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Hospitalised basketball and netball injuries

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Key findings

- In Australia in 2002, netball was the fourth and basketball the sixth most popular organised sport for participation for those 15 years and over (Australian Sports Commission 2003).
- There were 1,244 basketball related and 1,129 netball related hospitalisations in Australia in the 2002–2003 financial year.
- The majority of basketball related hospitalisations occurred in males and as expected, the majority of netball related hospitalisations occurred in females.
- Males had a higher rate of hospitalisation per participant than females for both basketball and netball (15 years and older).
- The knee and lower leg was the most common principal body region injured in hospitalised persons.
- Fractures were the most common type of injury in those requiring hospitalisation for basketball and netball, followed by sprain and strain.
- Injury to the Achilles tendon and rupture of the anterior cruciate ligament were the two most common primary diagnoses.
- Fractures of the distal forearm occurred mainly in 5–19 year olds, knee ligament and meniscal injury occurred mainly in 15–34 year olds and rupture of the Achilles tendon occurred mainly in 25–44 year olds.
- Repair of the Achilles tendon and closed reduction of a fracture of the distal radius were the two most common primary procedures.

Introduction

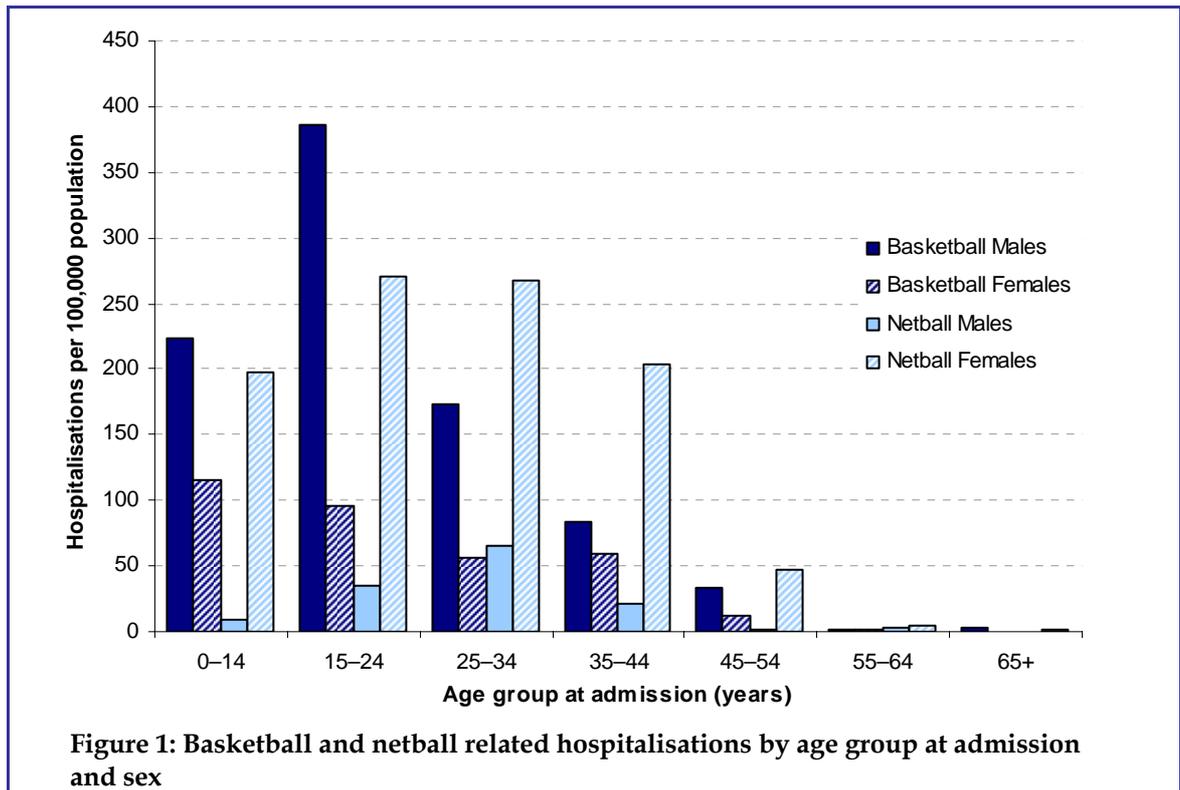
Exercise is important for minimising risk of conditions including cardiovascular disease, stroke, diabetes, cancer, hypertension, mental health disorders and premature death (Sacco et al. 1998; Blair et al. 1989; Stevenson et al. 2000; General 1999; Szabadi 1988; Siscovick et al. 1985). It is not uncommon for participants to be injured, however, the majority of injuries are not severe (Lindsay et al. 2000; Office for Recreation and Sport 2000). A study of sport and exercise related injury in the Latrobe Valley found one hospital admission for every 10 emergency admissions and 12 general practice consultations (Finch et al. 1999). Hospitalised injuries tend to be more severe and costly than other injuries (Watson & Ozanne-Smith 1997). Hence, while hospitalised sports injuries are small as a proportion of all sport injuries they warrant attention.

In 2003, basketball was the seventh and in 2002, the sixth most popular organised sport (for those 15 years and over). 161,200 Australian adults (18 years and over) play basketball (Australian Sports Commission 2000a). Netball was the fourth most popular organised sport, for participation, in Australia in 2002 and 2003 (for those 15 years and over) (Australian Sports Commission 2003). There are just under 278,900 adults participating in netball (18 years and over) (Australian Sports Commission 2000b). In Australian children, 5–14 years old, in the 12 months prior to April 2003, basketball was the fifth most popular organised sport, with 7.7% of those 5–14 years old participating (8.6% of males and 6.9% of females) and netball was the third most popular organised sport for participation, with 9.1% participating (0.6% of males and 18.1% of females) (Australian Bureau of Statistics 2005).

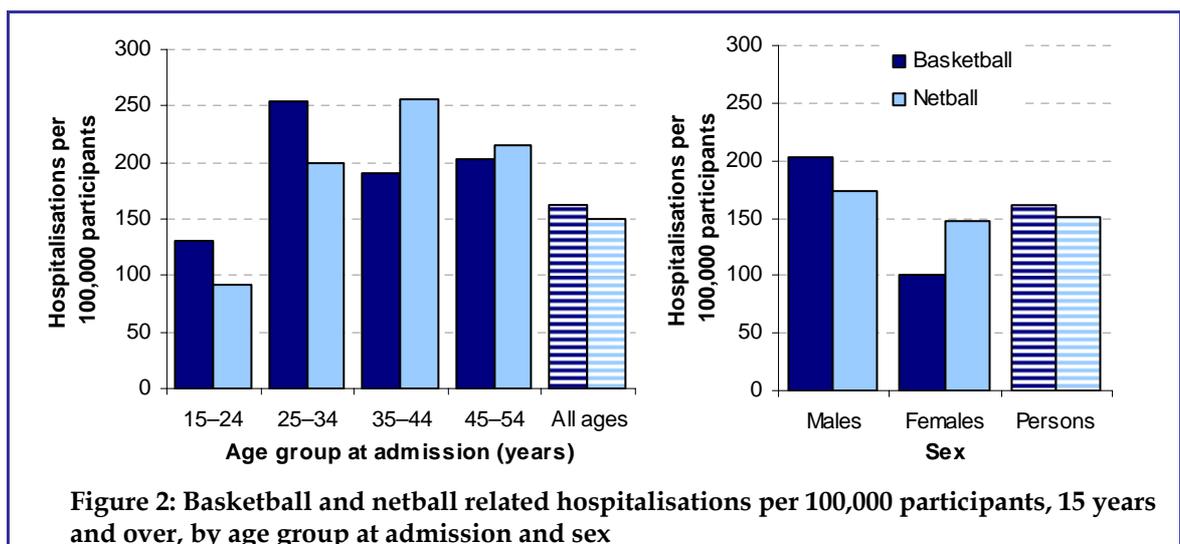
The briefing that follows is a short overview of basketball and netball related hospitalisations in Australia in the 2002–2003 financial year. It is an extension of the basketball and netball chapter found in the Australian Institute of Health and Welfare report by the same authors on hospitalised sports injury (Flood & Harrison 2006).

