



Swiss Toxicological
Information Centre

Annual Report 2001

www.toxi.ch

Support

The Swiss Toxicological Information Centre (STIC) is supported by a private foundation for public benefit, as well as by the Swiss Conference of the Cantonal Ministers of Public Health (CDS).

The supporting organisations are:

- the Swiss Society of Pharmacists (SSP)
- the Swiss Society of Chemical Industries (SSCI)
- the Swiss National Accident Insurance Fund (SNAIF)
- the Swiss Insurance Association (SIA)
- the santésuisse (SAS).

Substantial donations and contributions are also received from private companies and individuals.

Foundation Council

President: Dr. F. Merki (SSP)

Vice-President: Dr. D. Grauer (SSCI)

Members: H.P. Brändle (SIA), Dr. M. Brentano-Motta (SSP), A. Grüninger (State Councillor, CDS), Dr. M. Kuster (SSCI, since 5.7.01), Dr. W. Morger (SNAIF), U. Müller (SAS), Dr. W. Pletscher (CDS), Dr. H. Reust (SFOPH), Dr. B. Schläppi (SSCI), Dr. E. Stahel (SSCI), Dr. J.-Cl. Tarchini (SSP).

Honorary President: Dr. Dr. h.c. A. Nisoli

Management

Medical Director: Prof. Dr. med. P.J. Meier-Abt

Administrative Director: J.P. Lorent

Head Physician: Dr. med. H. Kupferschmidt

Senior Residents: Dr. med. M. Guirguis, Dr. med. Ch. Rauber, Dr. med. S. Schnorf

Staff

med. pract. Karin Christen, med. pract. Ivan Curjurić, Joanna Farmakis, med. pract. Monika Fehr, Rose-Marie Hauser-Panagl, Dr. med. Myriam Hoefter-Büchel (since 3.9.01), Dr. med. Katharina Hofer, cand. med. Julia Jordi, Christoph Kronenberg (since 20.3.01), Dr. med. Marta Wilfrida Kunz, Elisabeth Malnati-Rissi, dipl. pharm. Andrée Meier-Abt, Dr. pharm. Jessica van Montfoort, Evelyne Muggli (30.7.01 until 13.12.01), Antonia Nauser, Simone Nüesch (until 3.5.01), med. pract. Sandra Palenzona, Allan Pospisil, Gabriela Pintadu-Hess, Dr. med. Dragana Radovanovic-Ivosevic, Petar Radovanovic (since 13.8.01), Dr. med. Christiane Reif (until 30.11.01), Dr. med. Katrin Rohling (since 8.1.01), med. pract. Marianne Rüegg, Trudy Saile-Schneider, Andrea Schälchli (since 1.5.01), Dr. med. Matthias Schnorf (since 1.11.01), Yolanda Seidel, Franziska Spahr (until 30.4.01), Christian Spring (until 11.7.01).

Advisers

Numerous experts, mainly from hospitals, institutes, as well as state and federal offices, act as honorary advisers.



■ Contents

- 2 **Editorial**
- 3 **Introduction**
- 4 **Emergency and information service**
 - 4 Overall view of all calls
 - 6 Human poisoning
 - 16 Animal poisoning
- 19 **Other activities**
 - 19 Services
 - 19 Education
 - 20 Research projects
 - 20 Cooperations
- 21 **The Swiss Antidotes Network**
- 22 **Focus:**
 - Calling up the STIC – its value in the eyes of the public and its effect on Public Health costs**
- 23 **Income and expenditure**
- 24 **Donations**
- 25 **Publications**

Editorial

Dear Readers

The STIC's work load is continuously increasing. Fortunately it's the need for information that's on the up and not the number of life-threatening poisonings.

This annual report aims to illustrate what the public's demands are, what hospital physicians and general practitioners are dealing with, and what we have experienced in meeting all these demands.

What we have learned from specific cases and larger events, in partnership with the Department of Clinical Pharmacology and Toxicology at the University Hospital Zurich, results in specialised publications (see page 25) and continually updated entries on our internet web site (www.toxi.ch). After the terror attacks in the USA, we have, together with the Swiss federal authorities, concerned ourselves with the dangers of biological and chemical weapons. Improved information, a first class network of experts and the availability of antidotes are of paramount importance.

Our internet site as a source of information has been expanded; the number of visitors to the site in 2001 has again doubled.

The services of the STIC as a nation-wide 24 hour emergency consulting centre with modern IT are increasingly being prevailed on by other organisations. Good examples are the Swiss Federal Office of Public Health (professional statements and reports), SWISSMEDIC (notification of adverse reactions to drugs), SWISS OLYMPIC (doping hotline) and the industrial companies (availability of emergency information).

Thanks to sturdy financial support from many directions, the STIC has weathered the year 2001. However, our worries are far from over. Ever increasing and more challenging demands made on our team have created the need for additional reinforcements; the means to finance this step have only partially been met.

While thanking all our supporting agencies, clients and donors, I add to it our hope that we can continue to count on their continued support and that we may enlarge the circle of supporters in order to be able to undertake all that is necessary, not only when emergencies arise, but also in preventing them.

DR. FRANZ MERKI

PRESIDENT OF THE FOUNDATION COUNCIL

■ Introduction

The number of inquiries handled by the STIC in 2001 increased by a further 4.5% to a total of 32 330 calls. In parallel, the number of visitors to the Centre's internet website doubled to 40 415. Most requests came from lay persons and hospital physicians. Additional workload was created by intense media interest in the STIC's activities and an increase of requests for special expertises. The increased demands placed on a team whose budget remained the same meant optimising internal work management. Special cases were solved with the assistance of toxicologists at the neighbouring University Hospital of Zurich and the Swiss Federal Institute of Technology. It is in this respect that our cooperation with XERR, Centre for Xenobiotic and Environmental Risk Research is especially beneficial.

This year's annual report will again furnish you with the usual details concerning call statistics, type and severity of poisoning, educational activities, research projects, cooperations, the Swiss Antidotes Network, and publications. It also contains provisional results of a survey conducted on «Consulting by the STIC; its value in the eyes of the public and its effects on Public Health costs» (page 22). The survey shows that around 46% of the lay callers could be helped by the STIC, eliminating the need for unnecessary doctors' consultations. This means that an estimated 5000–8000 contacts with the Public Health Service could be saved. The vast majority of callers were very satisfied with the STIC's services. The results of the survey are in unison with the experiences of Poison Centres abroad. They prove that a competent clinical toxicological consultation for lay persons contributes to substantial savings in Public Health. A similar survey is planned for general practitioners and hospital physicians to clarify whether specific consulting on poisonings by the STIC also contributes to savings in the medical area (e.g. avoidance of, or reduced length of hospitalisation).



Emergency and information service

The main services of the STIC are the phone consultations for lay people and physicians in cases of acute and chronic poisoning. In addition, the centre answers theoretical questions and contributes to the prevention of accidental poisoning.

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

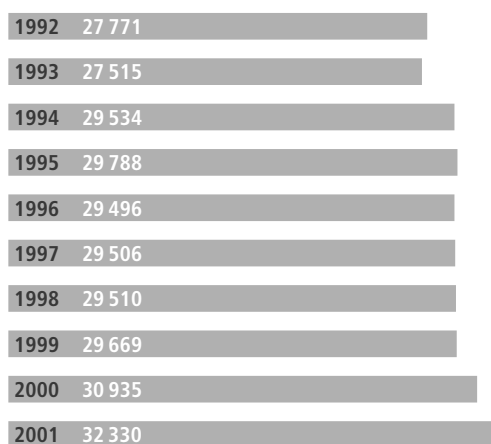
Overall view of all calls

Use of the service

In 2001, the information service of the STIC was called 32 330 times, which represents an increase of 4.5% over the previous year.

