

Incidence of juvenile idiopathic arthritis in Finland, 2000–2020

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Abstract

Objective

Previous epidemiological data of JIA in Finland are from the turn of the millennium. We aimed to determine the recent annual incidence of JIA in several consecutive years in Finland and to explore the differences in incidence between sexes, age groups, and regions.

Methods

We analyzed all children <16 years of age who met the ILAR classification criteria for JIA. Cases from 2000-2020 were identified from two national registers: the Care Register for Health Care of the Finnish Institute for Health and Welfare and the Reimbursement Register containing medication data from the Social Insurance Institution of Finland; cases from 2016-2020 were identified from the Finnish Rheumatology Quality Register.

Results

The incidence of JIA was 31.7 per 100,000 (95% CI 30.2, 33.1), according to the Care Register in 2000-2020 and peaked in 2010-2014. No considerable differences in incidence rates were observed among registers. In all age groups, incidence in girls was predominant compared to boys. The incidence in girls peaked at the ages of 2 years and 14-15 years. Decreasing incidence was observed among boys 0-3 years old during the entire study period, whereas increasing incidence was observed among teenage girls and boys 4-7 years old in 2000-2013.

Conclusion

The incidence of JIA is not only very high with respect to that in other parts of the world but also higher than previously reported in Finland. The incidence varied by region and year but was not higher at the end than the beginning of the study period.

Keywords: juvenile idiopathic arthritis, incidence, epidemiology, children, register study

Key message

- The incidence of JIA in Finland is high, from a global perspective, 31.7 per 100,000.
- The annual incidence was not higher in the year 2020 than 2000.
- The incidence decreased among the youngest boys and increased among teenage girls until 2013.

INTRODUCTION

Juvenile idiopathic arthritis (JIA) is an inflammatory disorder of unknown etiology beginning before the age of 16 years and characterized by inflammation of at least one joint persisting for more than 6 weeks (1,2). JIA is divided into seven categories in the International League of Associations for Rheumatology (ILAR) classification system, according to clinical and immunologic characteristics and family history (3–5). Although JIA is the most common rheumatic disease in childhood (2), it is relatively rare; therefore, long-term studies are needed to determine the disease burden and to plan health care resources.

In a systematic review of JIA prevalence and incidence using three classification systems for JIA — the American College of Rheumatology, the European Alliance of Associations for Rheumatology, and ILAR — the incidence rates have been found to range widely, from 1.6 to 23 per 100,000 (2). The variation depended on the study design and geographical location, and was likely to have been influenced by environmental factors and genetics (6). Since then, according to the ILAR classification, incidence rates in Europe have varied, according to reports of 3.2 per 100,000 in France in 2001 (7), 5.6 per 100,000 in the UK in 2000–2018 (8), and 6.9 per 100,000 in Spain in 2004–2006 (9). Differences have also been observed within continents; for example, incidence rates of 8.5–17.8 per 100,000 in Canada (10,11) and 10.3 per 100,000 in the USA (12). Moreover, incidence rates vary among the Nordic countries: the incidence has been reported to be 7.1 per 100,000 in Iceland (13), 12.8–17.1 per 100,000 in Sweden (13,14), 19.0–23.0 per 100,000 in Norway (13), and highest, 24.1 per 100,000, in Denmark (15).

In Finland, the most recent epidemiological studies of JIA were conducted at the turn of the millennium (16), and suggested that the incidence per 100,000 rose from 14 to 19.5–23

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3 (17,18), with regional variations (16,17). However, those studies were from single years or
4 covered only part of Finland (13,16–19).
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8 The aim of this study was to assess the recent annual incidence of JIA in Finland among
9 various patient groups during several consecutive years, examine possible epidemiological
10 changes, and compare the incidence rates across hospital districts and JIA categories.
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15 **MATERIALS AND METHODS**

16 **Registers**

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19 Data were collected from three registers: the Care Register for Health Care of the Finnish
20 Institute for Health and Welfare (Care Register), the Reimbursement Register of the Social
21 Insurance Institution of Finland (SII register), and the Finnish Rheumatology Quality Register
22 (FinRheuma), also maintained by the Finnish Institute for Health and Welfare. In Finland,
23 nearly every patient with JIA is treated in the public health care system by a pediatrician with
24 competence in pediatric rheumatology or a pediatric rheumatologist; therefore, the data in
25 the Care Register and the FinRheuma register are reliable.
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36 The Care Register includes statistics on outpatient visits and care periods in specialized
37 somatic health care collected from the entire country. According to Finnish law regarding
38 personal registers, service providers are required to contribute information to this register.
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43 If treatment with disease-modifying antirheumatic drugs (DMARDs) is started at the time of
44 the diagnosis, a medication reimbursement application is prepared by the rheumatologist.
45 The reimbursement is granted by SII for DMARDs. In addition to granting reimbursements
46 for patients with chronic illnesses, such as JIA, SII maintains a database of individuals,
47 including the International Classification of Diseases (ICD) code of the diagnosis and the date
48 of reimbursement.
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56 FinRheuma was started in 2018, but information since the end of the 1990s has been
57 imported into the register. The information involves clinical aspects of JIA, such as diagnoses,
58 category, visits, disease activity parameters, and medications. This study included
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3 FinRheuma data from eight hospital districts: four university hospitals (Oulu, Kuopio, Turku,
4 and Helsinki University Hospitals) and four central hospitals (Tavastia Proper, Päijänne
5 Tavastia, Central Ostrobothnia, and Vaasa Central Hospitals), where a pediatrician or
6 pediatric rheumatologist separately confirmed the data from the patient medical records
7 during the years 2016–2020. JIA categories in the FinRheuma data were determined
8 according to the ICD-10 code at the last visit when the patient was still younger than 16
9 years or, if absent, the first ICD-10 code after the age of 16 years.

