

# Childhood Fractures Above the Arctic Circle

## A population-based study, "Fit Futures"

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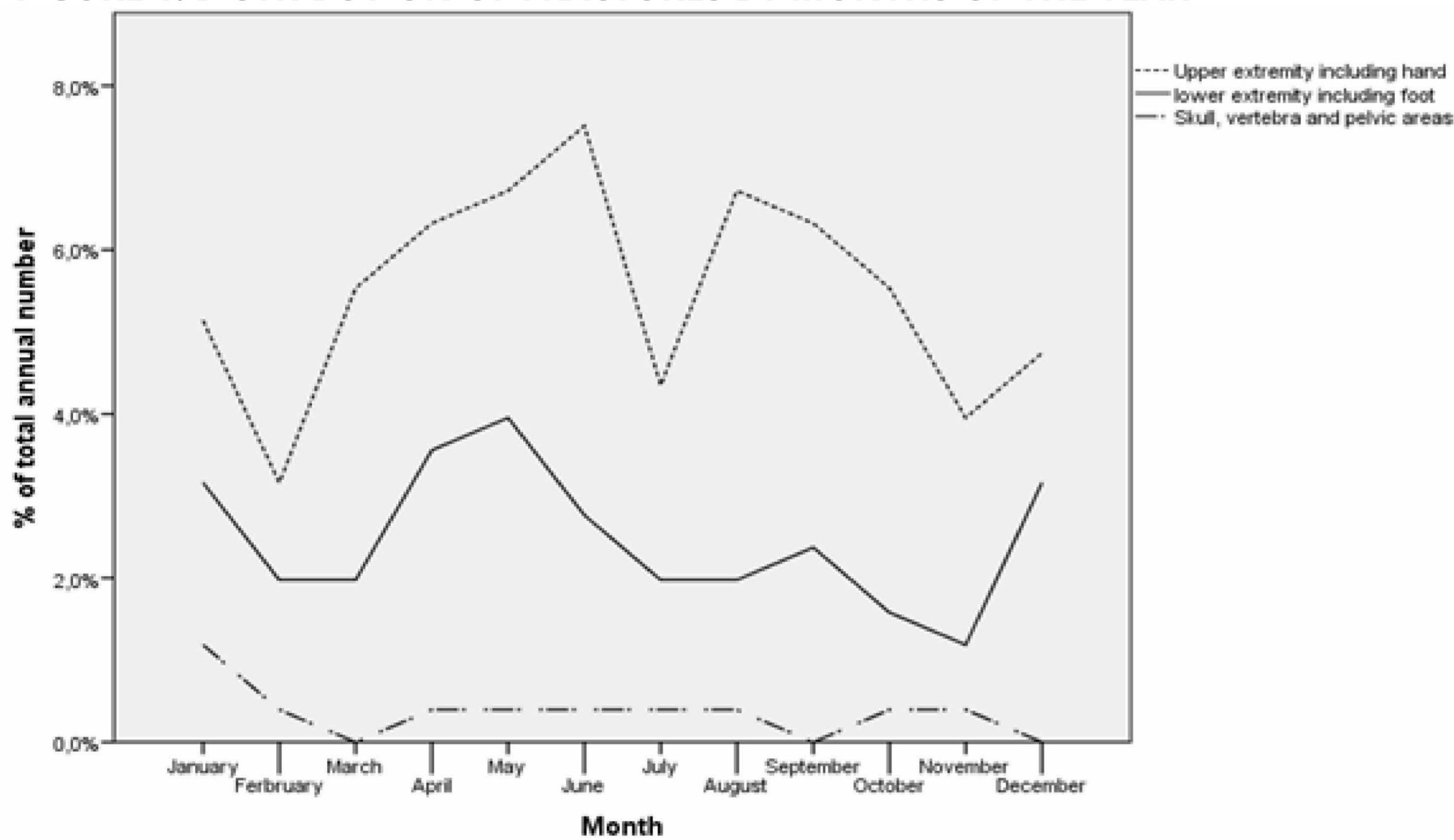
### / INTRODUCTION