Figure 1

Number of calls to the centre over the last ten years



Origin of calls

The largest number of calls came from the general public (62.2%). These calls reflect the need for information by the population, and they also mirror the degree of how well the STIC is known. The largest proportion of public calls originated from the canton of Zurich (4.7 per 1 000 inhabitants). Fewest calls came from the cantons of Jura, Ticino, Nidwalden and Obwalden.

Physicians used our service 9 643 times. Compared with the year 2000 there was an increase of + 365 calls by hospital physicians, and a slight increase in consulting to general practitioners was observed (+ 35). Based on head of population, the largest proportion of physician calls came from the cantons of Basel-Stadt and Jura, followed by the cantons of Geneva and Zurich. Veterinarians accounted for 560 calls to the STIC, and pharmacists 527.

The STIC also supplies information to the media (newspapers, radio and television), as well as to emergency services, homes, companies, and foreign toxicological centres. In 2001 we received a total of 1 510 information requests from such organisations.

Table 1
Origin of calls

Canton	Population	General public	Hospital doctors	Practitioners	Veterinarians	Pharmacists	Various organisations	Total	Calls per 1000 inhab.	
									Public	Physicians
AG	544 306	1 463	376	122	48	43	71	2 123	2.7	1.0
AI	15 021	28	3	5	1	–	–	37	1.9	0.6
AR	53 515	102	33	12	8	3	6	164	1.9	1.0
BE	943 696	2 513	727	270	108	55	161	3 834	2.7	1.1
BL	260 036	675	239	59	21	11	38	1 043	2.6	1.2
BS	187 667	538	340	60	9	14	78	1 039	2.9	2.1
FR	236 339	531	235	51	21	29	30	897	2.2	1.3
GE	408 820	883	603	127	21	44	46	1 724	2.2	1.8
GL	38 546	124	32	11	2	1	4	174	3.2	1.1
GR	186 744	399	160	81	16	19	20	695	2.1	1.4
JU	68 794	97	107	17	5	9	9	244	1.4	1.9
LU	347 209	701	287	119	29	13	47	1 196	2.0	1.2
NE	165 731	339	235	35	16	21	27	673	2.0	1.7
NW	38 000	56	7	7	–	–	4	74	1.5	0.4
OW	32 414	56	25	13	–	–	5	99	1.7	1.2
SG	449 399	1 272	349	130	34	12	56	1 853	2.8	1.1
SH	73 305	186	79	18	10	–	20	313	2.5	1.5
SO	244 015	484	134	55	16	3	27	719	2.0	0.8
SZ	130 232	257	68	41	10	5	14	395	2.0	0.9
TG	227 306	484	139	64	19	2	39	747	2.1	1.0
TI	310 215	413	255	48	9	20	33	778	1.3	1.0
UR	35 246	57	14	6	1	1	3	82	1.6	0.6
VD	620 294	1 536	639	131	39	82	92	2 519	2.5	1.3
VS	276 170	426	253	81	18	28	29	835	1.5	1.3
ZG	99 388	257	94	33	4	2	20	410	2.6	1.3
ZH	1 211 647	5 720	1 611	505	84	104	549	8 573	4.7	1.8
FL	32 863	67	11	10	1	1	4	94	2.0	0.7
Foreign	–	214	404	52	9	3	60	742	–	–
Unknown	–	212	7	14	1	2	18	254	–	–
Total	7 236 918	20 090	7 466	2 177	560	527	1 510	32 330	2.8	1.4
%	–	62.2	23.1	6.7	1.7	1.6	4.7	100	–	–

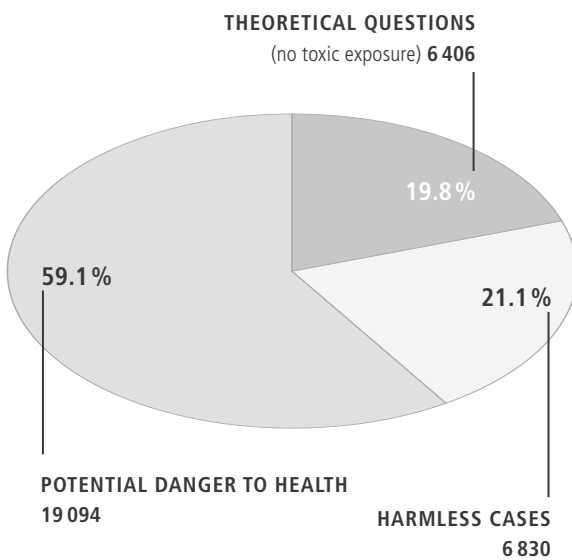


Types of calls

Calls can be categorised into theoretical questions without exposure and those with exposure. In cases of exposure a difference must be made between harmless situations where no or no relevant symptoms are expected, and cases of potential or definite danger to health.

Figure 2

Types of calls (n = 32 330)



Among the 6 406 calls without toxic exposure, frequent questions pertained to drugs and antidotes, toxicity of plants for children and pets, and to dangers of poisoning from spoilt food, household products and chemicals. To this group too, belongs advice and documentation for authorities, media, individuals and various organisations.

The 25 924 calls following toxic exposure concerned 24 920 humans and 1 004 animals. The following section will discuss

human poisoning, while animal poisoning will be dealt with in a separate section (page 16).

Human poisoning

The calls with toxic exposure (24 920) are presented in table 2. Children were concerned in 50.6% of the cases, adults in 48.8%. In 151 cases (0.6%), the age group remained unknown.

The most frequent incidents concerned children under five years of age (37.8%). The proportion of harmless cases was significantly higher in children (18.6%) than in adults (8.0%). In contrast, the proportion of potentially severe cases was somewhat higher in adults (40.8%) than in children (32.0%). Boys predominated slightly among the children (22.2% vs. 18.3%), women among the adults (24.4% vs. 16.4%).

Table 2

Age and gender of human cases with toxic exposure

		Harmless cases		Potentially severe cases		Total	
Children		4 616	18.6%	7 975	32.0%	12 591	50.6%
Age	< 5 years	3 366	13.5%	6 046	24.3%	9 412	37.8%
	5 – < 10 years	312	1.3%	605	2.4%	917	3.7%
	10 – < 16 years	144	0.6%	656	2.6%	800	3.2%
	unknown	794	3.2%	668	2.7%	1 462	5.9%
Sex	girls	1 576	6.3%	2 984	12.0%	4 560	18.3%
	boys	2 055	8.3%	3 458	13.9%	5 513	22.2%
	unknown	985	4.0%	1 533	6.1%	2 518	10.1%
Adults		1 998	8.0%	10 180	40.8%	12 178	48.8%
Sex	female	960	3.9%	5 113	20.5%	6 073	24.4%
	male	656	2.6%	3 450	13.8%	4 106	16.4%
	unknown	382	1.5%	1 617	6.5%	1 999	8.0%
Unknown		57	0.2%	94	0.4%	151	0.6%
Total		6 671	26.8%	18 249	73.2%	24 920	100%

Circumstances of poisoning

Table 3 shows the circumstances of poisoning in 24 920 cases. **Accidental acute intoxications** (17 994) made up the biggest part. These occurred most frequently at home; especially by children ingesting easily accessible drugs, household products or parts of plants. Adults too were involved in toxic exposures at home, but a significant number of poisonings occurred at the working place (920).

