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Use of youth care over time: Role of characteristics and functioning of community-based support teams

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Abstract

Objectives. Our aim was to study changes in youth care use in time, and the role of newly introduced community-based support teams herein.

Setting. Register data (2015 through 2018) were used on youth in a large city in The Netherlands.

Participants. Data on 126,095 youth (0-18 years) were available for analyses.

Primary and secondary outcome measures. Primary, specialist and residential youth care use were the primary outcomes,

Results. GEE analyses adjusted for individual characteristics demonstrated that over the four years, use of primary youth care increased from 2.2% to 8.5% (OR 1.70; CI 1.67-1.73), specialist youth care decreased from 7.2% to 6.4% (OR 0.98; CI 0.97-1.00), residential youth care increased slightly(OR 1.04; CI 1.01-1.06). Case load, team size, team turnover, team performance and transformational leadership showed significant associations with different types of youth care use. Only team size showed a significant interaction with time on use of primary youth care.

Conclusion. Since community-based support teams were introduced in 2015 in the Netherlands, patterns of youth care use changed towards more locally provided primary youth care, slightly less specialized and slightly more residential youth care. Characteristics of community-based support teams are associated with prevalence of youth care use. However, little evidence was found for their role on changes in youth care use in time. Further research into the role of contextual factors on patterns of youth care use is recommended.

Strengths and limitations of this study

- Our study is one of the limited number of studies on contextual determinants of youth care use.
- We used registry data on youth care use.
- A large population-based sample was available for analyses.
- Registry data can be incomplete or hold mistakes.
- Team characteristics were available for one year (2016) and not for all years included in the study (2015-2018).

Introduction

Youth care use has increased in several Western countries in the recent decades[1-4]. In the Netherlands, for example, the percentage of children (0-18 years of age) using mental health and parenting support services increased from 4% in 2000 to 12% in 2018[5]. The youth care system in The Netherlands was drastically reformed in 2015 in response to this increased need for youth care and to overcome the fragmentation of the former system of youth care. The responsibility for the provision of youth care was transferred from the national and regional governmental levels and health insurance suppliers to the municipalities. An important goal of this reform was to improve integrated care, timeliness and proximity of care[6]. Other aims were to improve the prevention of psychosocial problems and to reduce the use of more intensive forms of youth care use by empowering youth and their families.

To deal with these responsibilities, the majority of the Dutch municipalities implemented community-based support teams to provide primary youth care, including primary mental health care and parenting support[6]. In these teams, professionals with different expertise such as child safety, youth care, pedagogy, welfare and financial support, work together at the local neighbourhood level[7]. The assumption is that the deployment of community-based support teams leads to more accessible, timely, integrated and empowering care. This is expected to result in less intensive forms of youth care (more primary and less specialized and residential youth care).

Evaluation of these expected benefits needs to take into account the individual and contextual factors influencing the use of youth care apart from the reform in youth care[8, 9]. In the theoretical models of both Andersen[9] and Stiffman[8] apart from the (perceived) need for care, enabling and predisposing factors are distinguished at both the individual and contextual levels. Factors on the individual level that have been shown to be associated with youth mental health services include age, gender and ethnic background of the child, and family and caregiver characteristics including family composition and socio-economic characteristics[10-12].

Contextual factors include the youth care system itself. Successful performance of community-based support teams is likely to be influenced by team characteristics and processes[13]. Studies in the public administration field on teams in the social domain have shown that team size, stability and leadership affect how well team members work together, with cohesiveness being a vital element of team functioning[7, 13-15]. A larger team size potentially benefits the delivery of care services through the larger pool of resources[14]. A lack of stability in team membership due to high turnover rates demotivates team members and thus acts as a barrier[13]. Strong transformational leadership also contributes to effective team performance[13], through efforts to 'transform' individual aspirations into the overall vision of the team[15]. Team cohesion is characterized by strong unitedness in achieving shared goals and emphasis on the team members' social relationships[7]. Further, a high caseload of the team poses risks for suboptimal performance[16].

In this paper, the research question to be answered is: Is there a change over time in use of different types of youth care since the reform in 2015 and do characteristics of the community-based support teams influence this change?

Methods

Study design

Microdata from Statistics Netherlands were used over the years 2015-2018. Under strict conditions, this microdata are accessible for statistical and scientific research. Pseudonymised administrative information on the individual level about sociodemographic characteristics and youth health care use of the youth population registered in Rotterdam any time in this four-year time period has been used.

No ethics approval or consent to participate was necessary, as these data are publicly available.

Data on team characteristics were collected mid 2016 through an online survey sent to 42 community-based support teams within Rotterdam resulting in a response of 363 professionals (50%). All respondents were informed about the purpose of the study and were guaranteed anonymity. Missing data and incomplete responses (n=15) were removed, resulting in a dataset of 348 individual responses with a response rate per team ranging between 27% and 81%. Data were aggregated on team level. Administrative data on team size were collected in June 2016 from the municipality of Rotterdam. Administrative data on caseload and turnover in 2015 were additionally collected. Data on team characteristics were linked to the individual microdata-records by pseudonymised postal code of the home address.

Patient and Public Involvement

Discussions with local stakeholders from practice and policy preceded and shaped the formulation of the research question.

Study population

In this study, we included all children of 0-18 years old on the 1st of January in 2015 registered as living in Rotterdam (n=172,448). Children with missing data on educational level (n=25,985) or family status (n=24,920) were excluded. The study population consisted of 126,095 children.

Use of youth care

The outcome measure was the use of youth care in the consecutive years 2015 through 2018. Youth care included primary youth care (locally provided care by the community-based support teams), specialist youth care (ambulatory or day care with a referral from a medical doctor or community-based support team) and residential youth care.

Individual characteristics

Demographic characteristics included child gender, age, ethnic background, educational level, family status and neighbourhood. Demographic characteristics were determined at the 1st of January of 2015.

Ethnic background

In accordance with the classification system used by Statistics Netherlands, a child's ethnic background was classified as Dutch when both parents were born in the Netherlands and as non-Dutch when one or both parents were born outside the Netherlands.

Educational level

Children up to 4 years old were classified as 'not yet at school age'. Children with a basic qualification or over 18 years old without a school registration were classified as 'Off school age'. Children registered as following special (primary or secondary) education were classified as 'Special Education'. All other children were classified as 'Regular education'.

Family status

Family status was classified in 5 levels, namely two parent family (when the child lives with two adults who are living together), single parent family (when there was one parent in the household with one or more children), Residential or foster care (a household of one or more persons who are professionally provided with housing and daily necessities of life), other (Private household consisting exclusively of members other than family and unknown).

Team characteristics

Information about team characteristics and leadership included team size, turnover, average caseload, transformational leadership perceived team performance, team cohesion.

Caseload

Caseload was calculated by the mean amount of cases per month divided by the mean amount of FTE per team in 2015..

Turnover

Turnover rate was calculated as the sum of persons leaving the team and persons entering team divided by the average number of persons in the team in 2015.

Team size

Team sizes were obtained from the municipality's administration and ranged between 7 and 26 team members with on average 18 team members.

Team performance

Team performance was assessed based on the "employee judgment of effectiveness" scale[17]. Professionals were asked to grade their team on six effectiveness indicators like "the quality of care provided by our team" on a ten-point Likert-type scale with 10 as highest score corresponding to excellent (range 6.13 to 8.5; Cronbach's alpha .90).

Team cohesion

Team cohesion was measured using five items inspired by Carless' and De Paola's measure for team cohesion [18]. Items like "Our team is united in trying to reach its goals for performance" were scored on a five-point Likert scale with highest scores indicating high team cohesion (range 3.29 to 5.00; Cronbach's alpha .89).

Transformational leadership

Transformational leadership was measured using five items. The items were based on the transformational leadership scale by Jensen et al. (2019) and an example item is "our supervisor strives to get the team work together to realize its vision". The responses were given on a five-point Likert scale with highest scores indicating good leadership (range 2.50 to 4.67; Cronbach's alpha .91).

Statistical analyses

A repeated measures logistic regression analysis was conducted, using Generalized Estimating Equations (GEE). For the outcomes, i.e. the three types of youth care (primary, specialized and residential) separate models were fit. Firstly, univariable models were run with time, individual characteristics and team characteristics as separate predictors. Thereafter, multivariable models were performed including time, individual characteristics and community-based support team characteristics at the individual level. Because residential care was part of the characteristic family status, family status was not entered in models for residential care. Finally, interactions of time with community-based support teams characteristics were tested in order to answer our research question, whether characteristics of community-based support teams influence a change over time in use of different types of youth care.

The statistical significance level was defined as a p-value below 0.01 (two-tailed). Analyses were performed using R version 3.5.3.

Results

The study population consisted of children with diverse ethnic backgrounds, with 24.6% living in a single parent family and 2.6% receiving special education (Table 1). Children receiving care were older of age, more often boys, more often living in single parent families (39-47%) and following special education (11-22%). Ethnic background also differed from children not receiving youth care.

Table 1 Characteristics total population for analysis and split by type of youth care

characteristics	Total population 0-18	Primary youth care	Specialized youth care	Residential youth care
	n (%)	n (%)	n (%)	n (%)
Total	172,450 (100%)	16,480 (100%)	18,245 (100%)	3,170 (100%)
Gender (female)	84,440 (49%)	7,355 (44.6%)*[M]	7,550 (41.4%)*[M]	1,555 (49.1%)[M]
Ethnic background				
- Dutch	72,860 (42.3%)	6,100 (37.0%)[R]	9,030 (49.5%)[R]	1,360 (42.8%)[R]
- Moroccan	17,705 (10.3%)	1,920 (11.6%)*	1,520 (8.3%)*	190 (6.1%)*
- Turkish	13,955 (8.1%)	945 (5.7%)*	965 (5.3%)*	80 (2.6%)*
- Surinamese	11,385 (6.6%)	1,490 (9.0%)*	1,490 (8.2%)*	365 (11.5%)*
- Antillean	9,645 (5.6%)	1,820 (11.0%)*	1,375 (7.5%)*	420 (13.3%)*
- Other Non-Western	25,135 (14.6%)	2,670 (16.2%)*	2,185 (12.0%)*	450 (14.2%)
- Western	21,760 (12.6%)	1,535 (9.3%)*	1,680 (9.2%)*	300 (9.5%)
Family status				
- Two parent	99,555 (57.7%)	7,080 (43.0%)[R]	9,520 (52.2%)[R]	730 (23.0%)[N]
- Single parent	42,500 (24.6%)	7,790 (47.3%)*	7,360 (40.3%)*	1,225 (38.7%)
- Residential/ foster	1,590 (0.9%)	330 (2.0%)*	390 (2.1%)*	350 (11.1%)
- Other	3,880 (2.3%)	550 (3.3%)*	650 (3.6%)*	725 (22.9%)
- Missing	24,920 (14.5%)	730 (4.4%)*	325 (1.8%)	135 (4.3%)
Educational status child in 2015				
- Not yet at school age	34,465 (20.0%)	1,675 (10.2%)*	600 (3.3%)*	215 (6.7%)*
- Regular education	102,210 (59.3%)	10,555 (64.1%)[R]	13,710 (75.2%)[R]	1,855 (58.5%)[R]
- Special education	4,450 (2.6%)	1,795 (10.9%)*	2,325 (12.7%)*	690 (21.7%)*
- Off school age	5,340 (3.1%)	175 (1.0%)*	290 (1.6%)	115 (3.6%)*
- missing	25,985 (15.1%)	2,275 (13.8%)	1,320 (7.2%)	300 (9.5%)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Average age	9.9 (6.2)*	10.7 (5.3)*	12. (4.6)*	13.2 (5.4)

* Significant p < .01
[M] Male is reference category
[R] Reference category
[N] Not tested

Table 2 shows the average team characteristics (caseload, turnover, team size, team performance, team cohesion, transformational leadership) of the community-based support teams for children in the study population. Average team characteristics of the community-based support teams for children did not differ for most characteristics according to the youth care children did receive.

Table 2 Characteristics of community-based support teams split by type of youth care

Characteristics	**Total population 0-18**	**Primary youth care**	**specialized youth care**	**Residential youth care**
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Caseload	15 (6.7)	14 (6.6)*	14 (6.7)*	14 (6.9)
Turnover	0.6 (0.14)	0.6 (0.13)*	0.6 (0.14)*	0.6 (0.13)
Team size	18.4 (4.46)	18.9 (4.56)*	18.4 (4.55)*	18.8 (4.27)*
Team performance	7.5 (0.41)	7.4 (0.44)*	7.4 (0.43)*	7.4 (0.44)*
Team cohesion	4.0 (0.38)	4.0 (0.38)*	4.0 (0.39)*	4.0 (0.39)*
Transformational leadership	3.8 (0.48)	3.8 (0.49)	3.8 (0.49)	3.7 (0.49)

* Significant p < .01

The change in the use of primary youth care, specialist youth care and residential care over the years is illustrated in figure 1. The use of primary youth care has increased from 2015 to 2018 from 2.2% to 8.5%. The use of specialist youth care decreased from 7,2% to 6,4%. Residential youth care fluctuated slightly and was 1.2% in 2015 as well as 2018 (see supplemental table I).

<figure 1>

Figure 1. Types of youth care use across years

Table 3 shows an increase in primary youth care use (OR 1.70, 99%CI 1.67-1.73). Further a small decrease over time was found in specialist youth care use (OR 0.98, 99%CI 0.97-1.00) as well as a small increase over time in residential youth care use (OR 1.04, 99%CI 1.01-1.06).

Table 3. Adjusted associations of individual and neighbourhood team characteristics with youth care service use

	Primary youth care	Specialist youth care	Residential youth care
	OR (99% CI)	OR (99% CI)	OR (99% CI)
Time (years)	1.70 (1.67-1.73)*	0.98 (0.97-1.00)*	1.04 (1.01-1.06) *
Neighbourhood team characteristics			
- Caseload	0.88 (0.84-0.92)*	1.04 (1.00-1.09)	1.02 (0.92-1.12)
- Turnover	1.50 (1.19-1.89)*	1.67 (1.42-2.19)*	0.83 (0.50-1.37)
- Team size	1.01 (1.00-1.01)	0.99 (0.98-0.99)*	1.01 (1.00-1.03)*
- Team performance	1.09 (0.99-1.20)	0.90 (0.82-0.97)*	1.04 (0.84-1.28)
- Team cohesion	0.94 (0.84-1.04)	0.94 (0.85-1.03)	0.80 (0.63-1.01)
- Transformational leadership	0.91 (0.85-0.98)*	1.04 (0.97-1.70)	0.99 (0.84-1.15)

Multivariate models were used, fully adjusted for individual characteristics (age, gender, ethnic background, educational status, family status) and community-based support teams characteristics. *=significant at p<0.01

Primary youth care was negatively associated with caseload (OR 0.88; CI (0.84-0.92) and leadership (OR 0.91; CI 0.85-0.98), and positively associated with turnover (OR 1.50; CI 1.19-1.89), meaning that children have higher odds to receive this type of care if their community-based support team has a low caseload, low transformational leadership and high turnover rate.

