CHILD BURNS FACTSHEET

Hot substances and heat are the leading cause of hospital admissions for burn injuries. Children living in lower socioeconomic and urban areas are more likely to be killed and injured by burns. [1]

Burn injury rates are significantly higher for boys than girls, and for Māori and Pacific children compared to European and Asian children. [1]

Compared to adults, children have thinner skin that burns faster, deeper and at lower temperatures. Exposure to water at 54°C takes about 10 seconds to cause a full thickness burn. Exposure to water at 60°C only takes between 1 and 3 seconds to cause a full thickness burn. [2]

More than half of all young children (1-2 years) admitted to hospital for burns are scalded by spilt hot drinks (tea and coffee) and other liquids (such as soups and noodles). [2, 3] Because of their small size, a hot drink spilt over a baby is equivalent to a bucketful of boiling water tipped over an adult.

Excessively hot tap water in baths, showers and sinks are also common causes of hospital admissions. [2] A small adjustment to hot water tap temperature makes a big difference to a child's risk of burn injury. [2]

DATA:

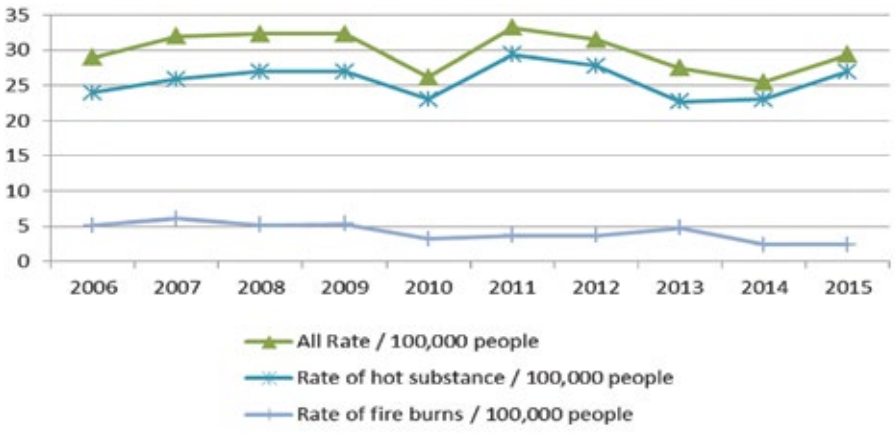
In New Zealand, every year on average approximately 270 children aged 0-14 years are admitted to hospital for an unintentional burn injury. A further three children are killed each year.

The leading cause of burn-related death is exposure to fire or flames.

Overall children aged between 0-4 years accounted for 77% of all burn injury-related hospitalisations, followed by children aged 5-9 years (13%), and children aged 10-14 years old (10%).

The rate for burn-related hospital admissions has been largely unchanged over the last decade. (See Fig. 1) [4]

Figure 1: Rate of Child Burn Injury Hospital Admissions, Aged 0-14 Years, 2006-2015 [4]



Source: IPRU, University of Otago. Accessed in 2017. Analysis by Safekids Aotearoa

Note: This data includes burns hospitalisations that were unintentional in intent and excludes day patients or those re-admitted for the same event, or who died in hospital as a result of their injury.

Table 1 shows the many reasons why children aged 0-14 years were hospitalised for burn-related injuries nationally.

The five leading causes of burns for children aged 0-14 years are hot object/substance type burns (see Table 1). Together they account for eight out of ten (81%) burn injury admissions.

The leading causes of fire/flame burn injury for children are exposure to fire that has ignited from a highly flammable material such as petrol and kerosene (3%), and burns from a controlled fire in a building or structure, such as from a fireplace or stove (3%).

Exposure to a fire caused by a highly flammable material such as petrol and kerosene (18%) is the leading cause of burn injury for children aged 10-14 years–this differs from the 0-4 and 5-9 age groups where the primary cause is hot substance/object type burns. [4]

In total, 86% of child burn admissions were due to contact with a hot object/substance, and this includes burns from contact with hot liquids and steam.

On average, 192 children (83%) aged 0-4 years are hospitalised from burn injuries every year caused by contact with a hot object/substance.

The leading causes of hot substance/object burns for this age group are spilt hot drinks, food, fats and cooking oils (40%), with water heated on a stove (22%) and contact with hot tap water and other hot fluids (14%).