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16 Almost all JIA patients in Finland are registered in all three registers. It is not possible that
17 one patient is counted twice within the same register.
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23 **Study design and study population**

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25 This population-based register study included all children under 16 years of age who had
26 been diagnosed with JIA and registered in the Care, SII, or FinRheuma registers (Table 1). The
27 patients' hospital districts were determined according to the place of residence at the time
28 of diagnosis. Parents in seven families declined to provide information on the place of
29 residence. These children were not included in the regional analyses. ICD-10 code M08.9,
30 describing the diagnosis of early JIA, was included in the SII register, since reimbursement is
31 often applied at an early stage, when the JIA category is yet unspecified. It is possible that
32 adult rheumatologists have treated a small number of teenage JIA patients from the
33 beginning of the disease and thus they received an incorrect diagnosis, for example
34 rheumatoid arthritis instead of JIA. Therefore we included these adult ICD-codes in the Care
35 Register (Table 1). The annual population size of children < 16 years of age was derived from
36 the public database of Statistics Finland, according to hospital district, sex, and age group.
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51 **Ethics**

52 This register-based study used data from the FinRheuma register, which is maintained by the
53 Finnish Institute for Health and Welfare which also granted approval for this study.
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Statistical analyses

The incidence rates with 95% confidence intervals (95% CIs) were calculated by division of the number of new JIA diagnoses by the total population at risk during the study period, and expressed per 100,000 children younger than 16 years. The statistical differences in incidence rates across sexes, age groups, and regions were tested with a standardized normal deviate test. Joinpoint regression analysis on a logarithmic scale was used to detect increasing or decreasing trends in incidence over follow-up time segments. The analysis started with a zero joinpoint model; subsequently, we tested whether a model with more joinpoints might be statistically significant. The number of joinpoints indicated how frequently the trends changed during the follow-up. The start and end points of each segment were calculated to achieve the best fit to the data. The annual percentage change (APC) was used to characterize trends in the incidence rate of JIA that change at a constant percentage per year in each time segment. The average annual percent change (AAPC) described the change in rate over a predetermined time segment in the study, over the entire follow-up period.

As the birth rate decreased during the follow-up from 56,550 to 46,524, the age distribution of the population in different years have changed during that time. The age distribution of the population in the year 2000 was used as the standard population to calculate comparable age-adjusted JIA incidences in Figure 1. Age group incidence rates were reported as crude values.

We used R version 4.3, and the tidyverse collection of R packages for manipulating data and generating plots (20,21). Joinpoint analyses were performed in the Joinpoint Regression 4.9.0.1 Program. Standardized normal deviate tests were performed in StatsDirect 3.3.6 statistical software. Two-sided P values <0.05 were considered to indicate statistical significance.

RESULTS

Clinical characteristics of the study population

A total of 6,386 new JIA cases in the Care Register were diagnosed during the study period, 3,961 (62.0%) of which were girls. In the SII register, the corresponding numbers were 5,556

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3 and 3,487 (62.8%), respectively. The mean age at diagnosis was 8.4 years (95% CI 8.3, 8.6) in
4 the Care Register and did not differ from that in the SII register.
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8 **General JIA incidence rates in the study population**

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10 The annual incidence rate was 31.7 per 100,000 (95% CI 30.2, 33.1 per 100,000) among all
11 children < 16 years of age during the years 2000–2020 in the Care Register (range 28.3–
12 37.6). In the SII register, the corresponding number was 27.5 (95% CI 26.1, 29.0 per 100,000;
13 range 23.6–34.6). Because of the absence of statistically significant differences in incidence
14 rates among registers, the results from the Care Register are reported in the text. The results
15 from the other registers are shown in Figures 1, 2 and 3.
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25 **Annual incidence of JIA by sex**

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27 Girls had higher annual incidence rates than boys during the years 2000–2020. The annual
28 incidence rate was 40.1 per 100,000 for girls and 23.5 per 100,000 for boys during the entire
29 study period.
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32 Joinpoint analyses were performed to detect the best fit model for annual trends in
33 incidence. According to the Care Register, the age-adjusted JIA rate increased by 2.4% per
34 year (95% CI 1.2, 3.7; $p=0.001$) among girls until 2013, and subsequently decreased by 3.7%
35 per year (95% CI -6.6, -0.7; $p=0.019$) until 2020 (Figure 1). Among boys, similar increasing
36 and decreasing age-adjusted incidence rates were observed: +1.7% per year (95% CI 0.1, 3.2;
37 $p=0.033$) until 2012 and then -3.4% (95% CI -6.0, -0.6; $p=0.02$) to the end of the study
38 period. When analysing age-adjusted data, there was minimal effect on the results
39 compared to crude data.
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50 **Annual incidence of JIA by age**

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52 Two incidence rate peaks were observed at the age of 2 years and in teenagers (Figure 2).
53 These peaks were due to the high incidence of girls in these age groups. Joinpoint analysis
54 indicated that girls had an incidence peak at 2 years of age, and the incidence subsequently
55 decreased until the age of 6 years, then increased until the age of 15 years (Figure 2A). The
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3 incidence rates were stable in boys at all ages (Figure 2B). The findings were similar between
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5 the Care and SII registers (Figure 2).

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7 We analyzed the changes in the age distribution of new JIA cases during the study period.
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9 Among girls, the only significant change in JIA incidence was a 5.7% increase (95% CI 2.8%,
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11 8.6%; $p=0.001$) among girls 12–15 years old from 2000 to 2013 (Figure 4). Among boys 0–3
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13 years old, a decreasing incidence was observed during 2000–2020 (APC -2.5%, 95% CI -4.5%,
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15 -0.5%; $p=0.016$). Among boys 4–7 years old, the incidence increased until 2013, then
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17 declined, and showed no overall change during the entire study period (Figure 4). In other
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19 age groups no statistically significant differences in incidence were found.

20 21 22 **Regional variations in JIA incidence**

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24 Geographical differences in the incidence of JIA in Finland were observed across the 21
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26 hospital districts during the years 2000–2020. The rates varied from 18.5 per 100,000
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28 (Eastern Savonia) to 46.6 per 100,000 (Tavastia Proper) and showed no specific geographical
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30 patterns in Finland (Figure 5).

