



GOVERNMENT CONSUMER SAFETY RESEARCH

Choking risks to children

under four from toys and other objects

dti

Department of Trade and Industry

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1. Introduction

The Consumer Affairs (CA) Directorate of the Department of Trade and Industry (DTI) is responsible for monitoring the number of accidents, both fatal and non-fatal, which occur in homes throughout the UK, and for taking appropriate action aimed at reducing the numbers of such accidents and the seriousness of their consequences.

One possible source of injury for young children is the aspiration or ingestion of the small parts of toys. Regulations are in force which require that all toys which are small themselves, or which contain small parts or parts that are easily detached, are labelled with the words "Not suitable for children under 36 months" or "Not suitable for children under three years". In addition, there should be a brief indication of the hazard - such as "Contains small parts". For the purposes of the Regulations, "small parts" are defined as parts which fit completely within the "small parts cylinder" illustrated on page 5.

The overall purpose of this study is to evaluate the effectiveness of the 'small parts cylinder' in preventing choking accidents from small toys or parts of toys. Two questions immediately arise from this:

- i) how many accident cases are there where children under three years choke on parts of toys which would not have fitted into the small parts cylinder - i.e. does the cylinder need to be redesigned?
- ii) how many accident cases are there where children in the age range three to four years choke on objects which would fit into the truncated cylinder - i.e. should the warning be extended to include children in this higher age range or should another test be designed to cover these somewhat older children?

Because children of different ages play together, and toys suitable for a three year old can easily fall into the hands of younger children, there follows a third question:

- iii) what would the effect be of reducing the availability to older children of small toys and small parts on choking accidents to their younger siblings?

The CA Directorate operates the HASS (Home Accident Surveillance System) and LASS (Leisure Accident Surveillance System) databases which contain details of a sample of all types of accidents in the UK (except road traffic accidents and accidents at work) where the victim visits a hospital A&E department. The Directorate also operates HADD (Home Accident Deaths Database) which records details of all fatal accidents in the home in England and Wales (see page 6 for further information on HASS, LASS and HADD). Metra Martech has carried out an analysis of all the choking accidents recorded on these databases among children, whatever the foreign body, though with particular reference to accidents involving toys.

This report contains the findings of the analysis which is based on 1,289¹ non-fatal cases between 1987 and 1996, and 182 fatalities between 1986 and 1995. The data for non-fatal incidents analysed in this report are taken from case records from 18 hospitals in the UK.

1 the non-fatal cases are approximately a 5% sample of all cases and are estimated to be equivalent to a national total of over 26,235 cases over ten years, or an average of 2,625 cases per year. The database records all fatal cases (i.e. it is not a sample of cases).

2. Summary and Conclusions

The principal findings of the study concerning the choking of children under four years of age in the UK are as follows:

- i) toys account for only a small proportion of cases and all choking cases, whatever the foreign body, have therefore been included. This is so that toy-related cases can be seen in the overall context of choking incidents, and so as to provide a broad picture of the shape and size of objects that are involved in choking incidents;
- ii) Metra Martech has concentrated on two groups of children: the under three year olds, for whom small parts labelling already applies, and three year olds;
- iii) the number of choking cases involving all kinds of foreign bodies among children under four in the UK is declining;
- iv) there was an average of 2,600 non-fatal cases per year between 1987 and 1996 and an average of 24 fatalities per year between 1986 and 1995;
- v) the number of cases declines with age. Some 56% of the non-fatal cases involve children under two and 82% of them children under three. The decline is even more pronounced for fatalities; 56% are under one and only 6% over 36 months;
- vi) according to the classification system which Metra Martech has adopted (see page 7) most of the cases (88%) were trivial or minor and 0.4% (11 cases per year) were very serious;
- vii) for all incidents involving the under four year olds, food was responsible in 51% of cases and non-food items (excluding toys) were responsible for 32%. Toys or parts of toys were responsible for 6% of cases. The remaining 11% were caused by unknown objects. The proportions were similar for children under three and for three year olds. Toys were involved in a total of 167 incidents per year of which 139 (84%) involved children under three;
- viii) the severity of accidents is not dependent on the type of foreign body involved and the more serious accidents are not attributable to any single type of foreign body;
- ix) only 2% of accidents were caused by large objects which would not fit completely within the small parts test cylinder. The figure is 3% after excluding the 33% of cases where the size could not be estimated;
- x) food-related accidents peak at around the age of one but then decline slowly. Non-food cases are at a similar level in the first year, have a slight peak at one year and then decline. Toy-related accidents decline steadily with age;
- xi) sweets are the most common cause of food cases (32%) followed by fishbones (20%) for children under three. For three year olds the figures are reversed, 42 % for fishbones and 29% for sweets;
- xii) non-food accidents are most often caused by coins - 26% for children under three and 54% for three year olds;
- xiii) there was an average of 167 choking accidents per year involving toys or parts of toys and children under four. Of these, 139 involved children under three. The vast majority

of cases (89%) were trivial or minor. The size of the foreign body is known or can be estimated in 47% of cases. Of these, 77% involve small objects and the consequences were almost wholly trivial or minor. Some 10% involved crushable objects such as paper or foil. Some 13% involved large objects (that is, they would not fit completely within the small parts cylinder). Of these latter incidents, all were minor or trivial;

- xiv) in the period 1986 to 1995, a total of 239 fatal choking accidents involving children under four were recorded which gives an average of 24 cases per year. Of these, 223 cases involved children under three. Of this total, 153 cases (69%) were caused by food; 18 (8%) were caused by identified non-food objects and 43 (19%) by unknown objects. There were nine cases (4%) which were caused by toys or parts of toys. There were 16 cases involving three year olds, at least nine of which were caused by food and two by toys or parts of toys;
- xv) based on the actual number of fatal choking accidents and the 5% sample of non-fatal accidents between 1986 and 1996² involving toys and parts of toys, it is estimated that the number of cases per year, by severity of accident and size of toy or part, is as follows³:

	Under three years old			Three years old		
	Small	Large	Crushable	Small	Large	Crushable
Trivial/Minor	101	15	10	18	5	3
Serious/Very Serious	7		5	1		1
Fatal	1					

² these data analyse fatal and non-fatal accidents each over a ten year period. It should be noted, however, that the period for fatal accidents is 1986 to 1995 inclusive, and for non-fatal accidents 1987 to 1996.

³ in some cases, the size of the toy or parts of toys was not known. Metra Martech therefore apportioned such toys or parts to the three size categories in the same ratio as for those toys and parts for which the size is known.

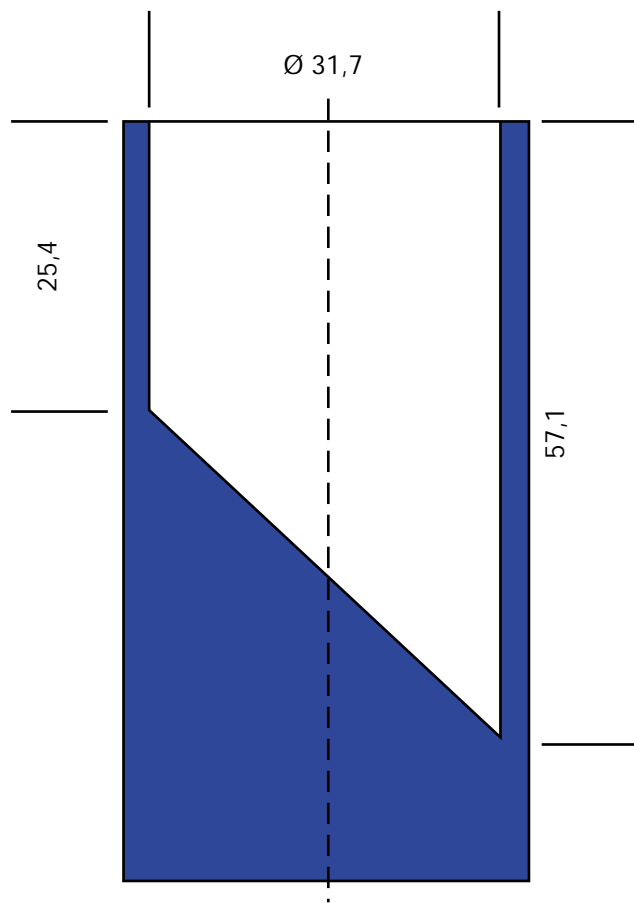
- xvi) redesigning the small parts cylinder to eliminate all the accidents involving large toys would save a maximum of 15 accidents in the under three age group and a further five in the three to four years group. However, this would only reduce accidents if parents and supervisors heeded all the warnings and ensured that children never came into contact with such toys;
- xvii) extending the present regulations to include the three to four years age group could potentially prevent 19 choking accidents involving small toys or parts of toys (all but one of these accidents would be trivial or minor according to the system of classifying accidents used in this research);
- xviii) if some means could be devised to prevent children under four coming into contact with small toys or parts of toys then 109 accidents would be eliminated for the under three age group and 19 for the three to four year old group. However, such a measure might also prevent older children from playing with small toys which are widely considered to be essential for the development of manual and intellectual skills. The benefit would be to eliminate a maximum of 100, mostly minor, accidents. The cost would be to deprive the majority of children of an opportunity to learn valuable skills.

3. CHOKING AND TOY SAFETY

Choking is defined as a blockage of the airway by a foreign body preventing passage of air to the lungs. The blockage can occur in the back of the throat (pharynx) or further down in the trachea or bronchi. If the blockage completely prevents the flow of air, anoxia can result and this leads to permanent brain damage in about two minutes and death in about three minutes. Sometimes when a foreign body is "swallowed", i.e. passes into the oesophagus and then to the stomach, the reactions of the patient appear similar to choking and such cases are sometimes classified as choking rather than swallowing. Such cases are normally much less life-threatening unless the size of the object in the oesophagus is such that it puts pressure on the trachea and closes it. In some very rare cases, choking may occur when the foreign body is swallowed but lodges in the oesophagus, pressing the posterior wall of the trachea and reducing its capacity to pass air freely. Even more rarely, the foreign body, after having entered the airway and caused a vagal type reflex, returns to the pharynx and continues down to the stomach.

In the UK there are about 16,000 cases of choking per year which are serious enough for the victim to visit a hospital A&E unit. The number of fatal cases is less than one per cent of this figure. In the main, choking accidents involve food and half the fatalities involve the elderly. As will be seen later, about 2,600 of the cases each year involve children under four years of age of which about 20 are fatal. Again, the cases involving children are caused mostly by food (51%) but a few of the cases (6%) involve toys.