The causes of fire/flame injuries resulting in hospitalisations are fire/flames/smoke in buildings, structures or elsewhere, and fire igniting from clothing or other highly flammable materials.

Children aged 0-4 years old are at a higher risk of a fire/flame-type burn (43%). Compared to older children, the leading cause of a fire or flame-type burn is exposure to a controlled fire in a building or structure such as a fireplace or stove. [4]

Table 1: Leading Causes of Child Burn Injury Hospital Admissions by Age, 2006-2015 [4, 5]

	0 to 4 Years					5 to 9 Years					10-14 Years					0 to 14 years				
	Cause	Admissions	Admissions per year	Rate	%	Cause	Admissions	Admissions per year	Rate	%	Cause	Admissions	Admissions per year	Rate	%	Cause	Admissions	Admissions per year	Rate	%
1	X10 - Contact with hot drinks, food, fats and cooking oils	829	82.9	27.3	40%	X12 - Contact with other hot fluids	105	10.5	3.6	30%	X04 - Exposure to ignition of highly flammable material	48	4.8	1.6	18%	X10 - Contact with hot drinks, food, fats and cooking oils	944	94.4	10.6	35%
2	X12 - Contact with other hot fluids	457	45.7	15.0	22%	X10 - Contact with hot drinks, food, fats and cooking oils	68	6.8	2.3	20%	X10 - Contact with hot drinks, food, fats and cooking oils	47	4.7	1.6	17%	X12 - Contact with other hot fluids	603	60.3	6.8	22%
3	X11 - Contact with hot tap-water	283	28.3	9.3	14%	X11 - Contact with hot tap-water	34	3.4	1.2	10%	X12 - Contact with other hot fluids	41	4.1	1.4	15%	X11 - Contact with hot tap-water	328	32.8	3.7	12%
4	X15 - Contact with hot household appliances	180	18	5.9	9%	X06 - Exposure to ignition or melting of other clothing and apparel	17	1.7	0.6	5%	X03 - Exposure to controlled fire, not in building or structure	20	2	0.7	7%	X15 - Contact with hot household appliances	199	19.9	2.2	7%
5	X16 - Contact with hot heating appliances, radiators and pipes	100	10	3.3	5%	X16 - Contact with hot heating appliances, radiators and pipes	16	1.6	0.5	5%	X08 - Exposure to other specified smoke, fire and flames	20	2	0.7	7%	X16 - Contact with hot heating appliances, radiators and pipes	122	12.2	1.4	5%
6	X02 - Exposure to controlled fire in building or structure	50	5	1.6	2%	X19 - Contact with other heat and hot substances	15	1.5	0.5	4%	X17 - Contact with hot engines, machinery and tools	17	1.7	0.6	6%	X04 - Exposure to ignition of highly flammable material	72	7.2	0.8	3%
7	X19 - Contact with other heat and hot substances	42	4.2	1.4	2%	X04 - Exposure to ignition of highly flammable material	14	1.4	0.5	4%	X11 - Contact with hot tap-water	11	1.1	0.4	4%	X02 - Exposure to controlled fire in building or structure	68	6.8	0.8	3%
8	X08 - Exposure to other specified smoke, fire and flames	31	3.1	1.0	1%	X15 - Contact with hot household appliances	14	1.4	0.5	4%	X02 - Exposure to controlled fire in building or structure	10	1	0.3	4%	X19 - Contact with other heat and hot substances	65	6.5	0.7	2%
9	X00 - Exposure to uncontrolled fire in building or structure	22	2.2	0.7	1%	X03 - Exposure to controlled fire, not in building or structure	13	1.3	0.4	4%	X00 - Exposure to uncontrolled fire in building or structure	9	0.9	0.3	3%	X08 - Exposure to other specified smoke, fire and flames	62	6.2	0.7	2%
10	X06 - Exposure to ignition or melting of other clothing and apparel	16	1.6	0.5	1%	X08 - Exposure to other specified smoke, fire and flames	11	1.1	0.4	3%	X06 - Exposure to ignition or melting of other clothing and apparel	9	0.9	0.3	3%	X03 - Exposure to controlled fire, not in building or structure	45	4.5	0.5	2%
	All the rest	71	7.1	2.3	3%	All the rest	40	4	1.4	12%	All the rest	41	4.1	1.4	15%	All the rest	193	19.3	2.2	7%
	Total	2081	208.1	68.5	100%	Total	347	34.7	11.8	100%	Total	273	27.3	9.3	100%	Total	2701	270.1	30.3	100%

Source: IPRU, University of Otago. Accessed in 2017. Analysis by Safekids Aotearoa

Note: This data includes burns hospitalisations that were unintentional in intent and excludes day patients or those re-admitted for the same event, or who died in hospital as a result of their injury.

