contacted on average 17 times per year because of suspected botulism. In most cases this concerned contaminated food or general enquiries. In only about two cases on average per annum the diagnosis of botulism could be confirmed clinically or analytically. The STIC often takes a central role in this difficult to diagnose disease with literature search, provision of antitoxins and coordination of laboratory analysis. Botulism is a notifiable disease in Switzerland.

Cyanide poisoning is rare and typically occurs in an occupational setting by exposure to potassium and sodium cyanide, hydrogen cyanide and organic cyanides (nitriles). In the reporting year the STIC was asked for advice on cyanide intoxication in 15 cases, twelve of these were of an occupational nature displaying only mild symptoms. One patient suffered moderate symptoms after ingestion of acetonitril in a suicide attempt.

Cyanogenic glycosides in plants can also lead to cyanide poisoning. Although there are over 1 000 cyanogenic plants, poisonings with e.g. bitter almonds or seeds from stone fruit are relatively rare. In 2006 the STIC recorded a severe intoxication in cows fed on the soft hulls of apricot kernels for additional roughage resulting in the death of two animals. A high HCN value in a sample of the material fed to the animals could be confirmed by GC-MS analysis.

A mild but spectacular case of intoxication with cyanogenic glycosides occurred in an institution where cherry pits used for the production of pillows were laid out to dry in a ill-ventilated room. A smell of bitter almonds was noticeable and some workers complained of mild dizziness or shortness of breath. Hydrogen cyanide was detected in the air.



Emergency and information service

The main services provided by the STIC are telephone consultations for members of the general public and physicians in cases of acute and chronic poisoning. In addition, the centre answers theoretical enquiries and contributes to the prevention of accidental poisoning.

All calls to the information service of the STIC are recorded electronically in its own data base, and are analysed in the Annual Report.

Overview of all calls

Use of the service

In 2006, the information service of the STIC received 31 184 enquiries which represents an increase of 6.9 % compared to the previous year.

Figure 2

Number of enquiries to the centre over the last ten years

1997	29 506
1998	29 510
1999	29 669
2000	30 935
2001	32 330
2002	33 111
2003	32 217
2004	31 404
2005	33 512
2006	31 184

Origin of calls

Table 1 shows the number of calls received in 2006 from the individual cantons of Switzerland and the different population groups.

The largest number of calls came from the general public (63.8 %). These calls reflect the need for information by the general public, and also how well the STIC is known. The largest proportion of calls from the public originated from the canton of Zurich (4.1 per 1 000 inhabitants). The smallest number of calls was received from the cantons of Ticino, Jura, Uri and Valais.

Physicians used our service 8 640 times. Compared to the year 2005 this represented a decrease of 388 calls by hospital physicians and also a slight decrease of 41 calls by general practitioners. Based on population, the largest proportion of physician calls came from the cantons of Basel-Stadt and Schaffhausen, followed by the cantons of Glarus and Jura. Veterinarians accounted for 555 calls to the STIC, pharmacists for 516.

The STIC answered 127 requests for information from the media (newspapers, radio and television). 1 454 enquiries were received from organisations such as emergency services, care homes, industry, poisons centres abroad and non-specified organisations.