31 32 33 **FinRheuma register and distribution of JIA categories**

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35 A total of 887 new JIA cases were diagnosed during the years 2016–2020 in the eight
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37 hospital districts, according to the FinRheuma register. The annual incidence rate was 29.4
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39 per 100,000 among children < 16 years of age, a value slightly higher but in line with the
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41 rates from the two other registers for the same time periods and regions (Figure 3): 27.3 per
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43 100,000 in the Care Register and 24.1 per 100,000 in the SII register. The distribution of JIA
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45 categories was 45.1% for oligoarthritis (M08.4) (persistent 43.3%, extended 1.8%), 24.1% for
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47 RF- polyarthritis (M08.3), 11.2% for enthesitis related arthritis (M08.1), 6.1% for newly
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49 diagnosed yet unspecified (M08.9), 4.6% for unknown category (M08), 3.6% for psoriatic
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51 arthritis (M09.0*L40.5), 2.5% for systemic JIA (M08.2), 1.8% for RF+ polyarthritis (M08.0),
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53 and 1.0% for unclassified JIA (M08.8).

54 55 56 57 58 59 60 **DISCUSSION**

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3 In this long-term population study based on data from three comprehensive national
4 registers, we found that the incidence of JIA was 27.5–31.7 per 100,000 per year. This
5 was higher than those previously reported both in Finland and globally. The incidence
6 peaked in the years 2010–2013 but did not increase from 2000 to 2020. Regional differences
7 in incidence were observed across hospital districts.
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14 Our rates are higher than those in previous epidemiological studies of JIA in Finland, in which
15 the incidence rates have been reported to increase from 14 per 100,000 (16) to 23 per
16 100,000 (18). Several differences in study design might explain these differences. Previous
17 studies have examined limited time periods consisting of only a few consecutive years
18 (13,18,19) and have covered geographically restricted areas of Finland (13,16–19). In
19 contrast, our study used regional data from multiple registers over two decades, covering
20 the entire country.
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29 The incidence of JIA is high in Finland with respect to other Scandinavian and European
30 countries. The reported rates have varied from 12.8 to 17.1 per 100,000 in Sweden
31 (13,14,22) and from 14 to 23 per 100,000 in Norway (13,23). In Southern Europe, the rates
32 have ranged from 3.2 (7) to 6.9 per 100,000 (9), and have been reported to be 5.6 per
33 100,000 in the UK (8). The study periods were shorter in earlier studies (9,13). Moreover,
34 some studies have used previous juvenile arthritis criteria instead of ILAR (13) and have not
35 focused on only JIA (23). In Germany, Horneff et al. have reported an incidence rate of JIA as
36 high as 34–60 per 100,000 among children 2–15 years old, according to data from two
37 databases (24). However, they also included the ICD-10 code M13 (other arthritis), which
38 can describe any short-term arthritis, and extrapolated the results to the entire population.
39 Moreover, they did not include children 0–2 years old, in whom the incidence is low. The
40 differences in incidence rates across studies might be due to differences in study designs and
41 periods, data collection, JIA classification criteria, and geographical region selection. In
42 Finland, JIA is diagnosed and treated in special pediatric rheumatology clinics in hospitals,
43 where a physician must register a patient's diagnosis code in the Care Register at all visits,
44 and registration in the FinRheuma register is mainly a routine in most hospitals. Therefore,
45 our findings regarding patients with JIA are likely to be based on comprehensive data. In
46 countries without accurate registers, not all JIA cases may be reported.
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5 Although we observed annual variations in the incidence of JIA, it remained relatively stable
6 during the years 2000–2020. To our knowledge, only one previous long-term study has
7 assessed the incidence of JIA in Finland, and has reported an increase in incidence from 14 to
8 19.5 per 100,000 from 1980–1990 to 1995 (17). However, that study included only 11 of 21
9 hospital districts, and used the American College of Rheumatology (ACR) instead of ILAR
10 criteria. Since then, diagnostic methods have improved, and use of magnetic resonance
11 imaging (MRI) has become more common, thus potentially partially accounting for the
12 increased number of cases. JIA incidence has also been speculated to be cyclical (12,24,25),
13 and long-term studies are necessary to determine whether the annual fluctuation observed
14 in our study might be part of a cyclical pattern. Advanced diagnostic tools, regional changes
15 in care responsibilities following the closure of the rheumatology hospital in Heinola,
16 infections, and vaccines could be reasons for changes in incidence across different age
17 groups (Figure 4).

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29 The COVID-19 pandemic started in Finland at the beginning of 2020, when the incidence of
30 JIA was simultaneously decreasing, according to our results. Changes in the incidence of
31 other autoimmune diseases have been observed after the onset of the pandemic, but
32 information regarding this phenomenon in children is still limited (26,27). Future studies are
33 necessary to assess whether an association might exist between JIA etiology and viral
34 infections, or whether the lower incidence during the pandemic has been due to avoidance
35 of seeking medical attention to limit social contact during the pandemic.

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42 Globally, conflicting results have been reported regarding epidemiological changes in JIA. A
43 steady incidence with temporal variation, as found in our study, has been observed in
44 previous long-term studies in Denmark (15) and in the USA (12). A recently published
45 Swedish study (22) has reported an increasing incidence of JIA, as has an Italian study (28).
46 However, those studies were limited to the time before 2010 (22) or included only limited
47 areas of the country (28).

