

## BURNS AND SCALDS IN THE POPULATION OF CHILDREN AGED UP TO 5 YEARS

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**Abstract:** *Accidents are the most common cause of death in children older than one year of age and in adolescents. The consequences of accidents are not only static but also psychological, social, economical, educational etc. For the selected interval up to 5 years of age the most common and the most severe accidents include namely burns and scalds. Study sample a methods: within the ELSPAC study mothers with residence in Brno reported on burns and scalds of their children in the age intervals from 0 to 6 months, 6 to 18 months, 18 months to 3 years and 3 to 5 years of age, always at the end of these intervals. With respect to burns and scalds the mothers replied to these queries (among other): whether they occurred in each of the studied intervals, how many times it occurred, where the accidents occurred, what burned or scalded the children, what type of injury was caused, who was with the child at the time of accident, and what he or she did with the child and what kind of treatment he/she provided, what other (subsequent) treatment was provided to the child and how each accident occurred. Results: in the specified study phases successively the following questionnaire counts were returned: 4670 – 3640 – 3627 and 3619, in total 15556 questionnaires, including 13 067 questionnaires from Brno (84,0 %) and from the Znojmo region 2489 questionnaires (16,0 %). From both regions 8036 (51,7 %) questionnaires were returned by mothers of boys and 7520 (48,3 % were returned by mothers of girl: despite uneven representation of town and rural areas the sex ratio was 1,069 which is common for children at this age. Burnt or scalded in the specified age intervals were successively the following numbers of children: 32 (0,68 %) – 413 (11,35 %) – 509 (10,03 %) and 283 (7,82 %), both sexes included. Some of the children were affected repeatedly in the specific interval which of course elevated the number of cases of these accidents. Conclusions: Based on the results the prevention possibilities will be presented.*

**Key words:** *burns, scalds, accidents, prevention, children up to 5 years of age*

### Introduction

Starting from one year of age accidents are the most frequent cause of death in children and young people. Their impacts are not only somatic but also mental, social, economic, pedagogical, etc. Burns and scalds are among the most frequent and most serious accidents in the period until five years of age.

## Group and methods

In the ELSPAC study mothers of children in Brno reported the burns and scalds of their children at the age of 0–6 months, 6–18 months, 18 months–3 years and 3–5 years with the reports submitted at the end of these periods.

Questionnaires in this longitudinal study have a very broad scope where health issues including injuries and accidents in the monitored group of children occupy considerable space. Included were children born to mothers with permanent residence in Brno and Znojmo district from 1 March 1991 to 30 June 1992. It was a 16-month research cohort.

In this paper we are going to discuss a very important topic of early age – burns and scalds.

Concerning burns and scalds, the mothers reported among other things the following:

- whether there were any accidents during the period in question
- how many accidents there were
- where the accidents took place
- how each of these accidents happened
- with what the children were burnt or scalded
- what type of injuries they suffered
- who was with the child at the time of accident
- what the person did with the child
- what treatment the person provided
- what other treatment the child received.

## Results

During the monitored period 4670 – 3640 – 3627 and 3619 questionnaires were turned in, the aggregate number for all periods is 15,556 questionnaires; from Brno there were 13,067, i. e. 84.0 %, from the Znojmo district there were 2,489, i.e. 16.0 %. From mothers of boys we collected 8,036 (51.7 %) questionnaires in both places, from mothers of girls there were 7,520 (i.e. 48.3 %); in spite of the imbalance between city and country the sex ratio of 1.069 was common for this age.

Burns and scalds in the age periods were suffered by 32 (0.68 %) – 413 (11.35 %) – 509 (14.03 %) and 283 (7.82 %) children of both genders. Some of them were afflicted repeatedly and therefore there are more accidents reported for obvious reasons.

**Table 1** shows the total numbers of treated children and numbers and proportions of those who suffered any burns or scalds divided by place of residence and gender.

Information about the number of children in each of the monitored periods of life is empirical data obtained from questionnaires. For aggregate five-year figures for all of these periods the number of surveyed and injured children is estimated as an average using numbers for all periods. This is given by the longitudinal character of the study: information for all four periods relates to the same children, even though their number is decreasing as they age (and due to the study's length, as it happens in all long-term studies) and the children are not all represented in their age groups. This is so-called *mixed longitudinal data*. If we carried out a purely longitudinal study, i.e. included only

children with information for all four surveyed periods, we would have been deprived of part of precious information from those who dropped out of the study or simply did not turn in the questionnaire for a certain period and then continued to participate at a later stage.

With regard to the fact that as far as we know there is no data available on the incidence of burns and scalds in the common population of children at such young age. There is only information on children who were taken in hospital because of burns and scalds. This is why it would be a loss if we reduced this precious information in any way.

Section B of the table shows the proportions of affected children in individual age periods compared by gender and place of residence:

The number of boys in Brno who were burnt or scalded was 1.38-fold higher than in girls aged 6–18 months ( $p < 0.001$ ) and 1.26-fold higher from 18 months and 3 years ( $p < 0.025$ ).

More boys than girls in the Znojmo district were injured in all surveyed periods but the differences – even though sometimes they were even more prominent than in the Brno group – did not reach statistical importance in the smaller population of Znojmo children.

In the entire population in both places the prevalence of injured boys over girls appeared as statistically significant at the age of 6–18 months (1.40 higher,  $p < 0.001$ ) and at 18 months to 3 years (1.23 higher,  $p < 0.025$ ), i.e. similarly to the larger Brno group.