Table 1

The number of calls received in 2006 by cantons and populations groups

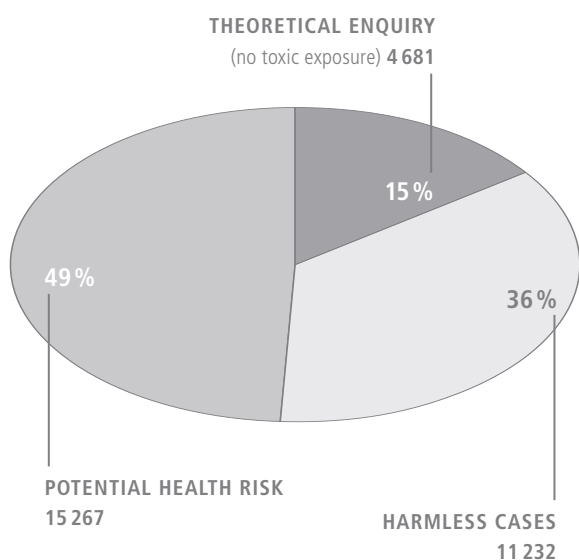
Canton	Population	General public	Hospital doctors	Practitioners	Veterinarians	Pharmacists	Various	Total	Calls per 1000 inhabitants	
									Public	Physicians
AG	569 344	1 504	546	99	30	41	97	2 317	2.6	1.2
AI	15 220	34	3	5	1	–	1	44	2.2	0.6
AR	52 561	115	27	7	1	–	8	158	2.2	0.7
BE	957 064	2 708	804	227	82	66	241	4 128	2.8	1.2
BL	266 089	666	187	56	23	13	42	987	2.5	1.0
BS	185 601	472	321	48	4	19	51	915	2.5	2.0
FR	253 954	506	212	39	15	9	26	807	2.0	1.0
GE	430 638	902	365	92	9	42	51	1 461	2.1	1.1
GL	38 173	72	47	20	2	–	2	143	1.9	1.8
GR	187 803	401	131	56	22	18	20	648	2.1	1.1
JU	69 110	104	91	10	6	1	7	219	1.5	1.5
LU	356 384	719	271	75	19	9	50	1 143	2.0	1.0
NE	168 444	311	141	13	13	29	26	533	1.8	1.0
NW	39 803	88	7	9	2	–	4	110	2.2	0.5
OW	33 269	81	18	13	–	–	2	114	2.4	0.9
SG	459 999	947	403	110	27	14	74	1 575	2.1	1.2
SH	73 764	186	96	27	14	6	22	351	2.5	1.9
SO	247 937	581	121	50	17	7	33	809	2.3	0.8
SZ	137 522	301	63	33	2	2	8	409	2.2	0.7
TG	234 332	540	180	55	25	1	41	842	2.3	1.1
TI	322 276	399	336	61	11	24	35	866	1.2	1.3
UR	35 087	54	15	3	–	–	1	73	1.5	0.5
VD	654 093	1 551	574	123	49	74	88	2 459	2.4	1.1
VS	291 575	483	167	44	20	24	24	762	1.7	0.8
ZG	106 496	248	72	38	8	–	30	396	2.3	1.1
ZH	1 272 590	5 185	1 299	357	117	104	511	7 573	4.1	1.4
FL	34 905	94	5	11	1	2	1	114	2.7	0.5
Foreign	–	248	398	42	32	6	67	793	–	–
Unknown	–	392	3	14	3	5	18	435	–	–
Total	7 494 033	19 892	6 903	1 737	555	516	1 581	31 184	2.7	1.2
%	–	63.8	22.1	5.6	1.8	1.6	5.1	100	–	–



Types of calls

Calls can be sub-divided into enquiries without exposure and enquiries where exposure has taken place. In cases of exposure we differentiate between harmless situations where no or no relevant symptoms are to be expected, and cases of potential or definite health risk.

Figure 3
Types of calls (n = 31 184)



Among the 4 681 calls (compared to 6 380 in the previous year, – 26.6 %) without toxic exposure, frequent questions concerned drugs and antidotes, toxicity of plants to children and pets, and the risk of poisoning from spoiled food, household products and chemicals, with the recommendations given by the STIC being predominantly of a preventive nature. This sub-category also includes advice and preparing reports for authorities, media, private individuals and various organisations as well as distribution of fact sheets and referring enquiries to appropriate experts.

The 26 503 calls received following potentially toxic exposure concerned 25 267 humans (compared to 25 875 in the previous year, – 2.4 %) and 1 236 animals (compared to 1 257, – 1.7 %). The following section discusses human poisoning, whereas animal poisoning is dealt with in a separate section (pages 14 – 15).

Human poisoning

Table 2 shows an overview of the calls received with potentially toxic exposure (25 267). Children were involved in 52.9 % of the cases, adults in 46.9 %. In 57 cases (0.2 %), the age group remained unknown.

The highest number of calls involved children under five years of age (41.4 %). The proportion of harmless cases was significantly higher in children (31.7 %) than in adults (11.2 %). In contrast, the proportion of cases with potential health risk was somewhat higher in adults (35.7 %) than in children (21.2 %). Boys were more frequently represented amongst the children (24.6 % vs. 22.4 %) and women amongst the adults (27.0 % vs. 18.0 %).

Table 2
Age and gender of human cases with potentially toxic exposure

		Harmless cases		Potential health risk		Total	
Children		8 004	31.7%	5 354	21.2%	13 358	52.9%
Age	< 5 years	6 522	25.8%	3 937	15.6%	10 459	41.4%
	5 – < 10 years	577	2.3%	469	1.9%	1 046	4.1%
	10 – < 16 years	241	1.0%	581	2.3%	822	3.3%
	unknown	664	2.6%	367	1.4%	1 031	4.1%
Sex	girls	3 515	13.9%	2 148	8.5%	5 663	22.4%
	boys	3 696	14.6%	2 509	9.9%	6 205	24.6%
	unknown	793	3.2%	697	2.8%	1 490	5.9%
Adults		2 841	11.2%	9 011	35.7%	11 852	46.9%
Sex	female	1 739	6.9%	5 072	20.1%	6 811	27.0%
	male	986	3.9%	3 569	14.1%	4 555	18.0%
	unknown	116	0.4%	370	1.5%	486	1.9%
Unknown		21	0.1%	36	0.1%	57	0.2%
Total		10 866	43.0%	14 401	57.0%	25 267	100%

Circumstances of poisoning

Table 3 shows the circumstances of poisoning in the 25 267 cases with potentially toxic exposure. **Acute accidental intoxications** (19 112, compared to 19 376 in the previous year, – 1.4 %) represented the largest group. These occurred frequently at home with children ingesting easily accessible household products, pharmaceuticals, or plant parts. Adults too were involved in toxic exposures at home, but a significant number of enquiries involved work place accidents (903).