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54 The predominance of JIA in girls is well known, both in Finland (16) and globally (2,12–
55 15,28,29), but has not been observed in the Taiwanese population (30). In our study, the
56 ratio of girls to boys with JIA was 1.7:1 and did not significantly change during the study
57 period, in agreement with findings from several previous studies (2). Horneff et al. have
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3 reported an increase in the ratio of girls to boys with JIA with increasing age in Germany
4 (29). Similar biphasic incidence peaks for girls and stable incidence for boys of different ages
5 have been reported in previous Nordic studies (13,15,31). A peak in the incidence of JIA has
6 been observed for boys 12 years of age (14).
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11 We observed significant geographical differences in JIA incidence, but we did not find
12 specific south-north differences, as previously speculated to exist in European studies (13).
13 In our study differences in recording methods and coverage of the registers as well as
14 regional over- and underdiagnosis cannot be excluded. Our results support previously
15 reported estimates regarding the roles of genetic factors in the etiology of JIA (32,33). One
16 of the lowest incidences was observed in Ostrobothnia, which had a rate similar to that
17 previously reported in Sweden (13,14), a geographical neighboring country with a shared
18 genetic background. Regional differences in Finland were also reported in the 1980–1990s,
19 although those studies covered only limited areas (17). During the years 1946–2010, a
20 special rheumatology hospital in Heinola in Finland had an important role in the diagnosis
21 and treatment of JIA. After 2010, the diagnosis of JIA has been geographically decentralized
22 in Finland, thus potentially leading to diagnostic heterogeneity. This factor might have
23 influenced the regional differences in incidence rates. In addition, the use of MRI can vary
24 regionally, and the interpretation of pediatric imaging findings is challenging and partly
25 dependent on the radiologist.
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40 Moreover, geographical differences in the incidence of other chronic autoimmune diseases,
41 such as type I diabetes (34) and multiple sclerosis (35,36), have been observed, thus
42 potentially indicating that common genetic factors may underlie these diseases. Further
43 studies are needed to understand the role of genetics in the etiology of JIA.
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51 **STRENGTHS AND LIMITATIONS**

52 This study has several strengths. This was a nationwide population study based on long-term
53 data for all regions in Finland. The incidence rates were consistent among all three registers,
54 and the FinRheuma data were separately confirmed, based on patient medical records.
55 Because Finland has a universal health care system, and nearly all JIA cases are treated in
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3 public hospitals, at pediatric or pediatric rheumatology clinics, selection bias was diminished.
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5 At these clinics registry reporting is usually routine. Moreover, use of MRI has become more
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7 common, and its accuracy has improved, thus increasing the sensitivity of arthritis diagnosis,
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9 particularly sacroiliitis and temporomandibular joint inflammation, which are otherwise
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11 difficult to diagnose. Therefore, it is likely that patients of all ages and categories are
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13 registered in Finland, and that the incidence rates, reported here, are reasonably specific.
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15 This study also has limitations. This was a retrospective register study and, therefore,
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17 subjected to the general weaknesses inherent in this kind of study design. Data analysis from
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19 clinical registers always includes a risk of over- and underdiagnosis. By combining the results
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21 from three registers, we were able to accurately estimate the incidence rates. The SII
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23 register contains patients approved for reimbursement for JIA treatments. Therefore, mild
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25 cases not needing DMARD treatment are not registered in the SII database, and the register
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27 indicates the minimum incidence. In contrast, the Care Register might slightly overestimate
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29 the number of new JIA cases. A potential small risk of misclassification of some cases as JIA
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31 rather than, for example, short-term transient reactive arthritis, might possibly have led to
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33 overestimation of the incidence. FinRheuma includes data from several hospital districts,
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35 where several physicians fill out the register; therefore, diagnosing and subtyping can be
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37 heterogeneous in register studies. In contrast, data from eight hospital districts, where the
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39 data had been separately verified for possible errors, were included from the FinRheuma
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41 register.
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43 **CONCLUSION**

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46 The incidence of JIA is very high with respect to that in other parts of the world and is higher
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48 than previously reported in Finland. We observed a peak in incidence in the years 2010–
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50 2013, but the incidence was not higher at the end of our study interval, in the years 2019
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52 and 2020, than at the beginning, in the year 2000. Decreasing incidence was observed
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54 among boys 0–3 years old during the entire study period, and increasing incidence was
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56 observed among teenage girls and boys 4–7 years old from 2000 to 2013. Further studies are
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58 needed to clarify the potential cyclicity of JIA incidence.
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6 on hospitalization and infection-related admissions. Turku; 2021.
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15
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29 **CONFLICTS OF INTEREST**

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31 The authors have no conflicts of interest to disclose.
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35 **DATA AVAILABILITY** Deidentified individual participant data will be made available, in
36 addition to study protocols and the statistical analysis plan. The data will be made available
37 upon publication until February 2034 to researchers who provide a methodologically sound
38 proposal for use in achieving the goals of the approved proposal. Proposals should be
39 submitted to maria.backstrom@ovph.fi.
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FIGURE LEGENDS

Figure 1. Annual age-adjusted incidence of JIA among children in Finland.

Annual age-adjusted incidence rates of JIA per 100,000 children < 16 years of age among girls (A) and boys (B). Joinpoint analyses were performed to detect the best fit model for annual trends in incidence. The figure indicates changes in incidence rates during 2000–2020 in the Care Register of National Institute for Health and Welfare (Care Register) and the Reimbursement Register of the Social Insurance Institution (SII register). Segments (dotted lines) with a statistically significant annual percentage change (APC) are marked a–g.

Figure 2. Incidence of JIA in the indicated age groups by sex. Incidence rates in girls (A) and boys (B) per 100,000 children < 16 years for different age groups in 2000–2020 in Finland. Joinpoint analyses were performed to detect the best fit model for age groups. The incidence was stable in boys (B) in all groups, whereas in girls (A), the incidence peaked at 2 years of age and also increased at 6–15 years of age. Segments (dotted lines) with statistically significant annual percentage change (APC) are marked a–d.

Figure 3. Incidence of JIA in the three study registers in eight hospital districts. Annual incidence rates of JIA from the Care Register of National Institute for Health and Welfare (Care register), the Reimbursement Register of the Social Insurance Institution of Finland (SII register), and the Finnish Rheumatology Quality Register (FinRheuma) in 2016–2020 in eight hospital districts in Finland.