Age and sex

4.3% of Australian males and 2.9% of Australian females, 15 years and over participate in basketball (Australian Sports Commission 2003). 74.6% of basketball participants are less than 35 years old and 58.5% of basketball participants are male (Australian Sports Commission 2000a). The largest number of basketball related hospitalisations occurred in the 15–24 year old age group (n=482) with 80.1% of these hospitalisations occurring in males. There were 6.3 basketball related hospitalisations per 100,000 population (Figure 1).



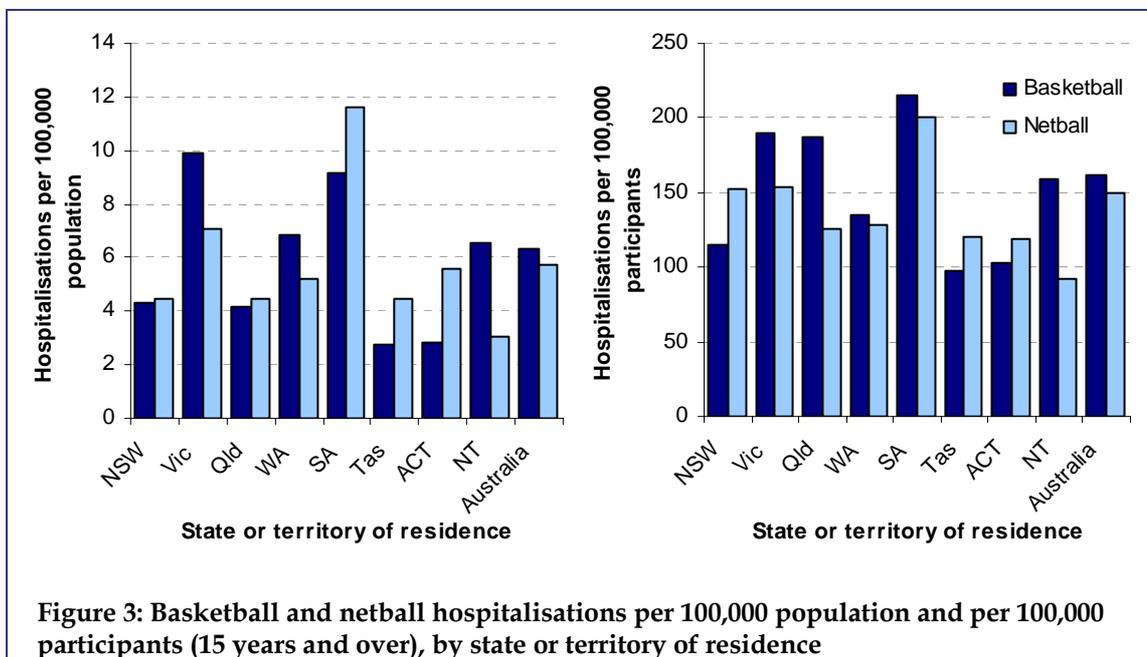
In 2003, 6.9% of females and 0.9% of males, 15 years and over, participated in netball (Australian Sports Commission 2003). 86.6% of netball participants are women and 80.4% of netball participants are less than 35 years old (Australian Sports Commission 2000b). The peak number of netball related hospitalisations was in the 25–34 year old age group (n=332) with 80.4% of these admissions being female. Only 5.7% (n=136) of all basketball and netball hospitalisations occurred in netball playing males. There were 5.7 netball related hospitalisations per 100,000 population (Figure 1).



The highest rate of hospitalisation per 100,000 participants, 15 years and over, for basketball was in the 25–34 year old age group (254.2) and for netball was in the 35–44 year old age group (256.2). Males had a higher rate of hospitalisation per

100,000 participants than females for both basketball (203.0 versus 99.9) and netball (173.3 versus 147.1) (Figure 2).

State or territory of residence



Victoria had the highest participation rate for basketball with 4.9% of the population participating, followed by Western Australia with 4.6% and South Australia (SA) with 4.2% (Australian Sports Commission 2003). Victoria had the highest number of hospitalisations per 100,000 population (9.9 per 100,000 population), followed by SA (9.2 per 100,000 population). SA had the highest rate of hospitalisation per 100,000 participants, 15 years and over, with 214.7 hospitalisations per 100,000 participants (Figure 3).

SA had the highest number of hospitalisations for netball injury per 100,000 population with 11.6 per population and the highest number of hospitalisations for netball injury per 100,000 participants, 15 years and over, with 200.6 per 100,000 participants compared with 5.7 and 150.2, respectively for Australia as a whole. SA also had the highest participation rate with 6.0% (15 years and over) (Figure 3).

Principal body region injured

In both basketball and netball the knee and lower leg was the most common principal body region injured in hospitalised persons. This predominance was more marked in netball where 49.4% of hospitalisations have the knee and lower leg as the principal body region injured compared with 30.4% for basketball. Elbow and forearm was the next most common body region injured. Elbow and forearm injury was more common in those 0–14 years old and knee and lower leg injury was more common in those 15–54 years old (Figure 4 and Table 1).

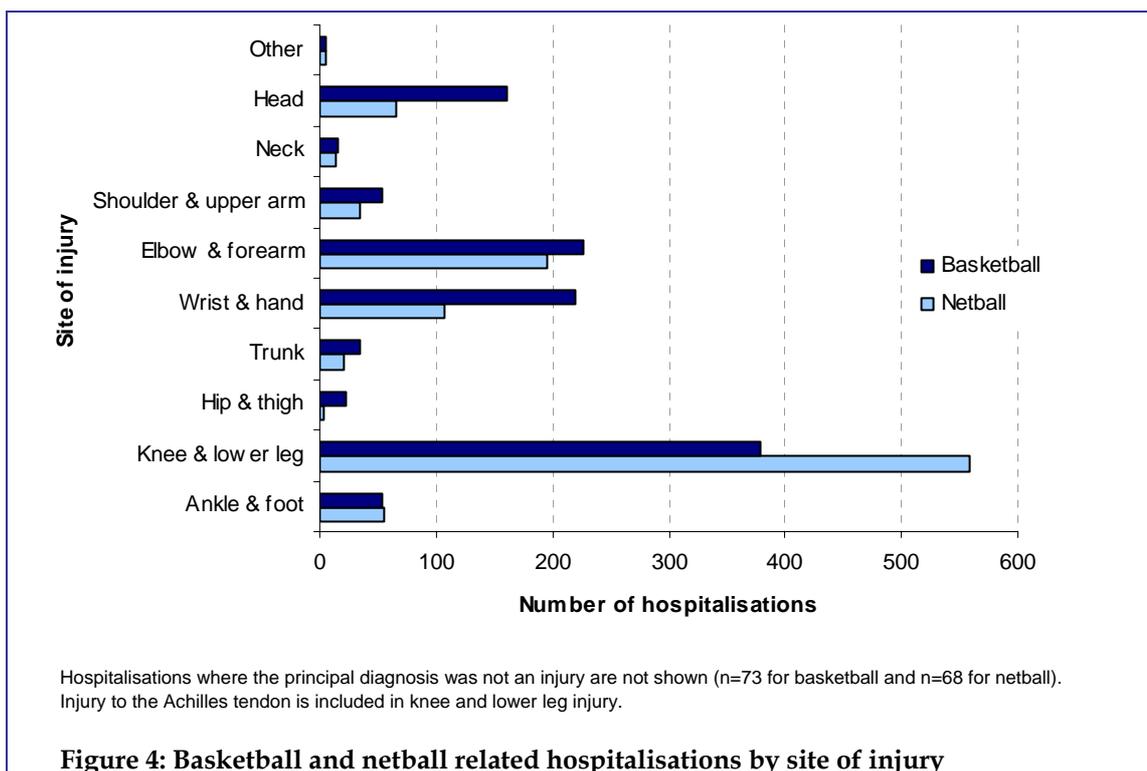


Table 1: Principal body region injured by age group at admission and sport played