Acute intentional poisoning was mostly due to attempted suicide (3 705 cases, compared to 4 120 in the previous year, – 1.1 %), less frequently due to drug abuse (469 cases) or related to criminal behaviour (61 cases).

Chronic poisoning was relatively rare (639 cases) compared to acute intoxications. **Adverse drug reactions** in therapeutic doses led to 190 information requests. These were mainly related to the establishment of a causal link between the observed symptoms and the medication taken.



Table 3
Circumstances of toxic exposures

Circumstances of toxic exposures		Acute poisoning (Exposure < 8h)		Chronic poisoning (Exposure > 8h)
Accidental domestic	17 211	68.1 %	222	0.9 %
Accidental occupational	903	3.6 %	72	0.3 %
Accidental environmental	16	0.1 %	23	0.1 %
Accidental others	982	3.9 %	83	0.3 %
Total accidental	19 112	75.7 %	400	1.6 %
Intentional suicide	3 705	14.6 %	17	0.1 %
Intentional abuse	469	1.9 %	61	0.2 %
Intentional criminal	61	0.2 %	12	0.1 %
Intentional others	959	3.8 %	149	0.5 %
Total intentional	5 194	20.5 %	239	0.9 %
Total accidental and intentional	24 306	96.2 %	639	2.5 %
Total acute and chronic		24 945	98.7 %	
Adverse drug reactions		190	0.8 %	
Unclassifiable		132	0.5 %	
Total		25 267	100 %	

Agents involved

For analysis, the agents and toxins were split up into twelve groups. Table 4 shows these different groups and how often they were involved in the total of 25 267 poisonings in humans.

Most toxic exposures occurred with pharmaceuticals (35.7 %), followed by household products (25.0 %) and plants (11.1 %). Details of the individual agent groups are available in the supplement to this Annual Report which can be ordered separately.

Severity of poisonings

5 647 enquiries from physicians (69 % of all medical calls) were concerned with cases of expected or already established poisoning. In these cases, the treating physicians received a written follow-up of the telephone consultation, together with a request for feedback on the clinical outcome. The STIC received a report on the outcome in 74 % of these cases. Thus the STIC received additional information, evaluated by physicians, concerning symptoms, clinical outcome and treatment of acute and chronic poisonings which was entered and analysed in our in-house information system.

Table 4
Agents involved in all cases of poisonings in humans

Agents/Age groups	Adults	Children	Age unknown	Total	
Pharmaceuticals	5 122	3 894	7	9 023	35.7%
Household products	2 056	4 238	11	6 305	25.0%
Plants	522	2 276	3	2 801	11.1%
Technical and industrial products	1 369	396	7	1 772	7.0%
Cosmetics and personal care products	209	997	–	1 206	4.8%
Food and beverages	603	324	9	936	3.7%
Recreational drugs, alcohol	440	369	1	810	3.2%
Agricultural and horticultural products	319	350	1	670	2.6%
Mushrooms	322	131	4	457	1.8%
Venomous animals	313	114	3	430	1.7%
Veterinary drugs	39	37	–	76	0.3%
Others or unknown agents	538	232	11	781	3.1%
Total	11 852	13 358	57	25 267	100%

Data capture and data evaluation was standardised according to circumstances, causality and severity of poisoning. This annual report only includes poisonings where the causality was confirmed or likely. Confirmed means the toxin has been found in the body, the time course and symptoms are compatible with the toxin, and the symptoms could not be explained by an underlying illness or any other cause. Likely causality fulfils the same criteria, except that the agent has not been detected in the body.

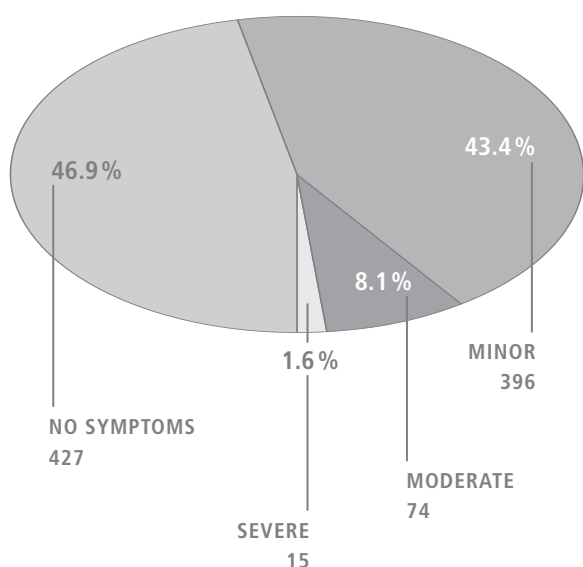
3 686 human cases both asymptomatic and symptomatic with sufficient evidence of causality were analysed further with regard to clinical course.