X00-X09 Hot substance/object type burns; X10-X19 Fire/Flame type burns [5]

Figure 2: Percentage of Child Burn Injury Hospital Admission by External Cause, Children 0-14 Years, 2006 to 2015 [4]

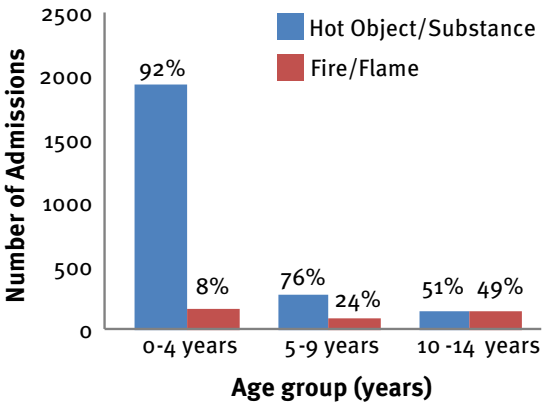


Figure 3: Percentage of Child Burn Injury Hospital Admission from 'Hot Object/ Substance' by Age Groups, 2006 to 2015 [4]

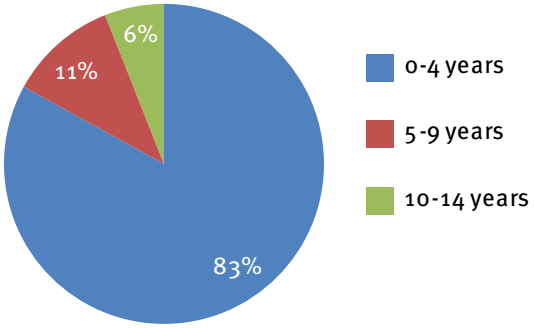


Figure 4: Percentage of Child Burn Injury Hospital Admission from 'Fire/Flame' by Age Groups, 2006 to 2015 [4]

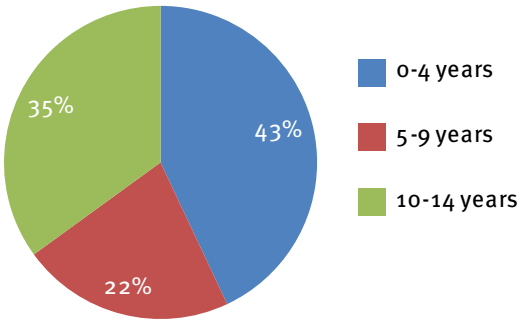
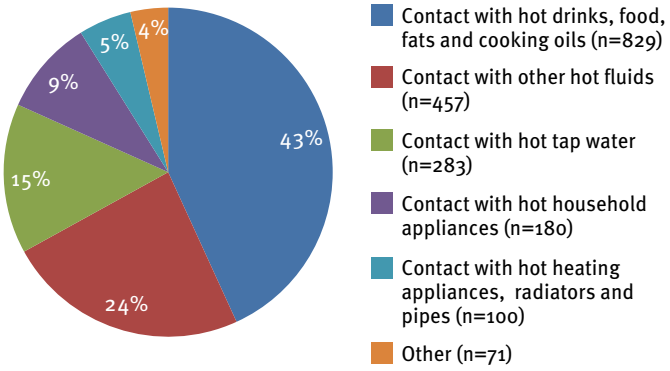


Figure 5: Leading Causes of Hot Object /Hot Substance Hospital Admissions for Children Aged 0-4 Years, 2006 to 2015 [4,5]



Source for figures 2-5: IPRU, University of Otago. Accessed in 2017. Analysis by Safekids Aotearoa

Note: This data includes burns hospitalisations that were unintentional in intent and excludes day patients or those re-admitted for the same event, or who died in hospital as a result of their injury.