Principal body part injured	Basketball			Netball		
	Age group at admission (years)			Age group at admission (years)		
	0-14	15-24	25-54	0-14	15-24	25-54
Head	15.0%	12.7%	11.8%	9.7%	8.2%	3.5%
Neck	0.9%	2.1%	0.7%	1.0%	3.3%	0.2%
Shoulder and upper arm	3.2%	5.6%	3.6%	1.4%	4.9%	2.6%
Elbow and forearm	40.3%	13.5%	6.0%	52.2%	7.2%	10.4%
Wrist and hand	17.6%	19.9%	14.6%	13.0%	7.2%	9.6%
Trunk	2.9%	2.7%	2.9%	1.0%	1.6%	2.3%
Hip and thigh	2.9%	1.2%	1.7%	0.5%	0.0%	0.2%
Knee and lower leg	10.9%	29.3%	48.0%	13.0%	54.6%	59.3%
Ankle and foot	2.1%	6.6%	3.4%	5.3%	6.9%	4.0%
Other injury	0.3%	0.4%	0.5%	0.5%	0.3%	0.7%
Principal diagnosis not an injury	3.8%	6.0%	7.0%	2.4%	5.9%	7.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0	100.0%

Values greater than 25% are shown shaded (excluding total). Percentages for the 55+ year old age group are not shown due to low numbers.

Nature of injury

Table 2: Nature of injury by age group at admission

	Basketball		Netball	
	Cases	Column Per cent	Cases	Column Per cent
Superficial injury	26	2.1	9	0.8
Open wound	23	1.8	12	1.1
Fracture	597	48.0	360	31.9
Dislocation	130	10.5	115	10.2
Sprain or strain	151	12.1	291	25.8
Injury to muscle or tendon	120	9.6	188	16.7
Internal organ injury	3	0.2	...	0.1
Eye injury	7	0.6	0	0.0
Nerve or spinal cord injury	...	0.2	...	0.2
Intracranial injury (including concussion)	42	3.4	21	1.9
Other injury diagnosis	70	5.6	62	5.5
Principal diagnoses not an injury	73	5.9	68	6.0
Total	1,244	100.0	1,129	100.0

Values greater than 25% are shown shaded (excluding total).
 Values less than 3 are not shown (...).

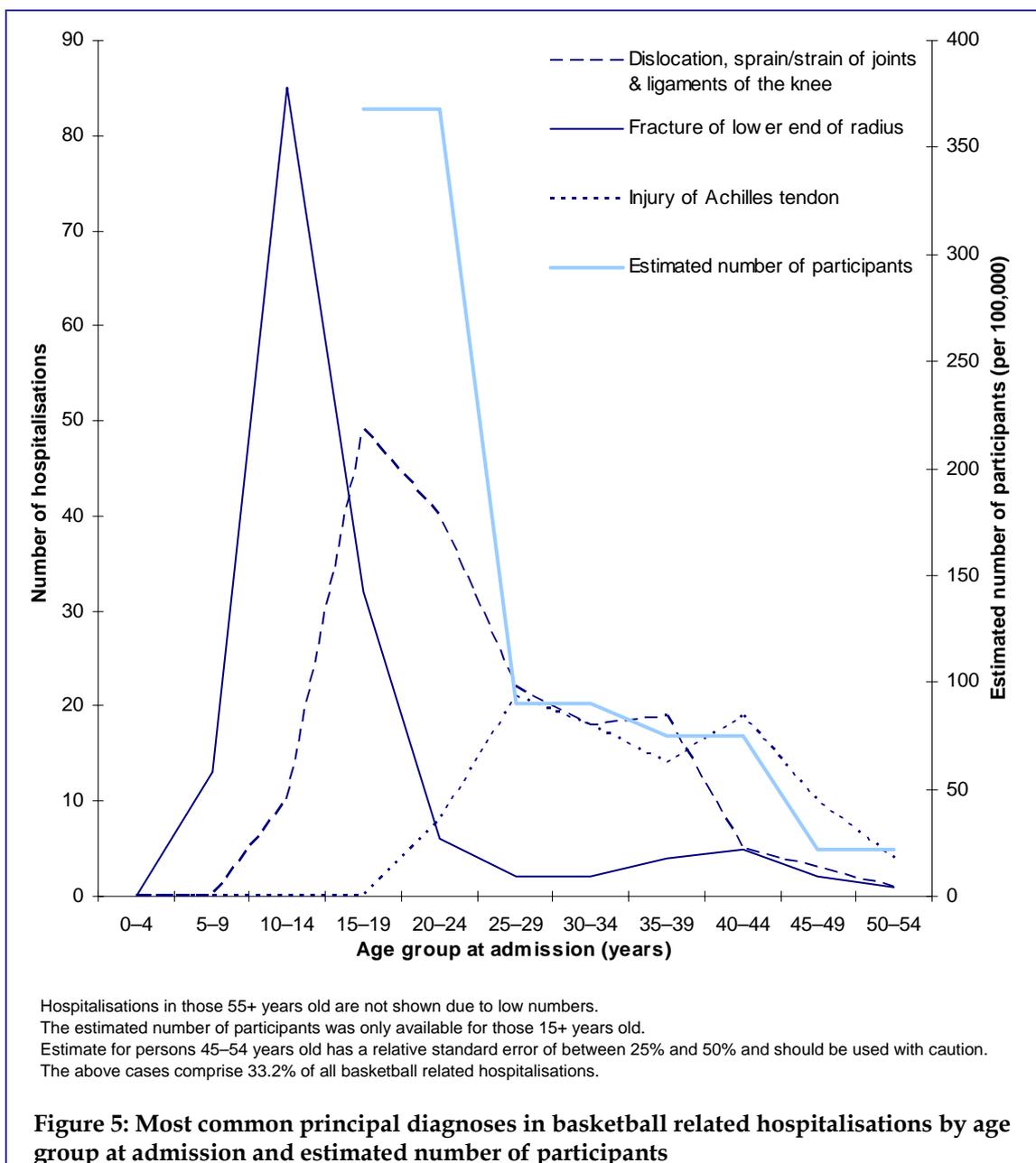
Table 3: Most common principal diagnoses

	Basketball		Netball	
	Cases	Per cent*	Cases	Per cent*
Injury to Achilles tendon (S860)	94	7.6%	175	15.5%
Rupture of anterior cruciate ligament (ACL) (S8353)	81	6.5%	167	14.8%
Fracture of proximal phalanx of finger (excluding thumb) (S6261)	68	5.5%	31	2.7%
Fracture of lower end of radius with dorsal angulation (Colles' fracture) (S5251)	56	4.5%	40	3.5%
Fracture of lower end of ulna and radius (S526)	41	3.3%	34	3.0%
Injury to multiple structures of the knee (S837)	19	1.5%	56	5.0%
Fracture of lower end of radius, unspecified (S5250)	37	3.0%	36	3.2%
Tear of meniscus, current (S832)	28	2.3%	38	3.4%
Fracture of nasal bones (S022)	48	3.9%	16	1.4%
Fracture of lower end of radius with volar angulation (Barton's or Smith's fracture) (S5252)	12	1.0%	30	2.7%
Fracture of lateral malleolus (ankle) (S826)	27	2.2%	12	1.1%
Unspecified head injury (S099)	20	1.6%	17	1.5%
Loss of consciousness for less than 30 minutes (S0602)	26	2.1%	9	0.8%

* Per cent of all basketball or netball related hospitalisations.
 The above diagnoses comprise 44.8% of all basketball and 58.5% of all netball related hospitalisations.
 Categories found in ICD-10-AM 3rd edition (National Centre for Classification in Health 2002a).

Fractures were the most common type of injury in those requiring hospitalisation for basketball (48.0%) and netball (31.9%). Sprain and strain and muscle and tendon injury were much more common in netball (25.8% and 16.7% respectively) than in basketball (12.1% and 9.6% respectively) (Table 2).