912 cases involved children and 2 774 adults. The severity of these cases is documented in Figure 4 with cases categorised as follows: no symptoms, minor, moderate, severe, or fatal. Minor symptoms generally require no treatment; moderate symptoms usually require treatment, and cases with severe symptoms must always be treated.

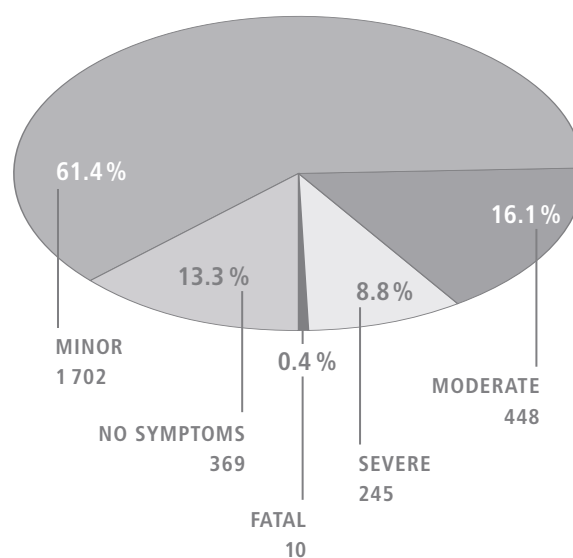


Figure 4
Clinical outcome of poisoning cases in children and adults

Children (n = 912)



Adults (n = 2774)



Amongst children, half of the cases (427 = 46.9%) were asymptomatic in contrast to adults where only 369 (13.3%) were asymptomatic. Minor symptoms were observed in 396 children (43.4%) and in 1702 adults (61.4%). Moderate symptoms were seen in 74 children (8.1%) and 448 adults (16.1%). Severe poisoning occurred in 15 children (1.6%) and 245 adults (8.8%). Ten cases in adults had a fatal outcome (0.4%).

Of the 3686 cases where causality was confirmed or likely (Table 5), about three fifths involved ingestion of only one toxin. In two fifths of the cases, two or more agents were involved. For the purpose of this report, these cases have been classified according to the most important agent involved. In those cases where follow up information was received and analysed, pharmaceuticals were again the most frequent cause of poisoning (65.9%), followed by household products (9.3%) and technical and industrial products (8.4%).

Table 5

Frequency of agent group and severity of human poisoning in cases where medical feedback was received and analysed

Agent groups Severity of poisoning	Adults					Children					Total	
	N	Mi	Mo	S	F	N	Mi	Mo	S	F		
Pharmaceuticals	270	1 147	300	188	8	258	195	51	12	–	2 429	65.9%
Household products	24	120	17	2	–	82	91	7	1	–	344	9.3%
Technical and industrial products	36	193	30	6	–	12	30	3	1	–	311	8.4%
Recreational drugs, alcohol	14	82	57	32	1	4	17	2	1	–	210	5.7%
Plants	4	21	15	–	–	30	19	5	–	–	94	2.5%
Mushrooms	2	35	14	7	–	6	6	–	–	–	70	1.9%
Agricultural and horticultural products	3	17	5	3	1	8	2	–	–	–	39	1.1%
Venomous animals	2	15	4	4	–	1	12	1	–	–	39	1.1%
Cosmetics and personal care products	3	14	–	–	–	10	9	–	–	–	36	1.0%
Food and beverages	3	6	3	1	–	3	1	2	–	–	19	0.5%
Veterinary drugs	2	6	–	1	–	2	–	–	–	–	11	0.3%
Others or unknown agents	6	46	3	1	–	11	14	3	–	–	84	2.3%
Total	369	1 702	448	245	10	427	396	74	15	0	3 686	100%

Severity of poisoning: N = no symptoms, Mi = minor, Mo = moderate, S = severe, F = fatal



Animal poisoning

Animals involved

The 1 236 calls received concerned the following animal species: 801 dogs, 260 cats, 56 horses/ponies, 26 cattle, 24 rabbits/hares, 12 guinea pigs, 12 sheep, 12 birds (including 1 stork), 7 rodents, 5 donkeys, 4 tortoises, 4 goats, 3 hedgehogs, 3 pigs, 2 ferrets, 1 alpaca, and 1 fish. The other cases related to several or unknown animal species.

Agents involved

Table 6 shows the number of calls for the twelve different groups of agents.