Specialized youth care was positively associated with turnover (OR 1.67; CI 1.42-2.19) and negatively associated with team size (OR 0.99; CI 0.98-0.99) and team performance ((OR 0.90; CI 0.82-0.97), meaning that children have higher odds to receive this type of care if their community-based support team has higher turnover, a smaller team size and lower evaluation of their team performance.

Residential youth care was only positively associated with team size (OR 1.01: CI 1.00-1.03), meaning that children have higher odds to receive this type of care if their community-based support team has a larger team size.

The only significant interaction term of community-based support teams characteristics and time was for team size, indicating a larger team size was associated with a stronger decrease in use of primary youth care over time. However, the association was very small (OR 1.00; CI 0.98-1.00) (see supplementary table II).

Discussion and conclusion

We studied the change in use of three types of youth care in time, and the possible role of team characteristics of community-based support teams in these changes, in the city of Rotterdam (The Netherlands) from 2015 through 2018. Our data show an increase in use of primary youth care and residential youth care, and a decrease in the use of specialised youth care. Some characteristics of community-based support teams showed a negative (caseload, team performance, transformational leadership) or positive (turnover) or both negative and positive (team size) significant associations with the use of the three youth care types after controlling for individual child characteristics. Team size was the only characteristic that showed a small negative significant association with change in youth care use over time for primary youth care use.

Our study shows an increase in time in the use of primary youth care, which is exclusively provided by community-based support teams. An annual increase was found, although a sharper increase is visible between 2016 and 2017. This specific finding might be (partly) due to registration artefacts as working with digital client systems for newly implemented community-based support teams may have been lagging behind.

Rising use of child and adolescent mental health services have been reported in several studies over the last years in several Western countries. Studies in Finland over the period 1989 – 2013 found a rise from 2.4% to 11.0% in parent reported mental health service use for 8 year olds[1, 19] In the USA outpatient care for 6-17-year olds between 1996 and 2012 increased from an annual 9.2% to 13.3%[4]. In Canada yearly surveys between 2011-2018 among Canadian youth between 12-24 years of age revealed an increase in mental health consultations from 12 to 18%[20]. In the Netherlands the rise in use of child and adolescent mental health services from 3.5% to 5.9% has been reported between 1993 and 2003[21]. Also a rising trend in institutionalized care between 2002 and 2006 in a study in nine European countries, including the Netherlands[22].

Explanations for these increases in service use are generally not found in an increase in psychosocial or mental health problems among youth, although some small increases in psychosocial problems are found in some studies and gaps between need for care and care use are still observed[1, 19, 20]. In The Netherlands general population based studies do not indicate large increases in parent, teacher or self-reported emotional and behavioural problems in the last few decades[23-26]. Enabling factors on the contextual level may explain the changes in the observed youth care use patterns[8, 9]. The community-based support teams may have increased the availability, accessibility and acceptability for primary youth care, which may have resulted in a reduced gap between those in need for care and actually receiving care. Earlier studies found improved access to care as a result of integrated forms of care[27, 28] and co-location of social workers[29]. A higher degree of coordination between different child and youth services were found to contribute to increased service use and diminishing ethnic disparities[30]. Indeed, more integrated services for adolescents and young adults in Australia, Ireland and the UK have been evaluated positively and were seen to improve access rates to care[31]. The community-based support teams in Rotterdam offer their services in the direct proximity of their clients. They are closely collaborating with other youth service providers in the community and they provide integrated care including social support for parents and adults. This may have contributed to the prevention of more serious problems needing specialized youth care. However, the increase in primary youth care use and decrease in specialized youth care use we found could also be due to an increased competence of community-based support teams or an increased familiarity of these teams in the communities they serve.

In our study we find team characteristics to be associated with the three studied types of youth care, yet no clear associations of any of these characteristics with changes in youth care use over time. Although we know from studies in the public administration field that the team characteristics we studied are associated with team functioning, these characteristics did not explain changes in youth care use over time Possible explanations for this finding include little variability between teams in the characteristics or the fact that characteristics were only measured at one moment in time. Research on the role of professional teams on patterns of different forms of youth care is limited to a few implementation studies that show the relevance of interprofessional communication and collaboration for successful provision of integrated care[32-34]. Stiffman found provider knowledge of resources and providers burden to explain mental health service use[35]. We did not include interprofessional communication and collaboration or providers knowledge of resources as measures in our study. However, caseload certainly is an indication of providers burden and social cohesion and team performance probably are a condition for good interprofessional communication and collaboration. Still, we did not find associations of these team characteristics with youth care use over time.

Our study is one of the limited number of studies on contextual determinants of youth care use. It has a number of strengths. We did not rely on self-reported data but on registry data that are gathered from youth care providers by the Dutch statistics agency based on the Youth Act. Our data are population-based and constitute a large sample. Because of the nature of our data there are also limitations. Registry data can be incomplete or hold mistakes. Because of missing data on individual characteristics, we had to exclude many records (27%) in the analysis. Another limitation is that team characteristics were measured in 2016 a year after the teams were set up. The team characteristics precede the reports on youth care use in the other years but may not have been stable in time. Further, the team characteristics have been included in the analysis on the individual level. Therefore, our findings

need to be interpreted with care. Further research in the role of contextual factors on patterns of youth care use is warranted.

Our study shows an increase in use of primary youth care use and to a lesser extent in residential youth care as well as a decrease in specialized youth care use since 2015, when community-based support teams were introduced in the Netherlands. Characteristics of community-based support teams were found to be associated with the prevalence of different types of youth care use. However, little evidence was found for the role of team characteristics on changes in youth care use in time. Our study finds trends in youth care use and adds to the sparse evidence on contextual determinants for youth care use.

Contributors

CLM and WJ wrote the manuscript with input from ALvZ. Data analysis and drafting of tables and figures was done by CLM and JvdE with the input from MS. CLM, JvdE, BS and WJ were involved in the study design and conception. WJ oversaw the study. All authors were involved in data interpretation and manuscript revision.

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Competing Interests

None declared.

Data availability statement

All data relevant to the study are included in the manuscript and supplementary files. Statistics Netherlands is owner of the registration data. Request for access can be directed at Statistics Netherlands.

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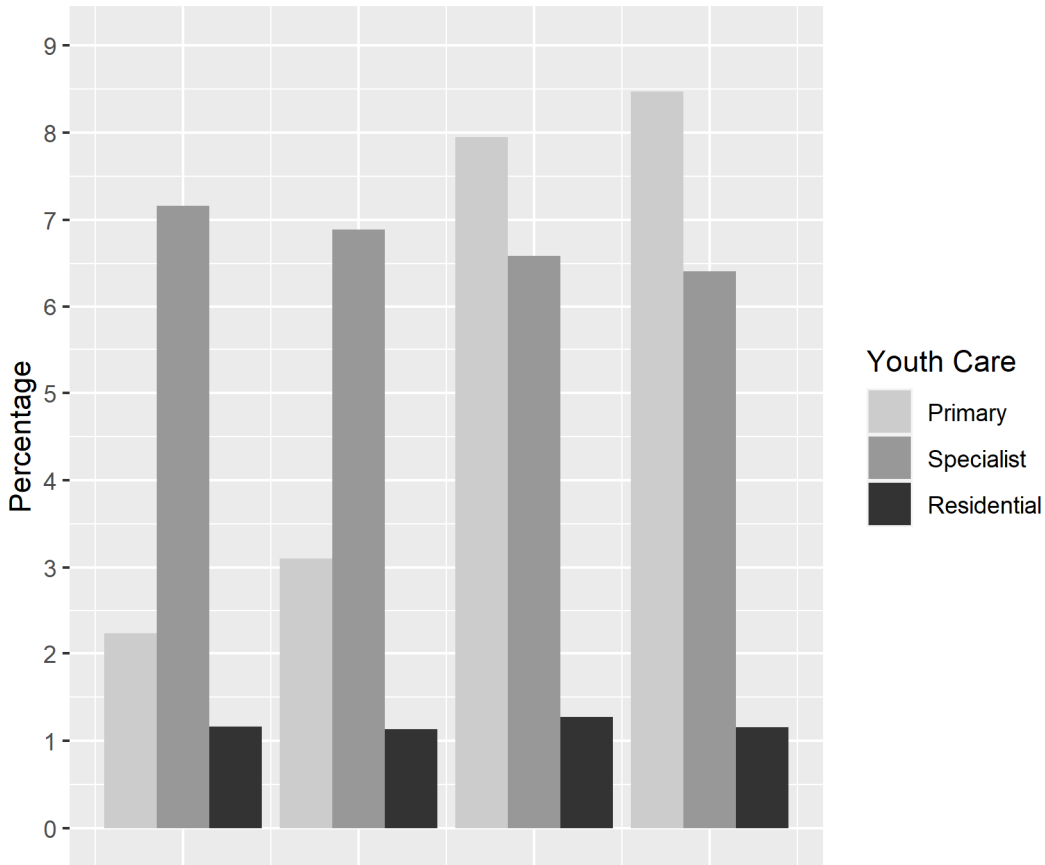
Percentage
0
1
2
3
4
5
6
7
8
9
2015
2016
2017
2018
Year
Youth Care
Primary
Specialist
Residential

Supplemental Table I Different types of youth care use in time

year	Total population 0-18	Primary youth care	Specialist youth care	Residential youth care
	N	N(%)	N(%)	N(%)
2015	106,689	2,380 (2.2%)	7,643 (7.2%)	1,238 (1.2%)
2016	116,782	3,620 (3.1%)	8,041 (6.9%)	1,326 (1.1%)
2017	116,508	9,263 (8.0%)	7,677 (6.6%)	1,482 (1.3%)
2018	115,617	9,795 (8.5%)	7,411 (6.4%)	1,332 (1.2%)

Supplemental Table II Associations between time and community-based support teams characteristics across type of youth care use

	Primary youth care	Specialist youth care	Residential youth care
	OR (99% CI)	OR (99% CI)	OR (99% CI)
Time (years)	1.85 (1.34-2.56)*	1.04 (0.80-1.36)	1.12 (0.72-1.75)
Neighbourhood team characteristics			
- Caseload	0.87 (0.80-0.95) *	1.04 (0.98-1.10)	0.98 (0.87-1.11)
- Turnover	1.40 (0.93-2.12)	1.63 (1.22-2.18)*	0.61 (0.33-1.13)
- Team size	1.02 (1.01-1.03) *	0.99 (0.98-0.99)*	1.02 (1.00-1.04)*
- Team performance	1.12 (0.95-1.31)	0.91 (0.82-1.02)	1.09 (0.85-1.40)
- Team cohesion	0.87 (0.72-1.04)	0.97 (0.85-1.11)	0.82 (0.62-1.10)
- Transformational leadership	0.97 (0.85-1.10)	1.00 (0.92-1.10)	0.94 (0.77-1.14)
Time by neighbourhood team characteristics			
- Time by Caseload	1.0 (0.97-1.04)	1.0 (0.97-1.03)	1.02 (0.98-1.07)
- Time by Turnover	1.03 (0.88-1.20)	1.06 (0.93-1.20)	1.20 (0.98-1.48)
- Time by Team size	1.00 (0.99-1.00)*	1.00 (1.00-1.01)	1.00 (0.99-1.00)
- Time by Team performance	0.99 (0.94-1.05)	0.99 (0.94-1.04)	0.97 (0.89-1.05)
- Time by Team Cohesion	1.03 (0.96-1.10)	0.97 (0.94-1.04)	0.98 (0.89-1.09)
- Time by Transformational leadership	0.980.93-1.03)	1.02 (0.98-1.07)	1.03 (0.97-1.10)

Multivariable models were fit, fully adjusted for individual characteristics (age, gender, ethnic background, educational status, family status) and community-based support teams characteristics. All variables and interactions were entered simultaneously.

*=significant at p<0.01

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Changes in Youth Care use after the implementation of community-based support teams: repeated measurement study using registry data and data on team characteristics

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Changes in Youth Care use after the implementation of community-based support teams: repeated measurement study using registry data and data on team characteristics

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Abstract

Objectives. New legislation on Youth Care in The Netherlands led to the implementation of community-based support teams, providing integrated primary Youth Care. Important aims of the new Youth Act were more integrated, timely care and less use of intensive forms of care. Our aim was to study changes in Youth Care use in time, and the role of newly introduced community-based support teams herein.

Setting. Register data (2015 through 2018) on youth of a large city were linked and combined with administrative and aggregated data on team characteristics.

Participants. Data on 126,095 youth (0-18 years) were available for analyses.

Primary and secondary outcome measures. Primary, specialized and residential Youth Care use were the primary outcomes.

Results. GEE analyses adjusted for individual characteristics demonstrated that over four years, use of primary Youth Care increased from 2.2% to 8.5% (OR 1.70; CI 1.67-1.73), specialized Youth Care decreased from 7.2% to 6.4% (OR 0.98; CI 0.97-1.00), residential Youth Care increased slightly (OR 1.04; CI 1.01-1.06). Gender, age, family status, migrant background and educational level were all associated with the types of Youth Care use and also with some trends in time. Likelihood to receive care increased in time for preschool and younger children but did not improve for migrant children.

Case load, team size, team turnover, team performance and transformational leadership showed significant associations with different types of Youth Care use, but hardly with trends in time.

Conclusion. Patterns of Youth Care use changed towards more locally provided primary Youth Care, slightly less specialized and slightly more residential Youth Care. Furthermore, Youth Care use among younger children increased in time. These trends are partly in line with the trends intended by the Youth Act. Little evidence was found for the role of specific team characteristics on changes in Youth Care use in time.

Strengths and limitations of this study

- Our study is one of the few studies including contextual determinants of Youth Care use.
- Registry data on a large population was available for analyses.
- Only time trends after (and not before) a major change in the Youth Care system were available.
- Time trends were studied over a limited time period (2015-2018).

Introduction

Youth Care use has increased in several Western countries in the recent decades[1-4]. In the Netherlands, for example, the percentage of children (0-18 years of age) using mental health and parenting support services increased from 4% in 2000 to 12% in 2018[5]. The Youth Care system in The Netherlands was drastically reformed in 2015 in response to this increased need for Youth Care and to overcome the fragmentation of the former system of Youth Care.[6, 7] The fragmentation encompassed the allocation of funding and responsibilities at different governance levels (central, regional, municipal) and medical insurance companies, which also resulted in shortcomings in integrated care and collaboration between professionals.
New legislation arranged the transfer of the responsibility and funding for the provision of Youth Care from the national and regional governmental levels and health insurance suppliers to the municipalities.[8] The aims of the new Youth Act were to improve integrated care, timeliness and proximity of care[9]. Other aims were to improve the prevention of psychosocial problems, reduce medicalization and to reduce the use of more intensive forms of Youth Care use by empowering youth and their families.[10] Furthermore, the Youth Act aimed at more collaboration in the chain of care and more professional space and lower administrative burden to provide the care and support that is needed.

