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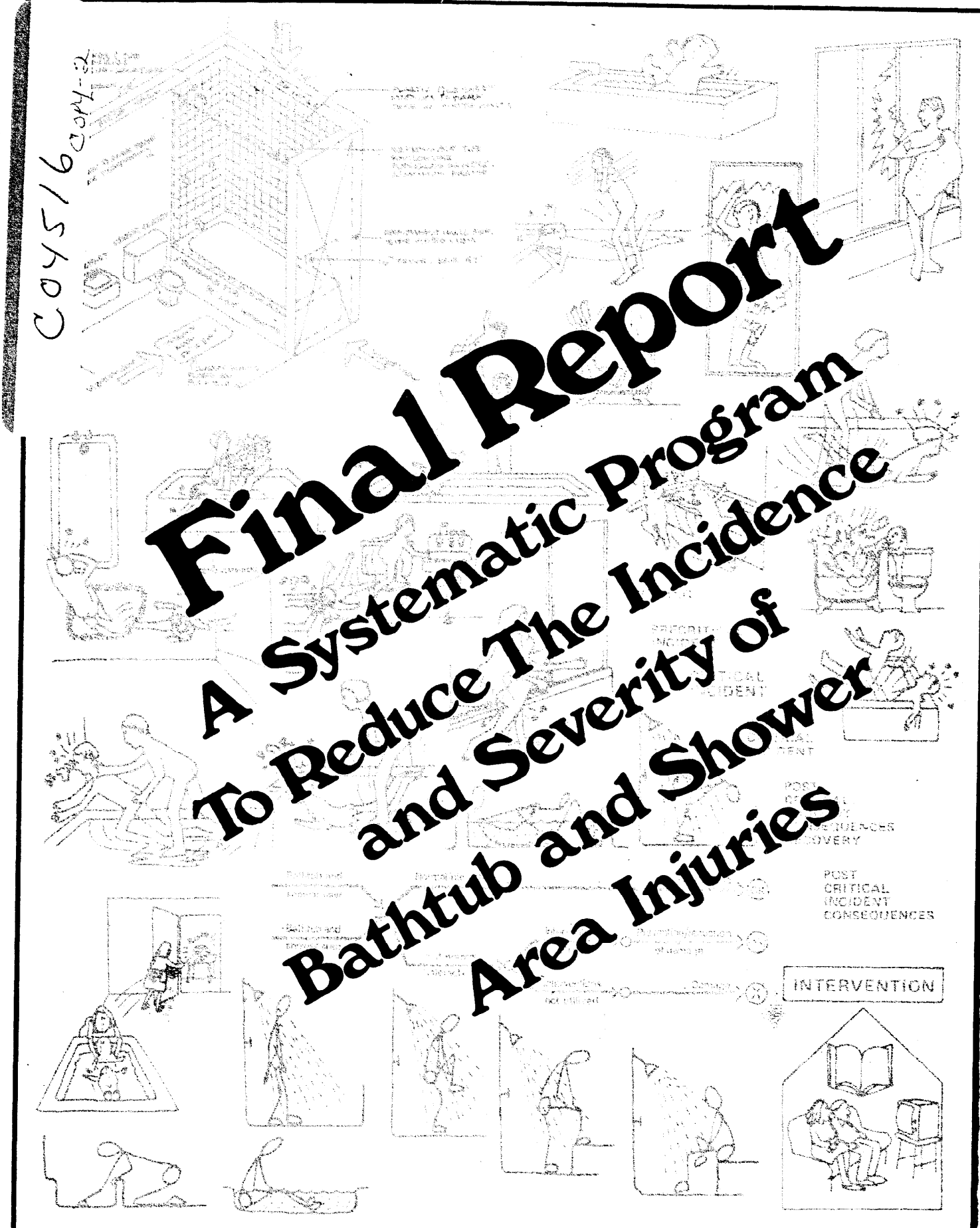

Final Report

A Systematic Program To Reduce The Incidence and Severity of Bathtub and Shower Area Injuries

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Contract # CPSC-P-74-334

A Systematic Program to Reduce the Incidence and Severity of Bathtub and Shower Area Injuries

DRAFT FINAL REPORT
June 4, 1975

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Disclaimer

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Acknowledgements

This report has been prepared by Abt Associates Inc. under contract # CPSC-P-74-334 for the Special Engineering Studies Division, Consumer Product Safety Commission. The Abt Associates team for this study included:

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The authors wish to thank Mr. Brian C. Pierman, Manager, Structural/Architectural Systems Programs of the Special Engineering Studies Division at CPSC, for his untiring professional assistance and support. His concern that this report provide policy-relevant recommendations has guided us throughout the course of this project. The authors also wish to thank Jules Bigio, Director of the Special Engineering Studies Division, for his support in the project. Finally, the authors wish to thank the Bureau of Epidemiology of CPSC for their assistance in providing the NEISS data on which our results were based.

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1.0 INTRODUCTION

In July, 1974, the Consumer Product Safety Commission awarded a contract to Abt Associates Inc. and a subcontract to RESEARCHITECTS, Inc. to study means of reducing the incidence and severity of bathtub and shower area injuries (CPSC-P-74-334). This report presents the final results of the study; previous reports on Phases I, II and III provide more detailed documentation of the intermediate steps in the research process.[1] This study was conducted by a social science research firm and an architectural/environmental research firm with input from the industrial and public sectors. Research was carried on in four phases, according to contractual specification.

Phase I consisted of a literature search and accident classification. Available data on accidents, largely from the National Electronic Injury Surveillance System (NEISS) used to determine factors most frequently associated with bathing injuries. Within the main categories of slips and falls, drownings, and burns, 56 associated factors were identified. These factors were ranked according to the frequency and severity of the accidents in which they appeared. This accident factor prioritization list provided the basis for development of accident scenarios and for economic analysis of costs and benefits of intervention strategies.

During Phase II, seventeen accident scenarios representing all the major types of accidents and appropriate intervention strategies were developed. These scenarios defined an accident as a system of six parts, from accident setting factors to incident recovery consequences. The seventeen scenarios

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[1] Phase I Report, "A Systematic Program to Reduce the Incidence and Severity of Bathtub and Shower Area Injuries," September 16, 1974. Phase II Report, "Accident Scenarios and Intervention Strategies," December 16, 1975. Phase III Report, "Intervention Strategies, Performance Guidelines and Cost/Benefit Analysis," February 13, 1975.

covered all the variable factors found in the NEISS In-Depth Case Studies, including relating types of accidents to specific user groups. Intervention strategies were designed to impact upon each scene in the accident scenarios.

