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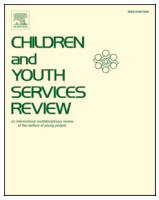

Every tenth child: Heterogeneity in characteristics and life-course patterns among children in contact with child welfare services

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ABSTRACT

Every tenth Norwegian child has been in contact with the child welfare services (CWS) before age 18. This paper describes the variation in background characteristics of CWS children with different types of services and their life-course patterns from ages 10 to 25, compared to other children. We use high-quality population-wide Norwegian register data, covering about 860 000 children from birth cohorts 1987–2001, of which roughly 85 000 have received a CWS initiative. CWS children typically have lower socioeconomic backgrounds than other children. In terms of individual outcomes, they are more likely to have a criminal charge, be prescribed drugs for mental health and ADHD, fail in the educational system, and experience labor market marginalization. However, the heterogeneity among CWS children receiving different initiatives is more pronounced than differences between those in contact and those not. Adolescents with multisystemic therapy (MST) have the most unfavorable life-course patterns, in line with children in childcare institutions. Still, MST youth enter CWS late and have an advantaged family background compared to other CWS children, suggesting that individual-level risk factors are particularly important for sorting into MST.

1. Introduction

The last decades have brought a series of studies on the background characteristics of children in public care (Bebbington and Miles, 1989; Berger, 2004; Franzén,Vinnerljung,and Hjern, 2007; Lindsey, 1991,1992; Pelton, 2015; Putnam-Hornstein et al., 2013; Turney and Wildeman, 2017), including the prevalence of different groups (Edwards et al., 2021; Yi et al., 2023). A parallel literature portrays the developmental outcomes for children in contact with child welfare systems (Gypen et al., 2017; Kääriälä and Hiilamo, 2017). This literature has shown that children and youth with a history of involvement with child welfare services (CWS) have an elevated risk of experiencing adverse life outcomes. Examples include teenage childbirth (Brännström,Vinnerljung,and Hjern, 2015,2016; Putnam-Hornstein and King, 2014; Vinnerljung,Franzén,and Danielsson, 2007; Vinnerljung and Sallnäs, 2008), educational failure (Trout et al., 2008; Vinnerljung,Öman,and Gunnarson, 2005), criminal behavior (Doyle Jr 2008; Vinnerljung,Brännström, and Hjern, 2015), suicidal behavior (Berlin,Vinnerljung,and Hjern, 2011; Vinnerljung,Hjern,and Lindblad, 2006), poor mental health (Jozefiak et al., 2016; Turney and Wildeman, 2016), substance abuse (von Borczyskowski,Vinnerljung,and Hjern, 2013), premature death (Jackisch,Brännström,and Almquist, 2019), unemployment (Brännström et al., 2017), and disability pension (Brännström et al., 2018; Vinnerljung,Brännström,and Hjern, 2015).

However, most studies focus on specific child welfare initiatives, such as out-of-home care (Brännström et al., 2017; Doyle Jr 2007; Turney and Wildeman, 2016). Distinguishing between different subgroups of CWS recipients has demonstrated a gradient, where those placed in out-of-home care are worse off than those who receive in-home services (Jackisch,Brännström,and Almquist, 2019; Vinnerljung, Brännström,and Hjern, 2015), indicating heterogeneity within the CWS population. Furthermore, although there are notable exceptions, including from the US (e.g., Putnam-Hornstein et al., 2013) and, especially, Sweden (e.g., Brännström et al., 2018; Vinnerljung,Hjern,and Lindblad, 2006; Vinnerljung,Öman,and Gunnarson, 2005), the CWS literature is dominated by small-scale studies that lack longitudinal data.

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This study contributes to this literature by providing a comprehensive description of the prevalence, background characteristics, and life-course patterns of all CWS children in Norway using population-wide register data. Only a handful of studies have had access to longitudinal data allowing for following children throughout childhood and adolescence (e.g., Berlin,Vinnerljung,and Hjern, 2011; Brännström et al., 2018; Brännström,Vinnerljung,and Hjern, 2016; Fallesen,Emanuel,and Wildeman, 2014; Putnam-Hornstein et al., 2021; Rouland and Vaithianathan, 2018; Vinnerljung,Brännström,and Hjern, 2015). Without such data about full birth cohorts, any estimate of, for example, prevalence is likely to be biased, leading to calls for more studies into CWS children using full birth cohorts (Wildeman, 2018). The register data used in this study gives us a unique opportunity to track entire birth cohorts throughout childhood and early adulthood, thereby providing an overall description of children in contact with CWS.

Every tenth child (or their parents) receives at least one CWS initiative within the age of 18 in Norway. However, these CWS children constitute a heterogeneous group regarding parental and child characteristics, as well as needs for specific services and initiatives (Wulczyn, 2005). Accordingly, there are variations in the degree of adverse outcomes for children with a history of CWS involvement (Jackisch, Brännström,and Almquist, 2019). Full-population register data allow us to compare children receiving different services, including foster homes, childcare institutions, multisystemic therapy (MST), and in-home services. Such comparisons provide valuable information about specific characteristics of children receiving different types of care. Most CWS initiatives are motivated by parental neglect and socioeconomic deprivation. Still, services to tackle children's behavioral problems are also common, especially among CWS entrants in their teens, who tend to have poorer life outcomes than other CWS children (Vinnerljung, Brännström,and Hjern, 2015; Vinnerljung and Sallnäs, 2008).

The richness, scale, and longitudinal nature of register data allow us to give detailed descriptions of the backgrounds, cumulative prevalence, and early life-course patterns of CWS children. By type of service, we describe children's background characteristics, measured by parental criminal records as well as standard measures like parental education, earnings, and welfare benefits. Additionally, the longitudinal nature of the register data allows us to follow children from adolescence to early adulthood. We start by examining early school performance, including grades and school behavior. Then, we study life-course patterns up to age 25 in children's criminal charges, prescription drugs, completion of upper secondary education, probability of receiving welfare benefits, and the likelihood of being outside of both the labor market and education.

This article's overall aim is to describe the characteristics and life-course patterns of CWS children rather than to identify the causal effects of specific initiatives. Partly, differences in life-course patterns could reflect the effects of child welfare services. However, differences could also reflect causes for CWS contact; especially early, adverse outcomes such as poor school behavior or criminal charges could result in a child being contacted by child welfare services. In addition, there are likely to be unobserved individual and family environment factors that trigger CWS services and also directly affect outcomes ("confounding"). Nevertheless, understanding the sorting into different CWS initiatives and the patterns of CWS children are informative for more ambitious studies that aim to identify causal effects of initiatives (e.g., Bald et al., 2019; Barth et al., 2022; Brännström,Vinnerljung,and Hjern, 2020; Doyle Jr 2007, 2008; Lindquist and Santavirta, 2014; Wakefield and Wildeman, 2022).