In order to reduce the risk of choking on small toys, or parts of toys, there are requirements for the proportions and labelling of toys that are embodied in UK regulations which implement the requirements of a European Directive (88/378/EEC) on the safety of toys. Toys are tested using the 'small parts cylinder'. The dimensions of the cylinder, as defined in European Standard BSEN 71-1: 1998 (Safety of toys - Specification for Mechanical and Physical Properties) are illustrated overleaf. Toys, or toys with detachable parts, which fit completely within the cylinder without the application of pressure are deemed not suitable for children under three years of age. Such toys must not be sold for children under three years of age. Any toys, or toys with detachable part, which fit within the cylinder and which are intended for children over three must bear a warning "Not suitable for children under 36 months", together with an indication of the reason - such as "contains small parts". This does not apply in cases where the toy in question is manifestly unsuitable for children under 36 months.



Small Parts Cylinder
(All dimensions in mm)

4. CHOKING ACCIDENTS IN THE UK

4.1 Source of Data

The Consumer Affairs Directorate of the Department of Trade and Industry operates the HASS (Home Accident Surveillance System) and the LASS (Leisure Accident Surveillance System) that provide data on accidents (except road traffic accidents and accidents at work) for the whole of the UK. Clerks in 18 hospitals (which represent a 5% sample of all accidents) with A&E units, collect data on home and leisure accidents by recording details of all patients that visit the A&E unit at that hospital and who were involved in such an accident. This information is stored in the HASS and LASS databases. The data recorded for each case include:

- i) date of accident
- ii) age of victim
- iii) sex
- iv) activity at time of accident
- v) location at time of accident
- vi) mechanism
- vii) articles involved
- viii) outcome of accident
- ix) length of inpatient stay (if any)
- x) a short description of the accident.

The important fields for this study are age, articles, outcome, length of stay and description. The latter can include up to about 50 words and frequently helps to determine whether the article involved in an accident is a toy or not.

The records on the CA database include about 5% of all the cases in the UK. Specific multipliers are available for each year to convert the figures obtained from the hospitals into estimated annual national totals for the whole of the UK.

The CA Home Accident Deaths Database (HADD) records figures for all accidental domestic deaths in England and Wales and is based on data from the Office for National Statistics (ONS). HADD contains similar information on each fatality to that recorded in HASS and LASS for non-fatal cases. Information on deaths in Scotland is available from the General Register Office in Edinburgh and figures for Northern Ireland from the General Register Office in Belfast.

This research analysed data from the CA systems for all accidents, both fatal and non-fatal, where the mechanism was "Choking on a Foreign Body, Internal Airway Blockage". For fatal accidents, the years covered were 1986 to 1995 inclusive and for non-fatal accidents, 1987 to 1996. A total of almost 1,500 cases relating to children under four years of age were analysed. As mentioned above, there is often confusion between choking and swallowing,

and the data analysed for this research undoubtedly included some cases of the latter.

Estimates for the total number of non-fatal cases for each year were arrived at by applying the appropriate HASS and LASS multipliers.

HADD records all fatal cases for each year and therefore no multipliers are necessary. Some results are presented to show trends over the relevant 10 year period but most are shown as the annual average of the estimated national total figures for the period.

4.2 Classification of Cases

Four new fields were added to the database and each case classified on the basis of combining and interpreting information from other fields as follows:

Severity: each accident was classified into one of the following categories using information in the 'outcome' and 'in-patient days' fields:

- Trivial 'Patient did not wait' or 'Examined but no treatment given';
- Minor 'Treated; no more treatment required', 'Referred to General Practitioner (GP)', 'Referred to any Outpatient (OP) clinic', 'Referred to OP or GP', 'Referred to other hospital' or 'Admitted for less than 1 day';
- Serious 'Admitted for one, two or three days';
- Very Serious 'Admitted for more than three days' or 'Transferred to a specialist hospital';
- Fatal All cases from HADD;
- Unknown 'Admitted for unknown time' or 'Unknown outcome'.

The figures discussed below apply to non-fatal and fatal choking accidents involving children under four in the UK. It should be noted that non-fatal cases include only those where the victim attended the A&E unit. However, the nature of choking is such that serious cases are emergencies requiring hospital treatment. It is probable therefore that any cases which are not seen in hospital would have been classified as 'trivial' if the patient had been taken to hospital.

Type of Foreign Body: the information in the 'article', 'activity' and 'accident description' fields were assessed to classify the object on which the victim choked. For example, if the 'activity' was described as 'eating' it is likely that the type of foreign body was 'food'. All objects were classified into one of the following:

- Food
- Non-Food (excluding toys or parts of toys);
- Toy (or part of toy);
- Possibly a toy (or part of toy);
- Unknown

Included in the toys category were items specifically produced as toys but not other items that were being used as toys. For example, plastic coins and crayons were classified as toys, but pens and pen caps were not.

Size: the size of the object was classified from information in the 'article' and 'accident description' fields as follows:

- Small - fits completely within the small parts cylinder;
- Large - will not fit into the small parts cylinder;
- Crushable - items such as paper, foil or cloth;
- Not relevant - items such as water;
- Not known

The classification of size was generally easy to make, but in some cases, decisions were somewhat arbitrary. Marbles and most plastic building bricks will fit completely within the small parts cylinder, but most pens, pen tops and crayons would probably not fit into the cylinder.

Object: from all the information on the cases, the objects involved in the accidents were classified into one of about 100 more detailed categories or as 'Unknown'. The full range of descriptions used is set out in the tables which follow.

4.3 Statistical Considerations

The number of cases in some categories in the following tables is small. Care must therefore be taken not to place undue significance on small differences between average rates or percentages which are based on only a few cases. Table 5, for example, shows that there was an average of about 2,000 minor cases per year where the foreign body was food. Over the 10 year period, there was an estimated total of 22,000 cases and the database thus contained about 1,000 cases.

The 95% confidence limits for the value of 2,000 are ± 125 . However, the number of very serious cases caused by food, non-food and toys (or parts of toys) was 4, 4 and 2 cases per year respectively. However, these averages are based on only 2, 2 and 1 actual cases and the theoretical confidence limits are ± 6 , ± 6 and ± 4 respectively. Although there may be uncertainty about the *differences* between these small numbers, there is a high level of confidence that the *actual values* of all three numbers are small and that the total for the three lies between 5 and 25 cases per year.

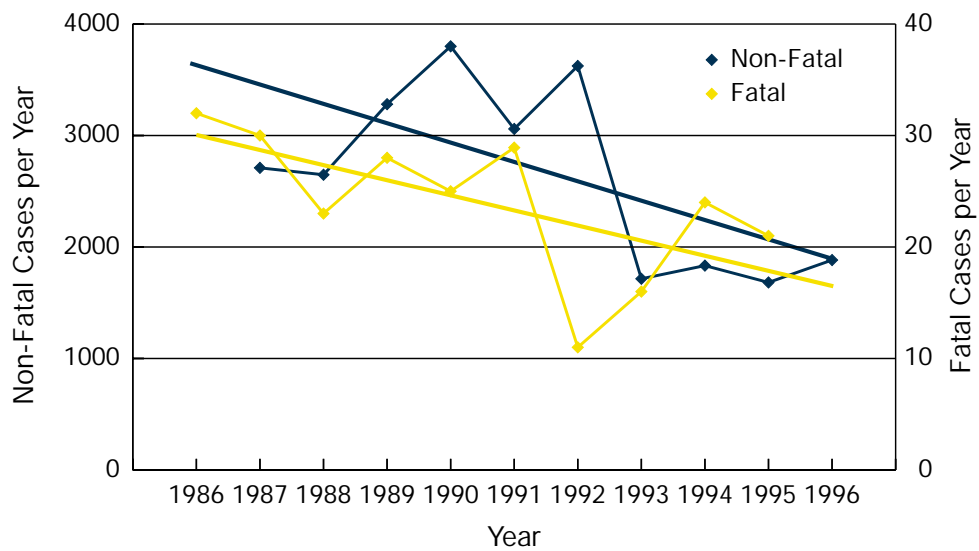
Fatal accidents are based on figures from HADD and figures for Scotland and Northern Ireland. The data record all fatal cases and not just a sample. Conclusions based on a small average number of fatal cases per year therefore have a greater statistical significance than those based on the same average number of non-fatal cases.

Table 1 THE NUMBER OF RECORDED CASES AND ESTIMATED UK ANNUAL TOTALS BY YEAR
Choking accidents involving children under 4 in the UK between 1986 and 1996

Year	Recorded Cases		Cases per Year	
	Non-Fatal	Fatal	Non-Fatal	Fatal
1986		32		32
1987	122	30	2,710	30
1988	135	23	2,648	23
1989	170	28	3,281	28
1990	201	25	3,800	25
1991	156	29	3,059	29
1992	161	11	3,624	11
1993	66	16	1,715	16
1994	89	24	1,833	24
1995	90	21	1,682	21
1996	98		1,883	
Total	1,289	239	26,235	239

Source: Metra Martech

Figure 1 TRENDS IN THE NUMBER OF CHOKING ACCIDENTS WITH ALL FOREIGN BODIES AMONG CHILDREN UNDER 4 IN THE UK 1986 to 1996



Source: Metra Martech

5. ANALYSIS OF THE CHOKING ACCIDENT DATA

All the data in this analysis refer to fatal or non-fatal cases of choking involving children under four years of age in the UK.

The numbers of non-fatal cases presented are based on the sample of cases from the 18 hospitals in the UK as recorded on HASS and LASS between 1987 and 1996. Metra Martech has used the appropriate multiplier for each year to make estimates of national totals for each year and divided the overall total by ten to arrive at average annual figures.

The numbers of fatal cases are based on those recorded on HADD which in turn uses data from ONS (The Office for National Statistics) and on corresponding cases in Scotland and Northern Ireland between 1986 and 1995. The data include all cases in the UK where the cause of death was determined to be 'blockage of the airway by a foreign body'.

Because of rounding errors when estimating national totals or when calculating averages, there are small differences in some tables between the sum of the components and the total presented in the table or in other tables.

5.1 The Overall Trend

Figure 1/Table 1 - The figures reported here apply to all choking cases, whatever the foreign body, which involve children under four years of age.

There are substantial year to year fluctuations but the trend in the number of non-fatal accidents appears to be downward at an average rate of perhaps 6% per year, to give the present total of about 2,000 cases per year.

The number of fatal cases appears to show a similar decline of about 4% per year to a current value of about 16 cases per year. There have been almost 110 non-fatal cases for every fatal one over the last 10 years.

There are approximately 2.4 million children under the age of four in the UK so the average rate, over the last 10 years, of non-fatal cases was 1 per 900 children per year. By contrast, the overall rate of all HASS and LASS accidents is about one per four children per year. Fewer than 1 in 200 of these accidents results from choking.