Phase II involved further development of these intervention strategies. Many intervention strategies suggest opportunities for new product development or improvement of existing products. Preliminary considerations were made for these performance guidelines, which differ from performance standards in that they designate a goal to be achieved by the product rather than a specific means of attaining the goal, thus allowing the manufacturers more flexibility for innovation. An economic analysis of the potential savings from successful implementation of the major intervention strategies was then performed.

The purpose of Phase IV was to disseminate the findings of the study to actors in the field of bathtub safety: manufacturers, testing laboratories, standards-setting groups, government and consumer representatives. A conference was held to present information to representatives from these groups. The conference attendees reviewed and discussed major intervention strategies, and made suggestions for implementation. Their comments have been integrated into the study team's findings to produce the final recommendations of the study.

This report presents the methodology and results of each of the four phases and final summative recommendations. These recommendations indicate the most promising cost-effective methods of reducing the incidence and severity of bathtub injuries and suggest areas in which further research could prove fruitful.

2.0 ACCIDENT SCENARIOS

Accidents in the bathtub and shower area can be defined as a complex, time dependent system of components interacting simultaneously and sequentially to produce injury. The individuality and individual significance to the victim of each accident is unquestioned. At the same time, an understanding of these events requires detailed objective analysis and synthesis of similar components and accident systems into classes or scenarios.

Three tools were used in the development of scenarios; first, the accident factor prioritization list; second, the review of case studies for patterning; third, variable factor interaction, grouping, and analysis.

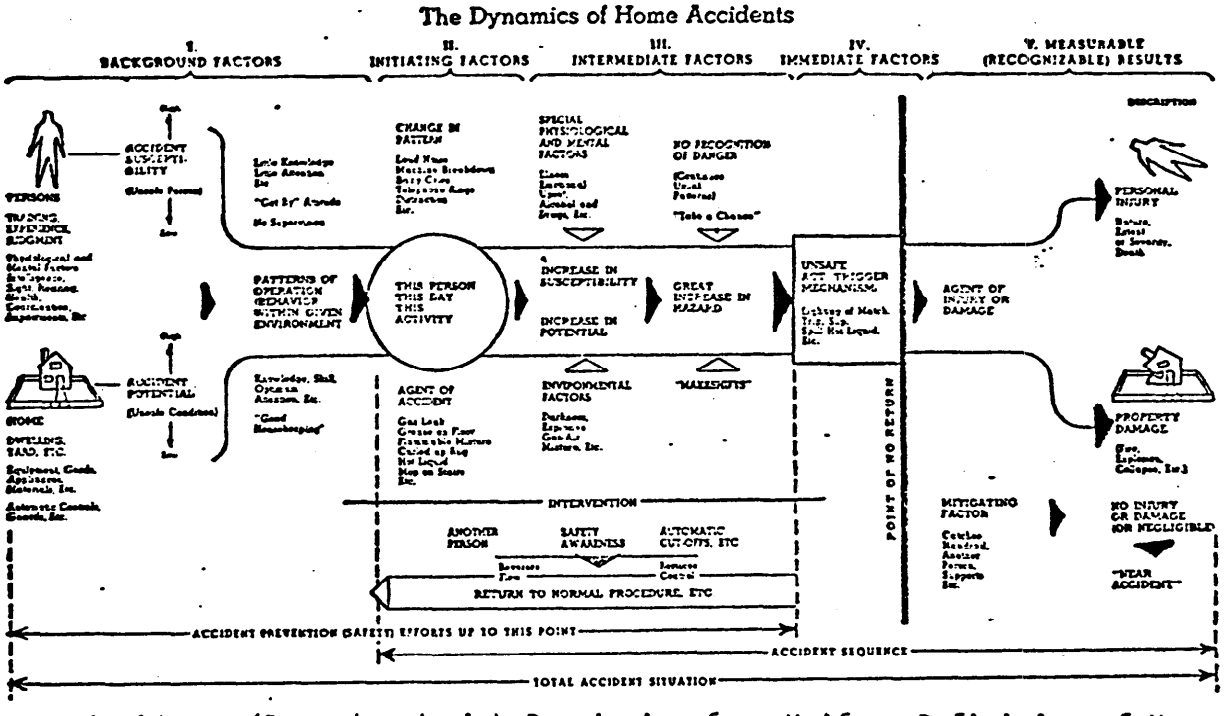
2.1 Accident Factor Prioritization

Accident classification seemed at the outset dependent upon the establishment of criteria for selecting, sorting and ranking factors within the accident. Soon after examining the accident phenomenon in the literature and the NEISS In-Depth case studies,[1] it became apparent that accidents are complex phenomena composed of many interrelated variables. Each of these variable factors in any one accident associated itself with a given injury in that accident, but the question emerged as to which factor to consider the "primary accident factor." Figure 2-1, suggests this anomaly which is in some contradiction to the "common sense" definition of accidents as have been "caused by something", implying one or a very limited number of culprits.

All indications were that many factors were responsible for each accident and that these were interrelated and connected in time and space to the injury. Even at this stage, therefore, it became clear that a comprehensive, exhaustive, and exclusive list of all the accident variable factors, in all the accidents reported in the NEISS In-Depth

[1] The National Electronic Injury Surveillance System (NEISS) is a data base maintained by the Bureau of Epidemiology of the Consumer Product Safety Commission, including statistical data and in-depth case studie's. For more detailed information concerning NEISS, see Section 4.1.

Diagram 2-1



Dynamics of Home Accidents (Reproduced with Permission from Uniform Definition of Home Accidents)

case study data base would need to be prepared. This list is reproduced in Table 2-2. Some sixty-five variable factors were coded and recorded from the information presented on the statistical and narrative portions of the case studies. It is clear that multiple choices were needed for each factor; for example, variable factor (5) AGE had choices of 0 to 2 years, 2 to 4 years, 5 to 9 years etc. Such an array of variable factors and choices, where at least 255 case studies were to be analyzed, represented a formidable body of information This information base had two additional dimensional requirements. The first requirement was relatively straightforward; that the frequency of appearance of any variable factor choice had to be recorded. This was necessary to establish a simple frequency ranking of in-depth case study factors. This frequency was then adjusted, to conform to the NEISS Survey data in order to eliminate the in-depth data bias in favor of more severe injuries. The second requirement was more complex. Each in-depth case study accident phenomenon resulted in an injury. Each injury could be classified according to its severity, and such a general injury classification was provided in the NEISS Injury Severity Index. These severities ranged from the least injurious at level 1 to death ranked as level 7. In this system, injuries of different types might be given equal levels of severity; for example, a slight cut and puncture might be noted equally at level 2.