2. Materials and methods

2.1. Study context

Norway is characterized by redistributive welfare state institutions, universal health care, low levels of income inequality, and relatively high levels of intergenerational mobility (OECD, 2015; UNICEF, 2016). Nevertheless, like in other Western countries (Edwards et al., 2021; Fallesen,Emanuel,and Wildeman, 2014; Rouland and Vaithianathan, 2018; Turney and Wildeman, 2017; Vinnerljung and Hjern, 2014; Wildeman et al., 2014; Yi,Edwards,and Wildeman, 2020), CWS is not a marginal phenomenon in Norway, with children and youth being in need for protection and help. For example, among OECD countries, Norwegian 10 to 19-year-olds have one of the highest suicide rates (Roh, Jung,and Hong, 2018).

Although child protection systems typically are based on a common ground of public responsibility for children at risk, and there are indications that the systems are converging, there is still a great deal of variability between countries (Berrick et al., 2017; Gilbert, 2012; Wildeman et al., 2022) or even within countries (Yi et al., 2023). In Norway, the CWS is regulated by the law to protect and assist children and youth who live in conditions detrimental to their health and development. Children and parents in need of assistance are met by the local CWS, which has several possible support and treatment initiatives, varying with the severity and origin of problems as well as the age of the child (Langford,Skivenes,and Søvig, 2019).

2.2. Register data

We use population-wide Norwegian register data covering all children born in Norway between 1987 and 2001 (approx. 860,000). Immigrant children arriving in Norway after birth are excluded since we study children's life-course patterns in this paper, while children of immigrants born in Norway are included. The register data enable us to follow children as they move through their life courses, and the data contains reliable information without attrition bias. To follow children, we combine data from various registers, including records of child welfare services, school careers, criminal charges, prescription drugs, and family background. These registers vary slightly in which years they cover, with, for example, data about prescription drugs being available from 2004 to 2018 while criminal charges being available from the years 1997 to 2014. An overview of variable coverage in different birth cohorts can be found in the Supplementary Appendix Table A3, while summary statistics can be found in Table A1.[1]

2.3. Measures

2.3.1. Child welfare service initiatives

Our child welfare services data include CWS records from 1994 to 2016. The children in contact with CWS often receive several different interventions throughout their childhood; we approach this heterogeneity by classifying CWS children according to the most extensive intervention. Some individual CWS experiences lean toward an uncontroversial classification, others not. An easy-to-classify example is a girl who received in-home initiatives during early childhood and moved to a childcare institution in her teens. This girl is classified as a childcare institution child, as in-home initiatives are naturally considered lighter than foster homes and institutional care. It is less straightforward to rank out-of-home care, such as enhanced foster homes, relative to in-home initiatives rooted in a child's behavioral problems, such as MST. The MST program, directed at parents of teens with severe behavioral issues,

[1] Since the data window differs across administrative registers, available information varies between birth cohorts. For example, we can only observe CWS initiatives for children born in 1987 from age seven and onwards. Thus, some children with early contact are recorded as receiving no initiative for this birth cohort. We have investigated life-course patterns of children where we can observe nearly complete child welfare service histories (birth cohorts 1992–1995) in Supplementary Online Appendix B. The results for these birth cohorts are very similar to the main results. Therefore, we have chosen to keep all birth cohorts to follow children longer..

is frequently offered as an alternative to institutions or forms of incarceration. We believe that MST children's characteristics and life course patterns are of specific interest and have chosen to rank MST after childcare institutions.

Building on this reasoning, we distinguish between seven child welfare initiatives, where CWS children have one unique value (from the most extensive to the least extensive): (1) childcare institutions (short and long stays), (2) MST, (3) enhanced foster homes, (4) foster homes, (5) kinship foster homes, (6) in-home initiatives. In-home initiatives include counseling, advisory services, financial assistance, support groups, and more, excluding MST. Note that many children have received multiple initiatives throughout childhood. For example, 26 % of children who received MST have also stayed in childcare institutions (Table A2).

The child welfare services register includes information on the reasons for each CWS initiative. The classification is done by the local CWS caseworker, and we use two main categories based on the record for the child's most extensive initiative: the child's behavior problems and parental neglect. The caseworker sometimes records both as motivation and in those cases, we classify the reason as child behavioral problems.

2.3.2. Background measures

The first aim of the analysis is to examine the characteristics of the children in contact with the child welfare services and various types of initiatives within the child welfare services. First, we distinguish between the caseworker's record of *parental neglect* (1 = yes) and *child behavioral problems* (1 = yes), as well as the child's gender.

Our family-level measures of parental socioeconomic background include *parents' years of education* equal to the average of mother's and father's years of education. *Parents' earnings* is defined as the earnings rank of mother's and father's average earnings between 11 and 15 years of age. The earnings are ranked in percentile rank by birth cohort, where children with parents with the lowest earnings receive 0 and children with parents with highest earnings receive 1. *Parents' criminal charges* measure whether either the father or mother has been charged with at least one felony when the child is between 10 and 12 years of age. P*arents' social welfare benefits* is a dummy variable for whether the father or the mother has received welfare benefits at least once when the child is between 10 and 12 years of age.[2] Finally, *immigrant background* is defined as children born to two non-Norwegian-born parents. Immigrants constitute a heterogeneous group in terms of resources, experience, and culture (Heath,Rothon,and Kilpi, 2008). Thus, to supplement the main findings, the online appendix Table A11 distinguishes between children of immigrant parents from different origin countries. All parental measures are based on biological parents, as defined by the official Population register.

2.3.3. Life course outcomes

The life course outcomes are chosen to cover a wide number of different adverse outcomes. Children's educational patterns are measured using 10th-grade academic achievements, poor school behavior, and school absence, as well as upper secondary completion between ages 18 and 25. Academic achievements are measured using the *grade point average (GPA)* on the school-leaving certificate from lower secondary education (10th grade), and it is standardized to have a zero mean and a standard deviation of 1. *Poor school behavior* is obtained from marks in orderliness and conduct in 10th grade, which is included on the school-leaving certificate from lower secondary education and distinguishing between good, fair, and poor. The student's teachers grade the order and conduct, and the marks reflect behavior such as being late to class, not doing homework, being violent, and cheating on tests. *School absence hours and absence days* include all undocumented absences between 8th and 10th grade and are printed on the school-leaving certificate from lower secondary education. Absence hours are registered if a student misses some school hours, while whole days are registered as absence days. Each school year, up to 10 absence days can be excluded if students have documented reasons for absence, such as health.