To deal with these responsibilities, the majority of the Dutch municipalities implemented community-based support teams[9]. These community-based support teams offer a broad integrated range of services because of their multidisciplinary composition. They typically consist of professionals with different expertise such as child safety, youth mental care, mental and behavioral care and support for children with mild intellectual disabilities parenting, welfare and financial support and typically operate at the local neighborhood level, reaching out if necessary[11]. They focus on empowerment of families and involving and strengthening the social network. Their main functions are to provide accessible support by offering consultation, advice, primary mental health care, ambulatory (parenting) support and basic diagnostics. They serve as linking pin between universal services and specialized Youth Care and coordinate support of families in collaboration with other services (schools, general practitioners, financial support, adult mental health services)[12]. If needed children and families are referred to specialized forms of ambulatory or residential Youth Care like specialized mental health care and parenting support services, to specialized Youth Care services for children and parents with mild or more serious intellectual disabilities and to youth protection or probation services. The assumption is that the deployment of community-based support teams leads to more accessible, timely, integrated and empowering care. This is expected to result in less intensive forms of Youth Care (more primary and less specialized and residential Youth Care).

Evaluation of these expected benefits needs to take into account the individual and contextual factors influencing the use of Youth Care apart from the reform in Youth Care[13, 14]. In the theoretical models of both Andersen[14] and Stiffman[13] apart from the (perceived) need for care, enabling and predisposing factors are distinguished at both the individual and contextual levels. Factors on the individual level that have been shown to be associated with youth mental health services include age, gender and ethnic background of the child, and family and caregiver characteristics including family composition and socio-economic characteristics[15-17].

Contextual factors include the Youth Care system itself. Successful performance of community-based support teams is likely to be influenced by team characteristics and processes[18]. Studies in the public administration field on teams in the social domain have shown that team size, stability and leadership affect how well team members work together, with cohesiveness being a vital element of team functioning[18-21]. A larger team size potentially benefits the delivery of care services through the larger pool of resources[20]. A lack of stability in team membership due to high turnover rates demotivates team members and thus acts as a barrier[18]. Strong transformational leadership also contributes to effective team performance[18], through efforts to 'transform' individual aspirations into the overall vision of the team[21]. Team cohesion is characterized by strong unitedness in achieving shared goals and emphasis on the team members' social relationships[19]. Further, a high caseload of the team poses risks for suboptimal performance[22].

In this paper, the research question to be answered is: Is there a change over time in use of different types of Youth Care since the reform in 2015 and are sociodemographic characteristics and characteristics of the community-based support teams associated with change?

Methods

Study design

Microdata from Statistics Netherlands were linked over the years 2015-2018 (see supplementary table I). Under strict conditions, these microdata are accessible for statistical and scientific research. Pseudonymised administrative information on the individual level about sociodemographic characteristics and youth health care use of the youth population registered in Rotterdam any time in this four-year time-period has been used.

No ethics approval or consent to participate was necessary, as these data are publicly available.

Aggregated data at team level on team characteristics were available from an earlier study, in which data were collected in 2016 through an online survey among 363 professionals of 42 community-based support teams within Rotterdam[11]. Response rate per team ranged between 27% and 81% with a mean of 50%. Administrative data on team size in June 2016 were available from the municipality of Rotterdam as well as administrative data on caseload and turnover in 2015. Data on team characteristics were linked to the individual microdata-records by pseudonymised postal code of the home address.

Patient and Public Involvement

Discussions with local stakeholders from practice and policy preceded and shaped the formulation of the research question.

Study population

In this study, we included all children of 0-18 years old on the 1st of January in 2015 registered as living in Rotterdam (n=172,448). Children with missing data on educational level (n=25,985) or family status (n=24,920) were excluded. The study population consisted of 126,095 children.

Use of Youth Care

The outcome measure was the use of Youth Care in the consecutive years 2015 through 2018. Youth Care included:

- primary Youth Care: locally provided care by the community-based support teams, including family and youth coaching and social support, basic mental health care and basic parenting support, as well as coordination of integrated care, also on multiple domains if needed.
- specialized Youth Care: ambulatory or day care focussing on parenting problems and/or mental health and behavioural problems with a referral from a medical doctor or community-based support team including specialized mental health care, specialized parenting support, specialized care for youth with (mild) intellectual disabilities.
- residential Youth Care: institutional care (institutional or family-based treatment groups, emergency care, assisted living), foster care.

Individual characteristics

Demographic characteristics included child gender, age, ethnic background, educational level, family status and neighbourhood. Demographic characteristics were determined at the 1st of January of 2015.

Ethnic background

In accordance with the classification system used by Statistics Netherlands, a child's ethnic background was classified as Dutch when both parents were born in the Netherlands and as non-Dutch when one or both parents were born outside the Netherlands.

Educational level

Children up to 4 years old were classified as 'not yet at school age'. Children with a basic qualification or over 18 years old without a school registration were classified as 'Off school age'. Children registered as following special (primary or secondary) education were classified as 'Special Education'. All other children were classified as 'Regular education'.

Family status

Family status was classified in 5 levels, namely two parent family (when the child lives with two adults who are living together), single parent family (when there was one parent in the household with one or more children), Residential or foster care (a household of one or more persons who are professionally provided with housing and daily necessities of life), other (Private household consisting exclusively of members other than family and unknown).

Team characteristics

Information about team characteristics and leadership included team size, turnover, average caseload, transformational leadership perceived team performance, team cohesion.

Caseload

Caseload was calculated by the mean amount of cases per month divided by the mean amount of FTE per team in 2015.

Turnover

Turnover rate was calculated as the sum of persons leaving the team and persons entering team divided by the average number of persons in the team in 2015.

Team size

Team sizes were obtained from the municipality's administration and ranged between 7 and 26 team members with on average 18 team members.

Team performance

Team performance was assessed based on the "employee judgment of effectiveness" scale[23]. Professionals were asked to grade their team on six effectiveness indicators like "the quality of care provided by our team" on a ten-point Likert-type scale with 10 as highest score corresponding to excellent (range 6.13 to 8.5; Cronbach's alpha .90).

Team cohesion

Team cohesion was measured using five items inspired by Carless' and De Paola's measure for team cohesion [24]. Items like "Our team is united in trying to reach its goals for performance" were scored on a five-point Likert scale with highest scores indicating high team cohesion (range 3.29 to 5.00; Cronbach's alpha .89).

Transformational leadership

Transformational leadership was measured using five items. The items were based on the transformational leadership scale by Jensen et al. (2019) and an example item is "our supervisor strives to get the team work together to realize its vision". The responses were given on a five-point Likert scale with highest scores indicating good leadership (range 2.50 to 4.67; Cronbach's alpha .91).

Statistical analyses

A repeated measures logistic regression analysis was conducted, using Generalized Estimating Equations (GEE). For the outcomes, i.e. the three types of Youth Care (primary, specialized and residential) separate models were fit. Firstly, univariable models were run with time, individual characteristics and team characteristics as separate predictors. Thereafter, multivariable models were performed including time, individual characteristics and community-based support team characteristics at the individual level. Because residential care was part of the characteristic family status, family status was not entered in models for residential care. Finally, interactions of time with sociodemographic characteristics and with community-based support teams characteristics were tested in order to answer our research question, whether sociodemographic characteristics and characteristics of community-based support teams influence a change over time in use of different types of Youth Care.

The statistical significance level was defined as a p-value below 0.01 (two-tailed). Analyses were performed using R version 3.5.3.

Results

The study population consisted of children with diverse ethnic backgrounds, with 24.6% living in a single parent family and 2.6% receiving special education (Table 1). Children receiving care were older of age, more often boys, more often living in single parent families (39-47%) and following special education (11-22%). Ethnic background also differed from children not receiving Youth Care.

Table 1 Characteristics total population for analysis and split by type of Youth Care

characteristics	Total population 0-18	Primary Youth Care	Specialized Youth Care	Residential Youth Care
	n (%)	n (%)	n (%)	n (%)
Total	172,450 (100%)	16,480 (100%)	18,245 (100%)	3,170 (100%)
Gender (female)	84,440 (49%)	7,355 (44.6%)*	7,550 (41.4%)*	1,555 (49.1%)
Ethnic background				
- Dutch	72,860 (42.3%)	6,100 (37.0%) R	9,030 (49.5%) R	1,360 (42.8%) R
- Moroccan	17,705 (10.3%)	1,920 (11.6%)*	1,520 (8.3%)*	190 (6.1%)*
- Turkish	13,955 (8.1%)	945 (5.7%)*	965 (5.3%)*	80 (2.6%)*
- Surinamese	11,385 (6.6%)	1,490 (9.0%)*	1,490 (8.2%)*	365 (11.5%)*
- Antillean	9,645 (5.6%)	1,820 (11.0%)*	1,375 (7.5%)*	420 (13.3%)*
- Other Non-Western	25,135 (14.6%)	2,670 (16.2%)*	2,185 (12.0%)*	450 (14.2%)
- Western	21,760 (12.6%)	1,535 (9.3%)*	1,680 (9.2%)*	300 (9.5%)
Family status				
- Two parent	99,555 (57.7%)	7,080 (43.0%) R	9,520 (52.2%) R	730 (23.0%) N
- Single parent	42,500 (24.6%)	7,790 (47.3%)*	7,360 (40.3%)*	1,225 (38.7%)
- Residential/ foster	1,590 (0.9%)	330 (2.0%)*	390 (2.1%)*	350 (11.1%)
- Other	3,880 (2.3%)	550 (3.3%)*	650 (3.6%)*	725 (22.9%)
- Missing	24,920 (14.5%)	730 (4.4%)*	325 (1.8%)	135 (4.3%)
Educational status child in 2015				
- Not yet at school age	34,465 (20.0%)	1,675 (10.2%)*	600 (3.3%)*	215 (6.7%)*
- Regular education	102,210 (59.3%)	10,555 (64.1%) R	13,710 (75.2%) R	1,855 (58.5%) R
- Special education	4,450 (2.6%)	1,795 (10.9%)*	2,325 (12.7%)*	690 (21.7%)*
- Off school age	5,340 (3.1%)	175 (1.0%)*	290 (1.6%)	115 (3.6%)*
- missing	25,985 (15.1%)	2,275 (13.8%)	1,320 (7.2%)	300 (9.5%)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Average age	9.9 (6.2)*	10.7 (5.3)*	12. (4.6)*	13.2 (5.4)

* Significant p < .01
R Reference category
N Not tested

Table 2 shows the average team characteristics (caseload, turnover, team size, team performance, team cohesion, transformational leadership) of the community-based support teams for children in the study population. Average team characteristics of the community-based support teams did not differ for the types of Youth Care children did receive.

Table 2 Characteristics of community-based support teams split by type of Youth Care

Characteristics	**Total population 0-18**	**Primary Youth Care**	**specialized Youth Care**	**Residential Youth Care**

	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Caseload	1.5 (0.67)	1.4 (0.66)*	1.4 (0.67)*	1.4 (0.69)
Turnover	0.6 (0.14)	0.6 (0.13)*	0.6 (0.14)*	0.6 (0.13)
Team size	18.4 (4.46)	18.9 (4.56)*	18.4 (4.55)*	18.8 (4.27)*
Team performance	7.5 (0.41)	7.4 (0.44)*	7.4 (0.43)*	7.4 (0.44)*
Team cohesion	4.0 (0.38)	4.0 (0.38)*	4.0 (0.39)*	4.0 (0.39)*
Transformational leadership	3.8 (0.48)	3.8 (0.49)	3.8 (0.49)	3.7 (0.49)
* Significant p < .01				

The change in the use of primary Youth Care, specialized Youth Care and residential care over the years is illustrated in figure 1. The use of primary Youth Care increased from 2015 to 2018 from 2.2% to 8.5%. The use of specialized Youth Care decreased from 7,2% to 6,4%. Residential Youth Care fluctuated slightly and was 1.2% in 2015 as well as 2018 (see supplemental table II).

<figure 1>

Figure 1. Types of Youth Care use across years

Table 3 shows an increase in primary Youth Care use (OR 1.70, 99%CI 1.67-1.73). Further a small decrease over time was found in specialized Youth Care use (OR 0.98, 99%CI 0.97-1.00) as well as a small increase over time in residential Youth Care use (OR 1.04, 99%CI 1.01-1.06).

Boys, younger children, children from non-two parent families, children form most migrant backgrounds and children following special education were more likely to receive Primary Youth Care. Preschool children and no longer school-aged children were less likely to receive primary Youth Care. Regarding characteristics and functioning of community-based support teams, primary Youth Care was negatively associated with caseload (OR 0.88; CI (0.84-0.92) and leadership (OR 0.91; CI 0.85-0.98), and positively associated with turnover (OR 1.50; CI 1.19-1.89), meaning that children were more likely to receive this type of care if their community-based support team had a low caseload, low transformational leadership and high turnover rate.

Specialized Youth Care was more likely to be provided to boys, older children, children form non-two parent families and children following special education. It was less likely to be provided to children from most migrant backgrounds, preschool children and no longer school-aged children. Regarding characteristics and functioning of community-based support teams, specialized Youth Care was positively associated with turnover (OR 1.67; CI 1.42-2.19) and negatively associated with team size (OR 0.99; CI 0.98-0.99) and team performance ((OR 0.90; CI 0.82-0.97), meaning that children were more likely to receive this type of care if their community-based support team had higher turnover, a smaller team size and lower evaluation of their team performance.

Residential Youth Care was more likely to be received by girls, older children, children following special education and no longer school-aged youth. Children from some migrant background were more likely to receive residential care (Surinam and Antillean background) while others were less likely to receive it (Moroccan and Turkish background. With regard to characteristics and functioning of community-based support teams, residential Youth Care was only positively associated with team size (OR 1.01: CI 1.00-1.03). This means that children were more likely to receive this type of care if their community-based support team had a larger team size.

