

# ACCIDENTAL POISONINGS IN PRESCHOOLERS IN BRITISH COLUMBIA

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## PROBLEM

Accidental poisonings continue to be prevalent among children 6 months to 4 years in British Columbia, despite child-proof containers, prenatal classes, and information available to consumers from poison control centres and other sources.

Of a total of 191,205 children between the ages of 0 and 4 years, 3,888 were accidentally poisoned in 1981, an increase over each of the previous 6 years (Province of British Columbia, 1975-1981). Primary preventive measures in operation at present may be inadequate. Implementation of a plan of prevention is of utmost importance for the reduction of the incidence of accidental poisonings in the 0-4 year old category.

## THE COMMUNITY

British Columbia is both the target and the vehicle for change. As the target, it is the arena in which the community health nurse (CHN) gathers evidence of environmental or social factors which may be viewed as undesirable, that is, statistics regarding accidental poisonings, composition of population and its characteristics, and the space and time in which accidental poisonings occur.

As a vehicle for change, British Columbia contains some of the elements needed to counteract the defined problem. The CHN may identify and utilize these elements and propose other community-based preventive measures.

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In their operational definition of a community, Shamansky and Pesznecker (1981) envisioned it as the "what" and then considered the dimensions of (a) "where and when," (b) "why and how," and (c) "who." We have found their model useful in our analysis of accidental poisonings in British Columbia (Figure 1).

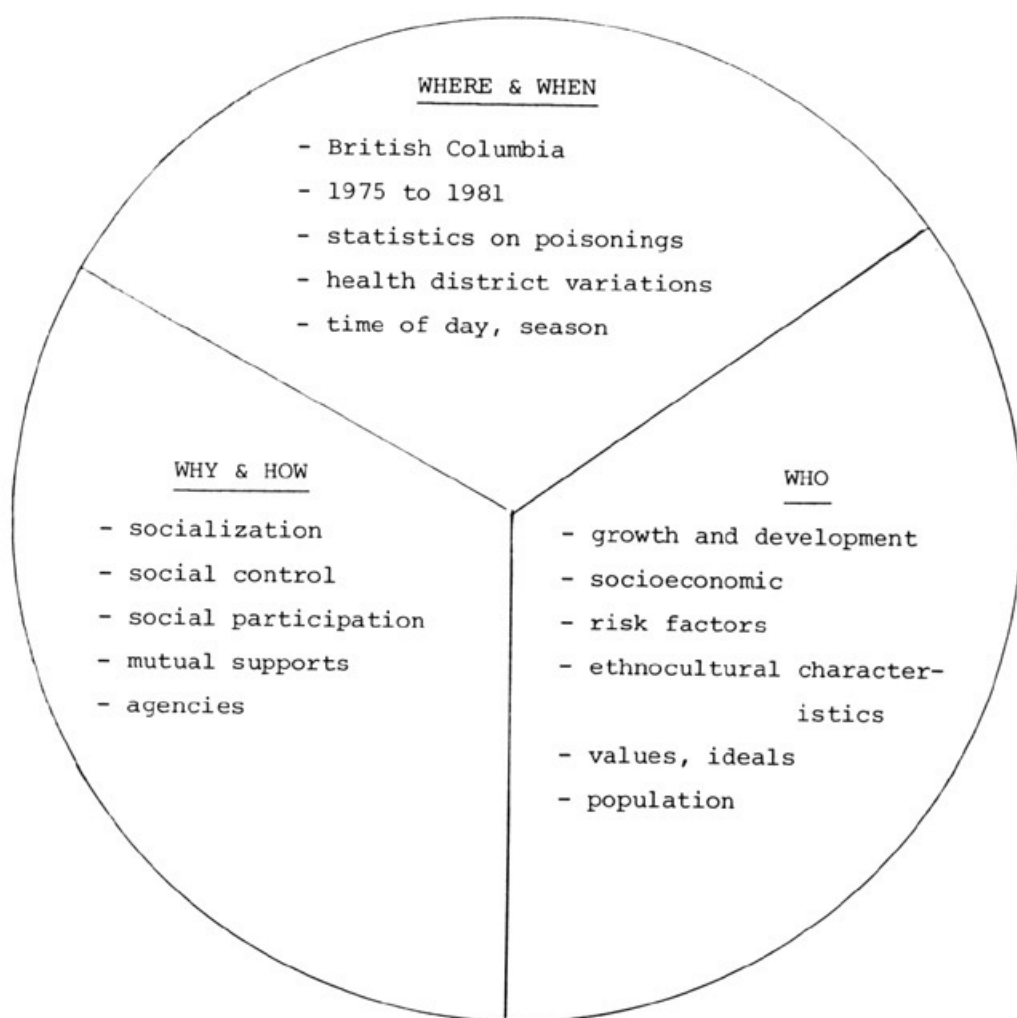


Figure 1. Operational definition of community.