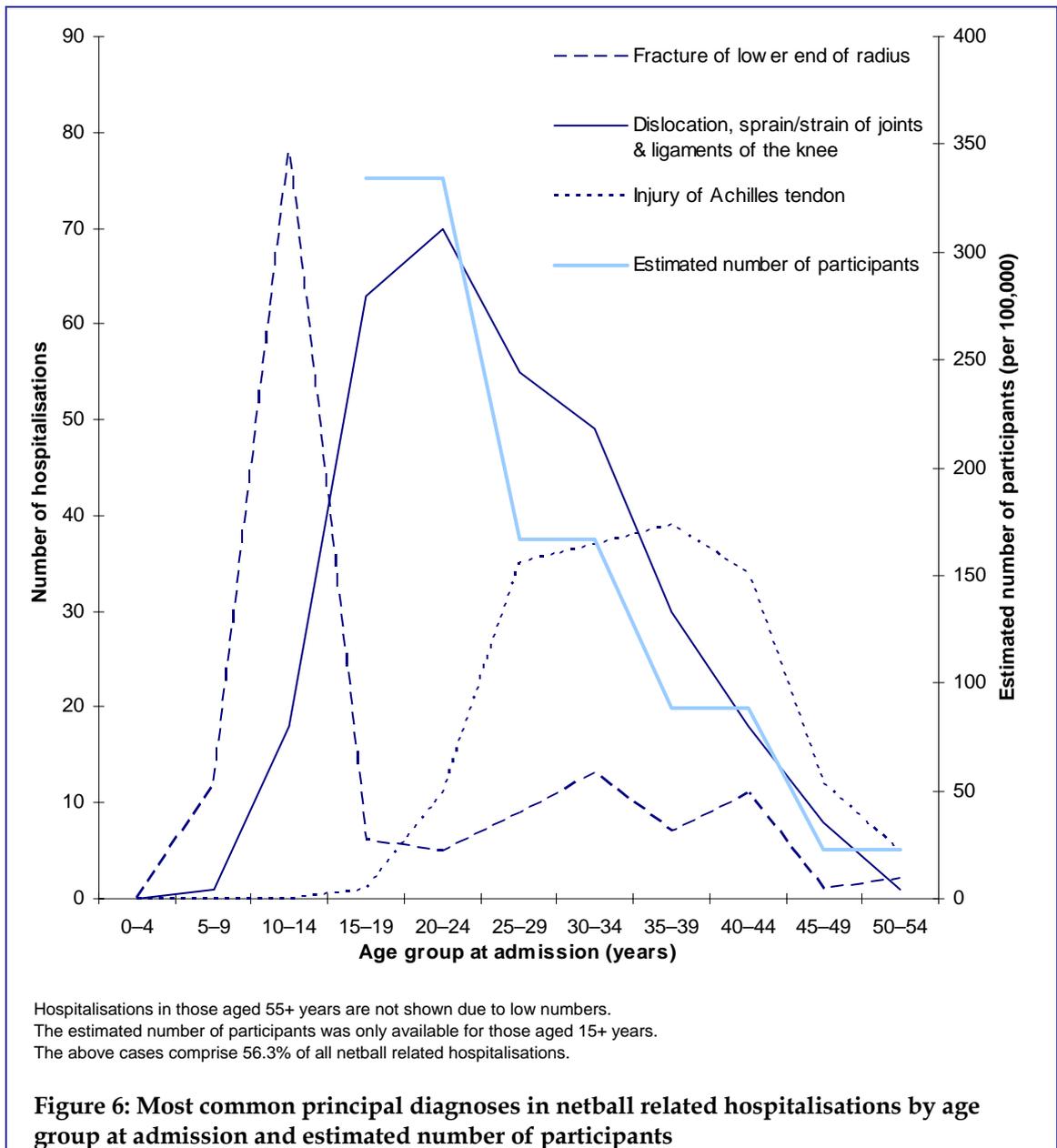
15.5% of netball related hospitalisations were due to injury to the Achilles tendon and 14.8% were due to rupture of the anterior cruciate ligament (ACL). These were also the two most common principal diagnoses for basketball related hospitalisations however, they occurred at a much lower frequency (7.6% and 6.5% respectively) (Table 3).



The number of hospitalisations due to dislocation, sprain/strain of the joints and ligaments of the knee (S83), fracture of the lower end of the radius (S525) and injury of the Achilles tendon (S860) is shown in Figure 5 (basketball) and Figure 6 (netball) (National Centre for Classification in Health 2002a). These include all hospitalisations

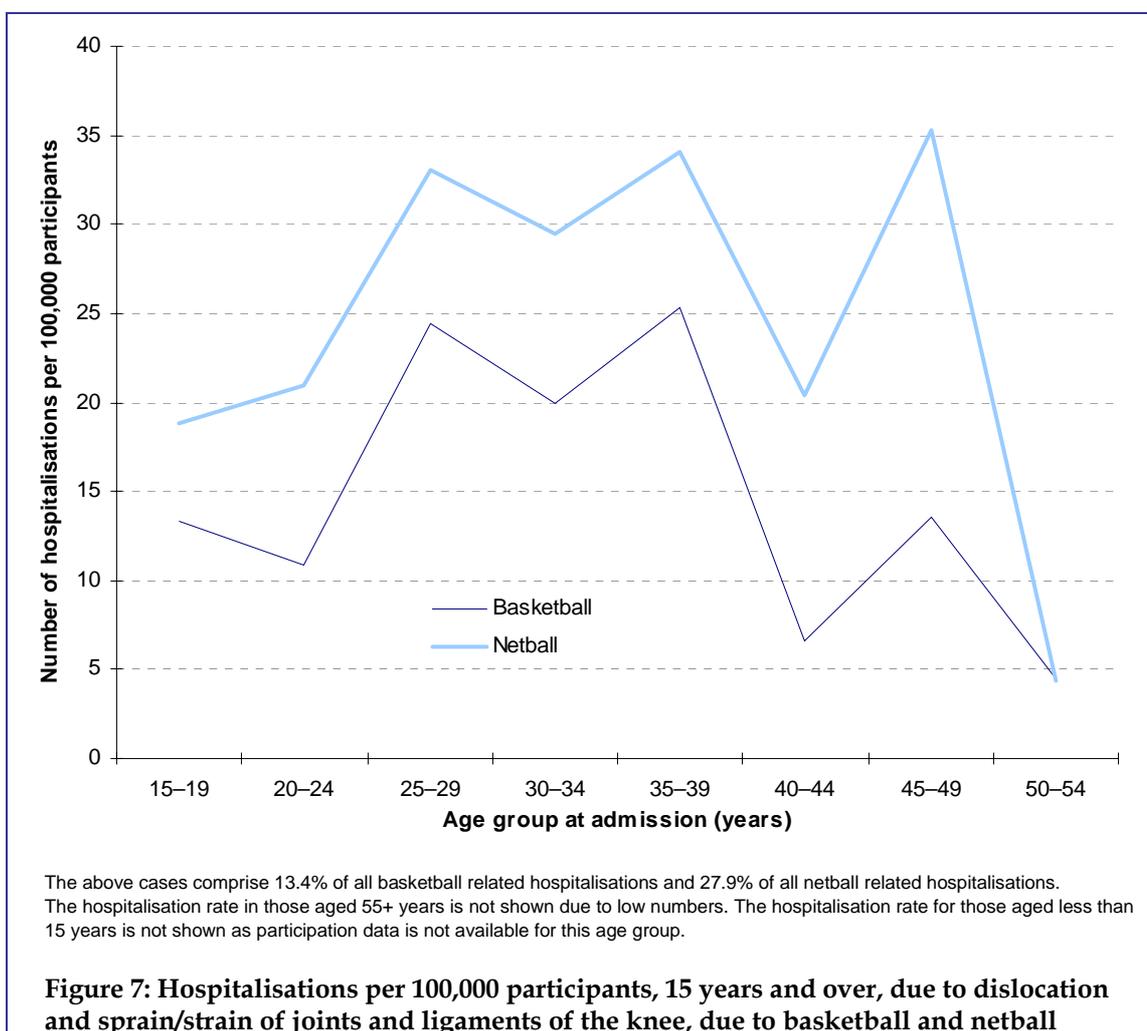
with a primary diagnosis with these categories, which are expanded from those shown in Table 3 to include all similar diagnoses.