Acute intentional poisoning was mostly suicidal (4 133 cases), less frequently due to drug abuse (511 cases) and rarely to criminal behaviour (64 cases).

Chronic poisoning was relatively rare (795 cases). **Adverse reactions to drugs in therapeutic doses** led to 319 information requests.



Table 3
Circumstances of toxic exposures

Circumstances of toxic exposures		Acute intoxications (Exposure <8h)		Chronic intoxications (Exposure >8h)	
Accidental domestic	15 749	63.2%	208	0.8%	
Accidental occupational	920	3.7%	162	0.7%	
Accidental environmental	46	0.2%	36	0.1%	
Accidental others	1 279	5.1%	161	0.6%	
Total accidental	17 994	72.2%	567	2.2%	
Intentional suicidal	4 133	16.6%	20	0.1%	
Intentional abusive	511	2.0%	72	0.3%	
Intentional criminal	64	0.3%	14	0.1%	
Intentional others	808	3.2%	122	0.5%	
Total intentional	5 516	22.1%	228	1.0%	
Total accidental and intentional	23 510	94.3%	795	3.2%	
Total acute and chronic		24 305	97.5%		
Adverse drug reactions		319	1.3%		
Unclassifiable		296	1.2%		
Total		24 920	100%		

Agents involved

Table 4 shows the frequency of exposure to the 12 groups of agents involved in the 24 920 cases of human poisoning.

Most toxic exposures occurred with drugs (37.3%), followed by household products (23.1%) and plants (10.1%). The severity of poisoning in the single agent groups will be discussed later in this section.

Severity of poisonings

6 563 inquiries from physicians (68% of all medical calls) concerned cases with potential or effective poisoning. In these cases, the treating physicians received a written confirmation of the phone consultation, together with a request for a clinical feedback. The STIC received a report on the outcome in 69% of these cases.

Table 4

Agent and age groups involved in human poisoning

Agent groups/Age groups	Adults	Children	Age unknown		Total
Drugs	5 589	3 675	22	9 286	37.3%
Household products	1 873	3 853	40	5 766	23.1%
Plants	463	2 034	9	2 506	10.1%
Technical and industrial products	1 489	391	14	1 894	7.6%
Toilet articles and cosmetics	169	933	1	1 103	4.4%
Recreational and abused drugs	527	430	–	957	3.8%
Food and beverages	588	295	23	906	3.6%
Products used in agriculture and horticulture	376	477	9	862	3.5%
Poisonous animals	310	136	4	450	1.8%
Mushrooms	224	114	8	346	1.4%
Veterinary drugs	22	48	–	70	0.3%
Other or unknown agents	548	205	21	774	3.1%
Total	12 178	12 591	151	24 920	100%

The clinical reports were classified according to causality and symptom severity. This annual report will consider only cases with confirmed or probable causality. Confirmed causality means the agent can be found analytically in the body, the outcome and symptoms are compatible to the toxin, and the symptoms could not have been triggered by an underlying illness or any other cause. Probable causality contains the same criteria, except that the agent is not detected in the body.

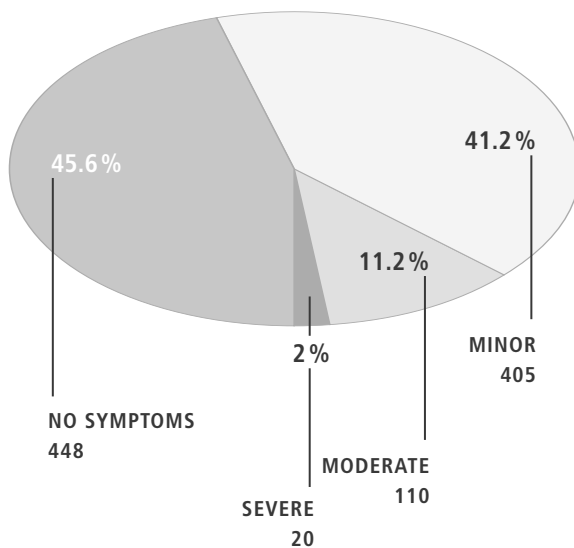
On the basis of the clinical outcome, 3 943 medical cases with or without symptoms, and with adequate causality were further analysed.

983 cases concerned children and 2 960 adults. The clinical outcome of these cases is documented in figure 3. These are grouped into cases with no symptoms, minor, moderate and severe, or fatal outcome. Minor symptoms generally require no treatment; moderate cases are generally treated, and cases with severe symptoms must be treated invariably.

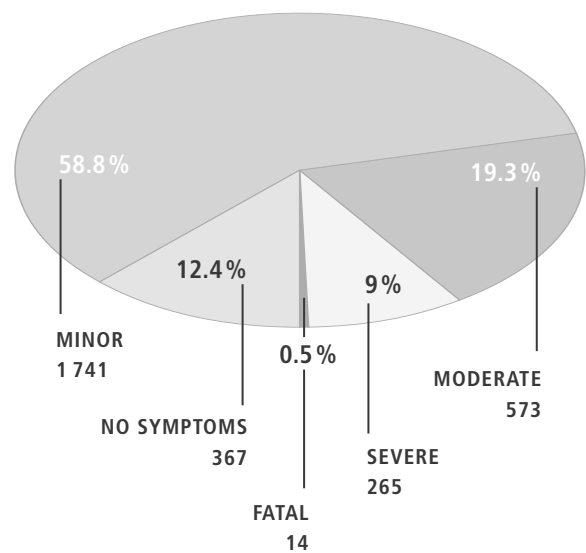


Figure 3
Clinical outcome of poisoning cases by children and adults

Children (n = 983)



Adults (n = 2 960)



Among children, a little bit less one half (448 = 45.6%) experienced no symptoms; among adults, only 367 (12.4%) were without symptoms. Minor symptoms were observed in 405 children (41.2%) and in 1 741 adults (58.8%). Moderate symptoms appeared in 110 children (11.2%) and 573 adults (19.3%). Severe poisoning occurred in 20 children (2.0%) and 265 adults (9.0%). Among the adults, occurred 14 fatal cases (0.5%).

Of the 3 943 cases with confirmed or probable causality (table 5), about three fifths were mono-intoxications. In approximately two fifths of the cases, two or more agents were involved. These combined intoxications have been classified under the most important agent in this annual report. In the cases with analysed medical feedback therapeutic drugs were the most frequent cause of poisoning (67.2%), followed by household products (9.9%), and in third place by technical and industrial products (7.5%).

Table 5
Agent group frequency and severity of human poisoning

Agent groups Severity of poisoning	Adults					Children					Total	
	N	Mi	Mo	S	F	N	Mi	Mo	S	F		
Drugs	279	1 195	391	200	8	290	201	75	14	–	2 653	67.3%
Household products	27	123	18	6	2	67	93	14	1	–	351	8.9%
Technical and industrial products	29	177	31	11	1	10	34	5	–	–	298	7.5%
Recreational and abused drugs	8	83	76	41	–	11	16	10	4	–	249	6.3%
Plants	6	20	14	2	–	20	10	–	–	–	72	1.8%
Products used in agriculture and horticulture	4	19	7	–	1	27	8	1	–	–	67	1.7%
Mushrooms	4	24	13	4	1	4	3	2	–	–	55	1.4%
Poisonous animals	2	12	9	–	–	4	12	2	1	–	42	1.1%
Toilet articles and cosmetics	2	14	2	–	–	7	12	1	–	–	38	0.9%
Food and beverages	1	15	6	–	1	1	2	–	–	–	26	0.7%
Veterinary drugs	–	1	1	–	–	–	–	–	–	–	2	0.1%
Other and unknown agents	5	58	5	1	–	7	14	–	–	–	90	2.3%
Total	367	1 741	573	265	14	448	405	110	20	0	3 943	100%

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

Drugs: In 2001 the STIC was contacted in 9 286 cases after drug ingestion (table 4), eight cases of which were fatal (table 5). These cases concerned drugs like lithium, tricyclic antidepressants, and opiates with a narrow therapeutic window. In one case, accidental ingestion of potassium permanganate by a confused patient led to severe corrosion and ultimately death.