Differences by residence always pointed out that compared to Brno more Znojmo children were burnt and scalded; in the periods in question it was 2.46 times – 1.15 times – 1.03 times – 1.28 times respectively. There was a statistically significant difference among the youngest children in the mixed group of boys and girls ( $p < 0.01$ ) and in the group of boys aged 3–5 years where in Znojmo there were 1.59 times more injured boys ( $p < 0.025$ ).

Also the differences among girls aged 0–6 months were close to the 5 per cent statistical significance; in Znojmo 2.47 times more of them were burnt or scalded and among all children together at the age 3–5 years in Znojmo 1.28 times more children were burnt or scalded compared to Brno.

Some children were burnt or scalded several times during the same period. Their distribution by number of incidents in each of the surveyed periods and by gender and residence are shown in **Table 2**.

Mothers in Brno reported that up to the age of 6 months none of the children was burnt or scalded repeatedly; in the Znojmo district this happened to two girls.

Between 6 and 18 months these repeated injuries occurred more frequently, four times in the Brno group and three times in the Znojmo group.

From 18 months to 3 years these accidents were more frequent, with one boy in Brno they were repeated even six times. In Znojmo children were burnt or scalded three times at the most.

From 3 to 5 years none of the country children suffered this type of injury more than three times but in Brno ten children were injured eight times and one child as many as nine times.

The table shows numbers (products) of burns and scalds cases as well as numbers of affected children. By comparing their number and numbers of children in whom mothers gave a positive answer to the previous question (whether the child was or was not burnt or scalded), we found out that information concerning the number of incidents was missing in 21 children. 17 mothers from Brno and four mothers from Znojmo or 14 mothers of boys and seven mothers of girls did not give answers. Numbers of children with missing information are shown in the table in the relevant sub-groups of children (by gender and residence).

### **a) CIRCUMSTANCES IN WHICH CHILDREN SUFFERED BURNS**

In this section mapping the circumstances in which children were burnt or scalded we are providing only information from Brno children in a mixed group of boys and girls. Dividing the children by gender or showing data for Znojmo would increase the number of data making the tables contents too dense.

The tables are designed in such way that the heading shows the number of all burns and scalds in Brno children identified in each age period. Sums of each sub-chapter items show how many of these injuries in individual age periods were covered by the mothers' answers.

Individual sub-chapters represent independent units based on mothers' answers to questions asked at the beginning. Individual items show numbers and proportions. In items consisting of more options the most frequent are mentioned ("of this..."). The entire item content cannot be exhausted because it contains various other options with low incidents which we do not report.

Concerning the mothers' answers to questions concerning burns and scalds it is important to mention that the questions were open-ended (with one exception) and mothers provided such eloquent answers that more circumstances could be deduced from each case. All identifiable circumstances have been included to make the overall picture as material as possible.

### **b) WHERE WERE THE CHILDREN BURNT OR SCALDED**

**Table 3** shows that in 1,202 cases the mothers indicated the **place of accident**, which covers 88.4 % of all identified accidents.

Burns or scalds happened at home in 88.4 %, at places of recreation in 4.7 %, near home in 4.1 % and in other places in 2.7 % cases.

In all age periods most of these children's accidents took place at home: up to 6 months it was a vast majority, at a later age their proportion dropped (94.4 %–92.5 % - 90.4 %–78.2 % respectively).

Of all burns and scalds that children suffered at home during the full five years in the youngest age there were 1.6 % but in the following age periods they increased to 35.0 % - 43.4 % and 20.0 %: home was the riskiest place for children aged 18 months to 3 years.

*At home* children were burnt or scalded mostly in the kitchen and other utility rooms, such as bathroom, boiler room or garage. There were only a few cases in living rooms.

The most frequent *places of recreation* were weekend homes or cottages, in a

smaller number of cases domestic holiday resorts, spas and foreign destinations during holidays. The number of burns and scalds grew with the age of children – up to 6 months there were no cases, after 3 years there were 52.6 %. Less than one quarter of accidents falls to both periods preceding 3 years of age.

Places *near home* where accidents often happened were the garden and backyard, playground, street and parking area. Especially in the garden and backyard over one half of burns happened at the age of 6–18 months (51.0 %), in the earlier and following period it was around 23 %. No accidents happening in these areas were reported in children up to 6 months.

In *other places* that were more distant from home accidents happened during visits to family and friends, in restaurants, outdoors (beaches, summer camps, kindergarten, camping sites, etc.). The number of accidents increased with the age of children from zero in the youngest babies to 15.2 %–33.3 % and 51.5 % in group aged 3–5 years.

### c) HOW THE ACCIDENT HAPPENED

The mothers submitted stories varying in length and complexity. There would be enough to write a book of unfortunate stories, however, it was not easy to elaborate it into a comprehensive overview. We made an attempt in **Table 4** (being aware that some simplification was necessary in order to stay within the limits of this paper).

The accident situations are divided into the following situations where the children:

- a) touched something – 52.3 %
- b) leaned on something – 14.9 %
- c) were scalded – 9.7 %
- d) pulled something hot onto themselves – 9.7 %
- e) other – 13.3 %.

Altogether we collected 1,047 answers clarifying 77.0 % circumstances in which burns or scalds were suffered. In individual age groups there were 83.3 %–96.1 %–74.0 %–60.1 % respectively: in older children the mothers did not have as much information as in the younger ones. The informative value of their reports was the highest in the period 6–18 months, in the following periods it dropped by 22.7 % ( $p < 0.001$ ) and by 36 % compared to the accidents in the age group 3–5 years ( $p < 0.001$ ).