X00-X09 Hot substance/object type burns; X10-X19 Fire/Flame type burns [5]

GENDER AND ETHNICITY:

Male children are one and a half times more likely to be hospitalised from a burn-related injury compared to females. [6]

Pacific Island and Māori children are also twice as likely to be hospitalised from a burn related injury compared to Asian and European/Other children. [6]

Burns from hot drinks, food, fats and cooking oils, burns from other hot fluids, hot tap water and hot household appliances are the leading causes of burns-related injuries. [4, 6]

Table 2: Rate of Leading Causes of Child Burn Injury Hospital Admissions by Ethnicity by Age, Aged 0-14 Years, 2006-2015 **[4, 5]**

Ethnicity	ICD10 cause	00-04 years	05-09 years	10-14 years
Pacific Island	X10 - Contact with hot drinks, food, fats and cooking oils	57.5	8.1	3.9
	X12 - Contact with other hot fluids	33.3	6.8	1.1
	X15 - Contact with hot household appliances	14.8	2.7	0.4
Asian	X10 - Contact with hot drinks, food, fats and cooking oils	29.2	4.4	1.7
	X12 - Contact with other hot fluids	11.6	3.4	2.1
	X11 - Contact with hot tap-water	6.0	2.0	0.7
European/Other	X10 - Contact with hot drinks, food, fats and cooking oils	20.9	1.0	0.9
	X12 - Contact with other hot fluids	8.5	3.2	1.4
	X11 - Contact with hot tap-water	5.7	0.9	0.3
Maori	X10 - Contact with hot drinks, food, fats and cooking oils	26.6	2.0	2.2
	X12 - Contact with other hot fluids	21.5	3.1	1.3
	X11 - Contact with hot tap-water	16.2	1.4	0.4

ACC DATA [7]:

Child burn injuries cost the ACC scheme just under five million dollars every year. Most burns occur in the home, especially in the kitchen.

Table 3: NZ Child Burn Injuries, Aged 0-14 Years, 2011/12 – 2015/16

Financial Year	New Claims (All burns)	Active Claims (All burns)	Total Cost (All burns)
Jul 2011 - Jun 2012	7,011	7,737	$4,291,316
Jul 2012 - Jun 2013	6,629	7,420	$3,889,426
Jul 2013 - Jun 2014	6,287	7,137	$4,960,944
Jul 2014 - Jun 2015	6,065	6,834	$4,791,805
Jul 2015 - Jun 2016	6,139	6,917	$4,884,570

Table 4: NZ Child Burn Injuries, Home Setting, Aged 0-14 Years, 2011/12 – 2015/16

Financial Year	New Claims (Home)	Active Claims (Home)	Total Cost (Home)
Jul 2011 - Jun 2012	5,792	6,370	$3,630,752
Jul 2012 - Jun 2013	5,502	6,150	$3,332,070
Jul 2013 - Jun 2014	5,294	5,991	$3,985,213
Jul 2014 - Jun 2015	5,093	5,709	$4,036,999
Jul 2015 - Jun 2016	5,097	5,743	$4,340,048

These statistics are approximate. If data is required for research or analysis purposes, contact statistics@acc.co.nz to request appropriate data that suits your particular purpose.

≤ 3 means that the cell contains less than or equal to three claims and the data has been suppressed to protect the privacy of our clients.

SAFEKIDS AOTEAROA BURN PREVENTION SAFETY MESSAGES:

Always keep hot drinks out of reach of tamariki.

Never drink hot liquids while holding a child.

Set your hot water temperature, so it is 50° Celsius at the tap.

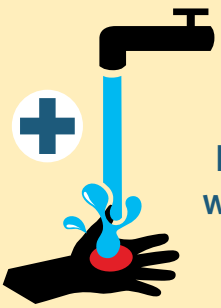
In the bath run cold water first.

Clothing burns, please make sure your tamariki are always a metre from the heater.

Have working smoke alarms and test them monthly. Install one in every bedroom, living area, and hallway - on every level in the house or whare.

Photoelectric smoke alarms are recommended. For more information, visit www.fire.org.nz.

Matches and lighters are not toys. Keep them out of sight and reach.



BURN FIRST AID - Cool the burn under cold running water for AT LEAST 20 MINUTES as soon as possible.