Fractures of the distal forearm occurred mainly in 5–19 year olds, knee ligament and meniscal injury occurred mainly in 15–34 year olds and rupture of the Achilles tendon occurred mainly in 25–44 year olds. The shape of the estimated number of participants curve mirrors the peaks of distal forearm fractures, knee ligament and meniscal injury and ruptured Achilles tendon injury (Figures 5 and 6).



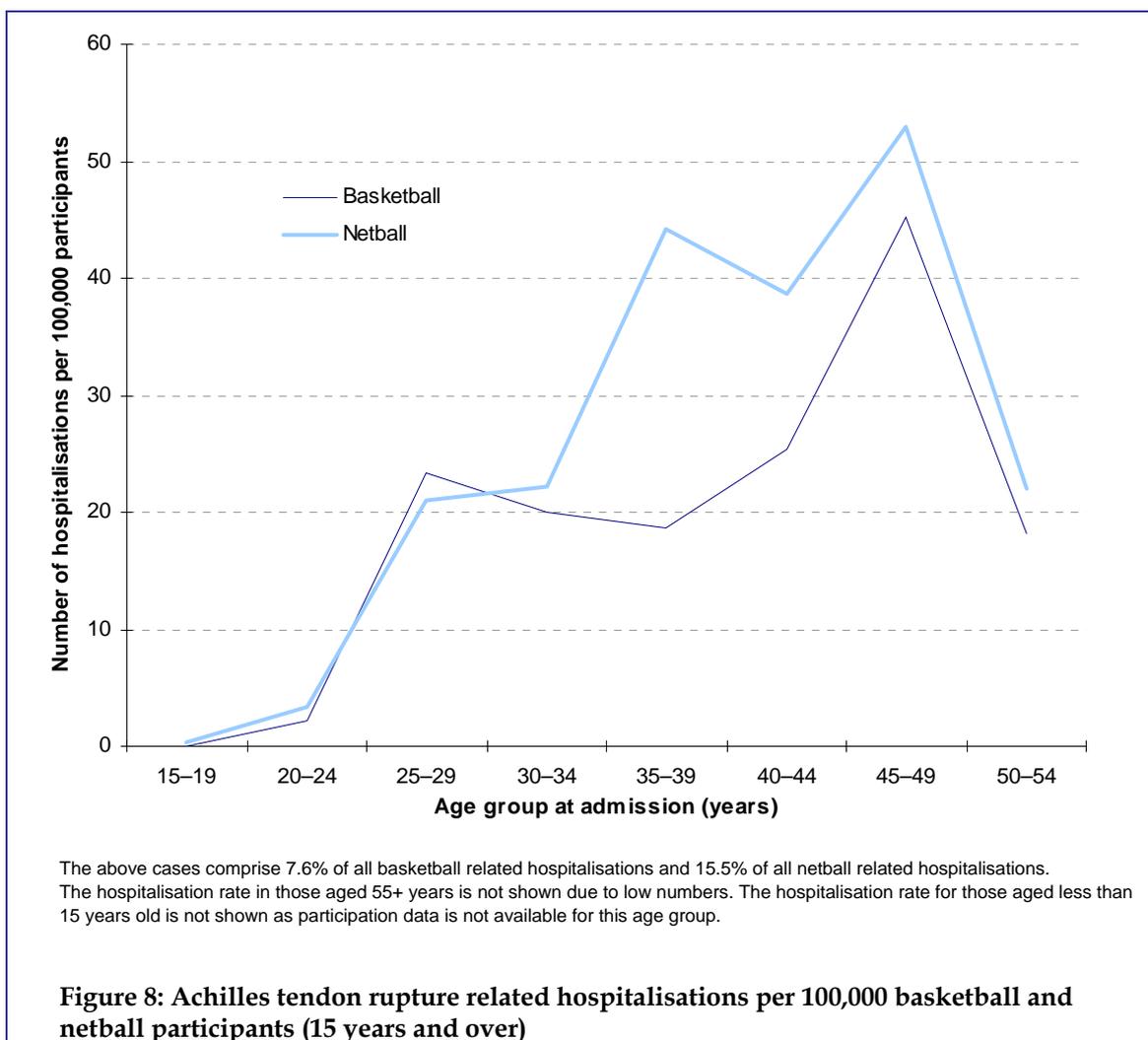
Dislocation, sprain and strain of joints and ligaments of the knee was more common in netball than in basketball, comprising 27.9% of all hospitalised netball injuries and 13.4% of all hospitalised basketball injuries. Knee joint and ligamentous injury was more common in females than males with 29.1% of injuries in netball females and 22.4% of injuries in basketball females versus 19.1% of injuries in netball males and 10.1% of injuries in basketball males. There was a higher rate of dislocation, sprain and

strain of joints and ligaments of the knee in netball than in basketball even after participation (for those 15 years and over) is considered (excluding for the 50–54 year old age group) (Figure 7).



There was a similar number of lower radius fractures due to basketball (12.2%) and netball (12.9%) as well as a similar number occurring in males (11.3%) as females (13.5%). A graph of the hospitalisation rate per participant for this injury is not shown as participation data is not available for this age group.

Rupture (partial or complete) of the Achilles tendon was much more common in netball than in basketball (n=175 versus n=94). There was not a marked sex difference with 12.4% of Achilles tendon injuries occurring in females and 10.0% occurring in males. Figure 8 shows the rate of Achilles tendon related hospitalisations per 100,000 participants, 15 years and over (Figure 8).



Costing of hospitalisations

It has been estimated that sports injuries cost Australia more than \$1.83 billion per year (including health professional costs and indirect costs e.g. time away from work) (Medibank Private Limited 2004). We have calculated the direct costs of basketball and netball related hospitalisations using the diagnosis related group (DRG) assigned to each hospitalisation. We estimate the direct cost (i.e. admitted patients only) of basketball and netball related hospitalisations in 2002–2003 to be \$2.7 million and \$2.4 million, respectively.

Procedures

Closed reduction of a fracture of the distal radius (8.7%) and repair of the Achilles tendon (6.5%) were the most common procedures performed in those hospitalised for basketball related reasons. Repair of the Achilles tendon (12.5%) and arthroscopic reconstruction of the knee (10.4%) were the most common procedures performed in those hospitalised for netball related reasons (Table 4).