### d) WITH WHAT WAS THE CHILD BURNT OR SCALDED

(See **Table 5**) This information is available in 1,199 (88.2 %) cases. In 42.4 % the accident involved electrical appliances, in 24.4 % various heaters, stoves and ovens, in 22.4 % hot liquids and food, in 6.9 % open fire, in smaller number of cases hot dishes, lamps, engines and tools.

As regards *electrical appliances*, the children were most often burnt with irons, electrical pans, curling irons, coffee makers, toasters and similar household appliances. However, there were also unusual cases of unexpected scalds, for example when a wa-

shing machine broke down (and was opened during the boiling programme), burns with sun-lamps, contacts with baking ovens, cookers and their accessories (such as grilles), barbecue and smoking equipment or portable heaters. The risk of burns with electrical appliances, heaters and cookers grew with the age in the range 1.1 % - 34.4 % to the maximum 45.6 % from 18 months to 3 years. After 3 years of age the proportion of such injuries dropped to 18.9 % as the children became more cautious thanks to their age.

As regards *food*, children were most often scalded with drinks served for breakfast or snack, soup and, in a smaller number of cases, thick foodstuffs, such as porridge, sauce, spinach, sausages, etc.).

In the five years there were 246 cases ((19.3 %) of **scalding** with hot liquids. Over one half of them (139, i.e. 10.9 %) were caused by carelessness in *handling, serving and drinking tea, milk, hot chocolate*. *Hot soup* caused 63 (3.4 %) of all scalds and the “*classic*” *hot water* during various handling – mostly connected with hygiene – 4.9 % accidents. Scalds with hot liquids were rather rare at the youngest age (2.4 %), then they increased in number many times (to 37.8 %) and after the period 6–18 months dropped to 34.69 and then to 21.1 % at the age of 5 years. In five years only 1.3 % was caused by hot food.

Children mostly suffered *burns with open fire* when stoking fire in a stove or fireplace, at bonfires, when handling candles, sparklers, matches, in one case in domestic fire.

The first burns with open fire happened after 6 months of age, up to 18 months there were 4.7 % of them, then the proportion grew to 5.1 % and 14.2 %. In five years there were 83 cases of which 6.9 % were for causes reported by the mothers and 6.5 % of all 1,276 identified burns and scalds.

In the age periods these accidents are divided as follows: 0 % - 22.9 % - 31.3 % and 45.8 % respectively.

Children suffered 1.6 % burns when trying to help their mothers with cooking or baking or their fathers with DIY. They were burnt with hot dishes, soldering lamps, car or motorcycle exhaust pipes. One child was seriously burnt with jellyfish when swimming in the sea, another by excessive sunbathing.

## e) BODY INJURIES CAUSED BY BURNING OR SCALDING

They are described in **Table 6**. Concerning this sub-chapter the mothers supplied less information than in other cases. The injuries caused by burns were specified in detail only in 65.4 % cases. The fewest details were provided in the youngest babies (44.4 %), the most at 6–18 months (67.1 %). In answering the question “What injury did the child suffer?” they often answered “he/she was burnt, scalded”.

The available answers suggest that burns and scalds most often affected upper extremities (665 cases, i.e. 79.5 %), mostly palms (414 cases, 49.5 %) and fingers (246 cases, 29.4 %). Other parts of upper extremities – shoulders, arms, forearms – were injured only in 5 cases (0.6 %).

Next were multiple burns and scalds on multiple body parts. There were 71 such cases, i.e. 8.5 %.

The following were 48 cases of trunk injuries (5.7 %), 26 cases (3.2 %) of head injuries, 2.9 % (24 cases) on lower extremities.

The age trends in injuries on upper and lower extremities were the opposite to injuri-

es on the head and trunk. The proportion of burns and scalds on upper extremities grew with the age from the youngest to the oldest period (from 37.5 % to 82.2 %), on lower extremities they grew from zero in the youngest age group to 3.9 % in the oldest age group.

On the other hand, the number of head and trunk burns and scalds dropped with the age of children. This is probably because there were a higher number of cases where the children injured themselves whereas at the younger age other persons were involved more often.

Concerning the head, most frequently affected was the face, namely nose, mouth and lips. There were two cases of eye burns and three cases of injuries on the haired part of the head. The proportion of such injuries dropped with age from 12.5 % to 1.7 %.

As regards trunk burns and scalds, the first cases happened after 6 months of age and in the following age period there were 10.5 % of them. As the children progressed toward 5 years of age, they dropped to 1.1 %. Most often were affected the front parts rather than backs and sides. On the lower extremities the shins were affected twice as often as the thighs, the feet only rarely.

#### **f) PERSONS PRESENT AT THE TIME OF ACCIDENT**

**Table 7** shows **who was with the child at the time of accident**: this question was answered in 1,168 cases, i.e. 85.9 % of all burns and scalds.

The present person was the mother in 85.7 % cases (majority). She was all alone in 43.8 % - 67.5 % - 75.8 % - 64.8 % cases, in the remaining cases other persons were also present. 152 (13.0 %) accidents happened in the mothers' absence; of them the fathers were present in 51 cases (4.4 %) and grandparents in 80 cases (6.8 %). In the remaining cases the children were being minded by other family members or friends. Health or pedagogical professionals were present in three cases (0.3 %), in eight cases (0.7 %) the child was all alone.