Table 3. Adjusted associations of time, individual and community-based support team characteristics with Youth Care service use

	Primary Youth Care	Specialized Youth Care	Residential Youth Care
	OR (99% CI)	OR (99% CI)	OR (99% CI)
Time (years)	**1.70 (1.67-1.73)**	**0.98 (0.97-1.00)**	**1.04 (1.01-1.06)**
Individual characteristics			
- gender (female vs male)	**0.89 (0.85-0.94)**	**0.76 (0.72-0.79)**	**1.29 (1.15-1.44)**

- age	**0.96 (0.95-0.96)**	**1.01 (1.01-1.02)**	**1.08 (1.07-1.09)**
- single parent (vs two parent)	**2,44 (2.31-2.58)**	**1.67 (1.59-1.76)**	
- residential (vs two parent)	**2.51 (2.05-3.08)**	**1.66 (1.37-2.01)**	
- different family type (vs two parent)	**2.47 (2.14-2.86)**	**1.73 (1.53-1.97)**	
- Moroccan background (vs Dutch)	**1.17 (1.08-1.28)**	**0.53 (0.48-0.57)**	**0.40 (0.31-0.51)**
- Turkish background (vs Dutch)	**0.75 (0.67-0.84)**	**0.39 (0.35-0.44)**	**0.24 (0.17-0.35)**
- Surinam background (vs Dutch)	**1.19 (1.08-1.31)**	**0.72 (0.66-0.78)**	**1.29 (1.08-1.56)**
- Antillean background (vs Dutch)	**1.69 (1.54-1.86)**	**0.77 (0.70-0.85)**	**1.93 (1.61-2.32)**
- Other non-Western background (vs Dutch)	**1.11 (1.03-1.20)**	**0.57 (0.53-0.62)**	0.94 (0.79-1.12)
- Western background (vs Dutch)			
- Not yet school-aged (vs attending regular school)	**0.91 (0.83-1.00)** **0.48 (0.43-0.53)**	**0.68 (0.62-0.73)** **0.18 (0.15-0.20)**	0.85 (0.69-1.04) 0.89 (0.66-1.21)
- Attending special education (vs attending regular school)	**5.03 (4.61-5.47)**	**6.51 (6.05-7.01)**	**9.30 (8.11-10.67)**
- No longer school-aged (vs attending regular school)	**0.71 (0.55-0.91)**	**0.83 (0.69-0.99**)	**1.31 (0.98-1.76)**
-			
Community-based support team characteristics			
- Caseload	**0.88 (0.84-0.92)**	1.04 (1.00-1.09)	1.02 (0.92-1.12)
- Turnover	**1.50 (1.19-1.89)**	**1.67 (1.42-2.19)**	0.83 (0.50-1.37)
- Team size	1.01 (1.00-1.01)	**0.99 (0.98-0.99)**	**1.01 (1.00-1.03)**
- Team performance	1.09 (0.99-1.20)	**0.90 (0.82-0.97)**	1.04 (0.84-1.28)
- Team cohesion	0.94 (0.84-1.04)	0.94 (0.85-1.03)	0.80 (0.63-1.01)
- Transformational leadership	**0.91 (0.85-0.98)**	1.04 (0.97-1.70)	0.99 (0.84-1.15)

Multivariate models were used, fully adjusted for individual characteristics and community-based support teams characteristics. For residential Youth Care family status was left out of the model. **bold**=significant at p<0.01

Table 4 shows trends in time for Youth Care use differed according to sociodemographic characteristics.

The likelihood to receive primary Youth Care increased in time for boys, younger children, preschool children and children receiving special education, while it decreased in time for children of single parent families and children of certain migrant backgrounds (Moroccan and other-non-Western). The likelihood to receive specialized Youth Care increased in time for girls as well as for younger children. It decreased in time for children in special education and no longer school-aged youth. The likelihood to receive specialized Youth Care did not change in time according to family status of migrant background.

The likelihood to receive residential Youth Care decreased in time for no longer school-aged youth and older children.

The only significant interaction term of community-based support teams characteristics and time was for team turnover, indicating a higher team turnover was associated with a stronger increase in use of residential Youth Care over time.

Table 4. Adjusted associations with Youth Care service use of time, individual and community-based support team characteristics and its interactions with time

	Primary Youth Care	Specialized Youth Care	Residential Youth Care
	OR (99% CI)	OR (99% CI)	OR (99% CI)
Time (years)	**2.06 (1.50-1.73)**	**1.79 (1.38-2.33)**	**1.59 (1.01-2.50)**
Individual characteristics			
- gender (female vs male)	0,97 (0.89-1.06)	**0.71 (0.67-0.75)**	**1.32 (1.15-1.52)**
- age	**0.99 (0.98-1.00)**	**1.09 (1.08-1.09)**	**1.13 (1.11-1.16)**
- single parent (vs two parent)	**3,03 (2.75-3.34)**	**1.65 (1.54-1.76)**	
- residential (vs two parent)	**2.62 (1.81-3.80)**	**1.76 (1.34-2.32)**	
- different family type (vs two parent)	**2.56 (1.96-3.35)**	**1.66 (1.39-1.99)**	
- Moroccan background (vs Dutch)	**1.64 (1.42-1.90)**	**0.53 (0.47-0.59)**	**0.42 (0.31-0.56)**
- Turkish background (vs Dutch)	**0.75 (0.61-0.92)**	**0.41 (0.36-0.47)**	**0.24 (0.16-0.36)**
- Surinam background (vs Dutch)	**1.32 (1.13-1.55)**	**0.69 (0.61-0.77)**	1.16 (0.92-1.45)
- Antillean background (vs Dutch)	**1.92 (1.65-2.25)**	**0.71 (0.63-0.81)**	**1.88 (1.50-2.36)**
- Other non-Western background (vs Dutch)	**1.31 (1.15-1.50)**	**0.56 (0.50-0.62)**	0.84 (0.67-1.04)
- Western background (vs Dutch)	0.87 (0.73-1.04)	**0.66 (0.59-0.74)**	0.78 (0.61-1.00)
- Not yet school-aged (vs attending regular school)	**0.35 (0.29-0.44)**	**0.14 (0.11-0.20)**	0.99 (0.62-1.58)
- Attending special education (vs attending regular school)	**3.21 (2.79-3.71)**	**7.77 (7.07-8.54)**	**10.17 (8.62-12.00)**
- No longer school-aged (vs attending regular school)	1.22 (0.82-1.83)	**1.52 (1.23-1.88)**	**3.11 (2.25-4.31)**
Neighbourhood team characteristics			
- Caseload	**0.89 (0.82-0.96)**	1.04 (0.98-1.10)	0.98 (0.87-1.10)
- Turnover	**1.57 (1.04-2.37)**	**1.57 (1.17-2.11)**	**0.51 (0.27-0.95)**
- Team size	**1.01 (1.00-1.02)**	**0.99 (0.98-0.99)**	**1.02 (1.00-1.04)**
- Team performance	1.05 (0.90-1.23)	0.91 (0.81-1.02)	1.10 (0.86-1.42)
- Team cohesion	0.89 (0.74-1.07)	0.96 (0.85-1.10)	0.84 (0.62-1.12)
- Transformational leadership	0.98 (0.87-1.12)	1.01 (0.92-1.11)	0.99 (0.94-1.03)
Time by individual characteristics			
- Time by gender	**0.97 (0.94-1.00)**	**1.04 (1.01-1.07)**	0.99 (0.94-1.03)
- Time by age	**0.98 (0.98-0.99)**	**0.96 (0.95-0.96)**	**0.98 (0.97-0.98)**
- Time by single parent	**0.92 (0.89-0.95)**	1.01 (0.98-1.04)	
- Time by residential	0.99 (0.84-1.16)	0.97 (0.85-1.12)	
- Time by different family type	0.99 (0.89-1.10)	1.04 (0.96-1.14)	
- Time by Moroccan background	**0.87 (0.83-0.92)**	0.98 (0.94-1.03)	0.99 (0.90-1.10)
- Time by Turkish background	1.00 (0.93-1.07)	0.96 (0.90-1.02)	1.02 (0.90-1.15)
- Time by Surinam background	0.96 (0.90-1.01)	1.02 (0.97-1.07)	1.07 (1.00-1.16)
- Time by Antillean background	0.95 (0.89-1.01)	1.05 (0.99-1.11)	1.03 (0.95-1.11)
- Time by Other non-Western background	**0.93 (0.89-0.98)**	1.00 (0.96-1.05)	1.06 (0.98-1.14)
- Time by Western background	1.01 (0.95-1.08)	1.01 (0.96-1.06)	1.04 (0.95-1.12)
- Time by Not yet school-aged	**1.12 (1.04-1.21)**	1.01 (0.90-1.15)	0.98 (0.84-1.13)
- Time by Attending special education	**1.22 (1.15-1.29)**	**0.88 (0.85-0.92)**	0.95 (0.90-1.01)
- Time by No longer school-aged	**0.80 (0.68-0.95)**	**0.57 (0.50-0.65)**	**0.53 (0.44-0.65)**
Time by community-based support team characteristics			
- Time by Caseload	1.0 (0.97-1.03)	1.00 (0.98-1.03)	1.03 (0.99-1.07)
- Time by Turnover	0.98 (0.84-1.14)	1.06 (0.93-1.20)	**1.23 (1.01-1.51)**
- Time by Team size	1.00 (0.99-1.00)	1.00 (1.00-1.01)	1.00 (0.99-1.00)
- Time by Team performance	1.02 (0.96-1.08)	1.00 (0.95-1.05)	0.98 (0.90-1.06)
- Time by Team Cohesion	1.02(0.95-1.09)	0.97 (0.91-1.03)	0.97 (0.88-1.07)
- Time by Transformational leadership	0.97(0.93-1.02)	1.01 (0.98-1.05)	1.03 (0.97-1.10)

Multivariate models were used, fully adjusted for individual characteristics and community-based support teams characteristics. For residential Youth Care family status was left out of the model. **bold**=significant at p<0.01

Discussion and conclusion

We studied the change in use of three types of Youth Care in time, and the possible role of sociodemographic characteristics and characteristics of community-based support teams in these changes, in the city of Rotterdam (The Netherlands) from 2015 through 2018. Our data show an increase in use of primary Youth Care and residential Youth Care, and a decrease in the use of specialised Youth Care. All sociodemographic characteristics were associated with Youth Care use. Boys, children from non-two parent families and children following special education were more likely to receive Youth Care, while preschool children and no longer school-aged youth were less likely to receive Youth Care. Children with a migrant background were more likely to receive primary Youth Care, whereas the likelihood to receive specialized and residential care differed according to country of origin. Some characteristics of community-based support teams showed a negative (caseload, team performance, transformational leadership) or positive (turnover) or both negative and positive (team size) significant associations with the use of the three Youth Care types after controlling for individual child characteristics..

In time the likelihood to receive Youth Care differed between children depending on sociodemographic characteristics. Among boys the likelihood to receive primary Youth Care increased whereas the likelihood to receive specialized Youth Care decreased. Among preschool children and younger children, the likelihood to receive specific types of Youth Care increased, while among no longer school-aged youth the likelihood decreased over time. Among children from single parent families and children of certain migrant backgrounds, the likelihood to receive primary Youth Care decreased over time. Characteristics and functioning of community-based support teams were not associated with changes of Youth Care use over time except for team turnover. High team turnover appeared to be associated with higher residential Youth Care use in time.

Our study shows an increase in time in the use of primary Youth Care, which is exclusively provided by community-based support teams. An annual increase was found, although a sharper increase is visible between 2016 and 2017. This specific finding might be (partly) due to registration artefacts as working with digital client systems for newly implemented community-based support teams may have been lagging behind.

Rising use of child and adolescent mental health services have been reported in several studies over the last years in several Western countries. Studies in Finland over the period 1989 – 2013 found a rise from 2.4% to 11.0% in parent reported mental health service use for 8 year olds[1, 25] In the USA outpatient care for 6-17-year olds between 1996 and 2012 increased from an annual 9.2% to 13.3%[4]. In Canada yearly surveys between 2011-2018 among Canadian youth between 12-24 years of age revealed an increase in mental health consultations from 12 to 18%[26]. In the Netherlands the rise in use of child and adolescent mental health services from 3.5% to 5.9% has been reported between 1993 and 2003[27]. Also a rising trend in institutionalized care between 2002 and 2006 in a study in nine European countries, including the Netherlands[28].

Explanations for these increases in service use are generally not found in an increase in psychosocial or mental health problems among youth, although some small increases in psychosocial problems are found in some studies and gaps between need for care and care use are still observed[1, 25, 26]. In The Netherlands general population based studies do not indicate large increases in parent, teacher or self-reported emotional and behavioural problems in the last few decades[29-32]. Enabling factors on the contextual level may explain the changes in the observed Youth Care use patterns[13, 14]. In 2015 the city of Rotterdam implemented an integrated preventive youth policy program aiming to increase the number of children that grow up in a safe, healthy and promising home[33]. An important part of this program is collaborative planning of preventive measures and interventions at the neighborhood level focusing on an increased use of evidence based preventive interventions especially on the domain of mental health promotion[34]. Further, the community-based support teams may have increased the availability, accessibility and acceptability for primary Youth Care, which may have resulted in a reduced gap between those in need for care and actually receiving care. Earlier studies found improved access to care as a result of integrated forms of care[35, 36] and co-location of social workers[37]. A higher degree of coordination between different child and youth services were found to contribute to increased service use and diminishing ethnic disparities[38]. Indeed, more integrated services for adolescents and young adults in Australia, Ireland and the UK have been evaluated positively and were seen to improve access rates to care[39]. The community-based support teams in Rotterdam offer their services in the direct proximity of their clients. They are closely collaborating with other youth service

providers in the community and they provide integrated care including social support for parents and adults. This may have contributed to the prevention of more serious problems needing specialized Youth Care. However, the increase in primary Youth Care use and decrease in specialized Youth Care use we found could also be due to an increased competence of community-based support teams or an increased familiarity of these teams in the communities they serve.

Our study indicates sociodemographic characteristics are associated with Youth Care use as well as changes in Youth Care use over time. Most remarkable are the higher likelihood to receive Youth Care among children from other than two parent families and attending special education in Youth Care. This finding is in agreement with earlier research[40, 41]. Also remarkable is the finding that children of migrant origin in general are more likely to receive primary Youth Care and less likely to receive specialized Youth Care, while the likelihood to receive residential Youth Care differs depending on country of origin. This is particularly of concern as little changes in time are found for children of migrant origin. Apparently, access to specialized Youth Care did not improve for children of migrant origin and is in line with other research on lower access to mental health care for minority children[42-44]. The higher access of children with a migrant background to primary Youth Care probably indicates that community-based support teams serve different populations, and maybe even populations that formerly may have been underserved. The small increases in time for the likelihood of younger children and preschool children to receive Youth Care and the decrease of this likelihood in time of no longer school-aged children might indicate a trend towards more timeliness of care.

In our study we find several team characteristics to be associated with the three studied types of Youth Care, yet no clear associations of most of these characteristics with changes in Youth Care use over time. Although we know from studies in the public administration field that the team characteristics we studied are associated with team functioning[11, 12, 45, 46], only one characteristics, - team turnover-, was positively associated with change in residential Youth Care use. High team turnover might result in changes in the professionals providing care to children, youngsters and families with negative consequences for consecutive alliance and probably higher referrals to more intense forms of care[47]. Other explanations are possible, including an erroneous finding. Possible explanations for the lack of other significant findings include little variability between teams in the characteristics or the fact that characteristics were only measured at one moment in time. Research on the role of professional teams on patterns of different forms of Youth Care is limited to a few implementation studies that show the relevance of interprofessional communication and collaboration for successful provision of integrated care[48-50]. Stiffman found provider knowledge of resources and providers burden to explain mental health service use[51]. We did not include interprofessional communication and collaboration or providers knowledge of resources as measures in our study. However, caseload certainly is an indication of providers burden and social cohesion and team performance probably are conditions for good interprofessional communication and collaboration. Still, we did not find associations of these team characteristics with Youth Care use over time.