Criminal charges measure whether children have been charged for a criminal act annually from age 10 to age 25, and we distinguish between felony offenses and misdemeanors.

Welfare benefits indicate whether children have received welfare benefits (1 = yes) annually from ages 18 to 25. Not in education, employment, or training (NEET) is also measured annually from ages 18 to 25. Individuals are considered NEET if they are not registered in education and their total annual pre-tax income from employment and self-employment is less than 1 basic amount (b.a.) (1 = yes).[3]

Finally, as health problem proxies, we use individual records from the Norwegian Prescription Database (NorPD), a national health register that tracks drugs dispensed by prescription since 2004. Drugs purchased without a prescription are not included, nor are drugs supplied to hospitals and nursing homes. NorPD classifies drugs according to the World Health Organization Anatomical Therapeutic Chemical (ATC) classification system. We focus on psycholeptic drugs (N05) and psychoanaleptic drugs (N06) within ATC group N (Nervous system), and measure annual prescriptions of different types of drugs from ages 10 to 24. We distinguish between antidepressants, anxiolytics, hypnotics and sedatives, antipsychotics, and centrally acting sympathomimetics (i.e., ADHD drugs).[4]

Note that some life-course outcomes are measured while children are potentially in public care, while others are measured after CWS contact. For example, MST children often enter CWS late, and school behavioral problems (i.e., 10th-grade school measures) may lead to the involvement of CWS. In contrast, upper secondary school completion is measured at ages 18 to 25, practically after CWS for all children.

2.4. Data analysis

In our description of CWS children's characteristics and life course patterns, we compare subgroups within CWS by type of service before age 18. For these subgroups, the average background characteristics and life-course outcomes are compared, and as a baseline, we also compare with children without CWS experience. We look at boys and girls

[2] Measuring parental earnings, criminal charges, or social welfare benefits at different child ages or over a longer span of child's life provides similar patterns, as shown by the supplementary online appendix tables A8-A10.

[3] The b.a. is used in the Norwegian pension and social welfare system to assess whether individuals are eligible for various benefits, including welfare and unemployment benefits. 1b.a. consituted 100 853 NOK in 2020.

[4] The prescription drugs groups are based on levels 3 and 4 of the ATC classification system. Antidepressants are defined as prescriptions with ATC code N06A, which comprise preparations used to treat endogenous and exogenous depressions as well as anxiety. Anxiolytics (ATC N05B) comprise preparations used to treat neuroses and psychosomatic disorders associated with anxiety and tension, including certain benzodiazepines. Hypnotics and sedatives (ATC N05C) comprise preparations with mainly sedative or hypnotic actions, including z-hypnotics and melatonin receptor agonists. Antipsychotics (ATC N05A) includes drugs with antipsychotic actions. Finally, centrally acting sympathomimetics (ATC N06BA) are primarily used to treat ADHD. Not that there is no one-to-one relationship between a specific prescription drug and a diagnosis or problem (Skurtveit et al., 2018; Wong et al., 2016). For example, while selective serotonin reuptake inhibitors (SSRIs) are classified within the ATC classification system as antidepressants, they are also the preferred drug for treating pediatric anxiety disorders (Ask et al., 2019; Wesselhoeft et al., 2020).

combined in the main results since their patterns are similar.[5]

Additionally, we report adjusted differences in the life-course outcomes where parental characteristics and gender are controlled for in linear least squares regressions. These control variables are included because they are potential confounders of CWS on life-course outcomes. However, importantly, unobserved family and child characteristics likely influence both CWS initiative *and* child outcomes (Bald et al., 2019), which means that these analyses are unsuitable for identifying causal effects of CWS initiatives. However, a comparison of unadjusted and adjusted models is informative on the selection into different types of CWS.

3. Results

3.1. Prevalence and timing of CWS initiatives

We begin by describing the prevalence of CWS contact, as shown in Table 1. The majority of CWS children only receive in-home initiatives (68 % of the CWS children, or 6.7 percent of all children) during childhood and adolescence. Next, 1.5 % are in various foster homes, and 1 % stay at a childcare institution at least once during childhood. Finally, 0.6 % receive MST.

Moreover, as discussed in more detail in the next section, the prevalence of CWS contact varies considerably by background characteristics. For example, among children with parents in the lowest earnings decile, nearly four of ten receives a CWS initiative, and 15.5 % experience out-of-home placement (foster homes or childcare institution). In contrast, only 1.7 % of those with parents in the highest earnings decile receive any initiative and 0.2 % experience out-of-home placement. Table 1 also illustrates that the MST initiative is different from the other initiatives in terms of parental background. If we compare children of high versus low SES proxy (e.g., education or earnings), the relative differences are smaller for MST than other initiatives.

Concerning the timing of initiatives by age, in-home initiatives are used over the whole childhood period, while MST and out-of-home initiatives, especially placement in childcare institutions, peak in early adolescence (Fig. 1). The high entry age of many MST children reflects that early adolescence is a phase where behavior problems grow salient, indicating a group of children that enter child welfare services late because of increasing behavioral problems (and not because of parental neglect).

3.2. Background characteristics of CWS children

Next, we describe the background characteristics of children in contact with child welfare services (Table 2). As expected, biological parents of CWS children have fewer years of education, lower earnings, are more likely to receive welfare benefits, and are more likely to be charged with a felony than parents in general (columns 1–4 in panel A). For example, the proportion of parents receiving welfare benefits is 41 percentage points higher among CWS children than among other parents (column 4). Parents of CWS children are also more likely to be immigrants. Furthermore, distinguishing between different immigrant groups demonstrates large variations between country backgrounds, with children of immigrants from more disadvantaged country backgrounds being considerably more likely to be in CWS (Table A11).

Moreover, there are large differences in parental characteristics across children in various initiatives (Panel B). These differences reflect a variety of causes; whereas parental neglect and disadvantaged family background are the leading causes for early in-home initiatives and foster homes, child behavioral problems are relatively more important for MST and, to a somewhat lesser degree, childcare institutions.

Most strikingly, children receiving MST have a more advantaged background in terms of parental characteristics than other CWS children with extensive services. For example, while children in various foster homes have parents with close to 40 percentile parental earnings rank lower than the non-CWS children, MST children have parents with earnings at 23 percentile ranks lower. In addition, parents of MST children are very similar to parents of children who receive in-home services only. By comparing columns (1)-(4) I Panel B, we see that the parents of children with MST are similar to those with in-home services only. MST children are also much more likely to be boys, and few have immigrant parents.

Children with MST and institutional care are much more likely to have behavioral problems (column 8), but are less frequently exposed to parental neglect (column 7), compared to those with other CWS initiatives.