With the exception of the youngest age the proportion of grandparents present at burns and scalds accidents of their grandchildren increased in the order 5.5 % - 7.0 % - 8.8 %, whereas all other minders including mothers alternated on the children's age scale. It would be interesting to know whether this regularity is due to the fact that the older the children were the more time they spent with their grandparents or because the grandparents grew more careless with the age of the children.

#### **g) WHAT THE PRESENT PERSON DID WITH THE CHILD**

This is shown in **Table 8**. Unlike the previous ones this was not an open-ended question. It offered five options: 1 – nothing, 2 – treated the child himself/herself, 3 – took the child to see a physician, 4 – took the child in hospital, 5 – other (specifying what exactly they did).

There were 1,191 answers to these questions covering 87.7 % burns and scalds. The fewest clarifications were provided by mothers of children aged 3–5 years (90.7 %), the most were provided in children aged 6 – 18 months (98.6 %). In total for five years the mothers reported that in 7.4 % accidents they did not do anything, no treatment was needed. 75.9 % injuries were treated by the present persons, in 8.9 % cases the children were taken to a physician and in 4.6 % cases to hospital. In 3.2 % cases they did something else: asked somebody for help, consulted health professionals or friends

on the phone, sought the children's parents. Almost one half of answers under "other" indicated first aid without further specification.

It is clear from the table that the number of burns and scalds that were mild enough that they did not require any treatment was continuously dropping from 29.4 % in the youngest age group to 5.7 % in the oldest age group. The number of children treated by the present person increased – in the marginal groups at the age scale from 41.2 % to 82.0 %.

The number of children who needed medical treatment was decreasing with the growing age: there were 11.8 % of the youngest babies who were treated in surgeries and only 5.0 % of the oldest. In hospitals the proportion of children treated for burns and scalds dropped only until 3 years of age in the order 5.9 % – 5.3 % – 3.8 % respectively but the proportion of children aged 3–5 years increased to 5.0 %.

The children with burns and scalds treated in various ways were distributed over the age scale as follows: Of 904 children treated after the accident by the present person 0.8 % were young babies, 32.2 % children were aged 6–18 months, 43.2 % were aged 18 months–3 years and 23.8 % were older than 3 years.

Out of 161 children in total, outpatient or hospital care was provided to 1.9 % youngest babies and in the older age groups to 41.6 % – 40.4 % – 16.1 % children respectively.

The age distribution of those who were treated for burns or scalds in hospitals in individual age periods was as follows: 1.8 % – 40.0 % – 34.5 % – 23.6 % children. In outpatients surgeries only treatment was given to 1.9 % – 42.5 % – 43.4 % – 12.3 % children.

The results shown above indicate that 13.5 % children who received medical treatment suffered more serious degrees of burns or scalds which applies especially to 4.6 % of those who were hospitalized.

From the point of view of studying the accident morbidity this means that we can find out the incidence of burns and scalds in only 4.6 %, resp. 4.3 % of the cases (depending on whether we consider the 1,191 mothers' answers or 1,360 identified burns and scalds as the point of reference) which were hospitalized. But this is true only in case that all of these cases are reported by the hospitals for statistical purposes.

Information on 106 (8.9 %) burns or scalds which required medical treatment but were treated in outpatients facilities is not reflected in any accident or morbidity statistics because outpatients facilities do not report these cases for statistical purposes at the time being.

Besides, there are still 75.9 % cases of burns and scalds which happened to 904 children in our population that are not registered anywhere but in the memories of the mothers and their answers in the study.

We believe that this information sufficiently explains the need and usefulness of epidemiological studies in the common population of children mapping out the risks they are subject to.

## **h) WHAT TREATMENT THE PRESENT PERSON PROVIDED**

This is shown in **Table 9**. The result is based on 979 mothers' answers who reported 72.0 % burns or scalds of children during the entire five years.

The fewest answers were provided in the youngest babies (44.4 %) and the most

in children aged 6–18 months (82.9 %). Concerning the injuries of children in the following two age periods we received 73.1 % and 59.8 % answers respectively.

Among the “clients” to whom the present persons gave treatment after the accident were the youngest babies in 0.8 % cases, in the following age groups there were 35.1 % - 40.8 % - 23.3 % children respectively.

The description of treatment suggests that 5.2 % of all children needed to calm down first, as they were shocked at the injury. This necessity ceased as the children’s age increased; it was from 12.5 % in the youngest to 1.7 % in the oldest children.

4.7 % of all children – with the proportion dropping with the growing age and varying from 12.5 % to 3.5 % - needed to be cleaned and stripped of clothes or changed into different clothes.

In terms of treatment, the mothers most often reported the cleaning and disinfection of the wound; in total in 50.8 % cases. In older children this was the case twice as often as in younger children, in the age scale it was in 25.0 % – 47.7 % – 53.6 % – 51.3 % injured children respectively.

As disinfectants for burn wounds they used ajatin, septonex, gentian violet. In 5.0 % burns cases they used ice or cold compression. Children who were scalded with hot drinks or food were given ice in the mouth.

Dry compression using clean cloth was mentioned only exceptionally (three times), more often they used gauze, greased tulle or adhesive patches. Most often they used wet compression with water, less frequently potions of various herbs: camomile, sage, Aaron’s beard, marigold, etc.

The use of various ointments and oils was widespread, in total in 32.8 % cases. They were applied to all children without difference in age. The range of products was wide and varied, most often they used camomile ointment, panthenol, framykoin (27.4 % accidents), in same cases they used an ointment with aloe vera, onion split in halves and other similar home remedies.