Our study is one of the few studies on contextual determinants of Youth Care use. It has a number of strengths. We did not rely on self-reported data but on registry data that are gathered from Youth Care providers by the Dutch statistics agency based on the Youth Act. Our data are population-based and constitute a large sample. Because of the nature of our data there are also limitations. No comparison could be made with use of Youth Care before 2015, because Youth Care data were not collected systematically before 2015. However, we assumed the 2015 reform would not lead to instant changes in patterns of Youth Care use in 2015 but would show a lag period. Still, as trends before 2015 are unknown, caution is needed in interpreting our findings. Further, the study period of 2015-2018 might have been too short to capture the possible changes as a result of the 2015 reform. Other limitations are that registry data can be incomplete or hold mistakes, causing bias. Because of missing data on individual characteristics, we had to exclude many records (27%) in the analysis. Also, team characteristics were measured in 2016 a year after the teams were set up. The team characteristics precede the reports on Youth Care use in the other years but may not have been stable in time. Further, the team characteristics have been included in the analysis on the individual level. Therefore, our findings need to be interpreted with care. Notwithstanding these limitations, our study has some practical implications. As caseload and team turnover are associated with Youth Care use and trends of Youth Care use in time, careful planning of community-based support teams and size of the community they are serving seems warranted and needs more research. Further, children attending Special Education are a lot more likely to receive Youth Care than children attending regular education, but our findings indicate a trend towards more primary Youth Care and less specialized care. This might reflect a greater need for integrated care as provided by the community-based support teams in this group of children.

As children with migrant backgrounds are less likely to receive specialized Youth Care and this is not changing over time, reaching this group of children with proper forms of care is of utmost importance for Youth Care

providers as well as policymakers. Transdisciplinary research is needed to further elucidate the role of contextual factors on patterns of Youth Care useOur study shows an increase in use of primary Youth Care use and to a lesser extent in residential Youth Care as well as a decrease in specialized Youth Care use since 2015, when community-based support teams were introduced in the Netherlands. This corresponds at least partly with the intended trends in the new Youth Act to reduce more intensive forms of Youth Care. Sociodemographic characteristics and characteristics of community-based support teams were found to be associated with the prevalence of different types of Youth Care use. There are indications that primary Youth Care that is provided by community-based support teams reaches new groups of children, especially children from migrant origin. Furthermore, there are indications that timeliness of care, as intended by the new Youth Act, is improved as the proportion of younger children receiving care increased in time. However, access of care to specialised Youth Care by children of migrant origin did not improve in time. Little evidence was found for the role of team characteristics on changes in Youth Care use in time.

Contributors

CLM and WJ wrote the manuscript with input from ALvZ. Data analysis and drafting of tables and figures was done by CLM and JvdE with the input from MS. CLM, JvdE, BS and WJ were involved in the study design and conception. WJ oversaw the study. All authors were involved in data interpretation and manuscript revision.

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Competing Interests

None declared.

Data availability statement

All data relevant to the study are included in the manuscript and supplementary files. Statistics Netherlands is owner of the registration data. Request for access can be directed at Statistics Netherlands (www.cbs.nl/microdata).

Ethics statement

In our study we used two sources of data. The first source of data are data available for research purposes at Statistics Netherlands. No ethics approval or consent to participate was necessary, as these data are publicly available for research purposes. Statistics Netherlands applies strict conditions for use of these data and adheres to specific legislation regarding the gathering and use of data by their institute (https://wetten.overheid.nl/BWBR0015926/2018-07-01). The second source of data are aggregated data on teams.

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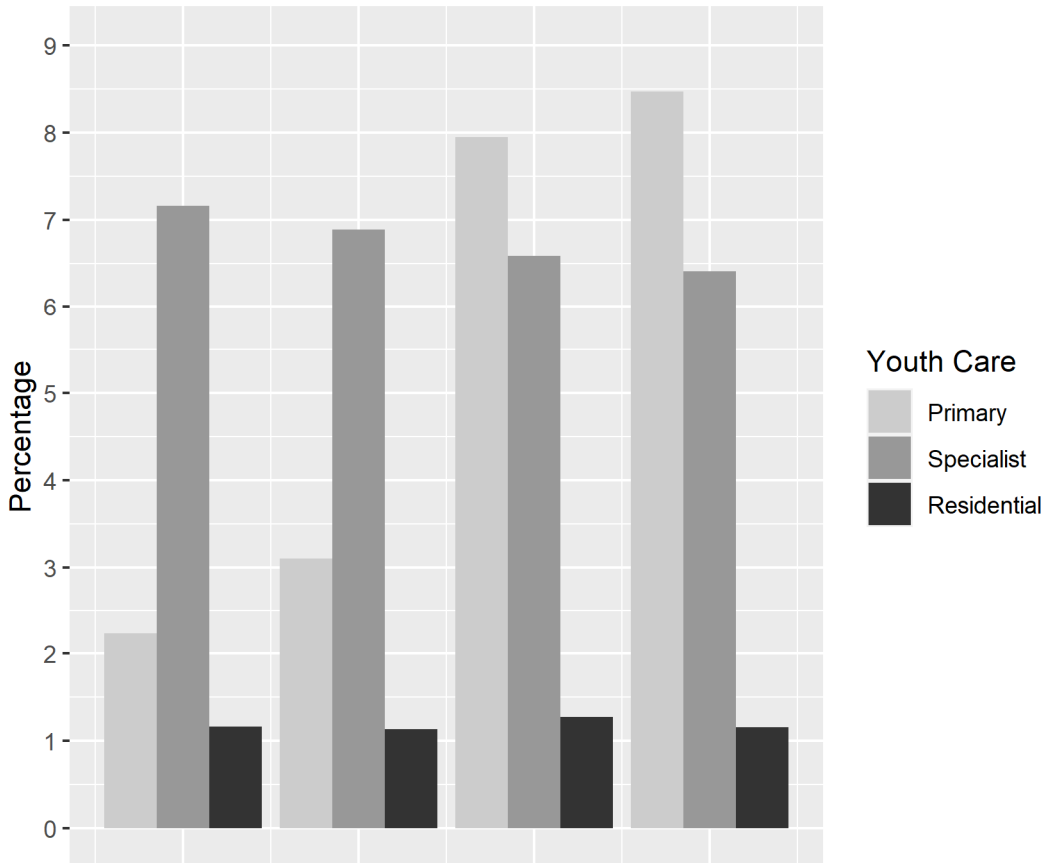
Percentage
9
8
7
6
5
4
3
2
1
0
2015
2016
2017
2018
Year
Youth Care
Primary
Specialist
Residential

Supplemental Table I Datasets used from Statistics Netherlands

NAME	CONTENT
JGDHULPBUS	youth care data
GBAPERSOONNTAB	Individual characteristics
GBAadresobjectbus	Pseudonymised addresses
VSLGWBtab, GBAHUISHOUDENSBUS	Household data
ONDERWIJSINSCHRTAB	Education data

NB. Datasets were combined by using pseudonymised identity numbers and pseudonymised household numbers.

Supplemental Table II Different types of youth care use in time

year	Total population 0-18	Primary youth care	Specialist youth care	Residential youth care
	N	N(%)	N(%)	N(%)
2015	106,689	2,380 (2.2%)	7,643 (7.2%)	1,238 (1.2%)
2016	116,782	3,620 (3.1%)	8,041 (6.9%)	1,326 (1.1%)
2017	116,508	9,263 (8.0%)	7,677 (6.6%)	1,482 (1.3%)
2018	115,617	9,795 (8.5%)	7,411 (6.4%)	1,332 (1.2%)

The RECORD statement – checklist of items, extended from the STROBE statement, that should be reported in observational studies using routinely collected health data.

	Item No.	STROBE items	Location in manuscript where items are reported	RECORD items	Location in manuscript where items are reported
Title and abstract					
	1	(a) Indicate the study's design with a commonly used term in the title or the abstract (b) Provide in the abstract an informative and balanced summary of what was done and what was found		RECORD 1.1: The type of data used should be specified in the title or abstract. When possible, the name of the databases used should be included. RECORD 1.2: If applicable, the geographic region and timeframe within which the study took place should be reported in the title or abstract. RECORD 1.3: If linkage between databases was conducted for the study, this should be clearly stated in the title or abstract.	Reported in abstract Reported in abstract Reported in abstract
Introduction					
Background rationale	2	Explain the scientific background and rationale for the investigation being reported			
Objectives	3	State specific objectives, including any prespecified hypotheses			
Methods					
Study Design	4	Present key elements of study design early in the paper			
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection			

Participants	6	*(a) Cohort study* - Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study* - Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study* - Give the eligibility criteria, and the sources and methods of selection of participants *(b) Cohort study* - For matched studies, give matching criteria and number of exposed and unexposed *Case-control study* - For matched studies, give matching criteria and the number of controls per case		RECORD 6.1: The methods of study population selection (such as codes or algorithms used to identify subjects) should be listed in detail. If this is not possible, an explanation should be provided. RECORD 6.2: Any validation studies of the codes or algorithms used to select the population should be referenced. If validation was conducted for this study and not published elsewhere, detailed methods and results should be provided. RECORD 6.3: If the study involved linkage of databases, consider use of a flow diagram or other graphical display to demonstrate the data linkage process, including the number of individuals with linked data at each stage.	Described in study population part of method section (page 2 main document) Not applicable Names of data sets used are included in supplementary table 1
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable.		RECORD 7.1: A complete list of codes and algorithms used to classify exposures, outcomes, confounders, and effect modifiers should be provided. If these cannot be reported, an explanation should be provided.	All outcomes and predictors are described in the method section (page 2 and 3 main document)
Data sources/ measurement	8	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group			

Bias	9	Describe any efforts to address potential sources of bias			
Study size	10	Explain how the study size was arrived at			
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen, and why			
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding (b) Describe any methods used to examine subgroups and interactions (c) Explain how missing data were addressed (d) *Cohort study* - If applicable, explain how loss to follow-up was addressed *Case-control study* - If applicable, explain how matching of cases and controls was addressed *Cross-sectional study* - If applicable, describe analytical methods taking account of sampling strategy (e) Describe any sensitivity analyses			
Data access and cleaning methods		..		RECORD 12.1: Authors should describe the extent to which the investigators had access to the database population used to create the study population.	Described in study design part of method section. (page 2 main document)

				RECORD 12.2: Authors should provide information on the data cleaning methods used in the study.	Not applicable (data are cleaned by Statistics Netherlands)
Linkage		..		RECORD 12.3: State whether the study included person-level, institutional-level, or other data linkage across two or more databases. The methods of linkage and methods of linkage quality evaluation should be provided.	data and linkage are described in study design part of the method section and supplementary table I. Result is described in study population part of the method section. (page 2 of main document)
Results					
Participants	13	(a) Report the numbers of individuals at each stage of the study (*e.g.*, numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed) (b) Give reasons for non-participation at each stage. (c) Consider use of a flow diagram		RECORD 13.1: Describe in detail the selection of the persons included in the study (*i.e.,* study population selection) including filtering based on data quality, data availability and linkage. The selection of included persons can be described in the text and/or by means of the study flow diagram.	Described in study population part of the method section. (page 2 of main document)
Descriptive data	14	(a) Give characteristics of study participants (*e.g.*, demographic, clinical, social) and information on exposures and potential confounders (b) Indicate the number of participants with missing data for each variable of interest			

		(c) *Cohort study* - summarise follow-up time (*e.g.*, average and total amount)			
Outcome data	15	*Cohort study* - Report numbers of outcome events or summary measures over time *Case-control study* - Report numbers in each exposure category, or summary measures of exposure *Cross-sectional study* - Report numbers of outcome events or summary measures			
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g., 95% confidence interval). Make clear which confounders were adjusted for and why they were included (b) Report category boundaries when continuous variables were categorized (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period			
Other analyses	17	Report other analyses done—e.g., analyses of subgroups and interactions, and sensitivity analyses			
Discussion					
Key results	18	Summarise key results with reference to study objectives			
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision.		RECORD 19.1: Discuss the implications of using data that were not created or collected to answer the specific research question(s). Include	Discussed in limitation section on the penultimate page

		Discuss both direction and magnitude of any potential bias		discussion of misclassification bias, unmeasured confounding, missing data, and changing eligibility over time, as they pertain to the study being reported.	of the discussion (page 9 of main document)
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence			
Generalisability	21	Discuss the generalisability (external validity) of the study results			
Other Information					
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based			
Accessibility of protocol, raw data, and programming code		..		RECORD 22.1: Authors should provide information on how to access any supplemental information such as the study protocol, raw data, or programming code.	Access to raw data is described in Data availability Statement section below the main text (page 10 of main document).

*Reference: Benchimol EI, Smeeth L, Guttmann A, Harron K, Moher D, Petersen I, Sørensen HT, von Elm E, Langan SM, the RECORD Working Committee. The REporting of studies Conducted using Observational Routinely-collected health Data (RECORD) Statement. *PLoS Medicine* 2015; in press.

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Changes in Youth Care use after the implementation of community-based support teams: repeated measurement study using registry data and data on team characteristics

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Changes in Youth Care use after the implementation of community-based support teams: repeated measurement study using registry data and data on team characteristics

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Abstract

Objectives. New legislation on Youth Care in The Netherlands led to the implementation of community-based support teams, providing integrated primary Youth Care. Important aims of the new Youth Act were more integrated, timely care and less use of intensive forms of care. Our aim was to study changes in Youth Care use in time, and the role of newly introduced community-based support teams herein.

Setting. Register data (2015 through 2018) on youth of a large city were linked and combined with administrative and aggregated data on team characteristics.

Participants. Data on 126,095 youth (0-18 years) were available for analyses.

Primary and secondary outcome measures. Primary, specialized and residential Youth Care use were the primary outcomes.

Results. GEE analyses adjusted for individual characteristics demonstrated that over four years, use of primary Youth Care increased from 2.2% to 8.5% (OR 1.70; CI 1.67-1.73), specialized Youth Care decreased from 7.2% to 6.4% (OR 0.98; CI 0.97-1.00), residential Youth Care increased slightly (OR 1.04; CI 1.01-1.06). Gender, age, family status, migrant background and educational level were all associated with the types of Youth Care use and also with some trends in time. Likelihood to receive care increased in time for preschool and younger children but did not improve for migrant children.

Case load, team size, team turnover, team performance and transformational leadership showed significant associations with different types of Youth Care use, but hardly with trends in time.

Conclusion. Patterns of Youth Care use changed towards more locally provided primary Youth Care, slightly less specialized and slightly more residential Youth Care. Furthermore, Youth Care use among younger children increased in time. These trends are partly in line with the trends intended by the Youth Act. Little evidence was found for the role of specific team characteristics on changes in Youth Care use in time.