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3 Figure 4. Changes in the incidence of JIA in the indicated age groups. Incidence
4 rates per 100,000 children < 16 years of age among boys and girls in different
5 age groups during the study period in the Care Register of National Institute for
6 Health and Welfare. Age groups 0–3 years old (A), 4–7 years old (B), 8–11 years
7 old (C), and 12–15 years old (D). Joinpoint analyses were performed to detect
8 the best fit model for annual trends in incidence. The figure shows statistically
9 significant changes among boys 0–3 years old (A) and 4–7 years old (B), and
10 among girls 12–15 years old (D). Segments (green dotted lines for boys and
11 orange for girls) with statistically significant annual percentage change (APC)
12 are marked with a and b.
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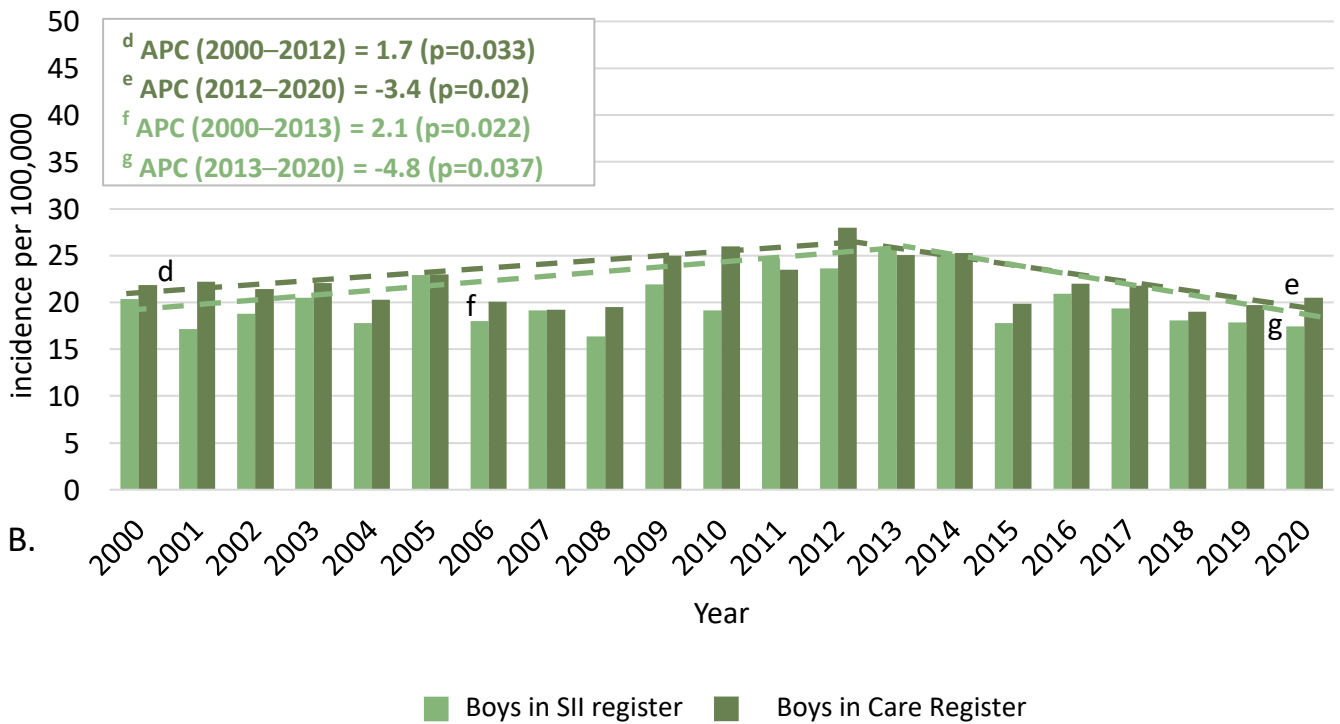
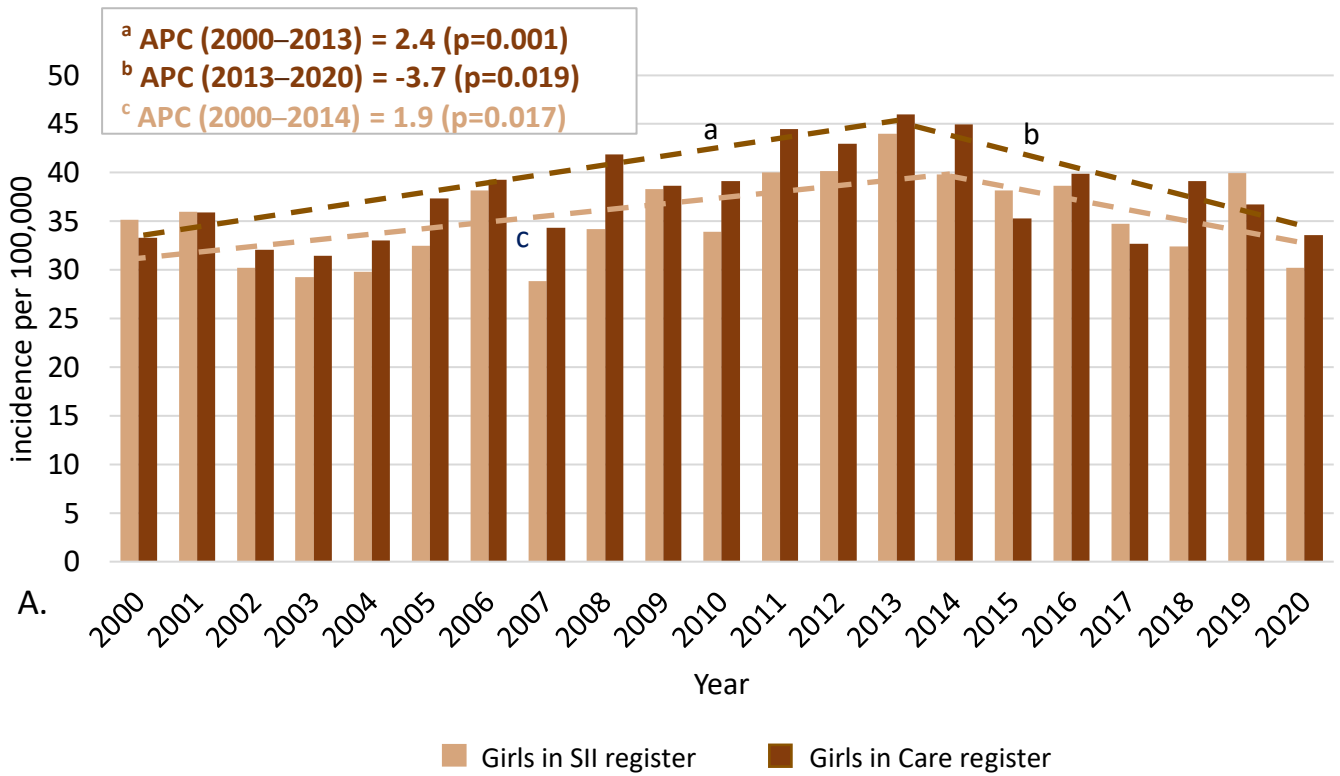
29 Figure 5. Regional differences in JIA incidence in Finland.