Table 4: Most common primary procedures

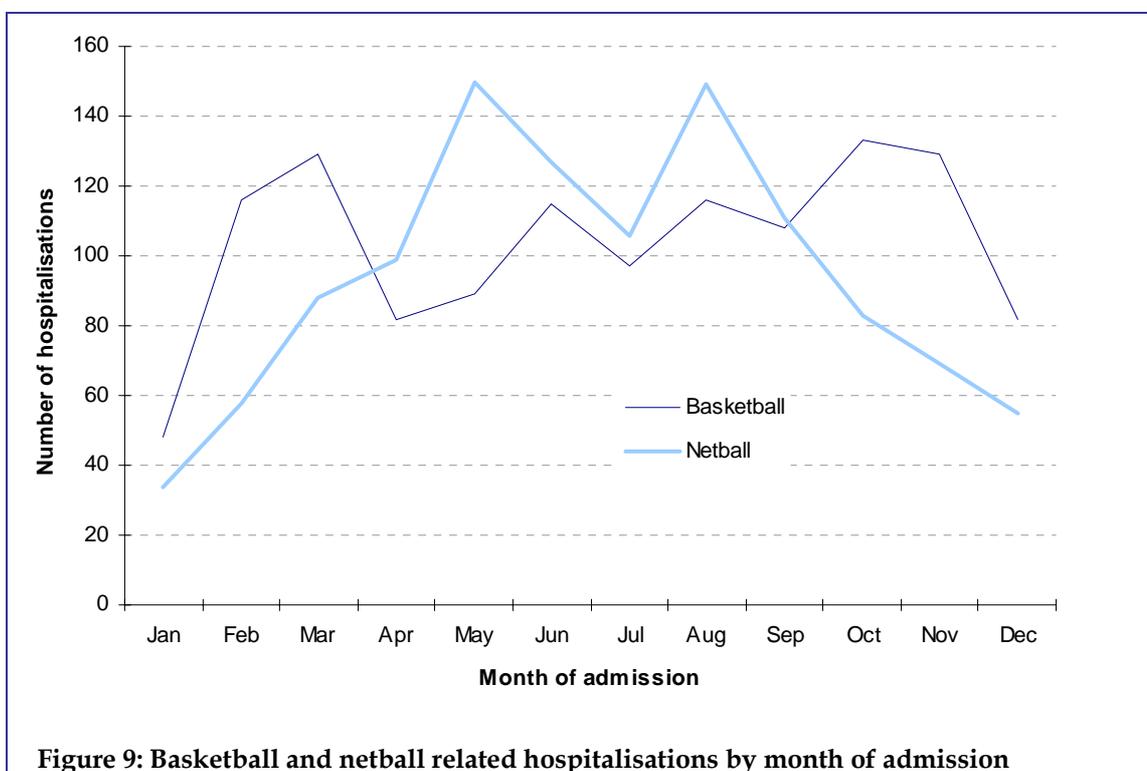
	Basketball		Netball	
	Cases	Per cent [*]	Cases	Per cent [*]
Repair of Achilles tendon	81	6.5%	141	12.5%
Closed reduction of fracture of the distal radius	108	8.7%	109	9.7%
Arthroscopic reconstruction of the knee	52	4.2%	117	10.4%
Physiotherapy	46	3.7%	38	3.4%
Closed reduction of fractured nasal bones	40	3.2%	13	1.2%
Arthroscopic meniscectomy of the knee with debridement, osteoplasty or chondroplasty	18	1.4%	32	2.8%
Arthroscopic reconstruction of cruciate ligament with repair of meniscus	15	1.2%	34	3.0%
Reconstruction of the knee	14	1.1%	30	2.7%
Open reduction of fracture of the proximal phalanx of hand with internal fixation	25	2.0%	17	1.5%
Open reduction of fracture of metacarpus with internal fixation	33	2.7%	5	0.4%
Open reduction of fracture of ankle with internal fixation of diastasis, fibula or malleolus	21	1.7%	14	1.2%

^{*} Per cent of all basketball or netball hospitalisations.

The above procedures comprise 36.4% of all basketball hospitalisations and 48.7% of all netball related hospitalisations.

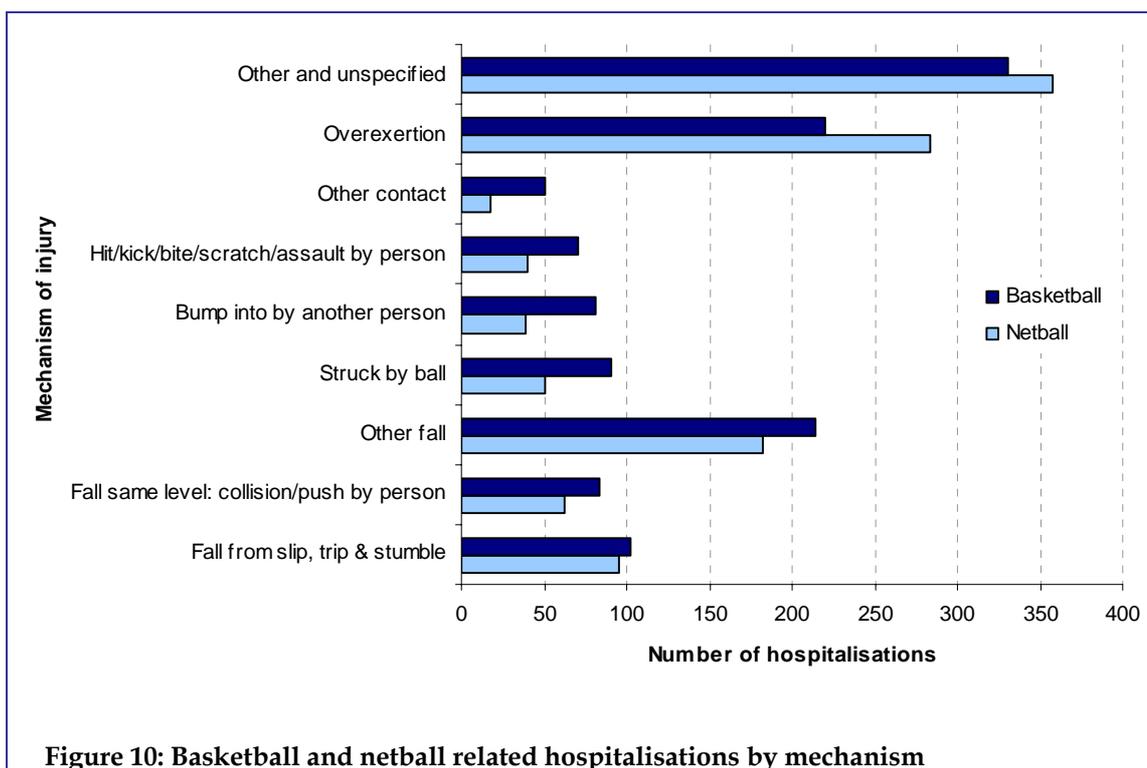
Procedure classification found in ICD-10-AM Tabular List of Procedures 3rd edition (National Centre for Classification in Health 2002b).

Month of admission



The peak number of basketball admissions was in October (n=133). The peak number of netball admissions occurred in May (n=150) and August (n=149) (Figure 9).

Self reported mechanism



32.2% of basketball related hospitalisations were due to falls and 17.7% were due to overexertion. 18.9% of basketball related hospitalisations were due to contact with another person (fall same level from collision or push by person, bumped into by another person and hit/kick/bite/scratch/assault by another person). Falls were the most common specified mechanism of injury for netball (30.0%). 25.2% of netball related hospitalisations were due to overexertion (Figure 10).

Length of stay in hospital

There was a general upward trend with advancing age in the mean length of stay for both basketball and netball (Figure 11).

Table 5 shows the percentage of hospitalisations that were discharged on the day of admission in the top thirteen diagnoses for basketball and netball. Rupture of the Achilles tendon and the ACL were unlikely to be discharged on the day of admission unlike fracture of the proximal phalanx of the finger (not including the thumb) (Table 5).