- Fractures are common injuries during childhood.
- Fracture incidence rates and patterns vary among countries and as a consequence of physical activity trends.
- Norway has among the highest incidences of hip fractures in adults ever reported.
- Descriptions of fracture patterns during youth in the same region are scarce.
- The aim of this study was to describe the incidence of fractures at different anatomical sites by age, sex and maturation in a representative sample of youths from regions above the Arctic Circle.

### / METHODS

- In 2010-2011 all first year upper-secondary school students in one urban and one rural municipality were invited to "Fit Futures", an expansion of the Tromsø Study.
- 1038 adolescents, 508 girls and 530 boys, attended the survey. The attendance rate was 93%. A total of 961 individuals age 15-18 years were included in the present analysis.
- Fractures in the cohort during 1992-2011 were recorded from the local hospital.
- Fractures were confirmed by a radiologist.
- Details on patients' fracture site and diagnosis date were merged with data from "Fit Futures"
- Sexual maturation stage was defined by puberty questions in "Fit Futures" self-administered questionnaire.

/ FIGURE 1: DISTRIBUTION OF FRACTURES BY MONTHS OF THE YEAR



/ TABLE 1: INITIAL FRACTURE SITE DISTRIBUTION

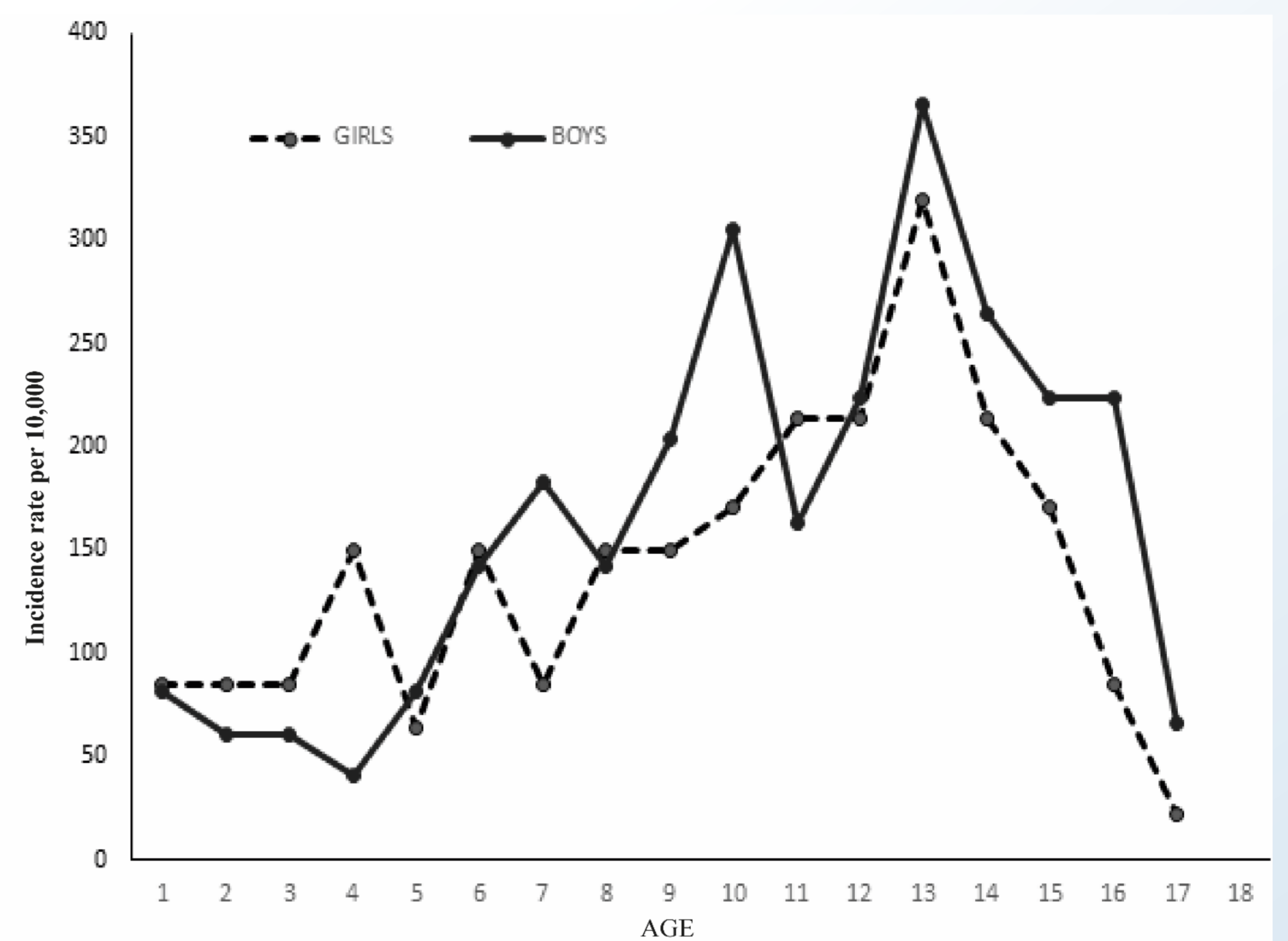
Fracture site	Diagnosis (ICD-10)	Total population			Girls		Boys	
		n	%	I	n	I	n	I
<b>Radius/Ulna</b>		63	24.9	40.7	29	38.3	34	43.0
Proximal	S52.0-S52.1	5		3.2	3	4.0	2	2.5
Diaphyseal	S52.2-S52.4	3		1.9	2	2.6	1	1.3
Distal	S52.5-S52.8	55		35.6	24	31.7	31	39.2
<b>Fingers</b>	S62.5-S62.7	50	19.8	32.3	19	25.1	31	39.2
<b>Toes</b>	S92.4-S92.5	43	17.0	27.8	18	23.8	25	31.6
<b>Humerus</b>		29	11.5	18.8	16	21.2	13	16.5
Proximal	S42.2	6		3.8	3	4.0	3	3.8
Diaphyseal	S42.3	1		0.6	0	0	1	1.3
Distal	S42.4	22		14.2	13	17.2	9	11.4
<b>Tibia/Fibula</b>		27	10.7	17.5	15	19.8	12	15.2
Proximal	S82.1	3		1.9	2	2.6	1	1.3
Diaphyseal	S82.4	3		1.9	2	2.6	1	1.3
Distal	S82.2	21		13.6	11	14.5	10	12.7
<b>Clavicle</b>	S42.0	24	9.5	15.5	12	15.9	12	15.2
<b>Other</b>	S02.0-S92.2	17	6.6	10.6	5	6.5	12	15.2
<b>Total</b>		253	100	164.0	114	150.7	139	175.9