The rate of fatalities from choking has been 1 per 100,000 children per year compared to an overall death rate for children under four from all causes of 1:400. In other words, choking by all types of foreign bodies accounts for fewer than 1 in 250 of all the deaths of children under four.

Choking is a very minor cause of accidents to children and, as will be seen later, choking cases involving toys are only a small proportion of all the choking accidents.

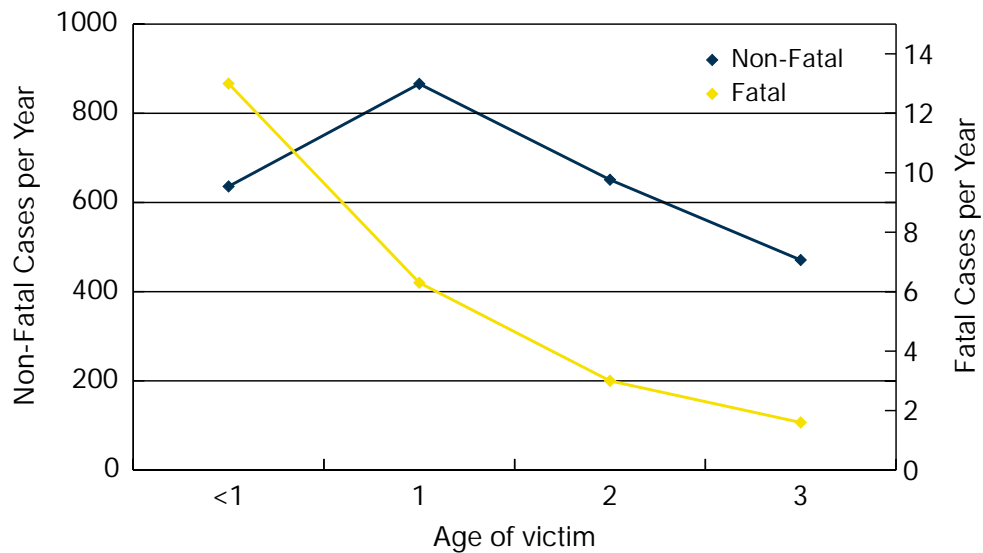
Table 2 THE NUMBER OF RECORDED CASES AND ESTIMATED UK ANNUAL TOTALS BY AGE AND SEX
Choking accidents involving children under 4 in the UK between 1986 and 1996

Age	Recorded Cases		Estimated Annual Average of Non-Fatal Cases
	Non-Fatal	Fatal	
Under 1	313	130	636
1	430	63	866
2	312	30	651
3	234	16	471
Total	1,289	239	2,624
<i>Boys</i>			
Under 1	171	76	346
1	250	33	503
2	166	20	342
3	123	9	246
Total	710	138	1,437
<i>Girls</i>			
Under 1	142	54	290
1	180	29	362
2	146	10	309
3	111	8	225
Total	579	101	1,187

Note : Because of rounding, estimates may not add up exactly to totals

Source: Metra Martech

Figure 2 TRENDS WITH AGE IN THE NUMBER OF CHOKING ACCIDENTS WITH ALL FOREIGN BODIES
AMONG CHILDREN UNDER 4 IN THE UK 1986 to 1996



Source: Metra Martech

5.2 The Trend with Age

Figure 2/Table 2 - Non-fatal cases show a peak between ages one and two years and then the number of cases declines steadily. In a previous study (*Choking Hazards for Children in the European Community*, published as DTI/Pub 2685/5K/3/97/R:1997) Metra Martech analysed accident rates by month over the first two years of life. This showed a pronounced peak between eight and 13 months, the age when children are beginning to move around and put things in their mouths but before they have fully developed the reflexes to eject unsuitable items.

The number of fatal cases shows a much sharper decline from 13 cases in the first year to an average of only 1.6 in the fourth year.

It will also be seen from Table 2 that the number of cases involving boys is consistently higher by about 20% than the number for girls.

In the previous study referred to above, it was found that 85% of deaths from choking of children under 10 occur in the first three years and 90% of them in the first four years. Similarly for non-fatal cases the proportions are 49% and 58%.

Choking accidents, particularly fatal ones, occur in the early years of life.

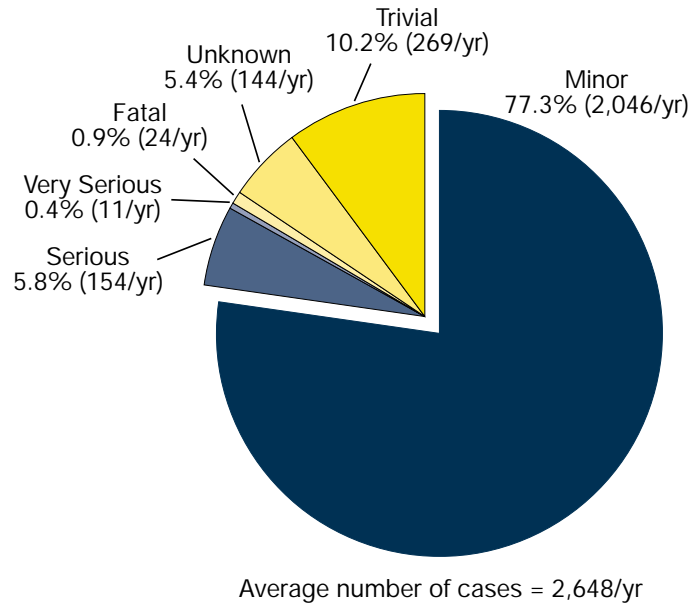
Table 3 THE NUMBER OF RECORDED CASES AND ESTIMATED UK ANNUAL TOTALS BY OUTCOME AND BY SEVERITY OF ACCIDENT. Choking accidents involving children under 4 in the UK between 1986 and 1996

Outcome	Recorded Cases	Estimated Annual Average	
Trivial (no treatment)	131	269	10.2%
Treated in A&E	766	1,562	58.9%
Referred to GP/OP/Other Hospital	233	476	18.0%
Admitted for < 1 day	4	8	0.3%
" " 1 day	42	84	3.2%
" " 2 days	27	52	2.0%
" " 3 days	9	18	0.7%
" " > 3 days	3	6	0.2%
Admitted for unknown time	54	108	4.1%
Transferred to another hospital	2	5	0.2%
Died	239	24	0.9%
Unknown Outcome	18	36	1.4%
Trivial	131	269	10.2%
Minor	1,003	2,046	77.3%
Serious	78	154	5.8%
Very serious	5	11	0.4%
Fatal	239	24	0.9%
Unknown	72	144	5.4%
Total	1,528	2,648	100.0%

Note : Because of rounding, estimates may not add up exactly to totals

Source: Metra Martech

Figure 3 OUTCOME OF CHOKING ACCIDENTS WITH ALL FOREIGN BODIES AMONG CHILDREN UNDER 4 IN THE UK 1986 TO 1996



Source: Metra Martech

5.3 Outcome of Cases

Figure 3/Table 3 - Section 4 describes how Metra Martech classified accidents into five groups based on severity. The overwhelming majority (88%) of cases are minor or trivial. There were 24 fatal cases per year and fewer very serious cases.

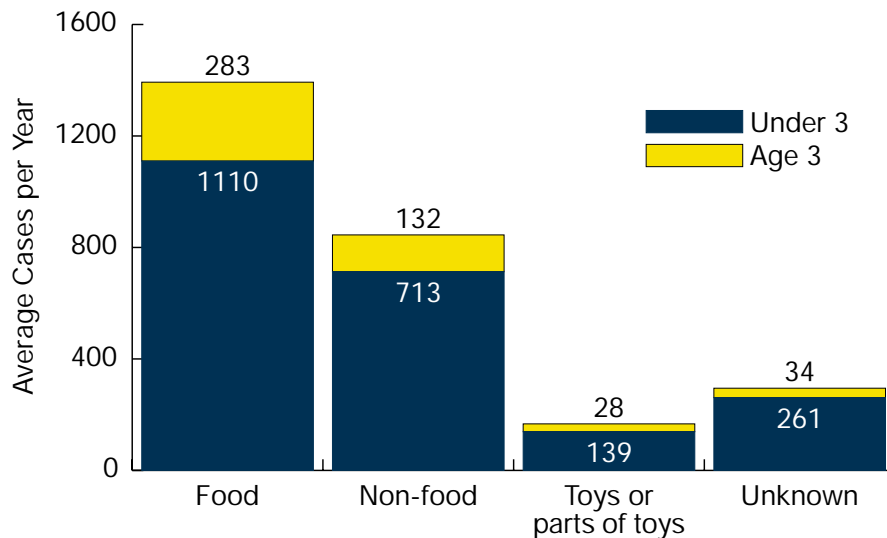
Table 4 TOTAL RECORDED CHOKING CASES AND ESTIMATED UK ANNUAL TOTALS BY TYPE OF FOREIGN BODY
Choking accidents involving children under 4 in the UK between 1986 and 1996

Foreign Body	Recorded Cases	Annual Average	
<i>Under 3</i>			
Food	666	1,110	49.9%
Non-Food (excluding Toys)	379	713	32.1%
Toy or Part of Toy	66	122	5.5%
Possible Toy or Part of Toy	9	17	0.8%
Unknown	158	261	11.7%
Total	1,278	2,223	100.0%
<i>Age 3</i>			
Food	149	283	59.2%
Non-Food (excluding Toys)	66	132	27.7%
Toy or Part of Toy	15	28	5.9%
Unknown	20	34	7.1%
Total	250	477	100.0%
<i>All Under 4</i>			
Food	815	1,393	51.6%
Non-Food (excluding Toys)	445	845	31.3%
Toy or Part of Toy	81	149	5.5%
Possible Toy or Part of Toy	9	17	0.6%
Unknown	178	295	10.9%
Total	1,528	2,699	100.0%

Note : Because of rounding, estimates may not add up exactly to totals

Source: Metra Martech

Figure 4 TYPES OF OBJECTS INVOLVED IN CHOKING ACCIDENTS AMONG CHILDREN UNDER 4
IN THE UK 1986 TO 1996



Source: Metra Martech

5.4 Type of Foreign Body

Figure 4/Table 4 - Most cases, 52%, involve food with a further 31% of cases involving non-food foreign bodies. A maximum of 6% of cases involve toys. The proportions are very similar for both children under three and three year olds.

Although the item causing the accident was not always described in detail, there were only 11% of cases where the foreign body was classified as unknown. There is no reason to suppose that this group contains a higher proportion of toys than the majority for which the type of foreign body is known. Assuming the "unknowns" contain the same proportion of toys, then the overall proportion of accidents involving toys is 7% of the total.