680 cases of toxic exposure were moderate or severe (table 5). Adults dominated with 591 cases as against 89 children. As every year, in adults the most frequently ingested drugs were tranquillizers (benzodiazepines), analgesics, and antidepressants (serotonin reuptake inhibitors and tricyclics). Here the spectrum is very wide. Two cases were unusual where lead poisoning resulted after chronic use of foreign herbal preparations. In both cases a raised blood lead level was confirmed as cause of anemia. Chemical analysis of the herbal preparation confirmed the lead contamination of the herbal preparations.



The 89 cases of moderate and severe poisonings in children can be divided into two large groups. Adolescent drug abuse often led to intoxications as a result of intentional overdosage of therapeutic drugs such as dextromethorphan, methylphenidate, and diphenhydramine. Young children's cases were generally accidental—frequently erroneous dosages administered by lay or medical staff led to severe outcomes. In one case, for example, the administration of a faulty fabricated gelatine capsule to a one-month girl with a congenital heart defect resulted in a severe digoxin poisoning. After hospitalisation and treatment with digoxin antibodies, the baby recovered well.

Many of the clinical reports deal with cases showing no symptoms or only minor symptoms. These reports from physicians are of great importance especially when they concern new drugs. Such information in tandem with medical literature is our most important source in determining critical doses and severity of poisoning in overdosages. In 2001 we directed special attention to olanzapine (Zyprexa®) and methylphenidate (Ritalin®). In the case of olanzapine, a new atypical neuroleptic, reports of moderate poisoning were registered already after the taking of 80 mg. Characteristically these cases followed fluctuating courses where somnolence was interrupted by phases of severe agitation. The only severe outcome with convulsions and coma occurred after the ingestion of 560 mg olanzapine.

The use of methylphenidate in Switzerland increased 7-fold between 1996 and 2001. Our analyses show that even slight overdosages, especially by children and adolescents, can lead to agitation, tachycardia, and hypertension, but no severe symptoms were found in oral ingestions up to 22 mg/kg (children) and 31 mg/kg (adults).

Household products: This was the second largest agent group concerned, generating 5 766 calls. In addition to the frequent inquiries surrounding washing and cleaning products, broken mercury thermometers were a frequent cause of concern. While ingested metallic mercury cannot be absorbed into the body through the gastro-intestinal mucosa, evaporated mercury can lead to toxic concentrations in small ill-ventilated rooms. Intoxications by inhalation can be prevented by thorough airing and cleaning of the room.

Compared with the high number of cases, household products seldom led to severe or fatal outcomes. In five of six cases corrosive products caused lesions of the gastro-intestinal tract or the eyes. Two elderly men died of the consequences of ingesting gasoline and lamp oil; the tracheobronchial aspiration of these petrol distillates led to severe pneumonia and death. Pneumonia caused by lamp oil was also the cause of the one severe pediatric case. Petrol distillates remain a relevant problem area—fortunately lamp oil cases have halved in the last five years, but other petrol distillates show no such decline.

Plants: After a constant increase of plant exposures in the last ten years, the number in 2001 has stabilised (table 4). There was a slight rise in adult cases from 443 to 463; in children a drop from 2 179 to 2 034. The STIC's preventive information activity on dangers of poisonous plants for children, at home as well as on play and sports grounds, may have contributed to this decrease. Lists of poisonous garden, wild and pot plants are freely distributed. A growing number of illustrated plant toxicity texts can be found on the internet at www.toxi.ch.

Despite the considerable number of calls concerning plants, no case had a fatal outcome (table 5). Two had a severe out-

come and 14 a moderate outcome. All pediatric cases showed minor or no symptoms. Abusive use of angel's trumpet and thorn apple as hallucinogens, and accidental ingestion of deadly nightshade varieties were the cause for numerous moderate and severe poisonings last year. Last year for the first time we saw intoxications due to mandragora officinarum, also known as mandrake. For centuries this plant, which is native to the Mediterranean region, has been an ingredient in magic potions and ointments. As deadly nightshade, it contains atropine and scopolamine. After consuming a mandrake tea, a young man became comatose, tachycardic and hypertensive. Another man, after consuming «wild vegetables» picked in Greece, suffered a moderate intoxication with hallucinations, dilated pupils and urine retention. He had probably confused the supposed wild vegetables with mandrake. Further cases of potentially dangerous mistaken plant identities involved the erroneous ingestion of castor oil plant seeds instead of sunflower seeds, and consumption of ornamental pumpkin instead of edible pumpkin. Ten cases concerned splashing with the milky juice of spurge (*Euphorbia* sp.), which led to one moderate and one severe corneal erosion. Moderate outcomes were also seen after abusive use of Hawaiian woodrose (*Argyrea nervosa*) and ingestion of lilies of the valley.

Technical and industrial products: 1 894 calls were registered in this group (table 4). Of the 1 082 exposures at the work place, 675 (62%) involved an agent from this group. In acute occupational accidents risk assessment and directions for appropriate treatment were of foremost importance. In chronic exposures the callers often asked for an expert opinion about the causal relationship between symptoms present and chemical products as a possible cause.

Non-occupational accidental toxic exposures with technical and industrial products also occurred. Especially dangerous is the filling of high potency poisons into drinking bottles. This exposure was reported several dozens of times in 2001.

Technical and industrial products gave rise to 48 significant cases of poisoning, namely one fatal, eleven severe, and 36 of moderate severity (table 5). The fatality resulted from self-inflicted poisoning with cyanide. The severe and moderate intoxications were caused mainly by highly irritating or corrosive substances. As a consequence they led to severe irritation of the respiratory tract or corrosions of the skin, eyes or the gastro-intestinal tract.

Toilet articles and cosmetics: The largest part of the 1 103 calls in this agent group (table 4) came from lay persons. They mostly concerned children who had ingested small amounts of perfume, soap, shampoo, baby care products, dental care products, or nail varnish remover. Apart from mild irritations these cases had harmless outcomes. In only three cases moderate outcomes were reported (table 5). An infant swallowed a mouthful of liquid hairspray resulting in bronchoconstriction and coughing. An adult ingested an insecticide containing diethyltoluamide, became comatose and experienced cardiac arrhythmia. A further adult confused eye drops with cuticle remover which led to injuries of the cornea.

Particularly current discussion issue in the area of cosmetics is the possible hormone-like effects of sun protection filters, and the allergic reactions to certain food preservatives. The exact influence of sun protection filters on humans has not yet been definitively clarified. Apart from any possible side-effects the experts unanimously agree that today no-one can afford to



dispense with effective sun protection. Other potentially problematic ingredients of cosmetics are isothiazolinones used as preservatives. These substances can trigger contact eczema. Around 5% of the Swiss population are sensitive to such substances; they are also used in watery paints, and sensitive persons can have allergic symptoms after a fresh painting.