The task of prioritizing these accident factors by their type, frequency, and severity level required the use of computer data processing.

By establishing the statistical frequency of appearance of each variable factor choice and crosstabulating these choices against the severity level associated with each choice, it was possible to compile a list of accident factors ranked according to their frequency and severity values. Additionally, certain factors were found strongly coupled to other factors.

Table 2-2

VARIABLE FACTORS

Summary of Variable Factors from NEISS In-Depth Case Studies

Scene Number	Master Code List No.	Variable Factor
Scene 1 Data Gathering for Analysis of Accident Scenario		
		Investigation of Accident
	1.	Case Number
	2.	Respondent
	3.	Time Spent in Investigation
	4.	Case Source
	-.	Card Number 1
Scene 2 Accident Setting		
		User Description
	5.	Age of Victim
	6.	Sex of Victim
	7.	Height of Victim
	8.	Weight of Victim
	9.	Race of Victim
	10.	Handedness of Victim
	11.	Education of Victim
	12.	Marital Status of Victim
	13.	Occupation of Victim
	14.	General Health of Victim
	15.	Dependence of Victim
		User Environment Description
	16.	Hospital Identification No.
	17.	General Location of Injury
	18.	Month of Year of Injury
	19.	Date of Month of Injury
	20.	Day of Week of Injury
	21.	Hour of Day of Injury
	* 22.	Tub/Shower Stall Description
	* 23.	Age of Above Tub/Shower Stall
	* 24.	Accident Related Product to be Described in Detail
	* 25.	Accident Related Products Description
	* 26.	Accident Related Product Certified/ Modified
	* 27.	Accident Related Product Safety Device Present/In Use
	* 28.	Accident Related Product Warning Statement Present/Followed

Table (cont.)

Scene Number	Master Code List No.	Variable Factor
	* 29.	Accident Related Products Proper Instructions Present/Followed
	* 30.	Bathroom Description

Scene 3 Accident Precritical Incident Factors

User Description

31.	Temporary Health of Victim at Precritical Incident
32.	Tired and/or Upset at Time of Precritical Incident
33.	Hurried and/or Drugs at Time of Precritical Incident
34.	Familiar with Operation/Aware of Danger at Time of Precritical Incident
35.	Precautions/History at Time of Precritical Incident
36.	Person Goals of Victim
37.	Distraction/Interruptions in Precritical Incident
38.	Responsible Attendant for Dependent
39.	Continuity of Attendance of Above Above Responsible Attendant
40.	Non-Attendance Persons Present
41.	Location in Bathroom of Nonattendance Person

User Environment Description

42.	Accident Precritical Incident Activity Area
* 43.	Products Other than Tub or Shower Stall in Precritical Incident
44.	Liquid Conditions in Tub/Shower just Prior to Critical Incident
* 45.	Safety Device Present and Used in Tub/Shower Described at Precritical Incident
46.	Precritical Incident Activity A
47.	Precritical Incident Activity B

Scene 4 Accident Critical Incident Factors

User Activity Description

48.	Critical Incident User Failure

User Environment Description

49.	Critical Incident Product Failure
50.	Critical Incident Additional Circumstances

Table (cont.)

Scene Number	Master Code List No.	Variable Factor
Scene 5 Accident Postcritical Incident Factors		
		User Environment Description
	* 51.	Post Critical Incident Product Failure
		User Activity Description
	52.	First Post-Critical Incident Activities A
	53.	Second Post-Critical Incident Activities B
		User Environment Description
	* 54.	Energy Transfer Surface Between Product/or Service and Victim
Scene 6 Accident Postcritical Incident Factors Consequence		
		User Description
	55.	First Body Part Injured Diagnosis--most severe
	56.	First Body Part Injured
	57.	Second Body Part Injured Diagnosis
	58.	Second Body Part Injured
	59.	Third Body Part Injured
	60.	Economic Loss
	61.	NEISS Index of Injury Severity
		User Activity Description
	62.	Sequence of Injuries
Scene 7 Accident Postcritical Incident Consequences Recovery		
		User Description
	63.	Post Emergency - Ward Treatment - Other than Hospitalization
	64.	Victim Disposition at Hospital
Scene 8 Accident Postcritical Incident Countermeasures		
		User Activity Description
	65.	Suggestions/Modifications from Respondent
Scene 9 The New Setting -- Follow Up		

Where this was established, these couples were also included within the Accident Factor Prioritization (See Section 4.3). Analysis of this accident factor prioritization list produced some overall conclusions which are summarized below:

- Bathtubs far exceed shower stall in accident potential; showers represent a very low-priority hazard based on absolute frequency and severity of injuries.
- The slipperiness of most bathtub surfaces constitutes the chief hazard, since slips and falls are the major form of bathtub accident.
- The hardness of most bathtub surfaces is the chief agent of injury in bathtub accidents.
- Lack of continuous supervision of children by a responsible attendant is a major factor associated with childhood bathtub accidents.
- Burns are a less frequent type of accident than slips and falls; however, burns are distinguished by the general high level of severity of these accidents.
- Fixture failures (breaking off of grab bars, etc.) do not account for a significant number of accidents.
- Children under the age of 10 are the most accident prone group, representing over 45 percent of bathtub and shower area accident victims but less than 20 percent of the population in the United States. In addition, most of the fatalities occur in this group.
- The elderly do not have a disproportionately large percentage of bathroom accidents, but their injuries tend to be more severe.

2.2 Review of Case Studies for Patterning

Where masses of data are involved and sophisticated analysis techniques are employed, the individual nature of case studies can be obscured as can the larger patterns of phenomena. To address the data from this perspective, we scanned the case studies and grouped them loosely in terms of certain obvious categories: "who", "where", "what", "consequence", and "why".

WHO	Who was the victim, broken down by age, sex, and race.
WHERE	Were did the precritical incident occur.
WHAT	What was the trigger event which caused the accident.
CONSEQUENCE	What were the post critical incidents and resultant injuries.
WHY	What caused the human or product failure

The table on the following page (Table 2-3) shows the results of the initial scanning of each case study. Next, as an example, similarities within the categories were noted; for example, the group of all case studies involving slips and falls, or all case studies involving children, were noted. These groups could be narrowed down as deemed appropriate; for example, slips and falls could be narrowed to slips entering the tub and slips leaving the tub. Through this method of scanning the case studies, natural groupings or factors which seem to be frequently correlated were identified. Thus, the scanning procedure allowed an overview understanding of the patterning (or groupings) according to these categories of age, location of incident, the trigger event leading to the accident, and why the accident occurred.