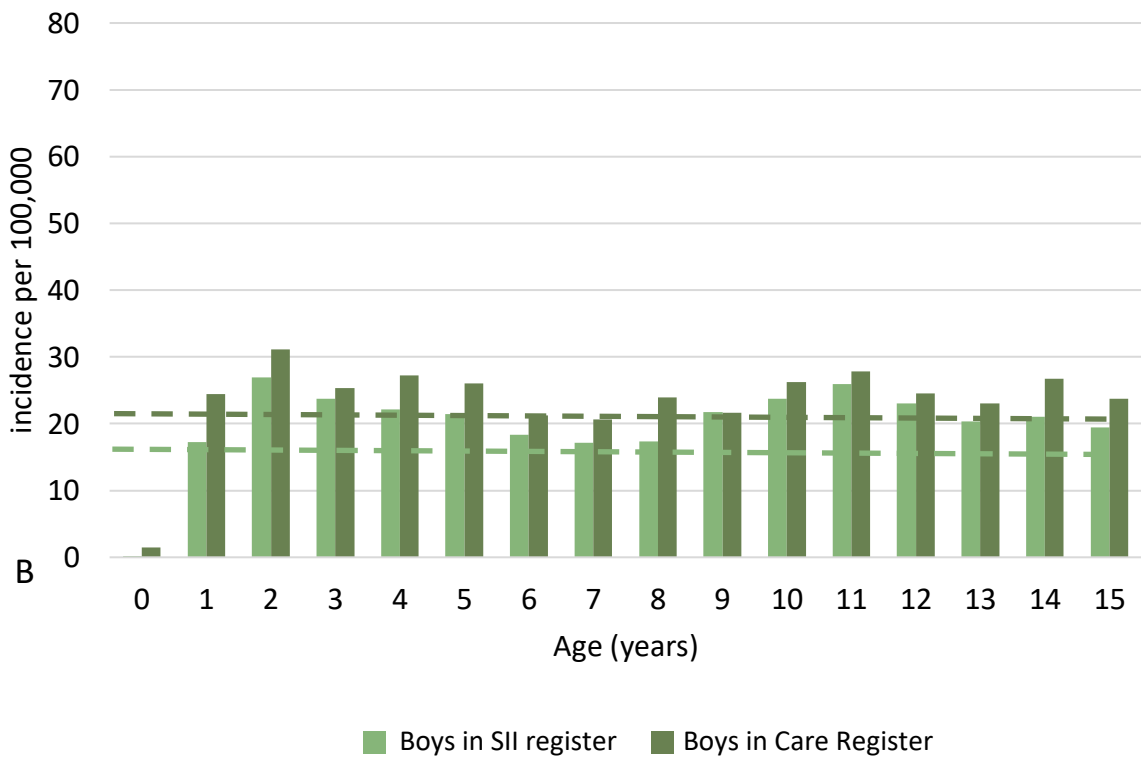
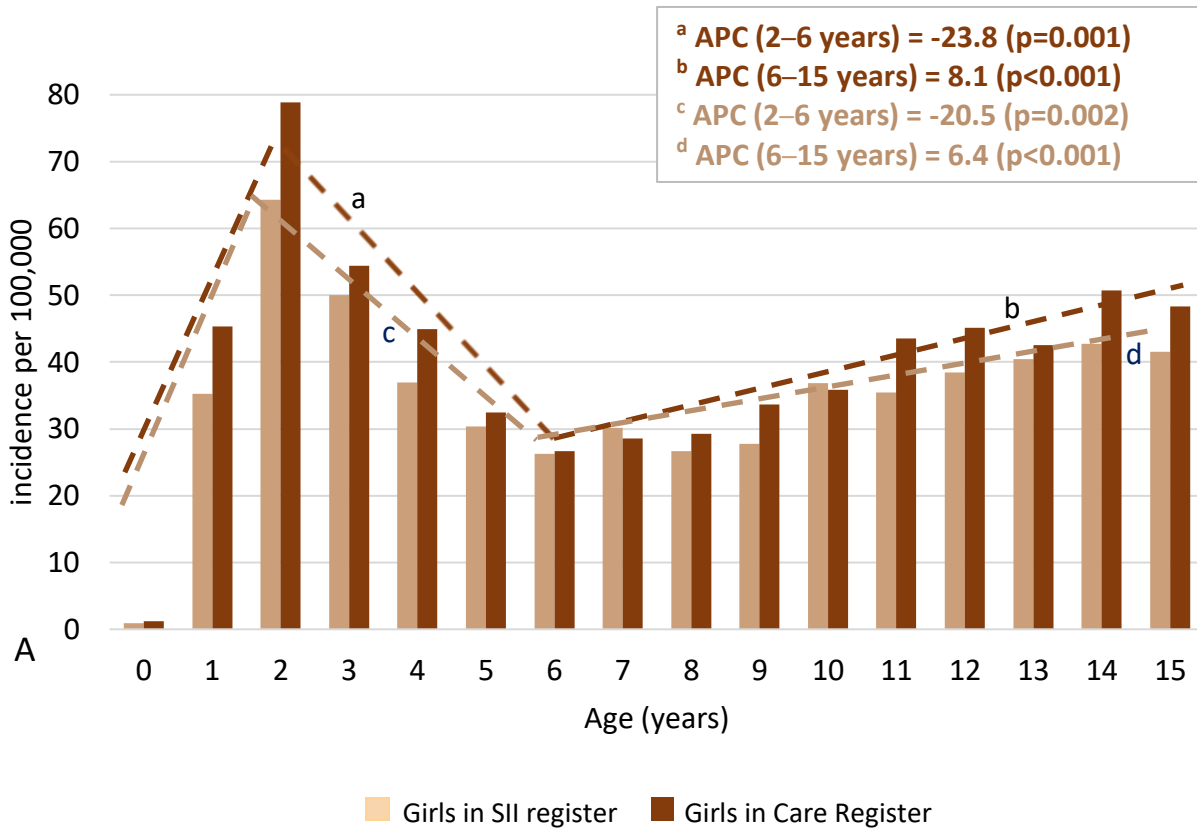
30 Geographical distribution of the mean annual incidence rates of JIA per
31 100,000 children in all 21 Finnish hospital districts during the years 2000–2020.
32 Data are from the Care Register of National Institute for Health and Welfare.
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Table 1. Study registers, study period, inclusion criteria, number of patients with JIA and population size