Powders, sprays and gels were applied in 1.5 % cases, the used sprays were aku-tol, the powder was framykoin. It is clear that the classical first aid (cooling the wound with running cold water) was applied only rarely. On the contrary, the use of ointments which is not recommended is widespread in our families.

## **i) WHAT OTHER TREATMENT THE CHILD RECEIVED**

**Other treatment** is specified in **Table 10**. The mothers gave only 628 answers to this question relating to 46.2 % of all burns and scalds identified in the population.

After the immediate treatment by the person present at the burning or scalding accident no other treatment was needed in 48.9 % cases according to the mothers’ statements. The older the children were, the less further treatment their injuries required, as we can see in the order 83.3 % – 57.6 % – 43.8 % – 41.4 %.

35.8 % children remained at home. The older they were the more often their injuries were treated at home only, which is clear in the order 16.7 % – 26.9 % – 39.4 % – 44.8 % children for whom this type of treatment was sufficient. Their treatment at home – apart from staying in bed – continued in a way similar to the initial treatment: compressions, dressing and mainly application of ointments, sprays, powders of the same type as at the initial stage.

74 children were taken to see a physician after the initial treatment. If necessary, they were invited for further checks and the physicians controlled the parents' interventions.

No young baby was among these children, the children in other age groups were represented evenly. Together with 106 children referred to outpatients care immediately after the accident (**Table 8**) there were now in total 180 children, i.e. 17.2 % of all children who suffered burns or scalds. In the individual age groups there were 10.5 % – 20.1 % – 16.9 % – 13.8 %.

22 children were referred to hospitals for further treatment, i.e. 2.1 % of all injured children. Together with 55 children transported to hospitals right after the accident there were in total 77 children (7.4 %) in hospital care. The surveyed age groups were represented in hospitalizations due to burns or scalds as follows: 5.3 % – 8.8 % – 5.7 % – 8.4 % respectively.

In total, 257 children in Brno, i.e. 24.5 %, received some form of medical treatment – inpatient or outpatient. Their distribution in age groups was: 15.8 % – 28.8 % – 22.6 % – 22.2 %; the fewest were in the youngest age groups, the most in the group aged 6–18 months.

Seven children had surgical treatment mostly in the burns centre. Concerning specialized checks and treatments the mothers provide very little information. If any, they state neurological, dermatological, ophthalmologic and psychological treatment.

## Discussion and conclusion

I would like to reiterate the main problem in treating children with burns and scalds. Powders, sprays and gels were applied in 1.5 % cases, the used sprays were aku-tol, the powder was framykoin. It is clear that the classical first aid (cooling the wound with running cold water) was applied only rarely. On the contrary, the use of ointments which is not recommended is widespread in our families.

We did not analyze the circumstances of accidents in the Znojmo district in so much detail as in the city. Nevertheless, we can imply some of them. From previous studies we know that in the Znojmo district they use solid fuels more often than in Brno and children can gain access to open fire more easily. Another known difference is the lower age of mothers in Znojmo on the one hand and the higher average number of children in families on the other. There are more farms in the Znojmo district and the people live with their parents or grandparents more often. Mothers have more duties and this may be why they often leave their children to siblings or grandparents, later they give them more freedom than mothers of children who live in the city. All this increases the risk of accident.

In this paper we describe a number of characteristics related to a chapter in the specific accident morbidity in the youngest children. Burns and scalds along with injuries caused by falls are the most frequent in children and it is surprising that their incidence has never been studied more closely in the children's population.

Thanks to the mothers participating in the ELSPAC study we have a chance to get to know these risks better in terms of their range and situations where they are the highest.

The findings in the population of city and country children are valid for the sur-

veyed population but they offer a certain possibility to draw general conclusions – estimates for the situation in this problem in other places.

In this place there should be a sophisticated discussion comparing our data with other. Unfortunately, no information of this type is available at the time being and we cannot compare. In this respect our data has to be taken as primary. From our findings it is possible to assume to what extent such results from other places might differ from ours. Child accident indicators for burns and scalds have a predictive value in some conditions, if we view them as variable and probability indicators.

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**Table 1:** Burns and scalds

Numbers of surveyed children by gender and residence (BO-Brno, ZN-Znojmo district) in age periods up to 5 years

Numbers and proportions of children with recorded burns and scalds, by gender and residence in age periods up to 5 years

Age	Boys	a) Nos. of surveyed children			b) Nos. and proportions of children with burns and scalds						
		BO	ZN	BOZN	BO		ZN		BOZN		p
Residence	Girls	n	n	n	n	%	n	%	n	%	
	Together										
0 – 6 months	p	1897	519	2416	9	0,45	6	1,16	15	0,62	ns
	Boys	1757	497	2254	10	0,57	7	1,41	17	0,75	±
	Girls	3654	1016	4670	19	0,52	13	1,28	32	0,68	0,01
	Together					ns		ns		ns	
6 - 18 months	p	1693	199	1892	218	12,88	31	16,32	249	13,16	ns
	Boys	1567	181	1748	146	9,32	18	9,94	164	9,38	ns
	Girls	3260	380	3640	364	11,17	49	12,89	413	11,35	ns
	Together					0,001		ns		0,001	
18 m.- 3 y.	p	1632	247	1879	251	15,38	39	15,79	290	15,43	ns
	Boys	1509	239	1748	188	12,46	31	12,97	219	12,53	ns
	Girls	3141	486	3627	439	13,98	70	14,40	509	14,03	ns
	Together					0,025		ns		0,025	
3 – 5 years.	p	1541	308	1849	110	7,14	35	11,36	145	7,84	0,025
	Boys	1471	299	1770	115	7,82	23	7,69	138	7,80	ns
	Girls	3012	607	3619	225	7,47	58	9,56	283	7,82	±
	Together					ns		ns		ns	
0 – 5 years	p	1691	318	2009	147	8,69	28	8,80	175	8,71	ns
	Děvčata	1576	304	1880	115	7,30	20	6,58	135	7,18	ns
	Spolu	3267	622	3889	262	8,02	48	7,72	310	7,97	ns
	p					ns		ns		±	