### *Where and When*

The population of British Columbia in mid-1981 was estimated at 2,637,000, an increase of 107,500 over 1980. In 1980, poisoned 0-4 year olds represented 1.57% of that age group and 44% of all poisonings. By 1981, the incidence had risen to 2.03% of the age group, and 46% of all poisonings (Table 1).

Table 1  
Comparison of Poisonings in All Ages  
in British Columbia, 1975-81  
(in percentages)

Year	Age Group							NS
	0-4	5-9	10-14	15-24	25-29	30-49	50+	
1981	46	2.9	3	24		12.3	11.8	
1980	44	3	3	18	7	15	11	
1979	39	3	3	20	8	15	11	
1978	34	2	3	21	9	18	12	
1977	32	2	3	23	1	19	10	
1976	34	2	3	23	10	19	6	5
1975	36	3	3	23	9	18	5	4

*Source.* Province of British Columbia, Ministry of Health, Reported poisonings by health district, 1975 to 1981.

From Table 1 we infer that children 0-4 years old account for the highest number of poisonings and that the incidence has been increasing since 1977. When one separates the number of accidental poisonings from intentional in all age groups, one can deduce that the age group of 0-4 year olds accounts for approximately 86% of all incidental poisonings.

An examination of the provincial health unit districts provides interesting insight into variances in the percentages of 0-4 year old poisonings among areas. Table 2 suggests that in 1981, 10 of the 22 districts had greater than 50% of their poisonings in the 0-4 year old group. Although variations in the incidence exist, the problem is province-wide.

A study of 111 cases of accidental poisonings of children in the United States (White, Driggers, & Wardinsky, 1980) could not demonstrate any predominance of the time of day, day of week, or month of year. However, an earlier study illustrated a waking-hour pattern with few

Table 2

Reported Poisonings by Health Unit District in B.C., 1980  
and 1981. A Comparison of 0-4 Year Olds as a Percentage  
of the Total Poisonings in Each District

Health Unit District	1980	1981
East Kootenay	41 %	55 % *
Selkirk	49	54 *
West Kootenay	38	36
North Okanagan	51 *	51 *
South Okanagan	43	33
South Central	58 *	55 *
Upper Fraser	46	42
Central Fraser	55 *	59 *
Boundary	46	41
Simon Fraser	42	35
Coast Garibaldi	55 *	61 *
Central Vancouver Island	40	37
Upper Island	52 *	50
Cariboo	57 *	57 *
Skeena	43	52 *
Peace River	41	43
Northern Interior	44	42
Greater Victoria	34	35
Greater Vancouver	41	52 *
North Shore/Lions Gate	42	60 *
Richmond General	26	15
Unit not stated	52	47
BRITISH COLUMBIA	44 %	46 %

*Note.* \* indicates districts which report greater than 50% of their total poisonings are in the 0-4 year old group.

*Source.* Province of British Columbia, Ministry of Health, 1980, 1981.

ingestions occurring between 11 p.m. and 6 a.m. (Krain, Bucher, & Heidbreder, 1971). They found that food-substitute poisonings peaked around mealtime. In British Columbia, the "Hospital report of a poisoning or drug abuse" has space for "Time of call" and "Time since ingestion," but these data are not tabulated.

*Why and How*

Preventive measures apply a force to the wellness end of the health/illness continuum, but factors can be identified within the community, which apply a negative force resulting in the high incidence of accidental poisonings in the 0-4 year old group. For example, the cleanliness ethic is seen as a social good but it has a potential hazard. Most homes in British Columbia have highly toxic substances on hand which may be within easy reach of a curious child. Toxic substances include cleaning and polishing agents, shampoos, pesticides, turpentine, and deodorants.

Furthermore, the population can be called "health conscious." Dietary supplements including vitamins and iron account for a large proportion of accidental poisonings of children.

Since the fashion in home decorating with indoor plants had become popular, the incidence of small children ingesting leaves and flowers has increased. Poisonous substances ingested as food had the highest ratio of all poisonous substances in 1981 (Table 3).

Table 3  
Trends in the Ratios by Year of Reported Poisonings  
by the Five Most Commonly Ingested Classes of Substances  
in 0-4 Year Olds in British Columbia, 1975-81

Class of Substance	1981	1980	1979	1978	1977	1975
Substances ingested as food*	.16	.19	.13	.12	.10	.09
Cleaning & polishing agents	.12	.12	.10	.11	.10	.11
Non-narcotic analgesics & anti-pyretics	.10	.10	.12	.13	.14	.13
Respiratory drugs	.10	.10	.12	.12	.07	.09
Dietary supplements	.08	.08	.08	.07	.07	.09

\* Also includes non-edible plants, ethyl alcohol, food poisonings, mushrooms, toadstools, etc.