APPENDIX 1:

SOME GOOD PRACTICE INTERVENTIONS [6]:

	Intervention	Evidence
Engineering	Product modifications can be a primary prevention strategy to reduce the risk of injuries to children [8-12].	The New Zealand mandatory Product Safety Standards (Cigarette Lighters) Regulations 1998 provides tests to ensure that cigarette lighters cannot be easily operated by children aged less than five years (to be updated in late 2015) [13]. Product safety standards and modifications such as wide based 'no spill' cups and stove guards are effective means to prevent injuries [9]. Fire resistant composition of upholstery materials.
	Correctly installed and charged smoke alarms with working batteries are effective early warning devices that reduce injury [9, 12].	Use of smoke alarms is recommended by the American Academy of Pediatrics to prevent fatality and injury from residential fires [14].
Enforcement	Legislation and effective enforcement can reduce the risk of burns and scalds from fire, hot water injuries from fireworks and flammable clothing.	Legislation to reduce thermostat settings, coupled with annual educational notices to households would generate significant cost savings and reduce tap water burns [18]. Legislation regulating the temperature of household hot water from taps by requiring a safe pre-set temperature for all hot water cylinders is effective in reducing burns and more effective than educational interventions alone [8, 9, 15, 16]. Legislation requiring the installation of smoke detectors in new and existing housing is an effective way to increase smoke detector use when combined with multi-factorial community campaigns and reduced price smoke alarms [9]. Introduction and enforcement of a smoke alarm mandatory standard for all New Zealand buildings and dwellings would save an estimated nine lives annually; the addition of a mandatory standard for ignition resistance of upholstered furniture and mattresses would increase the estimated number of lives saved annually to 13 [19]. Legislation regulating flammability of sleepwear is effective in reducing burn injuries when enforced [9, 20]. Legislation banning the manufacture and sale of fireworks combined with enforcement is the most effective way to restrict supply and prevent fireworks-associated injury [9, 21-23]. In New Zealand legislation was tightened in 2008, and limits the types of fireworks available, requires testing certificates for available fireworks, limits sparkler sales to fireworks packages of a limited number, and prohibits the sale of fireworks outside a yearly four-day period, and to minors (less than 18 years) ACC claims for fireworks-related injuries for children aged 0-14 years have decreased by 41 percent since legislation changes to restrict access to fireworks [24]. Countries with legislation restricting or banning the sale of fireworks show an 87 percent post-legislation reduction in the incidence rate of firework-related ophthalmic trauma [25]. Education and advocacy campaigns around fireworks are useful as supplemental efforts to support legislation [9, 12].
	Reducing ignition and burning behaviour of dwellings. Safe installation of potential hazards: solid fuel heaters. Safe installation of gas/electricity.	These legal regulations address risks identified from analyses of fires. Enforcement is through the NZ Building Act (2004) and associated Compliance Documents and Standards, and the Electricity Act (1992) and Gas Act (1992) which detail certification requirements and licensing of trade personnel.
Education	Community, school and home-based interventions and campaigns may increase burn and scald prevention knowledge and reduce injury; however further research is needed [8, 9, 28].	Community and home-based smoke alarm interventions increase the proportion of households with functional smoke alarms [12, 26, 27]. Smoke alarm installation interventions are more successful when they originate from a community identifying burns prevention as an area of community interest, support a trust relationship with householders from high-risk communities, involve an education component and are embedded into wider health programmes [27]. A New Zealand community injury prevention intervention including a media campaign and home-based educational programme on hot tap water temperature led to significant reductions in hot tap water temperatures [17]. Educational interventions that provide a tangible object, such a thermometer to enable measurement of hot tap water temperature, are more effective in reducing hot tap water temperature than education alone [9].
	Fire safety skills training increases child and parent knowledge, and fire safety behaviour [9, 29].	Evaluation of the New Zealand Fire Service Firewise school education programme found the programme increased children's knowledge of the dangers of smoke and fire, and of safety behaviours compared with children's knowledge from schools that had not run the programme [30]. A three-year evaluation of a New Zealand primary school-based educational intervention run by firefighters, which introduced children to a new information module each year, found that children's skills improved in some areas of fire safety compared with baseline results [31]. Programmes involving authority figures (firefighters), and using active participation, fear reduction techniques and teaching the rationale for fire safety behaviours improve knowledge and skill retention, particularly if programmes are periodically repeated [29].

APPENDIX 2

RELEVANT NEW ZEALAND LEGISLATION AND STANDARDS [3, PP.24-25]

"FLAMMABILITY OF CLOTHING

Children's Nightwear and Limited Daywear Having Reduced Fire Hazard (AS/NZS 1249:2003)

This Product Safety Standard aims to ensure that all children's nightwear is either designed to reduce fire danger or is made of fabric that is less likely to burn. All children's nightwear (including some types of daywear) must carry a fire hazard label. The label provides to caregivers information aimed at helping to reduce the risk of death and injury from fire hazards.