Scenario generalizations were then made for further understanding of the above groupings. Figure 2-4 is an example of one of these generalizations, which dealt with age as a category. Computer analysis of frequency/severity of the NEISS accident data showed natural divisions between the ages of 0 to 9, 10 to 64, and 65+. A wide variety of accident types occur within the 10 to 64 years age group; however, there is no significant association of particular accidents with particular ages in this group. Each of the three groups has its group accident characteristics, as the figure shows. As the individual developed from age 0 to 65 and over, there were similar characteristics related to attendance needs, how

Table 2-3

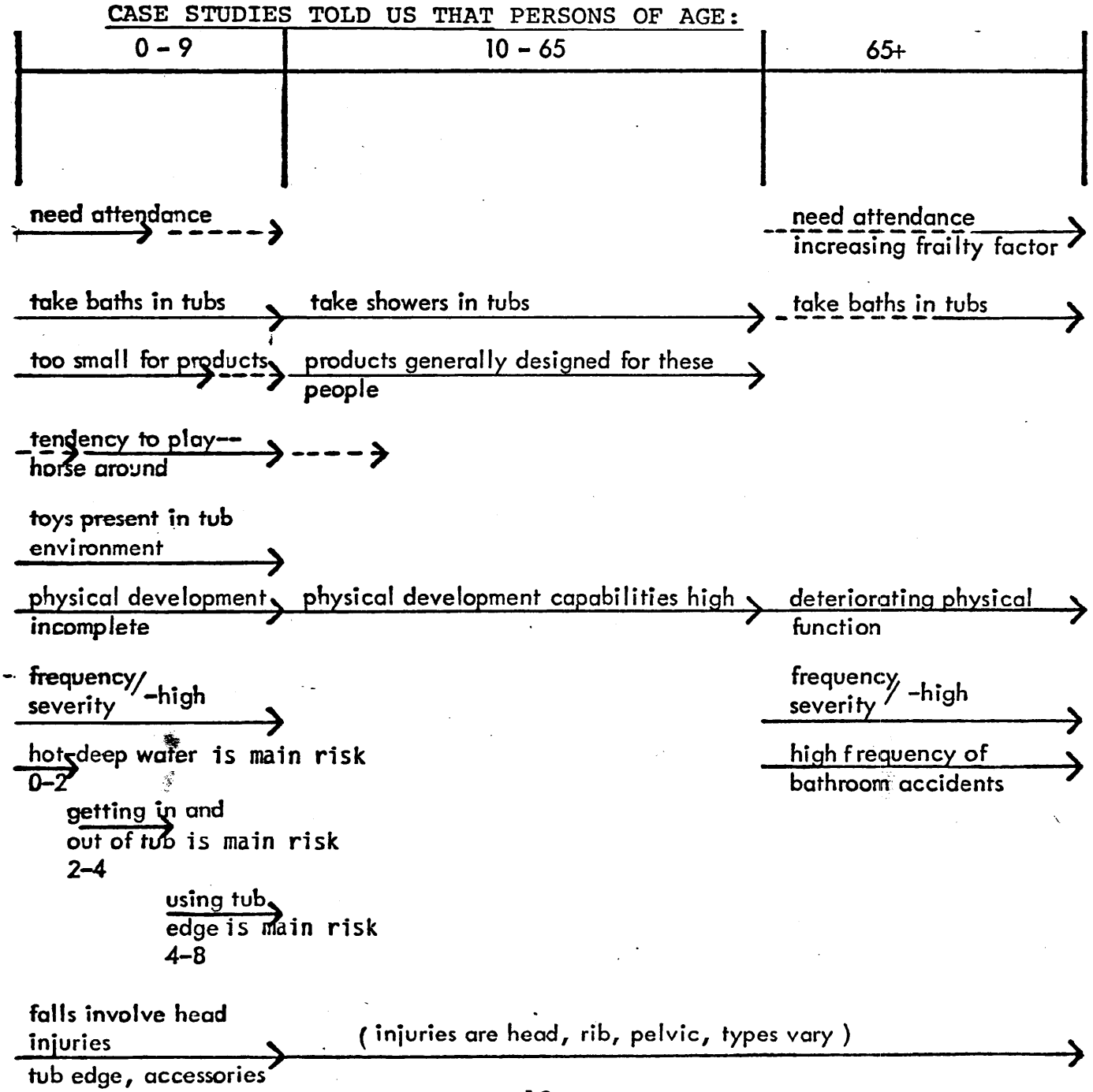
	Who			Where	What	Consequence	Why
44	18 mo	M	Bl	in bathroom with siblings - mother in kitchen leaned over side, filling tub	fell in up to elbow	burned	unattended by mother - hot wate
45	15mo	M	-	in bathroom, climbed into hot water - tub	climbed, fell into hot water - tub	burned	unattended by mother - hot wate
46	85	F	Bl	in bathtub	found in hot water on back and feet and legs hanging over side of tub	burned - died	hot water (age ?)
47	68	F	bl	leaving bathroom	small throw rug slipped on tile floor	fell back, head hit tub	rug slipped out fro under
48	35	F	Wh	stepping out of tub after bath	foot slipped in tub	fell fractured left shoulder	slipped (tub) in hurry
49	50	F	Wh	in bathroom walking	slipped in water on tile floor	fell - hit back of bathtub	wet floor
50	65	F	Bl	getting out of tub after bath	slipped	hit left side of tub	slipped (tub)
51	75	M	Bl	stepped out of shower	slipped in wet floor - fell hit head on door	head laceration	slipped on wet flo
52	9	F	Wh	leaving tub after bath	slipped on tub edge hit corner of hamper (head)	head laceration	slipped on tub edge, in hurry
53	60	F	Wh	4 AM - bathroom	fainted, fell across and into tub	bruises	fell, fell across tub
54	2	M	Wh	standing, getting out of tub after bath	left (deformed) foot slipped	fell into tub, hit chin (laceration)	slipped (tub) (deformed foot)
55	38	F	Bl	getting out tub after bath	bathoil added slippery, usual non skid mat not there	slipped and fell off inside rim of tub	slippery from bath oil
56	73	F	Bl	getting out tub after bath	arm slipped, lost balance, fell	fell off rail of tub fractured rib	arm slipped on tub rail

Figure 2-4

SCENARIO GENERALIZATIONS

1. In surveying the NEISS case studies there were three groups of users in terms of age:
    1. Children 0 to 9
    2. Teenagers and middle aged adults
    3. Elderly

    These had distinct characteristics and needs, and therefore, distinct features related to their use of the bathroom tub and shower. These features which were generalized from the above groups follow:



body cleansing was performed, the scale of products relative to size of individual, activities involved in the bathing process, and peaks of severity and frequency and the nature of injuries.