Recreational and abused drugs: 957 calls were recorded in this agent group (table 4). Most inquiries concerned cigarettes and alcohol. Cigarettes were predominantly the cause of accidental ingestion by children. Most cases had harmless outcomes, and only eight outcomes were with minor symptoms of nausea, vomiting and tachycardia. Alcohol, on the other hand, was largely abused intentionally; severe outcomes were registered for three children and eight adults. In addition, alcohol was often included in combined intoxications. Other inquiries concerned cannabis, cocaine, ecstasy, and gamma-hydroxybutyrate (GHB). While no severe outcomes with cannabis occurred, there were six severe cocaine, three severe ecstasy, and 13 severe GHB poisonings. Severe symptoms also appeared in two LSD cases, and one each with amphetamines, speed and 2C-T-7 (2,5-dimethoxy-4-(n)-propylthiophenethylamine). 2001 was the first year any inquiries had been made regarding the last named substance. 2C-T-7 is a designer drug related to mescaline and generates predominantly hallucinogenic effects. In our case of severe 2C-T-7 poisoning, the symptoms were agitation, epileptic convulsions and hallucinations. Calls concerning this latter substance were recorded the first time in 2001.

Food and beverages: By far the greatest number of the 906 inquiries concerning food and beverages came from the general public (table 4). Uncertainties about spoiled meat,

eggs, milk, cheese, fish and seafood made up most of the calls, although there were also questions relating to unexpected symptoms after consumption of certain foods.

Unfortunately, 2001 saw one fatal case of botulism. This was most probably due to contaminated preserved beans (table 5). Another person survived the meal with moderate symptoms. Four of the other six cases with moderate symptom outcomes concerned nutmeg. The partially desired hallucinations were accompanied by undesired nausea, vomiting, dry mouth, tachycardia, trembling and agitation. The sixth case with moderate symptoms was a case of gastroenteritis after consumption of seafood. The sixteen cases with minor symptoms were mostly due to spoiled food, over-consumption of high-caffeine lemonades and allergic-like reactions to tuna.

Products for agriculture and horticulture (including pesticides): 862 calls were registered in this agent group (table 4); a large part from lay persons. About one-third of the inquiries concerned insecticides; further sub-groups included questions about fertilisers, snail bait, rodenticides, and ant killers.

The ingestion of parathion, an insecticide, led to one fatality (table 5). No cases with severe symptoms were recorded, while there were eight with moderate outcomes. In half of these cases insecticides were involved. Two moderate outcomes were due to ingested rodenticides which in the case of a child led to coagulation disorders. Two further moderate outcomes were caused by the herbicide glyphosate and silo gases.

Poisonous animals: The 450 calls involved poisonous animals in most cases (table 4). Tick bites were particularly fre-

quent (98%). Among the 131 calls regarding stings by bees, wasps, hornets and bumblebees, we must differentiate between envenomation from multiple stings, and allergic reactions that can arise after only one sting in sensitive persons. Further envenomations were caused by domestic and exotic snakes, spiders, insects, scorpions, caterpillars and salamanders. Contact with jellyfish, venomous fish and other dangerous marine creatures led to additional inquiries.

Eleven moderate and one severe outcomes were observed (table 5). These were mainly accidents with reptiles (nine moderate) and insects (one severe and one moderate). A ten-year-old child, while running in the forest, was stung in the hands and back by five wasps or bees which resulted in a severe anaphylactic reaction. Five children were bitten by domestic vipers. One girl, after being bitten in the foot, suffered massive vomiting, drop in blood pressure, became tachycardic, displayed ECG irregularities and oedematous swelling of the extremities. In a three-year-old child a snake bite also provoked a drop in blood pressure and severe haemorrhagic oedematous swelling of the extremities. Both children received antivenins. The cases of the three viper bites in adults also led to moderate outcomes, as did bites from various terrarium snakes (mamba, cobra, rattlesnake, and horn vipers), as well as from a spider crab and hornet stings. Contacts with sea anemones, lion fish, stingrays, and processional caterpillars concluded with minor symptom outcomes.

Mushrooms: In contrast to the year before, the weather in 2001 did not favor mushroom proliferation. Correspondingly, the number of calls to the STIC concerning mushroom poisonings dropped from 374 to 346 (table 4). Independent of the weather and seasons, hallucinogenic mushrooms, also

known as magic mushrooms, continued to be popular. Most poisonings however in this group occurred after consuming decaying edible mushrooms. In 2001 the STIC was confronted with a problem hitherto unknown: after consuming chinese dried ceps (*Boletus edulis*), several people complained of stabbing pains in the mouth and throat region. The cause could be traced to contamination by pieces of araceae containing calcium oxalate raphides. As in the Far East mushrooms and other foodstuffs are often packed in leaves of various araceae, this might have been the source of the contamination.

During 2001 we saw unfortunately a fatal case of death cup poisoning (*Amanita phalloides*). Of the other 54 well-documented mushroom poisonings (table 5), four had severe and 15 moderate outcomes. Three of the four severe cases were the consequence of unchecked mushrooms picked in the forest and garden. *Amanita pantherina*, *Cortinarius* sp., and *Russula olivacea* could subsequently be identified. *Cortinarius* can, after a latent period of a few days, lead to severe renal damage. Two of the three meals contained *cortinarius*, which led to one case of acute renal failure. In the second case the meal contained mainly *amanita pantherina* and *inocybes*. The patient was found in a comatose state; he later hallucinated and developed an aspiration pneumonia. Consumption of *psilocybes* and other hallucinogenic mushrooms caused one severe and ten moderate outcomes. After the intentional ingestion of *psilocybe* a young man became psychotic. In the cases with moderate outcome, hallucinations, panic attacks and tachycardia were observed tachycardia.

Veterinary drugs: 70 times the STIC was consulted after ingestion of a veterinary drug. In most cases it was an unin-



tentional ingestion of a small amount, and the first call could predict an unproblematic outcome. In most cases no further measures needed to be taken.

Other or unknown drugs: This group contained 774 exposures (table 4) to toxins which could not be placed in one or another specific group, or could not be identified. In this category there are for instance poisonings with combustion gas, carbon monoxide, combat and tear gases, as well as gases and vapours of unknown use and pollutants. In about a quarter of the 774 cases the toxin remained unknown. In decreasing frequency calls concerning combustion gas, pepper sprays, carbon monoxide, mould and tear gas followed.

Fortunately no fatality was registered in this category (table 5). However, during a chemical experiment, exposure to benzyl bromide led to a severe laryngospasm. Among the five moderate outcomes there were two pepper spray, two combustion gas and one carbon monoxide exposures.

Animal poisoning

Animals involved

1 004 calls were related to the following animal species: 610 dogs, 218 cats, 34 beef cattle (2 of which calves), 33 horses/ponies, 20 rabbits/hares, 13 guinea-pigs, 13 birds, 11 sheep, 6 goats, 4 donkeys, 4 tortoise, 2 chinchillas, 2 fish, 2 chickens, 2 mice, 2 rats, 2 pigs, 1 duck, 1 goose, 1 hamster, 1 kangaroo, 1 llama, 1 peacock. In the other cases, various animals not further specified were involved.

Agents involved

Table 6 shows the number of calls for the 12 different groups of agents.

Table 6
Agents involved in calls concerning animals

Agent groups	Cases	
Products used in agriculture and horticulture	314	31.3%
Plants	214	21.3%
Drugs	158	15.7%
Household products	118	11.7%
Technical and industrial products	54	5.4%
Veterinary drugs	42	4.2%
Food and beverages	20	2.0%
Toilet articles and cosmetics	15	1.5%
Recreational and abused drugs	12	1.2%
Poisonous animals	8	0.8%
Mushrooms	6	0.6%
Other or unknown agents	43	4.3%
Total	1 004	100%

The calls primarily concerned products used in agriculture and horticulture (31.3%). Then followed in decreasing frequency calls relating to plants (21.3%), drugs (15.7%), household products (11.7%), technical and industrial products (5.4%) and veterinary drugs (4.2%).