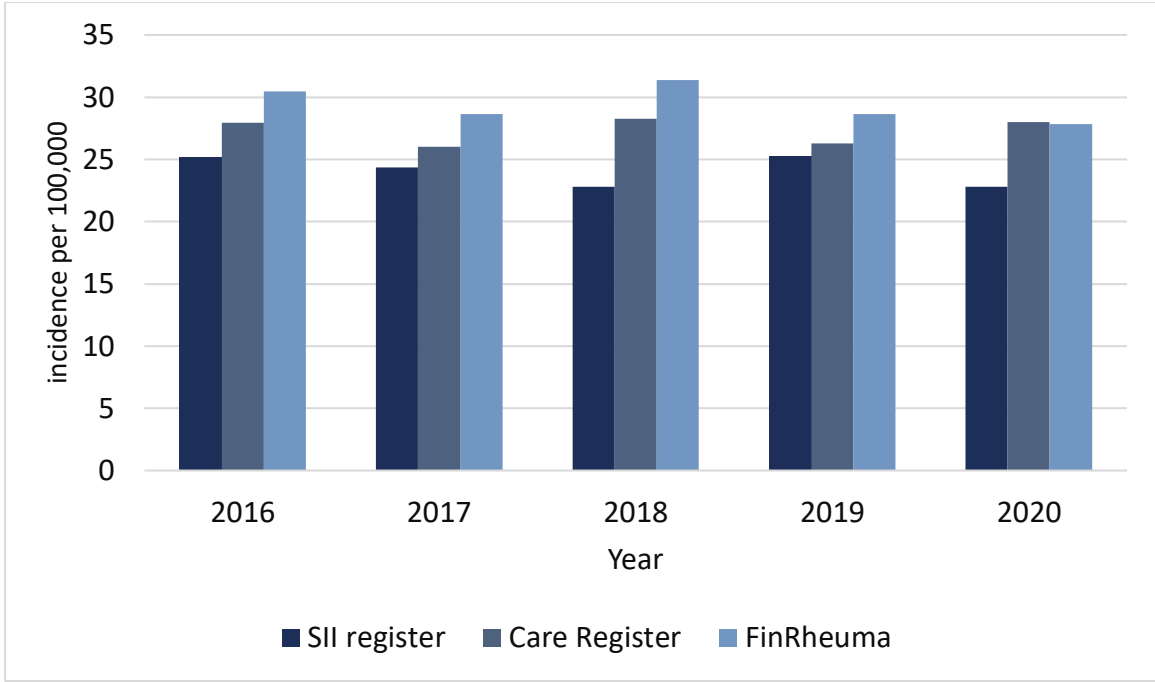
Register	Care Register	SII register	FinRheuma
Time of data collection	January 1, 2000, to December 31, 2020	January 1, 2000, to December 31, 2020	January 1, 2016, to December 31, 2020
ICD-10 codes included	M08.0, M08.1, M08.2, M08.3, M08.4, M07.0, M07.1, M07.2, M07.3, M09.0, M05.3, M05.8, M05.9, M06.0, M06.1, M06.4, M06.8, M06.9, M45.x, M46.1, and M46.9	M08, M08.0, M08.1, M08.2, M08.3, M08.4, M08.8, M08.9, and M09.0*L40.5	M08, M08.0, M08.1, M08.2, M08.3, M08.4, M08.8, and M09.0*L40.5
Inclusion criteria	Two or more visits with the above diagnosis codes at the age of 0–15.9 years. If JIA was diagnosed at the age of 15.0–15.9 years, the second visit with the diagnosis code was allowed in the following year, at the age of < 17 years.	The first time the above diagnosis code was mentioned during the study period, at the age of 0.0–15.9 years.	A timepoint of diagnosis in the register, which was confirmed from patients' medical records by a pediatrician or a pediatric rheumatologist in eight hospital districts. Age at diagnosis 0.0–15.9 years
Number of patients	6,386	5,556	887
Population size per year, range	year 2000: 1,000,497 to year 2020: 921,356	year 2000: 1,000,497 to year 2020: 921,356	year 2016: 607 802 to year 2020: 596 465