Strengths and limitations of this study

- Our study is one of the few studies including contextual determinants of Youth Care use.
- Registry data on a large population was available for analyses.
- Only time trends after (and not before) a major change in the Youth Care system were available.
- Time trends were studied over a limited period (2015-2018).

Introduction

Youth Care use has increased in several Western countries in the recent decades[1-4]. In the Netherlands, for example, the percentage of children (0-18 years of age) using mental health and parenting support services increased from 4% in 2000 to 12% in 2018[5]. The Youth Care system in The Netherlands was drastically reformed in 2015 in response to this increased need for Youth Care and to overcome the fragmentation of the former system of Youth Care.[6, 7] The fragmentation encompassed the allocation of funding and responsibilities at different governance levels (central, regional, municipal) and medical insurance companies, which also resulted in shortcomings in integrated care and collaboration between professionals.

New legislation arranged the transfer of the responsibility and funding for the provision of Youth Care from the national and regional governmental levels and health insurance suppliers to the municipalities.[8] The aims of the new Youth Act were to improve integrated care, timeliness and proximity of care[9]. Other aims were to improve the prevention of psychosocial problems, reduce medicalization and to reduce the use of more intensive forms of Youth Care use by empowering youth and their families.[10] Furthermore, the Youth Act aimed at more collaboration in the chain of care and more professional space and lower administrative burden to provide the care and support that is needed.

To deal with these responsibilities, the majority of the Dutch municipalities implemented community-based support teams[9]. These community-based support teams offer a broad integrated range of services because of their multidisciplinary composition. They typically consist of professionals with different expertise such as child safety, youth mental care, mental and behavioral care and support for children with mild intellectual disabilities parenting, welfare and financial support and typically operate at the local neighborhood level, reaching out if necessary[11]. They focus on empowerment of families and involving and strengthening the social network. Their main functions are to provide accessible support by offering consultation, advice, primary mental health care, ambulatory (parenting) support and basic diagnostics. They serve as linking pin between universal services and specialized Youth Care and coordinate support of families in collaboration with other services (schools, general practitioners, financial support, adult mental health services)[12]. If needed children and families are referred to specialized forms of ambulatory or residential Youth Care like specialized mental health care and parenting support services, to specialized Youth Care services for children and parents with mild or more serious intellectual disabilities and to youth protection or probation services. The assumption is that the deployment of community-based support teams leads to more accessible, timely, integrated and empowering care. This is expected to result in less intensive forms of Youth Care (more primary and less specialized and residential Youth Care).

Evaluation of these expected benefits needs to take into account the individual and contextual factors influencing the use of Youth Care apart from the reform in Youth Care[13, 14]. In the theoretical models of both Andersen[14] and Stiffman[13] apart from the (perceived) need for care, enabling and predisposing factors are distinguished at both the individual and contextual levels. Factors on the individual level that have been shown to be associated with youth mental health services include age, gender and ethnic background of the child, and family and caregiver characteristics including family composition and socio-economic characteristics[15-17].

Contextual factors include the Youth Care system itself. Successful performance of community-based support teams is likely to be influenced by team characteristics and processes[18]. Studies in the public administration field on teams in the social domain have shown that team size, stability and leadership affect how well team members work together, with cohesiveness being a vital element of team functioning[18-21]. A larger team size potentially benefits the delivery of care services through the larger pool of resources[20]. A lack of stability in team membership due to high turnover rates demotivates team members and thus acts as a barrier[18]. Strong transformational leadership also contributes to effective team performance[18], through efforts to 'transform' individual aspirations into the overall vision of the team[21]. Team cohesion is characterized by strong unitedness in achieving shared goals and emphasis on the team members' social relationships[19]. Further, a high caseload of the team poses risks for suboptimal performance[22].

In this paper, the research question to be answered is: Is there a change over time in use of different types of Youth Care since the reform in 2015 and are sociodemographic characteristics and characteristics of the community-based support teams associated with change?

Methods

Study design

Microdata from Statistics Netherlands were linked over the years 2015-2018 (see supplementary table I). Under strict conditions, these microdata are accessible for statistical and scientific research. Pseudonymised administrative information on the individual level about sociodemographic characteristics and youth health care use of the youth population registered in Rotterdam any time in this four-year time-period has been used.

No ethics approval or consent to participate was necessary, as these data are publicly available.

Aggregated data at team level on team characteristics were available from an earlier study, in which data were collected in 2016 through an online survey among 363 professionals of 42 community-based support teams within Rotterdam[11]. Response rate per team ranged between 27% and 81% with a mean of 50%. Administrative data on team size in June 2016 were available from the municipality of Rotterdam as well as administrative data on caseload and turnover in 2015. Data on team characteristics were linked to the individual microdata-records by pseudonymised postal code of the home address.

Patient and Public Involvement

Discussions with local stakeholders from practice and policy preceded and shaped the formulation of the research question.

Study population

In this study, we included all children of 0-18 years old on the 1st of January in 2015 registered as living in Rotterdam (n=172,448). Children with missing data on educational level (n=25,985) or family status (n=24,920) were excluded. The study population consisted of 126,095 children.

Use of Youth Care

The outcome measure was the use of Youth Care in the consecutive years 2015 through 2018. Youth Care included:

- primary Youth Care: locally provided care by the community-based support teams, including family and youth coaching and social support, basic mental health care and basic parenting support, as well as coordination of integrated care, also on multiple domains if needed.
- specialized Youth Care: ambulatory or day care focussing on parenting problems and/or mental health and behavioural problems with a referral from a medical doctor or community-based support team including specialized mental health care, specialized parenting support, specialized care for youth with (mild) intellectual disabilities.
- residential Youth Care: institutional care (institutional or family-based treatment groups, emergency care, assisted living), foster care.

Individual characteristics

Demographic characteristics included child gender, age, ethnic background, educational level, family status and neighbourhood. Demographic characteristics were determined at the 1st of January of 2015.

Ethnic background

In accordance with the classification system used by Statistics Netherlands, a child's ethnic background was classified as Dutch when both parents were born in the Netherlands and as non-Dutch when one or both parents were born outside the Netherlands.

Educational level

Children up to 4 years old were classified as 'not yet at school age'. Children with a basic qualification or over 18 years old without a school registration were classified as 'Off school age'. Children registered as following special (primary or secondary) education were classified as 'Special Education'. All other children were classified as 'Regular education'.

Family status

Family status was classified in 5 levels, namely two parent family (when the child lives with two adults who are living together), single parent family (when there was one parent in the household with one or more children), Residential or foster care (a household of one or more persons who are professionally provided with housing and daily necessities of life), other (Private household consisting exclusively of members other than family and unknown).

Team characteristics

Information about team characteristics and leadership included team size, turnover, average caseload, transformational leadership perceived team performance, team cohesion.

Caseload

Caseload was calculated by the mean amount of cases per month divided by the mean amount of FTE per team in 2015.

Turnover

Turnover rate was calculated as the sum of persons leaving the team and persons entering team divided by the average number of persons in the team in 2015.

Team size

Team sizes were obtained from the municipality's administration and ranged between 7 and 26 team members with on average 18 team members.

Team performance

Team performance was assessed based on the "employee judgment of effectiveness" scale[23]. Professionals were asked to grade their team on six effectiveness indicators like "the quality of care provided by our team" on a ten-point Likert-type scale with 10 as highest score corresponding to excellent (range 6.13 to 8.5; Cronbach's alpha .90).

Team cohesion

Team cohesion was measured using five items inspired by Carless' and De Paola's measure for team cohesion [24]. Items like "Our team is united in trying to reach its goals for performance" were scored on a five-point Likert scale with highest scores indicating high team cohesion (range 3.29 to 5.00; Cronbach's alpha .89).

Transformational leadership

Transformational leadership was measured using five items. The items were based on the transformational leadership scale by Jensen et al. (2019) and an example item is "our supervisor strives to get the team work together to realize its vision". The responses were given on a five-point Likert scale with highest scores indicating good leadership (range 2.50 to 4.67; Cronbach's alpha .91).

Statistical analyses

A repeated measures logistic regression analysis was conducted, using Generalized Estimating Equations (GEE). For the outcomes, i.e. the three types of Youth Care (primary, specialized and residential) separate models were fit. Firstly, univariable models were run with time, individual characteristics and team characteristics as separate predictors. Thereafter, multivariable models were performed including time, individual characteristics and community-based support team characteristics at the individual level. Because residential care was part of the characteristic family status, family status was not entered in models for residential care. Finally, interactions of time with sociodemographic characteristics and with community-based support teams characteristics were tested in order to answer our research question, whether sociodemographic characteristics and characteristics of community-based support teams influence a change over time in use of different types of Youth Care.

The statistical significance level was defined as a p-value below 0.01 (two-tailed). Analyses were performed using R version 3.5.3.

Results

The study population consisted of children with diverse ethnic backgrounds, with 24.6% living in a single parent family and 2.6% receiving special education (Table 1). Children receiving care were older of age, more often boys, more often living in single parent families (39-47%) and following special education (11-22%). Ethnic background also differed from children not receiving Youth Care.

Table 1 Characteristics total population for analysis and split by type of Youth Care

characteristics	Total population 0-18	Primary Youth Care	Specialized Youth Care	Residential Youth Care
	n (%)	n (%)	n (%)	n (%)
Total	172,450 (100%)	16,480 (100%)	18,245 (100%)	3,170 (100%)
Gender (female)	84,440 (49%)	7,355 (44.6%)*	7,550 (41.4%)*	1,555 (49.1%)
Ethnic background				
- Dutch	72,860 (42.3%)	6,100 (37.0%) R	9,030 (49.5%) R	1,360 (42.8%) R
- Moroccan	17,705 (10.3%)	1,920 (11.6%)*	1,520 (8.3%)*	190 (6.1%)*
- Turkish	13,955 (8.1%)	945 (5.7%)*	965 (5.3%)*	80 (2.6%)*
- Surinamese	11,385 (6.6%)	1,490 (9.0%)*	1,490 (8.2%)*	365 (11.5%)*
- Antillean	9,645 (5.6%)	1,820 (11.0%)*	1,375 (7.5%)*	420 (13.3%)*
- Other Non-Western	25,135 (14.6%)	2,670 (16.2%)*	2,185 (12.0%)*	450 (14.2%)
- Western	21,760 (12.6%)	1,535 (9.3%)*	1,680 (9.2%)*	300 (9.5%)
Family status				
- Two parent	99,555 (57.7%)	7,080 (43.0%) R	9,520 (52.2%) R	730 (23.0%) N
- Single parent	42,500 (24.6%)	7,790 (47.3%)*	7,360 (40.3%)*	1,225 (38.7%)
- Residential/ foster	1,590 (0.9%)	330 (2.0%)*	390 (2.1%)*	350 (11.1%)
- Other	3,880 (2.3%)	550 (3.3%)*	650 (3.6%)*	725 (22.9%)
- Missing	24,920 (14.5%)	730 (4.4%)*	325 (1.8%)	135 (4.3%)
Educational status child in 2015				
- Not yet at school age	34,465 (20.0%)	1,675 (10.2%)*	600 (3.3%)*	215 (6.7%)*
- Regular education	102,210 (59.3%)	10,555 (64.1%) R	13,710 (75.2%) R	1,855 (58.5%) R
- Special education	4,450 (2.6%)	1,795 (10.9%)*	2,325 (12.7%)*	690 (21.7%)*
- Off school age	5,340 (3.1%)	175 (1.0%)*	290 (1.6%)	115 (3.6%)*
- missing	25,985 (15.1%)	2,275 (13.8%)	1,320 (7.2%)	300 (9.5%)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Average age	9.9 (6.2)*	10.7 (5.3)*	12. (4.6)*	13.2 (5.4)

* Significant p < .01
R Reference category
N Not tested

Table 2 shows the average team characteristics (caseload, turnover, team size, team performance, team cohesion, transformational leadership) of the community-based support teams for children in the study population. Average team characteristics of the community-based support teams did not differ for the types of Youth Care children did receive.

Table 2 Characteristics of community-based support teams split by type of Youth Care

Characteristics	**Total population 0-18**	**Primary Youth Care**	**specialized Youth Care**	**Residential Youth Care**

	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Caseload	1.5 (0.67)	1.4 (0.66)*	1.4 (0.67)*	1.4 (0.69)
Turnover	0.6 (0.14)	0.6 (0.13)*	0.6 (0.14)*	0.6 (0.13)
Team size	18.4 (4.46)	18.9 (4.56)*	18.4 (4.55)*	18.8 (4.27)*
Team performance	7.5 (0.41)	7.4 (0.44)*	7.4 (0.43)*	7.4 (0.44)*
Team cohesion	4.0 (0.38)	4.0 (0.38)*	4.0 (0.39)*	4.0 (0.39)*
Transformational leadership	3.8 (0.48)	3.8 (0.49)	3.8 (0.49)	3.7 (0.49)
* Significant p < .01				

The change in the use of primary Youth Care, specialized Youth Care and residential care over the years is illustrated in figure 1. The use of primary Youth Care increased from 2015 to 2018 from 2.2% to 8.5%. The use of specialized Youth Care decreased from 7,2% to 6,4%. Residential Youth Care fluctuated slightly and was 1.2% in 2015 as well as 2018 (see supplemental table II).

<figure 1>

Figure 1. Types of Youth Care use across years

Table 3 shows an increase in primary Youth Care use (OR 1.70, 99%CI 1.67-1.73). Further a small decrease over time was found in specialized Youth Care use (OR 0.98, 99%CI 0.97-1.00) as well as a small increase over time in residential Youth Care use (OR 1.04, 99%CI 1.01-1.06).

Boys, younger children, children from non-two parent families, children form most migrant backgrounds and children following special education were more likely to receive Primary Youth Care. Preschool children and no longer school-aged children were less likely to receive primary Youth Care. Regarding characteristics and functioning of community-based support teams, primary Youth Care was negatively associated with caseload (OR 0.88; CI (0.84-0.92) and leadership (OR 0.91; CI 0.85-0.98), and positively associated with turnover (OR 1.50; CI 1.19-1.89), meaning that children were more likely to receive this type of care if their community-based support team had a low caseload, low transformational leadership and high turnover rate.

Specialized Youth Care was more likely to be provided to boys, older children, children form non-two parent families and children following special education. It was less likely to be provided to children from most migrant backgrounds, preschool children and no longer school-aged children. Regarding characteristics and functioning of community-based support teams, specialized Youth Care was positively associated with turnover (OR 1.67; CI 1.42-2.19) and negatively associated with team size (OR 0.99; CI 0.98-0.99) and team performance ((OR 0.90; CI 0.82-0.97), meaning that children were more likely to receive this type of care if their community-based support team had higher turnover, a smaller team size and lower evaluation of their team performance.

Residential Youth Care was more likely to be received by girls, older children, children following special education and no longer school-aged youth. Children from some migrant background were more likely to receive residential care (Surinam and Antillean background) while others were less likely to receive it (Moroccan and Turkish background. With regard to characteristics and functioning of community-based support teams, residential Youth Care was only positively associated with team size (OR 1.01: CI 1.00-1.03). This means that children were more likely to receive this type of care if their community-based support team had a larger team size.