Table 5 ANALYSIS OF CASES BY TYPE OF FOREIGN BODY AND SEVERITY OF ACCIDENT
Choking accidents involving children under 4 in the UK between 1986 and 1996

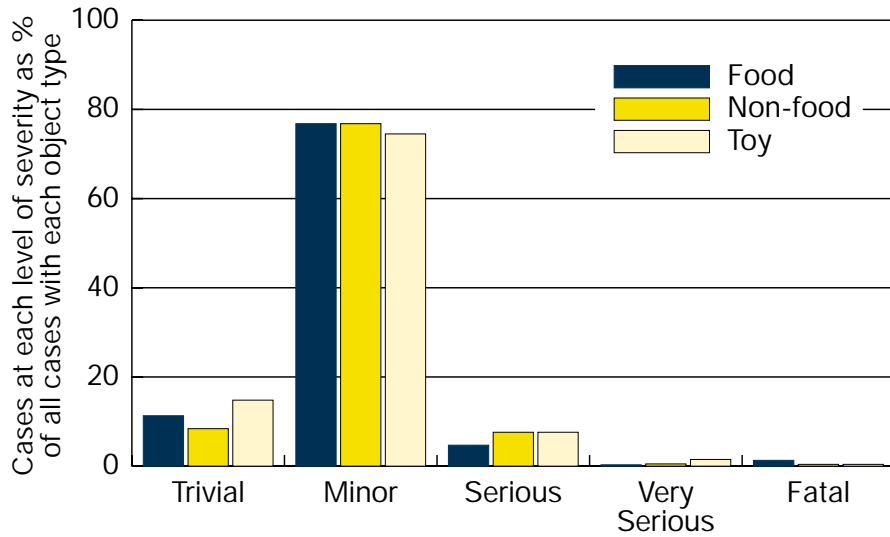
Foreign Body	Trivial	Minor	Serious	Very Serious	Fatal	Unknown	Total
<i>Food</i>							
Cases/year	152	1,040	64	4	17	77	1,354
Column%	56.3%	50.8%	41.4%	38.5%	68.0%	53.4%	51.1%
Row%	11.3%	76.8%	4.7%	0.3%	1.3%	5.7%	100.0%
<i>Non-Food (excl. toys)</i>							
Cases/year	71	649	64	4	3	54	845
Column%	26.4%	31.7%	41.7%	37.9%	12.0%	37.3%	32.0%
Row%	8.4%	76.8%	7.6%	0.5%	0.4%	6.3%	100.0%
<i>Toy or part of toy</i>							
Cases/year	25	124	13	2	1	2	167
Column%	9.2%	6.1%	8.2%	23.6%	3.8%	1.3%	6.3%
Row%	14.8%	74.5%	7.6%	1.5%	0.4%	1.2%	100.0%
<i>Unknown</i>							
Cases/year	22	233	13		4	12	284
Column%	8.1%	11.4%	8.7%		16.0%	8.0%	10.8%
Row%	7.7%	81.2%	4.7%		1.4%	4.1%	100.0%
Total							
Cases/year	269	2,046	154	11	25	144	2,648
Column%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Row%	10.2%	77.2%	5.8%	0.4%	0.9%	5.4%	100.0%

Note : Because of rounding, estimates may not add up exactly to totals

Source: Metra Martech

Figure 5

SEVERITY OF CHOKING ACCIDENTS WITH DIFFERENT TYPES OF FOREIGN BODY AMONG CHILDREN UNDER 4 IN THE UK, 1986 TO 1996



Source: Metra Martech

5.5 Severity of Accidents and Type of Foreign Body

Figure 5/Table 5 - The distribution of severity is similar with all types of foreign body. The proportion of trivial or minor cases is between 85% and 90% for food, non-food and toy objects and the proportions at the other levels of severity are very similar to each other, within the statistical significance of the sample size. In each case, the proportion of fatalities is about 1%.

Toys, if they cause accidents, are no more or less dangerous than the other types of foreign bodies which cause choking accidents.

Table 6

ANALYSIS OF CASES BY TYPE AND SIZE OF FOREIGN BODY
Choking accidents involving children under 4 in the UK between 1986 and 1996

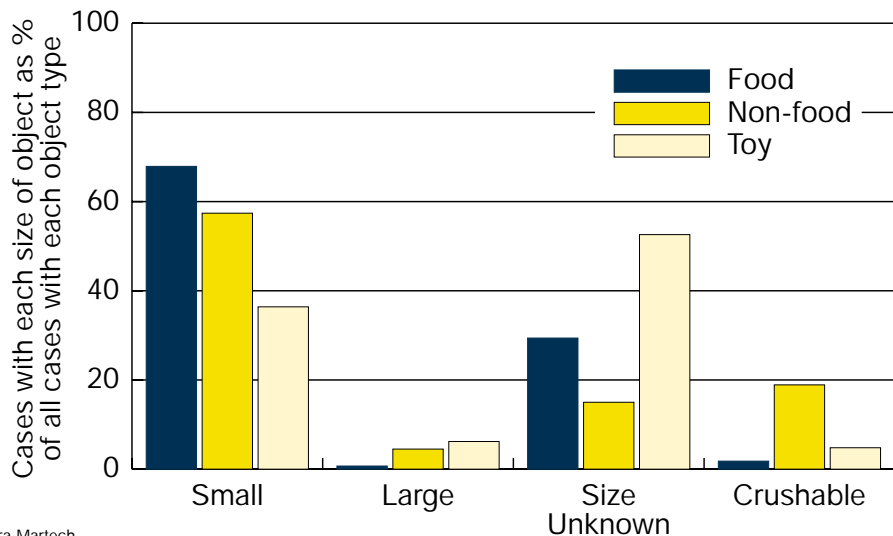
Foreign Body	Size				
	Small	Large	Size unknown	Not relevant	Crushable
<i>Food</i>					
Cases/year	916	9	402	1	25
Column%	61.1%	16.1%	46.5%	3.0%	12.9%
Row%	67.9%	0.7%	29.4%	0.1%	1.8%
<i>Non-Food (excl. toys)</i>					
Cases/year	485	38	127	35	160
Column%	32.4%	66.0%	14.7%	97.0%	83.0%
Row%	57.4%	4.5%	15.0%	4.2%	18.9%
<i>Toy or part of toy</i>					
Cases/year	61	10	88		8
Column%	4.0%	17.9%	10.2%		4.1%
Row%	36.4%	6.2%	52.6%		4.8%
<i>Unknown</i>					
Cases/year	36		247		
Column%	2.4%		28.6%		
Row%	12.9%		87.1%		
Total					
Cases/year	1,498	58	864	36	192
Column%	100.0%	100.0%	100.0%	100.0%	100.0%
Row%	56.7%	2.2%	32.5%	1.4%	7.3%

Note : Because of rounding, estimates may not add up exactly to totals

Source: Metra Martech

Figure 6

SIZE OF OBJECTS INVOLVED IN CHOKING ACCIDENTS WITH DIFFERENT TYPES OF FOREIGN BODY AMONG CHILDREN UNDER 4 IN THE UK, 1986 TO 1996



Source: Metra Martech

5.6 Type of Foreign Body and Size

Figure 6/Table 6 - Food items involved in choking accidents tend to be small (lots of nuts and fish bones) with only a tiny proportion (0.7%) that would not fit completely within the small parts cylinder. The proportion of large foreign bodies among non-food objects and toys is higher, but at 5% and 6% respectively is still low. The sizes of a substantial proportion (53%) of toys involved in choking accidents are not known. Some 19% of non-food foreign bodies are crushable items such as foil. Table 6 also shows that, after ignoring foreign bodies of unknown size, only 3% of all choking accidents are caused by large foreign bodies.

From Table 7 it will be seen that large objects cause a 50% higher proportion of serious cases than small objects (though they also cause a higher proportion of trivial cases). In absolute terms, of course, large objects cause very few accidents as only about 3% of the total is caused by such items - there are only 58 cases per year which involve large objects.

Large foreign bodies of all types cause very few accidents and it would be difficult to devise measures that would have a significant effect on the number of cases.

Table 7

ANALYSIS OF CASES BY SEVERITY AND SIZE OF FOREIGN BODY

Choking accidents involving children under 4 in the UK between 1986 and 1996

Severity	Size					Total
	Small	Large	Size unknown	Not relevant	Crushable	
<i>Trivial</i>						
Cases/year	132	10	101		27	269
Column%	8.8%	17.8%	11.7%		13.8%	10.2%
Row%	48.9%	3.8%	37.4%		9.9%	100.0%
<i>Minor</i>						
Cases/year	1,160	41	662	29	154	2,046
Column%	77.5%	71.2%	77.2%	79.9%	79.8%	77.5%
Row%	56.7%	2.0%	32.4%	1.4%	7.5%	100.0%
<i>Serious</i>						
Cases/year	94	6	44	2	8	154
Column%	6.2%	10.4%	5.1%	6.0%	4.1%	5.8%
Row%	60.9%	3.9%	28.7%	1.4%	5.1%	100.0%
<i>Very serious</i>						
Cases/year	11					11
Column%	0.7%					0.4%
Row%	100.0%					100.0%
<i>Fatal</i>						
Cases/year	2	-	21	1	-	24
Column%	0.1%	0.7%	1.7%	3.3%	0.2%	0.7%
Row%	6.2%	1.7%	87.5%	4.2%	1.2%	100.0%
<i>Unknown</i>						
Cases/year	100		36	4	4	144
Column%	6.7%		4.2%	10.8%	2.1%	5.4%
Row%	69.7%		24.8%	2.7%	2.8%	100.0%
Total						
Cases/year	1,498	58	864	36	192	2,648
Column%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Row%	56.7%	2.2%	32.6%	1.4%	7.3%	100.0%

Note : Because of rounding, estimates may not add up exactly to totals and "-" indicates an annual average of more than 0 but fewer than 0.5 cases

Source: Metra Martech

Table 8

ANALYSIS OF CASES BY TYPE OF FOREIGN BODY AND AGE OF VICTIM - Choking accidents involving children under 4 in the UK between 1986 and 1996