Further, it was noted that accident patterns overlap from age group to age group. Increasing incapacities are present through the aging process, but certain accidents most common to the 0 to 10 age group also appear to a lessening degree in the 10 to 20 group. Similarly, accidents most common to the 20 to 65 age group appear to a lessening degree in the 10 to 20 age group.

Similar scenario generalizations were developed, using a large number of categories such as physical environment characteristics, type of injury, type of movement initiating the accident, and other factors such as the presence of toys, hot water, or the mental state of the accident victim. These patterns provided the foundation for the generalized scenario development, as is shown in the scenario generalization involving children 0 to 9 years old, in Figure 2-5 on the following page. A total of nineteen potential scenario generalizations were identified in this manner for later use in scenario development.

2.3 Scenario Development

To reconstruct bathtub and shower area accidents by generic type in such a way as to reveal the simultaneous and sequential system of interacting factors, a scenario approach was taken. The scenario approach visualizes the accident process in a series of scenes connected in time. The bathtub and shower area accident sequence can be divided into nine parts or scenes. Each contains accident factors particular to those scenes.

The generalized form of these scenes is shown in Figure 2-6 and was found applicable to the bathtub and shower area accident phenomenon.

Figure 2-5

SCENARIO GENERALIZATION — Involving Children 0 – 9 years old

Who?	Where?	Attendance?	Other Factors?	Critical Incident?	Consequence?	Injury?
children 0 – 9	involving use of tub (all) outside tub (4) shower stall (1) fooling around	attendance (11) non attendance (10) other children present	bubble bath or oil involved (5) toys in area (3) playing	slipped on tub bottom (34) getting in or out of tub slipped (19) using edge of tub sitting–standing slips (7) slips or shoves	fall tub edge (45) fall tub bottom fall accessories(13) fall outside tub (4) fall door track or frame (7)	head injury generally
	Bathtub		Hot Water Involved			Burns
			Deep Water Involved			Drowns

SCENARIO IDENTIFICATION:

- Children 0 – 9, Hot Water – Burns (Attendance? Presence? Continuity of Attendance)
- Children 0 – 9, Deep Water – Drowns (Attendance? Presence? Continuity of Attendance)
- Children 0 – 9, Playing / Bathing / Showering – Slip, Fall — Tub edge / Tub bottom — Injury
- Children 0 – 9, Getting in or out of Tub – Slip – Fall – Injury
- Children 0 – 9, Sitting / Using / Standing – Tub edge – Slip – Fall – Injury

Table 2-6

Generalized Scenario for Bathtub and Shower Area Accidents

Scene 1	Data Gathering for Analysis of Accident Scenario
Scene 2	The Accident Setting
Scene 3	Accident Precritical Incident Factors
Scene 4	Accident Critical Incident Factors
Scene 5	Accident Postcritical Incident Factors
Scene 6	Accident Postcritical Incident Factors Consequence
Scene 7	Accident Postcritical Incident Consequences Recovery
Scene 8	Accident Postcritical Incident Countermeasures
Scene 9	The New Setting -- Follow Up

In addition, each of these nine scenes may be divided into primarily three components with their related factors. These components are:

- The User Description
- The User Activity Description
- The User Environment Description (including products)

The accident evolution was viewed as a developmental sequence occurring over time and involving varying stages of the above three components. Under each of the three components, significant factors were listed. Each scene was named according to its chronological position in the accident evolution and the variable factors within it. Each variable factor was named according to the variable quality of the values of terms within it.

The example in Figure 2-7 that follows should serve to describe the organization of this system.

The tools for scenario development were explained in Section 2.1 and 2.2. These are summarized again below:

- The NEISS In-Depth Case Studies
- Computer Data: Variable Factor Options
- Frequencies
- Computer Data: Variable Factors Options crosstabulated against severity categories
- Computer Data: Selected Variable Factors Options crosstabulated against other variable factor options
- Accident Factors Prioritization List
- Generalized Scenarios developed from the case studies pattern
- The data coded upon Indecks cards.[1]

With the scenario concept now fully developed these tools were utilized in an interactive process with searches conducted.

---

[1] Computer manipulation of complex data is often chosen because of its speed and capacity. These advantages are sometimes offset by the time needed for programming, accessibility requirements and the flexibility of entering difficult to define elements.

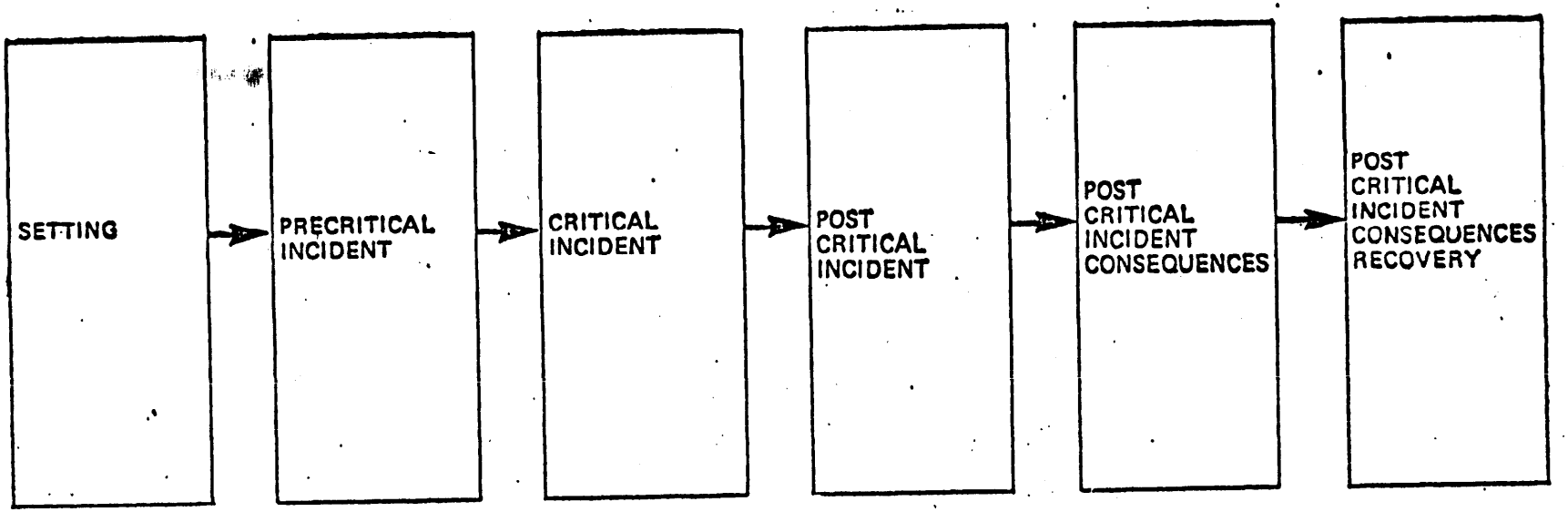
While the computer was used in establishing the accident factor prioritization list, for scenario development the computer was judged too cumbersome. A hand sort data storage, retrieval and correlating system known as the Indecks card system was chosen for this task.