3.3. Criminal charges

In the next subsections, we describe the life course patterns of CWS children. While the parents of MST children are comparable to those with in-home services, the children themselves have far more behavioral problems. Children outside of CWS are rarely charged with a felony or a misdemeanor, as shown by Fig. 2. However, CWS children are frequently charged, particularly those who have stayed in childcare institutions or received MST, where about 1 in 5 children are charged with a felony at age 16. In contrast, less than 1 in 20 children in various foster homes are charged at age 16. Even if the crime rates taper off after age 18, prevalence remains high until the mid-20 s.[6]

3.4. Prescription drugs

CWS children are more frequently prescribed drugs than other children, and again, children in childcare institutions or receiving MST stand out (Fig. 3). At age 15, children outside of CWS are rarely treated with antidepressants. Even if the prevalence is low also among children in childcare institutions and MST children, it is many times larger than in all other groups, as almost 5 % is treated with antidepressants. They also have higher levels of anxiolytics, antipsychotics, and hypnotics and sedatives than other children. For example, at age 24, about 14 % use antidepressants, 10 % use anxiolytics, 15 % antipsychotics, and 10 % hypnotics and sedatives. The prevalence of different prescription drugs is about half of those levels among other CWS children and even lower for those outside the CWS.

Also concerning ADHD, CWS children have a markedly higher likelihood of being treated than others. Particularly MST children are likely to be treated for ADHD by centrally-acting sympathomimetics. ADHD drugs are prescribed to about 20 % of MST children at age 15. In comparison, less than 15 % of children in enhanced foster homes and childcare institutions are treated with ADHD drugs, about 10 % of other child welfare children, and only 2 % of children outside child welfare services.

As with the other life-course patterns, the striking prescription rate differences may reflect causes for CWS contact *and* effects of CWS. Since behavioral problems are linked with health issues, the local caseworker may refer CWS children to specialized mental health services for psychiatric diagnosis and treatment, which could explain some of the higher prevalence among some groups.

[5] Supplementary Figure A2, Figure A3, Figure A4, and Figure A5 show that although the average outcomes differ by gender (e.g., boys have higher levels of youth crime), the life-course patterns and differences between CWS initiatives are similar.

[6] Children with MST or institutional care have higher criminal charges in all types of categories, but especially high for property crime, violence, drugs, and criminal damage, whereas traffic offense prevalence is more similar (Supplementary Appendix Figure A6).

Table 1
Proportion of children receiving at least one initiative from CWS.

	Any initiative	In-home initiative	Kinship foster homes	Foster homes	Enhanced foster homes	MST	Childcare institutions
All	0.0981	0.0673	0.0023	0.0035	0.0087	0.0060	0.0102
Parental education							
Primary school	0.2977	0.1786	0.0082	0.0134	0.0397	0.0155	0.0424
Up. sec. school	0.1131	0.0800	0.0027	0.0038	0.0088	0.0071	0.0107
Higher education	0.0463	0.0345	0.0008	0.0013	0.0028	0.0032	0.0038
Parental earnings							
Low (0–9 %)	0.3879	0.2157	0.0124	0.0215	0.0606	0.0173	0.0603
Middle (10–89 %)	0.0855	0.0629	0.0018	0.0024	0.0054	0.0057	0.0073
High (90–99 %)	0.0166	0.0129	0.0001	0.0002	0.0008	0.0015	0.0012
Parental felony							
No	0.0861	0.0616	0.0018	0.0028	0.0066	0.0053	0.0081
Yes	0.4333	0.2301	0.0174	0.0226	0.0669	0.0259	0.0703
Parental welfare benefits							
No	0.0580	0.0436	0.0009	0.0014	0.0033	0.0041	0.0046
Yes	0.4675	0.2859	0.0149	0.0221	0.0583	0.0239	0.0624
Gender							
Boys	0.1023	0.0719	0.0021	0.0030	0.0085	0.0068	0.0100
Girls	0.0936	0.0626	0.0025	0.0039	0.0089	0.0052	0.0105
Children of immigrants							
No	0.0946	0.0643	0.0023	0.0035	0.0084	0.0061	0.0098
Yes	0.1720	0.1312	0.0013	0.0026	0.0144	0.0036	0.0189

Note: Prevalence numbers include birth cohorts 1987–2001 and slightly underestimate the prevalence. See supplementary appendix Table B1 for prevalence numbers using birth horts 1992–1995.

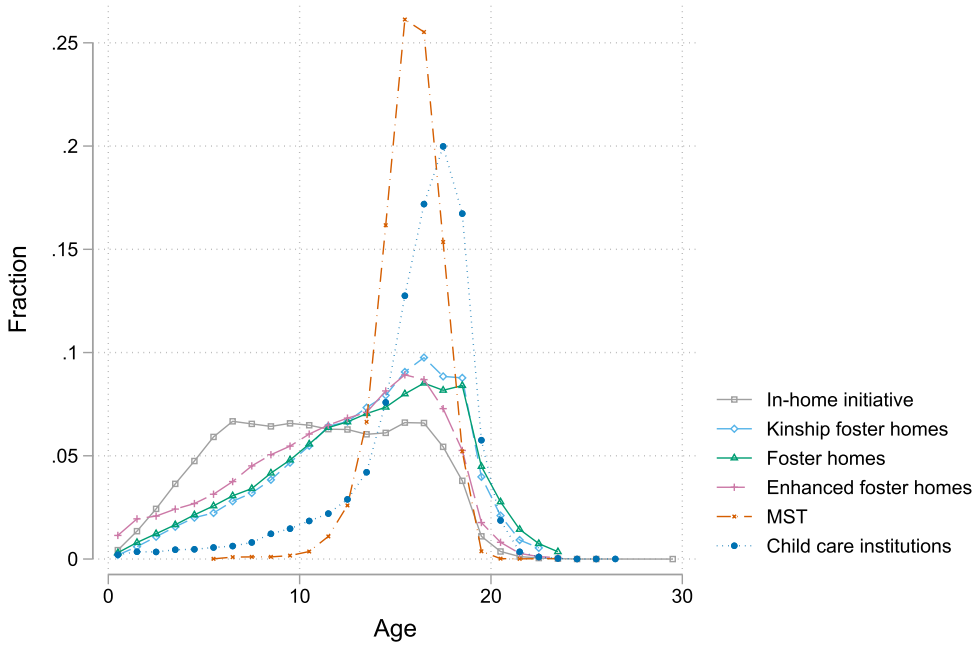

Fig. 1. Distribution of child welfare initiatives by age for CWS children. Note: Sample consists of 140,159 individuals in contact with the CWS with 566,449 person-year observations. The age composition is similar for boys and girls; see Appendix Figure A1. The age of first contact with CWS for children with different services can be found in Figure A7.