Severity of poisonings

Veterinarians were also requested to submit clinical reports on animal poisoning. From the total of 240 reports received 87 cases remained without symptoms, 83 were classified as minor and 70 cases had moderate, severe or fatal outcomes (table 7).

Products used in agriculture and horticulture (including pesticides): Six fatal and seven severe cases were recorded in this agent group in 2001. There were three fatal and three severe outcomes after ingestion of snail bait containing metaldehyde; this substance is toxic for domestic and farm animals. Rodenticides and insecticides were often administered to the wrong animal species, usually cats. One further fatality and one severe case resulted after cows consumed fertiliser.

Drugs: Drugs should be kept well locked away not only from children but from animals as well! Last year two dogs died:

Table 7

Agent groups and severity of animal poisoning

Agent groups	Outcome					Total	Total
	N	Mi	Mo	S	F		
Products used in agriculture and horticulture	40	28	16	7	6	97	40.4%
Drugs	18	20	6	2	2	48	20.0%
Plants	9	7	2	3	2	23	9.6%
Household products	9	7	3	–	–	19	7.9%
Veterinary products	8	6	5	5	3	27	11.2%
Technical and industrial products	2	4	–	2	1	9	3.8%
Poisonous animals	–	4	–	1	–	5	2.1%
Recreational and abused drugs	–	4	1	–	–	5	2.1%
Food and beverages (except mushrooms and alcohol)	–	2	–	1	1	4	1.7%
Toilet articles and cosmetics	–	1	–	–	–	1	0.4%
Other or unknown agents	1	–	1	–	–	2	0.8%
Total	87	83	34	21	15	240	100%

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



one after ingesting acetylsalicylic acid tablets, the other after consuming a calcipotriol cream. Dogs are very sensitive to these two substances. It took only a few acetylsalicylic tablets to kill the dog. There was one severe dog poisoning caused by valproic acid and another by diclofenac. Exposures with less severe outcomes were mostly due to tranquilizers and analgesics.

Plants: Three of the 23 recorded animal poisonings with clinical reports led to a fatality. Two rabbits died after consuming yew needles, and a guinea pig succumbed after consumption of oleander leaves. Another guinea pig was severely poisoned by cherry-laurel leaves. A horse that had ingested robinia leaves and bark suffered from severe colic, equilibrium and respiratory disturbances, and tachycardia; then became comatose and had to be euthanised. A welp developed violent vomiting and bloody diarrhoea after consuming poinsettia; another dog complained of severe gastro-enteritis after repeatedly ingesting snowball leaves (*Viburnum carlesii*). A cat vomited violently for more than 24 hours after ingesting beaucarnea, a plant closely related to the yucca palm. Many animal owners are not aware of the danger of thuya. A call from the public informed us about the death of several chin-chillas after ingesting thuya; the same happened to a kangaroo. Yew, laburnum, beech, robinia and other shrubs and trees which are highly toxic for animals are often components in the litter used in stables, and can thus lead to severe poisoning.

Veterinary products: Three gerbils died after having been treated with a herbal remedy for ectoparasites. Most likely they inhaled the powder and licked it from their fur. Four cats suffered severe outcomes when they were treated with per-

methrin preparations that are strictly for dogs. A further severe case involved a dog that had ingested carprofene tablets; it suffered vomiting, diarrhoea, and gastro-intestinal haemorrhage.

Technical and industrial products: One cat died from licking the diesel oil which has been used to remove tar from its fur. Two more cats and two dogs came in contact with tar. One of the dogs displayed severe symptoms, while the other three animals had no or only minor symptoms. The second severe case in this agent group concerned a dog that had ingested isopropanol and was comatous for several hours.

Poisonous animals: Three dogs were bitten by vipers. One dog developed severe symptoms while the other two displayed only swellings of the affected extremities. In addition a dog ate a toad, and another dog was stung by over 100 bees. Both these cases developed only minor symptoms.

Recreational and abused drugs: Four of the five clinical reports in this group concerned dogs that had consumed cannabis cookies. One moderate and three minor outcomes resulted. Symptoms displayed included stupor, coma, hypothermia, severe trembling, disturbed gait, and nystagmus. The fifth case involved a parrot that had ingested cigarette tobacco. Vomiting and walking disturbances were the consequences.

Food and beverages: The only fatal outcome in this group involved a sheep that had had access to a bag of cooking salt. In a horse botulism provoked severe symptoms. The two cases with minor symptoms involved a dog and a cat that had ingested chocolate.

■ Other activities

Services

Directly charged services included expertises, anonymised case analyses pertaining to specific products, elaboration of special product information for safety data sheets of manufacturers, and the mailing of 7 460 first aid guidelines for acute poisonings.

The Swiss Federal Office of Public Health obtained anonymised notification of serious incidents involving all products covered by the Swiss law on poisons.

The pay doping hotline, set up by the STIC at the request of the Swiss Olympic Sports Association, was called 263 time.

Our emergency service is still free of charge for the public as well as for medical professionals. The same applies to our expanding source of information on poisonings and toxicological risks on our internet website (www.toxi.ch). Visitors to the site numbered 40 415 in 2001 (21 666 the previous year).

Regular consultations in clinical toxicology were performed at the University Hospital Zurich by STIC senior medical staff, especially in emergency and intensive care cases. In addition weekly clinical visits to the wards with the team from the Division of Clinical Pharmacology and Toxicology took place.

Education

The academic members of the STIC participate actively in the teaching and educational program of the Division of Clinical Pharmacology and Toxicology of the University Hospital Zurich.

The experience of the STIC is an important basis for the teaching of medical students in clinical toxicology, and of environmental science students (SFIT/ETH) in environmental hygiene.

The senior medical staff of the STIC contribute regularly to the post-doctoral and continuous education of physicians and other professional organisations in clinical toxicology. In 2001, the STIC was consulted 129 times by the media on current problems of human toxicology.

Our research results were presented in two abstracts to the annual congress of the European Association of Poisons Centres and Clinical Toxicologists (EAPCCT) in Barcelona and three abstracts to the annual congress of the North American Congress of Clinical Toxicology (NACCT) in Montreal. The medical director of the STIC was also invited to deliver lectures at several national and international workshops and congresses.



Research projects

The main emphasis of our research efforts continued to be concentrated on the estimation of critical doses for moderate and serious toxic effects. Specific research projects dealt with the pharmacoepidemiology of adverse drug effects, interactions between drugs and phytopharmaceutical products, as well as genetic transport protein polymorphisms as risk factors in serious clinical-pharmacological and clinical-toxicological cases. These projects are carried out in cooperation with the Division of Clinical Pharmacology and Toxicology at the University Hospital Zurich.

Cooperations

In addition to the close cooperation with the Institute of Clinical Pharmacology and Toxicology at the University Hospital Zurich, the STIC is a member of the Centre for Xenobiotic and Environmental Risk Research (XERR) at the Swiss Federal Institute of Technology and the University of Zurich. This cooperation not only increases the competence of the STIC staff members in different areas of toxicology, but it also provides the opportunity of redirecting theoretical inquiries to other experts.