Product Safety Standards (Children's Nightwear and Limited Daywear Having Reduced Fire Hazard) Regulations 2008 (SR 2008/199)

This regulation, made under Section 29 of Fair Trading Act 1986 stipulates that children's sleepwear and limited daywear must conform to Standard AS/NZS 1249:2003.

FLAMMABILITY OF UPHOLSTERY

Furniture – Assessment of the Ignitability of Upholstered Furniture (AS/NZS3744:1998)

Ignitability characteristics of furniture can affect the ignition and spread of fires, especially when the furniture provides initial fuel for the fire (e.g. cigarette butt on couch, chair too close to a heater). This Standard specifies the testing and performance requirements for the ignitability of upholstered furniture based on different ignition sources.

Upholstery Materials for Domestic Furniture – Smouldering Ignitability (AS/NZS 4088.1:1996)

This Standard specifies testing and performance requirements for upholstery materials for domestic furniture use. While indicative of the likely ignitability characteristics of furniture items made from tested materials, variable outcomes may arise from different production methods and designs.

SMOKE ALARMS

Fire Detection and Alarm Systems in Buildings (NZS 4512:2003)

This Standard specifies the requirements for fire detection and alarm systems in specified buildings. It covers their design, installation, extension, modification, commissioning, testing and maintenance.

Interconnected Smoke Alarms for Single Household Units (NZS 4514:2002)

This Standard sets out the requirements for installation and commissioning of externally powered interconnected smoke alarms. It also provides information on the selection, installation and maintenance of smoke alarms.

CIGARETTE LIGHTERS

The Product Safety Standards (Cigarette Lighters) Regulations

This regulation, made under Section 29 of Fair Trading Act 1986, stipulates that cheap or disposable lighters must conform to various Standards.

Cigarette Lighters – Child Resistance Requirements (AS/NZS 4867.2:2002)

This specifies the testing and performance requirements to ensure that cigarette lighters are not useable by children. It stipulates that such lighters must not be ignitable by 85% of children in a test panel and that the child resistant mechanism resets after every ignition.

NZ BUILDING ACT (2004) AND ASSOCIATED COMPLIANCE DOCUMENTS AND STANDARDS

ELECTRICITY ACT (1992) AND GAS ACT (1992)

This Act makes provision for the regulation, supply, and use of gas and the gas industry in New Zealand and repeals the Gas Act 1982. It regulates the provision of electricity and gas, details the certification of electricians and gas fitters, and enables regulation of Standards for associated appliances. The Energy Safety website (www.energysafety.govt.nz) acts as a portal for specific information.

HOT WATER TEMPERATURES

BUILDING REGULATIONS 1992 (SR 1992/150) (AS AT 01 FEBRUARY 2009)

"G12.3.6 states "If hot water is provided to sanitary fixtures and sanitary appliances used for personal hygiene, it must be delivered at a temperature that avoids the likelihood of scalding."

The code requires all new and modified existing hot water systems to have hot water delivered to personal hygiene fixtures and appliances at a maximum temperature of 45 in early childhood centres, schools and old people's homes and 55 in all other building. It also requires that domestic hot water is stored at a minimum temperature of 60 to prevent the growth of legionella bacteria, recommending that a tempering valve is used to control delivery temperatures. Tempering valves mix hot and cold water to achieve a lower delivery temperature than the storage temperature. For further detail see http://www.dbh.govt.nz/UserFiles/File/Publications/Building/Compliance-documents/G12-Water-Supplies-30-sept-2010.pdf

EDUCATION (EARLY CHILDHOOD CENTRES) REGULATIONS 1998 (SR 1998/85) (AS AT 01 DECEMBER 2008)

Schedule 2 (Sanitary facilities required) Clause 3 (Hand-washing facilities):

(4) The centre must have a means, with an adjustable thermostat, of providing an adequate supply of hot water to the hand basins.

(5) The temperature of the water at hand basins accessible to the children must be effectively controlled so as not to be higher than 40° Celsius at the outlet.

(6) Notwithstanding subclause (5), where a hot water cylinder is used as a means of providing hot water, the water in it must at all times when the centre is open be kept at a temperature of at least 60° Celsius. See http://legislation.govt.nz/regulation/public/1998/0085/latest/DLM248108.html "

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