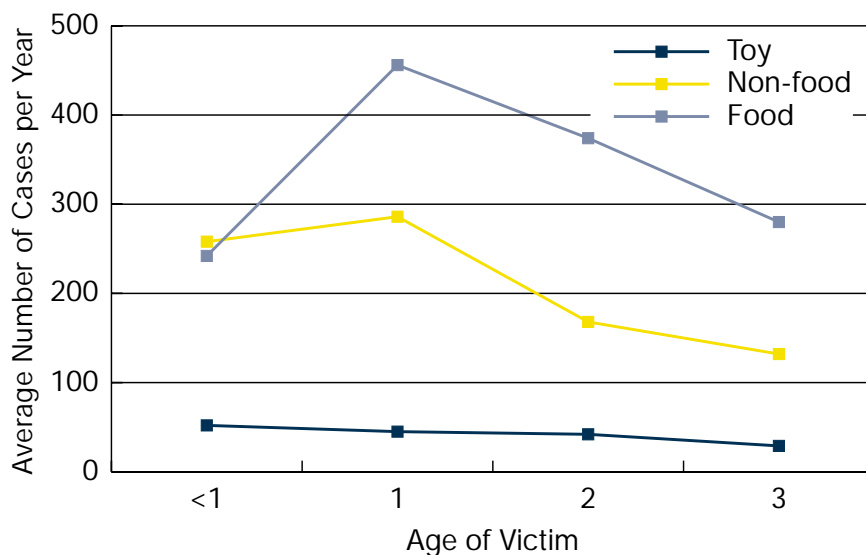
Foreign Body	Age of Victim			Total Under 3	Age 3	Total Under 4
	Under 1	1	2			
<i>Food</i>						
Cases/year	242	456	374	1,072	280	1,352
Column%	37.0%	52.2%	57.3%	49.2%	59.3%	51.0%
Row%	22.4%	42.6%	35.0%	100%	100%	100%
<i>Non-Food (excl. toys)</i>						
Cases/year	258	286	168	713	132	845
Column%	40.0%	32.9%	25.8%	32.9%	27.9%	32.0%
Row%	36.2%	40.1%	23.6%	100%	100%	100%
<i>Toy or part of toy</i>						
Cases/year	52	45	42	139	29	168
Column%	8.0%	5.2%	6.5%	6.4%	5.8%	6.3%
Row%	37.3%	32.3%	30.4%	100%	100%	100%
<i>Unknown</i>						
Cases/year	98	85	68	251	33	284
Column%	15.0%	9.7%	10.5%	11.5%	6.9%	10.7%
Row%	38.8%	33.9%	27.3%	100%	100%	100%
<i>Total</i>						
Cases/year	650	872	653	2,175	473	2,648
Column%	100%	100%	100%	100%	100%	100%
Row%	29.8%	40.1%	30.1%	100%	100%	100%

Note : Because of rounding, estimates may not add up exactly to totals

Source: Metra Martech

Figure 7

TRENDS IN NUMBERS OF CHOKING ACCIDENTS AMONG CHILDREN UNDER 4 IN THE UK WITH AGE, 1987 TO 1996



Source: Metra Martech

5.7 Type of Foreign Body and Age

Figure 7/Table 8 - Non-food accidents occur with similar frequency in each of the first two years of life and then decline. Food accidents peak in the second year and then decline rapidly. Toy accidents appear to decline steadily with age but the numbers are too small to draw definite conclusions.

Targeting measures to prevent choking accidents in children of up to three years of age appears to be an appropriate strategy.

Table 9 ANALYSIS OF CASES BY SEVERITY AND AGE OF VICTIM
Choking accidents involving children under 4 in the UK between 1986 and 1996

Severity	Age of Victim			Total Under 3	Age 3	Total Under 4
	Under 1	1	2			
<i>Trivial</i>						
Cases/year	55	100	75	230	40	269
Column%	8.6%	11.4%	11.5%	10.6%	8.4%	10.2%
Row%	24.1%	43.4%	32.6%	100%	100%	100%
<i>Minor</i>						
Cases/year	521	659	494	1,674	372	2,046
Column%	80.7%	75.6%	75.7%	77.2%	78.8%	77.5%
Row%	31.1%	39.3%	29.5%	100%	100%	100%
<i>Serious</i>						
Cases/year	36	47	41	124	29	154
Column%	5.6%	5.4%	6.3%	5.7%	6.2%	5.8%
Row%	29.1%	38.0%	32.9%	100%	100%	100%
<i>Very serious</i>						
Cases/year	2	9		11		11
Column%	0.3%	1.0%		0.5%		0.4%
Row%	17.4%	82.6%		100%		100%
<i>Fatal</i>						
Cases/year	14	6	2	22	2	24
Column%	2.2%	0.7%	0.4%	1.0%	0.3%	0.7%
Row%	63.6%	27.3%	9.1%	100%	100%	100%
<i>Unknown</i>						
Cases/year	22	52	40	114	30	144
Column%	3.3%	6.0%	6.2%	5.3%	6.3%	5.4%
Row%	18.9%	45.6%	35.5%	100%	100%	100%
Total						
Cases/year	650	872	653	2,175	473	2,648
Column%	100%	100%	100%	100%	100%	100%
Row%	29.8%	40.1%	30.1%	100%	100%	100%

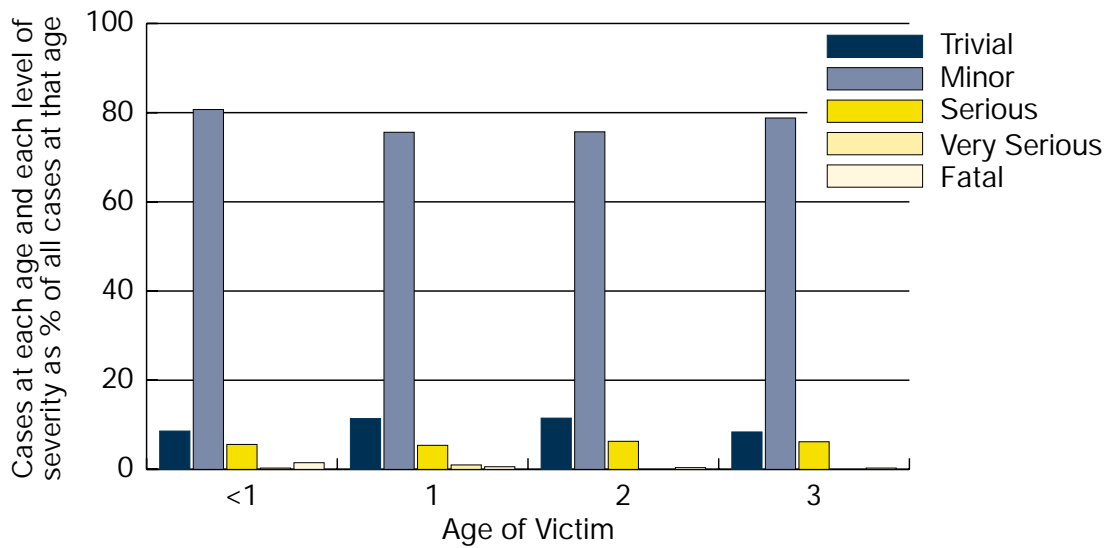
Note : Because of rounding, estimates may not add up exactly to totals

Source: Metra Martech

5.8 Severity of Accident and Age

Figure 8/Table 9 - The proportion of trivial and minor accidents is between 87% and 90% in all four age bands. The youngest band (< 1) has a higher proportion of fatalities and accounts for over half the deaths. Most of the deaths are caused by food and very few by toys.

Figure 8 PROPORTION OF ACCIDENTS AT EACH LEVEL OF SEVERITY AS A FUNCTION OF AGE FOR CHOKING ACCIDENTS AMONG CHILDREN UNDER 4 IN THE UK, 1986 TO 1996



Source: Metra Martech

Table 10 ANALYSIS OF CASES BY SIZE OF FOREIGN BODY AND AGE OF VICTIM
Choking accidents involving children under 4 in the UK between 1986 and 1996

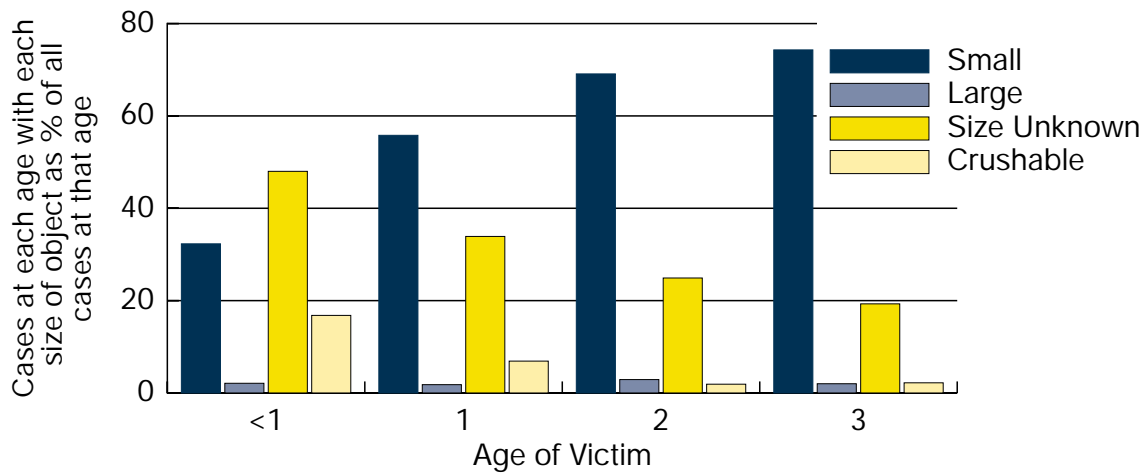
Size of Object	Age of Victim			Total Under 3	Age 3	Total Under 4
	Under 1	1	2			
<i>Small</i>						
Cases/year	210	486	451	1,147	351	1,498
Column%	32.3%	55.8%	69.1%	52.9%	74.3%	56.7%
Row%	18.3%	42.4%	39.3%	100%	100%	100%
<i>Large</i>						
Cases/year	13	16	19	48	10	58
Column%	2.1%	1.8%	2.9%	2.2%	2.0%	2.2%
Row%	27.8%	33.0%	39.2%	100%	100%	100%
<i>Size unknown</i>						
Cases/year	312	297	162	771	92	864
Column%	48.0%	33.9%	24.9%	35.3%	19.3%	32.5%
Row%	40.2%	38.6%	21.2%	100%	100%	100%
<i>Not relevant</i>						
Cases/year	5	13	8	27	10	36
Column%	0.8%	1.5%	1.3%	1.2%	2.1%	1.4%
Row%	18.7%	50.5%	30.8%	100%	100%	100%
<i>Crushable</i>						
Cases/year	109	60	12	182	11	192
Column%	16.8%	6.9%	1.9%	8.4%	2.2%	7.3%
Row%	60.2%	33.0%	6.8%	100%	100%	100%
Total						
Cases/year	650	872	653	2,175	473	2,648
Column%	100%	100%	100%	100%	100%	100%
Row%	29.8%	40.1%	30.1%	100%	100%	100%

Note : Because of rounding, estimates may not add up exactly to totals

Source: Metra Martech

Figure 9

PROPORTION OF ACCIDENTS WITH EACH SIZE OF OBJECT AS A FUNCTION OF AGE FOR CHOKING ACCIDENTS AMONG CHILDREN UNDER 4 IN THE UK, 1986 TO 1996



Source: Metra Martech

5.9 Size of Foreign Body and Age

Figure 9/Table 10 - Most of the accidents caused by crushable objects are among the very young. A significant proportion of these (20%) involve wrappers for sweets, chocolate or biscuits but there is no indication as to whether or not the wrapper was swallowed at the time the food was being eaten. A high proportion of objects of unknown size are involved in the accidents which occur in the first two years of life, probably because a very young victim is less able to give information about how the accident happened than an older child.