Within the framework of the new national pharmacovigilance network and under the direction of the Zurich University Division of Clinical Pharmacology and Toxicology, a point of call has been set up at the STIC where observations concerning adverse reactions to drugs may be reported.

■ The Swiss Antidotes Network

In Switzerland, the distribution and storage of antidotes is uniformly organised. 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, the place of administration of the antidote and logistic criteria. In general, only antidotes are included in the List which do not belong to the standard range of public and hospital pharmacies. The inclusion criteria are

1. the application of a substance as a classical antidote;
2. the application of a substance as an antidote which is not commonly available in hospitals;
3. the quantity of a drug if administered as an antidote exceeds the quantity that is normally available in a hospital for therapeutic use;
4. the use of the drug is not commonly known as antidotal. The ultimate goal is not maximum completeness, but a safe and rapid availability of important substances as antidotes. It is a tradition that the Apotheke Wülflingen organises the distribution of the antidotes in the List.

News 2001: Polyethylene glycol (PEG) 400 was removed from the List, as its advantages compared with immediate cleansing with water in cases of phenol contaminations could not be sufficiently proven. Acetylcysteine powder has been transferred from public pharmacies to hospital pharmacies because treatment of paracetamol poisonings is carried out exclusively in hospitals. Fomepizole is now available in the treatment of methanol and ethylene glycol poisonings as an alternative to treatment with ethanol. The hydrofluoric acid emergency kit has been updated and can be obtained from Schweizerhall Synopharm. In the treatment of bites from indigenous venomous snakes, ViperFav[®], also a Fab-fragment antibody, is now available in addition to ViperTab[®].

Decontaminants and antidotes for **radioactive materials** are stored at the Cantonal Pharmacy of Zurich, and can be ordered

Table 8

The three categories of antidotes of the Swiss Antidotes List

For public pharmacies: activated charcoal, amylnitrite, biperidene, calcium gluconate hydrogel, simeticone drops or tablets.

For hospitals: atropine (ampoules), biperidene, calcium gluconate, colestyramine, dantrolene, ethanol, flumazenil, glucagon, magnesium, N-acetylcysteine (vials and powder), naloxone, neostigmine, phytomenadione (vit. K), pyridoxine (vit. B6), sodium hydrogencarbonate, sodium polystyrene sulfonate.

For regional centres: atropine (100ml), calcium-disodium-EDTA, deferoxamine, digitalis antidote, dimethylaminophenol (4-DMAP), dimercaptopropane sulfonate (DMPS, Unithiol), dimercaptosuccinic acid (DMSA, Succimer), fomepizole, glycine, hydroxocobalamine, iron-(III)-hexacyanoferrate(II) (Berlin blue), labetalol, methylene blue, obidoxime, phentolamine, physostigmine salicylate, silibinin, sodium thiosulfate. The regional centres with their phone numbers are indicated in the List.

by hospitals and other pharmacies in emergencies. Information about the availability of botulinum antitoxin and antivenins for snake bites (vipers) is provided by the Swiss Toxicological Information Centre and the Berna Biotech AG in Berne.

The Swiss List of Antidotes is revised and updated regularly by a special working group of the Swiss Toxicological Information Centre 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/eng/welcome.html (→ Antidote) or at www.pharmavista.net/news/antidot/maind.htm.

Members of the working group are: M. Eggenberger (Berne), C. Fähr (Winterthur), Ch. Hasler (Zurich), S. Mühlebach (Aarau), Ch. Rauber-Lüthy (Zurich) and H. Kupferschmidt (Chairman, Zurich).



Focus: Calling up the STIC – its value in the eyes of the public and its effect on Public Health costs

Callers to the Swiss Toxicological Information Centre in the period of 1–28 February 2001 were requested to take part in a written survey after their telephone consultations. Particular attention was paid to the question of whether consulting by STIC could prevent unnecessary demands from being made on medical services. If that proved to be the case then costs can be saved in Public Health. In addition, callers were questioned about their satisfaction with toxicology consulting, circumstances of poisoning, demographic data and their further wishes.

A total of 888 completed questionnaires were returned, which represents a return rate of 84.8%. Of the callers who fulfilled the criteria for inclusion, 74.3% could be questioned. Our results show that telephone consulting by STIC did in fact reduce Public Health costs. Of the callers who completed the questionnaire fully, 45.8% could be prevented from burdening the health system. In 2000 with a total of 30 935 calls that would have meant 5280–7760 contacts with public health services would have been saved. Our results have been underpinned by other publications reporting similar results. Further economies by removing the need for consultations and hospitalisation are expected after poison centre consulting to physicians and others persons from the area of public health.

Callers to the STIC are predominantly satisfied with our services. It has emerged that the language of the consultation had some influence on the degree of satisfaction of the caller. Apart from that no notable differences between groupings could be discovered.

Three quarters of the calls came from women; 64.8% of the callers were 26–40 years old. Most toxic exposures concerned children up to six years.

From these facts we can draw the conclusion that further savings to Public Health can be achieved when the STIC is even better known by the general public and is used as «first port of call» in the case of poisonings. This means we should strive to increase the annual volume of telephone calls to the centre. Possible factors in reaching this goal are the maintenance of high quality consulting to a satisfied clientele, as well as improvements in consulting in French and Italian.

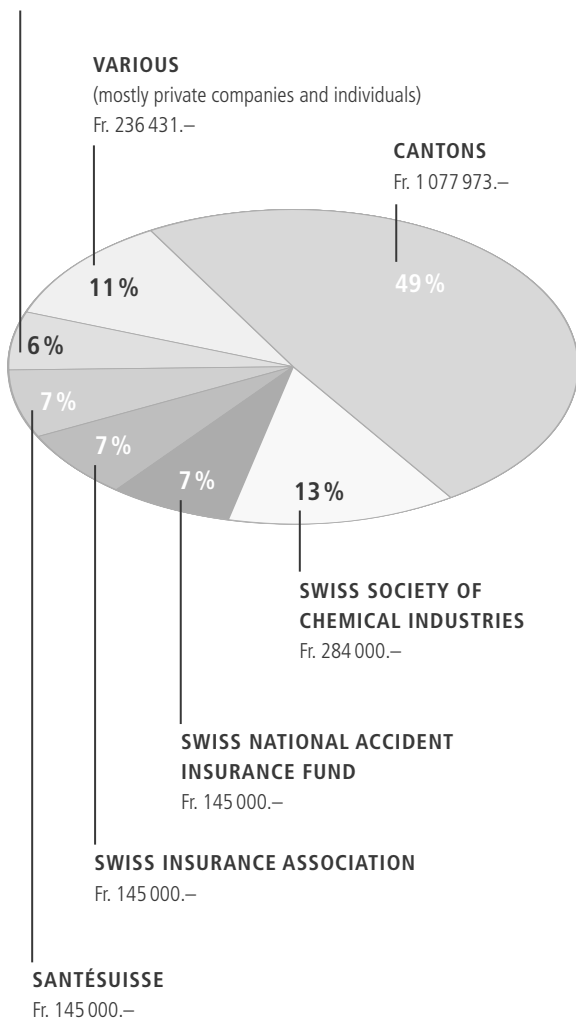
The media play a significant role in increasing the STIC's visibility. Therefore regular media presence of the STIC is desirable as it contributes in making a wider section of the population aware of our presence and services.