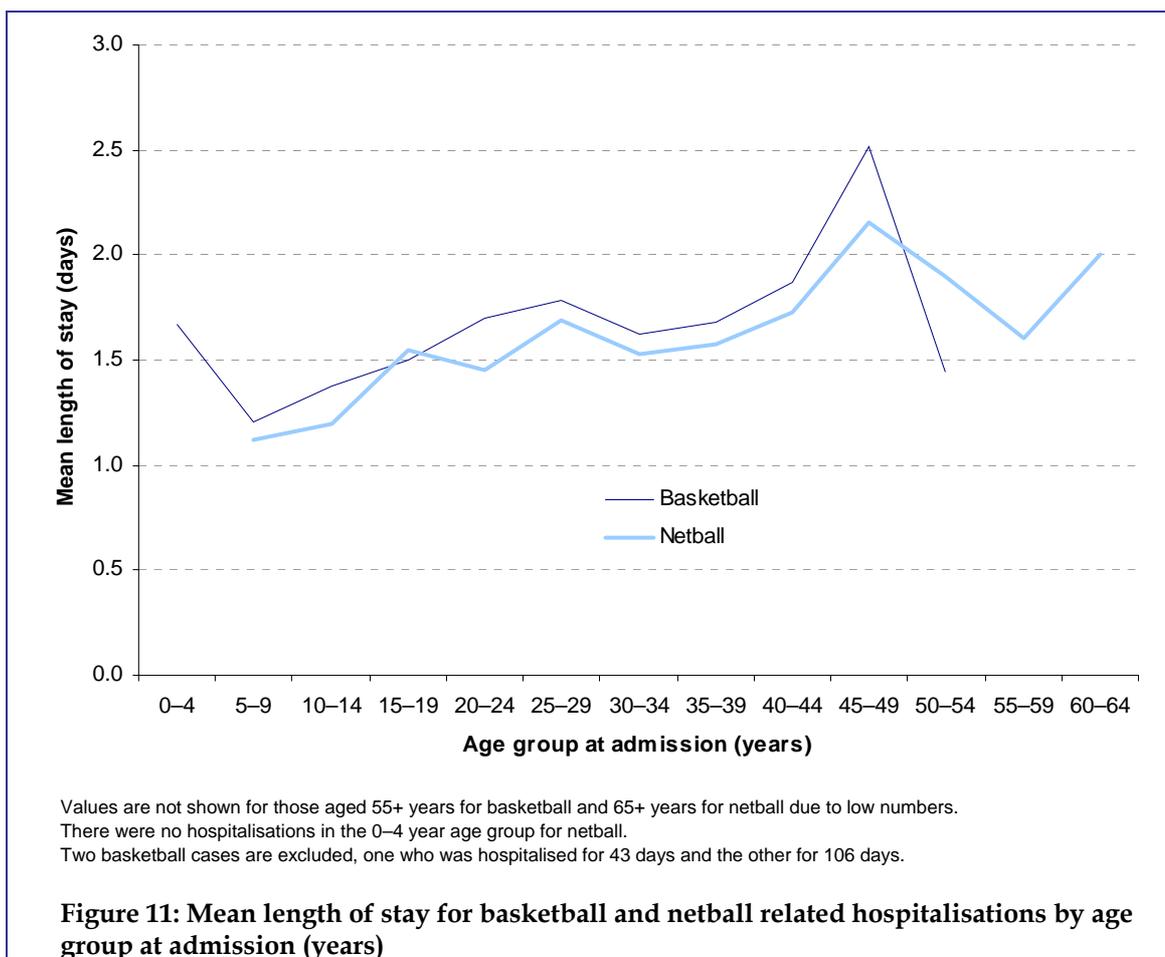


Table 5: Most common primary procedures by percentage discharged same day

	Percentage discharged sameday [*]	
	Basketball	Netball
Injury to Achilles tendon (S860)	5.3%	15.4%
Rupture of anterior cruciate ligament (ACL) (S8353)	13.6%	18.0%
Fracture of proximal phalanx of finger (excluding thumb) (S6261)	70.6%	64.5%
Fracture of lower end of radius with dorsal angulation (Colles' fracture) (S5251)	39.3%	30.0%
Fracture of lower end of ulna and radius (S526)	31.7%	44.1%
Injury to multiple structures of the knee (S837)	10.5%	19.6%
Fracture of lower end of radius, unspecified (S5250)	29.7%	44.4%
Tear of meniscus, current (S832)	67.9%	60.5%
Fracture of nasal bones (S022)	87.5%	93.8%
Fracture of lower end of radius with volar angulation (Barton's or Smith's fracture) (S5252)	33.3%	33.3%
Fracture of lateral malleolus (ankle) (S826)	18.5%	25.0%
Unspecified head injury (S099)	45.0%	58.8%
Loss of consciousness for less than 30 minutes (S0602)	42.3%	55.6%

^{*} Percentage of all basketball or netball admissions.

Percentages greater than 50% are shown shaded.

The above diagnoses comprise 44.8% of all basketball and 58.5% of all netball related hospitalisations.

Procedure classification found in ICD-10-AM Tabular List of Procedures 3rd edition (National Centre for Classification in Health 2002a).

Place of occurrence

As would be expected most basketball and netball hospitalisations occurred at a sports area, however, basketball hospitalisations had more commonly occurred at an indoor sports area (33.4%) and netball at an outdoor sports area (45.3%). (Figure 12)

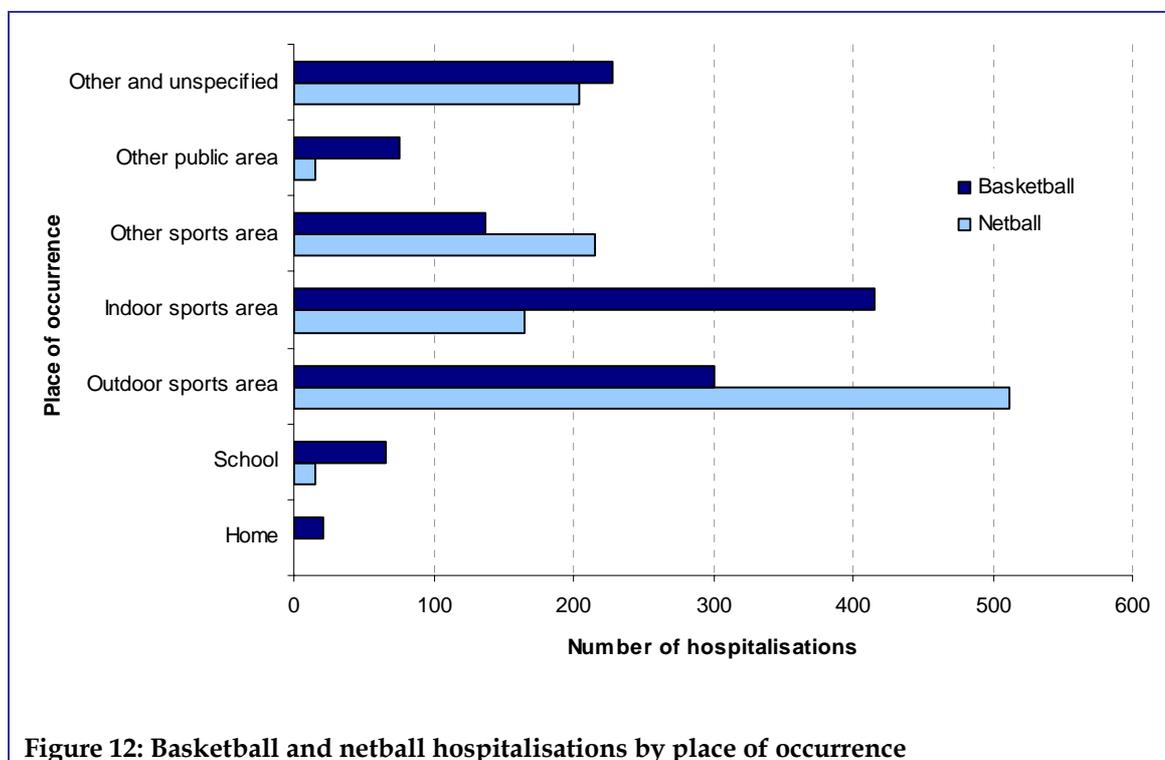


Figure 12: Basketball and netball hospitalisations by place of occurrence

Other studies

Basketball

In basketball injury can result from falls and poor landings after jumps, collisions, pivots and rapid acceleration or deceleration (Sickles & Lombardo 1993). The lower limb is the most common site of injury, with ankle injuries being most common. Inversion of the plantar flexed foot is the most common mechanism of injury (Sonzogni & Gross 1993). The knee is the second most commonly injured body region in basketball, however, it likely accounts for more time off play (Sonzogni & Gross 1993).

Gomez et al. studied girls' high school basketball injuries in Texas in the 1993–1994 season including 890 players on the school basketball teams. There were 436 injuries, i.e. 0.49 injuries per athlete per season, with an approximate risk of injury of 0.4% per hour of exposure (Gomez et al. 1996). Messina et al. followed up this study and reviewed boys' basketball injuries from the same Texas high schools in the 1996–1997 season. There were 973 athletes included who sustained 543 injuries i.e. 0.56 injuries per athlete per season, which was statistically significantly higher than in the girls (Messina et al. 1999). For both boys and girls the ankle was the most commonly injured body part. The girls had a significantly higher rate of knee injury ($P=0.0001$) and lower

limb injury ($P=0.003$) (Messina et al. 1999). The girls had a higher incidence of ACL injury (0.025% versus 0.007%) ($P=0.024$). The rate of knee injury remained higher in girls than boys even after ACL injury was excluded ($P=0.00013$). The exposure time knee injury risk was 2.29 times higher in girls than boys ($P<0.001$) and the exposure time ACL injury risk was 3.79 times higher in girls (Messina et al. 1999). There was a higher rate of serious injury (hospitalisation or surgery) in girls (0.038 per athlete per year) than boys (0.027 per athlete per year) however, this was not statistically significant (Messina et al. 1999).