±: p close to the level of 5% statistical significance

**Table 2:** How many times were the children burnt or scalded in individual age periods by residence and gender

Age	Place	<i>How many incidents of burns and scalds there were</i>											
			1x	2x	3x	4x	5x	6x	8x	9x	Burns	Children	N/A
0-6 months	Brno	CH	9	.	.	.	.	.	.	.	9	9	
		D	9	.	.	.	.	.	.	9	9	1	
		CH+D	18	.	.	.	.	.	.	18	18		
	Znojmo	CH	6	.	.	.	.	.	.	6	6		
		D	5	2	.	.	.	.	.	9	7		
		CH+D	11	2	.	.	.	.	.	15	13		
6-18 months	Brno	CH	174	33	3	.	.	.	.	249	210	8	
		D	129	12	3	1	.	.	.	166	145	1	
		CH+D	303	45	6	1	.	.	.	415	355		
	Znojmo	CH	25	4	2	.	.	.	.	39	31		
		D	13	3	.	.	1	.	.	24	17	1	
		CH+D	38	7	2	.	1	.	.	63	48		
18-36 months	Brno	CH	194	42	8	.	1	1	.	313	246	5	
		D	149	28	8	1	.	.	.	233	186	2	
		CH+D	343	70	16	1	1	1	.	546	432		
	Znojmo	CH	25	11	2	.	.	.	.	53	38	1	
		D	25	5	1	.	.	.	.	38	31		
		CH+D	50	16	3	.	.	.	.	91	69		
36-60 months	Brno	CH	79	24	4	.	1	.	2	160	110		
		D	75	25	4	.	1	1	8	221	115	2	
		CH+D	154	49	8	.	2	1	10	381	225		
	Znojmo	CH	26	8	1	.	.	.	.	45	35		
		D	13	6	2	.	.	.	.	31	21		
		CH+D	39	14	3	.	.	.	.	76	56		

Under N/A: number of children with unknown number of burns

**Table 3:** Burns and scalds in children – accidents situations and circumstances at the age up to 5 years. Place of accident

Age	0 – 6 m		6 – 18 m		18 m – 3 y		3 – 5 y		Total	
<b>Number of cases</b>	<b>18</b>		<b>415</b>		<b>546</b>		<b>381</b>		<b>1360</b>	
<b>Place of accident:</b>	n	%	n	%	n	%	n	%	n	%
<b>Home</b>	17	94,4	372	92,5	462	90,4	212	78,2	1063	88,4
of this:	Kitchen and kitchenette		265		364		61		701	
	Bathroom. garage. boiler room		23		15		5		45	
<b>Place of recreation</b>	-		14	3,5	13	2,5	30	11,1	57	4,7
<b>Near home</b>	1	5,6	11	2,7	25	4,9	12	4,4	49	4,1
<b>Other</b>	-		5	1,2	11	2,2	17	6,3	33	2,7
<b>Total</b>	<b>18</b>	<b>100,0</b>	<b>402</b>	<b>100,0</b>	<b>511</b>	<b>100,0</b>	<b>271</b>	<b>100,0</b>	<b>1202</b>	<b>100,0</b>
<b>% incidents</b>		<b>100,0</b>		<b>96,9</b>		<b>93,6</b>		<b>71,1</b>		<b>88,4</b>

**Table 4:** Burns and scalds in children – accidents situations and circumstances at the age up to 5 years. How the accident happened

Child - age	0 – 6 months		6 – 18 months		18 m – 3 y		3 – 5 years		Total	
<b>Number of incidents</b>	<b>18</b>		<b>415</b>		<b>546</b>		<b>381</b>		<b>1360</b>	
<b>How the accident happened:</b>	n	%	n	%	n	%	n	%	n	%
<b>A) touching something</b>	7	46,7	232	58,1	198	49,0	111	48,5	548	52,3
<b>B) leaning on something</b>	2	13,3	52	13,0	79	19,6	23	10,0	156	14,9
<b>C) scalding</b>	6	40,0	52	13,0	25	6,2	19	8,3	102	9,7
<b>D) pulling something hot on themselves</b>	.	.	41	10,3	40	9,9	21	9,2	102	9,7
<b>E) other</b>	.	.	22	5,5	62	15,3	55	24,0	139	13,3
<b>Total</b>	<b>15</b>	<b>100,00</b>	<b>399</b>	<b>100,00</b>	<b>404</b>	<b>100,00</b>	<b>229</b>	<b>100,00</b>	<b>1047</b>	<b>100,00</b>
<b>% incidents</b>		<b>88,3</b>		<b>96,1</b>		<b>74,0</b>		<b>60,1</b>		<b>77,0</b>

**Table 5:** Burns and scalds in children - accidents situations and circumstances at the age up to 5 years. With what was the child burnt or scalded