Up to the age of three, an increasing proportion of accidents is caused by small foreign bodies as children get older. The most important feature here is that only 2% of accidents involve large foreign bodies and this is true at all ages. Even allowing for items of unknown size, the proportion is still less than 4%.

Since so few choking accidents are caused by toys which do not fit completely within the small parts cylinder, raising the age warnings from 36 months to, say, four years would have little effect on the numbers of choking accidents.

Table 11 ESTIMATED AVERAGE OF CASES PER YEAR INVOLVING ITEMS OF FOOD BY TYPE OF FOOD AND SEVERITY OF ACCIDENT - Choking accidents involving children under 4 in the UK between 1986 and 1996

Type of Food	Trivial	Minor	Serious	Very Serious	Fatal	Unknown	Total
Sweet	67	342	2			13	424
Fish bone	12	273	21			26	332
Piece of fruit	19	87	4		-	2	112
Piece of bakery/biscuit	10	87	4			6	107
Meat bone	8	61	2			2	73
Lump of meat	8	51	8				66
Peanut/cashew/walnut	4	25	12	4	-	15	60
Piece of vegetable	11	31	6			4	52
Unknown food	4	22			14	4	45
Crisp	2	23					25
Fruit seed/stone	2	12			-	2	16
Lump of fish	4	8					12
Piece of chocolate		4	2				6
Foreign body in drink		4	2				6
Piece of pie	2					2	4
Egg		4					4
Cheese/dairy products		4					4
Drink/liquid						2	2
Bone		2					2
Vomit					1		1
Total	152	1,040	64	4	16	77	1,352

Note : Because of rounding, estimates may not add up exactly to totals and "-" indicates an annual average of more than 0 but fewer than 0.5 cases

Source: Metra Martech

Table 12 ESTIMATED AVERAGE OF CASES PER YEAR INVOLVING ITEMS OF FOOD BY TYPE OF FOOD AND AGE OF VICTIM - Choking accidents involving children under 4 in the UK between 1986 and 1996

Type of Food	Age of Victim			Total Under 3	Age 3	Total Under 4
	Under 1	1	2			
Sweet	45	162	138	345	80	424
Fish bone	20	73	122	214	118	332
Piece of fruit	44	54	4	102	10	112
Piece of bakery/biscuit	43	43	15	101	6	107
Lump of meat	11	17	24	52	14	66
Piece of vegetable	15	18	17	50	2	52
Peanut/cashew/walnut	2	32	16	50	10	60
Meat bone	10	20	15	45	28	73
Unknown food	24	13	3	40	5	45
Crisp	13	8	2	23	2	25
Fruit seed/stone		8	4	12	4	16
Lump of fish	2	2	6	10	2	12
Piece of chocolate	2	2	2	6		6
Foreign body in drink	4		2	6		6
Piece of pie		2	2	4		4
Egg	4			4		4
Cheese/dairy products	4			4		4
Drink/liquid		2		2		2
Bone			2	2		2
Vomit	1	-		1	-	1
Total	243	455	374	1,072	280	1,352

Note : Because of rounding, estimates may not add up exactly to totals and "-" indicates an annual average of more than 0 but fewer than 0.5 cases

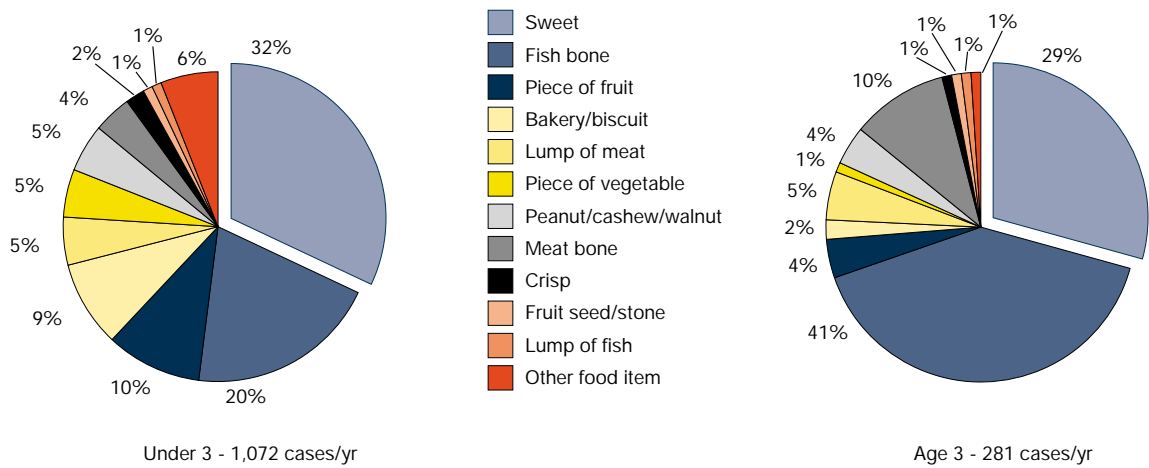
Source: Metra Martech

5.10 Choking Accidents Caused by Food

Figure 10/Tables 11/12 - For the under three year olds, the greatest number of accidents is caused by sweets. Among the three year olds, the greatest culprits are fish bones. This difference probably reflects a changing diet as children get older coupled with less effective supervision. Fish bones can certainly cause considerable discomfort in the throat though probably not real blockage of the airway.

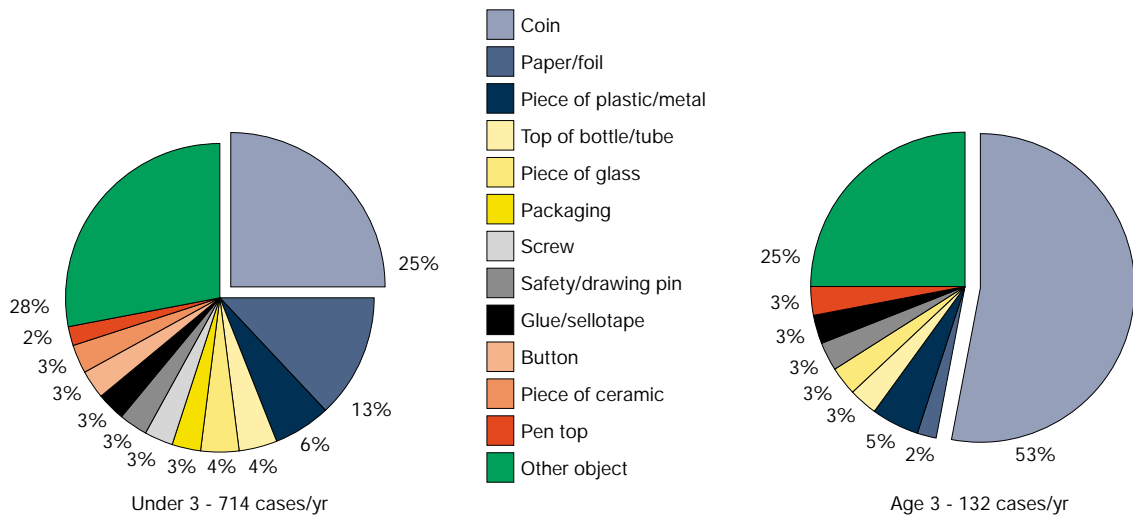
Again, most of the accidents are trivial or minor. Little is known about the foreign bodies involved in the fatal cases, but nuts feature prominently in the serious and very serious cases.

Figure 10 ESTIMATED NUMBER OF CASES OF CHOKING EACH YEAR CAUSED BY DIFFERENT TYPES OF FOOD AMONG CHILDREN UNDER 4 IN THE UK 1986 TO 1996



Source: Metra Martech

Figure 11 ESTIMATED NUMBER OF CASES OF CHOKING EACH YEAR CAUSED BY DIFFERENT TYPES OF NON-FOOD ITEMS, EXCLUDING TOYS, AMONG CHILDREN UNDER 4 IN THE UK 1986 TO 1996



Source: Metra Martech

5.11 Choking Accidents Caused by Non-Food Foreign Bodies

Figure 11/Tables 13/14 - Some 30% of choking accidents involving non-food foreign bodies are caused by coins, followed by a variety of mostly small objects. About 11% are caused by paper or foil (often sweet wrappers). As has been seen earlier, nearly all of these accidents are trivial or minor.

Table 13

ESTIMATED AVERAGE OF CASES PER YEAR INVOLVING NON-FOOD FOREIGN BODIES, EXCLUDING TOYS -
BY TYPE OF FOREIGN BODY AND SEVERITY OF ACCIDENT
Choking accidents involving children under 4 in the UK between 1986 and 1996

Type of Foreign Body	Trivial	Minor	Serious	Very Serious	Fatal	Unknown	Total
Coin	22	169	31		-	33	255
Paper/foil	14	72	4		-	2	93
Piece of plastic/metal	4	40	2		-		47
Top of bottle/tube	4	25	2		-		31
Piece of glass	2	24	2			2	30
Packet/package/bag	7	17			-		24
Screw		19	2		-	2	23
Safety/drawing pin		18		4			22
Glue/Sellotape	2	16	2			2	22
Button	2	20			-		22
Piece of ceramic/vase/plate		19			-	2	21
Pen top	4	16			-		20
Nail		12	2		-		14
Leaf/soil/grass		11				2	14
Crayon	4	8			-		12
Unknown		10			2		12
Thread/wool		10					10
Brooch/clip	2	8					10
Ear-ring		6	4				10
Jewellery/ring		6				5	10
Stalk		6				2	8
Stone		8			-		8
Piece of wood		8					8
Hanger		7					7
Top of thermometer		4	2				6
Hair comb/teeth		4	2				6
Straw		6					6
Foam		6					6
Hairbrush/broom		6					6
Other non-food object	2	4			-		6
Clothes peg		4	2				6

contd.