McKay et al. studied ankle injuries in basketball by observing 10,393 basketball participations in Melbourne. 67.1% were women and most were recreational (77.9%) rather than elite. There were 3.85 ankle injuries per 1,000 participations. The ankle injured group was significantly younger than the control group ($p<0.05$) (McKay et al. 2001). 45.0% of ankle injuries occurred during landing and 30% during sharp twist or turn. Players who had previously injured their ankles were almost 5 times more likely than previously uninjured players, to injure their ankles. Players with air cells in their shoes were more likely to injure their ankles by 4.3 times (McKay et al. 2001).

Netball

Netball is a game requiring rapid changes in direction, acceleration and elevated leaps to catch the ball (Hopper & Elliott 1993). Hopper and Elliott studied injuries sustained at the National Schoolgirls' Netball Championship and the Open and Under 21 years All Australia Netball Championships held in Perth in 1988 (Hopper & Elliott 1993). Almost one quarter (23%) of players were injured (Hopper & Elliott 1993). In the All Australian Netball Championship, the ankle was the most commonly injured body part (36.6%), followed by the calf/shins (19.2%), the knee (17.2%), the back (13.5%) and the foot (11.5%). Incorrect landing and contact with another player were the most common reasons, perceived by the player, contributing to their injury (both 28.8%). However, for knee injury alone, it was slip, trip or sudden stop (Hopper & Elliott 1993).

Hopper et al. studied injuries sustained during competition (A1 to D6 grades) at the Western Australia Netball Association Matthew's Centre from 1985 to 1989 (Hopper et al. 1995). There were 608 injured players out of 11,228 players (5.4%). There was a 8.5% injury rate for those in A grade compared with 3.3% for those in D grade (Hopper et al. 1995). The majority of injuries involved the ankle (84.3%), followed by the knee (8.3%), other (4.6%) and the hand (2.8%) (Hopper et al. 1995). The majority of ankle injuries involved the lateral ligament complex (67%) but 4% had fractured lateral malleolus and 1.5% a fractured medial malleolus (Hopper et al. 1995). 2.6% of total injuries involved the menisci of the knee and 1.8% the ACL (Hopper et al. 1995). The majority of injuries were ligamentous (81%), followed by fractures (11%) and muscle or soft tissue injuries (8%) (Hopper et al. 1995). At least 38% of players regarded incorrect landing to be the reason for their ankle and knee injuries (Hopper et al. 1995). Knee injuries tend to be more severe compared with ankle injuries, with more being referred to hospital (27% versus 15%) (Hopper et al. 1995).

Smith et al. reviewed 200 under 16 year old female netball players for injuries and hypermobility. The ankle was the most commonly injured site (42%), followed by the knee (27%) and the finger (15%). Netball players who were distinctly hypermobile

(Beighton scores 5–9) were 3 times more likely to be injured than players who were not hypermobile (Beighton scores 0–2) ($p=0.01$). Smith et al. did not find age to be a predictor of injury (Smith et al. 2005).

Discussion

There were 1,244 basketball and 1,129 netball related hospitalisations in the 2002–2003 financial year. 80.1% of basketball related hospitalisations occurred in males and 80.4% of netball related hospitalisations occurred in females. There were 6.3 basketball related and 5.7 netball related hospitalisations per 100,000 population. The highest rate of hospitalisation per 100,000 participants (15 years and over) was in the 25–34 year old age group for basketball and the 35–44 year old age group for netball.

In this study, for both basketball and netball, the knee and lower leg was the most common principal body region injured. In the basketball and netball related studies reviewed above the ankle was the most commonly injured body part (Hopper & Elliott 1993; Hopper et al. 1995; Sickles & Lombardo 1993; Messina et al. 1999). Two possible reasons for this disparity are as follows. Firstly, this paper reports on hospitalised injury only unlike the above studies which include even minor injury. Gomez et al. found in their study that knee injury was more likely than ankle injury to require surgery (Gomez et al. 1996). Hopper et al found that knee injuries were more severe than ankle injuries with more referred to hospital (Hopper et al. 1995). Secondly, in this report Achilles tendon injury has been included in knee and lower leg injury and not with ankle injury.

Injury to the Achilles tendon (partial or complete) was the most common diagnoses for both basketball ($n=94$) and netball ($n=175$). The next most common diagnosis was rupture of the ACL (partial or complete), with 81 basketball related and 167 netball related hospitalisations.

Fractures of the distal forearm occurred mainly in 5–19 year olds, knee ligament and meniscal injury occurred mainly in 15–34 year olds and rupture of the Achilles tendon occurred mainly in 25–44 year olds.

It is well known that female athletes have more knee injuries than male athletes, particularly ACL injuries (Messina et al. 1999; Murphy et al. 2003; Gwinn et al. 2000; Powell & Barber-Foss 2000; Beynnon et al. 2002). Potentially females could have more ACL strains than males due to having on average a narrower intercondylar notch of the femur (Shelbourne et al. 1998). Emerson reports that basketball related ACL injury is rare in preadolescents (Emerson 1993). Dislocation, sprain and strain of joints and ligaments of the knee was much more common in netball and in females than in males or basketball. 27.9% of all hospitalised netball injuries and 13.4% of all hospitalised basketball injuries involved knee joint and ligament dislocation and sprain or strain. 27.4% of hospitalisations in females and 11.3% of hospitalisations in males involved the knee joint and ligamentous injury or dislocation. The higher incidence of knee joint and ligament related hospitalisations in netball cannot be wholly explained by the slightly higher average age of netball participants. Netball players have a higher rate of hospitalisation per 100,000 participants (15 years and over) across all age groups except the 50–54 year old age group (where only small numbers are involved).

Achilles tendon injury occurred predominately in the 25–44 year old age group. 175 netball related hospitalisations were due to rupture of the Achilles tendon compared with 94 basketball related hospitalisations for the same. There was minimal sex difference (10.0% for males and 12.4% for females). Netball remains popular with the 35 year old plus players with fifty per cent more players than basketball (Australian Sports Commission 2003). However, this only partly explains the higher number of Achilles tendon ruptures in netball than in basketball (Figure 8).

Closed reduction of a fracture of the distal radius and repair of the Achilles tendon were the two most common procedures performed in persons hospitalised for basketball and netball related reasons.

Most basketball and netball hospitalisations occurred at a sports area with 33.4% of basketball related hospitalisations occurring at an indoor sports area and 45.3% of netball related hospitalisations occurring at an outdoor sports area.

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Data issues

Data

Cases are hospital separations from the National Hospital Morbidity Database from episodes in hospital where discharge occurred during the financial year to 30 June 2003 and where the principal diagnosis was an injury. Injury is defined as ICD-10-AM codes S00–T75 or T79. Only cases where the sport or leisure activity code for basketball (U50.1) or netball (U50.3) was used have been included. Cases involving transfer between hospitals were counted only once by omitting inward transfers from acute hospitals from the case counts (n=244).

Population data has been obtained from the AIHW. Participation data from the Participation in Exercise and Recreation and Sport Annual Report 2003, has been used for the participation based rates. This is compiled from telephone surveys in February, May, August and November about the previous 12 months. The total sample was 13,644 persons, 15 years and over, in private dwellings (Australian Sports Commission 2003).

Methods

All rates are age specific crude rates i.e. not age adjusted rates.

The total length of stay is the sum of the length of stay for all cases in a group of interest plus the length of stay for otherwise similar records where mode of admission was inward transfer from another acute hospital. Mean length of stay is total length of stay divided by the number of cases. Note that these values are for acute care and do not include rehabilitation.

Costing of hospitalisations has been calculated from the DRG assigned to each case multiplied by the cost weights for that DRG. Cost weights differ for the public and private systems and hence the cases in the public system and in the private system have been calculated separately and then added together.

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