3.5. Education and labor market exclusion

Many CWS children struggle at school, often with frequent behavioral problems and low achievement. Before looking at upper secondary completion, let us first check how they do on their 10th-grade school leaving certificate (Table 3). On average, CWS children's GPA is about a standard deviation below that of other children, they are 7.5 percentage points more likely to have poor school behavior, and their school absence is two times that of other children. As for other outcomes, there is considerable variation among children with CWS contact, and MST children have the least favorable performance. While the GPA of MST children is 1.5 standard deviations lower than for children outside of CWS, the difference is even larger for poor school behavior and absence.

The inferior school performance of CWS children also shows up in adult attainment. While 80 % of children without CWS complete upper secondary education before age 25 (Fig. 4), completion rates are only 40–45 % for children with in-home initiatives or various foster homes. The large majority of those with childcare institutions or MST experience drop out of school early, and only 20 % complete upper secondary education within age 25.

Childcare institution children and MST children also have a high probability of receiving welfare benefits in their early 20 s. For both groups, about 40 % receive welfare benefits, compared to around 20 % for other CWS children and less than 5 % for those without CWS before

Table 2
Background characteristics of CWS children compared to other children. Parental background measures are based on biological parents.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Educ.	Earnings rank	Felony	Welfare benefits	Immigrants	Girl	Parental Neglect	Child behavioral problems
Panel A								
No initiative (ref)								
CWS (1 = yes)	−1.706***	−0.284***	0.130***	0.409***	0.038***	−0.025***	0.671***	0.299***
	(0.009)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Panel B								
No initiative (ref)								
In-home initiative	−1.540***	−0.255***	0.096***	0.358***	0.047***	−0.037***	0.723***	0.239***
	(0.010)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Kinship foster homes	−2.053***	−0.361***	0.239***	0.576***	−0.017***	0.046***	0.778***	0.212***
	(0.053)	(0.006)	(0.004)	(0.006)	(0.005)	(0.011)	(0.003)	(0.003)
Foster homes	−2.122***	−0.384***	0.203***	0.567***	−0.008*	0.064***	0.756***	0.236***
	(0.043)	(0.005)	(0.003)	(0.005)	(0.004)	(0.009)	(0.003)	(0.003)
Enhanced foster homes	−2.357***	−0.399***	0.243***	0.599***	0.033***	0.008	0.735***	0.256***
	(0.027)	(0.003)	(0.002)	(0.003)	(0.002)	(0.006)	(0.002)	(0.002)
MST	−1.468***	−0.225***	0.126***	0.331***	−0.014***	−0.070***	0.222***	0.758***
	(0.033)	(0.004)	(0.002)	(0.004)	(0.003)	(0.007)	(0.002)	(0.002)
Childcare institutions	−2.170***	−0.362***	0.214***	0.539***	0.042***	0.010	0.490***	0.501***
	(0.025)	(0.003)	(0.002)	(0.003)	(0.002)	(0.005)	(0.002)	(0.001)
Panel C								
Means	14.364	0.570	0.034	0.098	0.045	0.487	0.066	0.029
N	860,334	861,518	861,562	861,562	861,562	861,562	861,562	861,562

Note: Standard errors in parentheses. Panel A compares CWS children with other children, while Panel B distinguishes between various types of initiatives. Panel C provides the overall means of the variables. Parental neglect and child behavioral problems are only observed for children in CWS. They are set at zero for other children, which implies that the coefficients in (7) and (8) sum to one for each row.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

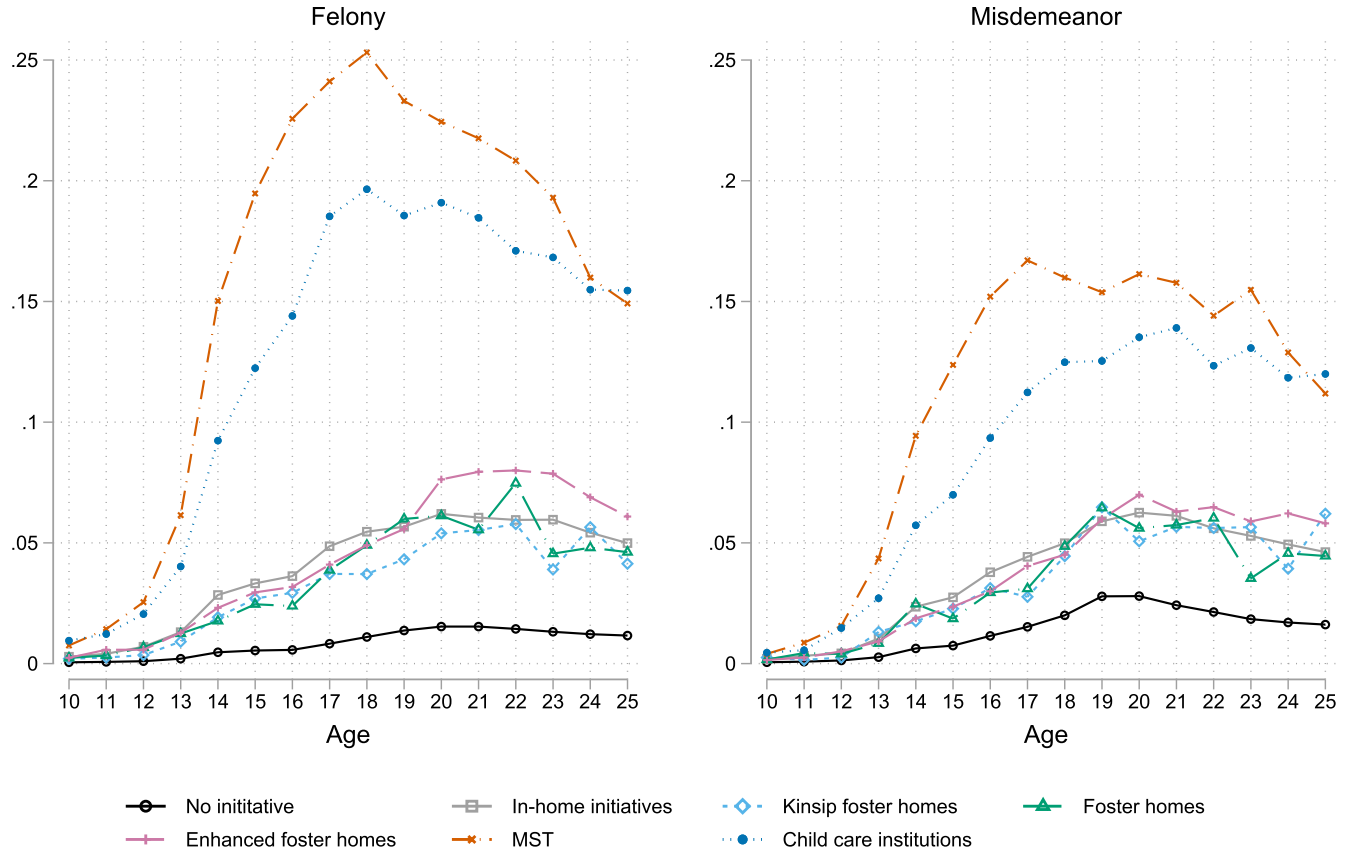

Fig. 2. Criminal charges by type of child welfare services.

age 18. Finally, one in two with childcare institution stays or MST is outside of work and education (NEET) in their mid-20 s, suggesting they often experience persistent exclusion.