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Type of Foreign Body	Trivial	Minor	Serious	Very Serious	Fatal	Unknown	Total
Staple		6					6
Locket		4	2				6
Hair slide		4					4
Pill		4					4
Cigarette filter		4					4
Curtain hook		2	2				4
Plaster/paint		2	2				4
Toothbrush		2	2				4
Ring pull from can		4					4
Ruler/stick		4					4
Eraser		2					2
Match		2					2
Shell		2					2
Teeth						2	2
Candleholder		2					2
Clock winder		2					2
Firelighter		2					2
Battery		2					2
Chain		2					2
Cable/wire		2					2
Spray		2					2
Belt		2					2
Twig	2				-		2
Total	71	649	64	4	4	54	846

Note : Because of rounding, estimates may not add up exactly to totals and "-" indicates an annual average of more than 0 but fewer than 0.5 cases

Source: Metra Martech

Table 14

ESTIMATED AVERAGE OF CASES PER YEAR INVOLVING NON-FOOD FOREIGN BODIES,
EXCLUDING TOYS - BY TYPE OF FOREIGN BODY AND AGE OF VICTIM
Choking accidents involving children under 4 in the UK between 1986 and 1996

Type of Foreign Body	Age of Victim			Total Under 3	Age 3	Total Under 4
	Under 1	1	2			
Coin	24	86	74	184	71	255
Paper/foil	69	20	2	91	2	93
Piece of plastic/metal	16	14	11	41	6	47
Top of bottle/tube	7	16	4	27	4	31
Piece of glass	2	18	6	26	4	30
Packet/packaging/bag	18	6		24		24
Screw	8	6	9	23		23
Safety/drawing pin	8	6	6	20	2	22
Glue/Sellotape	2	10	6	18	4	22
Button	8	3	7	18	4	22
Piece of ceramic/vase/plate	12	9		21		21
Pen top	4	6	6	16	4	20
Nail	4	8	2	14		14
Leaf/soil/grass	5		4	9	5	14
Crayon	4	6	2	12		12
Unknown	5	4	-	10	2	11
Thread/wool	4	4	2	10		10
Brooch/clip	6	4		10		10
Ear-ring	4	4	2	10		10
Jewellery/ring	4	4		8	2	10
Stalk	4		4	8		8
Stone	2	6		8		8
Piece of wood	2	2		4	4	8
Hanger	2	4		7		7
Top of thermometer	2	4		6		6
Hair comb/teeth	2	4		6		6
Straw	2	2	2	6		6
Foam	4	2		6		6
Hairbrush/broom	2	4		6		6
Other non-food object	2	-	2	4	2	6
Clothes peg	2	2		4	2	6
Staple	2	2		4	2	6
Locket	4			4	2	6
Hair slide			4	4		4
Pill	2		2	4		4
Cigarette filter	2	2		4		4
Curtain hook		2	2	4		4

contd.

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Type of Foreign Body	Age of Victim			Total Under 3	Age 3	Total Under 4
	Under 1	1	2			
Plaster/paint	2	2		4		4
Toothbrush		2	2	4		4
Ring pull from can	4			4		4
Ruler/stick			2	2	2	4
Eraser		2		2		2
Match		2		2		2
Shell	2			2		2
Teeth	2			2		2
Candleholder		2		2		2
Clock winder		2		2		2
Firelighter		2		2		2
Battery			2	2		2
Chain		2		2		2
Cable/wire		2		2		2
Spray					2	2
Belt					2	2
Twig					2	2
Total	259	286	168	714	132	846

Note : Because of rounding, estimates may not add up exactly to totals and "-" indicates an annual average of more than 0 but fewer than 0.5 cases

Source: Metra Martech

Table 15 ESTIMATED AVERAGE OF CASES PER YEAR INVOLVING TOYS OR PARTS OF TOYS BY TYPE OF TOY AND SEVERITY OF ACCIDENT - Choking accidents involving children under 4 in the UK between 1986 and 1996

Type of Toy	Trivial	Minor	Serious	Very Serious	Fatal	Unknown	Total
Part of toy	6	20					26
Toy - unspecified	4	16	4		-		24
Toy - specified	2	17	2		-		22
Unknown toy	2	17					19
Ball bearing		14	2		-		16
Plastic bead	2	12			-	2	16
Piece of plastic toy		12					12
Marble		6	2	2	-		11
Plastic brick	4	2	2				8
Coin/disk-plastic	2	6					7
Whistle	2						2
Snooker cue		2					2
Kinder egg		2			-		2
Total	25	124	13	2	1	2	167

Note : Because of rounding, estimates may not add up exactly to totals and "-" indicates an annual average of more than 0 but fewer than 0.5 cases

Source: Metra Martech

Table 16

ESTIMATED AVERAGE OF CASES PER YEAR INVOLVING TOYS OR PARTS OF TOYS BY TYPE OF TOY AND AGE OF VICTIM - Choking accidents involving children under 4 in the UK between 1986 and 1996

Type of Toy	Age of Victim			Total Under 3	Age 3	Total Under 4
	Under 1	1	2			
Toy - unspecified	6	12	6	24		24
Toy - specified	8	3	10	20	2	22
Unknown toy	12	8		19		19
Part of toy	11	4	2	18	8	26
Plastic bead		10	2	12	4	16
Piece of plastic toy	10	2		12		12
Ball bearing		-	10	10	6	16
Plastic brick	2	4	2	8		8
Marble		3	4	7	4	11
Coin/disk-plastic	2		2	4	4	7
Whistle			2	2		2
Snooker cue			2	2		2
Kinder egg	2			2	-	2
Total	52	45	42	139	28	167

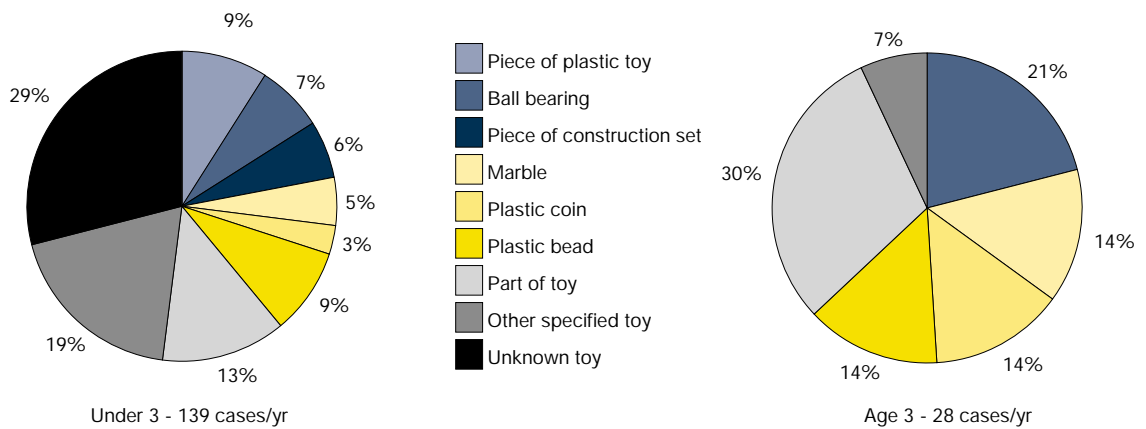
Note : Because of rounding, estimates may not add up exactly to totals and "-" indicates an annual average of more than 0 but fewer than 0.5 cases

Source: Metra Martech

5.12 Choking Accidents Caused by Toys

Figure 12/Tables 15/16 - Apart from the miscellaneous 'Other Specified Toys', most accidents are caused by small round items such as marbles, ball bearings and beads as well as plastic building bricks.

Figure 12 ESTIMATED NUMBER OF CASES OF CHOKING EACH YEAR CAUSED BY DIFFERENT TYPES OF TOYS, AMONG CHILDREN UNDER 4, IN THE UK 1986 TO 1996



Source: Metra Martech

Table 17

ESTIMATED AVERAGE NUMBER OF CASES PER YEAR INVOLVING TOYS OR PARTS OF TOYS BY SIZE OF TOY AND SEVERITY OF ACCIDENT - Choking accidents involving children under 4 in the UK between 1986 and 1996

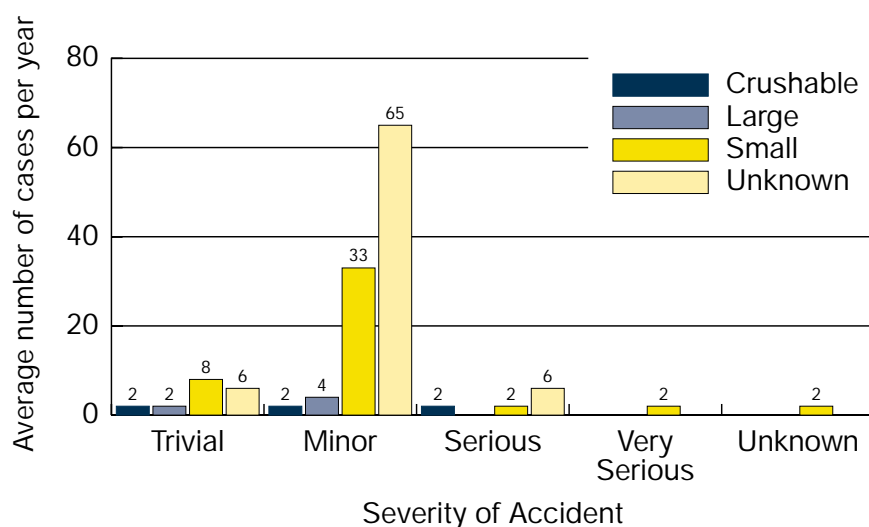
Severity	Size								Total	
	Small		Large		Size unknown		Crushable			
<i>Under 3</i>										
Trivial	8	5.9%	2	1.8%	8	5.6%	2	1.4%	20	14.7%
Minor	33	23.6%	4	3.0%	65	46.5%	2	1.4%	103	74.4%
Serious	2	1.4%			6	4.3%	2	1.6%	10	7.3%
Very serious	2	1.8%							2	1.8%
Fatal	-	0.1%			-	0.3%			1	0.4%
Unknown	2	1.4%							2	1.4%
Total	47	34.1%	7	4.8%	79	56.8%	6	4.4%	139	100%
<i>Age 3</i>										
Trivial					2	9.0%	2	6.6%	4	15.7%
Minor	13	47.7%	4	13.5%	4	13.7%			21	75.0%
Serious					2	9.0%			2	9.0%
Fatal	-	0.4%							-	0.4%
Total	13	48.1%	4	13.5%	9	31.8%	2	6.6%	28	100%
<i>Under 4</i>										
Trivial	8	4.9%	2	1.5%	10	6.2%	4	2.3%	25	14.8%
Minor	46	27.5%	8	4.7%	68	41.1%	2	1.2%	124	74.5%
Serious	2	1.1%			9	5.1%	2	1.3%	13	7.6%
Very serious	2	1.5%							2	1.5%
Fatal	-	0.2%			-	0.2%			1	0.4%
Unknown	2	1.2%							2	1.2%
Total	61	36.4%	10	6.2%	88	52.6%	8	4.8%	167	100%

Note : Because of rounding, estimates may not add up exactly to totals and "-" indicates an annual average of more than 0 but fewer than 0.5 cases

Source: Metra Martech

Figure 13

AVERAGE NUMBER OF CASES PER YEAR OF CHOKING BY TOYS AMONG CHILDREN UNDER 4 IN THE UK, 1986 TO 1996



Source: Metra Martech

5.13 Severity of Choking Accidents Caused by Toys and Size of Toys

Figure 13/Table 17 - Most accidents involving toys are trivial or minor and all the cases where the outcome is serious or very serious involve small toys or parts of toys which would fit completely within the small parts cylinder.