Table 6

Agents involved in calls concerning animals

Agent groups	No. of cases	
Plants	321	26.0 %
Agricultural and horticultural products	278	22.5 %
Human pharmaceuticals	219	17.7 %
Household products	146	11.8 %
Veterinary drugs	67	5.4 %
Food and beverages	64	5.2 %
Technical and industrial products	32	2.6 %
Venomous animals	27	2.2 %
Recreational drugs, alcohol	14	1.1 %
Cosmetics and personal care products	11	0.9 %
Mushrooms	9	0.7 %
Others or unknown agents	48	3.9 %
Total	1 236	100 %

The calls primarily concerned plants (26.0 %) followed by calls relating to agricultural and horticultural products (22.5 %), pharmaceuticals (17.7 %), household products (11.8 %), veterinary drugs (5.4 %) as well as food and beverages (5.2 %).

Severity of poisonings

Veterinarians were also requested to submit clinical reports on animal poisoning. We received a total of 224 reports which could be analysed. Of those 95 cases remained without symptoms, 79 were classified as minor and 50 cases had moderate, severe or fatal outcomes (Table 7).

Table 7
Agent groups and severity of animal poisoning

Agent groups	Outcome					Total	
	N	Mi	Mo	S	F		
Severity of poisoning							
Agricultural and horticultural products	28	16	10	3	2	59	26.3%
Pharmaceuticals	28	21	5	–	1	55	24.6%
Plants	7	6	6	4	1	24	10.7%
Veterinary products	11	9	3	–	1	24	10.7%
Household products	6	7	6	–	1	20	9.0%
Food and beverages (except mushrooms and alcohol)	5	7	2	–	–	14	6.3%
Technical and industrial products	2	4	–	2	–	8	3.6%
Recreational drugs, alcohol	3	1	1	–	–	5	2.2%
Venomous animals	1	3	–	1	–	5	2.2%
Cosmetics and personal care products	1	2	–	–	–	3	1.3%
Mushrooms	2	1	–	–	–	3	1.3%
Others or unknown agents	1	2	–	1	–	4	1.8%
Total	95	79	33	11	6	224	100%

Severity of poisoning: N = no symptoms, Mi = minor, Mo = moderate, S = severe, F = fatal



Other activities

Services

The STIC was contracted to provide principally the following services:

1. compilation of expert reports paying particular attention to unpublished experience of the STIC,
2. toxin-based anonymised case reports for the pharmaceutical and chemical industry,
3. handling medical emergency advice for Swiss products abroad (utilising safety data sheets and transport documentation) while having detailed product information available,
4. provision of medical emergency advice outside office hours for the pharmaceutical and chemical industry including unblinding in randomized clinical trials,
5. Distribution of printed materials, in particular 3 883 pamphlets.

The fee-for-service doping hotline for athletes whose establishment was mandated by Swiss Olympic was utilised 541 times.

The web site (www.toxi.ch) was updated towards the end of 2006 and replaced with a data based system which can be more easily expanded and administered. The web site was visited 206 637 times (previous year 163 704).

Senior medical staff regularly carry out clinical toxicological consultations at the Department of Internal Medicine of the University Hospital Zurich (mostly on emergency and intensive care wards).

Teaching and continuing education

The STIC continues its collaboration with the Division of Clinical Pharmacology and Toxicology at the University Hospital Zurich following the appointment of its new head Prof. Gerd Kullak-Ublick. Academic staff continue their active and regular participation in the continuing education activities in the field of clinical pharmacology and toxicology. H. Kupfer-

schmidt teaches in the post-diploma course «Risk and Safety» of the ETH (Swiss Federal Institute of Technology), the University of St. Gallen, the Paul Scherrer Institute and the Swiss Federal Institute for Snow and Avalanche Research and gave two presentations in the lecture series on Molecular Toxicology at the University of Basle.

H. Kupferschmidt lectured on toxicovigilance at the Symposium on Pharmacovigilance and Drug Safety of the Centre for Xenobiotic and Environmental Risk Research (XERR). Permanent academic staff regularly gave presentations in clinical toxicology for the postgraduate and continuing education of physicians and other members of the medical profession and professional organisations.

Four scientific contributions were made at the annual congress of the European Association of Poison Control Centres and Clinical Toxicologists (EAPCCT) and one to the Annual North American Congress of Clinical Toxicology (NACCT) in San Francisco. A workshop on drug poisonings was held in Basle at the 74th Annual Meeting of the Swiss Society for Internal Medicine and the Swiss Society of Clinical Pharmacology and Toxicology.

Research projects

The main focus of our research efforts continues to be dose-effect relationships in human poisonings, especially in overdose of pharmaceuticals. An investigation was finalised on poisonings with mefenamic acid as part of a doctoral thesis. We have started a three year project entitled «Multicentre Data Collection in European Poison Centres using Paraquat as an Example». The first part of the project «EAPCCT Monitor – Pilot Project for common European Poisoning Data Collection» was carried out. H. Kupferschmidt represented the EAPCCT at the European Commission's international project «Development of an Alerting System and the Criteria for Development of a Health Surveillance System for the Deliberate Release of Chemicals by Terrorists» (ASHT).