Age	0 – 6 m		6 – 18 m		18 m – 3 y		3 – 5 y		Total	
Number of incidents	18		415		546		381		1360	
With what was the child burnt, scalded:	n	%	n	%	n	%	n	%	n	%
<b>Electrical appliances</b>	8	47.0	148	36.6	250	49.0	103	38.4	509	42.4
<b>Heaters, stoves, cookers</b>	1	5.9	128	31.7	115	22.5	48	17.9	292	24.4
<b>Liquids and food</b>	6	35.3	104	25.7	102	20.0	57	21.3	269	22.4
of this:	Hot water	1		20		17		25		63
	Soup	2		11		29		2		44
	Hot drinks	3		62		49		25		139
	Hot food	-		8		6		3		17
<b>Open fire</b>	-		19	4.7	26	5.1	38	14.2	83	6.9
<b>Hot dishes</b>	2	11.8	-		3	0.6	14	5.2	19	1.6
<b>Light bulb, electrical current</b>	-		4	1.0	6	1.2	4	1.5	14	1.2
<b>Engines, tools</b>	-		1	0.2	7	1.0	2	0.7	10	0.8
<b>Other</b>	-		-		1	0.2	2	0.7	3	0.3
<b>Total</b>	<b>17</b>	<b>100.0</b>	<b>404</b>	<b>100.0</b>	<b>510</b>	<b>100.0</b>	<b>268</b>	<b>100.0</b>	<b>1199</b>	<b>100.0</b>
<b>% incidents</b>		<b>94.4</b>		<b>97.3</b>		<b>93.4</b>		<b>70.3</b>		<b>88.2</b>

**Table 6:** Burns and scalds in children - accidents situations and circumstances at the age up to 5 years. Body injuries caused by burning or scalding

Age	0 – 6 m		6 – 18 m		18 m – 3 y		3 – 5 y		Total	
Number of incidents	18		415		546		381		1360	
What injury was suffered:	n	%	n	%	n	%	n	%	n	%
<b>Head</b>	1	12.5	14	4.9	8	2.2	3	1.7	26	3.1
of this:	Nose and lips	-		10		7		3		21
	Eye and eyelids	1		1		-		-		2
<b>Trunk</b>	-		30	10.5	16	4.4	2	1.1	48	5.7
of this:	Front	-		23		6		2		31
	Back and sides	-		7		10		-		17
<b>Upper extremities</b>	3	37.5	232	81.4	282	77.5	148	82.2	665	79.5
of this:	Shoulders, arms, forearms	-		-		4		1		5
	Palms	3		142		160		109		414
	Fingers	-		90		118		38		246
<b>Lower extremities</b>	-		5	1.8	12	3.3	7	3.9	24	2.9
of this:	Thigh	-		2		3		2		7
	Shin	-		3		8		4		15
	Foot	-		-		1		1		2
<b>More places</b>	4	50.0	3	1.1	46	12.6	18	10.0	71	8.5
<b>Sunburn</b>	-		1	0.4	-		2	1.1	3	0.4
<b>Total</b>	<b>8</b>	<b>100.0</b>	<b>285</b>	<b>100.0</b>	<b>364</b>	<b>100.0</b>	<b>180</b>	<b>100.0</b>	<b>837</b>	<b>100.0</b>
<b>% incidents</b>		<b>44.4</b>		<b>68.7</b>		<b>66.7</b>		<b>47.2</b>		<b>61.5</b>

**Table 7:** Burns and scalds in children - accidents situations and circumstances at the age up to 5 years. Person present at the time of accident

Age	0 – 6 m		6 – 18 m		18 m – 3 y		3 – 5 y		Total	
<b>Number of incidents</b>	<b>18</b>		<b>415</b>		<b>546</b>		<b>381</b>		<b>1360</b>	
<b>Who was with the child at the time of accident:</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>
<b>Mother alone</b>	7	43.8	272	67.5	370	75.8	169	64.8	818	70.0
<b>Mother with one other person</b>	3	18.8	60	14.8	55	11.3	39	14.9	157	13.4
<b>Mother with more other people</b>	-		14	3.5	5	1.0	8	3.1	27	2.3
<b>Other persons without mother</b>	6	37.5	5	12.7	53	10.9	42	16.1	152	13.0
of this:	Father		20		15		13		51	
	Grandparents		22		34		23		80	
<b>Health or pedagogical professionals</b>	-		-		1	0.2	2	0.8	3	0.3
<b>Child alone</b>	-		4	1.0	3	0.6	1	0.4	8	0.7
n/a	-		2	0.5	1	0.2	-		3	0.3
<b>Total</b>	<b>16</b>	<b>100.0</b>	<b>403</b>	<b>100.0</b>	<b>488</b>	<b>100.0</b>	<b>261</b>	<b>100.0</b>	<b>1168</b>	<b>100.0</b>
<b>% incidents</b>		<b>88.9</b>		<b>97.1</b>		<b>89.4</b>		<b>68.5</b>		<b>85.9</b>

**Table 8:** Burns and scalds in children - accidents situations and circumstances at the age up to 5 years. What the present person did with the child

Age	0 – 6 m		6 – 18 m		18 m – 3 y		3 – 5 y		Total	
<b>Number of incidents</b>	<b>18</b>		<b>415</b>		<b>546</b>		<b>381</b>		<b>1360</b>	
<b>What the person did with the child:</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>
<b>Nothing</b>	5	29.4	37	8.9	31	6.2	15	5.7	88	7.4
<b>Treated the child himself/herself</b>	7	41.2	291	70.1	391	78.7	215	82.0	904	75.9
<b>Took the child to see a physician</b>	2	11.8	45	10.8	46	9.3	13	5.0	106	8.9
<b>Took the child in hospital</b>	1	5.9	22	5.3	19	3.8	13	5.0	55	4.6
<b>Other</b>	2	11.8	20	4.8	10	2.0	6	2.3	38	3.2
<b>Total</b>	<b>17</b>	<b>100.0</b>	<b>415</b>	<b>100.0</b>	<b>497</b>	<b>100.0</b>	<b>262</b>	<b>100.0</b>	<b>1193</b>	<b>100.0</b>
<b>% incidents</b>		<b>94.4</b>		<b>100.0</b>		<b>91.0</b>		<b>68.8</b>		<b>87.7</b>