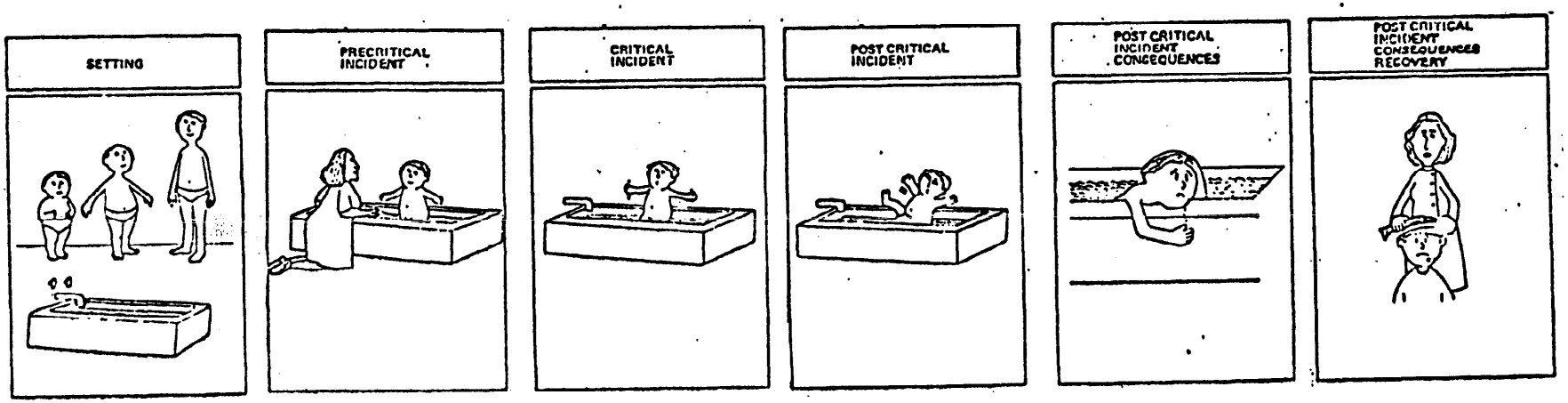
Its advantages are accessibility, flexibility, required capacity, rapidity of data correlation, ease of data introduction, simplicity in operation and economic feasibility.

Its methodology for use was explained fully in the Phase II report.

Figure 2-7

ACCIDENT SCENES





for correlated user descriptive variable factors options. Figure 2-8 suggests the outline of this process.

In this process of scenario generation, certain qualities of events were considered, including frequent events, events with similar severity levels, unique events separable from others, and events which were essentially similar in concept. Listed below are some of the steps that were employed:

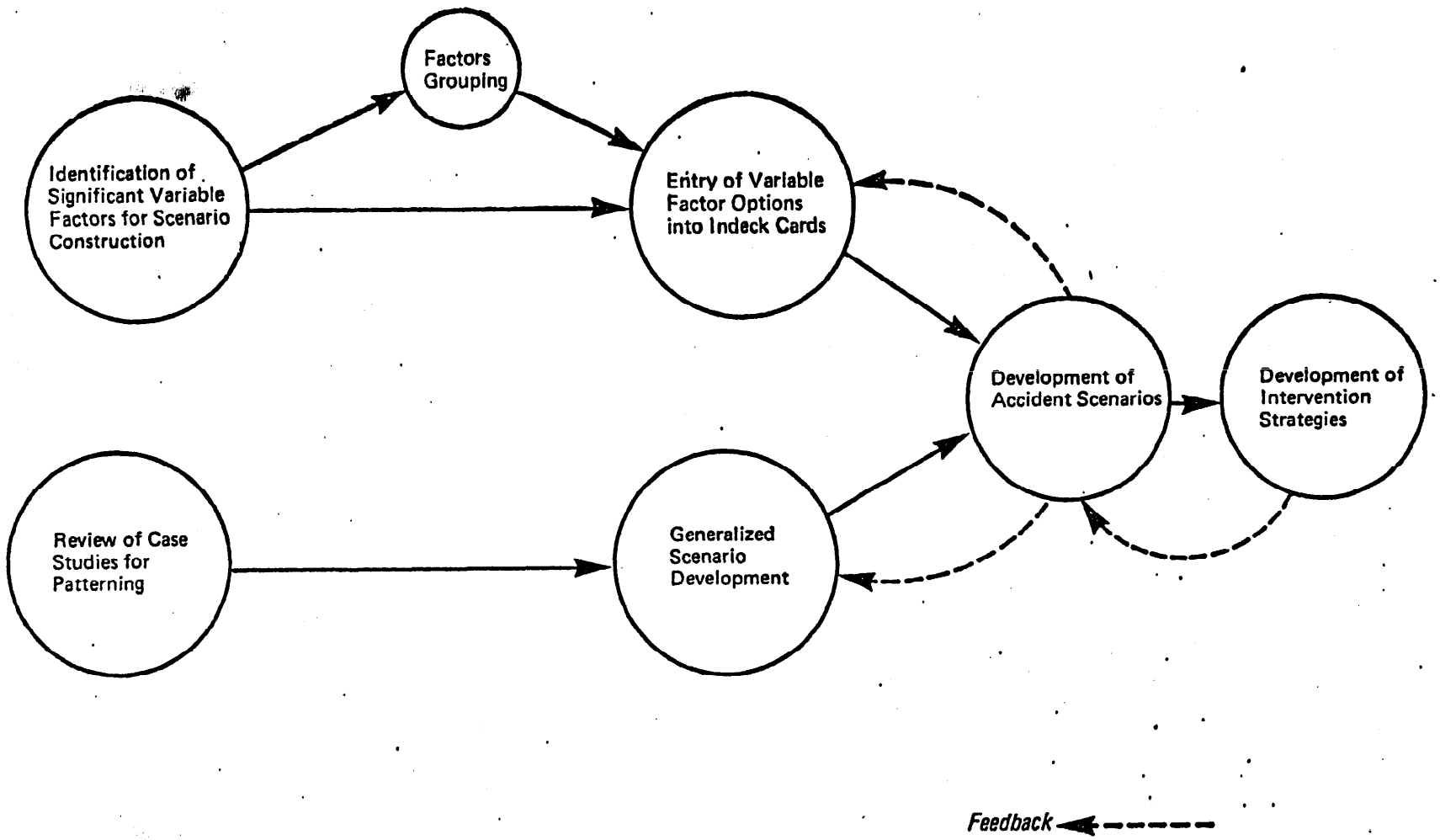
All NEISS In-Depth Case Studies were analyzed by:

- Scenes
- Variable factors within scenes
- Options within variable factors
- The frequency of each variable factor option
- The frequency by severity of each variable factor
- Cross tabulations of selected variable factors options
- Cases involving severity category 7 injuries
- Age categories, with examination of similarities of variable factor options within age groups
- Patterns between age groups to identify any inter-age similarity of patterns
- Other consequences for cases not falling into similar patterns within age groups
- The case studies falling into each generated scenario were reread for real similarity and scenario fit

Finally, a series of working rules was developed (which guided the process). First, all 255 In-Depth Case Studies would be accounted for, and at least 95% of them would be contained within specific scenarios. Second, those case studies outside specific scenarios would be intervened upon by intervention strategies developed in the scenarios. Third, each scenario would suggest at least one unique intervention strategy. Last, each scenario would have two or more unique variable factor options in each case study within that scenario which would differentiate it

Figure 2-8

ANALYSIS OF DATA AND DEVELOPMENT OF ACCIDENT SCENARIOS AND INTERVENTION STRATEGIES



from other scenarios.

Each step was balanced by examining the user descriptive factors, user activity factors, and environment descriptive factors. By providing a large array of variable factor options within each scenario developed, maximum opportunity was afforded for educational and/or product-centered intervention strategies.

The scenarios which were developed are listed in Figure 2-9.

This system groups the scenarios first by emphasis on user descriptive factors (a), second, by user activity descriptive factors (b); third, by product descriptive factors (c). Within each of these groups, scenarios including youngest children scenarios are followed by adult scenarios and bathroom centered scenarios followed by tub and shower area scenarios. Within each of these groups order is set by the earliest factors in the accident sequence. Finally, if none of these guidelines apply, order is by the highest frequency listed first. An alternative form in which scenarios might have been listed might be by frequency. Below is a list of the scenarios by number in order of decreasing frequency of cases included. However, in no way does this ordering represent a prioritization of scenarios in order of total severity.

Scenario Number	Frequency of NEISS In-Depth Cases
1	43
6	38
12	25
3	20
11	16
6	15
5	13
13	12
2	12
9	12
14	11
15	10
17	7
10	6

Figure 2-9

SCENARIOS

		Frequency	
Scenario 1:	User incapacity present and bathroom, tub or shower area activity	43	User Activity Factors
Scenario 2:	Direct action by a second party	12	
Scenario 3:	Bathroom activity with slips and falls against tub	20	User Activity Descriptive Factors
Scenario 4:	Tub bathing of under-attended children under two resulting in drowning	4	
Scenario 5:	Tub bathing of children under five with heated water resulting in burns	13	
Scenario 6:	Tub bathing of children under 10 with slips and falls resulting in laceration or contusions to the head	38	
Scenario 7:	Tub leaving activity of children under ten with slips on floor	4	
Scenario 8:	Platform position (other than tub edge) of children under fourteen with falls against tub edge	3	
Scenario 9:	Tub edge position with falls	13	
Scenario 10:	Tub rising activity of adults with slips and falls	6	
Scenario 11:	Tub standing activity of adults with slips and falls	16	
Scenario 12:	Tub entering or leaving activity with slips and falls	25	
Scenario 13:	Shower stall area activity results in laceration	12	Product Descriptive Factors
Scenario 14:	Tub enclosures glass breaks resulting in lacerations	11	
Scenario 15:	Tub and shower stall enclosure glass frame and track contacts	10	
Scenario 16:	Protuding fixtures contacts (other than door frames and glass)	15	
Scenario 17:	Fixture failures underload (other than door frames and glass)	7	

Scenario Number	Frequency of NEISS In-Depth Cases
4	4
7	4
8	3
Other	4
Total	255

Readings of the scenarios will also show that there are often strong similarities among many of them, but these similarities only extend to a point. At this point the user, user activity or product description factors options change in character and the scenario has a separate identity.

These scenarios do not represent only the 17 scenarios which might have been constructed using the NEISS In-Depth Case Studies. The factors might have been combined in different ways; for example, those involving a particular age, sex, or race; all those involving leaving or entering the tub, or all those involving certain types of bathtubs or fixtures, thus producing a differing though similar group of scenarios. Further, the methodology for generating these scenarios might have been altered by the addition of new data, in the form of further case studies or survey information.

Note that these scenarios, which were developed from the NEISS case studies, were not adjusted to make their frequency consistent with the NEISS sample data, as had been done for accident-related factors in the Accident Factor Prioritization List.[2] Nor was accident severity formerly integrated into a prioritization of scenarios. The reason for not normalizing frequency, integrating the severity, or deriving a prioritization of the scenarios was that these scenarios represented a theoretical construct to allow us to grasp the critical aspects of a logical clustering of the bathtub/shower area accidents, so that, in

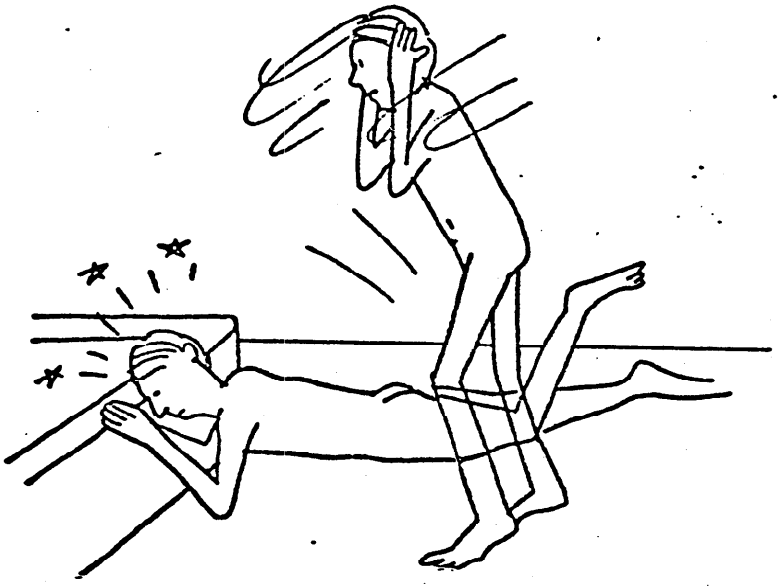
[2] See Section 4, concerning economic methodology.

turn, a comprehensive set of intervention strategies could be derived.