Income and expenditure

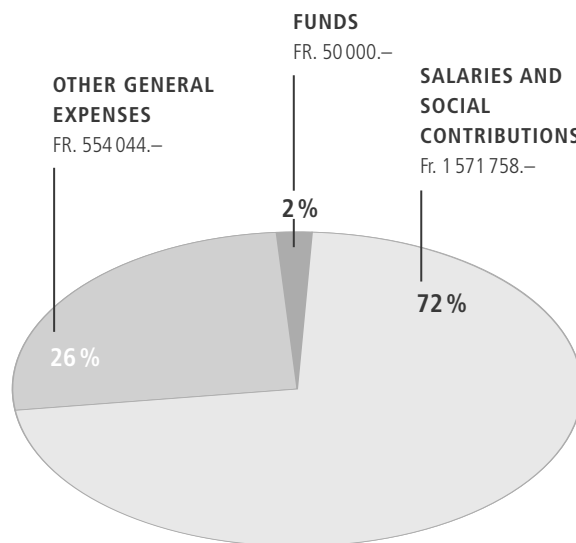
Income Fr. 2 168 203.–

SWISS SOCIETY OF PHARMACISTS

Fr. 135 000.–



Expenditure Fr. 2 175 802.–





Donations

Galenica AG	15 000	Acima AG	1 000
Federation of the Swiss Veterinary Surgeons	12 000	Association of the Swiss Soap and Detergent Industry	1 000
City of Zurich	10 000	Astra Zeneca	1 000
Migros culture commitment	10 000	BDO Visura	1 000
Sunrise TDC Switzerland AG (internet server hosting)	5 800	Berna Biotech	1 000
Winterthur Insurances	5 000	Biomed AG	1 000
Gösgen nuclear power plant	4 500	Boehringer Ingelheim (Switzerland) GmbH	1 000
Swiss Society of Druggists	4 000	Credit Suisse Group	1 000
Documed AG	3 500	Düring AG	1 000
Association of Swiss Varnish and Paint Manufacturers	3 000	Hänseler AG	1 000
Colgate-Palmolive AG	3 000	Helsana Insurances	1 000
Henkel & Cie AG	3 000	Jansen AG	1 000
Lever Fabergé AG	3 000	Orgamol SA	1 000
Procter & Gamble AG	3 000	Pfizer AG	1 000
Swiss Life	3 000	Sanitized AG	1 000
Swiss Dentists Association	3 000	Schweizerhall Chemicals AG	1 000
Association of the Swiss Cosmetic Industry	2 000	Staerkle & Nagler AG	1 000
Ernst Göhner-Foundation	2 000	Streuli G. & Co. AG	1 000
Merck Sharp & Dohme-Chibret AG	2 000	Zürcher Kantonalbank	1 000
Reckitt Benckiser (Switzerland) AG	2 000		
Voigt AG	2 000		
Martec Handels AG	1 500		
Swiss Petroleum Industry Association	1 500		

Smaller contributions not listed here are frequent and extremely welcome. We extend grateful thanks to all donors.

■ Publications

	Order number		Order number
<p>Fatal cerebral edema due to excessive water intake after recreational use of benzylpiperazine («A2») and ecstasy (Abstract). Balmelli C., Kupferschmidt H., Rentsch K., Schneemann M. Journal of Toxicology – Clinical Toxicology 39, 289-290, 2001.</p>	1-01	<p>Medizinische Probleme beim Konsum illegaler Drogen. Kupferschmidt H., Wyss P.A., Fattinger K., Meier P.J. In: Grundlagen der Arzneimitteltherapie, 15. Auflage, Hrsg. Sektion Klinische Pharmakologie der Schweiz. Gesellschaft für Pharmakologie und Toxikologie, Documed AG, Basel, 2001, p. 241-249.</p>	10-01
<p>Tödliches Hirnödem nach Einnahme von Ecstasy und Benzylpiperazin. Balmelli C., Kupferschmidt H., Rentsch K., Schneemann M. Deutsche Medizinische Wochenschrift 126, 809-811, 2001.</p>	2-01	<p>Tox-Zentrum 2000. Zum Jahresbericht des Schweizerischen Toxikologischen Informationszentrums. Rauber C., Guirguis M., Schnorf S., Lorent J.P., Meier P.J., Kupferschmidt H. Schweizerische Ärztezeitung 82 (41): 2184-2187, 2001.</p>	11-01
<p>Antidote bei Vergiftungen. Fäh C., Rauber-Lüthy Ch., Mühlebach S., Hasler Chr., Eggenberger M., Kupferschmidt H. Bulletin Bundesamt für Gesundheit 5, 101-107, 2001.</p>	3-01	<p>Acyclovir overdose in a newborn with consecutive renal impairment (Abstract). Rauber-Lüthy Ch., Guirguis M., Schnorf S., Kupferschmidt H., Meier P.J. Journal of Toxicology – Clinical Toxicology 39, 506-507, 2001.</p>	12-01
<p>Organic anion transporting polypeptides (OATPS) mediate uptake of microcystin into brain and liver (Abstract). Fischer W.J., van Montfoort J., Cattori V., Meier P.J., Dietrich D.R., Hagenbuch B. Journal of Toxicology – Clinical Toxicology 39, 1 237, 2001.</p>	4-01	<p>Akute Chloralhydrat-Monointoxikationen. Stäheli N.A. Thesis University of Zurich, 2001, 72 p.</p>	13-01
<p>Lethal ingestion of stored Amanita phalloides mushrooms. Himmelmann A., Mang G., Schnorf-Huber S. Swiss Medical Weekly 131, 616-617, 2001.</p>	5-01	<p>Chloral hydrate overdose: comeback of an old substance (Abstract). Stäheli N., Guirguis M., Meier P.J. Journal of Toxicology – Clinical Toxicology 39, 255-256, 2001.</p>	14-01
<p>Diurnal and seasonal variations of calls to a poison centre (Abstract). Kupferschmidt H. Journal of Toxicology – Clinical Toxicology 39, 235-236, 2001.</p>	6-01	<p>Tox-Zentrum Aktuell. van Montfoort J., Meier-Abt A., Rauber Ch., Guirguis M., Schnorf S., Lorent J.P., Kupferschmidt H. Schweizer Apothekerzeitung 139 (20); 678-680, 2001.</p>	15-01
<p>Features and management of nickel intoxications (Abstract). Kupferschmidt H. Journal of Toxicology – Clinical Toxicology 39, 225-226, 2001.</p>	7-01		
<p>Dekontamination und wichtigste Antidote. Meier P.J., Kupferschmidt H. Schweizerisches Medizin-Forum 2 (16), 402-405, 2001.</p>	8-01		
<p>Intoxikationen mit Arzneimitteln. Kupferschmidt H., Meier P.J., Scholer A., Rentsch K. In: Grundlagen der Arzneimitteltherapie, 15. Auflage, Hrsg. Sektion Klinische Pharmakologie der Schweiz. Gesellschaft für Pharmakologie und Toxikologie, Documed AG, Basel, 2001, p. 157-168.</p>	9-01		

The publications listed above may be ordered quoting order numbers via telephone (+41 1 634 10 20), Fax (+41 1 252 88 33), or by E-mail: info@toxi.ch

Furthermore the revised leaflet about first aid and poisoning prevention, and emergency telephone number stickers in German, French and Italian are available.

If you require several documents, please order by mail, enclosing CHF 4.50 in stamps per document, or the equivalent in international reply coupons.



Swiss Toxicological
Information Centre

24h Emergency Service +41 1 251 51 51

Non urgent cases +41 1 251 66 66

Office +41 1 634 10 20

Fax +41 1 252 88 33

Freiestrasse 16 / P.O. Box

CH-8028 Zürich

PC 80-26074-7

WebSite: www.toxi.ch

eMail: info@toxi.ch