Over the period covered by this report, there was an average of 139 choking accidents per year involving children under three and a further 28 involving three year olds. Breaking down these figures by size of object and severity of choking incident, and apportioning the numbers for 'Unknown' in Table 17 to the other categories, gives the following results for an 'average' year:

	Under three years old			Three years old		
	Small	Large	Crushable	Small	Large	Crushable
Trivial/Minor	101	15	10	18	5	3
Serious/Very Serious	7		5	1		1
Fatal	1					

Redesigning the small parts cylinder to eliminate all the accidents involving large toys would save a maximum of 15 accidents among the under three year olds and a further five among the three year olds.

Amending the present requirements by raising the age warnings from 36 months to, say, four years would potentially prevent 19 accidents. However, all but one of these accidents are minor or trivial and the measure would be unlikely to prevent more than a portion of them.

If some means could be devised which prevented children under four coming into contact with small toys or parts of toys, then 109 accidents could be eliminated for the under three year olds and 19 for the three year olds. However, such measures would be difficult to define and if effective would also prevent older children from playing with small toys which are widely considered to be essential in the development of manual and intellectual skills.

The benefit would be elimination of mostly minor accidents to perhaps 100 children. The cost may be to deprive the majority of children of an opportunity to learn valuable skills.

Table 18 ALL FOREIGN BODIES INVOLVED IN FATAL CASES

Choking accidents involving children under 4 in the UK between 1986 and 1995

Foreign Body	Age of Victim			Total Under 3	Age 3	Total Under 4
	Under 1	1	2			
Unknown food	94	34	10	138	8	146
Unknown	16	14	13	43	5	48
Vomit	8	2		10	1	11
Screw		2	1	3		3
Peanut/cashew/walnut	2		1	3		3
Coin	1	1		2		2
Paper/foil	2			2		2
Crayon*			2	2		2
Twig	2			2		2
Toy - unspecified*	1		1	2		2
Toy - specified*		1	1	2		2
Packet/packaging/bag	1			1		1
Piece of plastic/metal		1		1		1
Top of bottle/tube	1			1		1
Pen top		1		1		1
Button		1		1		1
Stone		1		1		1
Nail	1			1		1
Piece of Ceramic/vase/plate	1			1		1
Marble*		1		1		1
Other non-food object		1		1		1
Ball bearing*		1		1		1
Fruit seed/stone		1		1		1
Piece of fruit			1	1		1
Toy from Kinder egg*					1	1
Wheel from toy car*					1	1
Spindle from toy sewing machine*		1		1		1
Total	130	63	30	223	16	239

*Classified as toys

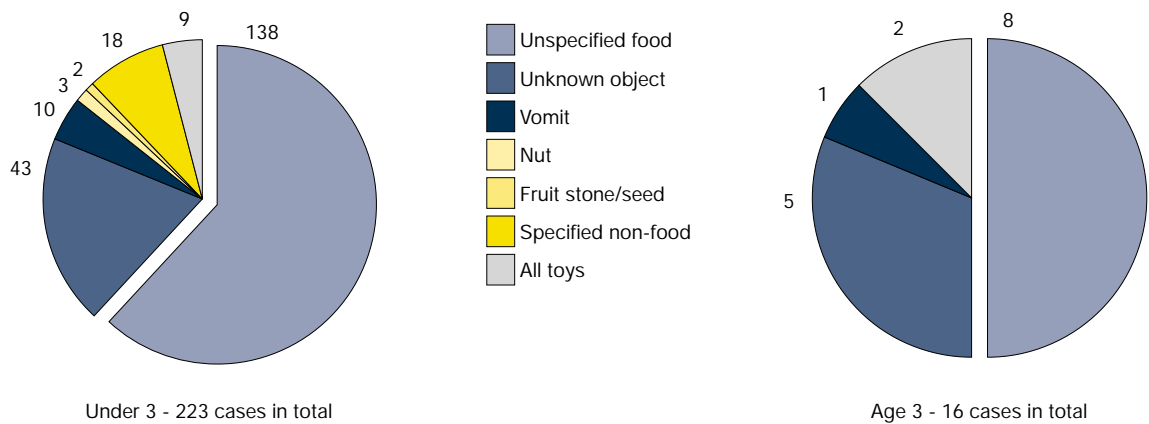
Source: Metra Martech

5.14 Types of Foreign Bodies Causing Fatalities

Figure 14/Table 18 - Almost 60% of all fatal accidents are caused by food and only 5% by a toy or part of a toy - that is eight cases over the 10 year period or an average of less than 1 per year.

Fatal choking accidents involving children are so rare that it would be very difficult to conceive of any action that would eliminate the risk completely.

Figure 14 FOREIGN BODIES INVOLVED IN FATAL CASES OF CHOKING AMONG CHILDREN UNDER 4, IN THE UK 1986 TO 1995



Source: Metra Martech

Table 19 ESTIMATED UK ANNUAL TOTALS BY TYPE OF FOREIGN BODY BY SEVERITY OF ACCIDENT AND YEAR. Choking accidents involving children under 4 in the UK between 1986 and 1996

Year	Trivial	Minor	Serious	Very Serious	Fatal	Unknown	Total
<i>Food</i>							
1986					29		29
1987		1,414	108		25	151	1,698
1988		1,166	78		16	117	1,377
1989		1,457	146		24	55	1,683
1990		1,793	112		15	37	1,957
1991		1,292	57		20	76	1,445
1992	89	1,436	67	22	8	133	1,755
1993	273	472	50		5	25	825
1994	367	469			8	41	884
1995	347	457	18	18	12	37	889
1996	442	442				96	980
Total	1,518	10,398	636	40	162	768	13,522
<i>Non-food</i>							
1986					3		3
1987		540	86	22	3		651
1988		585	78		6	176	845
1989		856	92	18	2	18	986
1990		1,087	93		6	56	1,242
1991		789	171		7	38	1,005
1992	22	1,338	22		2	67	1,451
1993	174	298	25		6	25	528
1994	122	448			4	81	656
1995	183	201	55		3	37	478
1996	211	346	19			38	616
Total	712	6,488	641	40	42	536	8,459
<i>Toy or part of toy</i>							
1987		86			1		87
1988		215	20		1		235
1989		273			1		274
1990		149			1		150
1991		171	19		1		191
1992		111	22				133
1993	75	50	25	25	1		175
1994	41	20	41		1		103
1995	55	128					183
1996	77	38				19	134
Total	247	1,241	126	25	7	19	1,666

Note : Because of rounding, estimates may not add up exactly to totals
Excludes foreign bodies of "unknown type"

Source: Metra Martech

5.15 Trends with Time

Figure 15/Tables 19/20 - Accidents with all three types of objects show a downward trend. Accidents with food are decreasing by 8% per year, non-food cases by 4% and toys by 3%.

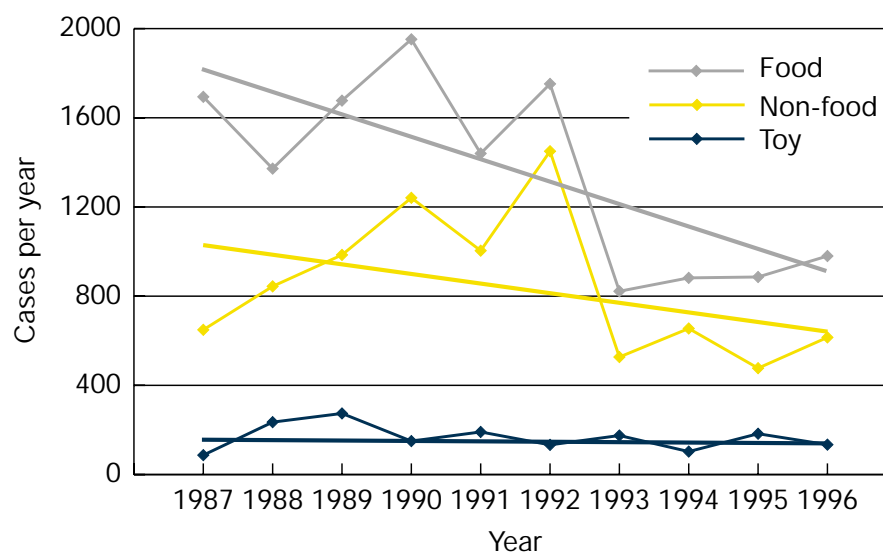
Table 20 ESTIMATED UK ANNUAL TOTALS FOR ALL CASES BY SEVERITY OF ACCIDENT AND YEAR
Choking accidents involving children under 4 in the UK between 1986 and 1996

Year	Trivial	Minor	Serious	Very Serious	Fatal	Unknown	Total
1986					32		32
1987		2,321	216	22	30	151	2,740
1988		2,180	176		23	293	2,671
1989		2,915	256	18	28	92	3,309
1990		3,447	223		25	130	3,825
1991		2,641	304		29	114	3,088
1992	111	3,158	111	22	11	222	3,634
1993	621	919	99	25	16	50	1,731
1994	591	1,080	41		24	122	1,857
1995	603	877	91	18	21	91	1,703
1996	768	922	19			173	1,883
Total	2,695	20,460	1,537	105	239	1,438	26,473

Note : Because of rounding, estimates may not add up exactly to totals

Source: Metra Martech

Figure 15 TRENDS IN NUMBERS OF CHOKING ACCIDENTS AMONG CHILDREN UNDER 4 IN THE UK BY TYPE OF FOREIGN BODY 1987 TO 1996



Source: Metra Martech

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