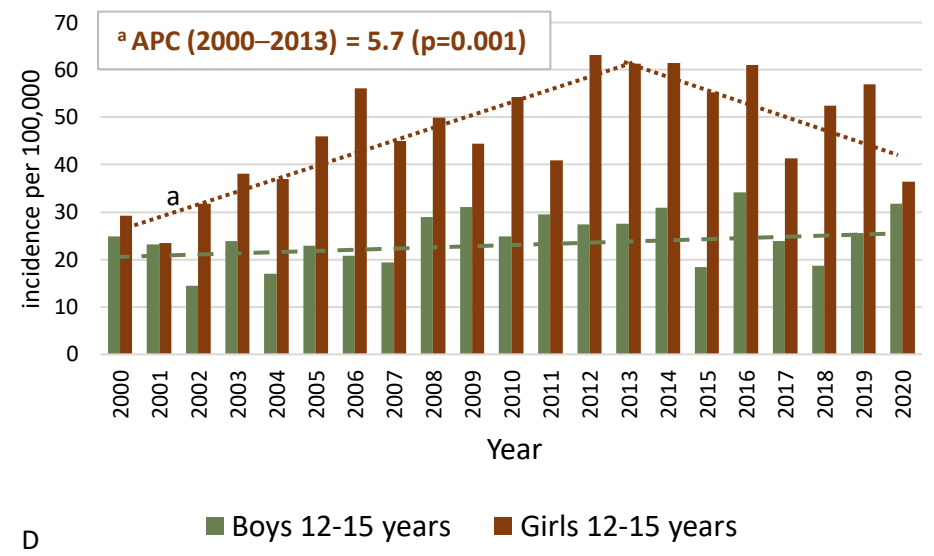
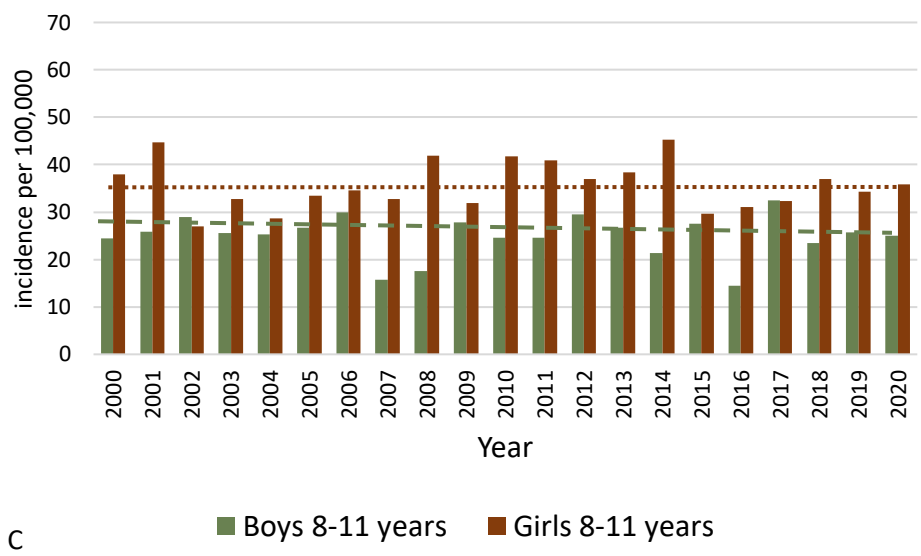
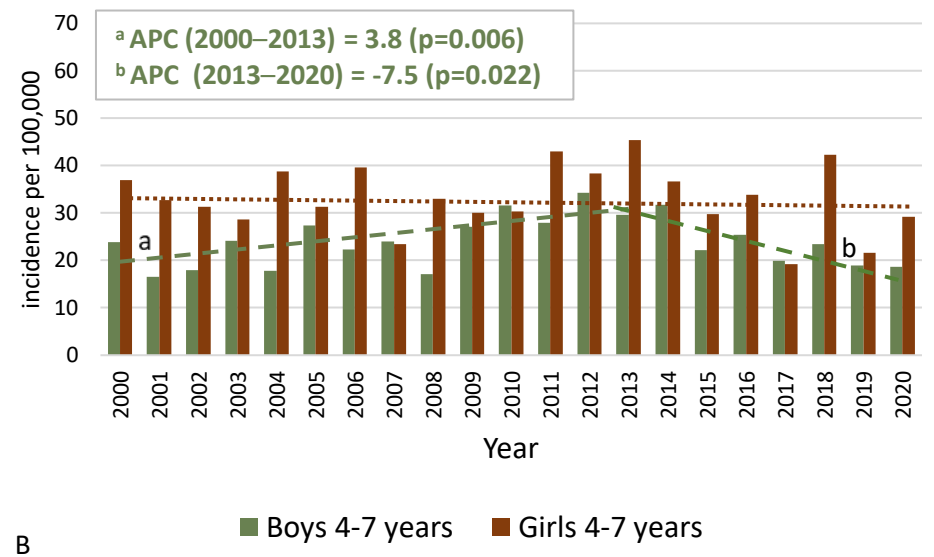
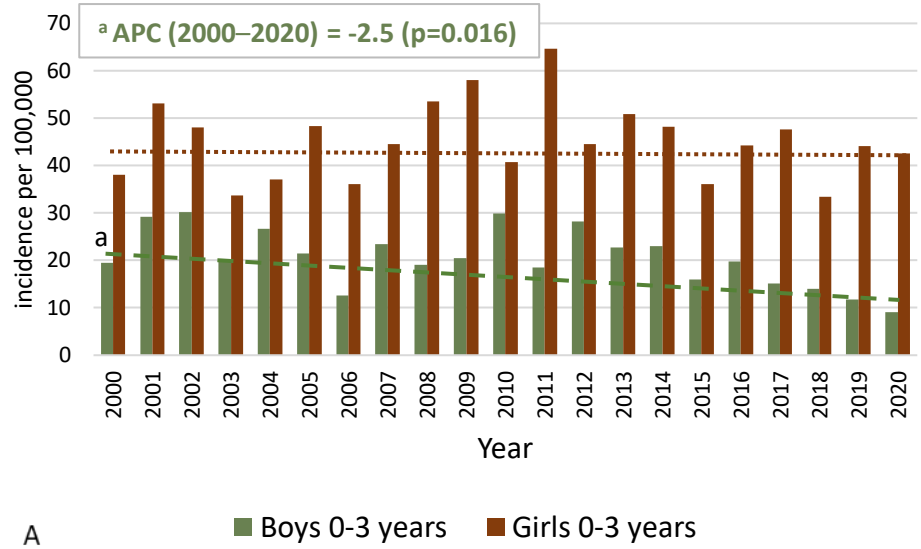
Care Register: the Care Register of National Institute for Health and Welfare; SII register: the Reimbursement Register of Social Insurance Institution of Finland; FinRheuma: the Finnish Rheumatology Quality Register; ICD-10: International Classification of Diseases, 10th Revision; JIA: juvenile idiopathic arthritis





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Incidence per 100,000 children <16 years