*Note.* 1976 data not available.

*Source.* Province of British Columbia, Ministry of Health, Reported poisonings by health district, 1975-1981.

By referring to Table 3, one can infer that noxious substances ingested as food have, except for 1981, increased each year since 1975. The trend of poisoning with non-edible plants increased each year from 1975 to 1981 from 68% to 82% of the total number of noxious substances ingested as food.

*Agencies available.* There are numerous agencies in British Columbia which are, at present, being used to counteract the problem of accidental childhood poisonings, at all three levels of prevention.

*Primary prevention*, as applied to a generally healthy population, has the purpose of decreasing vulnerability to a disease (Shamansky & Clausen, 1980), i.e. accidental poisoning of children.

Examples of teaching resources that may be available to new parents, which include poisoning prevention in the curriculum, are: (a) public health units — prenatal classes, well baby clinics, postnatal home visits; (b) new parents' discussion groups; and (c) Ministry of Health publications. Other examples of primary prevention include child-proof safety-caps, and container labelling of poisonous substances.

*Secondary prevention* begins at the moment a poisonous substance is ingested by the child. It emphasizes early diagnosis and prompt intervention to halt the pathological process (Shamansky & Clausen, 1980). Examples of resources and agents of secondary prevention include: (a) poison control centres; (b) emergency departments; and (c) administration of syrup of ipecac.

*Tertiary prevention* comes into play when a resulting disability is stabilized or irreversible (Shamansky & Clausen, 1980). Tertiary prevention can be applied to both the parent and the child. For instance, if the child dies as a result of having ingested a poisonous substance, the parent may be helped by: (a) CHN; (b) grief counselling services; and (c) church or affiliation and other support groups.

If, however, the child suffers irreversible brain damage, tertiary prevention would take the form of referrals to special education classes, or other resources, in order to increase the child's maximum potential.

### *Who*

Two stages of the family life cycle, according to Duvall (1977), are pertinent to our study. Stage II, the early child bearing family, is the stage wherein the oldest child is an infant through 30 months. Stage III, families with preschool children, is the stage wherein the oldest child is 2.5 to 5 years of age.

In stage II, the infant has certain developmental tasks. He is in a stage of dependency and is growing into a toddler, attempting to master his needs. The parental role changes from one of supplementing needs to allowing the child to express some mastery of his environment.

In stage III, life is more demanding and stressful for the parents as they must "design and direct family development" (Friedman, 1981, p. 55). The preschool child strives to become more independent and his needs to explore become more complex.

Infants characteristically grasp at anything and put everything grasped into the mouth, including poisonous plant leaves and flowers. By age 2, the child can, with relative ease, open cleaning preparation and medicine bottles. He is curious, climbs, explores and tastes. The incidence of poisonings declines between the ages 4 years and 14 years.

One American study demonstrated that families of young victims of accidental poisonings are white, lower middle class, and geographically and socially mobile (Sobel & Margolis, 1965). It is known that the population of British Columbia is increasing through immigration and that young families seeking employment are mobile.

White et al. (1980) found that in poisonings below the age of 2 years, there is a significant difference in sex: 78% male, 22% female. Sobel and Margolis (1965) found that more boys are poison repeaters in the 0-4 year age group, possibly because boys tend to be more exploratory, active, and behaviourally more problematic. However, Craft and Sibert (1977) found no significant difference by social class or sex in the 0-4 year age group.

Reported accidental poisonings in British Columbia in 1981 noted 1,933 (50%) males, 1,721 (44%) females, and 234 (6%) sex not stated in the 0-4 year age group. It is not tabulated which cases were poison repeaters.

Katz (1976) theorizes that the child may have a limited and frustrated relationship with his parents resulting in a struggle for autonomy and self-identity. He may take the poisonous substance knowing it is forbidden.

In one study of the behaviour of parents of poisoned children (Holden, 1979), it was found that the mother tends to be under 25 or over 31 years of age. The mother is the only parent in a significantly higher number of cases than in *control* families. The parental use of psycho-pharmaceuticals is also significantly higher in homes where the children have ingested poisonous substances than in the controls.



Furthermore, a higher number of case families receive public assistance than do control families, which may be due to the fact that in a higher number of these families only the mother is present.

Holden could not demonstrate significant differences between cases and controls with regard to (a) total number of persons in the household; (b) number of children less than 5 years old; (c) crowding; (d) education and employment of the mother; (e) knowledge about the medication; (f) storage precautions; or (g) type of packaging and labelling.