**Table 9:** Burns and scalds in children - accidents situations and circumstances at the age up to 5 years. What treatment the person provided

Age	0 – 6 m		6 – 18 m		18 m – 3 r		3 – 5 r		Total	
Number of incidents	18		415		546		381		1360	
What treatment the person provided:	n	%	n	%	n	%	n	%	n	%
Calming down the child	1	12.5	33	9.6	13	3.3	4	1.7	51	5.2
Change of clothes, washing	1	12.5	19	5.5	18	4.5	8	3.5	46	4.7
Rinsing and disinfecting wound	2	25.0	164	47.7	214	53.6	117	51.3	497	50.8
Compression, ice	2	25.0	16	4.7	6	1.5	25	11.0	49	5.0
Powder, spray, gel	-		4	1.2	6	1.5	5	2.2	15	1.5
Ointment, oil	2	25.0	108	31.4	142	35.6	69	30.3	321	32.8
of this:	camomile	-	37		80		21		138	
	Panthenol	2	22		35		33		92	
	framykoin	-	31		2		5		38	
	other	-	18		25		10		53	
<b>Total</b>	<b>8</b>	<b>100.0</b>	<b>344</b>	<b>100.0</b>	<b>399</b>	<b>100.0</b>	<b>228</b>	<b>100.0</b>	<b>979</b>	<b>100.0</b>
<b>% incidents</b>		<b>44.4</b>		<b>82.9</b>		<b>73.1</b>		<b>59.8</b>		<b>72.0</b>

**Table 10:** Burns and scalds in children - accidents situations and circumstances at the age up to 5 years. What other treatment the child received

Age	0 – 6 m		6 – 18 m		18 m – 3 r		3 – 5 r		Total	
Number of incidents	18		415		546		381		1360	
What other treatment the child received:	n	%	n	%	n	%	n	%	n	%
No further treatment	5	83.3	141	57.6	89	43.8	72	41.4	307	48.9
Hospital	-		10	4.1	6	3.0	6	3.4	22	3.5
of this: Surgery	-		3		2		2		7	
Outpatient with checks	-		28	11.4	28	13.8	18	10.3	74	11.8
At home	1	16.7	66	26.9	80	39.4	78	44.8	225	35.8
of this:	Dressing	-	13		28		19		60	
	Packing	-	4		4		5		13	
	Compression, ice	-	2		6		4		12	
	Ointments, sprays, powders	1		39		41		45		126
<b>Total</b>	<b>6</b>	<b>100.0</b>	<b>245</b>	<b>100.0</b>	<b>203</b>	<b>100.0</b>	<b>174</b>	<b>100.0</b>	<b>628</b>	<b>100.0</b>
<b>% incidents</b>		<b>33.3</b>		<b>59.0</b>		<b>37.2</b>		<b>45.7</b>		<b>46.2</b>

## POPÁLENINY A OPAŘENINY V DĚTSKÉ POPULACI DO 5 LET VĚKU

**Abstrakt:** Úrazy jsou od věku rok nejčastější příčinou smrti u dětí a dospívajících. Jejich dopady nejsou pouze somatické, ale i psychické, sociální, ekonomické, pedagogické apod. Pro vybrané období do pěti let věku patří mezi nejčastější a nejzávažnější poranění popáleniny a opařeniny. Soubor a metody: ve studii ELSPAC referovaly matky brněnských dětí o popáleninách a opařeninách svých dětí za věková období 0–6 měsíců, 6–18 měsíců, 18 měsíců – 3 roky a 3–5 let, vždy na koncích těchto období. U popálenin a opařenin matky mj. odpovídaly, zda k nim v každém sledovaném období došlo, kolikrát to bylo, kde se nehody přihodily, čím se děti popálily či opařily, k jakému zranění tím došlo, kdo byl s dítětem v okamžiku nehody, co s ním udělal, jaké ošetření mu poskytl, jakého dalšího ošetření se dítěti dostalo a jak ke každé z nehod došlo. Výsledky: za sledovaná období bylo odevzdáno postupně 4670 – 3640 – 3627 – 3619 dotazníků, celkem za všechna období 15 556 dotazníků, z Brna jich bylo 13 067, tj. 84,0 %, z okresu Znojmo 2489, tj. 16,0 %. Od matek chlapců jich bylo získáno z obou míst 8036 (51,7 %), od matek děvčat 7520 (tj. 48,3 %): přes nerovnoměrné zastoupení města a venkova ukazovalo sex ratio 1,069 obvyklé pro tento věk. Popáleno či opařeno bylo postupně ve věkových obdobích 32 (0,68 %) – 413 (11,35 %) – 509 (14,03 %) a 283 (7,82 %) dětí obou pohlaví společně. Některé z nich byly v daném věkovém období postiženy opakovaně, takže případů těchto nehod bylo pochopitelně více. Závěr: na podkladě výsledků budou prezentovány možnosti prevence.

**Klíčová slova:** popáleniny, opařeniny, úrazy, prevence, děti do 5 let