Table 3. Adjusted associations of time, individual and community-based support team characteristics with Youth Care service use

	Primary Youth Care	Specialized Youth Care	Residential Youth Care
	OR (99% CI)	OR (99% CI)	OR (99% CI)
Time (years)	**1.70 (1.67-1.73)**	**0.98 (0.97-1.00)**	**1.04 (1.01-1.06)**
Individual characteristics			
- gender (female vs male)	**0.89 (0.85-0.94)**	**0.76 (0.72-0.79)**	**1.29 (1.15-1.44)**

- age	**0.96 (0.95-0.96)**	**1.01 (1.01-1.02)**	**1.08 (1.07-1.09)**
- single parent (vs two parent)	**2,44 (2.31-2.58)**	**1.67 (1.59-1.76)**	
- residential (vs two parent)	**2.51 (2.05-3.08)**	**1.66 (1.37-2.01)**	
- different family type (vs two parent)	**2.47 (2.14-2.86)**	**1.73 (1.53-1.97)**	
- Moroccan background (vs Dutch)	**1.17 (1.08-1.28)**	**0.53 (0.48-0.57)**	**0.40 (0.31-0.51)**
- Turkish background (vs Dutch)	**0.75 (0.67-0.84)**	**0.39 (0.35-0.44)**	**0.24 (0.17-0.35)**
- Surinam background (vs Dutch)	**1.19 (1.08-1.31)**	**0.72 (0.66-0.78)**	**1.29 (1.08-1.56)**
- Antillean background (vs Dutch)	**1.69 (1.54-1.86)**	**0.77 (0.70-0.85)**	**1.93 (1.61-2.32)**
- Other non-Western background (vs Dutch)	**1.11 (1.03-1.20)**	**0.57 (0.53-0.62)**	0.94 (0.79-1.12)
- Western background (vs Dutch)			
- Not yet school-aged (vs attending regular school)	**0.91 (0.83-1.00)** **0.48 (0.43-0.53)**	**0.68 (0.62-0.73)** **0.18 (0.15-0.20)**	0.85 (0.69-1.04) 0.89 (0.66-1.21)
- Attending special education (vs attending regular school)	**5.03 (4.61-5.47)**	**6.51 (6.05-7.01)**	**9.30 (8.11-10.67)**
- No longer school-aged (vs attending regular school)	**0.71 (0.55-0.91)**	**0.83 (0.69-0.99**)	**1.31 (0.98-1.76)**
-			
Community-based support team characteristics			
- Caseload	**0.88 (0.84-0.92)**	1.04 (1.00-1.09)	1.02 (0.92-1.12)
- Turnover	**1.50 (1.19-1.89)**	**1.67 (1.42-2.19)**	0.83 (0.50-1.37)
- Team size	1.01 (1.00-1.01)	**0.99 (0.98-0.99)**	**1.01 (1.00-1.03)**
- Team performance	1.09 (0.99-1.20)	**0.90 (0.82-0.97)**	1.04 (0.84-1.28)
- Team cohesion	0.94 (0.84-1.04)	0.94 (0.85-1.03)	0.80 (0.63-1.01)
- Transformational leadership	**0.91 (0.85-0.98)**	1.04 (0.97-1.70)	0.99 (0.84-1.15)

Multivariate models were used, fully adjusted for individual characteristics and community-based support teams characteristics. For residential Youth Care family status was left out of the model. **bold**=significant at p<0.01

Table 4 shows trends in time for Youth Care use differed according to sociodemographic characteristics.

The likelihood to receive primary Youth Care increased in time for boys, younger children, preschool children and children receiving special education, while it decreased in time for children of single parent families and children of certain migrant backgrounds (Moroccan and other-non-Western). The likelihood to receive specialized Youth Care increased in time for girls as well as for younger children. It decreased in time for children in special education and no longer school-aged youth. The likelihood to receive specialized Youth Care did not change in time according to family status of migrant background.

The likelihood to receive residential Youth Care decreased in time for no longer school-aged youth and older children.

The only significant interaction term of community-based support teams characteristics and time was for team turnover, indicating a higher team turnover was associated with a stronger increase in use of residential Youth Care over time.

Table 4. Adjusted associations with Youth Care service use of time, individual and community-based support team characteristics and its interactions with time

	Primary Youth Care	Specialized Youth Care	Residential Youth Care
	OR (99% CI)	OR (99% CI)	OR (99% CI)
Time (years)	**2.06 (1.50-1.73)**	**1.79 (1.38-2.33)**	**1.59 (1.01-2.50)**
Individual characteristics			
- gender (female vs male)	0,97 (0.89-1.06)	**0.71 (0.67-0.75)**	**1.32 (1.15-1.52)**
- age	**0.99 (0.98-1.00)**	**1.09 (1.08-1.09)**	**1.13 (1.11-1.16)**
- single parent (vs two parent)	**3,03 (2.75-3.34)**	**1.65 (1.54-1.76)**	
- residential (vs two parent)	**2.62 (1.81-3.80)**	**1.76 (1.34-2.32)**	
- different family type (vs two parent)	**2.56 (1.96-3.35)**	**1.66 (1.39-1.99)**	
- Moroccan background (vs Dutch)	**1.64 (1.42-1.90)**	**0.53 (0.47-0.59)**	**0.42 (0.31-0.56)**
- Turkish background (vs Dutch)	**0.75 (0.61-0.92)**	**0.41 (0.36-0.47)**	**0.24 (0.16-0.36)**
- Surinam background (vs Dutch)	**1.32 (1.13-1.55)**	**0.69 (0.61-0.77)**	1.16 (0.92-1.45)
- Antillean background (vs Dutch)	**1.92 (1.65-2.25)**	**0.71 (0.63-0.81)**	**1.88 (1.50-2.36)**
- Other non-Western background (vs Dutch)	**1.31 (1.15-1.50)**	**0.56 (0.50-0.62)**	0.84 (0.67-1.04)
- Western background (vs Dutch)	0.87 (0.73-1.04)	**0.66 (0.59-0.74)**	0.78 (0.61-1.00)
- Not yet school-aged (vs attending regular school)	**0.35 (0.29-0.44)**	**0.14 (0.11-0.20)**	0.99 (0.62-1.58)
- Attending special education (vs attending regular school)	**3.21 (2.79-3.71)**	**7.77 (7.07-8.54)**	**10.17 (8.62-12.00)**
- No longer school-aged (vs attending regular school)	1.22 (0.82-1.83)	**1.52 (1.23-1.88)**	**3.11 (2.25-4.31)**
Neighbourhood team characteristics			
- Caseload	**0.89 (0.82-0.96)**	1.04 (0.98-1.10)	0.98 (0.87-1.10)
- Turnover	**1.57 (1.04-2.37)**	**1.57 (1.17-2.11)**	**0.51 (0.27-0.95)**
- Team size	**1.01 (1.00-1.02)**	**0.99 (0.98-0.99)**	**1.02 (1.00-1.04)**
- Team performance	1.05 (0.90-1.23)	0.91 (0.81-1.02)	1.10 (0.86-1.42)
- Team cohesion	0.89 (0.74-1.07)	0.96 (0.85-1.10)	0.84 (0.62-1.12)
- Transformational leadership	0.98 (0.87-1.12)	1.01 (0.92-1.11)	0.99 (0.94-1.03)
Time by individual characteristics			
- Time by gender	**0.97 (0.94-1.00)**	**1.04 (1.01-1.07)**	0.99 (0.94-1.03)
- Time by age	**0.98 (0.98-0.99)**	**0.96 (0.95-0.96)**	**0.98 (0.97-0.98)**
- Time by single parent	**0.92 (0.89-0.95)**	1.01 (0.98-1.04)	
- Time by residential	0.99 (0.84-1.16)	0.97 (0.85-1.12)	
- Time by different family type	0.99 (0.89-1.10)	1.04 (0.96-1.14)	
- Time by Moroccan background	**0.87 (0.83-0.92)**	0.98 (0.94-1.03)	0.99 (0.90-1.10)
- Time by Turkish background	1.00 (0.93-1.07)	0.96 (0.90-1.02)	1.02 (0.90-1.15)
- Time by Surinam background	0.96 (0.90-1.01)	1.02 (0.97-1.07)	1.07 (1.00-1.16)
- Time by Antillean background	0.95 (0.89-1.01)	1.05 (0.99-1.11)	1.03 (0.95-1.11)
- Time by Other non-Western background	**0.93 (0.89-0.98)**	1.00 (0.96-1.05)	1.06 (0.98-1.14)
- Time by Western background	1.01 (0.95-1.08)	1.01 (0.96-1.06)	1.04 (0.95-1.12)
- Time by Not yet school-aged	**1.12 (1.04-1.21)**	1.01 (0.90-1.15)	0.98 (0.84-1.13)
- Time by Attending special education	**1.22 (1.15-1.29)**	**0.88 (0.85-0.92)**	0.95 (0.90-1.01)
- Time by No longer school-aged	**0.80 (0.68-0.95)**	**0.57 (0.50-0.65)**	**0.53 (0.44-0.65)**
Time by community-based support team characteristics			
- Time by Caseload	1.0 (0.97-1.03)	1.00 (0.98-1.03)	1.03 (0.99-1.07)
- Time by Turnover	0.98 (0.84-1.14)	1.06 (0.93-1.20)	**1.23 (1.01-1.51)**
- Time by Team size	1.00 (0.99-1.00)	1.00 (1.00-1.01)	1.00 (0.99-1.00)
- Time by Team performance	1.02 (0.96-1.08)	1.00 (0.95-1.05)	0.98 (0.90-1.06)
- Time by Team Cohesion	1.02(0.95-1.09)	0.97 (0.91-1.03)	0.97 (0.88-1.07)
- Time by Transformational leadership	0.97(0.93-1.02)	1.01 (0.98-1.05)	1.03 (0.97-1.10)

Multivariate models were used, fully adjusted for individual characteristics and community-based support teams characteristics. For residential Youth Care family status was left out of the model. **bold**=significant at p<0.01

Discussion and conclusion

We studied the change in use of three types of Youth Care in time, and the possible role of sociodemographic characteristics and characteristics of community-based support teams in these changes, in the city of Rotterdam (The Netherlands) from 2015 through 2018. Our data show an increase in use of primary Youth Care and residential Youth Care, and a decrease in the use of specialized Youth Care. All sociodemographic characteristics were associated with Youth Care use. Boys, children from non-two parent families and children following special education were more likely to receive Youth Care, while preschool children and no longer school-aged youth were less likely to receive Youth Care. Children with a migrant background were more likely to receive primary Youth Care, whereas the likelihood to receive specialized and residential care differed according to country of origin. Some characteristics of community-based support teams showed a negative (caseload, team performance, transformational leadership) or positive (turnover) or both negative and positive (team size) significant associations with the use of the three Youth Care types after controlling for individual child characteristics.

In time the likelihood to receive Youth Care differed between children depending on sociodemographic characteristics. Among boys the likelihood to receive primary Youth Care increased whereas the likelihood to receive specialized Youth Care decreased. Among preschool children and younger children, the likelihood to receive specific types of Youth Care increased, while among no longer school-aged youth the likelihood decreased over time. Among children from single parent families and children of certain migrant backgrounds, the likelihood to receive primary Youth Care decreased over time. Characteristics and functioning of community-based support teams were not associated with changes of Youth Care use over time except for team turnover. High team turnover appeared to be associated with higher residential Youth Care use in time.

Our study shows an increase in time in the use of primary Youth Care, which is exclusively provided by community-based support teams. An annual increase was found, although a sharper increase is visible between 2016 and 2017. This specific finding might be (partly) due to registration artefacts as working with digital client systems for newly implemented community-based support teams may have lagged behind.

Rising use of child and adolescent mental health services have been reported in several studies over the last years in several Western countries. Studies in Finland over the period 1989 – 2013 found a rise from 2.4% to 11.0% in parent reported mental health service use for 8 year olds[1, 25]. In the USA outpatient care for 6-17-year olds between 1996 and 2012 increased from an annual 9.2% to 13.3%[4]. In Canada yearly surveys between 2011-2018 among Canadian youth between 12-24 years of age revealed an increase in mental health consultations from 12 to 18%[26]. In the Netherlands a rise in use of child and adolescent mental health services from 3.5% to 5.9% has been reported between 1993 and 2003[27]. Also a rising trend was reported in institutionalized care between 2002 and 2006 in a study in nine European countries, including the Netherlands[28].

Explanations for these increases in service use are generally not found in an increase in psychosocial or mental health problems among youth, although some small increases in psychosocial problems are found in some studies and gaps between need for care and care use are still observed[1, 25, 26]. In The Netherlands general population based studies do not indicate large increases in parent, teacher or self-reported emotional and behavioural problems in the last few decades[29-32]. Rather, enabling factors on the contextual level may explain the changes in the observed Youth Care use patterns[13, 14]. In 2015 the city of Rotterdam implemented an integrated preventive youth policy program aimed at increasing the number of children that grow up in a safe, healthy and promising home-environment[33]. An important part of this program is collaborative planning of preventive measures and interventions at the neighborhood level focusing on an increased use of evidence based preventive interventions especially on the domain of mental health promotion[34]. Further, the community-based support teams may have increased the availability, accessibility and acceptability for primary Youth Care, which may have resulted in a reduced gap between those in need for care and actually receiving care. Earlier studies found improved access to care as a result of integrated forms of care[35, 36] and co-location of social workers[37]. A higher degree of coordination between different child and youth services were found to contribute to increased service use and diminishing ethnic disparities[38]. Indeed, more integrated services for adolescents and young

adults in Australia, Ireland and the UK have been evaluated positively and were seen to improve access rates to care[39]. The community-based support teams in Rotterdam offer their services in the direct proximity of their clients. They are closely collaborating with other youth service providers in the community and they provide integrated care including social support for parents and adults. This may have contributed to the prevention of more serious problems needing specialized Youth Care. However, the increase in primary Youth Care use and decrease in specialized Youth Care use we found could also be due to an increased competence of community-based support teams or an increased familiarity of these teams in the communities they serve. Future research urgently needs to enlarge our limited knowledge base on how the way we organize our youth (mental health) care and support systems influence and enable care use and impacts on inequities in access to care as well as on patterns and individual trajectories of care use. Possible determinants as proximity of care and support, level of integrated services of care and support and level of collaboration among different providers in the chain of care should be included in these studies. Moreover, future research should elucidate underlying mechanisms and preferably be evaluative.