I = Incidence rate per 10 000 persons years

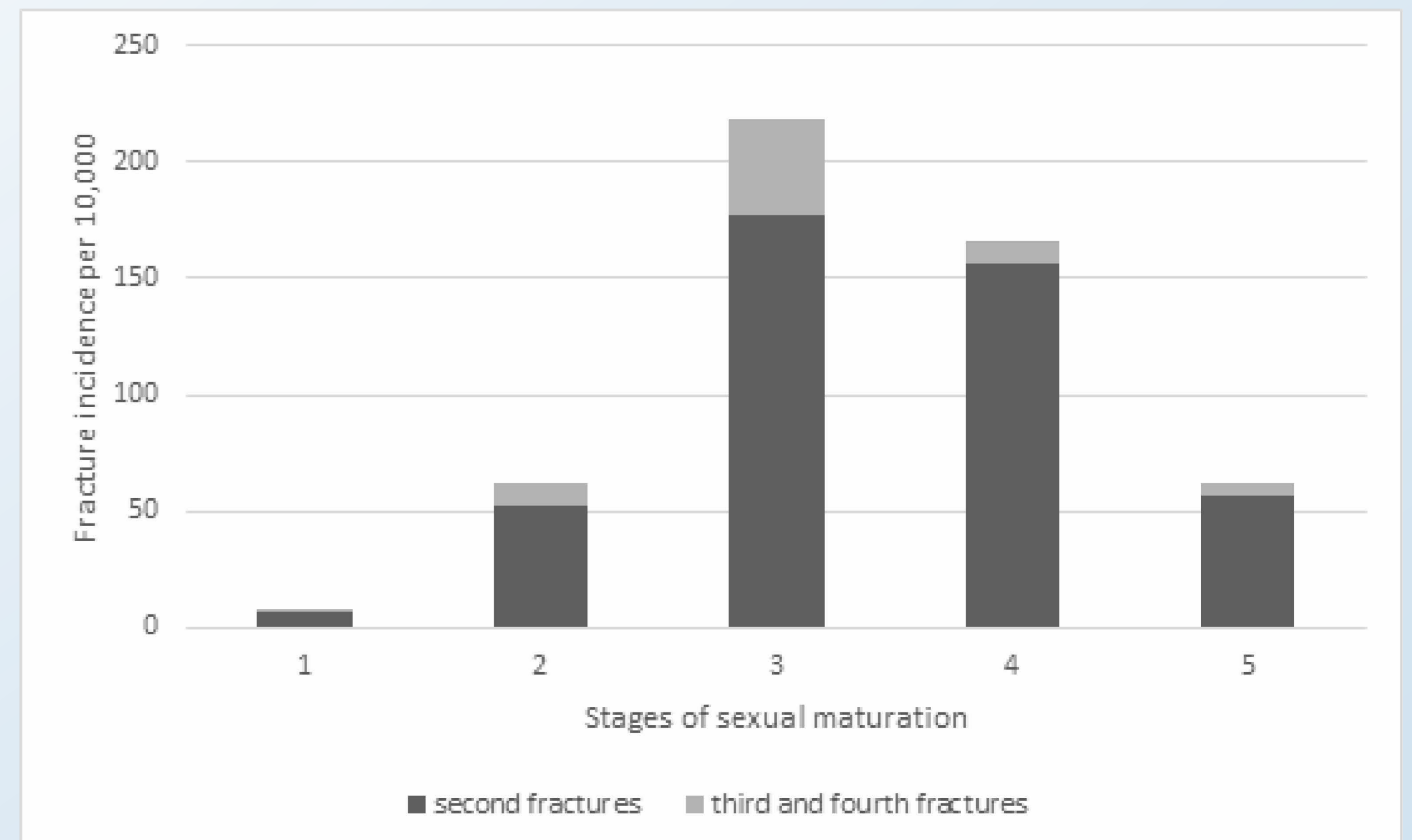
### / RESULTS AND CONCLUSIONS

- In the time from birth to 2010/2011, altogether 316 fractures in 253 individuals, 45% in girls and 55% in boys, were registered.
- The average annual fracture incidence rate was 164 per 10 000 persons years under the age of 18 and 173 under the age of 14. The incidence proportion or risk of having at least one fracture before age 18 was 26%
- The most common sites of fracture were the forearm (25%) followed by the phalanges (20%).
- Fracture frequencies were highest in April to June with 32% of all fractures.
- The proportion of fractures in girls is higher than in other studies.
- Both genders seem especially vulnerable in growth spurt during puberty

/ FIGURE 2: ANNUAL INCIDENCE OF FRACTURES BY SEX AND AGE



/ FIGURE 3: SUBSEQUENT FRACTURES BY SEXUAL MATURATION



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