3.6. Adjusted child outcome differences across CWS initiatives

This section compares the unadjusted CWS coefficients with the

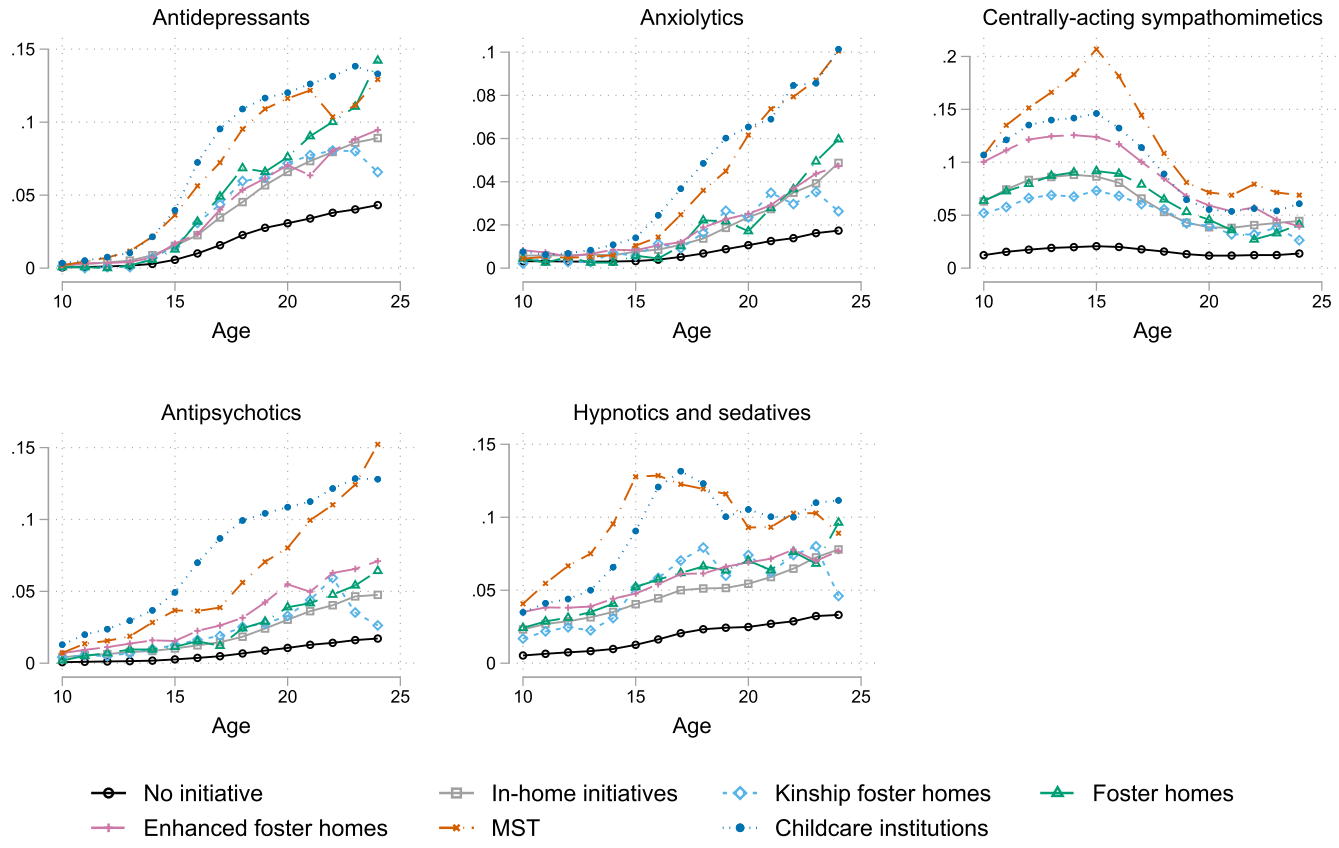

Fig. 3. Prescription drugs by type of child welfare services.

Table 3
Differences in early school results and school behavior of CWS children compared to other children.

	(1)	(2)	(3)
	GPA	Poor school behavior	Absence hours
Panel A			
No initiative (ref)			
CWS	−0.965***	0.075***	8.536***
	(0.004)	(0.001)	(0.093)
Panel B			
No initiative (ref)			
In-home initiative	−0.905***	0.061***	7.567***
	(0.005)	(0.001)	(0.109)
Kinship foster homes	−0.886***	0.044***	8.079***
	(0.024)	(0.005)	(0.569)
Foster homes	−0.785***	0.039***	5.308***
	(0.019)	(0.004)	(0.476)
Enhanced foster homes	−0.850***	0.032***	2.985***
	(0.013)	(0.003)	(0.297)
MST	−1.551***	0.252***	24.543***
	(0.015)	(0.003)	(0.362)
Childcare institutions	−1.196***	0.116***	12.084***
	(0.012)	(0.002)	(0.286)
Panel C			
	0.000	0.022	9.536
N	717,334	331,439	377,525

Note: Standard errors in parentheses. Panel A compares CWS children with other children, while Panel B distinguishes between various initiatives. Finally, panel C provides the overall means of the outcome variables.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

corresponding coefficients conditional on gender, birth cohort, and socioeconomic background in similar linear regression models. The changes in coefficients vary with initiative and outcome, as shown graphically in Fig. 5.[7] We have scaled the comparison such that values close to 0 mean no change in coefficient from the unadjusted to the adjusted model, while values close to 100 mean that the coefficients turn zero after adjusting for the control variables. For prescription drugs, especially antipsychotics and antidepressants, the coefficients hardly change after controlling for background characteristics. The lack of explanatory power for parental characteristics suggests the health problems proxied by medication are largely due to child-specific characteristics rather than a problematic family environment.