Collaborations

Universities: Apart from collaborating with the Division of Clinical Pharmacology and Toxicology at the University Hospital Zurich, the STIC is a member of the Centre for Xenobiotic and Environmental Risk Research at the ETH/University (XERR). This collaboration increases staff competence in general and special toxicological questions and offers the opportunity to pass enquiries on to other specialists within this centre of excellence.

Poisonings in animals were handled in part jointly with the Institute for Veterinary Pharmacology and Toxicology of the University in Zurich. A veterinarian from this Institute, Dr. med. vet. J. Kupper, works part-time at the STIC and is responsible for the areas of plant toxicology and poisonings in animals.

Authorities: It is the state's responsibility to protect its population from exposure to dangerous chemicals. By systematically gathering and evaluating incident data, necessary measures can quickly be taken to limit any potential damage and to recommend amendments to existing legislation to avoid such incidents in future. The new chemicals law has abolished comprehensive authorisation and registration of all compounds and preparations. Correspondingly, new ways had to be found to ensure protection of the population's health, and the STIC has taken on parts of these. This involves particularly the availability of a Poisons Centre for exposures with chemicals and compounds covered by this law. The Federal Office of Public Health (FOPH) benefits from the competence and 24 hour service of the STIC, and the STIC in exchange benefits from access to the database and search requests by the Federal Office of Public Health. As part of a service level agreement the STIC has constant access to the confidential data in the Federal Office of Public Health's product database Indatox Plus.

In 2006 the STIC provided quarterly reports to the Federal Office of Health on exposure to substances and products and prepared several documents aimed at educating about, and

preventing exposure to toxic chemicals and products. The STIC wrote fact sheets on lamp oil, anti-freeze and GHB. Another report dealt with respiratory symptoms following inhalatory exposure. A separate project compared poisoning in a few countries including Switzerland using other poisons centres' annual reports. Furthermore, the STIC prepared additional pages for the new online edition of Toxicology of Household Products.

S. Lüde and H. Kupferschmidt are members of the working group «Selected Foreign Substances and Ingredients in Foods» (AFIL) of the Federal Office of Public Health, C. Rauber-Lüthy is a member of the Swiss Federal Commission on ABC Protection (KomABC).

The Swiss Agency for Therapeutic Products (**Swissmedic**) has contracted the STIC to ensure toxicovigilance for pharmaceuticals. This helps Swissmedic in the early detection, risk assessment, handling and prevention of poisoning with animal and human medicines. The STIC notifies Swissmedic of new or unusual toxicity and prepares a quarterly analysis on poisoning with pharmaceuticals as well as abuse of drugs and medicines. The STIC thus plays an important role in ensuring drug safety in the areas of overdose and misuse.

The STIC collates information on undesired drug effects as part of the national pharmacovigilance network in collaboration with the Division of Clinical Pharmacology and Toxicology at the University Hospital Zurich.

International: The STIC collaborates closely with partner poisons centres abroad and gains access to other networks (such as Toxbase in the UK and Toxinz in New Zealand). It is represented in working groups of the Society for Clinical Toxicology representing German-speaking poisons centres whose current president is A. Stürer. The STIC is also represented in the Executive Committee of the European Association of Poisons Centres and Clinical Toxicologists (EAPCCT). H. Kupferschmidt was voted President-elect in 2006. He has been webmaster of the European Association's website for several years now.



■ The Swiss Antidote Network

Distribution and storage of antidotes in Switzerland is uniformly regulated by order of the Swiss conference of the cantonal directors of public health (CDS). Information on the individual antidotes and their availability is published regularly in the Swiss List of Antidotes. Antidotes are classified in three complementary categories based on the frequency of poisonings, on the location where an antidote is needed, and its availability. In general antidotes are only included in the list if they do not belong to standard range available at pharmacies in the community and in hospitals.

The inclusion criteria stipulate that:

1. the substance is used as a classic antidote;
2. the substance used as an antidote is not commonly available in hospitals;
3. the quantity of the drug if administered as an antidote exceeds the quantity that is usually available in hospitals for therapeutic use;
4. the use of the drug as an antidote is not well known. The Swiss List of Antidotes does not aim to be fully comprehensive, but wants to ensure the safe and rapid availability of the selected substances.

News 2007: More than half of the products on the antidote list are not registered and have to be imported directly from the manufacturers or from pharmacies near the border on the basis of paragraph 36 of the Swiss medical licensing regulations. Since many antidotes are orphan drugs and not commercially attractive and registration is expensive we do not expect this situation to change. In principle there are three ways to distribute medicines outside the normal registration procedures 1) by utilising drug monographs or the pharmacopoeia, 2) simplified registration with corresponding documentation and 3) direct import where there are no comparable products available in Switzerland.

Table 8

The categories of antidotes on the Swiss Antidote List

Basic supply available at pharmacies in the community: activated charcoal, biperidene (tablets), calcium gluconate (hydrogel), simeticone (drops or tablets).