Our study indicates sociodemographic characteristics are associated with Youth Care use as well as changes in Youth Care use over time. Most remarkable are the higher likelihood to receive Youth Care among children from other than two parent families and attending special education in Youth Care. This finding is in agreement with earlier research[40, 41]. Also remarkable is the finding that children of migrant origin in general are more likely to receive primary Youth Care and less likely to receive specialized Youth Care, while the likelihood to receive residential Youth Care differs depending on country of origin. This is particularly of concern as little changes in time are found for children of migrant origin. Apparently, access to specialized Youth Care did not improve for children of migrant origin and is in line with other research on lower access to mental health care for minority children[42-44]. The higher access of children with a migrant background to primary Youth Care probably indicates that community-based support teams serve different populations, and maybe even populations that formerly may have been underserved. The small increases in time for the likelihood of younger children and preschool children to receive Youth Care and the decrease of this likelihood in time of no longer school-aged children might indicate a trend towards more timeliness of care. However, further research is needed to confirm these hypotheses and explore underlying mechanisms.

In our study we find several team characteristics to be associated with the three studied types of Youth Care, yet no clear associations of most of these characteristics with changes in Youth Care use over time. Although we know from studies in the public administration field that the team characteristics we studied are associated with team functioning[11, 12, 45, 46], only one characteristic, - team turnover-, was positively associated with change in residential Youth Care use. High team turnover might result in changes in the professionals providing care to children, youngsters and families with negative consequences for consecutive alliance and probably higher referrals to more intense forms of care[47]. Our findings are comparable to a study among a USA sample of youth in where a high caseworker turnover was found to be associated with less favorable outcomes.[48] Other explanations are possible, including an erroneous finding. Possible explanations for the lack of other significant findings include little variability between teams in the characteristics or the fact that characteristics were only measured at one moment in time. Research on the role of professional teams on patterns of different forms of Youth Care is limited to a few implementation studies that show the relevance of interprofessional communication and collaboration for successful provision of integrated care[49-51]. Stiffman found provider knowledge of resources and providers burden to explain mental health service use[52]. We did not include interprofessional communication and collaboration or providers knowledge of resources as measures in our study. However, caseload certainly is an indication of providers burden and social cohesion and team performance probably are conditions for good interprofessional communication and collaboration. Still, we did not find associations of these team characteristics with Youth Care use over time. Also, concerning professional and team characteristics more transdisciplinary research is warranted to understand how these factors may contribute to the quality of Youth Care.

Our study is one of the few studies on contextual determinants of Youth Care use. It has several strengths. We did not rely on self-reported data but on registry data that are gathered from Youth Care providers by the Dutch statistics agency based on the Youth Act. Our data are population-based and constitute a large sample. Because of the nature of our data there are also limitations. No comparison could be made with use of Youth Care before 2015, because Youth Care data were not collected systematically before 2015. However, we assumed the 2015

reform would not lead to instant changes in patterns of Youth Care use in 2015 but would show a lag period. Still, as trends before 2015 are unknown, caution is needed in interpreting our findings. Further, the study period of 2015-2018 might have been too short to capture the possible changes resulting from the 2015 reform. Other limitations are that registry data can be incomplete or hold mistakes, causing bias. Because of missing data on individual characteristics, we had to exclude many records (27%) in the analysis. Also, team characteristics were measured in 2016 a year after the teams were set up. The team characteristics precede the reports on Youth Care use in the other years but may not have been stable in time. Further, the team characteristics have been included in the analysis on the individual level. Therefore, our findings need to be interpreted with care.

Notwithstanding these limitations, our study has some practical implications. As caseload and team turnover are associated with Youth Care use and trends of Youth Care use in time, careful planning of community-based support teams and size of the community they are serving seems warranted and needs more research. Further, children attending special education are a lot more likely to receive Youth Care than children attending regular education, but our findings indicate a trend towards more primary Youth Care and less specialized care. This might reflect a greater need for integrated care as provided by the community-based support teams in this group of children.

In conclusion, as children with migrant backgrounds are less likely to receive specialized Youth Care and this is not changing over time, reaching this group of children with proper forms of care is of utmost importance for Youth Care providers as well as policymakers. Evaluative and transdisciplinary research is needed to further elucidate the role of contextual factors on patterns of Youth Care use. Our study shows an increase in use of primary Youth Care use and to a lesser extent in residential Youth Care as well as a decrease in specialized Youth Care use since 2015, when community-based support teams were introduced in the Netherlands. This corresponds at least partly with the intended trends in the new Youth Act to reduce more intensive forms of Youth Care. Sociodemographic characteristics and characteristics of community-based support teams were found to be associated with the prevalence of different types of Youth Care use. There are indications that primary Youth Care that is provided by community-based support teams reaches new groups of children, especially children from migrant origin. Furthermore, there are indications that timeliness of care, as intended by the new Youth Act, is improved as the proportion of younger children receiving care increased in time. However, access of care to specialised Youth Care by children of migrant origin did not improve in time. Little evidence was found for the role of team characteristics on changes in Youth Care use in time.

Contributors

CLM and WJ wrote the manuscript with input from ALvZ. Data analysis and drafting of tables and figures was done by CLM and JvdE with the input from MS. CLM, JvdE, BS and WJ were involved in the study design and conception. WJ oversaw the study. All authors were involved in data interpretation and manuscript revision.

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Competing Interests

None declared.

Data availability statement

All data relevant to the study are included in the manuscript and supplementary files. Statistics Netherlands is owner of the registration data. Request for access can be directed at Statistics Netherlands (www.cbs.nl/microdata).

Ethics statement

In our study we used two sources of data. The first source of data are data available for research purposes at Statistics Netherlands. No ethics approval or consent to participate was necessary, as these data are publicly available for research purposes. Statistics Netherlands applies strict conditions for use of these data and adheres to specific legislation regarding the gathering and use of data by their institute (https://wetten.overheid.nl/BWBR0015926/2018-07-01). The second source of data are aggregated data on teams.

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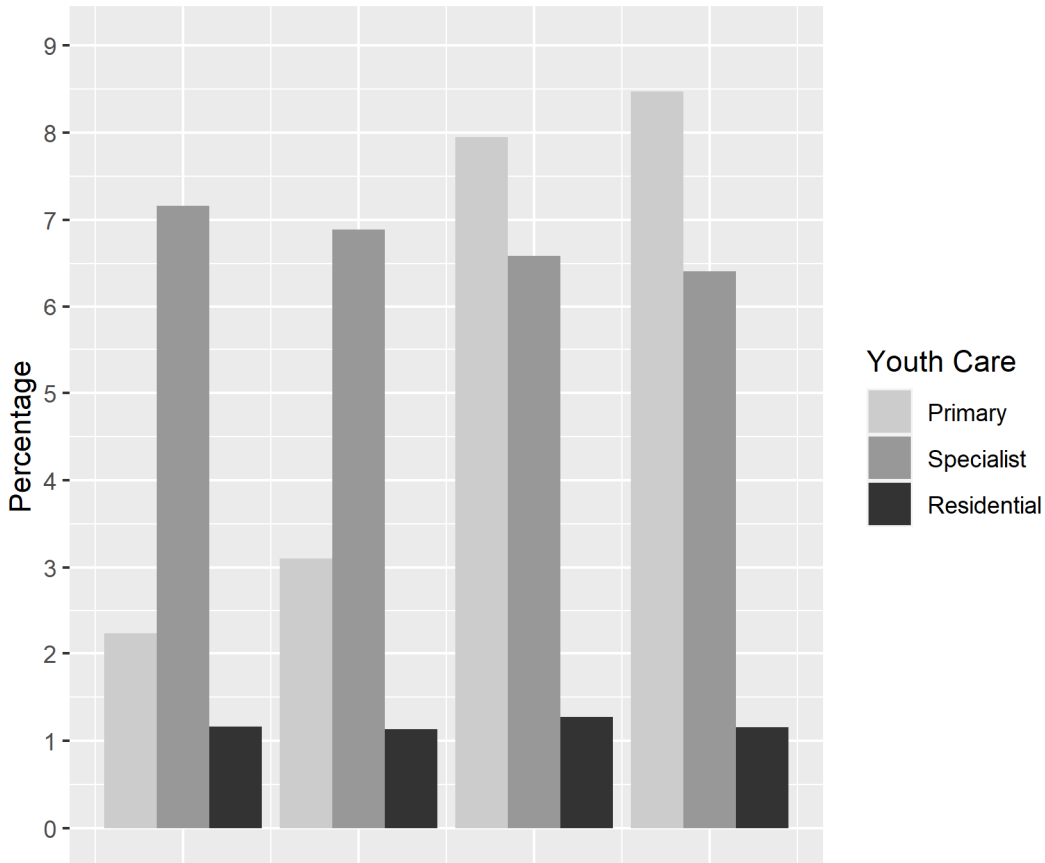
Percentage
9
8
7
6
5
4
3
2
1
0
2015
2016
2017
2018
Year
Youth Care
Primary
Specialist
Residential

Supplemental Table I Datasets used from Statistics Netherlands

NAME	CONTENT
JGDHULPBUS	youth care data
GBAPERSOONNTAB	Individual characteristics
GBAadresobjectbus	Pseudonymised addresses
VSLGWBtab, GBAHUISHOUDENSBUS	Household data
ONDERWIJSINSCHRTAB	Education data

NB. Datasets were combined by using pseudonymised identity numbers and pseudonymised household numbers.

Supplemental Table II Different types of youth care use in time

year	Total population 0-18	Primary youth care	Specialist youth care	Residential youth care
	N	N(%)	N(%)	N(%)
2015	106,689	2,380 (2.2%)	7,643 (7.2%)	1,238 (1.2%)
2016	116,782	3,620 (3.1%)	8,041 (6.9%)	1,326 (1.1%)
2017	116,508	9,263 (8.0%)	7,677 (6.6%)	1,482 (1.3%)
2018	115,617	9,795 (8.5%)	7,411 (6.4%)	1,332 (1.2%)

The RECORD statement – checklist of items, extended from the STROBE statement, that should be reported in observational studies using routinely collected health data.

	Item No.	STROBE items	Location in manuscript where items are reported	RECORD items	Location in manuscript where items are reported
Title and abstract					
	1	(a) Indicate the study's design with a commonly used term in the title or the abstract (b) Provide in the abstract an informative and balanced summary of what was done and what was found		RECORD 1.1: The type of data used should be specified in the title or abstract. When possible, the name of the databases used should be included. RECORD 1.2: If applicable, the geographic region and timeframe within which the study took place should be reported in the title or abstract. RECORD 1.3: If linkage between databases was conducted for the study, this should be clearly stated in the title or abstract.	Reported in abstract Reported in abstract Reported in abstract
Introduction					
Background rationale	2	Explain the scientific background and rationale for the investigation being reported			
Objectives	3	State specific objectives, including any prespecified hypotheses			
Methods					
Study Design	4	Present key elements of study design early in the paper			
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection			

Participants	6	*(a) Cohort study* - Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study* - Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study* - Give the eligibility criteria, and the sources and methods of selection of participants *(b) Cohort study* - For matched studies, give matching criteria and number of exposed and unexposed *Case-control study* - For matched studies, give matching criteria and the number of controls per case		RECORD 6.1: The methods of study population selection (such as codes or algorithms used to identify subjects) should be listed in detail. If this is not possible, an explanation should be provided. RECORD 6.2: Any validation studies of the codes or algorithms used to select the population should be referenced. If validation was conducted for this study and not published elsewhere, detailed methods and results should be provided. RECORD 6.3: If the study involved linkage of databases, consider use of a flow diagram or other graphical display to demonstrate the data linkage process, including the number of individuals with linked data at each stage.	Described in study population part of method section (page 2 main document) Not applicable Names of data sets used are included in supplementary table 1
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable.		RECORD 7.1: A complete list of codes and algorithms used to classify exposures, outcomes, confounders, and effect modifiers should be provided. If these cannot be reported, an explanation should be provided.	All outcomes and predictors are described in the method section (page 2 and 3 main document)
Data sources/ measurement	8	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group			

Bias	9	Describe any efforts to address potential sources of bias			
Study size	10	Explain how the study size was arrived at			
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen, and why			
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding (b) Describe any methods used to examine subgroups and interactions (c) Explain how missing data were addressed (d) *Cohort study* - If applicable, explain how loss to follow-up was addressed *Case-control study* - If applicable, explain how matching of cases and controls was addressed *Cross-sectional study* - If applicable, describe analytical methods taking account of sampling strategy (e) Describe any sensitivity analyses			
Data access and cleaning methods		..		RECORD 12.1: Authors should describe the extent to which the investigators had access to the database population used to create the study population.	Described in study design part of method section. (page 2 main document)

				RECORD 12.2: Authors should provide information on the data cleaning methods used in the study.	Not applicable (data are cleaned by Statistics Netherlands)
Linkage		..		RECORD 12.3: State whether the study included person-level, institutional-level, or other data linkage across two or more databases. The methods of linkage and methods of linkage quality evaluation should be provided.	data and linkage are described in study design part of the method section and supplementary table I. Result is described in study population part of the method section. (page 2 of main document)
Results					
Participants	13	(a) Report the numbers of individuals at each stage of the study (*e.g.*, numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed) (b) Give reasons for non-participation at each stage. (c) Consider use of a flow diagram		RECORD 13.1: Describe in detail the selection of the persons included in the study (*i.e.,* study population selection) including filtering based on data quality, data availability and linkage. The selection of included persons can be described in the text and/or by means of the study flow diagram.	Described in study population part of the method section. (page 2 of main document)
Descriptive data	14	(a) Give characteristics of study participants (*e.g.*, demographic, clinical, social) and information on exposures and potential confounders (b) Indicate the number of participants with missing data for each variable of interest			

		(c) *Cohort study* - summarise follow-up time (*e.g.*, average and total amount)			
Outcome data	15	*Cohort study* - Report numbers of outcome events or summary measures over time *Case-control study* - Report numbers in each exposure category, or summary measures of exposure *Cross-sectional study* - Report numbers of outcome events or summary measures			
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g., 95% confidence interval). Make clear which confounders were adjusted for and why they were included (b) Report category boundaries when continuous variables were categorized (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period			
Other analyses	17	Report other analyses done—e.g., analyses of subgroups and interactions, and sensitivity analyses			
Discussion					
Key results	18	Summarise key results with reference to study objectives			
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision.		RECORD 19.1: Discuss the implications of using data that were not created or collected to answer the specific research question(s). Include	Discussed in limitation section on the penultimate page

		Discuss both direction and magnitude of any potential bias		discussion of misclassification bias, unmeasured confounding, missing data, and changing eligibility over time, as they pertain to the study being reported.	of the discussion (page 9 of main document)
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence			
Generalisability	21	Discuss the generalisability (external validity) of the study results			
Other Information					
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based			
Accessibility of protocol, raw data, and programming code		..		RECORD 22.1: Authors should provide information on how to access any supplemental information such as the study protocol, raw data, or programming code.	Access to raw data is described in Data availability Statement section below the main text (page 10 of main document).

*Reference: Benchimol EI, Smeeth L, Guttmann A, Harron K, Moher D, Petersen I, Sørensen HT, von Elm E, Langan SM, the RECORD Working Committee. The REporting of studies Conducted using Observational Routinely-collected health Data (RECORD) Statement. *PLoS Medicine* 2015; in press.