The scenarios are presented on the following pages. Detailed supporting data is contained in the folded-over section.

SCENARIO 1

FREQUENCY 43



USER INCAPACITY PRESENT AND BATHROOM,
TUB OR SHOWER AREA ACTIVITY

After generating several scenarios, the data suggested that the accident evolution was precipitated by events within the user which probably predisposed him to injury in many other settings as well. It also became probable that the number of individuals in the population having incapacities was represented to a greater extent than normal in the population sample used in the NEISS In-Depth Case Studies.

It is probable that more incapacities would be represented had that question been asked in more depth or with more consistency.

All of those having incapacities would have been classified under one of the remaining sixteen scenarios had they not belonged to this scenario type.

Thus, the applicable intervention strategies would be operating to reduce or eliminate injury in these cases.

The accompanying table shows the number of cases by scenario and age into which scenario one cases would have fallen.

It is clear that incapacities account for a substantial number of the elderly (65+) involved in bathtub and shower area accidents (15 of 43 in scenario 1). Particularly striking is the percentage of all elderly with incapacities and accidents--more than 50%.

Since many of these elderly individuals fall within public services and protections, it may be well to review intervention strategies from this viewpoint.

Redistribution of Scenario 1 Cases into Scenarios 2 - 17

Scenario Number	0–19 yrs.	20–64 yrs.	65+ yrs.
2	1		
3	2	5	4
4			1 (except 1, 73 years)
5			1
6	3 (except 1 fracture leg)		
7	1		
10		1	1
11	2	3	2
12	1	4	4
13		1	2
15		1	
16	1	2	
Total in Scenario 1	10	17	15
Total in the Case Overall	138	91	27

SCENARIO 1

FREQUENCY 43

USER INCAPACITY PRESENT AND BATHROOM, TUB OR SHOWER AREA ACTIVITY

USER DESCRIPTION

ACCIDENT SETTING FACTORS

AGE
- 2 - 4 yrs (4)
- 5 - 9 yrs (2)
- 10 - 19 yrs (4)
- 20 - 24 yrs (1)
- 25 - 44 yrs (7)
- 45 - 54 yrs (6)
- 55 - 64 yrs (4)
- 65 + yrs (15)

SEX
- female (26)
- male (17)

0 - 19 yrs
- male (7)
- female (3)

20 - 64 yrs
- male (6)
- female (11)

65 + yrs
- female (12)
- male (3)

RACE
- females:
  - white (18)
  - black (4)
  - other (1)
  - ng (3)
- males:
  - white (13)
  - black (1)
  - ng (3)

EDUCATION

20 + yrs
- ng (19)
- elementary (3)
- high school grad or senior (8)
- college (1)
- postgrad (2)

MARITAL

20 + yrs
- ng (15)
- married (7)
- single (5)
- separated (4)

PRECRITICAL INCIDENT FACTORS

UPSETTIRED

0 - 19 yrs
- ng (9)
- upset and tired (1)

20 - 64 yrs
- ng (15)
- upset + tired (1)
- tired (2)

65 + yrs
- ng (13)
- upset (1)
- tired (1)

HURRIED

0 - 19 yrs
- ng (6)
- hurried (4)

20 - 64 yrs
- hurried (9)
- ng (9)

65+ yrs
- not hurried (15)

PRECAUTION/HISTORY

0 - 19 yrs
- ng (8)
- history (2)

20 - 64 yrs
- ng (16)
- history (2)

65 + yrs
- ng (13)
- history (2)

CRICITAL INCIDENT FACTORS

CRITUSER

0 - 19 yrs
- slip + lose balance (11)
- lose consciousness (2)
- other (1)

20 - 64 yrs
- lose consciousness (4)
- slip + lose balance (2)
- lose balance (1)
- other (1)

65 + yrs
- slip + lose balance (8)
- lose balance (2)
- lose consciousness (2)
- hand slipped (1)
- burned (1)
- other (1)

POSTCRITICAL INCIDENT FACTORS

POSTCRITICAL INCIDENT CONSEQUENCES

FIRST DIAG/ FIRST BODY

0 - 19 yrs
- laceration head (5)
- contusion/abrasion
  - head (3)
  - shoulder (1)
- fracture upper leg (1)

20 - 64 yrs
- laceration head (1)
- laceration hand (2)
- contusion/abrasion
  - ribs (2)
  - head (2)
  - upper trunk (2)
  - finger (1)
- dislocation ribs (1)
- dislocation knee (1)
- dislocation
  - shoulder (1)
- fracture ribs (2)
- fracture wrist (1)
- strain/sprain
  - lower back (1)
- hematoma head (1)

65 + yrs
- laceration head (4)
- laceration back (1)
- contusion/abrasion
  - upper trunk (1)
  - back (1)
  - toes (1)
- fracture ribs (1)
- fracture lower back (1)
- fracture upper leg (1)
- fracture upper arm (1)
- burn back (1)
- submersion (1)
- strain/sprin (1)

SEVERITY

0 - 19 yrs
- 3 (4)
- 4 (6)

20 - 64 yrs
- 1 (1)
- 2 (2)
- 3 (5)
- 4 (4)
- 5 (4)
- 6 (2)

INCIDENT RECOVERY CONSEQUENCES

DISPOSITION

0 - 19 yrs
- treated + released (9)
- hospitalized for 10 days (1)

20 - 64 yrs
- treated + released (15)
- hospitalized 1 day (1)
- treated + transferred (1)
- hospitalized 5 - 10 days (1)

65 + yrs
- treated + released (8)
- hospitalized 1 - 5 days (3)
- hospitalized 10+ days (2)
- expired afte:
  - 11 day (1)
- dead on arrival (1)