For the other outcomes, the changes vary by type of CWS initiative. Most strikingly, while the coefficients for foster homes drop considerably, the adverse coefficients for MST children remain largely unaffected after controlling for background characteristics. For example, the background characteristics lead to a 60–70 % drop in the outcome differential between the foster home and non-CWS children. In contrast, the MST coefficient only drops by 22 %. One takeaway from these results is that the problem behavior of MST is largely unrelated to their family socioeconomic resources, suggesting sorting into this treatment based on harder-to-observe individual-level risk factors.

4. Discussion

Child welfare services play a considerable role in many children's lives (Putnam-Hornstein et al., 2021), with every tenth child being in contact with CWS before the age of 18 in Norway. Previous research has

[7] All of the regression coefficients are reported in the online appendix (Table A5, Table A6, and Table A7); here, we only present the percent change in the coefficient from the unadjusted to the adjusted model.

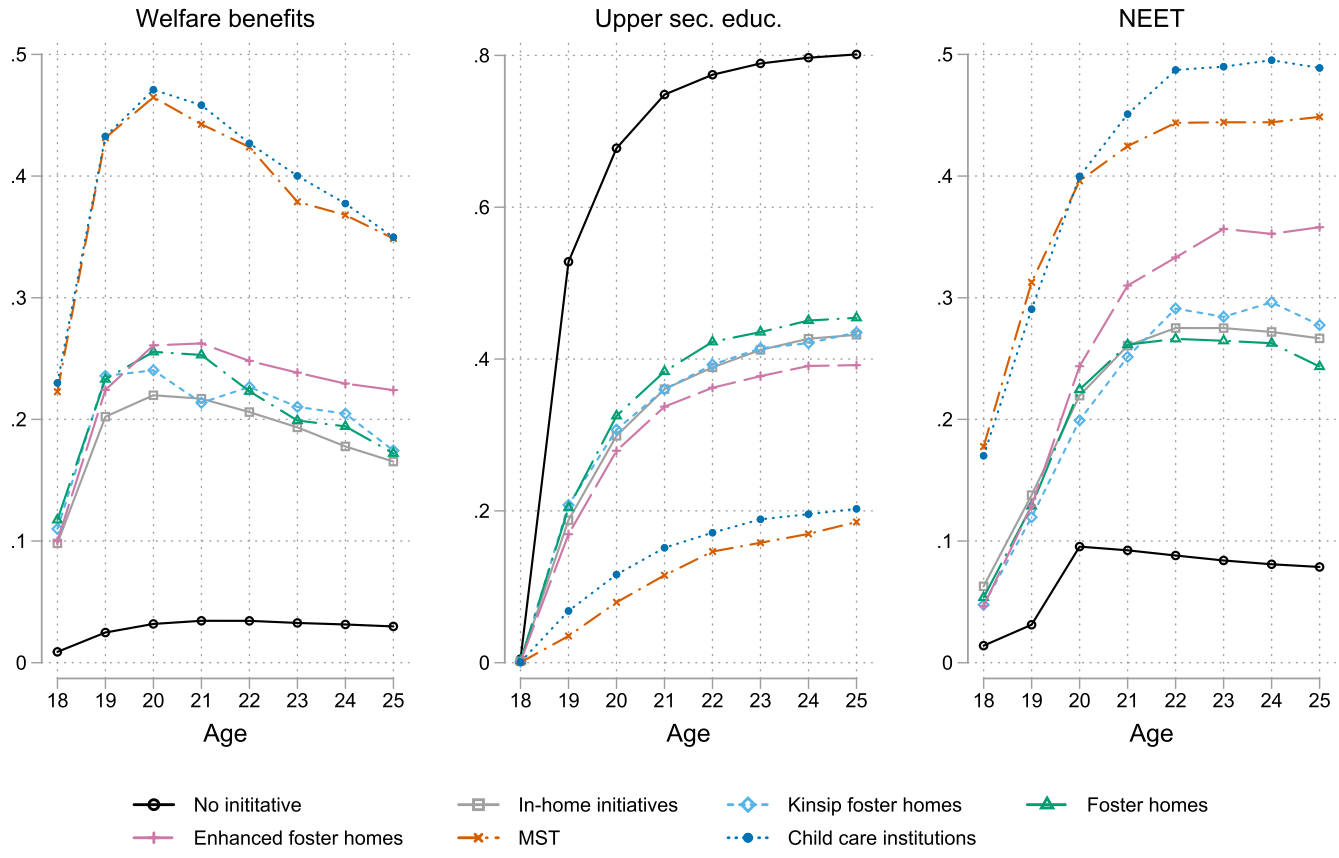

Fig. 4. Welfare benefits, upper secondary completion, and NEET by type of child welfare services.