Basic supply available at hospital pharmacies: amyl nitrite, atropine (1 ml), biperidene (ampoules), calcium gluconate (ampoules), colestyramine, dantrolene, ethanol, flumazenil, glucagon, insulin, magnesium, N-acetylcysteine (vials), naloxone, sodium bicarbonate, sodium polystyrene sulfonate, neostigmine, phytomenadione (vit. K), pyridoxine (vit. B₆).

Additionally available at regional centres: atropine (100 ml), calcium-disodium-EDTA, desferrioxamine, digitalis antidote, dimethylaminophenol (4-DMAP), dimercaptopropane sulfonate (DMPS, Unithiol), dimercaptosuccinic acid (DMSA, Succimer), iron-(III)-hexacyanoferrate(II) (Prussian blue), fomepizole, hydroxycobalamine, methylene blue, octreotide, obidoxime, phentolamine, physostigmine salicylate, silibinin, sodium thiosulfate.

Regional centres and their telephone numbers are included in the list.

Special supplies: The availability of antivenins for venomous snake bites can be seen on the list of the Swiss Antivenin Depot Network ANTIVENIN-CH (www.toxi.ch).

Botulinus- and Diphtheria-Antitoxin are stored at the Swiss Army's pharmacy and can be obtained via STIC.

The Swiss Antivenin Depot Network ANTIVENIN-CH comprises the pharmacies of the University hospitals in Berne (Inselspital), Geneva and Zurich, the cantonal hospitals in Chur and Münsterlingen, and the Ospedale San Giovanni in Bellinzona.

Calcium gluconate (Glucocalcium Streuli) is no longer available, however Calcium-Sandoz is. **Diphtheria antitoxin** is now available in the armed forces pharmacy. High dose insulin in combination with glucose is regularly used in the treatment of poisonings with calcium channel blockers. **Anti-digitalis-antibodies** are now available as DigiFab™ (40 mg). **Calcium di-sodium EDTA** is only available from Laboratoires SERB.

The cantonal pharmacy in Zurich stores decontamination products and antidotes for radionuclides in agreement with the Swiss Accident Insurance Society (SUVA). The products are available to all hospitals and pharmacies if and when required.

The Swiss List of Antidotes is updated annually by a special working group of the STIC and the Swiss Association of Hospital Pharmacists. It is published in the Bulletin of the Swiss Federal Office of Public Health and can also be viewed on the Internet at «www.toxi.ch» or at «www.pharmavista.net».

Members of the working group are M. Eggenberger (Aarau), C. Fähr (Winterthur), S. Mühlebach (Bern), N. Vernaz (Geneva), Ch. Rauber-Lüthy (Zurich), A. Züst (Zurich) and H. Kupferschmidt (Chairman, Zurich).



Publications

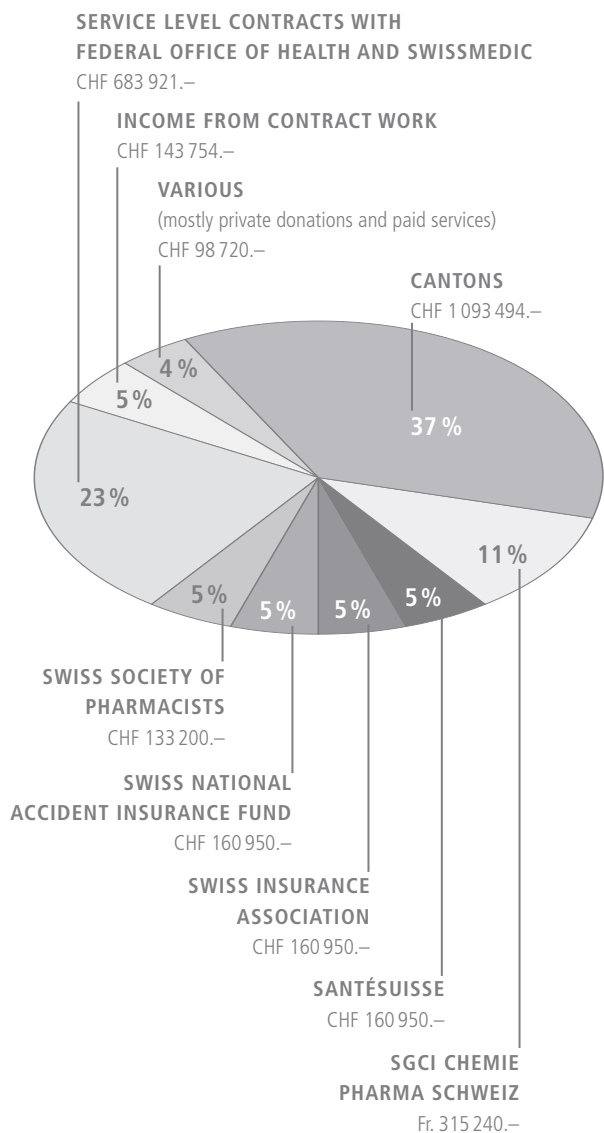
	Order number		Order number
Antidote bei Vergiftungen 2006. Fäh C., Vernaz N., Rauber-Lüthy Ch., Mühlebach S., Züst A., Eggenberger M., Kupferschmidt H. Bulletin Bundesamt für Gesundheit 5, 89-99, 2006.	1-06	Acute Respiratory Syndrome After Inhalation of Waterproofing Sprays: A Posteriori Exposure-Response Assessment in 102 Cases. Vernez D., Bruzzi R., Kupferschmidt H., De-Batz A., Droz P., Lazor R. Journal of Occupational and Environmental Hygiene 3, 250-261, 2006.	12-06
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Das Tox für alle (Vergiftungs-)Fälle. Rauber-Lüthy Ch. Clinicum 2, 40-42, 2006.	10-06		
Categorization Systems for Substances in Poisons Centres (Abstract). Stürer AW., Hüller G., Desel H., Kupferschmidt H., Weilemann LS. Clinical Toxicology 44 (4), 422-423, 2006.	11-06		