In Sobel and Margolis' (1965) study of 20 poison repeaters, 19 single ingesters and 13 controls, it was found that income, geographic setting and family size do not correlate with repeated poisoning in young children. They found that repetition is not related to accident proneness or pica. They were in agreement with Holden (1979) that an environmental hazard is the lack of parental supervision. Sobel and Margolis (1965) suggested, as did Katz (1976) and Craft and Sibert (1977), that ingestion of poisons is the result of purposeful behaviour on the part of the child correlated with hyperactivity, negativism, poor parent-child relationship, marital tension, and a tense and distant family atmosphere. Their suggestions have implications for the community health nurse.

Craft and Sibert (1977) concur with suggestions that the availability of poisons within the home is not an important factor, but that family stress is important. They also emphasize the personality of the child as being more active, immature, and uncooperative.

Katz (1976) found that the stressors exhibited in families "at risk" for accidental poisonings of children in the 0-4 year age group include serious illness in the family, maternal pregnancy, a recent move, the absence of one parent from the home, the presence of a mentally retarded child, and paternal unemployment. Family instability, disorganization, and unhappiness also seem to be factors in accidental poisonings.

Deeths and Breeden (1971) agree that poisoning in children has its base in the several factors cited above, and in (a) the availability of a poison in the child's environment and (b) the ability of the child to explore the environment.

## IMPLEMENTING A PRIMARY PREVENTION PROGRAM

Accidental poisoning must be viewed in the context of the whole family, not as an isolated event. It is a sign of poor safety precautions and may signal a deeper disturbance within the family.



### *Broad Objective*

The broad objective is to decrease the frequency of accidental poisonings in the 0-4 year age group from 2.03% to 1.00% in British Columbia within the 4 year period 1984-88.

### *Major Tasks*

Major tasks will include: (a) identifying families at high risk for accidental poisonings; and (b) developing a "poisonings pamphlet" for parental at-home education.

### *Task I*

*Objective.* To institute provincially the utilization of the "Poisoning supplement" by the CHN at the health unit level during the first home visit to the family with a newborn, as of January 1, 1984.

Questions to be included in the family assessment are: (a) Is the parent aware of some household plants being poisonous when ingested? (b) Are medicines and cleaning substances properly labelled and stored? (c) Is syrup of ipecac handy? (d) Is the family under stress, unhappy or unstable?

Steps in task I.

1. Approach the Public Health Nursing Department with data inciding trends in the accidental ingestion of poisons in the 0-4 year old group, 1975-1981.

2. Propose the use of the "Poisoning supplement" to identify the family at the first postnatal visit for potential early childhood accidental poisonings.

3. Propose that the CHN make a 9-month follow-up visit to families identified as a high risk potential for early childhood accidental poisonings.

Evaluation criteria.

1. Documentation of potential high risk families for early childhood accidental poisonings by the CHN in each health district.

2. Report on the 9-month follow-up visit to the high risk family by the CHN.

3. Number of cases in the 0-4 year old group per year of reported poisonings will be reduced from 2.03% to 1.00% over the 4 year period 1984-1988.

### *Task II*

*Objective.* To propose the development of a pamphlet on poisoning potential of household plants for use in parental education, use to be implemented on January 1, 1984.

Steps in task II.

1. Approach the Public Health Nursing Department with data indicating trends in the ingestions of non-edible plants in the 0-4 year old group over the period 1975-1981.

2. Propose the development of the pamphlet for distribution at prenatal classes and/or the first postnatal home visit.

Evaluation criteria.

The ratio of noxious substances ingested as food will be reduced from .16 to .09 over the 4 year period 1984-1988 in the 0-4 year old group.

## IMPLICATIONS FOR NURSING PRACTICE

The problem of accidental poisonings has implications for the community health nurse. Because there is variety in the incidence throughout the province, the nurse in each district should assess her community, perhaps utilizing Shamansky and Clausen's (1980) model as outlined in this article.

Evaluation of the proposed plan to reduce the incidence should be done through continuing research on a province-wide basis.

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## RÉSUMÉ

### **Empoisonnements accidentels d'enfants d'âge préscolaire en Colombie-Britannique**

Nous nous sommes servis d'un contexte épidémiologique pour évaluer les empoisonnements accidentels d'enfants âgés de 0 à 4 ans, en Colombie-Britannique, durant la période 1975-1981. Nous avons constaté que le nombre de ces empoisonnements était à la hausse. La recension des écrits à ce sujet semble indiquer que l'enfant qui s'empoisonne est un enfant à problèmes et que sa famille est généralement peu heureuse. Nous avons proposé un projet visant à réduire la fréquence des empoisonnements accidentels, en identifiant les familles à haut risque et en rédigeant, à l'intention des parents, une brochure sur les empoisonnements à domicile.