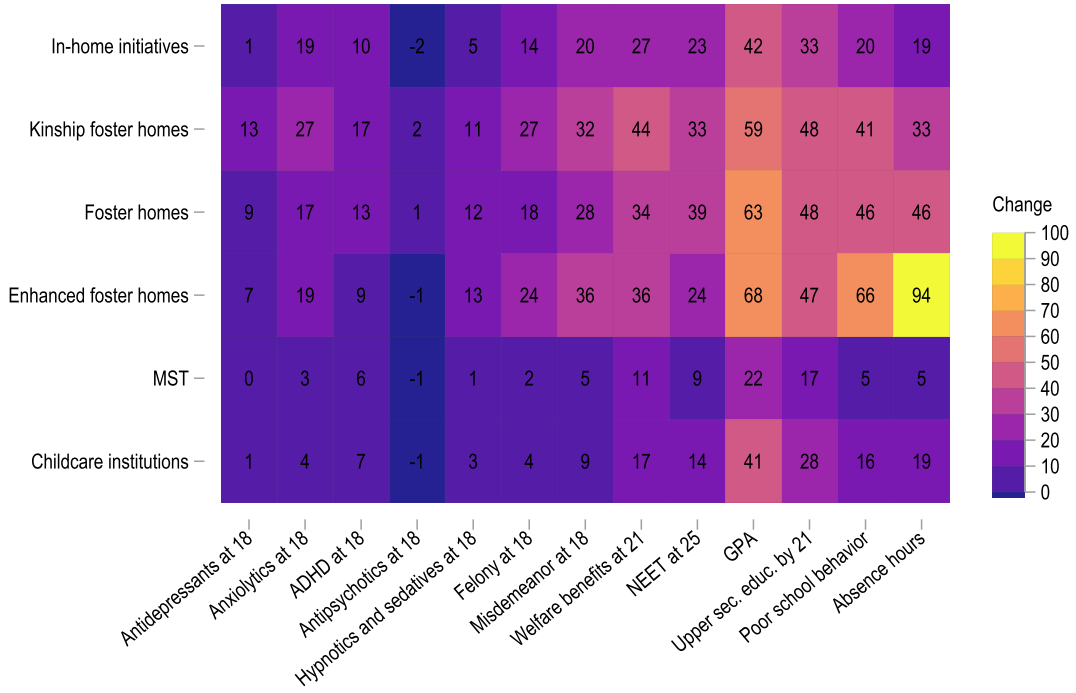

Fig. 5. Percent change in coefficients after controlling for background characteristics. **Note: The unadjusted models include no control variables, while the adjusted models control for parental education, parental earnings, parental welfare benefits, parental crime, immigrant background, and dummies for birth cohort. The change from the unadjusted (β_j^1) to the adjusted (β_j^2) coefficient for variable *j* in** Table A5, Table A6, and Table A7 **are divided by the unadjusted coefficients in the same tables:$(\beta_j^1 - \beta_j^2)/\beta_j^1$. Values close to 0 mean no change in coefficient from the unadjusted to the adjusted model, while values close to 100 mean that the coefficients turn 0 after adjusting for the control variables.**

shown that children and youth with a history of involvement with CWS have more disadvantaged family backgrounds (Franzén,Vinnerljung, and Hjern, 2007; Pelton, 2015; e.g., Turney and Wildeman, 2017) and adverse life outcomes (e.g., Berlin,Vinnerljung,and Hjern, 2011; Brännström et al., 2017; Brännström,Vinnerljung,and Hjern, 2015; Gypen et al., 2017; Jackisch,Brännström,and Almquist, 2019; Jozefiak et al., 2016; Kääriälä and Hiilamo, 2017; Vinnerljung,Brännström,and Hjern, 2015; Vinnerljung and Sallnäs, 2008). In line with previous studies, our findings show that CWS children have lower socioeconomic backgrounds than other children. Further, CWS children are considerably more likely to have a criminal charge, be prescribed drugs for mental health and ADHD, fail in the educational system, and experience labor market marginalization.

However, the heterogeneity among CWS children receiving different initiatives is more pronounced than differences between those in contact and those not. CWS initiatives serve very different purposes as they respond to the needs for protection, including the safety and care of younger children, as well as the behavioral needs of older children. Previous research has demonstrated the importance of distinguishing between different services, as life outcomes tend to be worse for those receiving out-of-home services compared to in-home services (Jackisch, Brännström,and Almquist, 2019; Vinnerljung,Brännström,and Hjern, 2015). In line with these findings, our results show that CWS children constitute a heterogeneous group where family background characteristics and life-course patterns vary considerably. From a bird's eye view, we can distinguish between three broad groups of CWS children.

First, about two-thirds of CWS children receive only in-home services like counseling, financial assistance, and support groups (excluding MST), often for a short period during childhood. Compared to children outside CWS, they have disadvantaged socioeconomic backgrounds, and they have more frequent criminal charges, a higher prevalence of prescribed drugs for mental health and ADHD, and less favorable school performance. Observed background characteristics partly account for the less favorable outcomes, with the largest impact on the GPA differential. However, family background does not explain the higher frequency of drug prescriptions among children with in-home services.

The second group is a small group of children who have lived in various types of foster homes before age 18. Unsurprisingly, these children have more disadvantaged socioeconomic background than children receiving in-home initiatives. Nevertheless, their life-course patterns largely resemble those of children receiving in-home initiatives. Although children in enhanced foster homes, typically used for children with high levels of behavioral problems, have less favorable outcomes than other foster home children, the differences are small compared to MST and childcare institution children. Our family background characteristics account for about half of the less favorable school outcomes among children with foster care initiatives. Still, most of the excess drug prescriptions remain.

Finally, CWS children with experience from childcare institutions or MST have more severe behavioral problems, and their early adult outcomes are considerably less favorable than for children with other CWS initiatives. A large fraction are charged for criminal activity already in early adolescence, and they continue to be in frequent contact with the police into adulthood. Moreover, many are treated for ADHD and mental health problems. Just one in five complete upper secondary education, and one in two experience persisting labor market exclusion.

Still, despite similar life course patterns, childcare institution children and MST children differ in one important aspect; while institutionalized children's parents often have few resources, the socioeconomic background of MST children is relatively high compared to other CWS children. Typically, the children who receive MST enter CWS late, primarily because of their own behavioral problems and rarely because of parental neglect. This finding aligns with previous US results, where those who enter CWS later are more likely to do so because of behavioral problems rather than family dysfunction (Wulczyn, 2005). Moreover, our findings complement previous studies from Sweden, which have shown that youth who enter out-of-home care because of behavioral problems have a higher likelihood of adverse outcomes compared to those who enter for other reasons (Vinnerljung and Sallnäs, 2008).

The sorting into MST illustrates the complex relationship between individual characteristics and family environment in causing behavioral and academic problems. Consequently, drawing conclusions on the effects of CWS initiatives from observed life patterns of individuals with CWS experiences faces huge challenges. Knowledge of unique sorting processes into various child welfare initiatives is needed for studies that aim to evaluate the effectiveness of CWS initiatives. For example, MST clients exhibit strong indicators of problem behavior, as indicated in our study by the frequency of police charges, academic failure, truancy, school dropout, and mental health problems. In contrast to what is found for poor mental and physical health of children placed in foster care in the US (Turney and Wildeman, 2016), family background variables cannot explain this variation. Thus, studies investigating the effectiveness of MST by simply adjusting for observable family background characteristics only (e.g., Dæhlen and Madsen, 2016) are likely to be biased because of unobserved individual-level confounders. Thus, credible effect estimates should ideally be based on sources of CWS initiatives uncorrelated with individual characteristics and childhood environment (e.g., case workers or local CWS practices) (Doyle Jr, 2007).

Despite the strength of the data used in this study, several limitations should be considered when interpreting the findings. Most importantly, the objective of this paper is purely descriptive, and the methodology does not provide the means to draw conclusions regarding the potential influences of different initiatives on life-course patterns, which limits the direct policy impact of our work. Further, the descriptive design in this study does not allow for investigating the timing and duration of contact, which may add further nuance to the heterogeneity in the CWS population. Finally, our data does not include investigations, which prevents us from describing how many families and children are investigated by the CWS, and their life-course patterns.

CRediT authorship contribution statement

Nicolai T. Borgen: Conceptualization, Methodology, Formal analysis, Visualization. **Ivar Frønes:** Conceptualization, Methodology. **Oddbjørn Raaum:** Conceptualization, Methodology, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The authors do not have permission to share data.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.childyouth.2023.107308.

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