The publications listed above may be ordered quoting the relevant order numbers via telephone (+41 44 251 66 66), fax (+41 44 252 88 33), or by e-mail to info@toxi.ch.

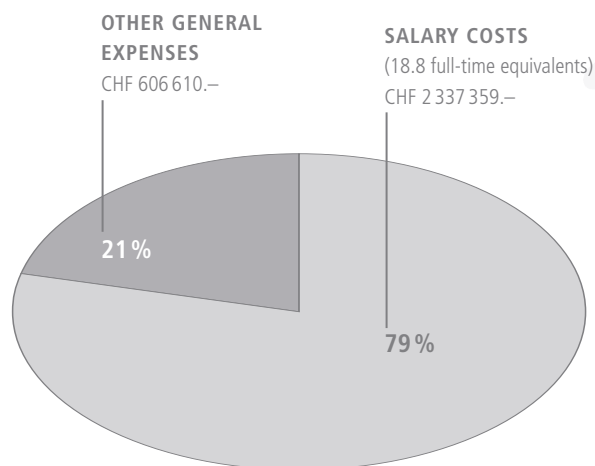
In addition, the revised leaflet about first aid and poisoning prevention is available as well as emergency telephone number stickers in German, French and Italian. Dissertations are only available on loan.

Income and expenditure

Income CHF 2 951 179.–



Expenditure CHF 2 943 969.–





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- the Swiss Society of Pharmacists (SSP)
- the SGCI Chemie Pharma Schweiz
- the Swiss National Accident Insurance Fund (SNAIF)
- the Swiss Insurance Association (SIA)
- the santésuisse (SAS).

The Federal Office of Health (BAG, consumer protection directorate) has a service level agreement with the STIC for tasks in compliance with the chemicals law. Swissmedic pays for services in the area of toxicovigilance of drugs, also on the basis of a service level agreement. Substantial donations and contributions are also received from private companies and individuals.

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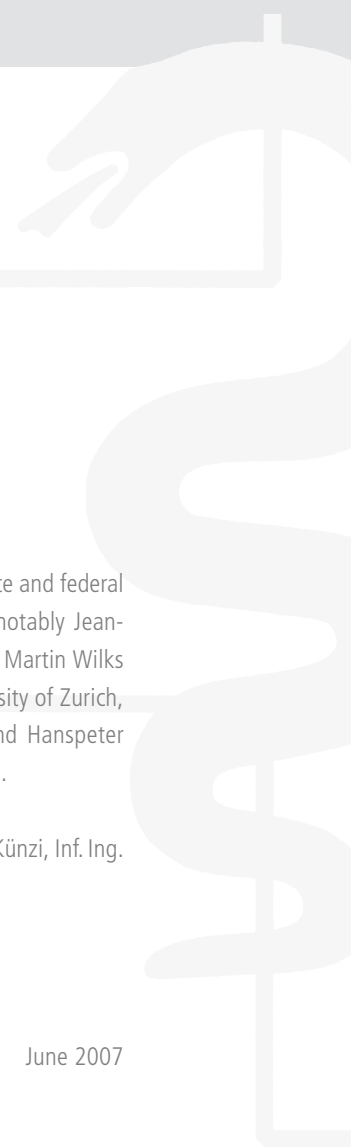
Advisers

Numerous experts from hospitals, institutes, state and federal organisations act as honorary advisers, most notably Jean-Pierre Lorent (former Director of the STIC), Dr. Martin Wilks (Syngenta), Prof. Dr. med. Philippe Hotz (University of Zurich, occupational and environmental medicine) and Hanspeter Neukom (Kantonales Labor Zurich, mycologist).

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